



# Entre communisme et capitalisme Essais sur l'évolution des inégalités de revenus et de patrimoines en Europe de l'Est 1890-2015 (République Tchèque, Pologne, Bulgarie, Croatie, Slovénie, Russie)

Filip Novokmet

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Filip Novokmet. Entre communisme et capitalisme Essais sur l'évolution des inégalités de revenus et de patrimoines en Europe de l'Est 1890-2015 (République Tchèque, Pologne, Bulgarie, Croatie, Slovénie, Russie). Economies et finances. École des hautes études en sciences sociales (EHESS), 2017. Français. NNT : 2017EHES0162 . tel-03168309

**HAL Id: tel-03168309**

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**Ecole des Hautes Etudes en Sciences Sociales**

**THESE**

Pour l'obtention du grade de docteur en Sciences Économiques  
de l'École des Hautes Études en Sciences Sociales

*Présentée et soutenue publiquement à Paris le 11 décembre 2017 par :*

Filip NOVOKMET

**Entre communisme et capitalisme :  
essais sur l'évolution des inégalités de revenus et de  
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(République Tchèque, Pologne, Bulgarie, Croatie, Slovénie, Russie)

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**Ecole des Hautes Etudes en Sciences Sociales**

**PhD Thesis**

Submitted to École des Hautes Études en Sciences Sociales  
For the Degree of Doctor of Philosophy in Economics

*Prepared and defended at Paris School of Economics on December 11, 2017 by :*

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**Between communism and capitalism :  
essays on the evolution of income and wealth inequality  
in Eastern Europe 1890-2015**

(Czech Republic, Poland, Bulgaria, Croatia, Slovenia, Russia)

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# Acknowledgments

This thesis would not have been possible without the help and support of a great many people. First, my sincerest gratitude goes to Thomas Piketty, who has been an outstanding thesis advisor. I am immensely indebted to him for the guidance, continuous support, patience and encouragement. I am especially grateful to my thesis reporters, Branko Milanović and Sergei Guriev, whose invaluable comments and suggestions greatly contributed to the improvement of this thesis. I would also like to thank the other members of my thesis jury, Alain Blum, Giles Postel-Vinay and Facundo Alvaredo. I am much honoured to have such a splendid jury. I must further thank my co-authors, Pawel Bukowski, Leonard Kukić, Stefan Nikolić and Gabriel Zucman. Working with them has been a pleasure and a truly enriching experience, and this thesis would not have been completed without them. I owe much to many scholars whose kind advices influenced me to engage in the present research, in the first place to the late Tony Atkinson, then to Patrick Wallis, Branko Milanović, and many others. Special thanks goes to Pawel Bukowski and Jonathan Goupille for their generous help at various stages of writing this thesis. Special acknowledgments go to Facundo Alvaredo and numerous individuals from the World Wealth and Income Database and the Paris School of Economics for continuous support and excellent working conditions. Thanks to my office colleagues, Alexandre, Brice, Jonathan and Simon, for the great atmosphere in the office during my stays in Paris. Finally, I would like to thank my family and friends for their patience and unconditional support. This thesis would not have been possible without the help of my parents in law Ivanka and Ivan, my mother and Anita. The greatest gratitude goes to my wife Kristina for her love and sacrifice, and for each new day with Paula and Ivan.

*In memory of my father*

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# Introduction

*Man's mind cannot grasp the causes of events in their completeness, but the desire to find those causes is implanted in man's soul. And without considering the multiplicity and complexity of the conditions any one of which taken separately may seem to be the cause, he snatches at the first approximation to a cause that seems to him intelligible and says: "This is the cause!"*

Lev Tolstoy, *War and Peace* (Book 13, Ch. 1)

This dissertation studies the evolution of income and wealth inequality in former communist countries in Eastern Europe from the nineteenth century up to the present. It brings together chapters that explore the historical inequality trends in six different countries: the Czech Republic, Poland, Bulgaria, Croatia, Slovenia and Russia. A uniting theme – conveyed in the dissertation's title 'between communism and capitalism' – and a distinguishing feature of the countries studied in the dissertation is the emphasis on a unique experience of living under the two major economic systems of the modern age. This unique experience also figures prominently in inequality research agenda and naturally calls for the comprehensive study of inequality patterns in former communist countries. Moreover, without the risk of exaggeration, we believe that these countries present at the moment the most compelling historical case studies in the global inequality agenda. The potential benefits of studying inequality in former communist countries are substantial, whether the goal is to better understand the role of institutions, ideology, or politics in shaping inequality, or to provide an important reference point for the comparative analysis looking at the relationship between inequality and the economic growth.

However, any serious attempt to assess the long-term inequality trends in former socialist countries has been hampered by the lack of the empirical evidence. The commonly used data sources deal with shorter time periods and are seldom comparable across countries. This work aims to address these issues by constructing long-term homogenous series of income concentration in Eastern Europe, comparable both over time and across countries. As a result, this dissertation has been primarily an economic history project, a laborious work of data collection, data analyzing and series construction. By insisting on historical perspective, the tax data lie at the heart of this project. The tax data are a unique source for social scientists interested in studying income inequality over the long run. It is their availability, often extending over the whole twentieth century and before, that

makes them unique in comparison to other data sources. This unusual historical extent, coupled with the regular frequency of observations, presents a critical aspect for understanding the evolution of income and wealth distribution, which is characteristically manifested in long-term structural processes, such as the shift from the agricultural to the industrial world (Kuznets 1955), effects of progressive taxation on wealth accumulation and concentration or the importance of inheritance (Piketty 2011), etc.

Recently, the income tax data has been used in a systematic manner to construct top incomes shares for a number of countries worldwide. Top income research has made a remarkable progress in charting long-term income inequality patterns, providing at the same time broad historical and international perspective (Kuznets 1953; Piketty 2001, 2014; Atkinson and Piketty 2007, 2010; Atkinson, Piketty and Saez 2011; Roine and Waldenstrom 2015). The main findings that emerge from this literature suggest that inequality sharply decreased in most countries in the first half of the twentieth century due to shocks to top capital incomes, such as destructions of world wars, major macroeconomic shocks, the changing political and ideological environment, etc. In the post-WW2 decades, top shares did not recover from these shocks and displayed a broad stability at the lower levels. In recent decades, however, there has been a divergent trend between countries, on the one hand a sharp rise of top income shares in Anglo-Saxon countries, while moderate in most of the other (Atkinson, Piketty and Saez 2011; Roine and Waldenstrom 2015).

This dissertation builds on this literature by constructing top income shares series for the ex-communist countries in Eastern Europe. As such, the series allow the analysis of long-term inequality trends in Eastern Europe, being at the same time a bridge to the pre-Communist period and a reference point for international comparison. This ‘two-dimensional’ perspective puts a special emphasis on distinguishing between global from country specific forces driving inequality. On the one hand, we aim to understand whether the inequality dynamics in Eastern Europe has been truly unique in comparison to the experience of non-communist countries, that is, whether we can identify some common patterns in the evolution of inequality in Eastern Europe. On the other, it is necessary to realize the diversity between ex-communist countries and look at their specific historical experience. Consequently, there is a need for a comprehensive historical analysis of inequality in particular countries. For example, the historical picture unveils the great diversity of pre-communist Eastern Europe.<sup>1</sup> Forces shaping inequality in the nineteenth century were markedly different in Tsarist Russia, Habsburg Bohemia, Prussian Poland or Ottoman Bulgaria. In the same manner, an appreciation of the diversity of the socialist model between countries (for example, the Soviet

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<sup>1</sup> Actually without strong rationale for such grouping in the first place; see, for example, Wolf (1994) on the intellectual history of the term.



Union versus Yugoslavia), may cast light on the emerging post-transition institutional framework, and, as a result, on different inequality equilibria. The mere fact that we are posing these questions, and, more importantly, that we can speak in response, presents one important contribution of the dissertation.

The methodological approach consists in using tabulations of personal income tax returns, organized by a large number of income brackets, providing for each bracket the number of taxpayers and the corresponding income. Income shares of specific top groups are obtained by relating information in tax statistics to reference totals for population and income (Atkinson 2007). For certain countries in the recent period, we have an access to individual level digital data, which has allowed detailed analysis. Exhaustive treatment of methodology and data sources is provided in chapter appendices.

This dissertation consists from six separate chapters.

Chapter 1 investigates the evolution of income inequality in the Czech Lands from the end of the nineteenth century until the present day. The chapter presents the new top incomes shares series in the 1898-2015 period. The main finding is that income inequality experienced the U-shaped evolution over the course of the twentieth century. High top income shares levels in the first half of the century were due to high concentration of capital income at the top of the income distribution. Equally, shocks to top capital incomes were the main reason behind the secular fall in inequality. A sharp decline in top shares in the first half of the twentieth century was largely due to a drop in the top percentile share, while lower top income groups of top decile, consisting mainly of labor income, have displayed more stable pattern. After residing at very low levels featured by remarkable stability for several decades, top income shares have increased after the fall of communism. The transition to the market economy saw a rise in both top labour and top capital incomes, but, in contrast to the pre-socialist period, there is a higher prominence of the working rich at the top. The chapter examines the specific historical context underlying documented patterns, especially viewed through the prism of multiple dimensions of wealth ownership. It emphasizes the critical role played by the interaction between private, public and foreign capital in shaping top income patterns. Except for the socialist period, when the bulk of wealth was in the public ownership, the holders of top capital incomes have disproportionately been foreigners.

Chapter 2 presents the history of top incomes in Poland from the time of Partitions to the present. It documents a U-shaped evolution of top income shares from the end of the 19th century. The initial high level, during the period of Partitions, was due to the higher concentration of capital income at the top of the distribution. The long-run downward trend in top incomes was primarily induced by shocks to capital income, from destructions of world

wars to changed political and ideological environment. The Great Depression, however, led to a rise in top shares as the richest were less adversely affected than the majority of population consisting of smallholding farmers. The introduction of communism abruptly reduced inequalities by eliminating private capital income and compressing earnings, and top incomes stagnated at low levels during the whole communist period. After the fall of communism, the Polish top incomes experienced a substantial and steady rise and today are at the level of more unequal European countries. While the initial upward adjustment during the transition in the 1990s was induced both by the rise of top labor and capital incomes, the strong rise of top income shares in 2000s was driven solely by the increase in top capital incomes, which make the dominant income source at the top. The chapter aims to explain these developments in the light of processes associated with the globalization.

Chapter 3 presents two novel datasets that are used to analyze inequality patterns in Bulgaria in the first half of the 20<sup>th</sup> century: 'dynamic social tables' and top income shares. The main finding is that inequality was relatively low in pre-industrial Bulgaria. This is explained in the framework of the sectoral development of the country and the absence of the structural change. In predominantly agricultural Bulgaria, poor and egalitarian primary sector constrained inequality in line with the logic of the 'inequality possibility frontier'. The inequality dynamics was largely driven by changes in the urban-rural income gap. On the other hand, both lower top incomes shares and their pronounced stability is explained by the absence of large capital incomes, which itself is attributed to the pre-industrial character of the country.

Chapter 4 examines the evolution of inequality in two former Yugoslav constituent republics, Croatia and Slovenia, in the period from the 1960s to present day. It finds that the transition to the market economy has led to a moderate increase in income inequality in both countries. Inequality increased in the 1990s and stabilized afterwards. This development is explained by the most 'gradual' transition course among the former communist countries. It is argued that in both countries, the slow privatization and the large public sector have contributed to the emergence of institutions that procured low inequality social equilibrium. The chapter also analyzes social groups in top incomes during the Yugoslav self-management in order to understand how prevailing power relations might have influenced the specific transition path and the emerging institutional framework.

Chapter 5 investigates 'capital transformation' from the central planning to the market economy in Eastern Europe. Using the national accounting framework, it analyzes the evolution of the national, private, public and foreign wealth in the Czech Republic from 1970 until 2015. The national wealth-income ratio declined in the 1990s and it has stagnated since the 2000s. A decline was caused by the sharp drop in public wealth-income ratio. It is

advanced that the communist capital was partly lost through the 'creative destruction', deficient restructuring and negative manifestations of the privatization. As a result, the mass give-away privatization of state enterprises has not enriched the Czech households. A brief episode of the 'Czech capitalism' was succeeded by the 'global' capitalism, where convergence has been based on the foreign capital. It is found that foreigners have obtained positive real capital gains on their capital, suggesting more successful restructuring and higher productivity gains of foreign-owned firms. On the other hand, it is showed that the housing privatization and marketization have been the main building blocks for the formation of the private wealth in Eastern Europe.

Chapter 6, the final chapter of the dissertation, examines the evolution of income and wealth inequality in Russia. It presents new series on the accumulation and distribution of income and wealth in Russia from the Soviet period until the present day. The main finding is that inequality has spectacularly increased in Russia during this period, substantially more than in other ex-communist countries in Eastern Europe. Top income shares are now similar to the levels observed in the United States. This is related to the specific transition strategy followed in Russia. The chapter provides the first complete balance sheets for private, public, and national wealth in post-Soviet Russia, including an estimate for offshore wealth. It is found that the wealth held offshore by rich Russians is about three times larger than official net foreign reserves, and is comparable in magnitude to total household financial assets held in Russia.

The emerging picture on long-term inequality trends in Eastern Europe suggests that broad patterns are not altogether different from those documented in non-communist countries over the course of the twentieth century. Top income shares were high at the beginning of the twentieth century. Consistent with the findings of the top incomes literature, the secular decline in inequality was largely due to shocks to top capital incomes, however with a clear feature that Communism entirely eliminated private capital income in Eastern European countries. Lower top groups of the top decile experienced more stable pattern, notwithstanding the communist compression of earnings. Communism itself was featured by stable and low (monetary) inequality.

Top income shares have increased in all studied countries after the fall of communism. This was in part inevitable, but there is a marked difference in the magnitude of the rise between countries. For example, Russia has experienced a striking rise of inequality, which has reached levels observed in the US and other world inequality leaders. In the same period, Slovenia has seen only a modest rise of inequality, showing levels similar to egalitarian Nordic countries. Poland, in turn, has assumed intermediate levels, converging to

German levels. Therefore, in order to explain these specific trajectories, or find “causes of events”, it is critical, as Tolstoy warned us, to recognize “multiplicity and complexity of the conditions” underlying the inequality dynamics in the post-communist transition. The sheer number of countries included in the analysis entails this outcome. In general, we have tried to abstain from boldly claiming “this is the cause!”, and have made efforts to analyze causes of events from multiple angles and, when thought appropriate, provided economic, political, institutional, or sociological perspective. Most importantly, the newly constructed series have made possible such analyses, and this is arguably the main contribution of this dissertation, and an asset for future studies.

## References:

Atkinson, A. B. (2007). "Measuring Top Incomes: Methodological Issues." In A. B. Atkinson and T. Piketty (eds.), *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries*, Oxford: Oxford University Press, pp. 18-42

Atkinson, A. B., and Piketty, T., ed. (2007). *Top incomes over the twentieth century: A Contrast between Continental European and English-speaking Countries*. Oxford: Oxford University Press

Atkinson, A. B., and Piketty, T., ed. (2010). *Top incomes: A global perspective*. Oxford: Oxford University Press

Atkinson, A. B., Piketty, T., and Saez E. (2011). "Top incomes in the long run of history." *Journal of economic literature*, 49(1), pp. 3–71.

Kuznets, S. (1953). *Shares of Upper Income Groups in Income and Savings*. New York: National Bureau of Economic Research

Kuznets, S. (1955). "Economic growth and income inequality". *American Economic Review*, 45, pp. 1-28.

Piketty, T. (2001). *Les hauts revenus en France au XXème siècle. Inégalités et redistributions, 1901-1998*. Grasset

Piketty, T. (2011). "On the Long-Run Evolution of Inheritance: France 1820-2050." *The Quarterly Journal of Economics*, 126(3), pp. 1071–1131.

Piketty, T. (2014). *Capital in the 21st century*, Cambridge MA: Belknap

Roine, J., and Waldenström, D. (2015). "Long-Run Trends in the Distribution of Income and Wealth." In A. B. Atkinson and F. Bourguignon (eds.), *Handbook of Income Distribution. Vol. 2B*, Elsevier, pp. 469- 592.

Wolff, L. (1994). *Inventing Eastern Europe: the map of civilization on the mind of the Enlightenment*. Stanford CA: Stanford University Press

# Chapter 1. The long-run evolution of inequality in the Czech Lands: Top income shares, 1898-2015

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## Abstract

This work analyses the evolution of the top income shares in the Czech Lands from the end of the 19th century until today. Top income shares followed a U-shaped evolution in the course of the 20<sup>th</sup> century. Higher shares in the first half of the 20th century were due to high concentration of capital income at the top of the income distribution. Equally, shocks to top capital incomes were the main force behind the secular fall in top concentration. Communism led to the virtual annihilation of private capital income and the stumbling of top income shares. A sharp decline in the first half of the twentieth century was largely due a drop in the top percentile share. After residing at very low levels featured by remarkable stability for several decades, top income shares have increased after the fall of communism. The transition to the market economy saw a rise in both top labour and top capital incomes. However, in contrast to the pre-communist period, there is a higher prominence of the working rich at the top. This evolution is explained by the continuous interplay of economic and political forces. The Czech Republic is the suggestive example of the critical role played by the interaction between private, public and foreign capital in shaping top income patterns. Except for the socialist period, when the bulk of wealth was in the public ownership, the holders of top capital incomes have disproportionately been foreigners.

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\* A part of this work is based on my master thesis (Novokmet 2011)

## 1.1. Introduction

This chapter investigates the long-term development of income inequality in the Czech Republic. We construct top income shares from the 1890s until the present day using the income tax data. This outstanding historical reach has been the main motivation to engage in the present project of charting historical patterns of inequality in Central Eastern Europe. We aim to outline the inequality development over time and to understand forces that have been driving it. At the same time, our goal is to contribute to the general understanding of historical processes in Central Eastern Europe. The extension of the Czech series all the way back to the end of the 19th century raises a broad range of issues, which still need to be tackled in the Central Eastern European economic history.

The use of tax data has been central to understand the evolution of the income and wealth distribution. It is their availability – often extending over the whole 20<sup>th</sup> century and before – that makes them unique in comparison to other commonly used sources. The long-term perspective is critical since the evolution of income distribution is characteristically manifested in longer structural processes, such as the shift from agricultural to industrial world (Kuznets 1955), effects of progressive taxation on capital concentration or the importance of inheritance (Piketty 2011), etc. The recent application of income tax data in the top incomes research has resulted in the fascinating work (Atkinson and Piketty 2007, 2010), which has provided a broad historical perspective of income inequality in the international context. The most valuable asset of the whole effort has been its empirical contribution which is visible in data series that are “homogenous across countries, annual, long-run, and broken down by income source for most countries” (Atkinson et al. 2011, p. 4).

The availability of the income tax data for the Czech Lands all the way back to the 19<sup>th</sup> century has allowed us to shed a light on the long-term evolution of inequality in the Czech Lands and to analyse the country’s experience in the international perspective. We provide first homogeneous series of top income shares in Czech Lands that allows comparability both through time and across countries. As such, we believe it to be the best available indicator of the long-term development of inequality in the Czech Lands. In addition, an insight into particular income sources of top groups has broaden our understanding of the role that various economic, institutional or political factors have played in the evolution of top incomes.

The main finding is that top income shares followed the U-shaped evolution of top incomes in the course of the 20<sup>th</sup> century. Top income shares attained the highest levels during the Habsburg period and surged during the First World War, which signified its secular peak. Subsequently, top income shares experienced a long-term falling trend. Communism was featured by the marked stability of top income shares at low levels. The transition to the market economy saw a rise in both top capital and top labour incomes.

The most important force underlying the evolution of inequality were changes to the concentration of the capital income at the top. Thus, higher shares in the first half of the 20<sup>th</sup> century were a consequence of the stronger concentration of capital income at the top of the income distribution. We relate high shares during the Habsburg era to the specific industrialization course in Central Europe, disproportionately benefiting top capital incomes. The secular decline in top incomes was equally ‘capital income phenomenon’, since shocks to the concentration of capital income were the main force behind an overall decline in inequality (Piketty 2001; Roine and Waldenstrom 2015). Major shocks such as the wars, the Great Depression, as well as anti-capitalist redistributive policies, had a decisive impact on the long-term reduction of inequality by striking the ‘capitalist’ top of the distribution. Czechoslovakia in addition provides, with the introduction of the communism, the most extreme example of the exogenous shock thoroughly modifying the income distribution. The complete elimination of private capital income resulted in a sharp drop in top income shares and the wealthy virtually ceased to exist.

On the other hand, top earnings exhibited relatively more stable pattern. A development of top earnings in the first half of the century is broadly indicated by the evolution of the top shares below the top percentile (e.g. top 5-1%). These were hurt during the WW1, but its relative standing had improved in the First Republic. Further, top earnings fared relatively well through the Great Depression due to wage rigidity during the prolonged deflation. However, they were struck by Nazi wage equalization, and the communist policy was only a continuation of this course. The socialist period was characterized by low and stable inequality of earnings, to the point that the notion of ‘Czech egalitarianism’ was coined.<sup>1</sup>

The outlined evolution clearly suggests that it is important to distinguish economic factors from the non-economic - such as political, institutional, or cultural factors - when accounting for

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<sup>1</sup> The phrase goes back to Connor (1979) (see Atkinson 2008, p. 174).



changes in inequality. Top incomes were shaped by the inextricable workings of economic and political forces. The interrelationship of the economic and political spheres was markedly different during pre-WWI Habsburg era, the First Republic, the Protectorate, the Socialist Republic, or the recent post-socialist era, which is accordingly reflected in the evolution of top income shares. For example, the episodes of boosts to business profits during the state economy in the late 1930s and later under the German occupation provide a clear evidence of the importance of the political variables in shaping distribution patterns.

Consequently, top income research need to inevitably stretch to other research areas and calls for an interdisciplinary approach. The sheer creation of the term ‘Czech egalitarianism’ reveals deficiencies of a solely economic reasoning when trying to explain the evolution of inequality. For example, after pointing to inadequacy of various economic arguments in explaining this phenomenon, Atkinson (2008, p. 49) points to Teichova’s (1988, p. 101) observation that “the desire for greater equality had deep historical roots in the social consciousness of the broad segments of society”. Večerník (1996, p. 212) similarly mentions the “social-democratic profile of the Czech nation” which was built from “plebeian roots”. However, this almost ‘Tocquevillian’<sup>2</sup> reasoning, relating initial social conditions to egalitarian and democratic character of the society (both thought to be true for the Czech Lands), should be put in the context. Most importantly, these narratives need to take into account the critical role that wealth concentration has played in the evolution of inequality. And it had been far from egalitarian.

The distribution of the capital ownership is the axis around which various dimensions of distributional conflict in the Czech Lands manifested, and, one should not, therefore, disregard the rich history of ethnic, class and political struggles and competitions when analysing the long-term evolution of inequality. A striking land concentration in the hands of the ‘foreign’ Habsburg nobility aroused strong feelings among predominantly agricultural population in Central Eastern Europe. Disproportionally larger role of the landholding nobility as the ‘capitalist class’ heightened further the ‘social consciousness’ (Gellner 1983; Hroch 1985, 2015, etc.). Equally, industrialization in Central Eastern Europe was featured by what Berend (1989) called the “missing indigenous middle class”, where Germans and Jews had to fill positions created by modern economy. To a certain extent, ‘Czech egalitarianism’ could be also seen as the reaction to the disproportionally higher ‘foreign’ component of top income shares until the end of WWII.

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<sup>2</sup> E.g. Tocqueville 1838, ch.3; another popular argument relates it to the protestant tradition of Hussism

As we show, these dividing lines especially sharpened during the key junctures in the country's history, such as during the World Wars or the Nazi occupation.

A multidimensional character of the distributional conflict critically impacted top income shares as conflicts had largely been centred on the wealth redistribution. Therefore, it affected the concentration of capital income, and, in turn, top income shares. Accordingly, we pay special attention to the historical context of major distributional struggles, such as the 'nostrification', the land reform, the progressive capital taxation, 'Aryanization' or communist nationalization. Furthermore, the balance between private, public and foreign capital has been another dimension affecting the top income shares through concentration of capital income. The corporate wealth has been traditionally concentrated in the Czech Lands (Teichova 1974; see chapter 5), and larger state ownership during Communism or foreign ownership both before Communism and subsequently, have made the concentration of private capital income less pronounced at the top of the income distribution.

Finally, this research has emphasized a need to take a long-run perspective to understand changes in income distribution. In this respect, top income research has done a tremendous leap forward in response to Atkinson's (1997) call to "bringing income distribution out of cold". New top income series allow us the analysis of historical trajectories that go beyond strictly distributional concerns, providing us with valuable insights during the critical moments of country's history such as industrialization, forming of the nation, wars and occupation, the introduction of communism and its eventual fall. It raises new issues and calls for new research in the Czech and Central European economic history.

The paper is organised as follows. Section 2 describes data sources and methodology. Section 3 outlines main trends of the top income shares since the end of the 19th century until today. Sections 4 to 7 analyse top income shares in particular time periods: in Imperial Austria, during the First Republic, during Communist Czechoslovakia and after the fall of communism. Section 8 compares the estimates for the Czech Republic with other countries. Section 9 concludes. The details of the data and estimation are discussed in the appendix

## 1.2. Data and methodology

The methodological approach used to construct top income shares was introduced by Simon Kuznets (1953) who first combined income tax data with external controls for the income and population totals to estimate top income shares for the United States. The work was revived by Thomas Piketty's (2001; 2003) work on top incomes in France, and has been intensified since, resulting in data series for more than thirty countries.

We have used the income tax statistics to construct top income series in the Czech Lands from 1898, which is the year of the introduction of the modern income tax in Imperial Austria. Since then, the tax return statistics had been published annually in a tabulation form for each province of Imperial Austria<sup>3</sup> until the outbreak of WWI. After the dissolution of Austria-Hungary, newly established First Czechoslovak Republic inherited its tax system. This, however, implied that two markedly different tax systems had operated in the Czech Lands and Slovakia – as a consequence of different tax legislations between the Austrian (Cisleithania) and the Hungarian (Transleithania) part of the Monarchy. A much-needed reform toward modern unified tax system, focused on direct taxes, was accomplished in 1927. Most importantly for our purposes, it resulted in renewed publishing of income tax statistics. Publication continued also under the German occupation. Unfortunately, we could not rely on the same source in order to assess the evolution of top incomes after the Second World War. The introduction of communism signified a major break in the data comparability. We therefore use alternative distribution sources to ascertain general trends in top inequality in communism and the subsequent transition to market economy: the household budget survey (the Czechoslovak Microcensus) and Employer Censuses of all workers. Finally, for the recent decade (2005-2015), our estimates are based on the statistics of personal income tax returns. These are used in combination with household survey data (EU-SILC) to estimate the whole income distribution. Namely, tax data on high-income individuals are used to correct the top of the income distribution in the survey, by assuming the piecewise-linear correction factors  $f(p)$  above percentiles for which the survey is held to be representative up to the percentiles in the tax data (see Piketty, Yang and Zucman 2017 and chapter 6). See appendix for all details.

The preferred income definition refers to gross income, before all personal deductions and personal income tax, but after deductions from revenues of costs needed to obtain and secure

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<sup>3</sup> Here we use the term Imperial Austria for the Austrian part (the so-called Cisleithania) of Austria-Hungary.

income. In general, the coverage of income reported on the tax return for the earlier periods was quite comprehensive, allowing very few exemptions. It included wages and salaries, business and self-employment income, capital income, rental income, income from land, as well as certain non-monetary incomes such as imputed rents of homeowners. For the communist period, we use the income reported in the Microcensus and gross earnings reported in Employer Surveys. Both give almost identical results, since earnings present a reliable indicator of the total income evolution due to the complete elimination of private income in communist Czechoslovakia.

Top income groups are defined according to the definition of the tax unit in the tax code. The tax unit in the Habsburg and in the interwar period was household, defined as a married couple with dependants. Therefore, the total number of tax units is taken as all adults minus the number of married females. The corresponding data are found in population censuses with estimates for in-between years linearly interpolated and complemented from the annual reports of the Movement of population. For the communist and the recent period, the unit of analysis has been individual, and we take all adults as the population control total. The total income of all potential tax units is estimated from personal income in National Accounts. For the interwar period, we use the historical national accounts of Stadnik (1946), Pryor et al. (1971) and Krejčí (1972, 1986). For the Habsburg era we use estimates of Schulze (2000, 2005, 2007), making necessary adjustments as described in the appendix. Finally, we obtain thresholds and average income of specific fractiles of interest by assuming the Pareto distribution for the upper tail of the income distribution. Top income shares are estimated by taking the income of corresponding fractile group as the proportion of estimated income. For the recent years, we apply generalized Pareto interpolation (Blanchet, Fournier and Piketty 2017)

### **1.3. The long-term evolution of top income shares**

Figure 1 presents the evolution of the top 1 per cent and the top 5-1 per cent income share in the Czech Republic from 1897 until 2015. Through the course of the 20th century top incomes experienced a marked U-shaped pattern, with communism marking the low point. In this period, we can clearly distinguish four distinctive subperiods in the evolution of top income shares: the period in Imperial Austria, the period of the First Czechoslovak Republic in interwar years and during the German occupation and WWII, the communist era, and finally the post-communist period. Accordingly, we look separately at each below.

Top 1 per cent income share had been stable at roughly 14 per cent at the beginning of the twentieth century until the First World War, when it jumped to almost 18 per cent, which signified its secular peak. The subsequent two decades saw a continuously declining pattern. The top percentile's share first fell during the interwar period, and then stumbled with the advent of the communism, after which it plateaued at levels slightly below 3 per cent for almost three decades. It has risen since the end of communism, and in the recent years has been at levels slightly below 10 per cent of the total income – thus still lower than in the first half of the twentieth century. The 'next 4 per cent' also underwent a U-shaped evolution, but it was characterized by strong upheavals in the first half of the twentieth century, and the post-WWII fall was less stunning than in the case of the top percentile. Especially remarking is the different experience with the communist accession to power in 1946, where the top 1 per cent share literally halved, while the top 5-1 per cent share remained the same.

Therefore, and this needs to be stressed repeatedly, in order to understand the evolution of top income shares it is critical to look at the development of various top income groups, which frequently exhibit different income composition and are representative of distinct social groups. Correspondingly, we can analyse the evolution of the top 1% per cent and the top 5-1% as indicative of the evolution of top capital and top labour incomes, respectively. Moreover, it is useful to look into the development of the very top groups. Figure 2 thus presents together three constituent parts of top 1 per cent: the share of the top 0.1 per cent which marks the very top of the distribution, the share of the 0.5–0.1 per cent group right under it, and the share for the remaining 0.5 per cent (1–0.5%). It can be seen that the top 0.1 per cent experienced quite pronounced shifts, and that it was the main driving force behind the evolution of the top percentile in the first half of the twentieth century. The lower two groups, on the other hand, besides taking part in an overall secular fall with the introduction of communism, have generally displayed more stable patterns. For example, top 0.1 per cent income share was the chief force behind a surge during WW1, a marked V-pattern from 1927 until 1943, a plunge immediately after WW2, or a drop during the recent crisis,

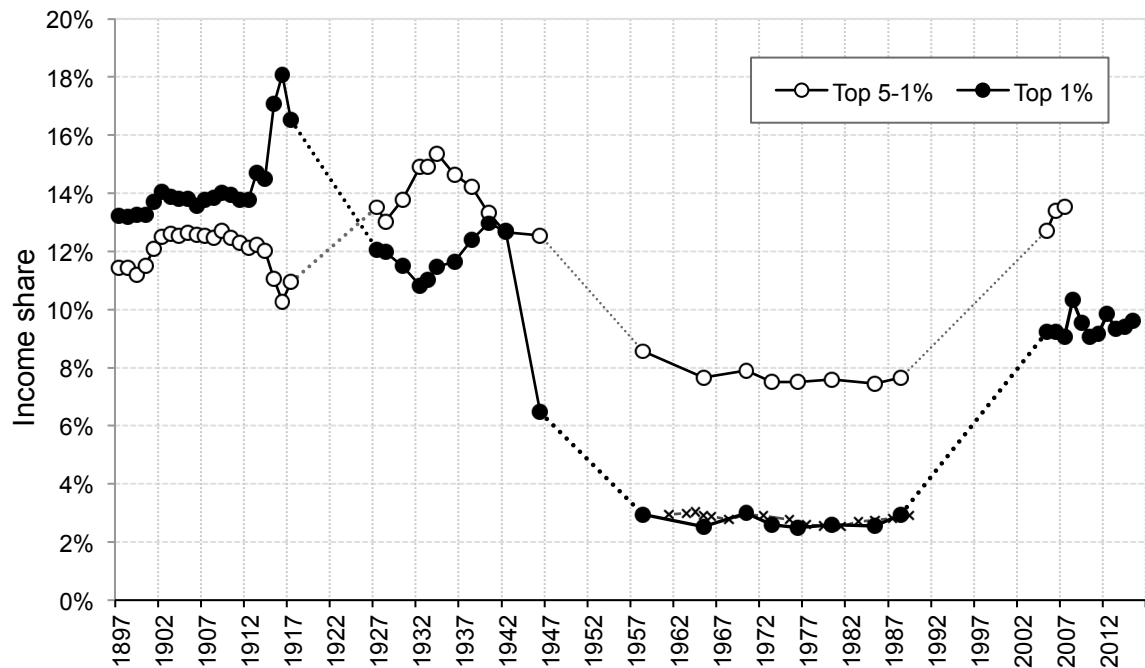


Figure 1: Top 1 per cent and top 5-1 per cent in the Czech Republic

Source: Author's computation based on income tax data

Note: Alternative series of the top 1 per cent income share for 1959-1987 are constructed from Employer census of all workers (see appendix)

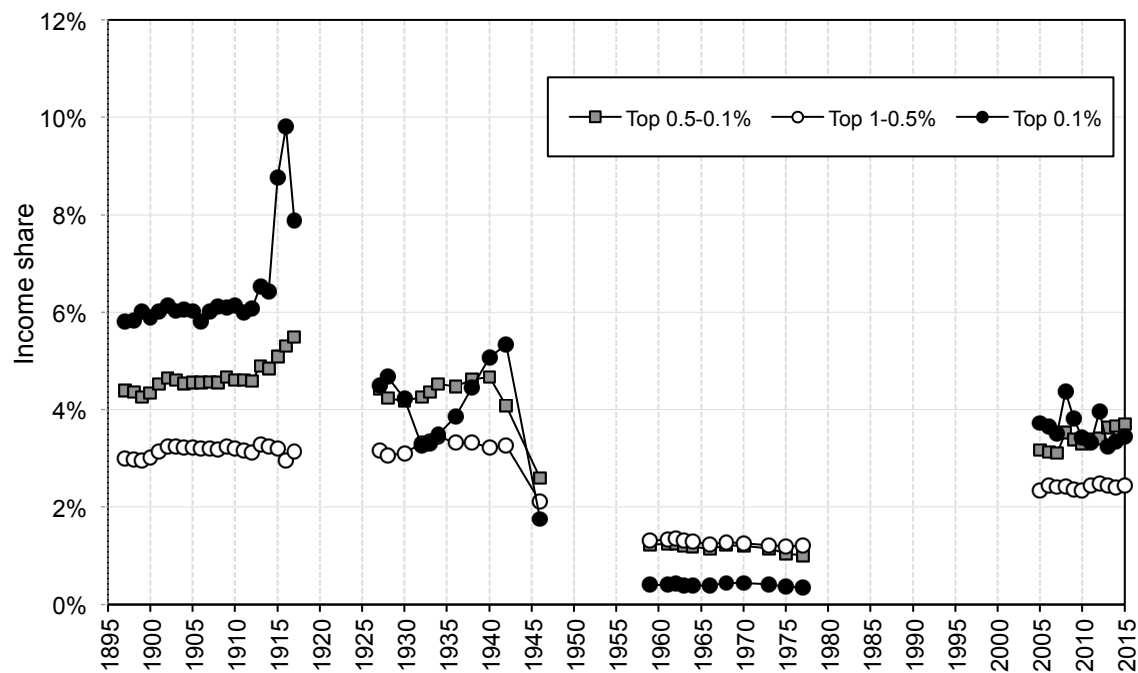


Figure 2: The decomposition of the top 1 per cent in the Czech Republic

Source: own calculation based on income tax data; estimates for 1959-1979 based on employer census of all workers

Note: 1927-1938 refers to the First Czechoslovak Republic; 1938-1944 to the Protectorate of Bohemia and Moravia;

## 1.4. The Czech Lands in Imperial Austria

### 1.4.1. The historical background: Industrialization in Central Europe

The Czech Lands were among the most developed region of the Habsburg Empire. The country has been rich in raw materials and located on important trade routes, especially its capital Prague. It abounded with highly skilled labour force, with the general educational attainment among highest in Europe.<sup>4</sup> The Lands prided itself on the centuries-long tradition of manufacturing, and many industries (such as textiles, the glass production, brewing, sugar refining, metallurgy etc.) were renowned outside its borders. In the simple outline, industrialization followed there the natural ('British-style') course, from textiles (to) and commercial agriculture, and later to heavy industry and engineering (Teichova 1988). The Czech Lands comprised almost three-quarters of the Empire's industry, while taking at the same time the lead in the intensive agriculture, with the sugar beet and hop particularly important for the emergence of commercial agriculture. The country's economy consequently assumed a unique 'agrarian-industrial' character (Kubu 2005).

As a starting point, it is useful to situate oneself in a broader historical context of the long-term development in the Czech Lands. The best available indicator of the long-term development in living standards in the Czech Lands is recently constructed real wage series by Cvrcek (2013), which stretches as far back to the 'Pre-March' era (*Vormärz*). Figure 3 shows the evolution of the real wage of a labourer in the province of Bohemia from the 1820s up to WWI. An observed trajectory can be ascertained in rough outlines thorough the lenses of the Habsburg economic history. First, the *Vormärz* (1815-1848) was characterized by the wage stagnation. A decade following the Revolution of 1848 was accompanied by a moderate increase in the real wage (1848-1858), but wages stagnated during the next decade. The greatest spur occurred during the so-called 'Founding period' (*Gründerzeit*; 1867-1873), but a strong upswing was terminated by the great financial crush of 1873 (the Vienna stock market crash), followed by the severe depression (the 'Great Depression'). From the mid 1880s the rising wage pattern set in and lasted unceasingly until WW1.

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<sup>4</sup> Largely as a consequence of Habsburg education reforms, such as the introduction of compulsory primary education under Maria Theresa or compulsory eight year schooling in 1869 (Melton 1988).

From 1867, the real wage development can be compared with the evolution of real output per worker (Schulze 2000, 2007; Cicarelli and Missiaia 2014). Figure 3 suggests that output experienced the same sharp fall and stagnation during the depression years, but its recovery in the 1890s had outpaced the wage rise, especially at the end of the decade. However, in contrast to the wage evolution, the output growth was halted at the turn of the century and regained its strength only from the mid 1900s, when it again notably outstripped the wage growth. This pattern corresponds to the conventional narrative of 1896-1901 and 1906-1913 as periods of the strong economic upswing, and 1902-1906 of the economic stagnation in the Habsburg Monarchy (Rudolph 1976, Good 1978; Komlos 1983).

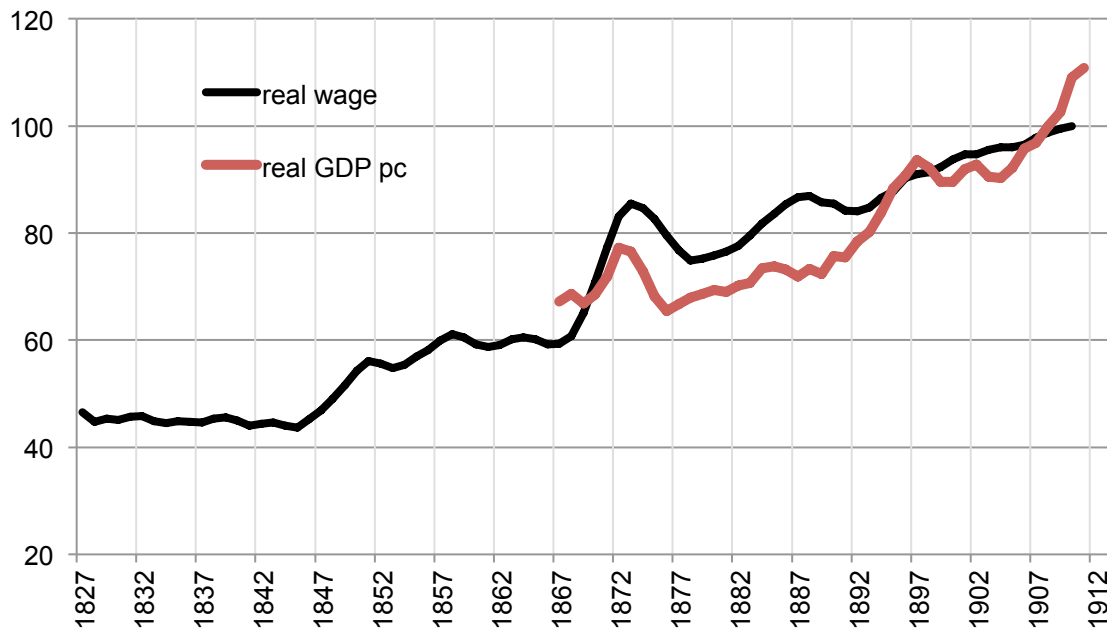


Figure 3: Development of real wage and real output per worker in Bohemia (1900=100)

Note: 3-year averages used to smooth series

Source: Real wage from Cvrček (2013), real GDP per capita from Schulze (2007) and Cicarelli and Missiaia (2014)



***Box 1: Distributional Effects of the Industrialization in Central Europe:***

***The 'classical' view***

Our analysis begins at dawn of the 20th century, which presents the culmination of the industrialization process accompanied by the thorough transformation of the Czech economy during the 'long nineteenth century'. The inevitable question intrinsic to this period is concerned with the distributional effect of industrialization. This question presents the crux of the literature on inverse-U (or Kuznets) curve. As is well known, Kuznets (1955) famously hypothesized that inequality rises in the early phases of industrialization,<sup>1</sup> but falls eventually at the more advanced stages of development. Consequently, a notion of the inverse-U (or Kuznets) curve was born. Although it is fair to say that the hypothesis has been somewhat 'overused', we believe that it is fair to raise it once more in the place of its origin, in Central Europe.<sup>2</sup> It is worth recalling that the rising inequality during the industrial take-off has been unambiguously confirmed only in the case of two German states, Saxony and Prussia, both neighbouring to the Czech Lands (Kaeble and Thomas 1991; Morrison 2000).

Industrialization of the Czech Lands evolved simultaneously and in direct contact with these areas. In general, one should not think of industrialization as occurring behind impregnable state borders (which were, besides, still very loosely defined at the time), but as a wider phenomenon shaped by day-to-day interactions and influences flowing between neighbouring regions. The historical link of the Czech Lands with German provinces was intense. The trade of the Czech lands had been traditionally oriented towards Germany (especially via the Elbe; Rudolph 1976, p. 45).<sup>3</sup> Most importantly, the local Germans, (later) more commonly referred to as Sudeten Germans, had been the constituent element in the Historic Lands and the important medium of transmitting new ideas and innovations from Germany and vice versa. Consequently, industrialization spread from these bordering areas, especially in the context of the common experience of the proto-industrialization in "the triangle of Saxony, Bohemia and Silesia" (Myška 1996, p. 188). Thus, it seems more natural to look at industrialization in Central Europe as a longer gradual process, rather than pinpointing specific (institutional) turning point, even if the critical one such as the Reform of 1848.<sup>4</sup>

The often-suggested mechanism behind rising inequality in Central Europe has been to attribute it to the rising capital share. Dumke (1991) thus finds that a rise of inequality during the industrialization in Prussia was related to the shift in the functional distribution of income towards capital income. The notion that early (modern) economic growth went along with rising profits and that the rich - necessarily at the time capitalists and great landlords - capture the greatest portion of the growth was obvious to contemporaries, such as Gustav Schmoller and adherents of the Historic school. Classical economists, together with the most of contemporaries, worked in a class-based framework and took for granted the fundamental inequality between capital (including profits and rents) and labour, where capital had resided at the top and labour at the bottom of the income distribution (hence, top incomes were essentially the 'capital income phenomenon'). Moreover, this inequality has been regarded as one of the stylized facts of the pre-WW1 social setting (Keynes 1919), allowing higher savings of the capitalist class (with higher propensity to save) and was beneficial for the capital accumulation, and hence for the economic growth. Kuznets (1955) also mentions the mechanism of concentrated saving in hands of high-income individuals. Accordingly, any shift in factor shares would have had an unambiguous impact on personal income distribution.<sup>6</sup>

Figure 3 thus suggests that the real wage in Czech Lands stagnated in the first half of the 19<sup>th</sup>

century, but embarked on the steady growth pattern in the second half of the century (Cvrček 2013). If the inception of industrialization (sparked by technology change) was accompanied by the general wage stagnation, then the onset of modern growth benefited the rich (following the discussion from above, there was a rise in capital share). Cvrček (2013) has surmised, based on “scattered” Kausel’s estimates of GDP in Cisleithania in the first half of the century, that there was an “upward trend in income per capita unfolding alongside stagnant real wages.” However, from the end of 1860s, there was a steady rise in wages, broadly in line with the output growth. We could thus say, following Robert Allen’s account for Britain (2007), that the Czech development was characterized by the two distinctive phases. The first was the so-called Engels’ pause, as Allen terms it, which is “the period of constant wages in the midst of rising output per worker”. The onset of the British Industrial Revolution was accompanied by the wage stagnation, but industrialization eventually contributed to the rise in workers’ living standard as well. Equally, Cvrček (2013, p. 26) believes that in Czech Lands “it seems that the economic growth eventually did trickle down all the way to common laborers and all social strata saw their fortunes improve.”

#### Reference:

<sup>1</sup> Or generally speaking, with the beginning of the modern economic growth. The common interpretation of the initial rise in inequality is the sectoral shift of workforce from (assumedly) less productive and less unequal agricultural sector to more productive and more unequal industrial/urban sector. Accordingly, inequality eventually falls due to the income compression in the non-agricultural sector.

<sup>2</sup> Kuznets was in fact influenced by the work of Procopovich (1926), who showed rising inequality in Prussia during the second half of the 19th century (e.g., Geinsberger and Mueller 1972; Dumke 1991; Grant 2005)

<sup>3</sup> Besides, overpowering influences flowing from Germany have induced many authors to see the Habsburg economy merely as a fringe of German-led Central European economy.

<sup>4</sup> The timing of the inception of the modern economic growth in the Habsburg Monarchy has been one of the most discussed issues in the Habsburg economic history this has been one of the (Marz, Rudolph, Komlos, Good, Gross, Schulze).

<sup>5</sup> Wages falling behind productivity advancements implied that capitalists could have reaped the benefits of the early growth through the increase of the profit share. The rising capital share assumedly led to the rise in the interpersonal inequality since capital income is generally more unequally distributed than the labour income, (e.g. see Atkinson and Bourginon 2000; Atkinson 2009). Allen (2009) has noted: “The surge in inequality was intrinsic to the growth process: technical change increased the demand for capital and raised the profit rate and capital’s share. The rise in profits, in turn, sustained the industrial revolution by financing the necessary capital accumulation.”

<sup>6</sup> As a rough approximation of the relative shift in factor shares we can take a divergent evolution of the productivity and the real wage (that is, the labour share  $LS=w/p$ , where  $w$  stands for the real wage and  $p$  for the real labour productivity; see Glyn 2009, p. 104).

### 1.4.2. Top income shares during the ‘Second Gründerzeit’

The expounded historical background is a useful conceptual framework to understand both the level and the evolution of top income shares from the start of the 20<sup>th</sup> century until the First World War. This was a period of the renewed economic expansion, sometimes labelled as the ‘Second founding period’ (*second Gründerzeit*) in Central Europe,<sup>5</sup> commonly related to the high point of the ‘Second Industrial Revolution’. A turn of the 19th to 20th century has been roughly

<sup>5</sup> Matis defines Second Gründerzeit’ as the 1896-1913 period.

identified as the peak of the inverse-U curve in (Central) Europe (e.g. Dumke 1991; Grant 2002;<sup>6</sup> Milanović 2016). In Prussia, as noted above, it presented a culmination of the steady rise of inequality that had lasted several decades, and was featured by the general stability in top shares until WW1.

Figure 4 suggests the similar evolution and levels of top shares in Prussia and Imperial Austria (Cisleithania) during two decades preceding WWI. Top income shares in Imperial Austria experienced slightly higher variability, in particular, they were more strongly hurt by the crisis in the early 1900s. But they generally moved in parallel to top incomes in Prussia, with a year to two lag. In fact, Good (1978, p. 180) posits that the international depression at the turn of the century came in Austria directly through Prussia. It seems that during this period top shares in both countries followed the business cycle fluctuation without a clear trend.

Following the above discussion, there was a sharp acceleration of the growth in mid 1890s where the output growth outpaced real wage (Figure 3). There was an increase in top shares during the economic boom of the 1890s,<sup>7</sup> which came to a halt with the turn-of-the-century depression. Good (1978, p. 97) has pointed out that there had been a shift towards capital share in Imperial Austria from the middle of the 1900s: “from this point real wages tended to stagnate or grow only slowly, while profits grew dramatically”. Mosser’s (1980) data show the explosion of business profits in the 1910-1913.<sup>8</sup>

In addition, it appears that the rise of the real wage was associated with the positive development in the wage distribution, providing further explanation for the stabilization of top inequality in the two decades leading to WW1. In this respect, Kocka has advanced that the ‘Second Industrial Revolution’ in Central Europe led to certain ‘job deskilling’, notably due to the technology change and workplace reorganization (Kaeble 1986, p. 72). Coupled with the introduction of general education, this led to a fall in skill premium between white-collar and manual workers and resulted in equitable apportionment of rising wages. Finally, the precedence

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<sup>6</sup> Grant (2002), for instance, conjectures that the peak of the ‘Prussian Kuznets curve’ occurred in 1906.

<sup>7</sup> However, one should be cautious about the magnitude of the increase in the late 1890s, experienced both by the top 1 and the top 5-1 per cent, as this could also indicate more rigorous enforcement and gradual improvement in the tax collection after the comprehensive income tax had been put in work in 1898.

<sup>8</sup> One could infer, with the obvious risk of oversimplification, that capital (labour) share expanded (contracted) in the in the last decades of the 19th century, while the proportional growth of wages and productivity could have resulted in stability of top shares from the mid-1900s until the Great War, as this would, in theory, imply the stability of distributive shares.

of the broad social legislation in Central Europe, in Germany under Bismarck and in Imperial Austria under Taaffe (such as workers insurance and labour protection; compulsory social insurance was introduced in Bohemia and Moravia in 1888 (Teichova 1988)), conceivably improved the lot of the working class. This might be to a large extent related to the adverse distributional impact of industrialization in Central Europe in the course of the 19<sup>th</sup> century.

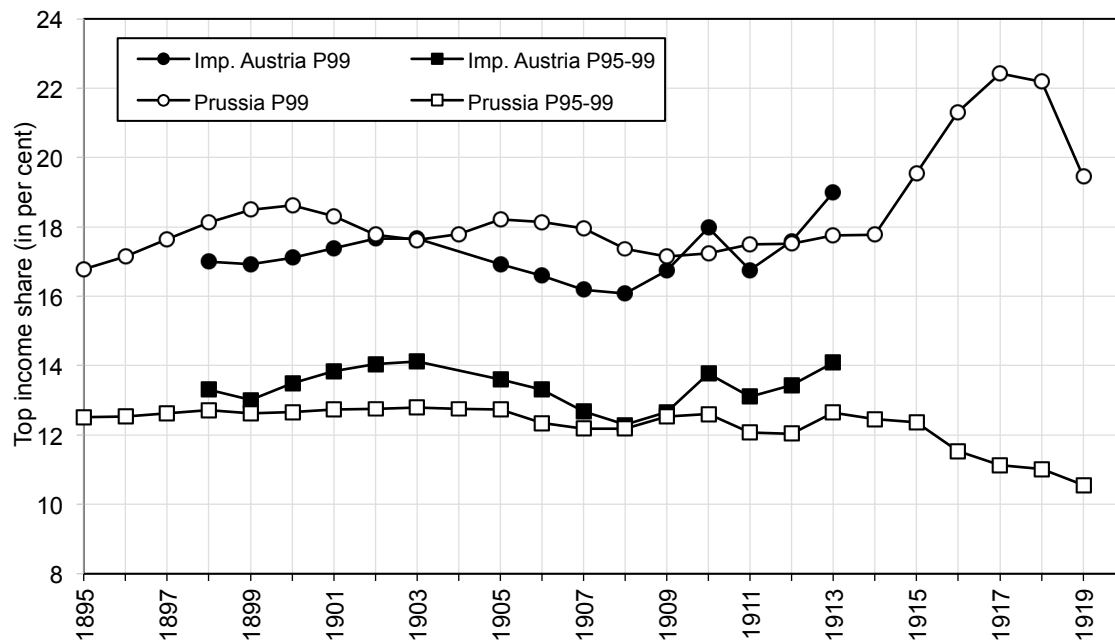


Figure 4: Top income shares in Central Europe: Imperial Austria (Cisleithania) and Prussia  
Source: Imperial Austria: author's computation based on income tax statistics; Prussia: WID, Dell 2007

A grasp on the income composition of top income groups has proven to be especially helpful to pinpoint different economic mechanisms affecting the income distribution, and could shed additional light on the balance between capital and labour income at the top. Unfortunately, it is available only the total reported income by sources of all taxpayers,<sup>9</sup> but looking at it could be nonetheless rewarding. Figure 5 thus presents income sources of all taxpayers, comprising roughly the top 5 per cent of the population.<sup>10</sup> It can be seen that top incomes were dominantly composed of capital income - broadly defined in opposition to labour income - such as profits from industrial and commercial businesses<sup>11</sup>, from land, financial capital and rents. Income from

<sup>9</sup> There is no available composition at the bracket level to ascertain income sources of the specific top income groups.

<sup>10</sup> This proportion was fairly stable until WW1, when it rose, to comprise close to the top 10 per cent of taxpayers at the end of the war.

<sup>11</sup> Note that business income was the predominant form of capital income in Austria-Hungary due to the fact that incorporated organizations were much less popular, in particular due to disadvantageous tax treatment (see Rudolph 1976, pp. 159-162).

employment, on the other hand, represented around one third of the top quintile's total income in the decade preceding the First World War. The figure further shows that the top income composition had remained quite stable until WW1, while the war resulted in the marked 'wage squeeze'. It is plausible to assume, on the basis of the documented patterns during the War and in the interwar period (as discussed below), that the capital income was strongly concentrated at the top of the income distribution (such as the top 1 per cent and above), while the labour income was more prevalent income source of the 'lower' constituent groups (such as the top 5-1 per cent). Figure 5 shows that employment income slightly expanded during the 1900-5 period. The sharp rise in top shares in 1913 could be explained by the rise in the proportion of the business and capital income.

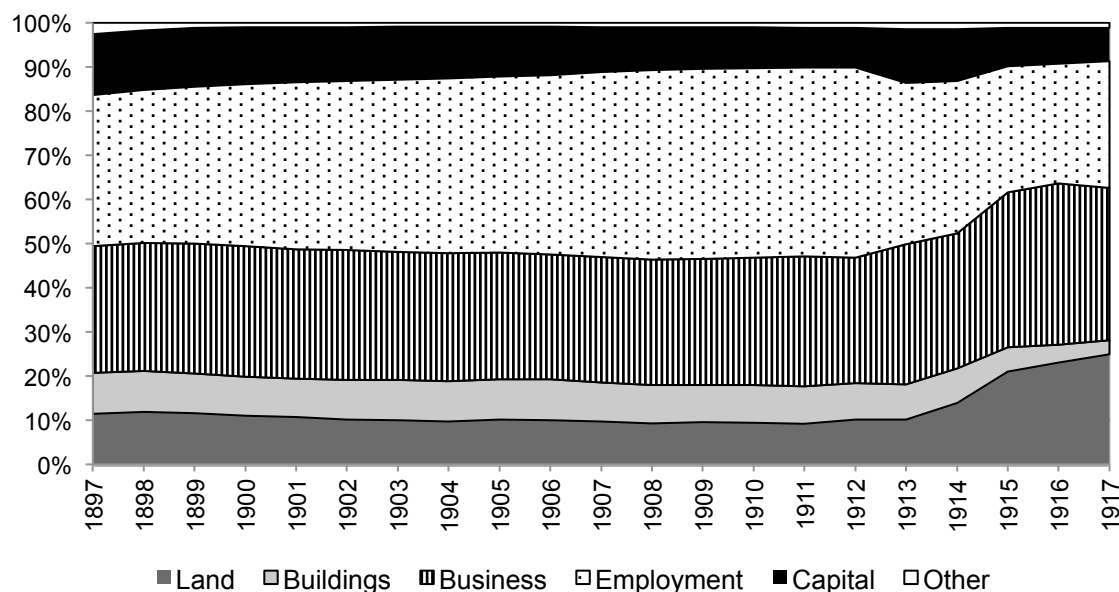


Figure 5: Income composition of all taxpayers in the Czech Lands (Bohemia, Moravia and Silesia), 1897-1917

Source: author's calculation based on the income tax data

### 'Vienna' effect

Finally, top income estimates during the Austria-Hungary should be seen as the lower bound. One needs to bear in mind that in contrast to other countries for which top incomes series have been constructed and which have been independent political units, the Czech Lands were until 1919 a constituent part of Imperial Austria (Cisleithania). It is well documented that there had been strong tendencies for high incomes to concentrate in the capital city, Vienna.

Consequently, incomes generated in various regions of the Monarchy were liable to personal income tax in the region of Lower Austria. The capital income is the apparent illustration, as it has been documented that many (if not most) of the ‘grand capitalists’ resided in Vienna. Take, for example, only the largest industrial concerns in the Czech Lands, such as Vitkovice Works<sup>12</sup> owned by the Viennese Rotschilds and Gutmanns, or the Mining and Metalurgic Co. owned by the Archduke Friedrich von Habsburg. Obviously, the same kind of ‘bias’ occurs in every country where foreigners own disproportionately high share of the domestic capital stock,<sup>13</sup> or in countries where richer regions own other less prosperous ones, but it has been generally acknowledged that Vienna held exceptionally important place in the economy of Imperial Austria.<sup>14</sup> Figure 6 shows that the ‘Vienna’ effect was quite important for the very top groups, such as the top 0.1 per cent, where, conceivably, capital income predominated. The transfer of property income was clearly more important in the case of the Czech Lands (as the industrial stronghold of the Monarchy) than for other Habsburg provinces.<sup>15</sup> For example, one might tentatively argue that this is the reason why the profit boom in the early 1910s was more visible in top shares in Imperial Austria as a whole (Figure 4) than in the Czech Lands (Figure 1).

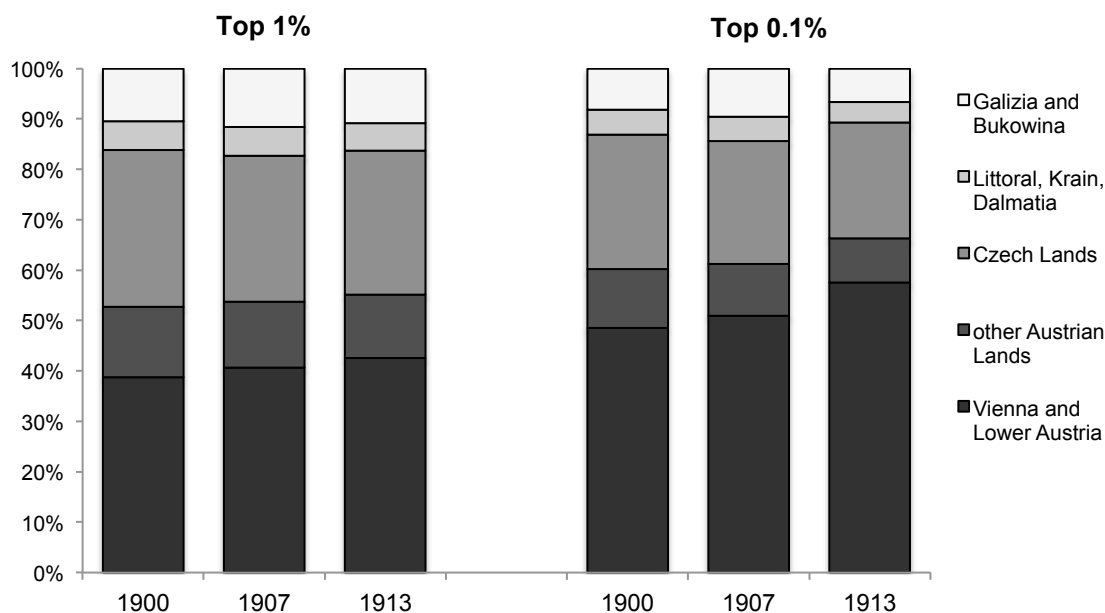


Figure 6: Regional composition of top income groups in Imperial Austria

Source: authors' computation based on the income tax statistics

<sup>12</sup> For example, Teichova (1974, p. 88) gives a revealing account (although referring to the interwar period): “foreign investors regularly skimmed off almost the whole net earnings of the Vitkovice combine, a fairly significant part of the Czechoslovak national income”.

<sup>13</sup> The extreme examples were British and French colonial empires (Piketty 2014).

<sup>14</sup> A similar ‘bias’ occurs today when rich ‘capitalists’ increasingly transfer their wealth to tax havens and are, as a result, missing from the interpersonal inequality within a country (Zucman 2015).

<sup>15</sup> Clearly, it had been problematic that profits obtained in the Czech Lands were not reinvested there.

Figure 7 shows the average income of the top 1 per cent in various provinces of Imperial Austria. It can be seen that the top 1 per cent in Lower Austria were disproportionately richer than their counterparts in other Cisleithanian provinces, which cannot be explained by the difference in the relative living standards or other economic indicators. Importantly, such concentration of the economic, and together with it of the political power, made strong impression on relatively young national consciousness in many parts of the Monarchy, in the first place on that of the Czechs.

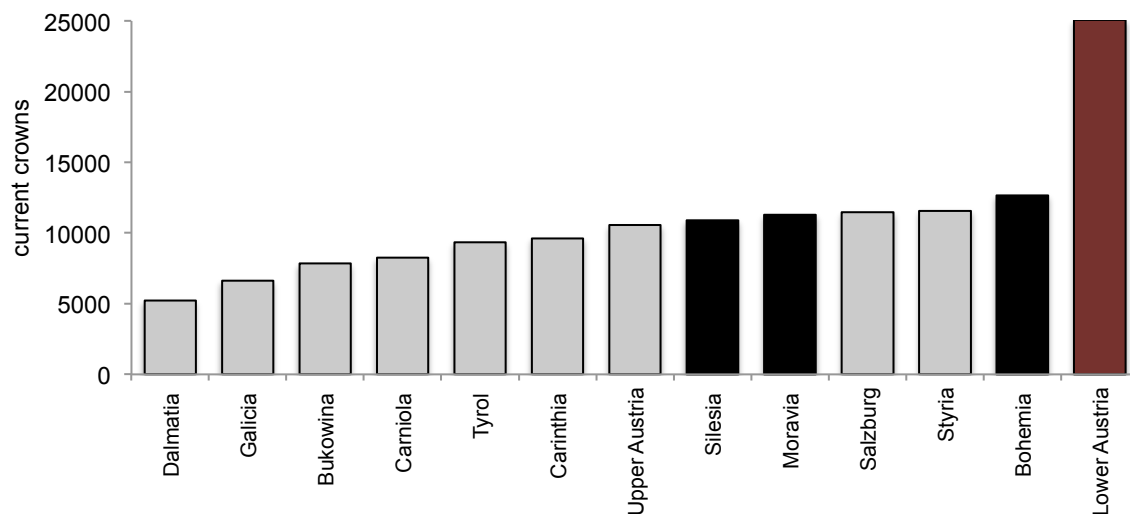


Figure 7: 'Vienna effect': the average income of top 1 per cent in Cisleithania in 1910

Source: author's computation based on the income tax data

Furthermore, most of the top salaried officials from various parts of the Monarchy were fictionally settled in Vienna for tax purposes. Namely, special sales offices consisting of top remunerated employees were formed outside the companies (the so-called *Betriebe*). As Rašin (1923, pp. 135-7) noted, this was primarily due to fiscal reasons, since communal taxes that were levied on the basis of corporate income tax obligation, were in the significant part paid to communes where company had its head-office, while the rest went to communes where company actually carried its economic operations. If there were several locations where firms operated, then this tax was split between communes according to paid compensation to employees.

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Here, we should be reminded of history of ethnic rivalries in Central Europe. A marked distinction of social classes along ethnic lines during the industrialization in Central Eastern Europe implied

that distributional conflict assumed additional dimension, and could have contributed to growing national consciousness (e.g. Gellner 1983) and to what Hroch (1985, 2015) called 'nationally relevant conflict'. Major economic and social changes in the late 19<sup>th</sup> century heightened 'social consciousness' of Czechs, reacting to the overarching influence of 'foreign' landholding nobility, or the critical role of 'nonindigenous' middle (and eventually capitalist) class in CE Europe (notably Germans and Jews; Bernend 1989). The conflict between Czechs and Germans had been especially pronounced in both the economic and the political sphere, and had traditionally burdened the Habsburg Monarchy (Bauer 1907; Taylor 1948; Judson 1996).<sup>16</sup>

### **Social structures during the industrialization: the 'persistence of the Old Regime'**

Further, tracking the evolution of high land incomes from the end of the 19<sup>th</sup> century is especially interesting, since the transition to the modern world has been often seen as a transformation of landed wealth into 'modern' forms of wealth (industry, finance, etc.). In Central Eastern Europe, this transformation occurred relatively later than in the west of the continent, and we find among these industrial 'laggards' a disproportionally greater role of land income in top income shares. Actually, one interesting finding of this work has been to show that big landed wealth occupied the very top of the wealth distribution in the Czech Lands still during the first decades of the 20th century (Figure 24; see section 5.4.). In consequence, one observes here social phenomena intermingling both remnants of feudalism and the prominent role of landed estates as drivers of industrialization and factors of the social change. Quite importantly, landed nobility exerted strong influence on the political process (i.e., in Germany all the way up to WW2<sup>17</sup>) and regularly enjoyed the privileged economic treatment.<sup>18</sup>

Industrialization in central-eastern Europe underwent a unique course and one of its notable features had been the entrepreneurial outlook of landed estates. For example, the (proto-)industrialization in Czech Lands had been characterized by the unusually high participation of

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<sup>16</sup> However, it would be an oversimplification to look solely through the 'ethnic' prism, since rich historical and sociological work has made us aware that large economic and social changes unleashed complex microcosm of social structures (Cohen 1981; Brubaker 2005).

<sup>17</sup> The classical (negative) account are Gerschenkron (1944), Dahrendorf (1965), Wehler (1985), etc.

<sup>18</sup> For example, through the electorate system; then (austro-)corporatism from the 19<sup>th</sup> century; then in the realm of taxation or industrialization policy (subsidies, tariffs)).



nobles in the development of manufacturing (Myška 1996). One may draw a link to peculiar phenomenon of commercial demesne holding, which assumed a prominent place from the time of the economic recovery in the 17th century and the presumed emergence of the 'agrarian dualism' in Europe<sup>19</sup> (when the landlords in central east Europe had derived bulk of their income from commercial pursuits, in contrast to their counterparts in Western Europe, who had chiefly relied on rental income (Blum 1957, p. 822)). Moreover, this entrepreneurial involvement happened against the background of the so-called 'Second serfdom' in central east Europe, assumedly marked by the increase in feudal constraints after the late Middle Age crisis and especially after the depopulation caused by the Thirty-year wars.<sup>20</sup>

The structural change in central east Europe was, as often advanced, associated with the strong increase in the inequality (e.g., in Prussia or Saxony). Prussian and Czech trajectories were linked in a yet closer tie through the central role that commercial agriculture assumed in bringing about the large-scale industrialization in both countries. This process was characterized in Central Europe by the transformation of large noble estates into true capitalist undertakings (Lacina 1990), what Lenin (1907) famously labelled as the 'Prussian road' to capitalism. The role of noble rural estates as agents of social change had been relatively more important than in Western Europe. Noble latifundia dominated the rural landscape in central east Europe and took the lead in introducing the commercial agriculture. For example, it has been documented that most of the greatest landed magnates in the Czech Lands (Tables A5 and A6), were pioneers in introducing the agrarian capitalism into the country (Klima 1991; Blum 1957).<sup>21</sup> In Germany, similarly, the agricultural production had become strongly capital intensive, and, moreover, Dumke (1991) has shown that it was actually the capital share in agriculture that increased in the second half of the 19th century and induced a rise in the aggregate capital share.<sup>22</sup> At the same time, a thorough transformation had spread through the Czech agriculture, with the production of

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<sup>19</sup> Kriedte roughly placed the river Elbe as a dividing line (cited in Cerman 2012).

<sup>20</sup> This is not a place to dwell upon the actuality or the legacies of the 'Second Serfdom', but it suffices to point out here that the traditional view, focused on factor endowments (e.g. Domar 1970) and ensuing 'commercial' engagement of landlords at rent extraction by weakening peasant economies (e.g. *roboty* or estates sale monopolies), is oversimplification (see Cerman (2012) for the most thorough survey). But what this unmistakably reveals is that the social structure was important for the industrialization in the Czech Lands, and that the role of commercial landed enterprises (not necessarily the nobility itself, since in many occasions it implied hired foreign entrepreneurs) especially evolving as an agent of social change (Klima 1979; Rudolph 1980; for general debate see Brenner 1976).

<sup>21</sup> Myška has noted: "estate owners transformed themselves into great agrarian capitalists" (translation from Glassheim 2005, p. 13).

<sup>22</sup> Dumke (1991) shows that the evolution of inequality displays high correlation with the capital share, and interprets it as a clear sign that the rising capital share spurred the rise in personal inequality. Capital share in industry did not increase. Importantly, Dumke shows that this development would have been missed if one looked only at skill wage differential which did not rise throughout this period.

‘industrial’ crops as sugar beet being fundamental in driving this process.<sup>23</sup> Blum (1957) moreover notes that a turn towards capitalist agriculture occurred earlier in Habsburg lands than in Germany. Already during the *Vormärz* (1815-1848) the lands of Bohemian crown took the precedence among the so-called German Confederation in advancing commercial agriculture.

In line with the Dumke's finding, we find in chapter 2 that the agricultural revolution in the Prussian Poland in two decades preceding WW1 was accompanied by a notable increase in top incomes, which were almost exclusively obtained in the countryside.<sup>24</sup> It is well-known that Poznan and Pomerania were archetype of East-Elbian latifundia (Figure 8).

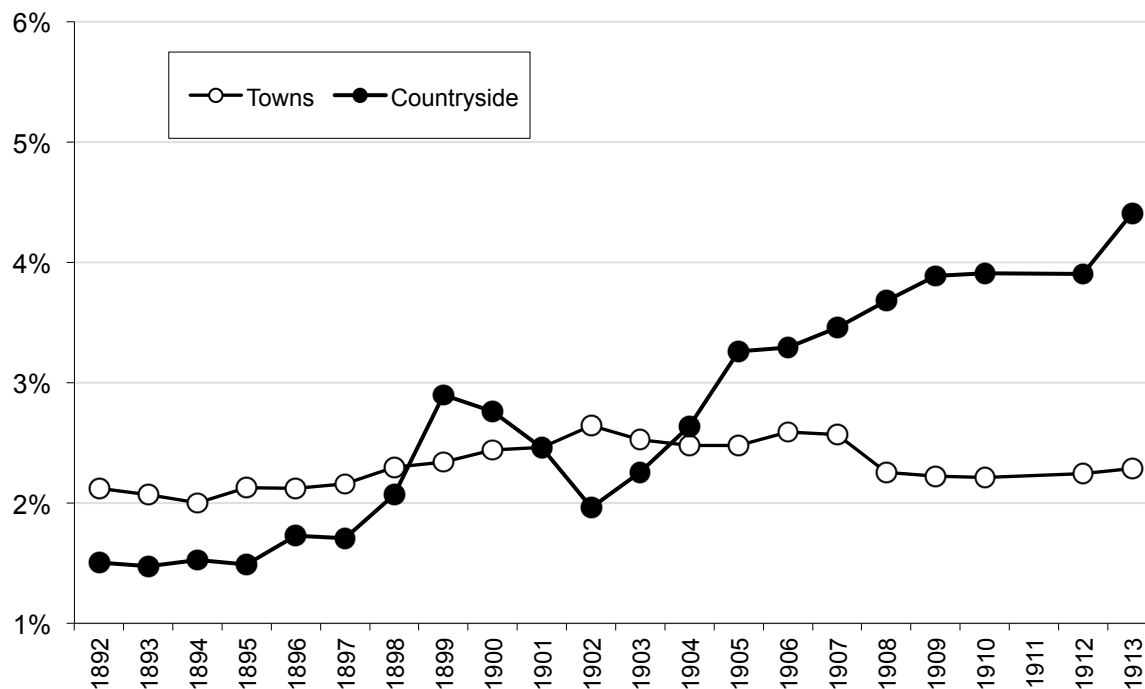


Figure 8: Top 0.1 in Poznan (Prussian Poland)

Source: chapter 2

<sup>23</sup> Rudolph (1976, pp. 47-8), for example, stresses the central place of sugar beet industry for the diffusion of market-orientation in the Czech Lands. Grant (2002) equally posits for Eastern Germany. Due to its prominent place for the evolution of income distribution, Dumke (1991, p.143) refers to it as the “sugar beet theory of income distribution”.

<sup>24</sup> The process of rising capital share, driven by rising capital intensity in agriculture, assumedly came to a standstill in Prussia in the 1890s, and the period leading to WW1 saw a remarkable stability in top concentration, after which additional increase of capital intensity in agriculture did not further contribute to an increase in the aggregate capital share (Dumke 1991, Morrisson 2000). However in east Prussian provinces, the rise in agriculture continued to make impact even after 1890s (Muller and Geinseberg 1975), in particular in the province of Posen (chapter 2).

The nobles' participation in commercial agriculture, mining, and other industrial branches in the Czech Lands was central in promoting capital accumulation during the country's industrialization (Rudolph 1976). The 'industrial-agricultural' character of the Czech Lands manifested itself accordingly on the patterns of top concentration. Big landed wealth mingled with industrial and financial capital at the upper echelons of the economic and the political power. One thus finds among Bohemian landlords in Table A5 the most prominent Habsburg statesmen (e.g. Schwarzerberg or Lobkowitz families) and the cream of the empire's society, the so-called 'First society'. The 'persistence of the Old Regime', as propounded by Arno Mayer (1971), probably nowhere manifested itself more than in Central Europe until the First World War.

Figure 5 shows that land income accounted for around 10 per cent of the top quintile's income in the Czech Lands prior to WWI, but as land distribution was extremely skewed to the right, this income was largely concentrated in the hands of higher top groups, such as the top 1 per cent and above (see section 4.2. below). Table 1 indeed indicates a striking land inequality in the Czech Lands at the end of the 19<sup>th</sup> century, which was notably higher than in other Cisleithanian Habsburg provinces (e.g. than in Austrian Lands, and more similar to Hungary). Similarly, according to the *Handbuch der Millionäre* most of German millionaires before the First World War were large landowners (Evans 2016; Baten and Schulz 2005, p. 49), and to draw analogy still further, most of them resided in neighbouring Silesia<sup>25</sup> (Eddie 2008), itself a Habsburg province until Frederick the Great annexed it to Prussia during the so-called Silesian wars.<sup>26</sup>

	Gini index	Bottom 50%	Top 20%	Top 10%	Top 5%	Top 1%	Top 0.1%	Top 0.05%
Bohemia	84,2%	1,7%	88,3%	75,2%	62,1%	43,9%	33,1%	27,9%
Moravia	84,1%	2,3%	89,0%	76,5%	63,7%	42,4%	32,6%	29,0%
Silesia	83,0%	2,5%	85,8%	74,3%	63,5%	48,5%	38,9%	32,6%

Table 1: Land distribution in the Czech Lands in 1896

Source: own calculation from *Grundbesitzstatistik*

Note: Pareto interpolation used to obtain specific land shares

<sup>25</sup> Furthermore, many Silesian land magnates, such as Donnermarcks (whose wealth in Germany came second only behind the Krupp family), had estates both in Prussia and the Habsburg Monarchy.

<sup>26</sup> A small part of former Habsburg Silesia is Czech historic land (whose center is Ostrava). This should be distinguished from the larger part that was the Prussian province Silesia (which became a part of Poland after WW2).

In addition, the Czech Lands show much higher level of landed industries than found in other Habsburg provinces (Medinger 1919, p. 47)).<sup>27</sup> Rudolph (1980, p. 58) notes that “nowhere in Central Europe does it appear that there was an aristocratic or landed class so involved in manufacture as that of Bohemia”. Big landlords in Czech Lands assumed the leading, or at least a prominent role, in metallurgy and mining, textiles, food processing, glass production etc. (Cerman 2012, pp. 32-3)<sup>28</sup>, which were the most significant industrial branches at the beginning of the 20th century.

It is not our contention to dismiss the importance of the urban, or the ‘bourgeois’, element for the growth of industry in the Czech Lands, in particular in north-western Bohemia, where, in line with the Mendels’ (1972) classic account of proto-industrialization, the rural cottage industry was gradually replaced by the urban factory production (Klima 1974) (e.g. textile industry in Liberec).<sup>29</sup> Instead, it should be recognized that (proto-)industrialization in the Czech Lands was to a substantial extent carried by noble estates, and well before 1848 (Rudolph 1980; Cerman 2012, p. 33), hence in opposition to oversimplified historical narratives traditionally contrasting ‘progressive’ bourgeoisie with ‘reactionary’ landlords (especially in east-central Europe before the serf emancipation).<sup>30</sup> As pointed by Blum (1957), it were exactly big noble landowners-entrepreneurs that most strongly promoted the reform of 1848 (and the reform might have been a product of on-going capitalist development rather than its precondition, e.g. Komlos 1983).

Indications of the evolutionary process, from landed large estates to industrial factories, might be also surmised from Mosser’s (1983) investigation of big Habsburg firms, in which he finds significant portions of agricultural land among firms’ assets.<sup>31</sup> The evolutionary path should not be seen as irreconcilable to ‘big spurt’ theories, quite prominent in central-east European economic history (such as Gerschekron’s ‘substitutes for prerequisites’). A substantial government support for industrial development in the 18<sup>th</sup> and 19<sup>th</sup> century had been primarily directed at noble landlords, aimed to further existing industries on their estates (Rudolph 1980). In addition, strong protectionism in the Monarchy pursued through the tariff policy was

<sup>27</sup> Eddie (2008) has similarly challenged the conventional wisdom of backward agriculture and the absence of industries on Junkers’ estates in East-Elbian Prussian provinces.

<sup>28</sup> For example, Rudolph (1976, p. 51) states that nobility owned almost all iron production.

<sup>29</sup> Neither we aim to dwell on the debate whether the agricultural revolution was necessary precondition of the industrial revolution (see Brenner 1982, Allen 1992, Craft 1985).

<sup>30</sup> One is reminded of the famous line from Lampedusa’s *Gatopardo*: “If we want things to stay as they are, things will have to change”.

<sup>31</sup> For example, Škoda Works in Plzen, one of the largest industrial concerns in the Czech Lands throughout the 20th century until today, is an illustrative example of this evolution, starting as the machine building enterprise for the sugar industry of the noble Waldstein family, before Emil Škoda purchased it in 1869 (Rudolph 1976, p. 122).

“supported by a coalition of the landed aristocracy, large industrial magnates, and directors of the Viennese Great Banks, who were often the self-same person” (Rudolph 1976, p. 17), a coalition reminiscent of the ‘marriage of iron and rye’ in Germany.<sup>32</sup> The nobles were the important link in the rising *Austro-corporatism* (Tálos and Kittel 1996). The role of banks rose in particular in the last decades of the 19<sup>th</sup> century (Rudolph 1976), and it is important in the context of ‘big spurt’ theories. Banks promoted cartelization as their risk management policy, leading to pervasive oligopolistic structures in the heavy industry, engineering, banking and finance, etc.<sup>33</sup>

Figure 9 suggests relatively high structural concentration in the pre-WWI period both in the Czech Lands and Germany by looking at ‘shares within shares’. This measure is useful, as it is independent of the total income denominator and thus robust to measurement errors inherent in the total income estimates (Atkinson 2007a)<sup>34</sup>. The figure depicts the share of the top 0.1 within the share of the top 1 in the Czech Lands and Germany until the end of WW2 (after which the institutional framework diverged). In both countries, the income of the top percentile had been disproportionately concentrated in the hands of the richest individuals. We observe a remarkably similar evolution of the top concentration, and this high positive correlation offers convincing evidence of similarity in top distributional patterns of the very top groups in the two countries. Interestingly, high correlation continued in the interwar period, at which we look below.

<sup>32</sup> As Friedrich Engels noted: “aristocracy had left the old and respectable days behind and now swell the lists of directors of all sorts of sound and unsound joint-stock companies” (cited from Evans 2016)

<sup>33</sup> For example, it has been often suggested that the Empire’s industrial structure had been highly concentrated, displaying strong monopolistic tendencies. Thus, Central Europe - and Germany and Austria-Hungary above all - became a synonym for the late nineteenth and the early twentieth century dominance of concentrated business structures that interweaved the whole economy (Teichova 1974; Cotrell and Teichova 1983). This could be plausibly related to the specific character of the Second industrial revolution with large units in the producer goods industries (Chandler 1977). A relative backwardness of Central and Eastern Europe precluded significant state intervention in promoting industrialization (acting as Gerschenkron’s ‘substitutes for prerequisites’) and banks especially had a prominent role in pooling funds as well as in promoting cartelization as a part of their risk-management strategy (Hilferding 1923, Rudolph 1976). In addition, the Empire’s protectionist policy relieved Czech industry from foreign competition (Teichova 1988, p. 17).

<sup>34</sup> Which are often critical for the earlier periods

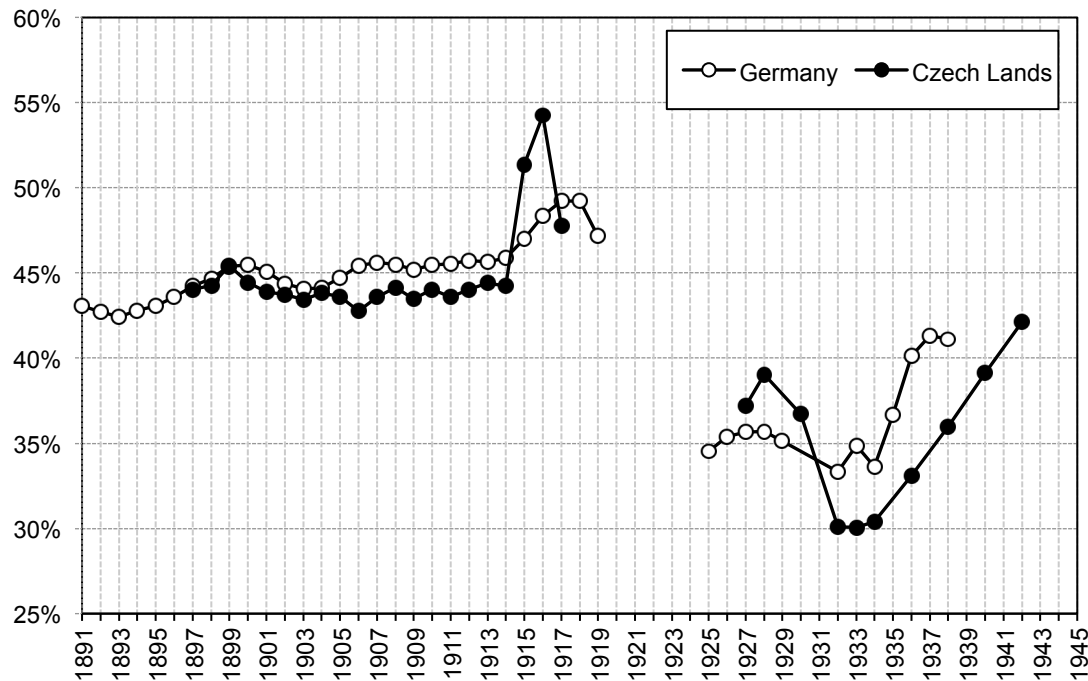


Figure 9: Share of the top 0.1% in the top 1% in the Czech Lands and Germany

Source: Czech Lands: own computation; Germany: Dell (2007)

Note: 1928-1936 refers to First Czechoslovak Republic; 1891-1918 for Germany refer to Prussia

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The ‘functional distribution’ narrative of the Kuznets process attaches much explanatory weight on the top of distribution. If a parallel was drawn to (eastern) Germany, which had undergone a similar industrialization path, it seems natural to compare the Czech experience to other regions in the Habsburg Empire, especially since the highly industrialized economic base and intensive agriculture of the Czech Lands stood in stark contrast to the predominantly backward agricultural character of other parts of the Empire. Figure 10 compares top concentration in Bohemia and Lower Austria on the one hand, as the industrially most developed regions in the Empire, and Bukowina and Dalmatia on the other, as the least developed regions and still of the predominantly agricultural character. The indicator used is the inverted Pareto-coefficient  $b$ , with higher  $b$  indicating stronger concentration and higher inequality (Atkinson et al. 2011). It can be seen that developed and industrial regions show higher concentration than less developed and agricultural regions of the Empire. Structural change in the advanced regions in Empire might have resulted in functional shift toward capital and higher concentration of capital income.

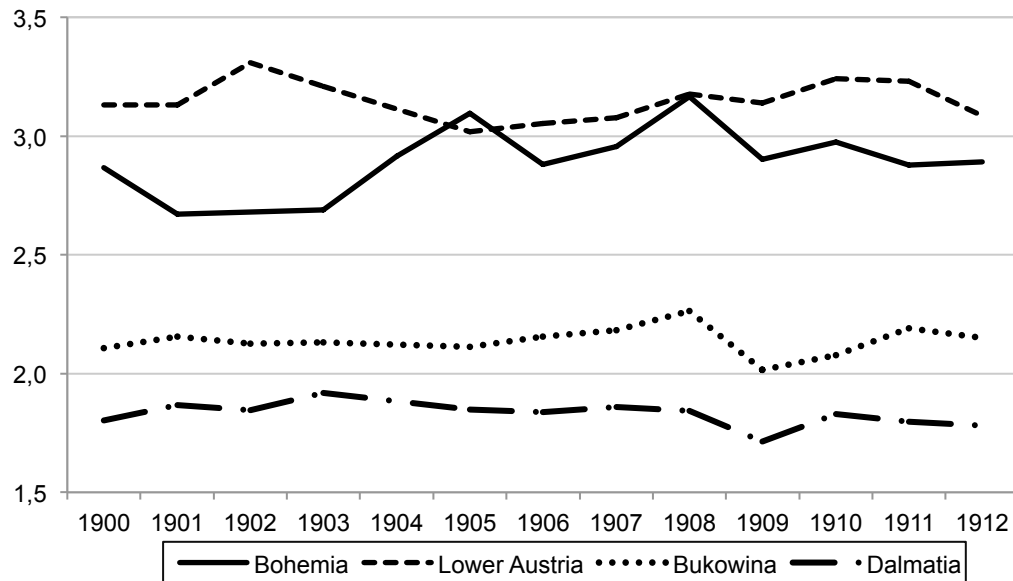


Figure 10: Inverted Pareto-Lorenz coefficient b

Note:  $b = (a - 1)/a$ ; Pareto coefficient  $a$  is calculated from the share of the top 0.1 per cent in the top 1 per cent:  $a = (1 + \log_{10}(S_{0.1}/S_1))$

### 1.4.3. The Great War

The First World War caused the collapse of the economic activity in Austria-Hungary. Schulze (2005) estimates that real GDP at the end of the war was barely 60 per cent of the pre-war 1913 level. The outbreak of the Great War caused an unprecedented surge in concentration at the top, with the top 0.1 per cent share jumping by more than 50% in the period between 1914 and 1917 (see also Prokopovich 1925). Figures 1 and 2 reveal in addition that the concentration at the very top, as evidenced by shares of the top 0.1 per cent and above, attained during the Habsburg era its secular maximum and the Great War signified its peak. In Austria-Hungary, highly regulated war economy brought closer the state and the heavy industry with the top policy priority attached to the armament production. Schulze (2005) points to the precedence of war industries, energy and metallurgical sector - in short, sectors where Czech Lands were especially prominent.<sup>35</sup> The Czech Lands, as the industrial stronghold of the monarchy, had to assume an important contribution to the overall war effort.<sup>36</sup> Cottrell and Teichova (2000, p. 53)

<sup>35</sup> For example, Schulze (2005) quotes Riedl's (1932) estimates according to which state military needs absorbed as much as 85% of the total steel production, while before the War military demands did not exceed 5% of the total steel production.

<sup>36</sup> And the importance of armament production in the Czech Lands has been shown repeatedly during the course of the twentieth century, as the country figured prominently both in the of Nazi war effort or later for Soviets during the Cold War arms race (the Figure points that interwar period where similarly the rise of industrial profits was induced by armament production (Teichova 1974)).

similarly point to the strong increase in industrial concentration. As stressed by Morrison (2000, p. 249), the war stands as a clear example of the importance of political variable in shaping income distribution. A dramatic increase in concentration at the very top occurred in most of European countries during the Great War, such as Germany, France, Netherlands, or Sweden, among others.<sup>37</sup>

Figure 5 shows that land income experienced the largest proportional rise during the war. Its share in the total reported income rose from 10 per cent in 1913 to 25 per cent in 1918. Food prices literally exploded during the war (while the famine reigned), conceivably bringing exorbitant rewards to large agriculturalists.<sup>38</sup> Next, business profits similarly experienced a robust growth during the war. However, one cannot tell whether smaller entrepreneurs and self-employees also benefited from this rise, or if it was disproportionately captured by big business owners deriving profits from large unincorporated industrial enterprises benefiting, as argued, from the war economy.<sup>39</sup> Salaries and wages, in contrast, experienced a strong contraction, and its proportion in the total reported income shrank by a third, falling from 43 per cent in 1913 to 29 per cent in 1918. Finally, rental income was unsurprisingly negatively affected by the wartime inflation and rent controls (Rašin 1923).

What can be said with regard to diverging wartime patterns of the top 1 per cent and the top 5-1 per cent groups (Figure 1) in the light of these findings? First, it may be conjectured that the top percentile and higher income groups, which saw a jump in their shares during the war, were primarily comprised of capital income, while the adversely affected groups below were mainly composed of employment income. Thus, the war resulted in the redistribution at the top plausibly through the wage squeeze. Next, our results suggest that the surge in the top 1 per cent was exclusively limited to the top 0.1 per cent group, while lower constituent groups generally did not take part in this 'roller coaster' (Figure 2). In agreement with a widespread public perception at the time, we find indeed an evidence of spectacular enrichment of certain individuals, but it seems that it had been limited to the small number of big (armament producing) businessmen and landowners.

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<sup>37</sup> But the global reach of the war implied that the equal shooting up at the top happened simultaneously around the globe, from Canada to Japan (Atkinson and Piketty 2007, 2010).

<sup>38</sup> It should be added that Czech Lands were important food producer (Moravia in particular) in the Empire.

<sup>39</sup> There is a possibility that the decline in income of smaller businessmen was only less steep in comparison to the documented plunge in the total income.



Here, one may draw a parallel to the debate in German economic history regarding the distributional effect of the First World War. Notably, Baten and Schulz (2005) and Ritschl (2005) have challenged Kocka's popular hypothesis that there was a massive redistribution between capital and labour in Germany during the War, and consequently a large increase in the overall inequality. While the former authors do not deny the existence of certain number of 'outliers' corresponding to the popular picture of war profiteers, they argue that entrepreneurs were in large adversely affected by the war, that is, they experienced the fate similar to that of wage earners.<sup>40</sup>

## 1.5. The First Republic

Our series re-emerge only a decade later, in 1927 (the tax statistics for the early 1920s was not produced). Figure 1 has suggested that important changes in top income patterns had occurred during this period. Notably, the top percentile and the top 5-1 per cent groups swapped places in comparison to the previous period. While the latter group suffered disproportionately during the Great War, its share emerges at notably higher levels ten years later. This is yet another interesting finding made possible by the use the tax data.

Here again the income composition of different top groups has been central to understand observed top income patterns. In the previous section we suggested that the top 5-1 per cent group in Imperial Austria was dominantly composed of employment income. And this was still the case during the interwar period, as we show in a moment. On the other hand, higher top income groups, comprised of capital income recipients, suffered a notable fall in their shares after they had experienced a secular peak during the WW1. In the same manner, higher 'structural' concentration at the top that featured for the Habsburg period was notably reduced (Figure 4), suggesting that certain redistribution occurred within the top percentile. Figure 2 indicates that the very top shares, which surged during the war, such as the 'inflated' top 0.1 per cent, in the same way stumbled immediately afterwards. One can hypothesize that the drop was similarly sharp during the first years after the war. The immediate post-war years were chaotic, characterized by the political turmoil as the old empire was dismembered and the economy on the brink of the catastrophe. Conceivably, the effects on industrial profits were disastrous as the

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<sup>40</sup> For example, Dell (2007, p. 372) ponders that the fall of share the top 5-1 per cent group in Germany during the war could be identified with smaller businesses.

market suddenly shrank and its traditional export markets, such as Germany or South-Eastern Europe, sunk into chaos.

On the other hand, the mid 1920s marked a gradual economic recovery. After the successful stabilization, the 'golden years' of the First Republic ensued. The pre-war output levels were already reached by 1924 (Pryor et al. 1971, Teichova 1988). The subsequent prosperity was quite likely shared by all top income groups. This picture would roughly correspond to the historical narrative portraying the first years of the Czechoslovakia's existence. In the same way, the absence (or relatively milder blow) of shocks that plagued the surrounding countries in the first half of the decade – notably the hyperinflation in Weimar Germany, Austria, Poland or Hungary – could partly explain comparatively more robust standing of Czechoslovak top shares in the mid-1920s.

### **1.5.1. *Volksstumskampf*: The Economic Nationalism**

But more importantly, the post-WWI period was one of unique historic moments when extraordinary government intervention brought about fundamental changes in the distributional sphere. As pointed by Morrisson (2000, p. 250), "such interventions are usually made in an exceptional political climate, such as a revolution or a war, and they correspond to an upheaval of political and social balance". He further adds that such measures are unfailingly directed at wealth distribution, which inevitably leads to enduring decline in inequality.

However, it should be recognized that there was more than one mechanism at work in driving the observed patterns. The interwar period has usually been depicted as the arena of the intense class struggle, when the political action pushed the balance to the side of the labour. This generally proceeded from external pressures rather than the enlightened attitude of the government.<sup>41</sup> The post-war period was characterized by strong radicalization, the threat of communist overthrow, strong trade unions and massive strikes (notably, the December strike in 1920). The recent Bolshevik revolution in the Soviet Union still resonated strongly (or for that matter the uprising in the immediate neighbourhood, in Hungary under Bela Kun (Miller 1999))<sup>42</sup>. The response of the Czechoslovak government was to introduce plausibly the broadest package

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<sup>41</sup> Although the genuine humanist inclinations should not be denied in the case of many contemporaneous politicians, most notably Masaryk (e.g. «Social Question»)

<sup>42</sup> Ensuing concessions could be understood in the framework of the 'political Kuznets curve' as proposed by Acemoglu and Robinson (2002).

of social legislation measures at the time, including the eight-hour working day, unemployment benefits (under the Ghent system), workers councils, sickness and accident insurance, and large-scale housing program, among others (Agnew 2004 p. 184).

Regarding the general improvement of the workers' position<sup>43</sup>, one should emphasize that high-salaried employees, quite likely those constituting the top 5-1 per cent, reaped the greatest benefits from this development. For example, salary scales introduced in 1926 (the year before the tax data become available) made this group relatively better off (Teichova 1988).<sup>44</sup> The First Republic is frequently seen as the golden age for high salaried white-collar workers and civil servants, and not rarely, these are identified with the ascendant Czech bourgeoisie. Here one should also include professors, lawyers, physicians whose social status was especially prominent. It would be probably too much to think of it in terms of Hobsbawm's 'labour aristocracy', but one should nonetheless point to increasing layering in comparison to lower-skilled and manual workers (for the exceptional status of white-collar employees in Central Europe see Wagner (1991) for Vienna, or Kocka (1981) for Germany), as well as growing opposition to 'capitalist' strata of the society traditionally dominated by Germans and Austrians.

This brings us to the next point, that government's measures in wealth distribution could be, among other issues, related to the burning national question in the country. Namely, this was a period when the Czech bourgeoisie attained the political power and became the dominant social force in the life of the First Republic.<sup>45</sup> Finally liberated from the Austrian-German dominance, new leaders and the circles surrounding them perceived economic independence as the critical ingredient in guaranteeing political sovereignty (Boyer 2000). And it is "the economic dimension of the national question has been little examined" (Patek et al. 2000). It should be noted that the social question in the Historic Lands had traditionally presumed ethnic connotation, such as "identification of capital with the Germans and labour with the Czechs" (Wiskemann 1938, p. 111, Urban 1998, p. 202). Similarly, the landowning aristocracy was always seen as foreign element (Austrian and German; or Hungarian in Slovakia), standing in stark contrast to

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<sup>43</sup> For example, average wage was nine times higher in 1928 in comparison to 1913 (Teichova 1988).

<sup>44</sup> Note that at the same time in Germany, the finance minister Köhler raised public servants wages (Voth 1993, p. 281), which has been also seen as one potential reason for the sluggish Weimar growth. It has been claimed, in the context of the so-called "Borchardt controversy", that the rise in wages outstripped productivity, and caused the fall in profit share and investment activity.

<sup>45</sup> It should be added here that this primarily meant Czech economic elites since the Czech Lands were far more economically advanced.

smallholding - and frequently debt-ridden - Czech farmers. Similarly in Slovakia, the relations with Hungarian minority resembled the Czech-German conflict.

The Land reform of 1919/20 was among the first big moves of the new government. Initiated under the slogan of 'undo the White Mountain' (Majerova 2000), it contained an overt ethnic dimension. The central issue was huge inequality in land ownership, which was predominantly in the hands of foreign (non-Czech) nobility such as Schwarzenbergs, Lobkowitzs, Wallensteins, Liechtensteins, Clam-Gallas, Kinskys, etc. (Tables A5 and A6 indicate that almost all large landowners were of non-Czech origin). The numbers are quite indicative of the gravity of the problem (see Table 1). In addition, dissatisfaction among peasants had reached an alarming level after the war. Peasant parties, armed with agrarian ideology that was calling for land redistribution, were flourishing all over Central and Eastern Europe (Teichova 1988). However, the problem of the peasant overpopulation was less acute in Czechoslovakia<sup>46</sup> than in other Eastern European countries since most of the rural 'surplus' had already been absorbed by industry (Berend 1985, pp. 158-9). Consequently, the actual implementation of the reform was much slower than in other countries, and gained momentum of practical importance only in the 1930s.<sup>47</sup> Moreover, from the efficiency viewpoint, it was, by many accounts, regarded as a success<sup>48</sup>, because it further contributed to the implementation of the modern, commercial agriculture in the country, especially in the medium sized holdings (Patek 2000; Teichova 1988, pp. 29-31).

The next setting for *Volksstumskampf* (ethnic struggle) was in the industry and in the banking. While tensions boiling in the agriculture, the situation was even tenser in industry, where the stakes were higher. Immediately after the War, as pointed out by Teichova (1974, p. 97) "a violent competitive struggle developed between the Czech bourgeoisie, who had taken over the Czechoslovak government, and the politically weakened German and Austrian bourgeoisie, who still held key positions in industry and banking in the newly established state". From the very

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<sup>46</sup> That is, in the industrially developed Czech Lands, but it was more urgent in Slovakia where the number of landless peasants was substantial.

<sup>47</sup> According to the reform, the State could expropriate above 150 ha for agricultural estates and above 250 ha for any estate (Agnew 2004). This was a first big blow affecting wealth distribution. Nevertheless, the reform was carried out reasonably peacefully, and in the end the extent of redistribution in the initial phase should not be overstated and large landowners were able to keep a considerable part of their estates (at least until 1930s, see below), especially as the implementation itself was prolonged (Majerova 2000).

<sup>48</sup> Crampton (2007, p. 63) comments that "Masaryk called the land reform 'the greatest act of the the new republic'"

beginning of the Republic's existence the Czech governing circles took measures that were aimed at diminishing the German and Austrian economic dominance.

The most important policy pursued in this direction was the so-called 'nostrification'. During peace negotiations after the WWI, the alternatives of expropriating the losing side were considered, mainly to curb economic foundations of Germany's '*Drang nach Osten*'. Among the resolutions of the peace treaties, an option was granted to countries in Central and South-Eastern Europe that had fought on the victorious side to buy (rather than socialize) the property of defeated countries within their territory. This affected in particular the property of German, Austrian and Hungarian citizens<sup>49</sup> (Teichova 1988b, p. 905). This possibility was most ardently pursued in Czechoslovakia,<sup>50</sup> being swiftly adopted to materialize rights from the treaties when the situation in defeated countries was far from enviable. The Nostrification Act, coupled with the newly introduced Currency reform and Banking laws, made it increasingly difficult for German and Austrian owners to finance their subsidiaries in the Republic (Rašin 1923, Teichova 1974). In a period when the hyperinflation was ravaging in Weimar Germany, Austria, and Hungary, the relatively strong Czechoslovak currency implied favourable buying conditions for the Czech bourgeoisie (Teichova 1988b, p.905).<sup>51</sup>

### 1.5.2. The Great Depression

Economic crises impact critically every aspect of inflicted countries, not rarely resulting in unpredictable events that stretch far beyond the strictly economic sphere and whose impact could endure through several decades. This is especially evident in the case of interwar Czechoslovakia where the world crisis was, beyond doubt, partly responsible for the watershed

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<sup>49</sup> Teichova (1988b, p. 905) notes: "article 297 of the Versailles peace treaty concerning the property of German nationals, by article 249 of treaty of St Germain and by article 232 of the Trianon treaty with regard to Austrian and Hungarian nationals respectively".

<sup>50</sup> The Czechoslovak government passed the Nostrification Act in 1919, which required all companies operating in Czechoslovakia to be also registered there (previously, as discussed, most of the companies had their head office in Vienna). In addition, it was required that at least half of the management board members were Czechoslovak citizens.

<sup>51</sup> The distributional effects of 'nostrification' are difficult to assess, as it mostly affected owners in Austria (notably in Vienna) and Germany. The Czech capital in Živnostenská banka (Živnobanka), headed by Jaroslav Preiss, was dominant force behind the process. Equally, it led in significant part to simply changing stakes between Entente and Central powers, since in most cases the Czech capital showed to be insufficient for large take-overs, so it was at least intended that it assumes the role of a junior partner to the Entente capital. This was usually conducted under the auspices of the top political figures and it corresponded to the changed political reality after the WW1. Beneš was particularly active in bringing French and British capital into the industries formerly controlled by Germans and Austrians (Teichova 2008, pp. 195-7). The case of the industrial giant Škoda-Works is revealing in this respect with bringing French Schneider-Creusot (where top Czech political figures had frequently been board members).

events in the country's history, from initiating large social and ethnic tensions, political extremism, the eventual German occupation and the unprecedented institutional change of the introduction of communism. And quite naturally, the economic crises of the historical proportion as the Great Depression might have affected distributional patterns in a decisive manner. Indeed, a research on top incomes has found that big exogenous shocks of this type were the main cause of a large drop of top income shares in the interwar period, and particularly, it was the concentrated 'capitalist' top of the distribution that was most severely hurt by the Great Depression through stock-market crashes, (hyper)inflation, contraction in international trade etc.

Czechoslovak top incomes in the interwar period were on the level of the industrialised western countries. Even the subsequent decline in the early 1930s corresponds to western experience. We saw in that large changes experienced by the top 0.1 per cent were the main factor affecting the development of the top percentile shares (Figure 2). During the Great Depression shares of the top 0.1 per cent strongly fell, while 'lower' top groups proved more resistant to the crisis (Figure 11). Figure 12 depicts the evolution of the real mean income for various groups of the population in the period from 1927 to 1936. It can be seen that the income of the top 0.1 experienced a strong decline from the outset of the crisis in 1929, substantially 'outpacing' the fall in average income of the total population, as well as that of the lower top percentile's group (top 1-0.5 per cent). Consequently, we observe a sharp decline in the share of the top 0.1 per cent in the total income. In the same manner, one can understand an increase in lower top income groups (especially a bounce in the average income of the top 5-1 per cent group) which did not experience a deterioration in their real income until 1932, and smaller proportional decline with respect to average income until 1934. However, this development was reversed from the middle of the decade when the top 0.1 bounced back more strongly than the average income, while the corresponding rise did not occur for the lower top income groups.

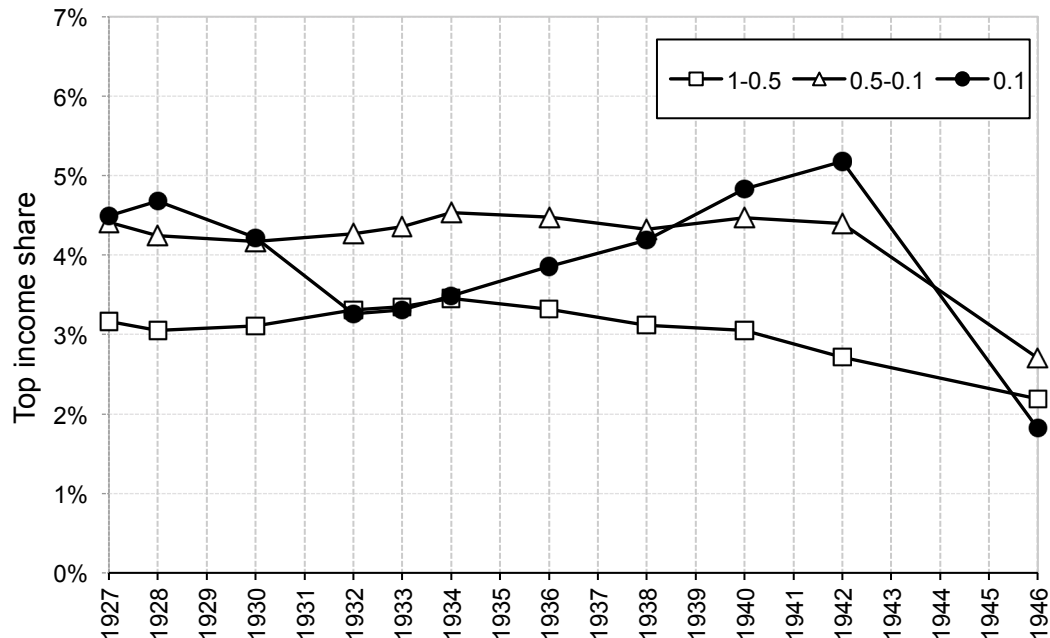


Figure 11: Top percentile in Czechoslovakia, 1927-1946

Source: Author's computation based on the income tax data

Note: 1940 and 1942 refers to the Protectorate of Bohemia and Moravia

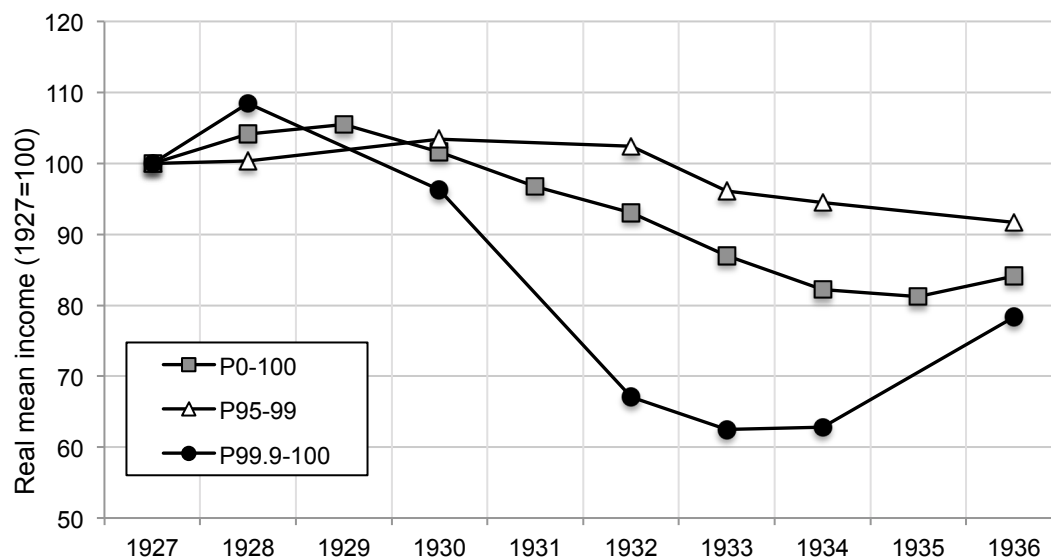


Figure 12: Average real income during the Depression, Czechoslovakia 1927-1936

Source: author's computation based on income tax data

Note: the real series were derived using the cost of living index

In order to understand described evolution, it is essential to have an insight into the income decomposition of the different top income groups. In Figure 13 we point to various income sources of the top 0.1 per cent and 'bottom' constituent group of the top percentile, the top 1-0.5

per cent. The presented structure clearly shows that ‘unearned’, or broadly defined capital income, accounted for the bulk of the top 0.1 per cent income, but also experienced the largest fall in the Depression.<sup>52</sup> The ‘labour income’, on the other hand, showed substantial ‘stickiness’ in the same period, and, as can be seen from Figure 13, accounted (more than any other source of income) for the observed stability in the 1–0.5% series. As we proceed further down the income distribution, especially below the top percentile, the labour income becomes more important.

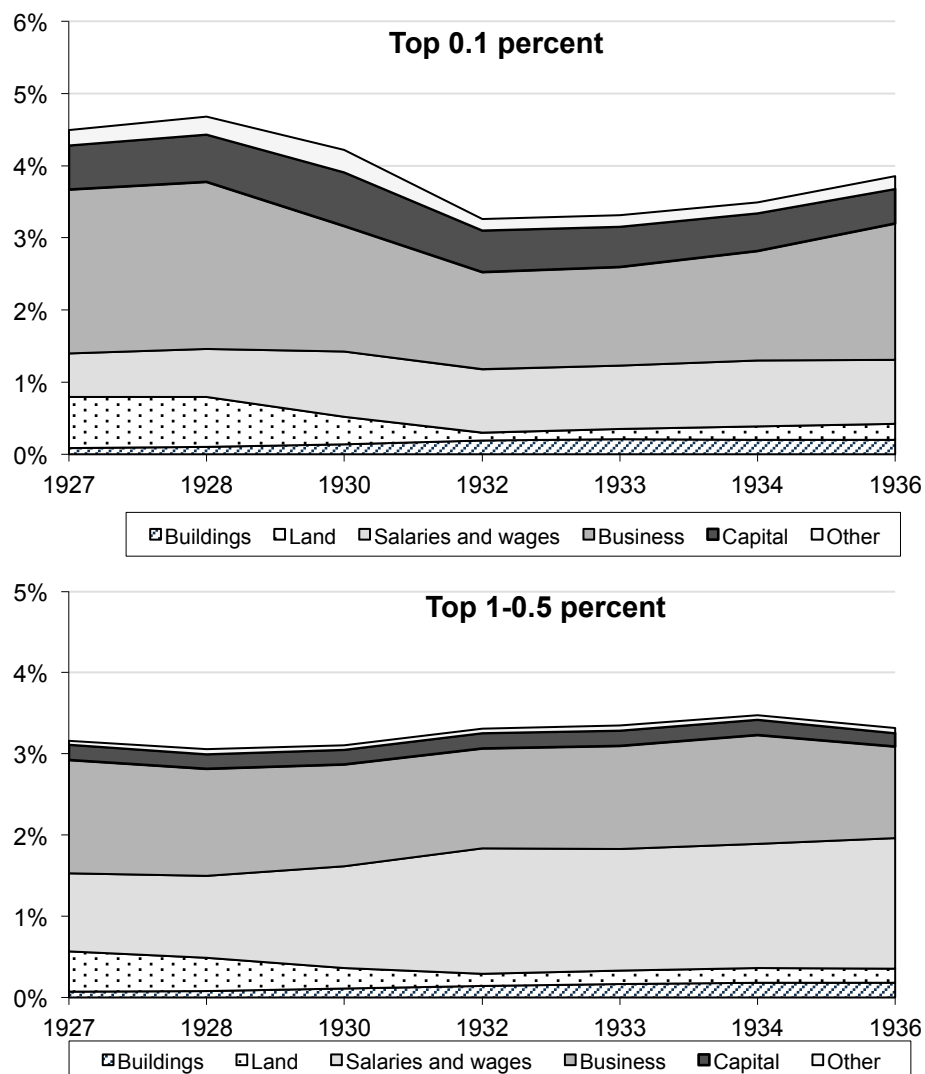


Figure 13: Income composition of the top 0.1 per cent and 1-0.5 per cent in Czechoslovakia

Source: author's computation based on income tax statistics

<sup>52</sup> Covered years indicate availability of detailed statistics.



Figures 14a and 14b present detailed income composition for various top groups in 1927 and 1932, that is, before the start of the Great Depression and right in the midst of it. As said, it can be noticed that the importance of labour income is negatively related with the income rank. Thus, wage income makes the predominant income source for the top 5-1 per cent group in 1927, and falls steadily for higher fractiles, to become practically irrelevant for the very top groups such as the top 0.01 per cent and above. However, only few years later, with the arrival of the crisis, the relative position of labour income at the top becomes noticeably more prominent (Figure 14b).

It may be argued that it was primarily due to a severe deflation that dominantly wage-composed top income groups were made better off relative to the very top. Wage rigidity did not lead to a downward adjustment of their income (Figure 12) relative to other income sources. Let us remember that Czechoslovakia succumbed to the 'gold orthodoxy' and adhered relatively longer to the French-led Gold bloc, while it managed to free itself from the consequent deflation by fairly late devaluations in 1934 and 1936 (Eichengreen 1992). Exactly the same development of top incomes is observed in other countries, such as France (Piketty 2003) or Germany (Dell 2007), where shares of lower groups within the top decile, dominated by labour income, such as P90-95 and P95-99, experienced a strong growth during the Depression.

Similarly, Figures 14a and 14b reveal that other types of income that traditionally benefit from deflation fared relatively better during the crisis. Rental income (including owner-occupier imputed rents) thus gained in importance in 1932 relative to 1927. One could similarly argue that fixed-income portion of capital income<sup>53</sup> made this source relatively more resilient.

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<sup>53</sup> The tax law designated primarily dividends and interests as 'income from capital' (Novotny 1938, p. 70).

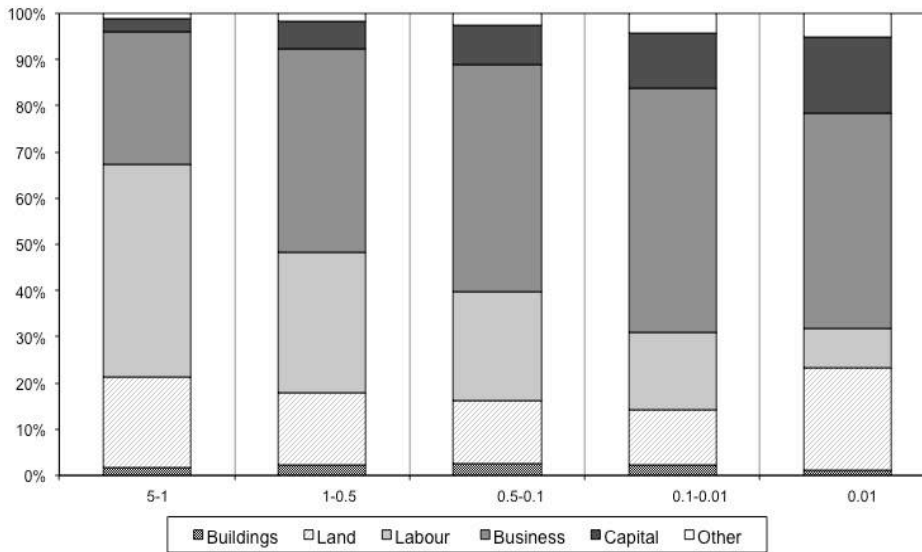


Figure 14a: The decomposition of the top 5 per cent by income source, ČSR 1927

Source: own computation based on income tax statistics

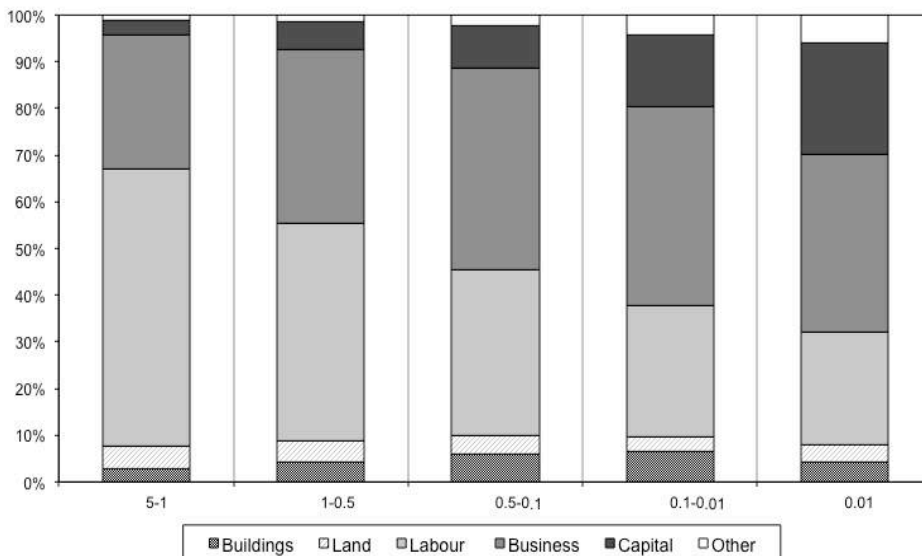


Figure 14b: The decomposition of the top 5 per cent by income source, ČSR 1932

Source: own computation based on income tax statistics

On the other hand, business profits were exceedingly hurt by the crisis.<sup>54</sup> First, let us point to the ‘industrial character’ of the top incomes in interwar Czechoslovakia (since business income had been the most important income source of top shares), which is revealed from the

<sup>54</sup> The unincorporated businesses form was characteristic for Central Europe (see Dell 2007 for Germany) (up to present day; see chapter 2).

decomposition of the business income in top groups according to economic branches (Figure 15).

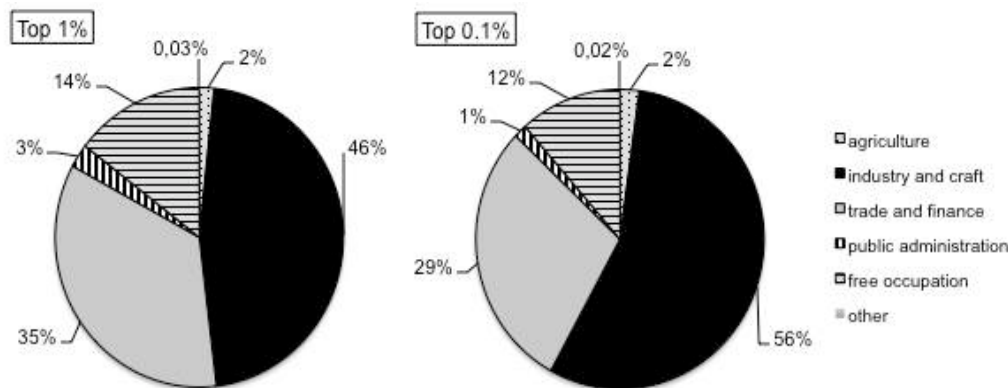


Figure 15: 'Business and self-employment' income of the top 1% and the top 0.1% according to economic branch in 1930

Source: author's computation based on income tax statistics

To understand the effect of the crisis on business profits, it should be noted that in Czechoslovakia a large part of capital was tied to export-orientated industries, which consequently suffered most from the contraction in international trade. As mentioned already, the Czech industrial potential, inherited from the Habsburg period, outsized the domestic market of the First Republic, making the country exceedingly dependent on export. However, it seems that Czechoslovakia had less painfully adapted to the dissolution of the protected market of Austria-Hungary than to the contraction in global trade in the 1930s. Figure 16 shows the development of exports between 1926 and 1936. It can be seen that exports literally more than halved until 1933. The path of exports indicates remarkable positive correlation to the very top shares - such as the top 0.1 per cent - from the outset of the crisis. Figure 13 shows that the recovery of the top 0.1 per cent was exclusively driven by the rising business profits.

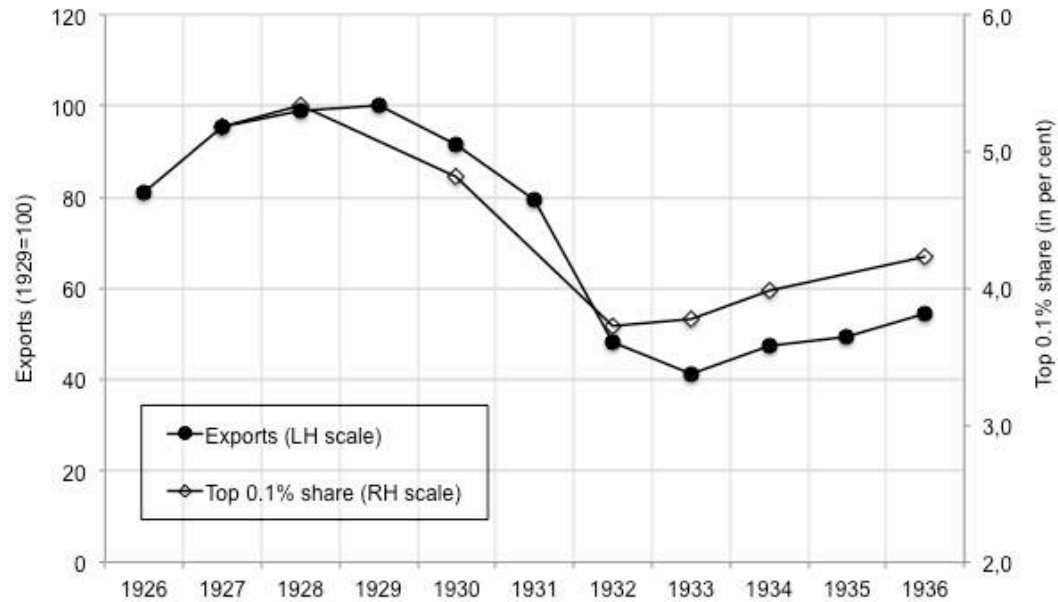


Figure 16: Export (of commodities) index

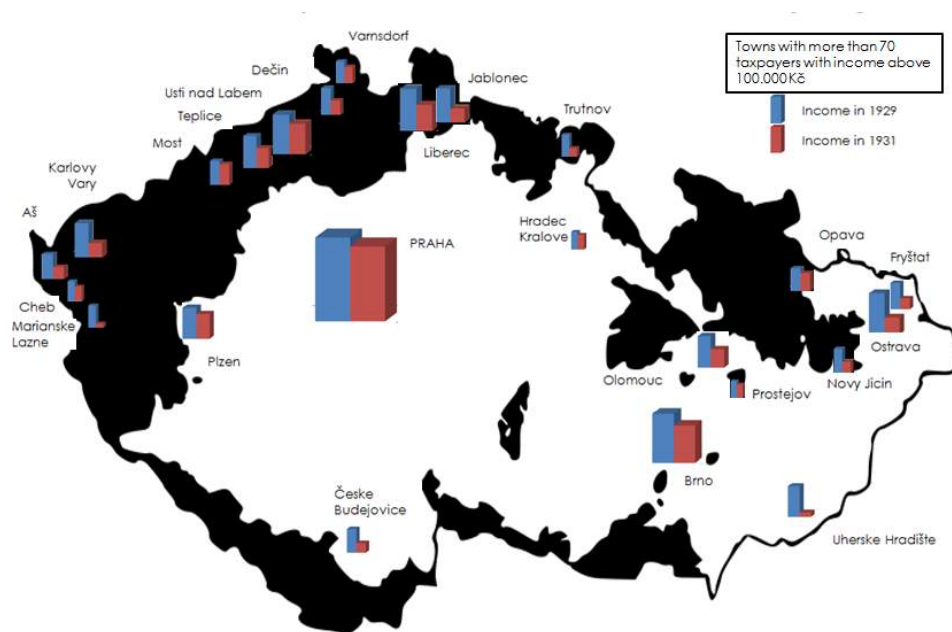
Source: exports: Teichova (1988); top shares: author's computation based on income tax statistics

The most disastrous effect was felt in consumer goods industries concentrated in the regions with the German majority (Teichova 1988, p. 61), which were moreover traditionally exported-oriented. 'Sudetenland' (*Sudety*) was industrially the most advanced part of the Czech Lands, primarily specialized in export-orientated industries, and was in consequence the region that suffered most during the crisis. This further alienated the Germans from the Czechs because they believed that the Czechoslovak state and the 'Czech banks' were not doing enough to help them (Wiskemann 1938). Local 'German banks' such as Böhmsche Escompte-Bank and the Böhmsche Union Bank had to be saved due to reckless lending to industry and, more importantly, due to the financial crises that hit Austria and Germany in 1931 when all deposits were blocked (Wiskemann 1938, p. 166)

Map 1 compares incomes of taxpayers that declared income above 100.000 Kč in 1930 and 1932.<sup>55</sup> People with annual income above this threshold occupied the top of income distribution, roughly the top 0.1 per cent. It is plausible to conclude from the map that shocks to 'industrial capital' accounted for most of the decline in income in 1932, as well as that German-speaking

<sup>55</sup> We take only towns with more than 70 taxpayers because this level included the predominant part of income. From Slovakia, only Bratislava and Košice satisfy this requirement, but they did not experience a significant decline of income.

regions (indicated by the black area) were hit disproportionately harder by the Depression than the rest of the country. Particularly strong concentration of top incomes was recorded in the industrial north-western area, in the birthplace of industrialization of the Historic lands, around Liberec and Usti nad Labem. This region experienced the strongest fall in income in 1931, along with the area around Ostrava, renowned for its heavy industry, and the world famous tourist destinations in the west. Furthermore, we should probably also add the effect of 1931 financial crisis in Austria and Germany, where Sudeten Germans traditionally invested their capital (Wiskeman 1938). The depression-ridden economic situation resulted in growing nationalism that pushed Sudeten Germans to political alignment with Nazi Germany (Teichova 1988, p. 61), which presented the first step in the eventual dismemberment of Czechoslovakia. Deflation, brought about by 'gold orthodoxy', had as well more negative impact on (industrial) capital income than on less flexible labour income which could have made significant part in the big administrative and financial centres, most notably in Prague and Brno.



Map 1: The Great Depression and 'Die Sudetenfrage'

Notes: Black areas indicate German-speaking majority

Source: Author's computation based on income tax statistics

Finally, one notices in Figure 14a an important proportion of land incomes among the top income groups in 1927. However, one should not be surprised at this,<sup>56</sup> since it was already pointed to the specific ‘industrial-agrarian’ character of the Czechoslovak economy. As discussed in some detail above, most big landowners had been engaged in commercial agriculture, for example in sugar beet and hop cultivation, which has traditionally been a backbone of the intensive farming in the Czech Lands. Moreover, these branches were almost as important to country’s economy and export potential as its strong industry.<sup>57</sup> Large landholders made still an important economic factor in the country in the late 1920s.<sup>58</sup> One should also add that mid-1920s were especially beneficial to agriculture due to rising global agricultural prices and the introduction of tariffs in 1926 (Berend 1985, p. 163; Drabek 1985, p. 412). The land reform itself signified only the final move towards commercial agriculture and, as indicated by Teichova (1988), it resulted that “the last traces of feudalism vanished and the agricultural bourgeoisie was strengthened. Thus, favourable conditions were created for structural change in agriculture”.

But Figure 14b suggests in addition that, besides a fall of business profits experienced by the top groups, the Great Depression proved especially devastating for the Czechoslovak agriculture, delivering consequently an extremely hard blow to land income component of top groups in the early 1930s. It can be seen from Figure 13 how, in accordance with historical accounts, the crisis was firstly felt in agriculture (Lacina 1974), already in 1930 (for example, due to the world crisis on the sugar market which started already in 1928). One can clearly discern the crisis-induced fall in importance of land income for all top income groups.<sup>59</sup> It seems thus plausible to ascribe a detrimental effect of deflation on top land incomes (in contrast to rental income from real-estate or fixed-income instruments) to the commercial (rather than rentier) orientation of big landlords. In a similar manner, we saw that the WWI inflation and soaring food prices caused top land incomes to surge during the war.<sup>60</sup>

<sup>56</sup> Thus, when Piketty (2007, p. 51) notes as an interesting fact that capital owners at the beginning of the twentieth century in France were very rarely landlords, it could be similarly acknowledged the opposite to be true in the First Republic.

<sup>57</sup> In interwar Czechoslovakia arable land accounted for a substantial part of the total country's area (around 43 per cent of its total surface in 1928 (see *Aperçu statistique 1930*, p.65, Tab. 1)) in comparison to western countries (Teichova 1988).

<sup>58</sup> As a political group they were mostly gathered around the conservative wing of the Agricultural party under Karel Prášek, which stood in opposition to a more moderate wing of the party's leader, Antonín Švehla (Miller 1999).

<sup>59</sup> The provided decomposition for Czechoslovakia in Figure 13a and 13b corresponds closely to that found in the Czech Lands, in particular in Bohemia which made around two-thirds of top incomes (Moravia and Silesia accounted for 22 per cent, Slovakia for 12 per cent, while Subcarpathian Rus for less than 1 per cent).

<sup>60</sup> Land income, as defined in the tax law, was determined for the sale of agricultural products and for smaller farmers (that do not keep books) was based on the cadastral net yield assessments. We could not find any evidence that the

As Figure 17 below indicates, there was a rise in wage inequality, which was due to the fact that white-collar workers saw relatively smaller fall than was the case for the blue-collar employees (that kept their job). This is why we see that wage inequality of those still employed workers rose. On the other hand, this contrast markedly sharpens with huge rise in unemployment (workers have now zero incomes). For example, the share of blue-collar workers with employment in 1934 was barely 25% (Teichova 1988).

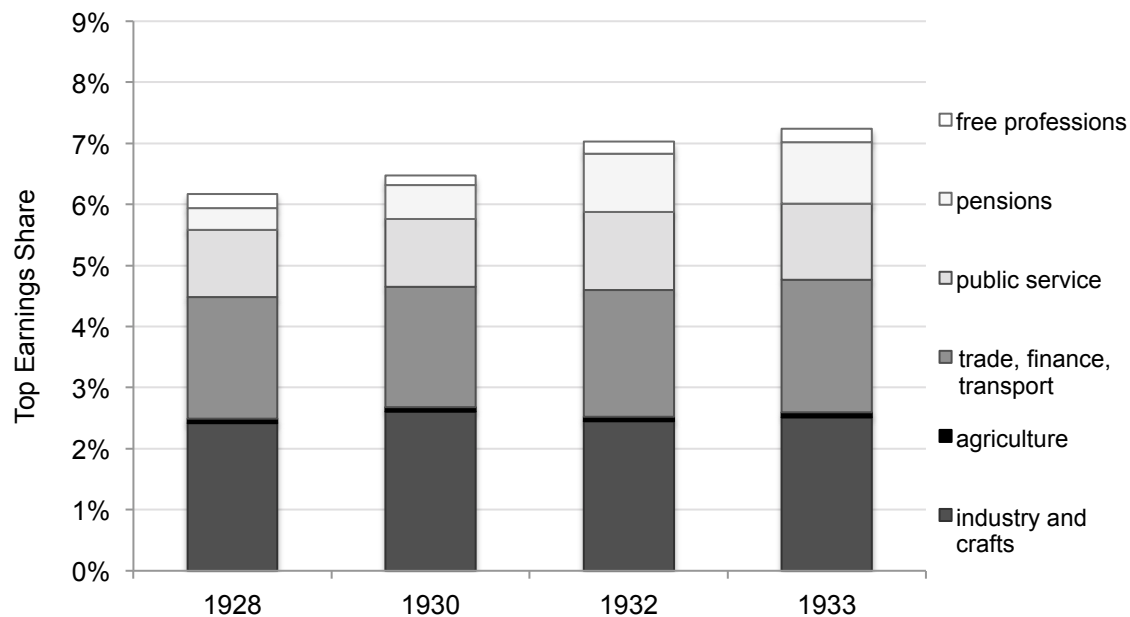


Figure 17: Top 1 per cent of earnings distribution

Source: author's computation from the income tax statistics

### 1.5.3. State, cartelisation and occupation

The recovery from the Great Depression proved to be especially painful and prolonged. The rigid adherence to the gold standard (in the so-called Gold bloc centred around its closest ally, France) severely undermined country's international competitiveness, and Czechoslovakia only managed to free itself from the consequent deflation by late devaluations in 1934 and 1936. But this alone, even though it stimulated exports initially, proved to be insufficient to result in the

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observed fall could have been a result of changes in income tax legislation (for instance, intended as a help to the agriculture during the crisis).

strong recovery. The more so as the government still insisted on conservative fiscal and monetary policies (e.g., Eichengreen 1992, p. 365, Pryor 1979).

Real incomes started to recover only in 1936, lagging thus behind the most of European countries. However, we saw that the recovery of the top 0.1 per cent had been much more formidable than for the rest (Figure 12). Figure 13 further shows that this was due to the rise in business profits. One should partly attribute this to the moderate recovery in exports (Figure 16). Especially the armament boom in the late 1930s stimulated the country's wounded industry, as Czechoslovakia had been one of the largest world armament producers at the time (Hauner 1986). Government expenditure on defence increased strongly amid growing militancy and clear signs of hostility from Hitler's Germany. Thus, while spending on defence made 15% of the total government expenditure in 1925, it accounted for as much as 30% in 1936 and 40% in 1938 (Teichova 1988).

But above all, the re-concentration of the very top income shares in the years immediately preceding Munich needs to be understood in the light of the increasing state intervention into the economic sphere, most notably, through the intense cartelisation of the whole economy (Teichova 1974). In the country that had already been characterized by one of the most concentrated industrial structures, with clear monopolistic features (especially in producer-goods industries) (Hexner 1933), this development led to rising concentration at the very top, as evidenced in the recovery of the top 0.1 per cent (Figure 2). Notwithstanding the fact that Czechoslovak industry had shown a certain level of cartelisation before, only after the introduction of compulsory cartelisation in 1933 it became the dominant feature of the whole economy.<sup>61</sup> This legislation provided the basis for concentration and monopolistic behaviour, since it was only necessary that the largest producer in the specific industry ask for the official cartelisation (Teichova 1988; p. 44; Prucha et al. 2004, pp. 281-5).<sup>62</sup>

Following this reasoning, we should attribute a decline in shares of all top groups below the top 0.1 per cent (Figure 1 and 2) to the concentration tendencies related to the more state-regulated and cartelised economy. Figures 1 show that shares of lower top groups, such as the top 5-1 per

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<sup>61</sup> It was intended as the anti-crisis measure, in order to check unbridled competition that had caused deflation and overproduction. Similar legislation measures were implemented worldwide, such as the National Industrial Recovery Act (NIRA) of 1933 in the US.

<sup>62</sup> Teichova (1988, p. 44) explains further that "outsiders were no longer allowed to produce these goods and entry into the cartelised industry was impossible without special official permission".



cent, started to fall from 1934. This was, as we saw, a group dominantly composed of wages earners and it may be argued that wages were held in check by cartels, whose sole *raison d'être* is to safeguard profits (thus they are more likely to be formed during slumps; Kalecki 1938, p. 111). In the same manner, smaller businesses outside the cartelised sector did not benefit from the prevailing 'corporatism' (e.g. see Phelps 2013). The fall of the top 5-1 per cent from 1932 to 1936 was caused in the same proportion by the fall in wages and businesses profits.<sup>63</sup> On the other hand, Figure 18 shows that the recovery of the top 0.1 per cent was driven by the rise in business profits, clearly pointing to the redistribution of business profits at the expense of smaller businesses.<sup>64</sup>

The trend of increased layering of the top percentile continued with the German occupation, when the Protectorate of Bohemia and Moravia became an integral part of the Third Reich's war economy. By 1942, in the heyday of Heydrich's terror rule, the top 0.1 per cent surpassed its pre-depression levels. The Protectorate, with its industrial capacity, was exclusively in the service of the German war effort and the link between the political authority and economy became stronger than ever. The region of Bohemia and Moravia was of crucial interest for the German war industry, and contributed to 9-12 per cent of the total German industrial production during the war years (Teichova 1988, p. 84). There was a strong increase in the industrial concentration during the German occupation (see Olšovský et al. 1963, pp. 537-550).

In Germany the top percentile experienced a sudden upswing following the Nazi conquest of power. Dell (2007, pp. 374-75) attributes this to the closer relationship of the industry and the regime due to growing war preparations (Spoerer 1996; Sweezy 1941).<sup>65</sup> It can be similarly surmised that in the Protectorate the importance of limited number of big businesses – quite likely represented by 0.1 per cent group and above – rose relative to the lower top income groups (Fig. 2). There is rich historical evidence pointing to a marked enrichment of the particular layers of society, in the first place of large industrialists who collaborated with the Nazi regime (Kral 1959). In addition, the wartime often offers various means for rapid and spectacular enrichment, and in this respect we should mention the infamous process of 'Aryanization' through which Jewish property was confiscated and dominantly transferred into the German

<sup>63</sup> Note the timing of cartelization – in 1933 and 1934 there is moderate improvement of the bottom groups of the top percentile (of business incomes, probably due to economic recovery), but afterwards there is fall of these of groups (especially business incomes)

<sup>64</sup> In this respect, we could say that Kalecki (1971) was wrong, since the increase of the so-called 'degree of monopoly' did not lead to a rise in the aggregate capital share (Stadnik 1946; Krejčí 1972).

<sup>65</sup> But Kalecki (1943) was obviously right when stating "The fascist system starts from the overcoming of unemployment, develops into an armament economy of scarcity, and ends inevitably in war".

hands (Table 2) (Junz 2002).<sup>66</sup> Teichova (1998, p. 286) states that it caused a “scramble for the spoils among business circles of Sudeten Germans and Reich Germans as well as among state and private enterprises”. However, this implied that the effect of this policies on the private income and wealth concentration was less marked in the Protectorate than in the Reich, since in the former it disproportionately benefited the German state and the German residents,<sup>67</sup> as documented by the spectacular rise of the German net foreign assets in the Protectorate (Teichova 1998) (see below).

Figure 18 shows that the rise in top concentration by 1940 was induced by the rise of business profits. One observes in addition a modest recovery of land income, while the contribution of other income sources fell. Inflation was conceivably beneficial to the recovery of land incomes, while its effect on the rise of business income was of secondary importance as the differing experience of business profits among top groups suggests that the rising inequality at the top was more important.<sup>68</sup> Equally, higher inflation adversely affected capital income (Prucha et al. 2004, p. 444) (especially fixed interest securities; which correspondingly benefited from the deflation during the Great Depression), but the fall could also partly stem from growing ownership transfers of largest corporations to the German (state) enterprises (e.g. Reichswerke Hermann Göring, Dresdner bank etc.), as well as due to the flight of the Czech capital (Prucha et al. 2004, p. 439)

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<sup>66</sup> The definition of 'Jewish enterprise' was quite broad (such as that one Jewish board member was enough for a company to be qualified as 'Jewish'), and accordingly allowed wide scope for confiscation (Teichova 1998, pp. 289-90)

<sup>67</sup> These 'state enterprises' immediately bring to mind the industrial giant 'Reichswerke Hermann Göring' (Overy 1983) or big German banks such as Dresdner Bank and Deutsche Bank.

<sup>68</sup> Inflation would have presumably benefited business incomes for all top income groups.

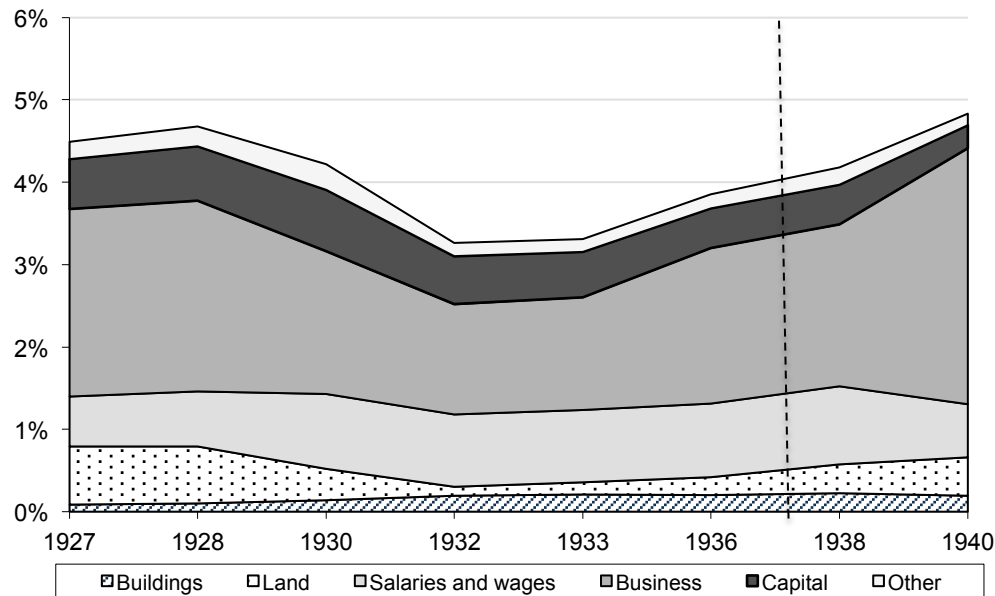


Figure 18: Top 0.1 per cent in Czech Lands 1927-1936, and Protectorate of Bohemia 1938-1940

Note: vertical intermittent line indicates that series that series refer to the Protectorate after 1938

On the other hand, there was a decline in shares of lower top income groups that were dominantly composed of wages, in particular of the top 5-1 per cent (Figure 1). Equally, note that a fall in the 'bottom' constituent part of the top percentile, which derived a larger part of income from employment, was more marked than that of the intermediate 0.5-0.1 per cent. Once again, it is useful to draw a parallel to Germany. Dell (2007) similarly finds a significant reduction in shares of top groups below the top percentile. The Nazis, as later would the communists, subdued consumption to accumulation considerations (primarily in war industries) through wage ceilings and the narrowing of the wage differential. Conceivably, the high-paid workers had to bear proportionally the larger burden of these policies.

In general, the wage equalization occurred in the Czech Lands from the mid-1930s (Teichova 1988)<sup>69</sup> and assumedly continued under the German occupation. Večerník (1996, p. 213) thus points out that "during the World-War II period, the Germans introduced a policy which was directly aimed at equalisation. On the one hand, they preferred to reward manufacturing workers for producing for the German war machine. On the other hand, they simultaneously suppressed Czech intellectuals in order to break the spiritual basis of the nation intended to be Germanised. Intellectuals were considered more hostile to the Nazi occupation and less acceptable for planned assimilation."

<sup>69</sup> Also quoted in Atkinson 2008, p. 176.

Description of assets	Value in K	% of nat.income
1. Value of bank accounts	2.063.534.076	3,6%
2. Value of confiscated enterprises	1.603.238.112	2,8%
3. Value of landed property		
a) building sites	830.863.747	1,5%
b) arable land	413.084.000	0,7%
4. Confiscated cash and receipts from sale of immovable assets	42.808.077	0,1%
5. Special possessions	1.075.276.926	1,9%
Total	6.028.804.938	10,5%

Table 2: The expropriated Jewish wealth in 1942

Source: Teichova 1998, Tab. 292; national income from Stadnik 1946 (net domestic product at factor costs)

### 1.5.4. Regional development: Slovakia in the First Republic

A regional development in interwar Czechoslovakia was unequally distributed. While the Czech Lands were at the economic level of western European countries, Slovakia (and Carpathian Ruthenia) was still predominantly agricultural in character. Indeed, one of the expounded rationales for the creation of the joint state were positive benefits that the union would have on the industrialization of Slovakia. Similarly, in the post-war ethnic tensions all over Central Europe, Czechs, who became the dominant political power in the Republic, saw a union with Slovaks as further strengthening their position against the local Germans (Krejčí 1996). However, the idea of the single Czechoslovak nation promoted from Prague, often accompanied by centralist tendencies, was received with certain reservation among the Slovaks (Skalnik Leff 1988). Germans, on the other hand, as the economically most advanced (and previously politically dominant) ethnic group, felt to be trapped in a country. Strong competition ensued between Czechs and Germans (Boyer 2000). Traditionally, the ethnic conflict between Czechs and Germans had decisively impacted the economy of the Czech Lands and troubled the old Monarchy,<sup>70</sup> often bringing a political process to a standstill (for example, leading to the downfall of both Taaffe and Badeni).

<sup>70</sup> For example, David Good (1978), finds all economic argument aiming to explain the depression in Imperial Austria at the turn of the century as unsatisfactory, and argues instead that the most likely reason was the 'Czech-German' national struggle (pp. 180-1).

Figure 19 reveals an evident disproportion in the regional distribution of top incomes. It can be seen that the Czech Lands (Bohemia, Moravia and Silesia) contributed to almost 90 per cent of the top percentile's occupiers, while Slovakia to barely 10 per cent.<sup>71</sup> This result is not surprising as the level of development was strongly biased in favour of the Czech Lands. Slovakia accounted for barely 9.2 per cent of all industrial establishments and 7.7 per cent of the country's employment (Prucha et al. 2004, Tab. 2.13). The real average wage in Bohemia was almost 20 per cent higher than in Slovakia at the eve of the great crisis (Teichova 1988). In all, the prospects for the Slovak industry worsened in comparison to the pre-war period in Austria-Hungary, where Slovakia accounted for the important part of the industry in Hungary and benefited from policies promoting industrialization. The laissez-faire policy advanced from Prague contributed to a constant lag of Slovak enterprises, which were no match to Czech or local German enterprises (Teichova 1988).

The composition of top income groups, presented for Czechoslovakia in Figures 14a and 14b closely corresponds to that found in the Czech Lands, due to the region's dominant contribution to top incomes.

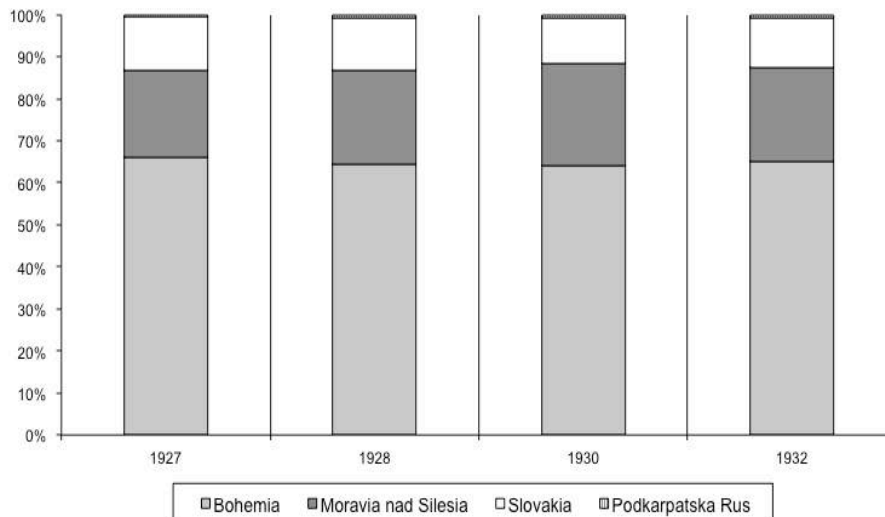


Figure 19: The composition of the top 1 per cent in Czechoslovakia by region

Source: author's computation based on the income tax statistics

The Slovak top income composition (Figures 20a and 20b) shows greater predominance of land income. Shocks to land income were therefore even more pronounced in Slovakia, then still the agricultural part of the country, where, accordingly, land accounted for the relatively more

<sup>71</sup> Although Slovakia's share in the total population was almost 25 per cent.

important factor of production. In contrast to high land productivity characteristic for the Czech Lands, the Slovak agriculture was dominantly characterized by the extensive farming and low productivity. Land inequality during the Habsburg period was equally pronounced in Slovakia due to vast landholdings of the Hungarian nobility.<sup>72</sup> Correspondingly, Figures 20a and 20b point to the greater importance of land income for the top incomes groups in Slovakia, as well as the more substantial shock experienced in the Great Depression. Although markedly higher industrialization of the Czech Lands made the impact of the world agricultural crisis felt less adversely in Czechoslovakia than in other countries in Central and Eastern Europe, the crisis was especially pronounced in agricultural Slovakia.

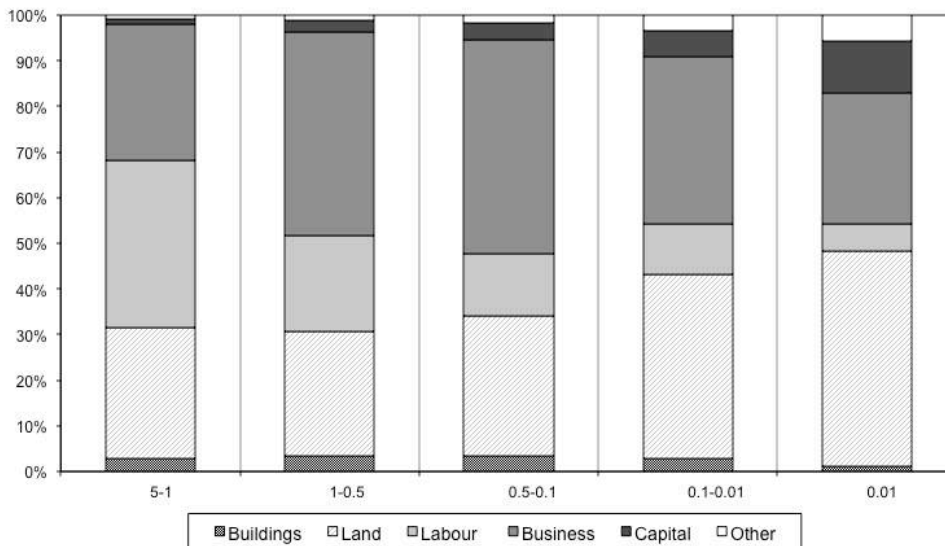
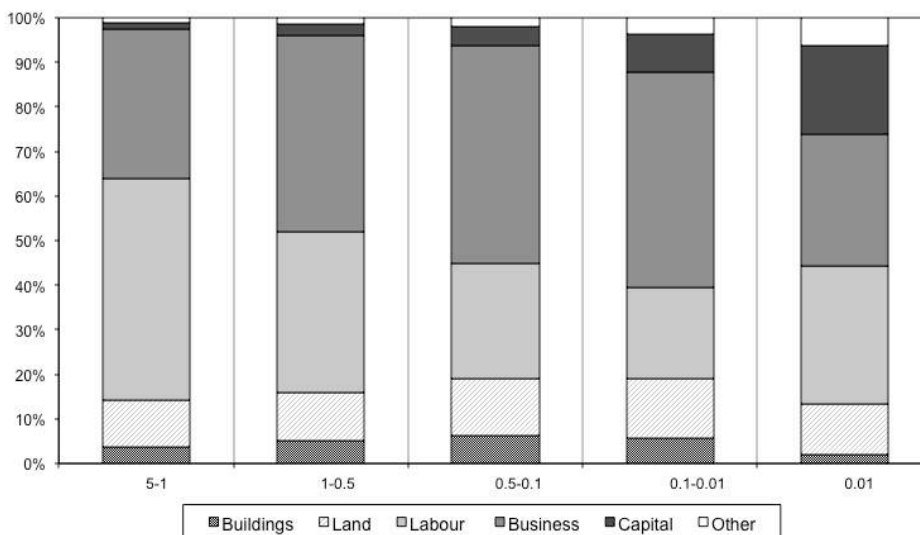


Figure 20a: The decomposition of the top 5 per cent by income source, Slovakia 1927

Source: own computation based on income tax statistics



<sup>72</sup> For example, the Esterházy, the greatest landowning Hungarian noble family had vast holdings in Slovakia.

Figure 20b: The decomposition of the top 5 per cent by income source, Slovakia 1932

Source: author's computation based on income tax statistics

Figure 21 shows that during the Great Depression a proportionally larger drop in income shares was experienced by higher groups within the top percentile, primarily due to the stumbling of top land incomes which made the largest part of their income prior to crisis (Figures 20a and 20b). As already noted, central European countries saw a plunge in exports of agricultural products, which generally fell by more than 50 per cent of its pre-crisis level, in the first place due to falling agricultural prices. In addition, the 'price scissors' aggravated further the Slovak position in Czechoslovakia (Berend 1998), as prices of agricultural products fell more strongly than of industrial products, which deepened the rift between Czechs and Slovaks (see chapters on Bulgaria and Poland for more on the effect of 'price scissors' on inequality during the Great Depression).

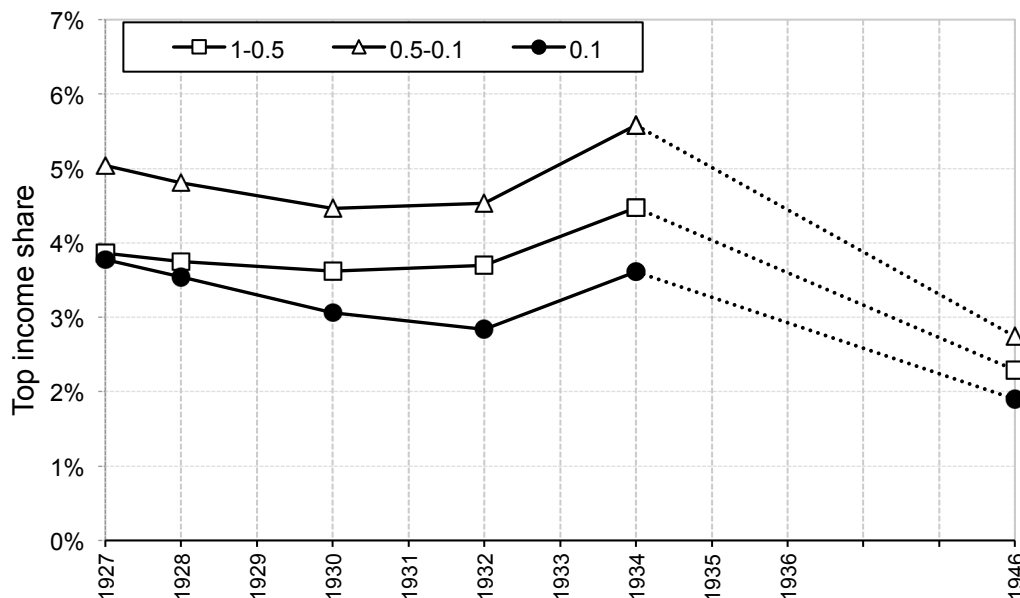


Fig 21: Top 1-0.5, top 0.5-0.1 and top 0.1 per cent in Slovakia, 1927-1946

Source: author's construction based on the income tax data

#### 1.5.4. Wealth distribution before Communism

The strong concentration of capital income at the top of the income distribution is one defying feature of inequality in the first half of the 20<sup>th</sup> century. For example, Figure 22 indicates striking

inequality of capital income (dividends, interests, etc.). As a result, it is useful to have an insight in the wealth distribution, as top incomes are directly dependant on it (Morrisson 2000).

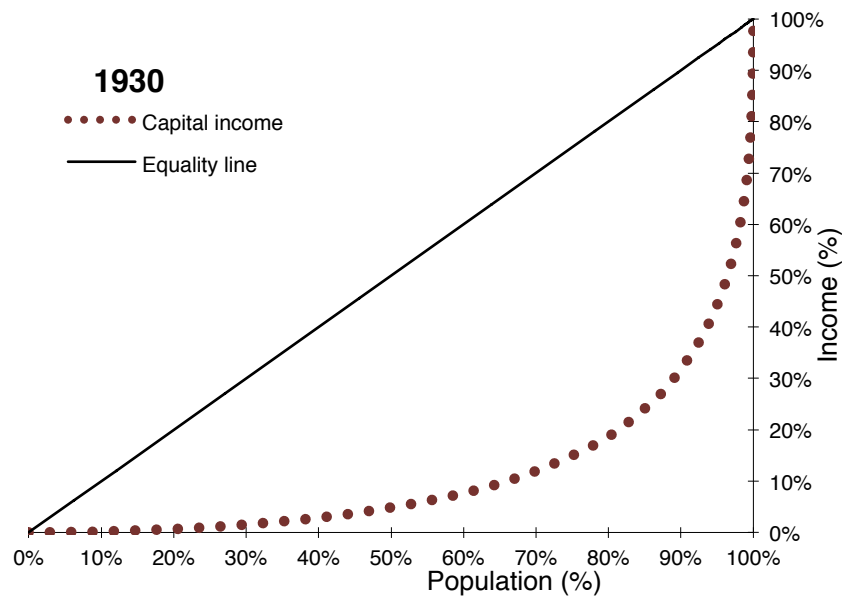


Figure 22: capital income recipients ranked according to capital income

Source: author's computation based on the income tax data

Note: capital income does not include business profits (from unincorporated businesses) and income from land and buildings

Evidence on the wealth distribution in the Czech Lands is scarce to be able to produce long run series on historical wealth distribution, but nonetheless, the available data for the interwar period provide us with the important findings that deserve its due attention. For example, a detailed statistics on wealth tax in 1919 allows the construction of a wide range of distribution estimates, including the top wealth shares. Figure 23 shows that top 10 per cent wealth share in the interwar Czechoslovakia was at the level of European countries. The top 1 per cent wealth share equally points to similar concentration patterns as in other European countries at the similar level of development such as Norway or Finland, but noticeably below some other (more advanced) countries like France or Netherlands (see appendix; we estimate Gini coefficient as equivalent to 0.76). However, one should bear in mind that the immediate post-war estimates could have been significantly affected by the war, either due to the property destruction in belligerent countries or due to international shocks that frequently accompany the war period.



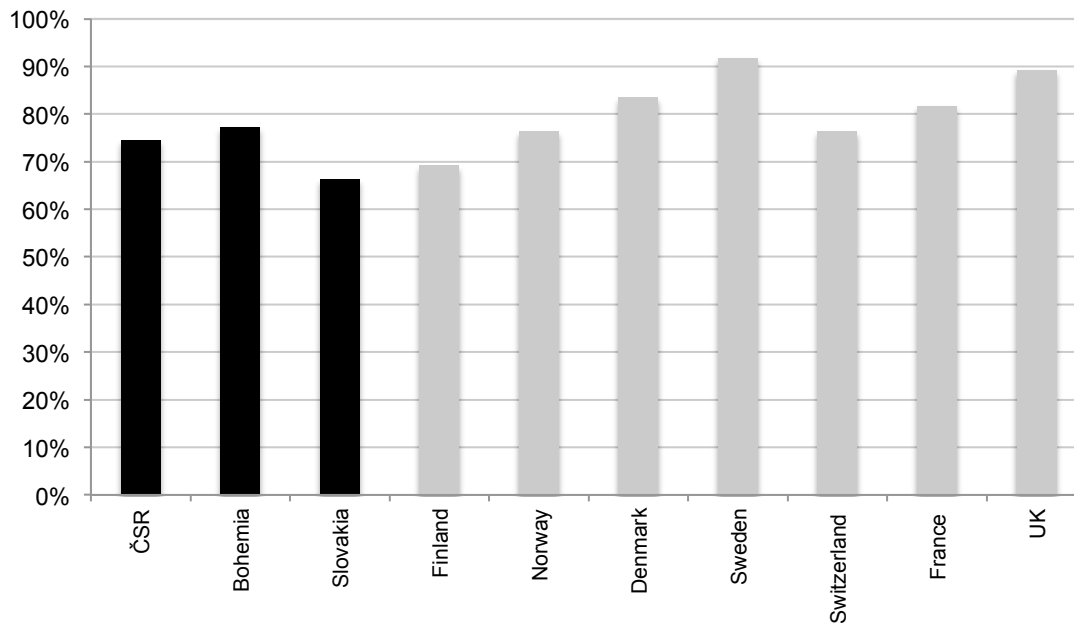


Figure 23: Top 10 per cent wealth share in 1919

Source: author's computation from the wealth tax data; other countries from Roine and Waldenström 2015

Data on the wealth composition is revealing, in the same way as the income composition was found to be central for understanding the evolution of top incomes. Fortunately, it is possible to observe wealth composition at two snapshots, at certain time distance, thus as a rough indicator of longer term patterns. Besides 1919, we have at our disposal also the data for 1943 when the wealth tax was introduced in the Protectorate of Bohemia and Moravia. First, Figure 24 depicts wealth composition for the Czech Lands in 1919. It can be seen that agricultural wealth dominates at the top decile level, all the way until the 0.5-0.1 per cent and then emerges again as the main asset source at the very top of the distribution. We have discussed the importance of large landowners and of the commercial agriculture in the Habsburg period, as well as the 'agricultural-industrial character' of the Czech Lands.<sup>73</sup> It can be seen that the grand nobility was still after the war the most prominent wealth holder in the country. As noted, land inequality was especially high in Central Europe before the First World War (Table 1). For example, most of the German millionaires before WWI were large landowners (Baten and Schulz 2005).

And one should bear in mind that the observed distribution in 1919 refers to the situation immediately preceding the big land reform, particularly directed against aristocratic (mostly Austrian) large estates. It was only in 1930s that the expropriation became substantial, affecting

<sup>73</sup> The arable land in interwar Czechoslovakia accounted for a substantial part of the total country's area (around 43 per cent of its total surface in 1928 (see *Aperçu statistique* 1930, Tab. 1)) in comparison to western countries (Teichová 1988).

more than a third of the total land (Otahal 1963, Teichova 1988; Berend 1985, p. 159). The final result was a strong deconcentration of landed wealth. An increased pace of land reform and a devastating impact of the Great Depression contributed without doubt to the virtual elimination of top landholders from the very top of the wealth distribution. Many (German) big landowners hoped in vain for the repeal of land reform with the Nazi occupation (Glassheim 2005, pp. 195-200).

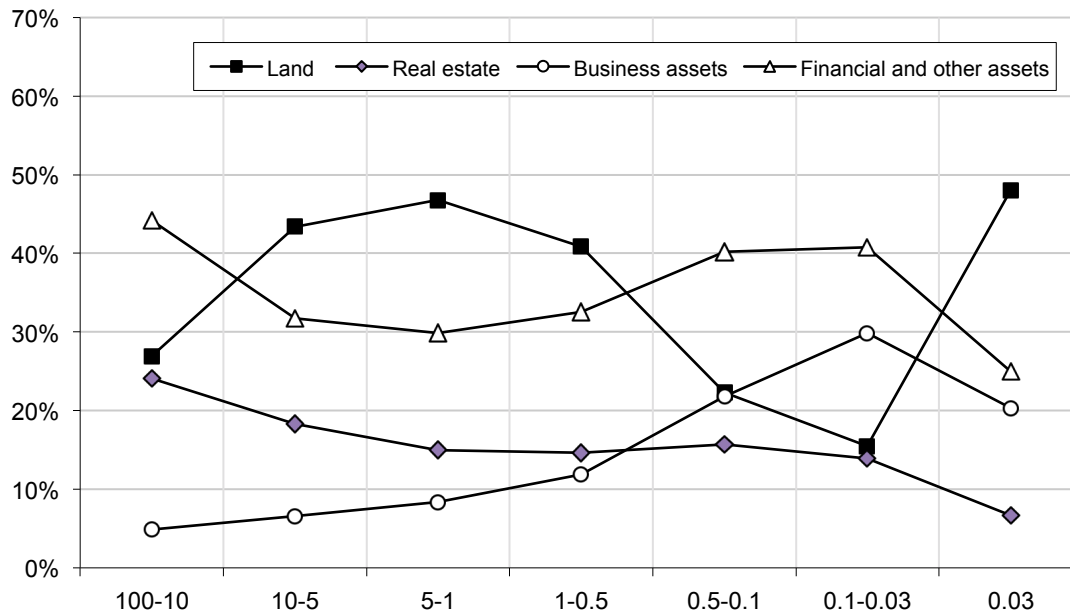


Figure 24: Asset composition in Bohemia in 1919

Source: author's computation based on the wealth tax statistics

Thus, by 1943 business assets became the most important component of the very top wealth-holding groups (Figure 25). In line with the previous discussion, it seems that big business owners were principal beneficiaries from the state economy in the late 1930s and the subsequent German occupation. The industrial capacity of the Protectorate was exclusively designated to serve the German war effort and the economic policy predominantly focused on the further industrial expansion, in particular of the armament programme. Consequently, one should aim to understand the distributional repercussions of income and wealth during the German occupation chiefly in the light of strategic priorities of the war economy. For example, Maxine Sweezy (1939, 1941) argued that Nazi's favoured concentration of wealth in order to induce higher saving and discourage private consumption (private wealth concentration was also

stimulated through the large-scale 'reprivatisation' of public capital (Bel 2006; Schweitzer 1946)).<sup>74</sup>

The war economy demanded high morale of Czech workers, and prevented to large extent unrestrained 'colonization' as practised in some industrially less developed countries in Eastern Europe.<sup>75</sup> Glassheim (2005, p. 205) notes, for instance, that Himmler vetoed any attempt at the land reform reversal, stressing the importance of securing high morale of Czechs. But at the same time, one observes a complete reversal in the importance of German capital in the economy, ascending to the dominant position after its role had been greatly diminished after WW1 (in the first place due to the 'nostrification' in the early 1920s, primarily intended to limit the influence of the German capital). Germany was thus only the fifth largest foreign direct investor in Czechoslovakia in 1937 (its share was 7 per cent of the total FDI), but already at the end of 1940 Germany became the leading direct investor and its share increased to 47 per cent of the total FDI (Teichova 1998, Tab. 14.4).<sup>76</sup> Krejčí (1986; p. 454) finds that the extent of unrequited deliveries to Germany during the occupation equalled to more than one-third of GDP. In the course of few years, the 'Germanization' (*Eindeutschung*) of the economy took place, with the inducement toward the stronger industrial concentration, benefiting (strategic) big businesses accompanied by liquidations of medium and smaller businesses, appointing directors in firms with Czech owners<sup>77</sup> (Teichova 1998, pp. 288-9). Machonin (1996, p. 142) notes that the 'castle-like system' replaced the 'ordinary European class system'.<sup>78</sup>

<sup>74</sup> In the same manner, high investment rates were pursued through the wage policy (both through workers' stimulation and exploitation).

<sup>75</sup> And also resulted in the indeterminate postponement of plans to 'Germanize' Czech Lands and eventually liquidate of the Czech nation (*Endlosung*) (Teichova 1998, p. 284; Machonin 1996, p. 141; Kural 1994).

<sup>76</sup> Enemy property (Teichova 1998, p. 286)

<sup>77</sup> Machonin (1996, p.142) notes that: "A 1941 statistical survey on the population employed in Czech industry showed that the share of Germans among its total labour force was 4.4 per cent, 12.8 percent among the employees of the Genral Administratives and Directories and 36.3% among the active owners and top managers.»

<sup>78</sup> Teichova (1998) explains the unambiguous colonial pretension of Germans by the mere term of Protectorate (after that for the French Morocco)

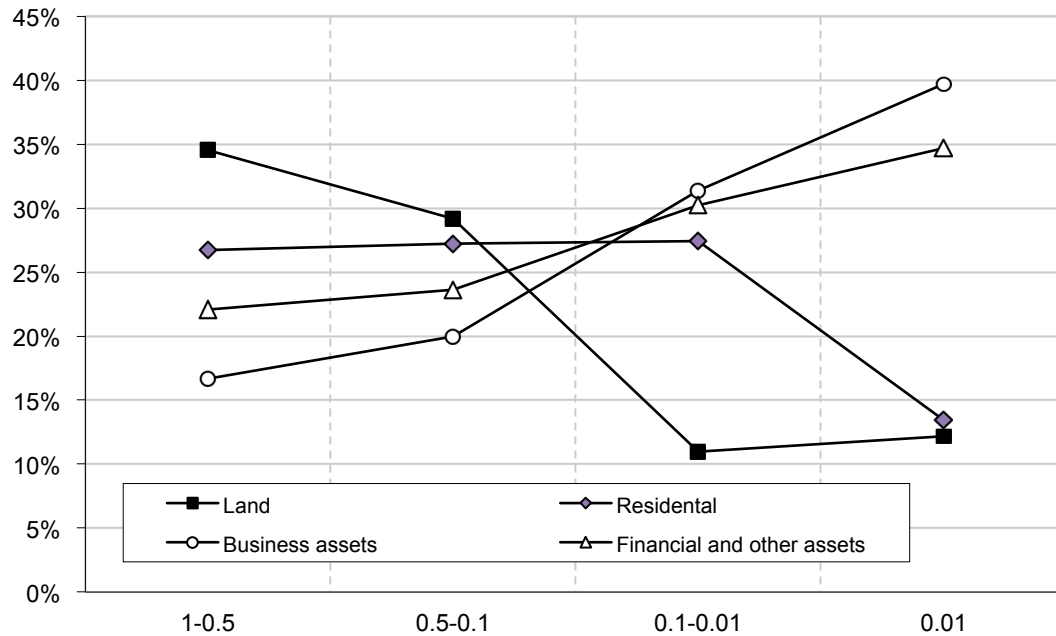


Figure 25: asset composition of the top 1 per cent wealth holders in the Protectorate of Bohemia and Moravia in 1943

Source: author's computation based on the wealth tax statistics

## 1.6. Communist Czechoslovakia

The communist experience clearly presents a landmark in the twentieth-century history in Central Eastern Europe and one should make it as the reference point when trying to ascertain the long-term distributional patterns. Figure 1 shows that top incomes plummeted immediately after WWII. By 1946, the top 1 per cent income share almost halved from the levels observed during the Protectorate. Figure 2 further points that the very top shares saw the strongest fall. Thus, the fall of top 0.1 per cent share was more substantial than documented for lower constituent groups of the top percentile. In particular, the 'bottom' top 1-0.5 per cent experienced the smallest fall, while the top 5-1 per cent income share actually slightly increased.

But we should note that this fall occurred already before the communist takeover in 1948. Reasons should be searched for in the immediate proceedings of WWII. In the post-war disarray, the Nazi war economy was dismantled and the capital share in the economy sharply contracted (Krejčí 1968; Teichová 1988, Tab. 3.3.). The top income composition during the Protectorate (Figure 16) suggests that the post-war fall was largely driven by the plunge in

business profits. Both official and private retributions were taken against the collaborating big business and war profiteers. Quite importantly, Germans, who had made previously important contribution to top income shares were expelled from the country (Map 1). In a spontaneous rally, the worker councils took over many large enterprises.<sup>79</sup> In fact, the large-scale nationalization had largely occurred before the communist takeover (notably, the Beneš's nationalization decrees), Teichova (1988) notes that by 1947 "nationalised industries and confiscated companies employed approximately 80 per cent or all workers and disposed of over two-thirds of Czechoslovakia's production capacity". Furthermore, top incomes suffered from the 1945 currency reform, the introduction of the taxation directed at top wealth holders (e.g. the 'millionaires levy'), etc. The communist takeover only exacerbated the fall and prevented the recovery of top shares (as seems to had been the case in Germany, where by 1950 top shares returned to their pre-war levels; Dell 2007).

The appropriation of the capital stock in the brief period after the WW2 eliminated capital (property) income as the important source of income dispersion at the top. And since capital income (business profits and dividends, land income, interests, etc.) made, as we saw, the predominant income source for high-income groups, there was a dramatic reduction in the concentration at the top. Following Piketty (2003), we show in Figure 26 the top 1 per cent of the income distribution and the top 1 per cent of the wage distribution. As can be seen, the decline in the top concentration in the communism was primarily caused by the fall in capital income, which accounted for the predominant part of the top percentile in the interwar era. This was Piketty's (2001, 2003) important finding for France that directly challenged the natural ('Kuznetsian') fall of inequality in the course of the development. The fall was anything but natural, caused by exceptional exogenous shocks that decimated capital incomes. As shown by Piketty, wage inequality in France was largely unaffected. However, wage compression did occur in countries that introduced communism, but as Figure 26 indicates, it was of secondary importance for the evolution of top incomes when compared with shocks incurred by capital incomes.

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<sup>79</sup> The communists actually brought an end to it.

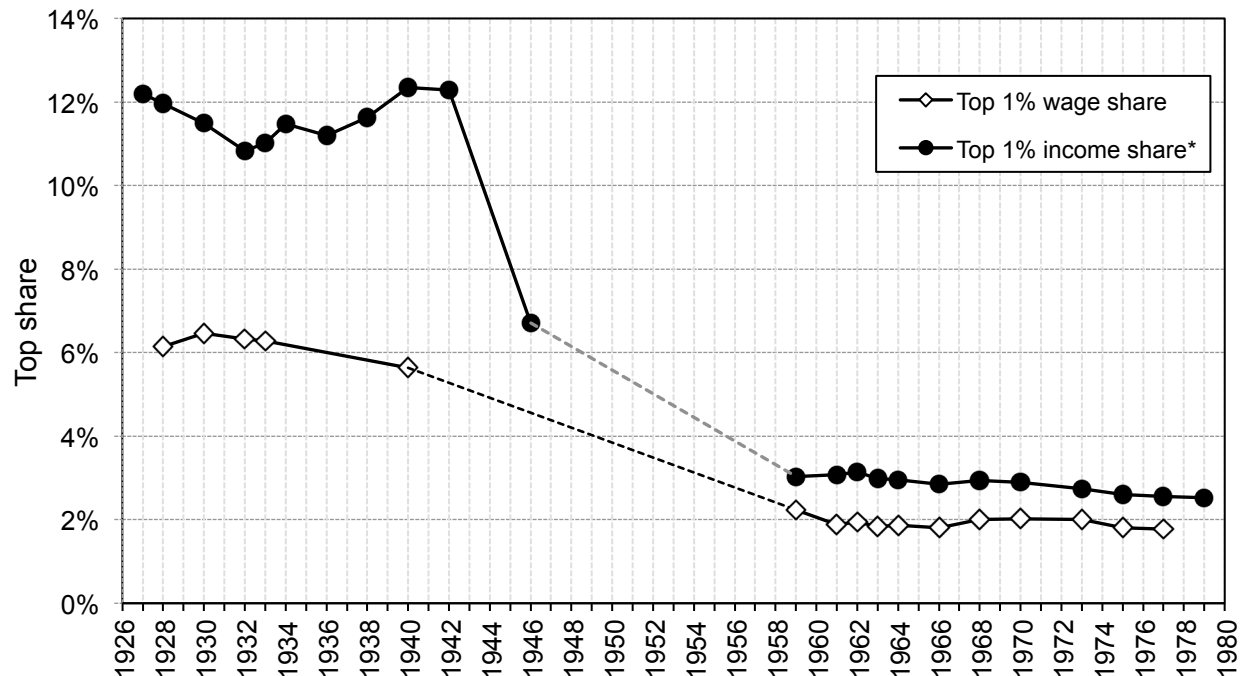


Figure 26: Top 1 per cent income share and the top 1 per cent wage share

Source: Top income share and top wage share in the interwar period: author's computation based on income tax statistics; both top income shares and top wage shares in the communist period constructed on the basis of employer surveys

Already by 1948, the largest part of the national wealth (close to 90 per cent fixed capital stock other than housing) was in public hands (Historicka Rocenka 1985). The expediency of the process is astonishing and its scope was extreme even in comparison to other communist countries. The first nationalization wave came about in 1945-47, and focused on big industry including over two thirds of productive capacity. Banks and trade were nationalized during the second wave in 1948, as well as all medium-sized businesses. During the next few years, almost all small businesses were affected. Collectivization of the land ensued, as something that, in words of Teichova (1988), would cement the “alliance between workers and peasants” (similar to the Soviet *‘smychka* of the town and the village’). Household ownership was transformed into the right of personal use (Michalovic 1992). As a final blow, monetary reform of 1953 confiscated all personal savings.

On the other hand, the wage compression, which had already started in the mid-1930s and during the Protectorate (Večerník 1996), attained new pace under the communist system of central planning. In part, it was as a tool for rapid capital accumulation. As pointed out by Adam

(1974), the accumulation needs kept wages below the productivity rise,<sup>80</sup> and one of the principal means in achieving this consisted in forced narrowing of wage differential, even at the expense of sluggish productivity growth. The burden of increased investment spending fell mostly on white-collar workers since manual workers formed the basis of the communist support.<sup>81</sup> Among the communist countries, Czechoslovakia went furthest both in its reliance on the extensive growth model and in the extent of the compression the wage structure, and the two should not be looked upon in isolation. Wage setting process was thoroughly centralized with planners keeping monopoly on wage grids throughout the whole socialist period, leaving no discretion at the enterprise level (Munich, Švejnar and Terell 2000). The adverse repercussions on incentives was recognized early on and it did not lack criticism (e.g. Machonin 1968), but all attempts at the reform (even by the Party itself) failed to realize, either due to internal reasons such as the fear of the potential discontent of manual workers or due to the external Soviet pressure.

Once egalitarianism implemented, it stayed until the end. Moreover, its breadth was so thorough, that Atkinson and Micklewright could claim (1992, p. 104): “Among the Eastern European countries, Czechoslovakia stands out. The low recorded degree of earnings dispersion in Czechoslovakia is indeed remarkable, as is the relative stability of the distribution over a period of three decades” (see more Connor 1979; Krejčí 1968; Večerník 1991).

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<sup>80</sup> Adam (1974, p. 47) comments that “it was raised to the status of a general law. It has become a dogma”.

<sup>81</sup> The Czechoslovak communist Party (KSČ) retained its dominantly blue-collar base, restricting the entry of intelligentsia. Grzymala-Busse (2002, p. 31), in the cross-country overview, thus points out that “the KSČ was the only party to insist on its ‘working-class’ character until the very end.”

## 1.7. The return to capitalism

The return to capitalism could be seen as the reverse process of the Communist equalization, manifested in the rising wage dispersion and the rising concentration of private capital income (Večerník 2001). It has been acknowledged that income inequality strongly rose in the 1990s and that it was dominantly driven by the concentration at the top of income distribution (Večerník 2001; Atkinson 2008; Kahanec et al. 2012). The increase in inequality in the Czech Republic was primarily caused by a sudden jump in the top decile's share in the early nineties, which stabilized afterwards (Večerník 2001; Atkinson 2008). Plausibly, the great speed of transformation contributed to the observed immediacy of the increase. The speed was one of the most distinctive features of the Czech mass (or 'voucher') privatization, which stands as the prime example of the so-called 'big bang' privatization strategy. On the other hand, a more modest overall rise of inequality in the Czech Republic has been attributed to the mitigating effects of the social redistributive policies for the lower deciles, in particular due to the relatively more preserved scope of the welfare system after the transition (Ivanova 2006; Kahanec et al. 2012).

The top income series re-emerge only in the mid-2000s, and by then, most of the dispersion had already occurred. Figures 27a and 27b presents composition of the top percentile in the most recent period.<sup>82</sup> The overall composition suggests that the rise in the top percentile share after Communism was caused both by the rising wage and capital income concentration. However, today employment income is the most important source for top income groups. It can be seen that before the crisis, capital income (that is, other than income from employment) was the most important income source for the top 0.1 per cent. In contrast, in the interwar period capital income was already predominant source for lower percentiles (Figure 14a)

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<sup>82</sup> The series for the interwar and the recent period are based on the tax data while estimates for the communist period are constructed from the employer survey.



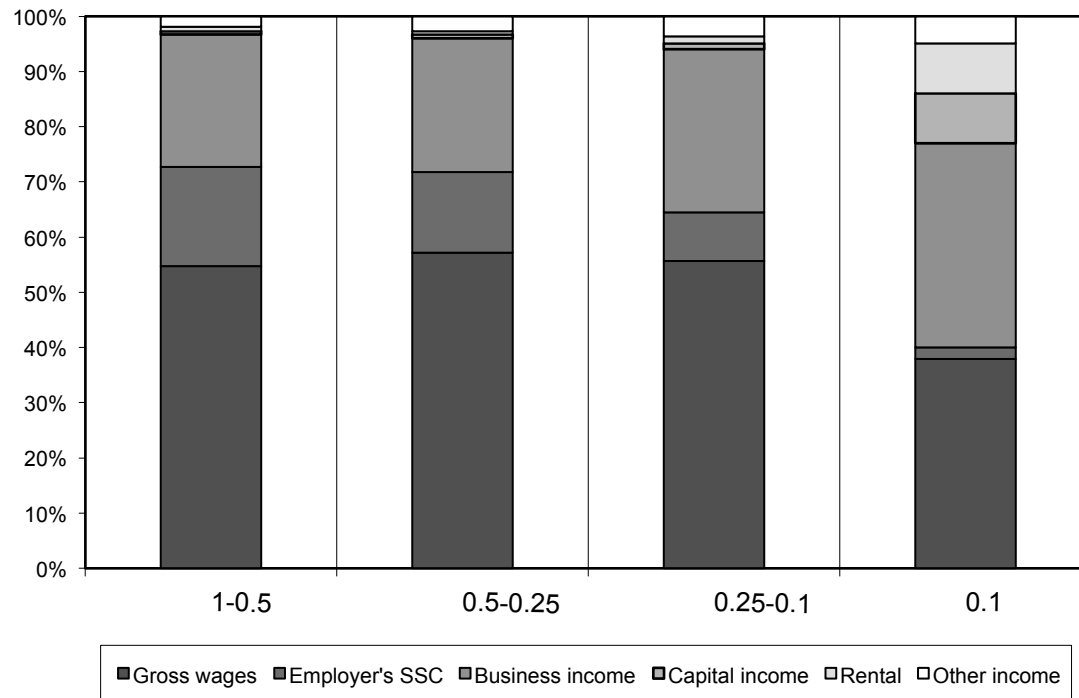


Figure 27a: Decomposition of top 1% by income source, the Czech Republic 2008

Source: author's computation based on the income tax data

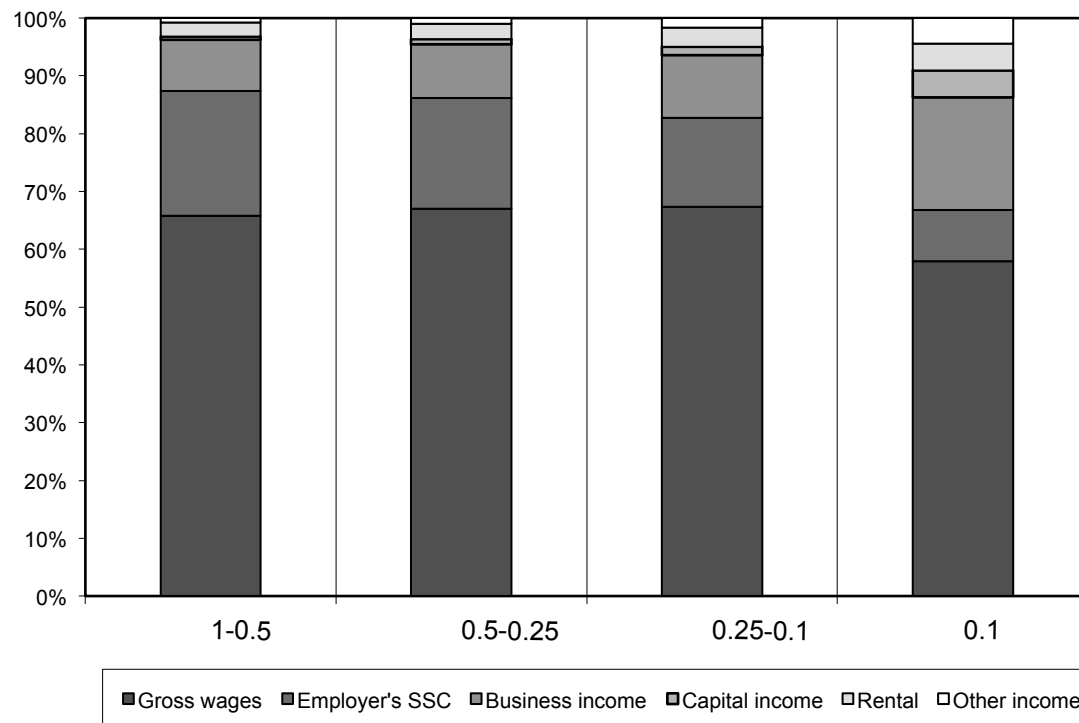


Figure 27b: Decomposition of top 1% by income source, the Czech Republic 2013

Source: author's computation based on the income tax data

A fall in the share of the top percentile since 2008 has been mostly induced by economic factors, in the first place due to the negative effects of the global economic crisis on the Czech economy. A fall was largely induced by the corresponding drop in the share of the top 0.1 per cent group (Figure 2), while lower income groups within the top percentile (top 1-0.5 per cent and top 0.5-0.1 per cent) have been more stable throughout this period. The income decomposition of the top 0.1 per cent clearly shows that it was business income that was hit hardest by the crises (Figure 27a and 27b) and generally has driven short-term fluctuations of top incomes. The Czech Republic, as a relatively small open economy, has traditionally been dependent on industrial exports and thus excessively vulnerable to shocks in external demand (in the first place in Germany, its main trading partner).<sup>83</sup> A specific pro-cyclical character of the top income shares evolution in the Czech Republic has been recorded both in the First Republic and today, where the low points in the top income levels correspond to the largest drops in industrial production. On the other hand, labour income at the top exhibited certain rigidity in both instances. Wages and salaries are more resistant to deflation (especially acute problem during the interwar period), but in general, there is an increase in inequality of labour income in crises due to higher unemployment (see section 5.2). In this respect, the recent appreciation that there are lessons to be learned from the Great Depression, equally applies when it comes to distributional issues.<sup>84</sup>

### 1.7.1. Top earnings

Following the preceding discussion, we consider first the importance of earnings for the top concentration. Top 0.1 per cent has returned to pre-WW2 levels. But the data suggest that today the 'working rich' dominantly populate the top of the distribution. In general, most theories trying to explain the rise of inequality in former communist countries in Central and Eastern Europe have concentrated on the shocks induced by the structural changes in the labour market that

<sup>83</sup> It is plausible that business income makes the predominant form of capital income, especially since incorporated dividend paying companies are mostly in foreign ownership (chapter 2). The unincorporated business forms are more frequent under the German corporate law (Dell 2007 for Germany, chapter 2 for Poland) Unfortunately, we cannot appreciate the contribution of capital income deducted at source, and it is fairly plausible that it is concentrated at the top (most notably dividends), thus making capital income more represented at higher levels of income distribution. Alternative sources on income distribution such as household surveys (e.g. EU-SILC) especially suffer from the poor coverage of the property income (Atkinson, Rainwater, and Smeeding 1995). Capital income category in the tax data refers to interest on given loans, which are reported on the tax return.

<sup>84</sup> For example, there is a similar conservative attitude taken by the Czech government in the recent crisis as evident in austerity measures and fiscal consolidation. Brada (1991), for instance, distinguishes 'fiscal conservatism' as the important intellectual legacy in the Czechoslovak policy, influential in both the pre-communist and the communist period.

resulted in growing earnings dispersion, such as decentralization of wage setting (Večerník 2001), a dissolution of the large communist wage-compressed state sector and the consequent shift of workers towards more wage-dispersed private sector (Milanović 1999), etc. The most robust explanation of rising earnings dispersion across studies has been attributed to a rising return to (higher) education, suppressed during the communist regime. Rutkowski (2002, p. 34) thus notes that “high earnings inequality is to a large extent a cost of the revaluation of human capital that has taken place during the transition.” Although this explanation is widely accepted, a word of caution should be made, as stressed by Atkinson (2008, p. 177), who points that the observed concentration at the top in the early transition could also imply ‘monetization’ of various benefits in kind enjoyed previously by a small communist elite (see Atkinson and Micklewright 1992, pp. 167-70).

After the initial surge in dispersion, distribution stabilized in the subsequent decade. However, the 2000s brought about a ‘fanning out’ of the top (Atkinson 2008). Figure 28 thus indicates that higher percentiles have risen more rapidly, for instance, as observed by faster rise of P95 than P90 (relative to the median). The highest percentiles (which exhibit stronger volatility) seem to have experienced especially rapid growth. This rise in earnings dispersion in the Czech Republic has been equally identified in the literature (e.g. Eriksson et al. 2013). Various arguments have been offered, frequently in the dominant supply and demand framework, where a substantial increase in demand for skilled workers has been attributed to skill-biased technological change (Katz and Murphy 1992).

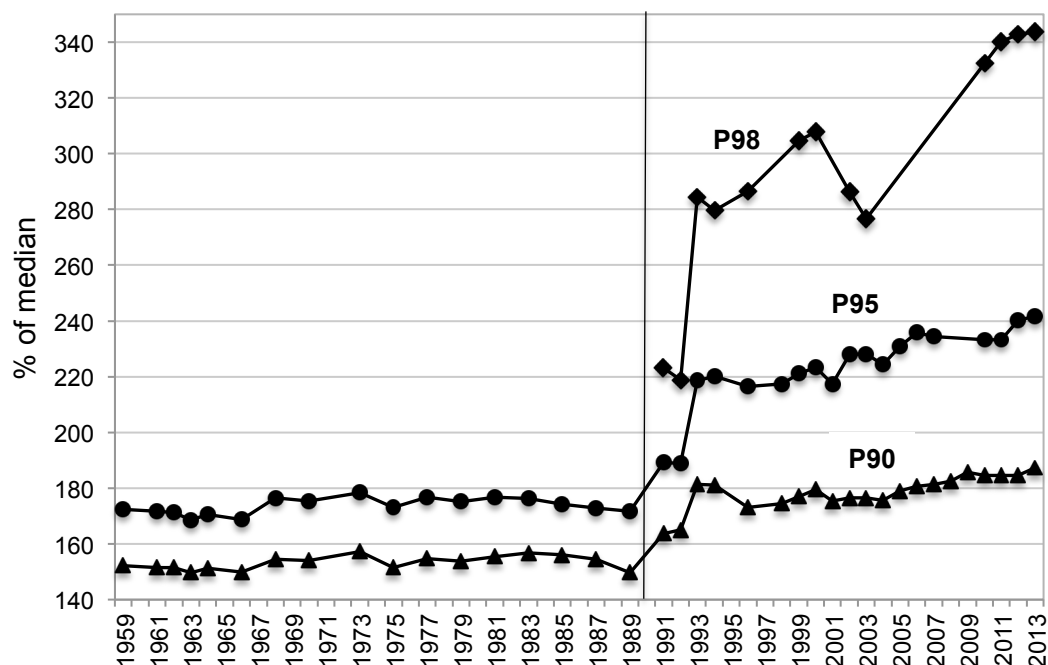


Figure 28: Top of the earning distribution in the Czech Republic

Source: 1990-2012: author's computation from Enterprise survey (see also Atkinson 2008); 1959-1989 from Atkinson and Micklewright (1992) based on the Employer census (it refers to Czechoslovakia)

But, this framework, or 'economists' approach' (Atkinson 1997, p. 309), has long been recognized as an oversimplification. Moreover, in the context of rising top income shares, explanations based on the education premium are of little help, since the most critical wage differentiation has occurred among those with higher education. Namely, those in the top 1 (or more notably, in the top 0.1) per cent have been disproportionately well-rewarded in the labour market with respect to their former fellow students (Atkinson et al. 2011, p. 58). Consequently, it is important to have a more detailed insight at what is happening within the top groups.

Atkinson (2007, p. 36) thus points to the "globalisation of the demand side of the market for top managers, one group for whom movement across national borders is significant. Corporations are now seeking to recruit globally to the upper echelons of their organization". To a certain degree, this explanation is closely related to the 'superstar' theory of Rosen (1981). In the light of this theory we could perceive high salaried individuals in the Czech Republic, such as the top executives, (similarly as hockey or football players) as individuals in possession of special organizational and technical talents and often coming from abroad. Atkinson (2008) has thus proposed a combination of the superstar theory with the so-called hierarchical theory (e.g. see Lydall 1959) in order to explain rising earning dispersion in OECD countries. In particular, he singles out three principal mechanisms leading to higher earning concentration: "increased concentration of superstar rents, resulting from technology and trade; increasingly steep pay hierarchies in pyramidal organizations; switch from hierarchical pay to rent-sharing" (Atkinson 2008, p. 78).

We can tentatively argue that the higher prominence of multinational enterprises (MNEs) in the Czech Republic (see below) could account for some dispersion at the very top, as top personnel of MNE's are often paid by global ('western') remuneration standards, which makes them quite distinguishable in comparison to the average Czech earnings.

### 1.7.2. Capital transformation

The historical transformation from public to private capital after the fall of communism in Eastern Europe could have critically impacted distributional patterns. Communist Czechoslovakia was, as we saw, characterized by exceptionally high level of public capital ownership, a proportion that was extraordinary even in comparison to other communist countries in Eastern Europe. But in spite of it (or rather in large part exactly because of it), the Czech Republic embarked on a thorough privatization program whose main feature was to be its speed<sup>85</sup> that would allow a comprehensive grasp and guarantee the irreversibility of the process.

Another feature was that it principally took a form of mass (voucher) privatization with mostly free provision of assets to the public. It enjoyed initially a large public support because it was perceived as fair and inclusive. It was assumed best to leave everything to market forces, which could efficiently identify highest value users (and result in certain concentration that would mitigate potential repercussions that diffused ownership might have on corporate governance). However, it turned out that the big-bang approach as implemented in the Czech Republic (and Russia) only led to the 'big-bang' disappointment. It resulted in restructuring chaos, which amid weak institutional framework benefited very few, and for the majority of population vouchers turned out practically worthless. Above all, privatization was quite often surrounded by the lack of transparency. The widespread conception has been that the process resulted in the strong wealth concentration, quite the opposite of the 'popular ownership' initially promised. This could be related to breaking the myth of the 'Czech miracle', which was reflected in widespread bankruptcies, bank failures, privatization scandals and corruption, (e.g. 'tunnelling'), etc. Thus, Martin Myant (2003) has advanced that afterwards the 'Czech capitalism' was replaced by the convergence based on foreign capital.<sup>86</sup>

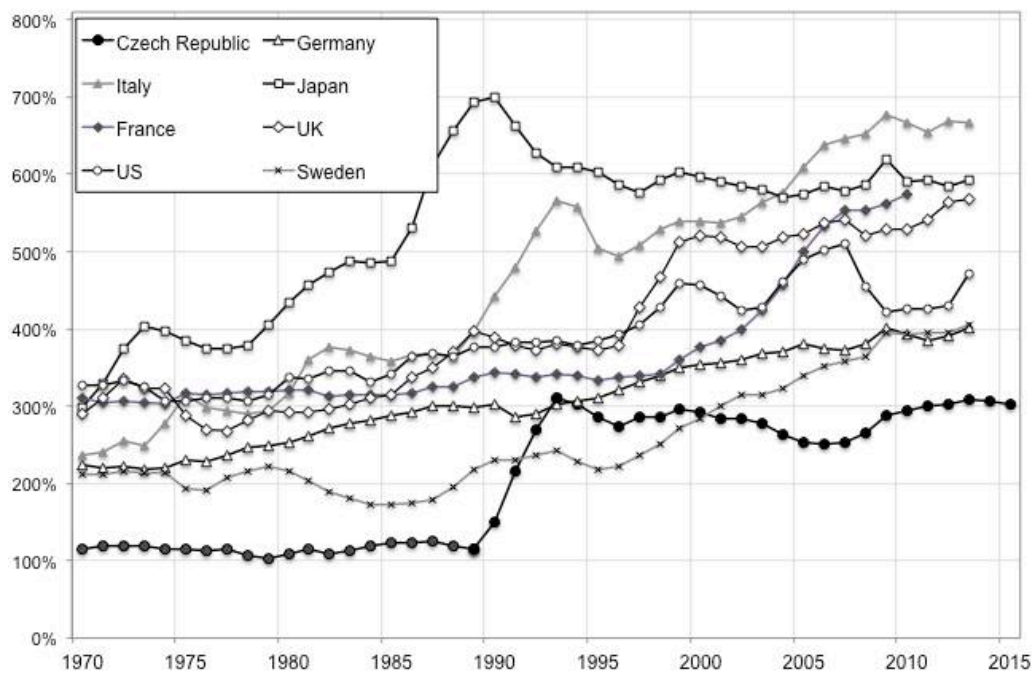
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<sup>85</sup> The so called 'Big bang' approach in opposite to the 'gradual' privatization. It was epitomized by the Prime Minister Vaclav Klaus, and was one of the reasons behind the Velvet Divorce (the Slovaks under Mečiar more in favour of the gradual approach).

<sup>86</sup> Initially, in the midst of reawakening of the national identity all over the former communist bloc, a notion about the link between economic and political sovereignty became pervasive and resulted in a sentiment of general aversion to foreign ownership (for example, see Bandelj 2008). One should be reminded here of a similarity to the above-mentioned interwar experience, when the perception of a need for greater national ownership had been equally present.

There is scarce evidence on the wealth inequality in the Czech Republic.<sup>87</sup> Alternative way to gauge the wealth concentration is by looking at the development of private wealth-income ratio (Piketty and Zucman 2014). Piketty (2014) has recently brought attention to ‘natural’ economic forces that result in rising concentration of capital income. He suggests that the rising wealth-income ratio  $\beta$  (as evidenced in advanced countries in the last decades; primarily due to the growth slowdown in accordance with Harrod-Domar-Solow formula  $\beta = s/g$ ) leads to a rising capital share in national income as the rate of return on wealth exceeds the rate of growth of national income ( $r > g$ ).<sup>88</sup> Since capital income is generally more unequally distributed, this could negatively affect personal inequality. Consequently, it is important to follow developments in the private wealth.

Figure 29 shows that private wealth in the Czech Republic has been slightly less than three years of national income, which is lower than what Piketty and Zucman (2014) found for developed European countries. In this respect, the importance of wealth in these ‘wealth-young’ countries<sup>89</sup> is comparatively smaller. Moreover, it is mostly composed of housing, which is generally found to be more equally distributed (see chapter 5).



<sup>87</sup> E.g. see Credit Suisse on the international wealth distribution (Davies et al. 2014)

<sup>88</sup> However, this requires that elasticity of substitution between capital and labour is higher than 1.

<sup>89</sup> A term used by Milanović 2015

Figure 29: Private wealth in the Czech Republic and selected countries, 1970-2015 (as % of national income)

Source: chapter 5

On the other hand, it has been found that the financial wealth, especially corporate securities have been quite unequally distributed, making at the same time the bulk of wealth of the rich (Glynn 2009, Saez and Zucman 2015; Roine and Waldenstrom 2015).<sup>90</sup> In this respect, the major ownership of corporate wealth by the rest of the world implies that most holders of top capital incomes are foreigners. Here one observes clear similarity with the Habsburg Empire ('Vienna' effect; Figure 7). The importance of foreign capital has risen and the net international investment position has turned from small positive values in early 1990s to negative values around 50 per cent of national income today. The importance of foreign capital could be substantial for a small open economy as the Czech Republic. Today around 10 per cent of Czech national income goes abroad as remuneration to foreign capital. This amount stands for as much as the half of the capital income that has been generated in the country. Large positive trade balance has been required in order to stabilize the net foreign asset position.

The top income shares could be clearly impacted in a significant way if foreigners own a non-negligible part of the corporate stock. Moreover, large capital outflows indicate high returns (as a proportion of net foreign assets), meaning that foreign capital acquired high-yielding corporate stock. In general, corporate stock is much more unequally distributed than the total wealth. Note for instance that the wealth of the top wealth holders worldwide most often consists of equity holdings (both of non-listed and listed corporations) (Saez and Zucman 2015). In addition, private capital in the Czech Republic is mostly composed of housing and (relatively low-yielding) safer financial instruments, which is usually more equally distributed<sup>91</sup> and quite negligible for top wealth individuals.

Thus, the importance of capital income for top income shares could be similarly affected by the significant extent of foreign ownership as had been previously by pervasive state ownership (in much more limited scope).<sup>92</sup> For example, Kessler and Wolf (1991) attributed lower documented

<sup>90</sup> The Czech households dominantly hold safer instruments such as currencies

<sup>91</sup> Note that the ownership of housing is widespread in Central Eastern Europe.

<sup>92</sup> Similarly, capital income at the top could be affected by higher proportion of retained earnings in corporations not included in taxable income (Atkinson 2007b).

wealth inequality in France than in the US in 1980s primarily to the fact that higher level of non-private (in this case state ownership) of the corporate stock in France than in the US.

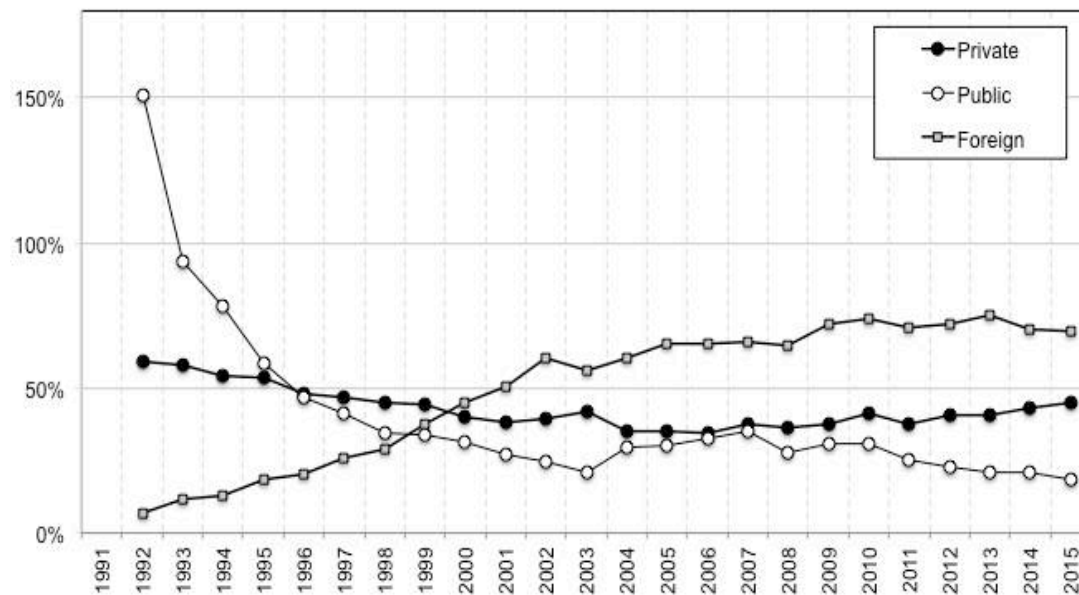


Figure 30: The ownership of Czech corporations by sectors: equity holdings as proportion of national income

Source: chapter 5

## 1.8. International Comparison

Figure 31 shows a development of the top percentile in the Czech Republic together with Germany, France and Sweden in the course of the twentieth century. All countries have experienced a secular fall in inequality over the century, with strongest fall occurring after the world wars. The First World War saw a rise in top income shares in all countries. The Second World War was devastating for the top percentile in belligerent France, while it had rather modest effects in the Czech Republic and Sweden, where the actual warfare did not take place. The fall of the top percentile in the Czech Republic immediately after WW2 is astounding. All countries displayed stability in top income shares in post-war decades, however, it took place at notably different levels. We observe highest top shares in the Germany, and the lowest in communist Czechoslovakia. In the last two decades, top income shares have significantly increased in the Czech Republic.



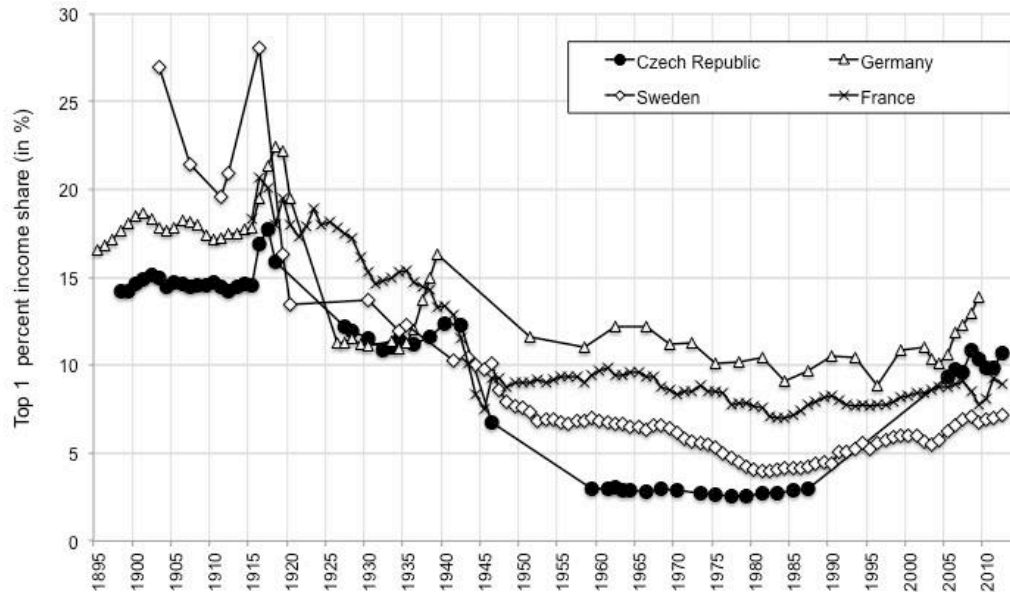


Figure 30: Top 1 per cent share in the Czech Republic, Germany, France, and Sweden

Source: WID

## 1.9. Conclusion

This chapter has examined the evolution of the top income shares in the Czech Lands from the end of the 19th century until today. Top income shares followed a U-shaped evolution in the course of the 20th. Higher shares in the first half of the 20th century were a consequence of the stronger concentration of capital at the top of income distribution. The long-run fall in top shares was equally 'capital income phenomenon'. A sharp decline in the first half of the twentieth century was largely due a drop in the top percentile share. On the other hand, the top shares below the top percentile (top 5-1%), largely composed of labour income, exhibited relatively more stable pattern. Communism led to the virtual annihilation of private capital income and the stumbling of top income shares. A sharp decline in the first half of the twentieth century was largely due a drop in the top percentile share. After residing at very low levels featured by remarkable stability for several decades, top income shares have increased after the fall of communism.

**Table A1: Top income shares (in %)**

Year	P90-100	P95-100	P99-100	P99.5-100	P99.9-100	P99.99-100	P90-95	P95-99	P99-99.5	P99.5-99.9	P99.9-99.99
1897		24,6	13,2	10,2	5,8	2,6		11,4	3,0	4,4	3,2
1898		24,6	13,2	10,2	5,8	2,6		11,4	3,0	4,4	3,2
1899		24,4	13,2	10,3	6,0	2,8		11,2	3,0	4,3	3,2
1900		24,7	13,3	10,2	5,9	2,7		11,5	3,0	4,3	3,2
1901		25,8	13,7	10,5	6,0	2,7		12,1	3,1	4,5	3,3
1902		26,6	14,0	10,8	6,1	2,8		12,5	3,3	4,7	3,4
1903		26,5	13,9	10,6	6,0	2,7		12,6	3,2	4,6	3,3
1904		26,4	13,8	10,6	6,1	2,8		12,5	3,2	4,5	3,3
1905		26,4	13,8	10,6	6,0	2,7		12,6	3,2	4,6	3,3
1906	34,7	26,1	13,6	10,3	5,8	2,5	8,6	12,6	3,2	4,6	3,3
1907	34,8	26,3	13,8	10,6	6,0	2,6	8,5	12,6	3,2	4,6	3,4
1908	34,8	26,3	13,9	10,7	6,1	2,7	8,5	12,5	3,2	4,6	3,4
1909	35,4	26,7	14,0	10,8	6,1	2,7	8,7	12,7	3,3	4,7	3,4
1910	34,9	26,4	14,0	10,8	6,1	2,7	8,5	12,5	3,2	4,6	3,4
1911	34,4	26,0	13,8	10,6	6,0	2,6	8,3	12,3	3,2	4,6	3,4
1912	34,1	25,9	13,8	10,7	6,1	2,7	8,2	12,1	3,1	4,6	3,4
1913	35,3	26,9	14,7	11,4	6,5	2,9	8,3	12,2	3,3	4,9	3,7
1914	34,7	26,5	14,5	11,3	6,4	2,7	8,2	12,0	3,3	4,8	3,7
1915	35,7	28,1	17,1	13,9	8,8	3,8	7,5	11,1	3,2	5,1	5,0
1916	35,3	28,4	18,1	15,1	9,8	4,3	7,0	10,3	3,0	5,3	5,5
1917	34,3	27,4	16,5	13,4	7,9	3,2	6,8	10,9	3,1	5,5	4,7
1927	35,6	25,6	12,1	8,9	4,5	1,7	10,0	13,5	3,2	4,4	2,8
1928	34,5	25,0	12,0	8,9	4,7	1,9	9,5	13,0	3,1	4,2	2,7
1930	35,8	25,3	11,5	8,4	4,2	1,7	10,5	13,8	3,1	4,2	2,5
1932	36,9	25,7	10,8	7,5	3,3	1,0	11,1	14,9	3,3	4,3	2,3
1933	37,3	25,9	11,0	7,7	3,3	1,0	11,4	14,9	3,3	4,4	2,3
1934	38,5	26,8	11,5	8,0	3,5	1,1	11,6	15,4	3,5	4,5	2,4
1936	37,2	26,3	11,6	8,3	3,9	1,3	10,9	14,6	3,3	4,5	2,6
1938	36,1	26,6	12,4	9,1	4,5	1,6	9,5	14,2	3,3	4,6	2,9
1940	35,7	26,3	13,0	9,7	5,1	1,8	9,4	13,3	3,2	4,7	3,3
1942		25,3	12,7	9,4	5,3	2,0		12,7	3,3	4,1	3,4
1946	30,5	19,0	6,5	4,4	1,8	0,5	11,4	12,5	2,1	2,6	1,3
1958	20,4	11,5	2,9				8,9	8,6			
1965	18,4	10,2	2,5				8,2	7,7			
1970	19,0	10,9	3,0				8,1	7,9			
1973	18,1	10,1	2,6				8,0	7,5			

1976	18,0	10,0	2,5					8,0	7,5		
1980	18,3	10,2	2,6					8,1	7,6		
1985	17,9	10,0	2,6					7,9	7,4		
1988	18,5	10,6	2,9					7,9	7,7		
2005	31,6	22,0	9,2	6,4	3,2	1,2		12,7	2,8	3,2	2,1
2006	32,4	22,7	9,3	6,3	3,2	1,1		13,4	2,9	3,1	2,0
2007	32,4	22,6	9,0	6,1	3,0	1,1		13,5	2,9	3,1	1,9
2008			10,3	7,9	4,4	1,9			2,4	3,5	2,5
2009			9,6	7,2	3,8	1,5			2,4	3,4	2,3
2010			9,1	6,7	3,4	1,3			2,3	3,3	2,1
2011			9,2	6,7	3,3	1,2			2,4	3,4	2,1
2012			9,8	7,4	4,0	1,7			2,5	3,4	2,3
2013			9,3	6,4	2,8	0,9			2,9	3,6	1,9
2014			9,4	6,5	2,8	0,9			2,9	3,7	1,9
2015			9,6	6,7	3,0	1,0			3,0	3,7	2,0

Note: 1897-1917 refer to Habsburg provinces Bohemia, Moravia and Silesia; 1927-1936 refer to First Czechoslovak Republic; 1938-1942 to the Protectorate of Bohemia and Moravia; 1946-1988 refer to Czechoslovak Socialist Republic; 2005-2015 to the Czech Republic

## A.1. Personal income tax data in the Czech Lands from the 19<sup>th</sup> century until today

### Income tax in Imperial Austria

Imperial Austria (Cisleithania) introduced the modern income tax in 1896, and it was put into operation in 1898. For its model, it took the Prussian income tax of 1891. The new income tax replaced the old schedular tax from 1849 (Sieghart 1898) as a move towards more comprehensive (Haig-Simon) definition of taxable income. In general, the new taxation allowed very few exemptions. Income was defined as net income after subtraction (from revenues) of costs needed to obtain, secure and maintain it. Income below 1,200 crowns was tax exempt.

The tax unit was family with the total income of family members ascribed to the head of family. The structure of the tax was progressive. The fixed tax liability was applied to each bracket. The tax was imposed on income of the preceding calendar year, or the average income of the previous three years when income varied through years (Sieghart 1898, Van Sicle 1931).<sup>93</sup> The tax law defined following taxable income sources: income from land, from buildings, from business and self-employment, from capital and from other sources (Van Sicle 1931, p. 35).

<sup>93</sup> The latter practice was abandoned in 1914 (Ryba 1924, p. 7\*).

Taxable income also included imputed rents of owner-occupiers and own consumption. Capital gains were exempt, except when made as a part of general business activity. Income from land was assessed based on the cadastral net yield.

Income tax tabulations for each region of Imperial Austria were published in the annual Reports of the Ministry of Finance (*Mitteilungen des K.K. Finanz-Ministeriums*) and in the Statistical Yearbooks<sup>94</sup>. Note that statistics are presented for the 'fiscal' year, which refers to the income of the previous year.

### Income tax in interwar Czechoslovakia

After its formation in 1918, Czechoslovakia inherited tax system of Austria-Hungary. But now two distinctively different tax systems had been operating in the country, as a consequence of different tax legislation between the Austrian ('Cisleithania') and the Hungarian ('Transleithania') of the monarchy (Vencovsky 1997, p. 324). A much-needed reform toward modern unified tax system had to be postponed until the economic stabilization was accomplished. This primarily entailed strong currency, so indisputably pursued by Alois Rašin, and policy of balanced budget, personified by Karel Engliš (Vencovsky 1997, p. 332), the famous Czech economist who succeeded Rašin as the finance minister<sup>95</sup>. With the termination of deflationary policy of the early 1920s and few years of strong growth that stabilized public finance, Engliš engaged in the thorough reform of tax system. The reform focused on direct taxes, most notably on income tax, with the aim of "reducing high tax burden and promoting capital accumulation and entrepreneurship" (Vencovsky 1997, pp. 328, 332-3).

Taxpayers in tabulations are ranked according to the level of gross income, before personal deductions and personal income tax. It is important to note that the statistics used to construct top income shares relates to 'direct taxpayers' (*poplatníci přímo zdanění*) and does not include 'withholding' taxpayers (*poplatníci srážkoví*). Namely, an individual was not obliged to submit the tax return if (s)he obtained income exclusively from employment, for which the tax obligation was deducted at source and considered as final. However, this special case was only applicable when the annual income from employment - as the only income source - was above 10,356 Kč (in which case an employee did not pay income tax) and below 23,566 Kč (above which the taxpayer was designated as a 'direct' taxpayer) (Fajfr 1935, p. 14). Most importantly, if the taxpayer earned income above 23,566 Kč, (s)he was designated as 'direct' taxpayer, and thus included in the income tax statistics. In consequence, this allowed a construction of income shares for the top 5 per cent of the population. The stated amounts (applicable in 1930) refer to 'gross' wage, that is, before the deduction of allowed lump-sum expenses.<sup>96</sup> The exception was in the event when the 'family member' (other than the head of the family) had earned income

<sup>94</sup> Tables in the statistical yearbook: *Die Ergebnisse der Veranlagung der Personaleinkommensteuer*

<sup>95</sup> After the assassination of the former

<sup>96</sup> A deduction of lump sum expenses from the 'gross' wage was allowed as following: 20% for the first 20,000Kč, 10% for the amount between 20,000Kč and 30,000Kč, and 5% for the amount above 30,000Kč (Novotny 1937, p. 69).

from employment, when this income alone is not added to the family head. For example, this could have led to the underestimation of household income if the wife and children of the family head obtained this type of income. However, this should not affect the obtained results in important way, especially for higher top income shares.

The data for interwar Czechoslovakia are found in official publications of income tax statistics. After the reform of tax system in 1927, these were published with four (to five) years lag. Thus, the statistics for the first available year 1927 were published in 1931, and the last official publication before German annexation in 1938 refers to income year 1933. Even in this brief period, statistics were published only for the following years: 1927 (Státní úřad statistický 1931), 1928 (Státní úřad statistický 1932), 1930 (Státní úřad statistický 1935), 1932 (Státní úřad statistický 1937), and 1933 (Státní úřad statistický 1938). As a preparation for the new tax reform of 1927, the Statistical office published income tax report for the Czech lands for the 1914-1918 period (Státní úřad statistický 1924), which also contains report for years from 1898 (from the introduction of the income tax in Cisleithania (Van Sickle 1931) to 1913.

The published reports are quite detailed, dividing tax units into 22 brackets (according to tax rate that was applied progressively from 2 to 28 per cent (the highest rate was applied to incomes above 5 mil Kč) (Novotny 1937, pp. 57-8), and each bracket containing the number of tax units and their corresponding estimated income and tax liability. In addition, total income is decomposed by income sources: income from land (z pozemků), from buildings (z budov), from business and self-employment (z výdělečných podniků a zaměstnání), employment (ze služebního poměru), from capital (z kapitálu). It also included imputed non-monetary income such as rent of owner-occupiers (užitková hodnota bytu ve vlastním domě) or own consumption of households. Decomposition is also available by region (Bohemia, Moravia and Silesia, Slovakia, and Subcarpathian Ruthenia). Required filing threshold was set to 6,000 Kč (*Koruna československá*).

Income data for 1946 were obtained from the returns of the general wealth levy related to the currency reform of 1945 (St. Digest 1948, p. 107; Michal , p. 459). This peculiar reporting occurred due to the fact that there was no time for separate assessment of income tax. Everyone had to submit the tax return (, which were then distinguished as 'declarations of persons liable to levy' (*příznání s dávkou*) and 'declarations of persons not liable to levy' (*příznání bez dávky*) (St. Digest 1948). Reported income referred for the month of September in 1946, and was aggregated to corresponded to the whole year income (Dolansky 1947, p. 157). The income tax legislation for 1946 preserved the structure from the interwar era (Žatecký 1946).

**Table A2. Income Tax Data, 1897-1946**

Income year	Publication	Table and page
1897	Österreichisches Statistisches Handbuch für... 1900	Tab. 7d; p.334
1898	Österreichisches Statistisches Handbuch für... 1901	Tab. 7d; p.332
1899	Österreichisches Statistisches Handbuch für... 1902	Tab. 7d; p.337
1900	Österreichisches Statistisches Handbuch für... 1903	Tab. 7d; p.334
1901	Österreichisches Statistisches Handbuch für... 1904	Tab. 7d; p.386
1902	Österreichisches Statistisches Handbuch für... 1905	Tab. 7d; p.437
1903	Österreichisches Statistisches Handbuch für... 1906	
1904	Österreichisches Statistisches Handbuch für... 1907	Tab. 7d; p.448
1905	Österreichisches Statistisches Handbuch für... 1908	Tab. 7d; p.378
1906	Österreichisches Statistisches Handbuch für... 1909	Tab. 7d; p.449
1907	Österreichisches Statistisches Handbuch für... 1910	Tab. 7d; p.467
1908	Österreichisches Statistisches Handbuch für... 1911	Tab. 9.4; p.445
1909	Österreichisches Statistisches Handbuch für... 1912	Tab. 9.4; p.446
1910	Österreichisches Statistisches Handbuch für... 1913	Tab. A.11.d; p.393
1911	Österreichisches Statistisches Handbuch für... 1914	Tab. A.11.d; p.441
1912	Österreichisches Statistisches Handbuch für... 1915	Tab. A.12.d; p.385
1913	Österreichisches Statistisches Handbuch für... 1916	Tab. A.12.d; p.430
1914	Daň z příjmu ... v letech 1914-1918	Tab. 67, 68; pp. 58-9
1915	Daň z příjmu ... v letech 1914-1918	Tab. 67, 68; pp. 58-9
1916	Daň z příjmu ... v letech 1914-1918	Tab. 67, 68; pp. 58-9
1917	Daň z příjmu ... v letech 1914-1918	Tab. 67, 68; pp. 58-9
1927	Statistika daně důchodové placené přímo... za rok 1927	Tab.1, p.20; Tab.6, p.108
1928	Statistika daně důchodové placené přímo... za rok 1928	Tab.1, pp.22-3; Tab.7, pp.176-7
1930	Statistika daně důchodové placené přímo... za rok 1930	Tab.1, p.8; Tab.7, pp.44-5
1932	Statistika daně důchodové placené přímo... za rok 1932	Tab.1, p.10; Tab.7, pp.44-7
1933	Statistika daně důchodové placené přímo... za rok 1933	
1934	Zprávy státního úřadu statistického XVII (1937), 170	Tab.1, pp. 1298-9
1936	Zprávy státního úřadu statistického XX (1939), 39	Tab.2, pp. 290-1
1938	Zprávy Ústředního statistického úřadu XXII (1941), 101-4	Tab. 2, pp. 758-9
1940	Zprávy Ústředního statistického úřadu XXIII (1942), 102-5	Tab.2, pp.790-1
1942	Stadnik 1946	Tab.99, p. 229
1946	Zprávy státního úřadu statistického XIX (1948), 11-3	Tab.3, pp. 68-9

### The socialist period

Top incomes for the socialist Czechoslovak are estimated from the Czechoslovak Microcensus (Atkinson and Micklewright 1992, p. 248), the official household budget survey of the Czechoslovak Statistical Office. The income concept is net income. The observation unit is household. We take the total population and the total income from the survey. To arrive at the percentiles of interest, we apply generalized Pareto curves techniques (Blanchet, Fournier and Piketty 2017).

In addition, we use Enterprise census as an alternative source to construct top income shares. The basic assumption behind this approach is that top earners in the wage distribution and in the income distribution overlap. Enterprise census in Czechoslovakia covered all workers in the socialist sector, while excluding employees of the Communist Party, of the Army, as well as employees in agricultural cooperatives (Atkinson and Micklewright 1992, p. 248). Income definition refers to monthly gross earnings. Survey took no annual bonuses into account (Atkinson and Micklewright 1992, p. 248). In order to arrive at annual income in each bracket, we multiply it with 13, accounting in addition for one yearly bonus. The number of individuals in the bracket is multiplied by the mid-value of the bracket. Top bracket is assumed to be Paretian (the same assumption was made by Atkinson and Micklewright 1992).<sup>97</sup> The total control income is taken as the sum of wages and salaries, employers social security contributions, income from agricultural cooperatives, income from private plot, other income from work, interest receipts, pensions and other social benefits. The data for specific years are found in *Historická Ročenka* 1985, p. 350.

### The Czech Republic, 2005-2015

The data used to construct top income shares come from the statistics of the 'Natural person income tax from tax returns' (Daň z příjmů fyzických osob podávajících daňové přiznání) published annually by the Czech Ministry of Finance and made available on its official website. The data come in the form of tabulations organized by income ranges (the number of brackets is around forty) containing the number of tax returns with the corresponding income, including the breakdown by specific income sources (the 'particular tax base'), personal deductions, and tax payable.

The available statistics do not include taxpayers whose tax obligation has been settled by their employer(s) (which the law allows only in the case when taxpayers have obtained income exclusively from employment), or for that matter for any income for which the tax is withheld at source. Unfortunately, to our knowledge, the statistics for the withholding payroll tax of 'Natural person income tax from employment' (Daň z příjmů fyzických osob – závislá činnost) has not been published. Our working assumption is that top income groups generally file tax returns. Even if an individual is not required by law to submit the tax return (for example, if the individual obtains only income whose tax liability is settled by withholding tax agent, and thus considered

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<sup>97</sup> One should be aware that this is open to criticism (e.g. see Lydall (1968, p. 130) who points to strong deviation from Pareto law for top incomes especially in contemporaneous communist countries.

as final), it needs to file a tax return in order to claim available personal deductions. It is reasonable to assume that high-income individuals have higher incentive to claim personal deductions (for example, for charitable contributions). For this reason we focus on top income groups in the tax data.

Income is defined as 'gross income' before personal deductions and taxes. It corresponds to the tax base (základ daně) as defined by the Personal Income Tax Act (tabulations are ranged by the level of the tax base), which equals the sum of partial tax bases from the following income sources (Radavan 2010, p. 12):

- Incomes from dependent activity (employment) and function benefits;
- Income from business and from other independent gainful activity;
- Capital property income;
- Rental income;
- Other income.

We need to distinguish two periods when analysing the available statistics, before and after the comprehensive reform of the personal income tax in 2008. Before the reform, the partial tax base from employment was 'net wage or salary', that is, the gross wage (after employers' social contributions) reduced by social and health insurance contributions paid by the employee (in total 12.5 per cent of gross wage)<sup>98</sup>. Equally, in order to obtain partial tax base from the business activity, social and health insurance contributions paid by entrepreneurs and self-employed were recognized as business expenses. Business expenses (expenses incurred to generate, assure and maintain income) are estimated either as the actual expenses incurred, or using prescribed lump-sum proportion of revenues (e.g., 80% of revenue from agricultural production, forestry and fishery; 60% from business activity; 40% from self-employment, etc.).

In 2008 a major tax reform took place when progressive tax schedule was replaced by the flat rate of 15 per cent. After the reform, social and health insurance contributions paid by employee are no longer tax-deductible. Moreover, social and health insurance contributions paid by employer are included in the tax base from employment as well, in what has been commonly referred to as the 'super gross wage'. In addition, a maximum contributory base for social insurance was introduced and set to 48 times of average monthly wage.

Social benefits received by households are in general exempted from the personal income tax. Most importantly, pensions are tax exempt up to 198,000 CZK per year (162,000 CZK before 2008), and taxed only for the amount exceeding this threshold under the partial tax base of 'other income'.

For years from 2008 onwards, we construct series that both include and exclude employer's social security contributions in the income concept used after 2008. The published tabulations

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<sup>98</sup>Social security contributions paid by employee make in total 12,5% of the gross wage, of which social insurance account for 8% (pension insurance 6,5%, unemployment insurance 0,4% and sickness insurance 1,1%) and health insurance for 4,5% of the gross wage.



give us the amount of employers' social contributions in a separate column. For the series that exclude employers' social security contributions ('adjusted' series), we adjust the raw series from 2008 onwards by subtracting employers' social contributions from the partial tax base from employment and adjust bracket thresholds downwards by the mean employers' contributions for the specific bracket. The employers' social security contributions account for as much as 34 per cent of the gross wage.<sup>99</sup> A cap on the social insurance contributory base reduces the importance of social insurance in income as one moves upward the distribution. Thus, the proportion of employers' social contributions falls from almost 20% of the corresponding total tax base in brackets as one enters the top percentile to 2% of the tax base (or 4% of the income from employment) for the top bracket. In practice, this adjustment might lead to the re-ranking of taxpayers. It is difficult to say with certainty how this has biased our results without having the insight into the income tax micro-data. As a consequence, we prefer the series before

Taxpayers are required to report only a portion of capital income in their tax return under the partial tax base from capital (such as interests on bank deposits for business purpose and interests on given loans, credits, bills of exchange, as well as capital income received from abroad), since a large part of capital income (dividends, interest on private deposits, on bonds etc.) is subject to withholding tax at source. Consequently, the available tabulations used in the analysis do not include a substantial part of capital income received by private taxpayers.

Capital gains are taxable under the partial tax base of 'other income' in the tax return. However, there are many exemptions available. Notably, capital gains on the sale of securities are tax exempt if the holding period of a security has exceeded minimally 6 months and if the ownership share has been less than 5% of the company's capital in the period of 24 months before the disposal (in opposite, capital gains are tax exempt only if the holding period of securities exceeds at least 3 years). Capital gains on the sale of the ownership share in limited liability company or partnership is tax exempt if it has been held for more than 5 years. Capital gains on the sale of business property are exempt if individual has held it for more than five years (or two years if this has been individual's principal residence).

In general, we would like to construct series that both include and exclude capital gains, since realized capital gains might often cause significant short-term volatility in comparison to other, more stable, annual income sources, especially due to the lumpiness of its realization which is often affected by non-economic factors (quite often by tax legislation changes) (Piketty and Saez 2003). Unfortunately, available tabulations do not provide amounts of realized capital gains separately, which is the reason why we produce only series keeping non-exempt realized capital gains in our income concept.

However, we can make a simple exercise in order to account for the importance of realized capital gain component in our top shares estimates. First, the realized capital gains are taxed under the partial tax base of 'other income', and we can thus make a simple check by looking at the importance of 'other income' component for various top income groups. Even if it is assumed

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<sup>99</sup>Social insurance accounts for 26% of the gross wage (pension insurance 21,5%, unemployment insurance 1,2% and sickness insurance 2,3%) and health insurance for 9% of the gross wage.

that the total 'other income' actually refers to realized capital gains (which might not be very far from the truth for the groups at the very top)<sup>100</sup>, then still capital gains would account for a quite small proportion of income obtained by the top income groups. For example, thus defined realized capital gains (the upper bound) make only 5 per cent of the total income of P99.9-100. Hence, if we subtract 'other income' component in full from our top share estimates (including capital gains), then P99.9-100 income share would fall in 2008 from 5,24 per cent to 4,95 per cent. For lower groups within the top percentile, the fall is quite negligible. For example, for P99-99.5 the exclusion of other incomes results in the fall in 2008 from 2,46 per cent to 2,40 per cent. In general, we can be assured that the presence of the limited part of non-exempt realized capital gains does not affect our estimates in any significant way.

## **A.2. Estimation procedure, 2005-2015**

One of the main goals of this work is to provide a more reliable picture of the top of the income distribution. It has been found that the income tax data are more trustworthy source to capture the top of the distribution than the household budget surveys, dominantly used in the distributional analysis (see chapters on Poland, Croatia and Slovenia below). Moreover, by failing to notice the true development at the top, one can overlook the development in the overall inequality (Piketty and Saez 2003, Saez and Vaell 2004). However, the use of the income tax data is not without drawbacks. One should bear in mind that the income tax data, as a general rule, have been prepared and published for reasons not related to the distributional analysis. In this respect, the income tax data for the Czech Republic is an illustrative example of various difficulties in the application of the tax data for this particular purpose. One important reason is legislative changes (e.g. Burkhauser et al. 2015). As we shall see, tax reform in 2008 induced substantial reaction in the taxpayers' reporting behaviour.

### The option of joint filling

One mechanism that could partly explain the observed increase in 2008, especially concerning the rise of reported income from employment, could be elimination of the joint filling of married couples. In 2005 an option of common taxation of married couples (with at least one child) was introduced. This option was abolished in 2008 as the progressive schedule was abolished (and disappeared the potential benefits of income splitting to reduce the tax burden). It is fairly plausible that those eligible at the top of income distribution substantially reduced their reported tax base by filing jointly with their low-income spouse, where each spouse declared (and was taxed accordingly) the half of their total income.

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<sup>100</sup> Other incomes include besides realized capital gains most importantly: income from occasional activities or occasional lease of movable assets; winnings in lotteries, betting and other games of chance; prizes from public competitions and sporting competitions, etc. (Karavan 2010, p.15)

According to reports of the Czech tax administration, the number of tax returns jumped by a third in 2005 primarily due to the introduction of joint filing (Annual Report 2006, pp. 19-20) suggesting that many eligible taxpayers “relocated a settlement of their tax obligation from their employers to themselves” (Annual Report 2006, p.21)<sup>101</sup>. Common taxation of spouses was widely used during the applicable period. For example, around 40% of tax returns in 2007 used this option, mainly by those obtaining income from employment (70% of tax returns using common taxation option, while the remaining 30% were used by entrepreneurs and self-employed (*Informace o činnosti daňové správy České republiky za rok 2008*, p. 12-3)).

The proportion of taxpayers filling tax return in the total tax units was substantially higher in the years when joint taxation of married couples was in force.<sup>102</sup> Unfortunately, there are no available tabulations for 2004 and earlier years which would be more revealing in order to ascertain the importance of joint filling for the reported incomes at the top. Similarly, it is difficult to speculate whether a relatively higher use of the common taxation option could point to higher intra-household income inequality in the Czech Republic, and thus could stand in contrast to observed trend of rising correlation between spouses’ earnings at the top of distribution (‘rich marrying rich’) which has been exacerbating overall inequality among households in the US (for example the ‘assortative mating’ along earnings (e.g. Schwartz 2010)). Kalíšková (2014) finds that the introduction of common taxation in the Czech Republic primarily negatively affected married women employment decisions, while Mysíková finds higher within-couple inequality in the Czech Republic than in other former transition countries.

### Estimation procedure for 2005-2007: the combination of EU-SILC and income tax data

For the period when the option of joint filing was applicable, and by most accounts, widely used, we estimate top shares combining the survey data, namely EU-SILC, and income tax data. First, we estimate equal-split distribution of the ‘net income’ (after social security contributions, see above) from the survey. We have assumed that survey is representative up to 90<sup>th</sup> percentile ( $p_0=0.9$ ) and that the tax data is representative  $p=0.999$ , since here and above, the tax data strongly ‘beat’ the survey (for example, for  $p=0.99-0.991$  the ratio between mean income is only 1.09). We believe this is due to the fact that probability of claiming itemized deductions (which then compel the taxpayer to submit the return even though she obtains only income from employment) rises with income rank, and the proportion is substantial for higher groups within the top percentile. We have then applied piecewise-linear correction factors from  $p_0=0.9$  up to  $p_0=0.995$  and generalized Pareto interpolation techniques (Blanchet, Fournier and Piketty 2017) to produce the corrected distribution. For more details, see chapter 6.

<sup>101</sup> The Annual Report of the Czech Tax Administration (*Výroční zpráva české daňové správy*), The Central Financial and Tax Directorate

<sup>102</sup> Thus, in accordance with this interpretation, an important reason behind a fall in the proportion of tax returns in the total tax units from 2008 onwards would be caused by the reallocation of tax settlement of many taxpayers (that had been eligible to common taxation of married couples) back to their employers.

### The flat tax reform in 2008

It has been noted already that the comprehensive reform of the income tax in 2008 might have induced important changes in the reporting behaviour of taxpayers. The main explanation behind the sudden increase reported incomes in 2008 could be sought in behavioural responses induced by the replacement of progressive schedule by the flat tax regime. The fall in marginal top rates could in theory lead to an increase of reported income to the tax administration, either by reducing tax evasion/avoidance or by increasing real economic activity ('supply-side' response) (e.g. on elasticity of taxable income see Feldstein 1999; Gruber and Saez 2002; Saez, Slemrod and Giertz 2012). This, and especially the former channel, has been proposed for some other countries in Central and Eastern Europe that introduced flat tax rates (e.g. Gorodnichenko, Martinez-Vazquez and Peter (2009) in Russia, or Kopczuk (2012) in particular for the 'business' income in Poland).

More importantly, along this line of reasoning, the observed rise in reported income in 2008 might be explained by income shifting from corporate to personal tax base due to the existing gap between the respective tax rates. An incentive for shifting taxable income towards personal tax base was created by the comprehensive reform of the personal income tax system in 2008, when the progressive schedule (with four marginal tax rates: 12, 19, 25 and 35 per cent) was replaced by the linear rate of 15 per cent. On the other hand, the corporate income tax rate was reduced 'only' from 24 to 21 per cent (it is 19 per cent in 2014). In practice, there are numerous potential ways how taxable income could be shifted from corporate to personal tax base (and vice versa), and some of them were examined in a considerable detail by Gordon and Slemrod (1998), such as increasing corporate debt financing, altering between incorporated and unincorporated legal status, or changing remuneration modes for employees, among others.

By looking at these in more detail could be especially useful in order to better apprehend the break caused by the tax reform in the Czech tax statistics in 2008. In the first place, it has been found in the literature that a prompt response to tax incentives in general (and thus in the form of income shifting between corporate and personal tax base) has been mostly a practice of the very high-income individuals, who show much higher overall elasticity of taxable income (Saez 2004, Gruber and Saez 2002). This seems to have also been the case in the Czech Republic recently where the rise in reported income has come mostly from the very top income groups. We have constructed for this purpose homogenous series for the top 1 per cent,<sup>103</sup> and it can be discerned from Figure, which shows the evolution of income shares of three constituent groups of the top 1 per cent (top 1-0.5%, 0.5-0.1% and 0.1%), that the 2008 rise was dominantly induced by the top 0.1 per cent group.

Business income is especially sensitive to tax incentives of this sort (note that business income had to be declared on the tax return both in pre-reform and post-reform years, and therefore it is not related to filing a tax return to claim personal deductions). Smaller businesses are relatively

<sup>103</sup> Namely, we have used the gross wage concept for 'the particular tax base from employment'. We have added to the tax base employees SSC before 2008, and excluded employer's SSC afterwards. The total income control is adjusted accordingly.

flexible with respect to the designated legal status. For example, a massive switch from incorporated to unincorporated status has been evidenced during the sequence of reductions of the top marginal income tax rates throughout the 1980s in the US (Slemrod 1996, Gordon and Slemrod 1998, Saez 2004). Accordingly, a considerable part of the documented rise of reported income after the reforms was caused by the sudden increase of business income of unincorporated entities (more precisely, of S-corporations after the 1986 tax reform; see Saez 2004).<sup>104</sup> We find a stronger increase in business income in the Czech Republic following the 2008 reform, which was plausibly induced in part by the one-time change of the corporate status as an immediate response to lower personal income tax rate relative to corporate income tax rate.<sup>105</sup>

Further, we find a substantial rise of reported capital income. Capital income required to be reported on the tax return consists primarily of interests on given loans/credits and interests on deposits for business purposes. In this respect, an abrupt rise in capital income component for the top groups could be explained as a move towards higher use of debt financing of corporations (and away from equity). Since interest payments are deductible from the corporate income tax base, a potential in reducing an overall tax burden becomes more apparent as the corresponding increase of interests on given loans and credits for private individuals is taxed at the lower tax rate (Gordon and Slemrod 1998, p. 4). Certainly, the benefits of debt tax shield are all too familiar to entrepreneurs and their tax advisors, as it has been one of the most researched issues in the corporate finance since the seminal propositions of Modigliani and Miller.

Finally, an equally prominent rise in wage income component documented in Figure A2 is also examined in the light of these theories. The most straightforward example of shifting labour income is in the case of incorporated business owners who can simply optimize between corporate and personal tax base by choosing whether to pay cash salaries to themselves (which are taxed as personal income; and thus lower corporate tax base by expensing these) or to keep most of profits in the firm as retained earnings (Gordon and Slemrod, p. 6-7; on the fuzzy frontier between labour and capital income see Piketty and Saez 2012). In a similar manner, a shift from employee stock options to more traditional forms of personal remuneration (salaries and wages, bonuses) could account for the observed overall rise in personal income from employment.

### A.3. Total control for population

In order to estimate the control total for population, the first step is to define the tax unit (household or individual). For years 1898-1918 tax unit has been household, which the tax law

<sup>104</sup>Related to this, Gordon and Slemrod (1998, p. 3) refer to the research which finds that following the 1986 tax reform there is no clear evidence of increased economic activity or higher compliance through reduced evasion.

<sup>105</sup>As a reminder, proprietors subject to personal income tax are liable to tax with their total profit, whether retained in the business or withdrawn.

defined as the married couple and dependants. Consequently, we estimate the total number of households in the country as the number of adults (above 20 years of age) minus the number of married females (the assumption is that the number of non-adults that filled the tax returns separately was negligible). The data come from censuses held in Austria-Hungary in 1890, 1900 and 1910:

- *Die Ergebnisse der Volkszählung vom 31. December 1890 in den im Reichsrathe vertretenen Königreichen und Ländern*
- *Die Ergebnisse der Volkszählung vom 31. December 1900 in den im Reichsrathe vertretenen Königreichen und Ländern*
- *Die Ergebnisse der Volkszählung vom 31. Dezember 1910 in den im Reichsrathe vertretenen Königreichen und Ländern*

The tax unit in interwar Czechoslovakia was household (or family) (Novotny 1937, pp. 35-7). The total income of the household was attributed for the tax purpose to the head of the family (*hlava rodiny*). This applied, as a general rule, to the husband/father, defining in turn the wife and children as the household members (*příslušníky domácnosti*). Adult children were not recognized as the members of the household for the tax purposes, even if they lived in the same household with the head of the family (Novotny 1938, p. 37; *Státní úřad statistický* 1935, p.14). Bachelors and widows/widowers represented a separate tax unit. Equally as for the Habsburg era, we estimate the total number of households in the country as the number of adults minus the number of married females. The data are found in population censuses that took place in 1921 and 1930, as well as in reports on the *Movement of population*:

- *Sčítání lidu v Republice československé ze dne 15. února 1921*; Praha, Státní úřad statistický 1924-1927.
- *Sčítání v Republice československé ze dne 1. prosince 1930*; Praha, Státní úřad statistický 1934-1938

Estimates for the years between censuses are derived as follows. The proportion of adults to the total population and the proportion of married females in adult population are linearly interpolated between the census years and applied to number of total population from the official reports in the *Movement of Population*.<sup>106</sup>

The income tax data from 1938 to 1942 refer to the taxpayers in the territory of the so-called Protectorate of Bohemia and Moravia. The population control is accordingly adjusted. The number of adults (20+) is found in:

- *Mitteilungen des Statistischen Zentralamtes des Protektorats Böhmen und Mähren (Zprávy Ústředního statistického úřadu, Protektorát Čechy a Morava) 1944, 27-9.*

The proportion of married women is taken from the 1930 census (the above source gives the number of married women for the territory that eventually formed the Protectorate). Finally, we apply the proportion of adults and the proportion of married females to the estimates of the total

<sup>106</sup> The use of linear interpolation (for proportion of adults in total population between census years) should not bias estimates. For example, the linear interpolation of the number of total population between the census years gives closely the same number as found in the annual reports of the *Movement of Population*.

population in the Protectorate from 1938-1944 (*Statistisches Jahrbuch für das Protektorat Böhmen und Mähren* 1941-1944; Krejčí 1986)

For 1946, population control is estimated from the *Soupis obyvatelstva v Československu v letech* 1946-1947.

Finally, the tax unit in the Czech Republic is individual. Hence, as our control total for population we take the number of adults aged 20 and above. These figures come from the population statistics of the Czech Statistical Office.

**Table A3: Population and income control total**

Year	Total tax units	Total income (mill.current units)	Year	Total tax units	Total income (mill.current units)
1897	3.452.449 *	2.576	1927	6.157.949 **	54.065
1898	3.465.257 *	2.689	1928	6.248.118 **	57.272
1899	3.478.064 *	2.849	1930	6.428.458 **	55.935
1900	3.490.872 *	2.849	1932	6.517.747 **	48.763
1901	3.515.280 *	2.781	1933	6.557.448 **	45.598
1902	3.539.687 *	2.743	1934	6.592.406 **	43.128
1903	3.564.095 *	2.801	1936	6.649.354 **	46.023
1904	3.588.503 *	2.901	1938	3.463.362 ***	28.557
1905	3.612.911 *	2.970	1940	3.540.410 ***	34.125
1906	3.637.318 *	3.088	1942	3.475.526 ***	42.863
1907	3.661.726 *	3.262	1946	5.024.618 **	118.821
1908	3.686.134 *	3.438			
1909	3.710.541 *	3.554	2005	8.053.497 *	943.614
1910	3.734.949 *	3.790	2006	8.114.835 *	1.016.036
1911	3.760.713 *	4.053	2007	8.189.779 *	1.068.396
1912	3.780.225 *	4.374	2008	8.299.282 *	1.117.857
1913	3.797.573 *	4.708	2009	8.368.944 *	1.190.492
1914	3.817.691 *	4.948	2010	8.400.320 *	1.244.317
1915	3.849.467 *	6.402	2011	8.393.932 *	1.317.625
1916	3.830.355 *	8.597	2012	8.426.179 *	1.392.035
1917	3.798.453 *	10.761	2013	8.441.222 *	1.468.034
			2014	8.465.034 *	1.506.538
			2015	8.479.640 *	1.513.855

Note: \* Czech Lands (1897-1917); Czech Republic (2005-2015); \*\* Czechoslovakia; \*\*\* Protectorate of Bohemia and Moravia

## A.4. The control total for income

### Habsburg period, 1898-1918

The control total for income for the Habsburg era was derived as follows. We take as our starting point Schulze's (2007) estimates of regional GDP in Austria-Hungary. Schulze provides estimates for 1870, 1880, 1890, 1900 and 1910, expressed in 1990 Geary-Khamis international dollars. In order to convert estimates for Bohemia, Moravia and Silesia into current Austrian-Hungarian crowns we take the following steps. First, we convert these estimates to 1913 crowns by applying the exchange rate Schulze used (namely 3.36 GK dollars per crown; see Schulze 1997, p. 14). To obtain GDP for other years (for those between 1890, 1900 and 1910), we apply real growth rates of GDP for Bohemia, Moravia and Silesia taken from Ciccarelli and Missiaia (2014). Next, nominal values were obtained by using regional living cost indices in Austria-Hungary estimated by Cvrcek (2014). Finally, we take 55 per cent of nominal GDP as our total control income.

Needless to say, this approach could entail the significant margin of error and the obtained estimates should be rather seen as reasonable approximations of the total income. We take as the income control for the year  $t$  as the average of income for three years ( $t$ ,  $t-1$ ,  $t-2$ ) in order to smooth the series as they show substantial fluctuation, as well as due to the fact that taxable income was estimated as the average income from the three preceding years (see section A.1).

For years 1914-18 we use the 'top-bottom' approach (Atkinson 2007) to estimate total income denominator. Namely, we start from the total reported income of filers and estimate the remaining income of non-filers. For years 1898 until 1913, we can estimate the total income of non-filers as the difference between the total control income (estimated as described above) and the total income of filers. Thus obtained average income of non-filers results in on average in 20 per cent of the mean income of filers. We simply apply this proportion to 1914 and 1915, while we take it to be 25 per cent in 1916, 30 per cent in 1917 and 35 per cent for 1918. The decision to increase is largely discretionary, in order to obtain the lower bound, as well to due to increase in tax-filers due to wartime inflation from 1916.

We take this approach rather than starting from Schulze's (2005, Tab. 3.8) estimate of real GDP in 1914-18 in 1913 prices for the whole territory of Cisleithania (for example, by assuming the same growth rates after 1913), because we lack regional estimates of GDP and, more importantly, reliable regional price indices. In the midst of wartime inflation it is plausible to assume that this approach would result in highly unreliable estimates.

### Interwar period

For the total income of Czechoslovakia, we take as our departing point estimates of GDP by Pryor et al. (1971). But one should point to the lack of consensus regarding this estimate among the leading experts in the field. Less controversy is on the share of personal income in total



income (since Czechoslovakia had large corporate as well as public sector, which was quite similar to western countries), and more on the order of magnitude of GDP itself.

Namely, Jaroslav Krejčí (1968) made also national income estimates in the interwar period, and even though the index of the GDP development in constant prices is quite similar in Krejčí (1968) and Pryor et al. (1971), the difference for GDP at market prices for base year 1929 is non-negligible. The difference is quite substantial amounting to 20 billion Kč in 1929 (Pryor et al 73,4 bill Kč, while Krejčí's 93,4 bill Kč). The debate ensued between Krejčí and Milos Stadnik. Krejčí's estimates were criticized by Stadnik in Pryor et al. (1971) and Stadnik (1972), to which Krejčí (1972) responded. Here, we take as our guide the 'international blessing' of Angus Maddison, who included Pryor et al. (1971) estimates in his database (see Mitchell as well), which have become standard for studies on the interwar Czechoslovakia (see for example Broadberry and Klein 2011).

However, in order to estimate GDP in current prices we 'reflate' Pryor et al. (1971) estimates by implicit GDP deflator of Krejčí (1968), which is available for 1930-1937. For 1926 and 1927, we reflatd Pryor et al. figures of GDP in constant prices by taking two-thirds of living cost index and one-third of the wholesale price index (Teichova 1988, p. 18). With respect to the proportion of total household income (in accordance to the definition of income as defined by the tax law) we take it as 80 per cent of GDP.

Pryor et al. (1971) series ends in 1937, so it cannot be used as a starting point for 1942, which refers to the Protectorate of Bohemia and Moravia. For 1942 we take the following approach. Stadnik (1946) in his pioneering research estimated interwar national income (corresponding roughly to net domestic income at factor prices) for Czechoslovakia, including the Protectorate. We take the total control income as 75 per cent of this estimate, which is the average proportion in which our total control income takes from Pryor et al estimate for 1929-37

## 2005-2015

We use national accounts in order to arrive at the total income denominator. This measure should ideally correspond to "the total income that would have been reported if everybody had been required to file a tax return" (Atkinson 2007, p. 29). We start from the series for the primary income of the household sector from which we subtract and add items to approach the aggregate that corresponds as closely to our definition of income reported in the tax statistics.

We differentiate between 'adjusted' and 'non-adjusted' series. The 'adjusted' refers to the series for which we adjust our income concept in the raw data by adding social security contributions paid by employees for 2005-7 (when income from employment was defined as net wage) and by subtracting social security contributions paid by employers from 2008 onwards (when income from employment was defined as 'super-gross wage'). When we speak of the 'non-adjusted' series we refer to the series where income from employment corresponds to the legal definition and as it is presented in the tabulations.

The control total for ('non-adjusted') income for 2008 – 2015 has been estimated as:

- Balance of primary incomes for the household sector (net)
- Imputed rent of owner-occupiers
- 20% of Households' actual social contributions
- + 50% of Social security pension benefits in cash
- 50% of Interests and Dividends received by the household sector
- Other investment income

We do not subtract 'Employer's actual social contributions' from the 'balance of primary incomes' as these are part of 'super gross wage', which makes the partial tax base from employment. Yet, we do not subtract all 'household social contributions', which comprise in addition to employees' SSC, also social contribution paid by entrepreneurs and self-employed which have been still. As already mentioned above, the tax reform in 2008 led to important changes in the definition of the tax base, most importantly, in a switch from the 'net wage' to 'super gross wage' in defining the partial tax base from employment. Thus, for the adjusted series after 2008, where we excluded employers' social security contributions in the raw data, we add employees' social security contributions to the above-defined total control for income. Equally, for adjustment of the series in 2005-2007, we add employees' social security contributions.

For the ('non-adjusted') series that include employer's social contributions in income concept, we add both Employers' actual social contributions and Households' actual social contributions. National accounts series are found in the Database of National Account of the Czech Statistical Office (CZSO). The ESA 2010 version has been used.

### Interpolation

The income tax data come in the tabulation form, ranged according to income thresholds of the progressive tax schedule. Therefore, in order to estimate shares for the specific percentiles of interest, such as the top 1 per cent, we interpolate by assuming the Pareto distribution for top incomes. Here we follow the well-established empirical observation that the upper tail of the income distribution is approximately Pareto in form.

More specifically, cumulative distribution function  $F(y)$  for income  $y$  is given by  $1 - F(y) = (k/y)^a$ , where  $1 - F(y)$  is the proportion of individuals with income above  $y$ , and with  $k$  and  $a$  constant. One then finds that the ratio between the average income  $y^*(y)$  above the certain threshold  $y$  and the threshold  $y$  is constant. This constant is often referred as the inverted Pareto coefficient  $b = y^*(y)/y$  (equally  $b = a/(a - 1)$ ). Percentile thresholds and average income can then be easily obtained for the specific top income groups (Piketty 2007, Atkinson 2007a).

### Top Earnings (Figure 17)

The total number of employees used as a population denominator is taken from the Stadnik (1946) and Historická Ročenka (1985). The total amount of salaries and wages is taken from Stadnik (1946, pp. 180-1). As discussed in more detail above, Krejčí's series do not differ from Stadnik's regarding the national aggregates for wages and salaries, and these amounts should

be seen as quite reliable (actually, both authors constructed them on the basis of social security statistics). We arrive at the top percentile income share by using Pareto interpolation.

## EU-SILC

To allow comparability with the tax-based estimates, we take adults as the unit of observation, while the total income is taken from the survey, which should be representative for the whole population. In addition, as property income is only available at the household level, we impute it to the highest income earner in the household. Thus, this refers to the upper bound.

Table : Top income shares (in %),

	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top10-5%	Top 5-1%	Top 1-0.5%	Top 0.5-0.1%	Top 0.1%
2005	31,2	20,5	8,1	5,4	2,1	10,8	12,4	2,6	3,3	2,1
2006	31,2	20,4	7,9	5,2	1,6	10,8	12,5	2,7	3,7	1,6
2007	31,0	20,3	7,7	5,0	1,7	10,8	12,5	2,7	3,3	1,7
2008	30,7	20,0	7,5	4,9	1,6	10,7	12,5	2,6	3,3	1,6
2009	30,3	19,7	7,6	5,1	1,3	10,7	12,0	2,6	3,8	1,3
2010	30,1	19,4	7,2	4,7	1,4	10,8	12,2	2,5	3,3	1,4
2011	30,1	19,2	6,7	4,1	1,1	10,9	12,6	2,6	3,0	1,1
2012	29,9	19,1	6,7	4,1	1,1	10,8	12,4	2,6	3,0	1,1
2013	29,8	19,0	6,5	3,9	1,0	10,8	12,5	2,5	2,9	1,0

Table A4: Top income shares from EU-SILC based on gross income (after social security contributions paid by employer)

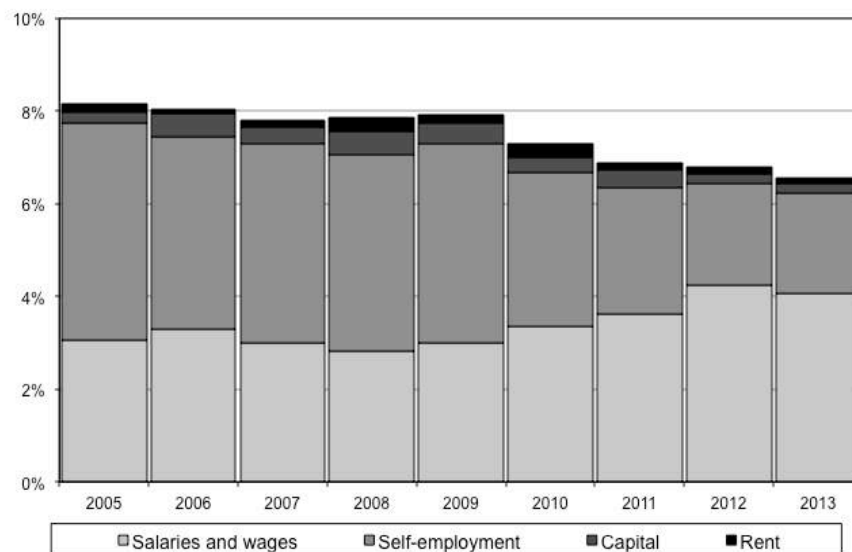


Figure A1: Top 1 per cent composition in EU-SILC

Note: it refers to gross income (after employer SSC)

## A.5. Wealth distribution

### Wealth tax in Czechoslovakia, 1919

The 1919 wealth tax was a one-time levy introduced to finance the withdrawal of the Austrian-Hungarian krone by paying off the Austrian-Hungarian National Bank. Accordingly, an exhaustive census of all existing wealth on 1 March 1919 was carried out. The examination lasted until August 1919 and the law regulating the wealth tax was finally passed on 8 March 1920 (Rašin 1923, p. 49). The subject of the tax was twofold: the net wealth (gross assets after subtraction of debt), and the wealth increment between 1914 and 1919. Wealth was defined as including all real and financial property, while excluded were consumer durables and other objects for personal use, pension rights and undue claims on life insurance less than 4,000 Kč (Rašin 1923, pp. 50-1). The valuation was made according to the market value. The tax was progressive, with rates climbing from 1 to 30 per cent.

Exempt from tax was wealth of foreign heads of states and diplomatic representatives, as well as wealth of non-profit institutions serving the public purpose. Most importantly, wealth below 10,000 Kč was tax-exempt (Rašin 1923, p. 50).

Fortunately, the statistics reports the total estimated wealth, including that below 10,000 Kč (namely, only 0.12 per cent of reported households with property were subject to wealth tax). The corresponding figure is taken as the total wealth denominator used to calculate top wealth shares. The tax unit was household, and we use the total number of adults minus the number of married females as the total population control. Since the statistics reports all tax units with positive wealth, the difference between this number and our total control for population accounts for households with zero wealth.

Wealth was classified into four categories (Horvath 1935, p. 14): (i) agricultural (and forest) wealth; (ii) residential wealth; (iii) business wealth; and (iv) financial and other wealth. Tabulations report for each bracket the corresponding amount of the mentioned asset category together with the total liability. As stated above, the wealth increment between 1914 and 1919 was also subject to the tax (it was primarily aimed to target war profiteers (Rašin 1923)). The statistics thus reports tabulations for 1914, but including only those taxpayers present in the statistics for 1919. Consequently, we do not use the existing reports to estimate the wealth distribution in 1914.

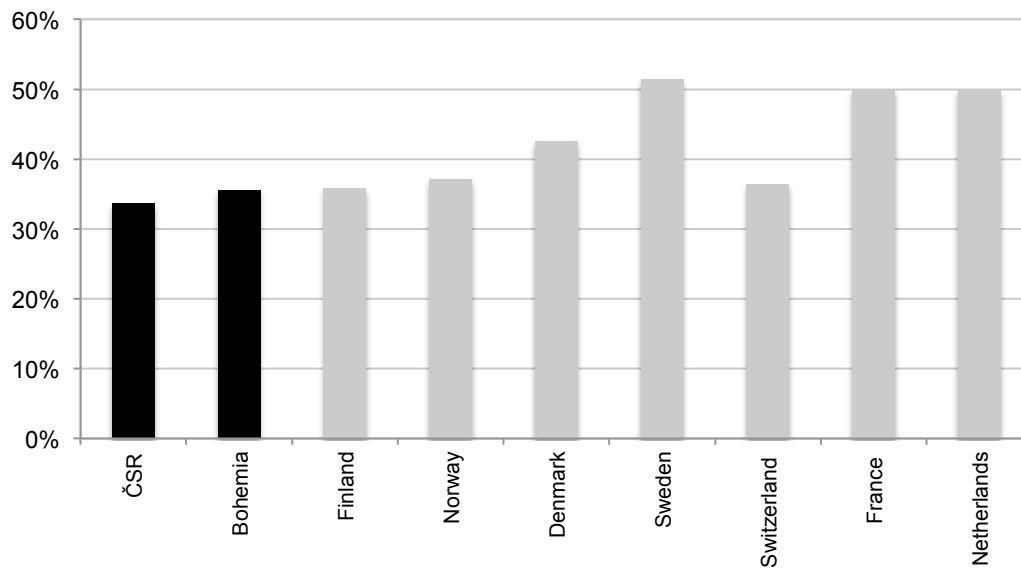


Figure A2: Top 1 per cent wealth share in 1919

Source: author's computation from the wealth tax data; for other countries from Roine and Waldenström 2015 (we take the closest year to 1919)

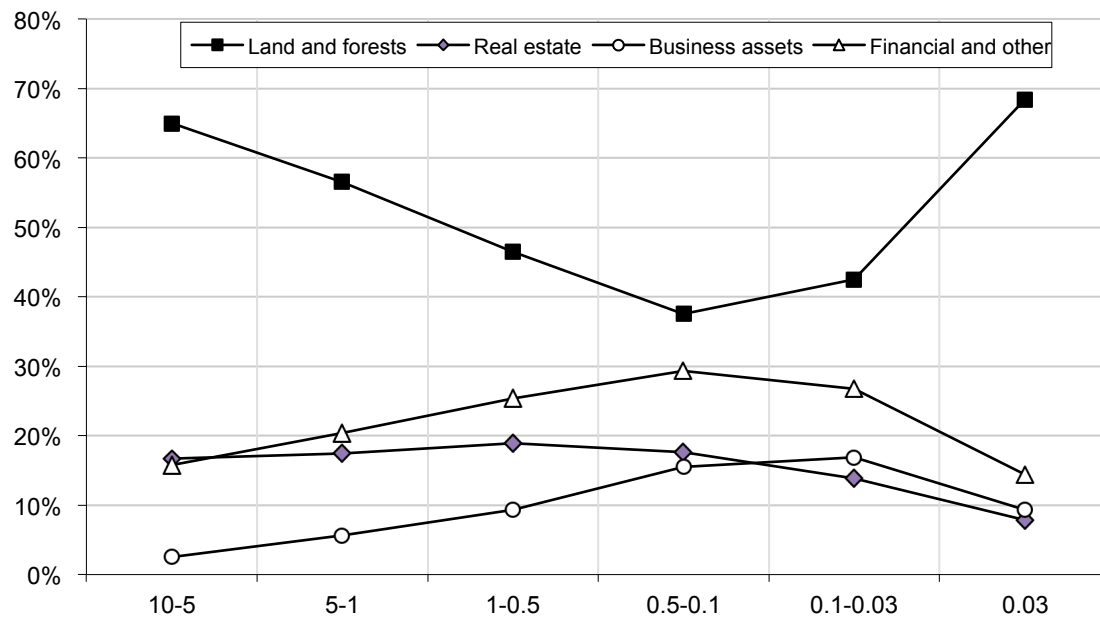


Figure A3: asset composition in Slovakia in 1919

Source: author's computation from the wealth tax data

Table A5. Large landholdings in Bohemia, 1913

Source: Sandgruber 1978

Latifundia, above 10000 ha	Ha	Large landholdings from 5000-10000 ha	Ha
Adolf Josef Fürst Schwarzenberg	176 000	Marie Fürstin Hohenlohe-Kaunitz	9-10 thd
Josef Fürst Colloredo-Mannsfeld	58 000	Alex. Joh. Prinz Thum und Taxis	
Adolf Graf Waldstein (1916)	47 000	Prämonstratenser-Stift Tepl	
Max Egon Fürst Fürstenberg	40 000	Johann Graf Palffy	8-9thd
Johann Fürst Liechtenstein	37 200	Prämonstratenser-Stift Strahov	
Weil. Kaiser Franz Josef I.	34 700	Graf Kolowrat-Krakowskysehe Admin.	
Eugen Graf Czernin	32 000	Erwein Graf Schlik	7-8thd
Franz Graf Clam-Gallas	31 600	Karl Fürst Clary-Aldringen	
Zdenko Ferd. Fürst Lobkowitz	28 000	Alex. Markgraf Pallavicini	
Karl Fürst Schwarzenberg	28 000	Phil. Ernst F. Hohenlohe Schillingsfürst	6-7thd
Karl Fürst Kinsky	25 500	Maria Gräfin Nostitz-Rienek	
Karl Graf Buquoy	25 000	Karl Graf Schönborn	
Albert Fürst Thum und Taxis	24 500	Theobald Graf Czernin	5-6thd
Erzbistum Prag	23 000	K.k. Theresianisches adeliges Damenstift	
Johann Graf Harrach	20 000	Erzherzog Ludwig Salvator	
Alfred Fürst Windisch-Grätz	20 000	Bohuslav Graf Kolowrat-Krakowsky	5-6thd
Clemens Fürst Metternich	20 000	Richard Freih. Dräsche v. Wartinberg	
Franz Josef Fürst Auersperg	19 000	Hermann Freih. v. Königswarter	
Aloisia Gräfin Czernin	17 600	Heinrich Graf Clam-Martinitz	5-6thd
Franz Graf Thun-Hohenstein	17 600	Johann Graf Hartig	
Karl Fürst Trauttmansdorff	17 000	Karl Freih. v. Lilgenau	
Zdenko Graf Kinsky	14 700	Emmerich Graf Chotek	5-6thd
Wilhelm Fürst von Hohenzollern	14 500	Karl Friedr. Fürst Oettingen	
Karl Fürst Paar	14 000	Felix Freih. v. Aehrenthal	
Karl Fürst Löwenstein	14 000	Zisterzienserstift Hohenfurt	5-6thd
Erwein Graf Nostitz-Rienek	13 500	Rudolf Fr. Freih. v. Geymüller	
Alain Fürst Rohan	13 000	Stadtgemeinde Ellbogen	
Georg Fürst Lobkowitz	12 600	Malteser Ritterorden	5-6thd
Weil. Erzherzog Franz Ferdinand	12 600	Nikolaus Graf Desfours-Walderode	
Fürstin Khevenhüller und Gräfin Festetics	12 000	Alois Graf Sternberg	
Heinrich Fürst Hanau	12 000	Otto Sigmd. Prinz Schönburg Waldenburg	5-6thd
Gottfr. Prinz Hohenlohe-Langenburg	11 000	Rudolf Ferd. Graf Kinsky	
Metropolitankapitel St. Veit	11 000	Benediktinerstift St. Margareth	
Josef Oswald Graf Thun-Hohenstein	10 400	Oskar Freih. Parish v. Senftenberg	5-6thd
Friedrich Herzog Beaufort-Spontin	10 000	V. und O. Danek Edle v. Esse	
Josef Graf Herberstein	10 000		
Will.Karl Aug. Prinz zu Schaumburg-Lippe	10 000		5-6thd
Leopold Graf Sternberg	10 000		
<b>TOTAL</b>	<b>946 400</b>	<b>TOTAL</b>	<b>268 300</b>

Table A6. Large landholdings in Moravia and Silesia, 1913

Source: Sandgruber 1978

Latifundia, above 10000 ha	Ha	Large landholdings from 5000-10000 ha	Ha
<u>Moravia</u>		<u>Moravia</u>	
Johann II. Fürst von Liechtenstein	109 000	Osten. Verein f. Zellulosefabrikation	8-10 thd.
Fürsterzbistum Olmütz	36 600	Alfred Graf Harrach	
Anton Dreher	17 000	Metropolitankapitel Olmütz	
Anton Graf Magnis	14 000	Gabriele Fürstin Hatzfeld-Wildenburg	
Hugo Fürst Salm-Reifferscheidt	12 800	Wladimir Graf Mittrowsky	6-8 thd.
Gebrüder Thonet	12 700	Leopold Graf Berchtold	
Freih. de Forest	12 700	Ferdinand Graf Kinsky	
K.u.k. Familien-Fondsgüter	11 500	Alfons Graf Mensdorff- Pouilly	
Heinrich Graf Haugwitz	11 500	Damenstift Maria Schul, Brunn	
Emanuel F. Collalto et S. Salvatore	10 800	Rudolf Graf Wrba-Kaunitz	
Hoch- und Erzstift Olmütz	10 500	Franz Graf Seilern-Aspang	
Alois Gr.Podstatzky-Liechtenstein	10 400	Erzherzog Friedrich	
Deutscher Ritterorden	10 000	Franz Graf Hanach	
Wenzel Graf Kaunitz	10 000	Adolar Graf Karatsonyi	
		Franz Freih. V. Wiesenberg	
		Alois Prinz Liechtenstein	
		F. Khevenhüller und Gräfin Festetics	
		Friedrich Graf Chorinsky	
		Luitgarde Gräfin Stadnicki	5- 6 thd.
		Gräf. Reichenbach und Pr. Löwenstein	
		Landeshauptstadt Brunn	
		A. und M. Baltazzi	
TOTAL MORAVIA	289 000	TOTAL MORAVIA	155 100
<u>Silesia</u>		<u>Silesia</u>	
Erzherzog Friedrich	64 000	Johann II. Fürst Liechtenstein	9 500
Bistum Breslau	33 800	Hans Graf Wilczek	6 200
Heinrich Graf Larisch-Mönnich	18 200		
Deutscher Ritterorden	13 900		
TOTAL SILESIA	129 900	TOTAL SILESIA	15 700

## References:

**Acemoglu, D., and Robinson, J. (2002)**, "The Political Economy of the Kuznets Curve", *Review of Development Economics*, 6(2), pp. 183-203.

**Acemoglu, D. (2002)**. "Technical Change, Inequality, and the Labor Market". *Journal of Economic Literature*, 40( 1), 7-72.

**Adam, J. (1974)**. *Wage, price and taxation policy in Czechoslovakia, 1948-1970*, Berlin: Duncker & Humblot

**Adam, J. (1984)**. *Employment and wage policies in Poland, Czechoslovakia and Hungary since 1950*, London: Macmillan

**Agnew, H. L. (2004)**, *The Czechs and the lands of the Bohemian crown*, Stanford: Hoover Institution Press of Stanford University

**Allen, R. C. (2009)**. "Engels' pause: Technical change, capital accumulation, and inequality in the British industrial revolution", *Explorations in Economic History* 46(4), 418-435.

**Atkinson, A. B. (1997)**. "Bringing Income Distribution in From the Cold", *The Economic Journal*, 107(441), pp. 297-321.

**Atkinson, A. B. (2005)**. "Top Incomes in the UK over the 20th Century." *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 168 (2), 325-43.

**Atkinson, A. B. (2007)**. "Measuring Top Incomes: Methodological Issues." In A. B. Atkinson and T. Piketty (Eds.), *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries* (pp. 18–42), Oxford University Press.

**Atkinson, A. B., and Brandolini, A. (2001)**. "Promise and Pitfalls in the Use of "Secondary" Data-Sets: Income Inequality in OECD Countries as a Case Study", *Journal of Economic Literature*, 39, 771-79.



**Atkinson, A. B., and Brandolini, A. (2009).** "On data: a case study of the evolution of income inequality across time and across countries", *Cambridge Journal of Economics*, 33, 381–404

**Atkinson, A. B., and Micklewright, J. (1992).** *Economic Transformation in Eastern Europe and the Distribution of Income*. Cambridge: Cambridge University Press.

**Atkinson, A. B., and Piketty, T. (2007).** *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries* (Eds.), Oxford: Oxford University Press.

**Atkinson, A. B., and Piketty, T. (2010).** *Top Incomes: A Global Perspective* (Eds.), Oxford: Oxford University Press.

**Atkinson, A. B., Piketty, T., and Saez, E. (2011).** "Top Incomes in the Long Run of History". *Journal of Economic Literature*, 49(1), 3-71.

**Autor, D. H., Katz, L. F., and Kearney, M. (2008).** "Trends in U.S. Wage Inequality: Revising the Revisionists." *Review of Economics and Statistics*, 90, (2), 300-323.

**Bachinger, K., and Lacina, V. (1996).** "Wirtschaftliche Ausgangsbedingungen". In A. Teichova and H. Matis (eds.), *Österreich und die Tschechoslowakei: 1918-1938; die wirtschaftliche Neuordnung in Zentraleuropa in der Zwischenkriegszeit*, (pp. 51-90), Wien: Böhlau.

**Baten, J., and Schulz, R. (2005),** "Making profits in wartime: corporate profits, inequality, and GDP in Germany during the First World War I", *Economic History Review*, LVIII, 1, pp. 34–56

**Bel, G. (2006),** "Retrospectives: The Coining of "Privatization" and Germany's National Socialist Party", *The Journal of Economic Perspectives*, 20(3), pp. 187-194

**Benaček, V. (2001).** "History of Czech economic and political alignments viewed as a transition". In D. Salvatore, J. Damijan and M. Svetlicic (Eds.), *Small Countries in a Global Economy*, (pp. 133-154), New York: Palgrave/Macmillan.

**Berend, I. (1985).** "Agriculture", In M. Kaser, (ed.), *The Economic History of Eastern Europe 1919- 1975, Vol. 1*, Oxford: Clarendon Press, pp. 148-209.

**Berend, I. T. (1998).** *Decades of crisis: Central and Eastern Europe before World War II*. Berkeley: University of California Press

**Bergson, A. (1984).** "Income Inequality under Soviet Socialism," *Journal of Economic Literature*, 22, 1052–1099.

**Bernanke, B. (1995).** "The Macroeconomics of the Great Depression: A Comparative Approach". *Journal of Money, Credit and Banking*, 27(1), 1-28.

**Blanchet, T., Fournier, J., and Piketty, T. (2017).** "Generalized Pareto Curves: Theory and Applications", WID.world Working Paper 2017/03

**Bound, J., and Johnson, G. (1992).** "Changes in the Structure of Wages in the 1980s: An Evaluation of Alternative Explanations," *American Economic Review*. 82, 371–392.

**Brada, J. C. (1991).** "The Economic Transition of Czechoslovakia From Plan to Market". *The Journal of Economic Perspectives*, 5(4), pp. 171-177.

**Broadberry, S., and Klein, A. (2011).** "When and Why did Eastern European Economies begin to Fail?: lessons from a Czechoslovak/UK Productivity Comparison, 1921-1991", *Explorations in Economic History*, 48, 37-52.

**Brubaker, R. (1996).** *Nationalism Reframed: Nationhood and the National Question in the New Europe*, Cambridge University Press

**Butschek, F., and Prucha, V. (1996)** "Einkommensniveau und Wirtschaftsstruktur in der Zwischenkriegszeit". In A. Teichova and H. Matis (eds.), *Österreich und die Tschechoslowakei: 1918-1938; die wirtschaftliche Neuordnung in Zentraleuropa in der Zwischenkriegszeit*, (pp. 309-328), Wien: Böhlau.

**Buys, E., and Franaszek, P. (2010).** "Sectoral developments". In S. Broadberry and K. H. O'Rourke (Eds.), *The Cambridge Economic History of Modern Europe, Volume 2: 1870 to the Present*, (pp. 208-231), Cambridge University Press.

**Card, D., and DiNardo J. E. (2002).** "Skill-Biased Technological Change and Rising Wage Inequality: Some Problems and Puzzles." *Journal of Labor Economics*, 20(4), 733-783.

**Cerman, M. (2012).** *Villagers and lords in Eastern Europe, 1300-1800*. Basingstoke; New York: Palgrave Macmillan

**Cvrcek, T. (2013),** "Wages, prices, and living standards in the Habsburg Empire, 1827-1910," *Journal of Economic History*, 73(1), pp. 1-37.

**Cohen, G. B. (1981).** *The politics of ethnic survival: Germans in Prague, 1861-1914*. Princeton: Princeton university press.

**Crafts, N. (1985).** *British Economic Growth during the Industrial Revolution*, Oxford: Clarendon Press

**Deininger, K. and Squire, L. (1996).** "A New Data Set Measuring Income Inequality," *World Bank Economic Review*, 10, 565–91

**Dell, F. (2007).** "Top Income in Germany throughout the Twentieth Century: 1891–1998". In A. B. Atkinson and T. Piketty (eds.), *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries*, (pp. 365-425), Oxford University Press.

**Douglas, D. W. (1950).** "Social Security in Czechoslovakia", *Social Service Review*, 24(3), pp. 310-318

**Dumke, R. (1988).** "Income Inequality and Industrialization in Germany, 1850–1913: images, trends and causes of historical inequality". *Research in Economic History* 11, 1–47.

**Dumke, R. (1991).** "Income inequality and industrialization in Germany, 1850–1913: the Kuznets hypothesis re-visited". In Y. S. Brenner, H. Kaelble and M. Thomas (eds.), *Income Distribution in Historical Perspective*, (pp. 117-48). Cambridge: Cambridge University Press.

**Eichengreen, B. J. (1992).** *Golden fetters: the gold standard and the Great Depression, 1919-1939*. New York: Oxford University Press

**Eichengreen, B. J., and Hatton, T. J. (1988).** *Interwar unemployment in international perspective*. Dordrecht and London: Kluwer Academic.

**Eddie, S. (2008),** *Landownership in Eastern Germany Before the Great War: A Quantitative Analysis*

**Esteban, J., and Ray, D. (2011).** "Linking Conflict to Inequality and Polarization." *American Economic Review* 101 (4), pp. 1345–74.

**Esteban, J., Mayoral, L., and Ray, D. (2012).** "Ethnicity and Conflict: An Empirical Study", *American Economic Review* 2012, 102(4), pp. 1310–1342

**Fajfr, F. (1935).** "Poznámka k metodologii důchodové statistiky". *Statistický Obzor*, 15(1-3), pp. 55-63.

**Faltus, J., and Prucha, V. (1969).** *Prehľad hospodárskeho vývoja na Slovensku v rokoch 1918-1945*. Bratislava: VPL

**Feenberg, D. R., Poterba J. M. (1993).** "Income Inequality and the Incomes of Very High-Income Taxpayers: Evidence from Tax Returns." In J.M. Poterba (Ed.) *Tax Policy and the Economy*, (pp. 145–77), Volume 7, Cambridge and London: MIT Press.

**Flemming, J. S., and Micklewright, J. (2000).** "Income distribution, economic systems and transition," *Handbook of Income Distribution*, In A. B. Atkinson and F. Bourguignon (eds.), *Handbook of Income Distribution. Vol. 1*, (pp. 243-918). Amsterdam: Elsevier.

**Friedländer, S. (1998).** *Nazi Germany and the Jews. Volume I, The years of persecution, 1933-*

1939. New York: Harper Perennial

**Gellner, E. (1983).** *Nations and Nationalism*, Oxford: Blackwell

**Gerschenkron, A. (1943),** *Bread and Democracy in Germany*, Berkley: University of California Press

**Gerschenkron, A. (1962),** *Economic Backwardness in Historical Perspective*, Cambridge, MA.

**Gerschenkron A. (1977),** *An economic spurt that failed: four lectures on Austrian economic history*, Princeton: Princeton University Press

**Glassheim, E. (2005),** *Noble nationalists: the transformation of the Bohemian aristocracy*, Cambridge, Mass.: Harvard University Press

**Grzymala-Busse, A. M. (2002).** *Redeeming the Communist Past. The Regeneration of Communist Parties in East Central Europe*. Cambridge: Cambridge University Press

**Good, D. F. (1978),** "The Great Depression and Austrian Growth after 1873", *The Economic History Review* 31 (2) , pp. 290 – 294

**Good, D. F. (1984).** *The Economic Rise of the Habsburg Empire, 1750 – 1914*, University of California Press

**Good, D. F. and Ma, T (1998),** "New Estimates of Income Levels in Central and Eastern Europe, 1870 – 1910", in F. Baltzarek, F. Butschek and G. Tichy (eds.) *Von der Theorie zur Wirtschaftspolitik – ein österreichischer Weg*, Stuttgart,

**Hanley, E., Matějů, P., Vlachová, K., and Krejčí, J. (1998).** The Making of Post-Communist Elites in Eastern Europe, Working papers of the research project "Social Trends" 4/1998

**Hardach, G. (1977).** *The First world war. 1914-1918*, London : Allen Lane, 1977

**Hauner, M. (1986).** "Military Budgets and the Armament Industry". In M. C. Kaser and E. A. Radice, ed., *The Economic History of Eastern Europe 1919-1975, Volume 2: Interwar Policy and Reconstruction*, (pp. 49-116). Oxford: Clarendon Press.

**Hobsbawm, E. (1992).** *Nations and Nationalism since 1780s: Programme, Myth, Reality*, Cambridge University Press, (2<sup>nd</sup> ed.)

**Hroch, M. (1985).** *Social Preconditions of National Revival in Europe: A Comparative Analysis of the Social Composition of of Patriotic Groups among the Smaller European Nations*, Cambridge University Press

**Hroch, M. (2005).** *Das Europa der Nationen: die moderne Nationsbildung im europäischen Vergleich*. Göttingen: Vandenhoeck & Ruprecht

**Hroch, M. (2015).** *European nations. Explaining their formation*. London: Verso

**Junz, H. B. (2002).** *Where Did All the Money Go? The Pre-Nazi Era Wealth of European Jewry*, Berne: Stämpfli

**Kalecki, M. (1938)** "The Determinants of Distribution of the National Income", *Econometrica*, 6(2), pp. 97-112

**Kalecki, M. (1943).** "Political Aspects of Full Employment", *Political Quarterly*

**Kalecki, M. (1971).** *Selected Essays on the Dynamics of the Capitalist Economy*. Cambridge: Cambridge University Press

**Kessler, D. and Wolff, E. N. (1991)**, "A comparative analysis of household wealth patterns in France and the United States", *Review of Income and Wealth*, 37(3), pp. 249-266.

**Klíma, A. (1974).** "The Role of Rural Domestic Industry in Bohemia in the Eighteenth Century", *The Economic History Review*, 27(1), pp. 48-56

**Klíma, A. (1979).** "Agrarian Class Structure and Economic Development in Pre-Industrial

Bohemia", *Past & Present*, 85, pp. 49-67

**Klíma, A. (1991).** *Economy industry and society in Bohemia in the 17th-19th centuries*. Prague: Karolinum

**Kocka, J. (1981)**, "Capitalism and Bureaucracy in German Industrialization before 1914", *The Economic History Review*, 34(3), pp. 453-468

**Kocka, J. (1984).** *Facing total war: German society, 1914-1918*. Cambridge MA: Harvard University Press.

**Koenig, E. (1957).** "Agriculture". In V. Busek and N. Spulber, ed., *Czechoslovakia*, (pp. 245-67). London: Atlantic Books.

**Komlos, J. (1978)**, "Is the depression in Austria after 1873 a "myth"?", *Economic History Review*, 31(2), pp. 287-289

**Komlos, J. (1983)**, *The Habsburg Monarchy as a Customs Union. Economic Development in Austria- Hungary in the Nineteenth Century*, Princeton

**Král, V. (1957-1959).** *Otázky hospodářského a sociálního vývoje v českých zemích v letech 1938-1945*. (3 vol.) Praha: Nakladatelství ČAV

**Krejčí, J. (1968).** "Intertemporal Comparability of National Income in Czechoslovakia", *Review of Income and Wealth*, 14, 247-266.

**Krejčí, J. (1972a).** *Social change and stratification in postwar Czechoslovakia*. London: Macmillan Press

**Krejčí, J. (1972b).** "Comment on Pryor, Pryor, Stadnik, and Staller Czechoslovak aggregate production in the interwar period". *Review of Income and Wealth*, 18(2), 251-252.

**Krejčí, J. (1982).** *National income and outlay in Czechoslovakia, Poland, and Yugoslavia*. London : Macmillan

**Krejči, J. (1986).** "The Bohemian-Moravian War Economy". In M. C. Kaser and E. A. Radice, ed., *The Economic History of eastern Europe 1919-1975, Volume 2: Interwar Policy and Reconstruction*, (pp. 452-492). Oxford: Clarendon Press.

**Krugman, P (1995).** "Growing World Trade: Causes and Consequences", *Brookings Papers on Economic Activity*, 327-377.

**Krugman, P. R. (2008).** "Trade and Wages, Reconsidered." *Brookings Papers on Economic Activity*, 2, 103-138.

**Kubů, E., Novotný, J., and Šouša, J. (2004).** „Under the Threat of Nazi Occupation“. In C. Kobrak, and P. Hansen (Eds.), *European business, dictatorship, and political risk, 1920-1945* (pp. 206–222). New York: Berghahn Books

**Kubu, E. (2005),** "České (československé) transformační kontinuity 20. století", *Acta Oeconomica Pragensia*, 13(3)

**Kuznets, S. (1953).** *Shares of upper income groups in income and savings*. New York: National Bureau of Economic Research.

**Kuznets, S. (1955).** "Economic growth and income inequality". *American Economic Review* 45, pp. 1-28.

**Lacina, V. (1974).** *Krise československého zemědělství: 1928-1934*, Praha: Ústav československých a světových dějin ČSAV

**Lacina, V. (1984).** *Velká hospodářská krize v Československu 1929-1934*. Praha: Academia.

**Lacina, V. (1990).** *Hospodářství českých zemí: 1880-1914*. Praha : Historický ústav ČSAV, 1990

**Lacina, V. (2000a).** "Narodny duchod, hruby narodny produkt a hruby domaci produkt v prvním období" . In E . Kubů and ., J. Pátek (eds.), *Mýtus a realita hospodářské vyspělosti Československa mezi světovými válkami*, (pp. 45-54) V Praze : Karolinum.



**Lacina, V. (2000b).** *Zlatá léta československého hospodářství 1918-1929*. Praha: Historický ústav.

**Leigh, A. (2007).** “How Closely Do Top Income Shares Track Other Measures of Inequality?”, *Economic Journal*, 117(524), F619–33.

**Lemieux, T. (2006)**, “Increasing Residual Wage Inequality: Composition Effects, Noisy Data, or Rising Demand for Skill?” *American Economic Review*, 96, pp. 461-498.

**Lindert, P. H. (2000).** “Three Centuries of Inequality in Britain and America. In A. B. Atkinson and F. Bourguignon (eds.), *Handbook of Income Distribution*. Vol. 1, (pp. 167- 216). Amsterdam: Elsevier.

**Lydall, H. (1959).** “The distribution of employment incomes”, *Econometrica*, 27(1)

**Mendels, F. (1972).** “Proto-industrialization: the first phase of the industrialization process”. *Journal of Economic History* 32, pp. 241–61.

**Maddison, A. (2001).** *The World Economy. A millennial perspective*. Paris: OECD.

**Maiwald, K. (1931).** “Hospodářské poměry národnostní v historických zemích ve světle statistiky daně důchodové”, *Statistický Obzor*, 12 (3-4), pp. .

**Majerova, V. (2000)**, “Four Milestones in the Social and Economic Development of Czech Agriculture”, *Czech Sociological Review*, 8(2), pp. 157-76

**Mathias, P. and Pollard, S. (1988).** *The Cambridge economic history of Europe. Vol. 8, The industrial economies: the development of economic and social policies*. Cambridge: Cambridge University Press.

**Melton, E. (1988).** “Gutsherrschaft in East Elbian Germany and Livonia 1500–1800: a critique of the Model”. *Central European History*, 21, pp. 315–349.

**Milanović, B., Lindert, P. and Willimson, J. (2011).** “Pre-Industrial Inequality”, *Economic Journal* 121 (551), pp. 255-272.

**Milanović, B., (1998).** *Income, Inequality, and Poverty During the Transition from Planned to Market Economy*. Washington DC: The World Bank.

**Miller, D. E. (1999).** *Forging political compromise: Antonín Švehla and the Czechoslovak Republican Party, 1918-1933*. Pittsburgh: University of Pittsburgh Press.

**Morrisson, C. (1984),** “Income Distribution in East European and Western Countries”. *Journal of Comparative Economics*, 8(2), 121–138.

**Morrison, C. (2000).** “Historical Perspectives on Income Distribution: the Case of Europe”. In A. B. Atkinson and F. Bourguignon (eds.), *Handbook of Income Distribution. Vol. 1*, (pp. 217–60). Amsterdam: Elsevier.

**Mosser, A. (1980).** *Die Industrieaktiengesellschaft in Österreich, 1880-1913: Versuch einer historischen Bilanz- und Betriebsanalyse*, Wien: Verl. der Österreichischen Akademie der Wissenschaften

**Muhlpeck, V., Sandgruber, R. and Woitek H. (1979),** “Index der Verbraucherpreise, 1800-1914” in *Geschichte und Ergebnisse der zentralen amtlichen Statistik in Österreich 1829-1979*, Kommissionsverlag, Österreichische Staatsdruckerei, Vienna

**Münich, D., Svejnar, J. and Terrell, K. (2005),** “Returns to Human Capital Under the Communist Wage Grid and During the Transition to a Market Economy”. *Review of Economics and Statistics*, 87, pp. 100-123.

**Mysíková, M. (2011).** “Income Inequalities within Couples in the Czech Republic and European Countries”, IES Working Paper, 4

**Myška, M. (1996),** “Proto-Industrialization in Bohemia, Moravia and Silesia”, in S. Ogilvie, and M. Cerman (eds.), *European proto-industrialization*, Cambridge: Cambridge University Press

**Nachtigal, V. (1969).** *Národní důchod Československa: dokumentační shrnutí podkladů z období 1913-1966 a analýza období 1946-1955*, Praha : Ekonomický ústav ČSAV, 1969

**Novotny, J. M. (1937).** *Daňová příručka* (6th ed). Praha

**Otáhal, M. (1963).** *Zápas o pozemkovou reformu v ČSR*. Praha: Nakladatelství Československé akademie věd

**Pátek, J., Matis, H., and Teichova, A. (2000).** *Economic change and the national question in twentieth-century Europe*. Cambridge, New York : Cambridge University Press

**Phelps Brown, H. (1977).** *The inequality of pay*. Oxford: Oxford University Press

**Perkins, J. A. (1986)**, "Dualism in German Agrarian Historiography", *Comparative Studies in Society and History*, 28(2), pp. 287-306.

**Piketty, T. (2014).** *Capital in the 21st century*, Belknap, Cambridge, MA.

**Prokopovič, S. (1925).** "Rozdělení národního důchodu v Čechách, na Moravě a ve Slezsku v letech 1913-1917". *Československý statistický věstník*, VI, pp. 322-329.

**Prucha (1974).** *Hospodárske dejiny Československa v 19. a 20. storočí*. Bratislava: Pravda

**Prucha, V., a kolektiv (2004)**, *Hospodářské a sociální dějiny Československa, 1918-1992 1. díl. Období 1918-1945*. Brno: Doplněk

**Prucha, V., a kolektiv (2009)**, *Hospodářské a sociální dějiny Československa 1918-1992, 2. díl. Období 1945-1992*. Brno: Doplněk

**Pryor, F. L., Pryor, Z. P., Stadnik, M., and Staller, G. J. (1971).** "Czechoslovak aggregate production in the interwar period". *Review of Income and Wealth*, 16, 35-59.

**Pryor, Z. P. (1973)**, "Czechoslovak Economic Development in the Interwar Period." In V. S. Mamatey and R. Luza (eds.), *A History of the Czechoslovak Republic 1918-1948*. Princeton: Princeton University Press, pp. 114-131.

**Pryor, Z. P. (1979)**, "Czechoslovak Fiscal Policies in the Great Depression", *The Economic History Review, New Series*, 32(2), pp. 228-240

**Radice, E. A. (1986)**. "The German Economic Programme in Eastern Europe". In M. C. Kaser and E. A. Radice (Eds.), *The Economic History of eastern Europe 1919-1975, Volume 2: Interwar Policy and Reconstruction*, (pp. 299-308). Oxford: Clarendon Press.

**Rákosník, J. (2008)**. *Odvracená tvář meziválečné prosperity: nezaměstnanost v Československu v letech 1918-1938*. Prague: Karolinum

**Rašin, A. (1923)**. *Les finances de la Tchécoslovaquie jusqu'à la fin de 1921*. Paris: Editions Bossard.

**Ritschl, A. (2001)**. "Nazi economic imperialism and the exploitation of the small: evidence from Germany's secret foreign exchange balances, 1938-1940", *Economic History Review*, 54, 324-345.

**Roine, J., and Waldenström, D. (2008)**. "The Evolution of Top Incomes in an Egalitarian Society: Sweden, 1903–2004." *Journal of Public Economics*, 92(1–2), 366–87.

**Roine, J., and Waldenström, D. (2015)**. "Long-Run Trends in the Distribution of Income and Wealth", In A. B. Atkinson and F. Bourguignon, (eds.), *Handbook of Income Distribution, Vol. 2*, Amsterdam: North-Holland

**Rosen, S. (1981)**. "The Economics of Superstars." *American Economic Review*, 71(5): 845- 858.

**Rudolf, R. (1976)**, *Banking and Industrialization in Austria-Hungary. The Role of Banks in the Industrialization of the Czech Crownlands, 1873 – 1914*. Cambridge University Press, Cambridge

**Rubinstein, W. D. (1980)**, "Modern Britain". In W.D. Rubinstein (ed.), *Wealth and the Wealthy in the Modern World*, (pp. 46-89). Croom Helm, London

**Scheve, K., and Stasavage, D. (2010)**. "The Conscription of Wealth: Mass Warfare and the Demand for Progressive Taxation", *International Organization*, 64, 529–561.

**Schweitzer, A. (1946)**. "Big Business and Private Property Under the Nazis", *The Journal of Business of the University of Chicago*, 19(2), pp. 99-126

**Sandgruber, R. (1978)**. Österreichische Agrarstatistik 1750-1918. Vienna.

**Schulze, M. (2000)**. Patterns of Growth and Stagnation in the late 19th century Habsburg Economy", *European Review of Economic History* 4, pp. 311–340

**Schulze, M. (2007)**. "Regional Income Dispersion and Market Potential in the Late Nineteenth Century Hapsburg Empire", *LSE Working Paper* 106/07

**Scitovsky, T. (1966)**. "An International Comparison of the Trend of Professional Earnings", *The American Economic Review*, 56 (1/2), pp. 25–42

**Sieghart, R. (1898)**, "The Reform of Direct Taxation in Austria", *The Economic Journal*, 8(30), pp. 173-182

**Skalnik Leff, C. (1988)**. *National Conflict in Czechoslovakia: The Making and Remaking of a State, 1918-1987*. Princeton University Press

**Spulber, N. (1957)**. "National income and product". In V. Busek and N. Spulber, ed., *Czechoslovakia*, London: Atlantic Books, pp. 220-66.

**Spoerer, M. (1996)**. *Von Scheingewinnen zum Rüstungsboom: die Eigenkapitalrentabilität der deutschen Industrieaktiengesellschaften, 1925-1941*. Stuttgart: Steiner Verlag.

**Stadnik, M. (1946)**. *Národní důchod a jeho rozdělení: se zvláštním zřetelem k Československu*. Praha: Knihovny Sborníku věd právních a státních.

**Stadnik, M. (1972).** "Macroeconomic Relations in Czechoslovakia, 1929-1966: Challenges and Response", *Review of Income and Wealth*, 18(4), 429–434.

**Stiglitz, J. E. (2012).** *The price of inequality: how today's divided society endangers our future*. New York: W.W. Norton & Co

**Sweezy, M. Y. (1939),** "Distribution of Wealth and Income under the Nazis", *The Review of Economics and Statistics*, 21(4), pp. 178-184

**Svejnar, J. (1996).** "Enterprises and workers in the transition: econometric evidence". *American Economic Review Papers and Proceedings*, 86, pp. 123–127.

**Tálos, E., and Kittel, B. (1996).** "Roots of Austro-Corporatism: Institutional Precondition and Cooperation Before and After 1945". In G. Bischof and A. Pelinka (eds.), *Austro-Corporatism: Past, Present, Future*, New Brunswick and London: Transaction Publishers

**Teichova, A. (1974).** *An economic background to Munich: international business and Czechoslovakia, 1918-1938*. London: Cambridge University Press.

**Teichova, A. (1988).** *The Czechoslovak Economy 1918-1980*. London: Routledge.

**Teichova, A. (1998).** "The Protectorate of Bohemia and Moravia (1939–1945): the Economic Dimension". In Teich, M. (Ed.), *Bohemia in history* (pp. 267-305) Cambridge: Cambridge University Press.

**Van Sickle, J.V. (1931).** *Direct taxation in Austria*. Cambridge: Harvard University Press.

**Večerník, J. (1991).** "Earning Distribution in Czechoslovakia: Intertemporal changes and International Comparison", *European Sociological Review*, 7(3), pp. 237-252

**Večerník, J. (1996).** "Earning Disparities in the Czech Republic: The history of Equalisation", *Czech Sociological Review*, 4(2), pp. 211-222

**Večerník, J. (2009).** *Czech society in the 2000s: a report on socio-economic policies and structures*. Praha: Academia

**Vencovsky, F. (1994).** "Státní finance v historii Československa – období 1918–1947 (The History of the Czechoslovak State Finances from 1918 to 1947)". *Czech Journal of Economics and Finance (Finance a uver)*, 44(8), 407-417.

**Vencovsky, F. (1997).** "K rozpočtové a daňové reformě před sedmdesáti roky (On the Budget and Tax Reform before 70 years)". *Czech Journal of Economics and Finance (Finance a uver)*, 1997, 47(6), 321-332.

**Voth, H. (1993),** "Wages, Investment, and the Fate of the Weimar Republic: A Long-term Perspective", *German History*, 11(3), pp. 265-292.

**Williamson, J. G., and Lindert, P. H. (1980).** *American Inequality: A Macroeconomic History*. New York: Academic Press.

**Wiskemann, E. (1938).** *Czechs and Germans: a study of the struggle in the historic provinces of Bohemia and Moravia*. London: Oxford University Press.

**Žatecký, V. (1946).** *Nová daň důchodová platná pro berní rok 1946 a další*. V Praze: A. Neubert

# Chapter 2. Top Incomes during Wars, Communism and Capitalism: Poland 1892-2015

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## Abstract

This study presents the history of top incomes in Poland. We document a U-shaped evolution of top income shares from the end of the 19<sup>th</sup> century until today. The initial high level, during the period of Partitions, was due to the strong concentration of capital income at the top of the distribution. The long-run downward trend in top incomes was primarily induced by shocks to capital income, from destructions of world wars to changed political and ideological environment. The Great Depression, however, led to a rise in top shares as the richest were less adversely affected than the majority of population consisting of smallholding farmers. The introduction of communism abruptly reduced inequalities by eliminating private capital income and compressing earnings. Top incomes stagnated at low levels during the whole communist period. Yet, after the fall of communism, the Polish top incomes experienced a substantial and steady rise and today are at the level of more unequal European countries. While the initial upward adjustment during the transition in the 1990s was induced both by the rise of top labour and capital incomes, the strong rise of top income shares in 2000s was driven solely by the increase in top capital incomes, which make the dominant income source at the top. We relate these developments to processes associated with the new phase in the globalisation.

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\* This chapter is co-authored with Pawel Bukowski



## 2.1. Introduction

Right from the beginning of modern economics an interest in distributional issues has constantly been present in economic and public discourse, varying strongly in its intensity from the initial enthusiasm of the classical economists,<sup>1</sup> but often finding itself unjustifiably ousted at the margins of economic interest. In the middle of the twentieth century, Simon Kuznets renewed the enthusiasm and taught us about the inextricable interplay of inequality and economic growth in the process of economic development. However, the evolution of inequalities and its determinants are still not well understood. Our understanding of the evolution of inequalities depends on the available empirical evidence, and as we have obtained new evidence, charting inequality further back in time, the old paradigms have been challenged and new ones developed. The research on top incomes (Kuznets 1953; Piketty 2001; Atkinson and Piketty, 2007, 2010) has played a central role in charting these new modes of understanding by providing the empirical basis for path-breaking theories in the field. Although numerous developed countries have been extensively studied, surprisingly little attention has been devoted to Central and Eastern Europe. Importantly, Poland has been missing from the picture. Moreover, the episodes of state formation, wars, socialism, transition into capitalism and integration into the EU make Poland a particularly compelling case for studying determinants of income inequalities.

This paper is a first comprehensive attempt to look at the long-run evolution of inequality in Poland by constructing top income shares from the end of the 19<sup>th</sup> century until today. Our motivation is to fill the void in the literature and contribute to the understanding of the long-term determinants of inequality. We provide first homogeneous series that offers a possibility to compare the level of income inequality in Poland and its evolution both through time and across countries. As such, we believe it to be the best available indicator of the long-term development of inequality in Poland.

In fact, it has been found that the evolution of top income shares reasonably well outlines the evolution of the overall income distribution through the 20<sup>th</sup> century (Roine and Waldenström 2015). Changes at the top can critically affect the whole distribution. The economic mechanisms at the top may influence the performance of the entire economy, as apparent in the case of

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<sup>1</sup> For David Ricardo, it presented “the principal problem in political economy”.

Poland, with top incomes assuming the main role, for instance, in driving capital accumulation in the pre-WW1 era or in leading the post-socialist convergence (for technology transfers or by partaking in global value chains). However, along with income, wealthy accumulate command over resources and people. This could adversely impact democracy, as the concentration of economic power increases the political influence of the richest.

Figure 1 presents the long run economic growth in Poland and Western Europe (France, Germany and the UK). Throughout the 20<sup>th</sup> and 21<sup>st</sup> centuries the income per adult in Poland is around half of the income in Western Europe (and so the nominal difference has increased). The gap widened during the communist period, especially in the 1980s, and has narrowed after the transition in 1989. Today, Poland is considered by the World Bank as a high-income country. Figure 2 summarizes our main results. Top income shares in Poland followed a U-shaped evolution from 1892 until today. Inequality was high in the first half of the 20<sup>th</sup> century due to strong concentration of capital income at the top of the distribution. As documented now in many countries, the downward trend was induced by the fall in capital income concentration. The introduction of communism signified comparatively greater shock to capital incomes relative to other countries, by literally eliminating private capital income with nationalisations and expropriations, while in addition it implied strong reduction of top labour incomes. After the fall of communism the Polish top incomes experienced a substantial and steady rise and today are at the level of more unequal European countries.

Table 1 summarizes the major episodes in the Polish history since the 19<sup>th</sup> century. We follow this historical periodization in our analysis, as we believe that the specific historical setting and changing institutional frameworks are essential in shaping inequality in the long-run. Initially, during the period of Partitions, top income shares experienced different trajectories in the Prussian and Austrian parts. A steady rise in the former contrasts with the stagnation in the latter. The end of the First World War and the immediate post-war development led to the sharp reduction in top income shares, owing to the shocks to capital income such as the wartime destruction or the hyperinflation of the early 1920s. This course was reinforced by the introduction of the anti-rich policies such as stronger taxation of the wealthy or the introduction of social legislation. During the interwar period, top income shares recovered from this low-point, with the urban-rural gap playing the central role in the evolution of income distribution. The Great Depression resulted in further top concentration since top incomes were less adversely affected than the majority of the population consisting of smallholding farmers. The proportionally lower decrease in in-

comes of top groups during the depression was largely procured by the rapid cartelization and intensified industrial concentration. The Second World War seemingly had a relatively more modest effect on the top income shares than its predecessor, however the early years of communism significantly impaired income concentration by eliminating private capital income and compressing earnings. During the remaining four decades of the communist rule, top income shares displayed notable stability at these lower levels.

Polish top incomes experienced a substantial and steady rise after the fall of communism and today are at the level of more unequal European countries, most notably Germany and the United Kingdom. It has been found that the post-transformation rise in income inequality has been in general limited to the top and the bottom end of the income distribution.<sup>2</sup> It was mostly driven by a sharp increase in income shares of the top groups within the top decile. The evolution of the top of income distribution becomes thus an essential ingredient of inequalities in Poland.

The highest increase in top shares took place after Poland joined the EU and top income groups have been main beneficiaries of strong Polish growth in the 2000s. In 2003-2008 almost half of the real income growth was obtained by the top 5%. The beginning of the 2010s marks a stabilisation, yet in the most recent period, we again document a growing trend in top income shares. Income composition has been different for the top percentile and the lower top income groups. The top 1 per cent has been mostly composed of capital income, which shows strong concentration at the top of the distribution. On the other hand, labour income dominates for the groups below the top percentile. While capital income is more pro-cyclical, labour income has been in general more resilient to economic fluctuations.

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<sup>2</sup> For example, Milanović and Ersado (2010) point to a rise of the top decile's income share and a fall in the bottom decile's share, while intermediate deciles were largely unaffected. Similarly, the World Bank estimates show that income dispersion was somewhat more pronounced in Poland than in the other former socialist countries, and it was mostly driven by a surge in income shares of the top groups within the top decile

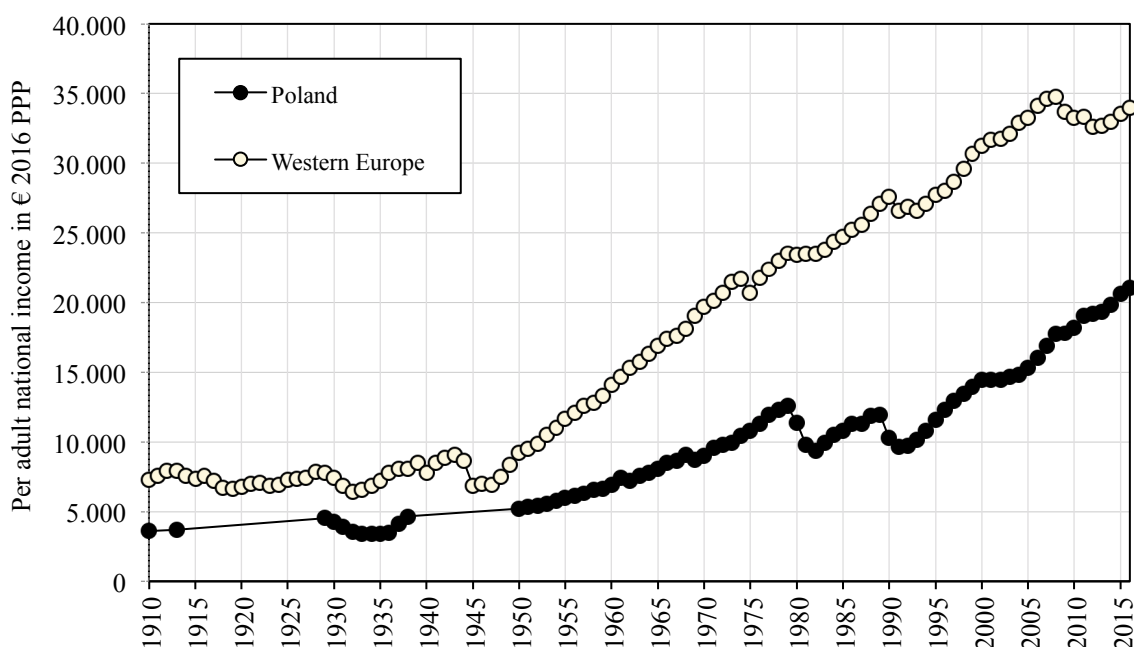


Figure 1: Real income per adult in Poland and Western Europe 1910-2015

Source: authors' computation based on WID and Maddison (2013). Western Europe is the unweighted average of Germany, France and UK.

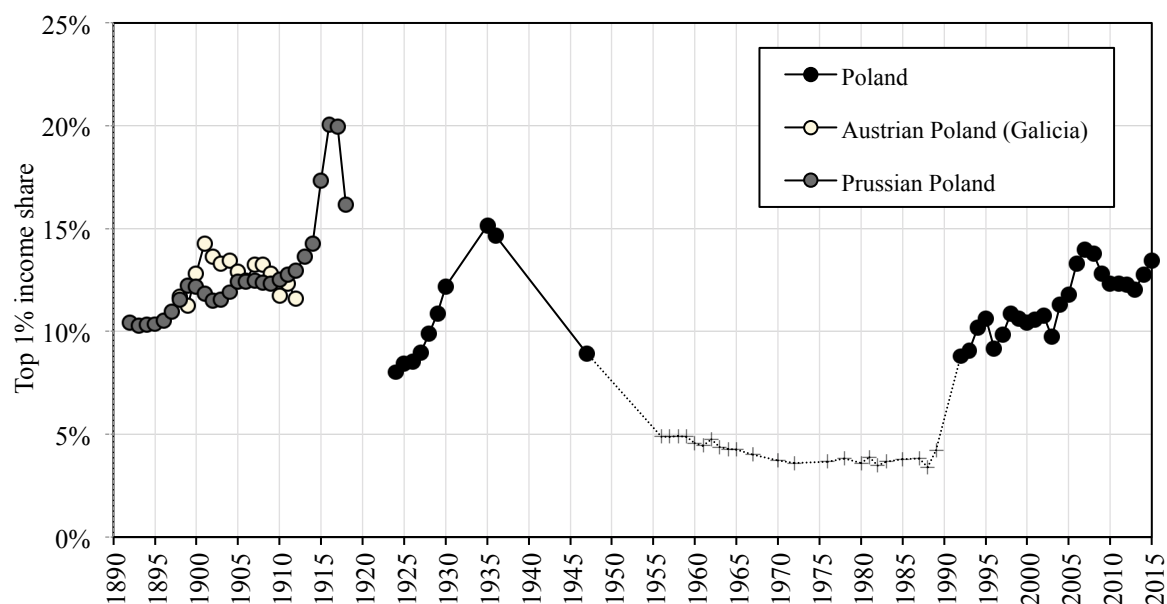


Figure 2: Top 1 per cent income share in Poland 1892-2015

Source: authors' computation based on income tax statistics; Note: the Prussian Poland is the Province of Posen and West Prussia, Galicia is the Austrian partition. For 1925-1937 Poland is the Second Polish Republic (with 1918-1939 borders), for 1992 Poland is the Third Polish Republic (with post-1945 borders).

*Table 1: Major Episodes in the Polish History since the 19<sup>th</sup> Century*


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1772 – 1918	The Partitions of Poland - Austria, Prussia and Russia divided Poland and imposed their own institutions.
1914 – 1918	World War I – the occupying Empires fought on the opposite sides, leading to a massive destruction on the Polish lands.
1918 – 1939	The Interwar Poland – the country was re-created and gained a full independence. It drifted from democratic parliamentary republic towards authoritarian presidential republic.
1939 – 1945	World War II – Poland was occupied by Germany and experienced the biggest relative war losses. Approximately 17% of the 1939 population were killed and 62% of the national wealth was destroyed.
1945 – 1989	Communism – Soviet communist system with a centrally planned economy was introduced. Almost a complete elimination of private capital income, through e.g. nationalisation or expropriation.
1989 –	Capitalism – a market based economy with parliamentary democracy was re-established. In 2004 Poland joined the European Union.

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Our paper is closely related to the voluminous literature looking at the relationship between inequality and economic growth. Kuznets (1953) has constructed first top income shares for the US, which served as the empirical basis for the inverted-U curve, according to which inequality rises in early phases of economic development but falls eventually as the growth advances (Kuznets 1955). Economists have generally applied the ‘demand and supply of skills’ framework to explain changes in inequality (see i.e. Acemoglu 2002; Card and DiNardo 2002). The recent rise of inequality has been perceived as a byproduct of technological change that has been spurring economic growth and bringing exorbitant rewards to few visionary entrepreneurs. But inequality is bound to fall eventually as these innovations permeate the economy and new skills are acquired by the rest of the society, most importantly through education (Tinbergen 1974; Goldin and Katz 2008). But, the revival of the Kuznets’s pioneering study (1953) by Piketty (2001, 2003) has challenged this optimistic view, as we observe continuously growing inequalities.<sup>3</sup> Piketty (2014) has recently offered a more sombre view of the growth-inequality link, according to which unrestrained capitalist development inevitably leads to rising inequality.

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<sup>3</sup> In addition to the skill-biased technological change, economists have explored alternative explanations, especially tax policy favouring the richest, changing worker’s bargaining power and increasing wealth inheritance (Alvaredo, Atkinson, Piketty and Saez 2013). This could be partially explained by the institutional change, notably decreasing minimum wage and declining importance of trade unions (Machin and van Reenen 2007).

He believes that the 'great levelling' of the twentieth century was a historically unique episode and that there is no spontaneous fall in inequality.

This study shows that evolution of inequality is shaped by the inextricable workings of economic, social and political factors. Institutions matter. The communist system eliminated private capital income and compressed earnings, which led to the sharp fall and decades-long stagnation of the top income shares. By the same token, the labour market liberalisation and privatisation during the transition instantly increased inequalities and brought them to the level of countries with long histories of capitalism. Major political forces, such as wars and occupations, fragile balances of political power and vested interests have differentially affected top shares at various junctures in the Polish history. Equally, economic factors have been significant and often persistent. The history of disparities during the Partitions of Poland shows that industrialisation had different impact on top income shares in the Prussian and Austrian partitions. This study uses the interwar period county-level data to show that these differences persisted even after the unification of the country in 1918. The structural transformation, emigration, or the expansion of general education, all played a role in shaping inequalities throughout the 20th century.

Finally, the recent developments suggest that the future of inequalities in Poland is likely to be linked with the prominent role of capital among the top incomes. Moreover, one should not expect a weakening of this trend, as processes connected with globalisation seem to contribute to the growing dominance of capital in the economy. There is no spontaneous fall in inequality and the future will depend on the institutions and policies taken. We hope that our work, by providing historical perspective, will be a contribution in how to approach these imminent challenges.

The paper is organised as follows. Section 2 describes data sources and methodology. Section 3 presents trends and composition of the top income shares since the end of the 19<sup>th</sup> century until today. We also discuss trends in inequalities for the Prussian and Austrian Partitions of the pre- World War I Poland. Section 4 compares the estimates for Poland with other countries and other measures of inequality. Section 5 outlines areas for further research, namely wealth concentration and privatisation. Finally, Section 6 concludes. The details of the data and estimation are discussed in the appendix

## 2.2. Data and Methodology

The methodology used to estimate top income shares was pioneered by Simon Kuznets (1953) who first combined income tax statistics with accounts for the income and population totals. Since Piketty's (2001, 2003) research on France, this methodological approach has been consistent across studies (for detailed exposition see Atkinson 2007), resulting in homogenous and long-run series for more than thirty countries.<sup>4</sup> The income tax statistics has usually come in the form of tabulations organized by income ranges, containing the number of taxpayers with their corresponding income. To arrive at income shares of specific top groups, income tax data is combined with external control totals for the population and the income. The main advantage is that the tax data aggregate information from the entire population of high-income earners. Moreover, the tax law enforcement ensures that the reported income statements are less prone to measurement error in the form of under coverage of top income groups.

### Income Tax Statistics in Poland

The first modern income tax in the Polish lands was established by the Prussian (1891) and Austrian Empires (1898) during the Partitions of Poland. Both Prussian and Austrian tax statistics provide tabulations of income taxpayers in a regional breakdown, which has allowed us to construct top income shares for provinces with significant Polish population (Pomerania, Posen, Silesia, West Prussia in Prussia; Galicia in Imperial Austria). There is no tax data for the Russian Partition (the Congress Kingdom), as comprehensive income tax did not exist in the Imperial Russia.

In 1924 the newly independent Poland introduced a unified progressive income tax for its whole territory. Detailed interwar income tax statistics were published separately for unearned income (*fundowany*) and earned income (*niefundowany*), organised by a large number of (gross) income brackets containing the number of income taxpayers in each bracket and their corresponding tax obligation. The total income in brackets is missing, but bracket ranges are quite narrow, and consequently, estimates of total bracket income are robust to the particular distributional assumptions (see Appendix for more details).

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<sup>4</sup> Which is not true for i.e. the Gini coefficient, see e.g., De Maio (2007).

The communist government was established in 1945, but the interwar income tax system was still in use for several years, and the income tax tabulations are available for 1945-7. However, with the waves of nationalisations and the elimination of the private sector in the late 1940s, the personal income tax de-facto disappeared along with tax statistics. Instead, the communist government published detailed wage statistics, which covered almost the entire workforce.<sup>5</sup> Since the private capital income played a marginal role in the Polish socialist economy,<sup>6</sup> top earnings provide a reasonably good approximation of top incomes.

For the post-communist era, data used to construct top income shares come from the annual reports on the settlement of the personal income tax published by the income tax department of the Polish Ministry of Finance starting from 1992. Tabulations are organised by income ranges that correspond to the tax brackets as defined by the progressive tax schedule, with each bracket containing the number of taxpayers, their total income, deductions and the corresponding tax obligation. However, due to the limited progressivity of the tax system, the number of income brackets presented in the tax statistics has been small (it equals seven from 1992 to 1993, three from 1994 until 2008, and only two afterwards). Hence we focus only on percentiles with thresholds close to those of the given income intervals.

### Definition of Income

The use of income tax statistics entails the use of fiscal income. Our preferred income concept is that of 'gross income', which refers to income before all personal deductions and personal income taxes.<sup>7</sup> Taxable income in Prussia and Imperial Austria, as well as in the interwar period was quite broad and allowed very few exemptions. The post-communism tax data include income from employment, pensions, income from non-agricultural business activity and special agricultural activity, income from self-employment, rental income, capital gains and income from other sources. Capital income, notably interest and dividends, are taxed separately at a source and thus not included in the statistics for the progressive schedule.

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<sup>5</sup> Covering both state and cooperative enterprises (Atkinson and Micklewright 1992, p. 257). Moreover, household budget survey from 1957 until 1972 covered only employees in socialized sector (*ibid.*, p. 258).

<sup>6</sup> The bulk of non-wage private income was largely concentrated in the small-scale agriculture, characterised by the low productivity and the small earning potential, and thus plausibly did not contribute to top incomes.

<sup>7</sup> Note that gross definition is after subtraction (from revenues) of costs needed to obtain, secure and maintain income.



We account for the changes in the tax law, which modify the definition of income. There were no major reforms of the tax system during the inter war period. However, the post-communist tax law has been amended several times since 1992. At the beginning of the 2000s, a taxation of capital income (interest and dividends) and capital gains (i.e. from selling company's shares, stocks, derivatives) have been introduced. While the former income is taxed using the presumptive tax and is not reported in the statistics, the latter is taxed using the progressive scale and thus appears in the tabulations. Since 2004 business income from non-agricultural business activity (further referred as business income) can be taxed separately using a newly introduced flat tax (see Appendix for more details).

### Control Total for Population and Income

The definition of the control total for a population is based on the definition of the tax unit in the tax code. Tax unit in Prussia and Imperial Austria was household, with the total income of household members ascribed to the head of the household. The tax unit in interwar Poland was both household and individual depending on the income source obtained. Namely, someone earning employment income was individually taxed, while for other sources, incomes of all family members were combined and attributed to the 'head of family' (see Appendix for a detailed exposition). We take as our population control a 'hybrid' construct defined as the total number of adults minus the number of married women not employed or self-employed. Our definition thus treats working females as separate tax units, but note that most of them were not married,<sup>8</sup> and therefore the total reference roughly corresponds to the total number of married couples plus singles. The number of adults is taken from population censuses (and annual figures from the statistics on the movement of the population), while the number of non-working females is equally found in censuses and linearly interpolated for in-between years.

For the communist period, we take, following the definition in the employer survey, the individual as the population unit. For the post-communism period, the tax unit has been an individual, and we take as the control total for the population the total number of adults and subtract the number of individual farmers (who pay PIT only if they receive income from a taxable source).

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<sup>8</sup> According to the 1931 census, less than 15 per cent of employed females outside agriculture were married (Maly Rocznik 1939, p. 260, Tab. 5))

Next, we estimate the total income obtained by all potential tax units. There are two methods of approaching this reference, either taking the total reported income of filers and adding the estimated income of non-filers, or starting from some personal income aggregate and excluding items that do not enter into used income concept ('bottom-top' versus 'top-bottom' approach; Atkinson 2007). We follow the latter approach, which is more suitable for the interwar period due to the relatively small proportion of population subject to income tax. For this purpose, we had to rely on historical national accounts. For the recent period, we use official sectoral national accounts published by the Central Statistical Office. The details are outlined in Appendix.

### Interpolation

The income tax data are ranged according to income thresholds of the progressive tax schedule. In order to estimate shares for the specific percentiles of interest, such as the top 1 per cent, we interpolate by assuming the Pareto distribution for top incomes. Here we follow the well-established empirical observation that the upper tail of the income distribution is approximately Pareto in form. More specifically, cumulative distribution function  $F(y)$  for income  $y$  is given by  $1 - F(y) = (k/y)^a$ , where  $1 - F(y)$  is the proportion of individuals with income above  $y$ , and with  $k$  and  $a$  constant. One then finds that the ratio between the average income  $y^*(y)$  above the certain threshold  $y$  and the threshold  $y$  is constant. This constant is often referred as the inverted Pareto coefficient  $b = y^*(y)/y$  (equally  $b = a/(a - 1)$ ). It is straightforward to obtain percentile thresholds and average income for the specific top income groups (Piketty 2007, Atkinson 2007a).<sup>9</sup>

## 2.3. Trends and composition

Figure 2 shows the top 1 per cent income shares in Poland since 1892 until today (see Table A 1 and Table A 2). In the Partitioned Poland, the trends in income shares were different for the Prussian and Austrian partitions. In the former, we observe a continuous rise, from slightly below

<sup>9</sup> However, in practice coefficient  $b$  can slightly vary with  $y$  even for the given year. As the number of brackets in published statistics has been relatively small (generally equal to three for the post-communist period), we restrict our analysis to the top 5 per cent and the top 1 per cent income share, for which thresholds are very close to the reported bracket thresholds and generally restrain from extrapolation into the open interval.

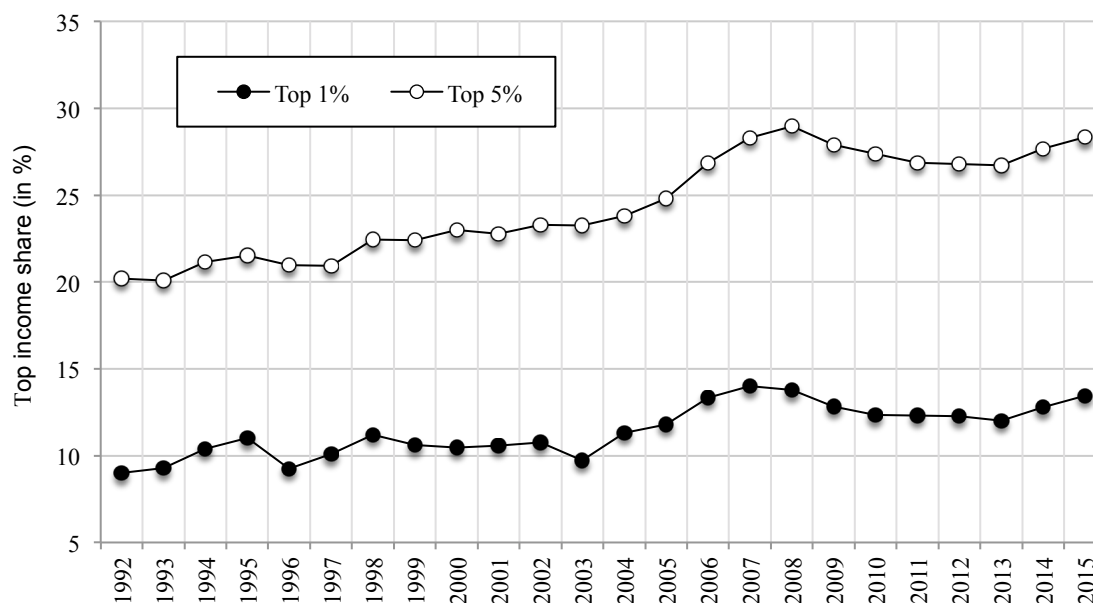
10% to 15% at the outset of WWI. For Galicia, the initial increase of over 2pp was followed by a decade of continuous fall in top income shares, approaching the starting level in 1913. World War I was characterised by an explosion in top shares in the Prussian partition, the strongest one occurring in Posen, which eventually dropped during the later years of war.

The interwar period saw a continuous rise in the top percentile share. In 1924, which is our first documented point, the share of the top percentile was slightly above 8 per cent. Already in 1930, the top 1 per cent share jumped to levels above 12 per cent. However, when the series re-emerged in 1935, the top percentile is found at 15 per cent, which corresponds to its secular peak in the time of peace. It presents a marked contrast to first transition years in the early 1990s, suggesting a levelling during the communist period, at which we look below.

The Second World War had a relatively modest effect on the top income shares. However, the early years of communism significantly impaired income concentration. Although there is no tax data for the communist period, we document a decline in the concentration of labour income during this time.

In the first transition years, the top 1 per cent income share was slightly below 9 per cent. Already by 1995, there was a 2 pp increase in the top percentile share. After a temporary fall in 1996, the top percentile bounced again, and from 1998 it stabilised at slightly above 10% for five years. However, the most dramatic change in the top 1% income share started in 2004 – the year of the EU accession – and lasted until 2008. Throughout this period the proportion of total income attributed to the top percentile increased from 11% to 14%. From 2009 onwards, the estimates dropped slightly and stabilised at around 12%. The most recent period witnessed growth, reaching almost 14% in 2015.

The estimates for the top 5% income share, depicted in Figure 3, evolved similarly as the top percentile, except the changes were more profound. The increase in 1994 is almost of the same magnitude as for the top 1%. However, since then there was a modest but steady increase until 2002. The biggest change took place during the period between 2004 and 2008, where the income share rose by 6pp. It stabilised afterwards at the level of 27% and grew to over 28% in 2015.



*Figure 3: Top 1 percent and top 5 per cent in Poland, 1992-2015*

Source: authors' computation based on income tax statistics

### 2.3.1. Partitioned Poland

The Partitions of Poland (1771-1918) between Austria, Prussia, and Russia took place in three stages during the second half of the 18th century and put an end to a two-hundred-year-old Polish-Lithuanian Commonwealth. As a result of Partitions, Poland was removed from the map of Europe for 123 years and came back into existence only after the World War I.

The three Partitions displayed different levels of economic development as well as specific institutions and different social conditions. The best economic situation was in the Prussian part, where the authorities carried out many reforms. The most important of these was the abolition of serfdom, which allowed peasants to become owners of the land after repaying the nobility. Impressive industrialization and urbanization of western Prussia led to a demand stimulus for agricultural products, inducing specialization along these lines in the eastern part of the country (e.g. changes in agricultural technology (crop rotation), fertilizers application, machinery purchases, etc.). Specialization itself was facilitated by the rising integration within Germany due to advances in the transport technology and the institutional structure (e.g. *Zollverein*). As a result, the agriculture, rather than industry, was the main driver of the economic progress.

Economies of the other partitions were different. In the Russian partition, it was the industry that developed the most. The clusters of textile industry were created in Łódź and Białystok. Warsaw became a modern city with its sewers, streets, gas lighting, and power plant switchboard. Economic progress, however, did not improve the well-being of workers who had to work long hours (14 hours) for low wages in unsafe conditions. The delayed abolition of serfdom reforms, which were introduced only during the second half of the 19th century, contributed to the relative backwardness of the agriculture in the Congress Kingdom. However, the worst economic situation was in the Austrian part. Before the end of the 19th century, Galicia had not been industrialized, and the agriculture was under invested and parcelled. Consequently, people had experienced one of the worst poverty rates in all of the Habsburg Empire, and at the beginning of the 20th century, over two million Galicians emigrated abroad to escape the severe economic conditions.

Another important contrasting point is that inheritance patterns differed in the three partitions, which, in turn, resulted in different wealth distributions, as well as in dissimilar general socio-economic structure (as famously propounded by Tocqueville). The unique inheritance patterns were especially important for the contrasting outcomes in the distribution of land (Mieszczankowski 1960), as the main source of living in pre-industrial societies. The inheritance law in the Prussian partition stipulated strictly impartible inheritance of land holdings, while partible inheritance was practiced in the Austrian and the Russian part (with the difference that there was a limit to the division in the Russian part which did not exist in Galicia) (Rudolph 1995, p. 12).

## Prussian Partition

Prussia assumes a special place in the analysis of historical distributional patterns, primarily due to an early introduction of the comprehensive income tax in the nineteenth century, which was accompanied by regular annual publications of the detailed statistics. Most importantly, this coincided with the industrialization and the structural transformation of the country's economy, the emergence of the modern economic growth and the eventual rise of Germany to the global economic pre-eminence.<sup>10</sup> For the same reason, the Prussian income tax data offer invaluable

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<sup>10</sup> The use of the Prussian data has been used for coining path breaking theories in the development economics concerned with the interaction of inequality and economic growth, or the often-termed literature in the Kuznetsian tradition. One should be thus reminded that the Prussian income data actually served as the basis for the Kuznets' in-

research opportunities to study the long-term evolution of inequality in Poland. This section focuses on the Prussian partition before 1914, in the next section we analyze the First World War period.

Figure 4 shows the evolution of the top 1 per cent in Prussia, Silesia and jointly the two Prussian provinces with significant Polish population (provinces of Posen (Greater Poland) and West Prussia), and which became an integral part of the Second Polish Republic after WWI.<sup>11</sup> First, it can be seen that following a moderate rise in the 1890s, top inequality stabilized in Prussia after 1900. Silesia, as industrially the most advanced among three provinces, displays the same pattern as Prussia in total, and the top 1 percent remained remarkably stable there from the turn of the century. In contrast, the top percentile in the Province of Posen and West Prussia experienced a strong rise of almost 4pp in the 1890-1913 period and narrowed the 'gap' with the rest of Prussia at the dawn of the Great War.<sup>12</sup>

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verse-U evolution of inequality during the economic development, as they present an unambiguous evidence of the rising inequality during the industrialization phase of the country in the second half of the nineteenth century until the First World War, as well as the ensuing fall afterwards (Prokopovich 1926; Kuznets 1955; Müller and Geisenberger 1972; Keaelble 1986; Dumke 1991).

<sup>11</sup> Only district Oppeln from Silesia had entered interwar Poland, while the region was predominantly included in Poland only after WWII. Series for Oppeln is currently under construction.

<sup>12</sup> The evolution of inequality in Prussia was overwhelmingly influenced by the development in richer and more populous regions in western and central Prussia, most notably in the Rhine provinces and above all in Berlin, where resided the greatest number of taxpayers. In general, inequality in towns was greater than in the countryside (Bresicani-Turroni 1915), and observed stabilisation of top income shares in Prussia is equally documented for industrial and urban regions. In agricultural regions, in contrast, inequality was still rising after the turn of the century (Grumbach 1957; Muller and Geisenberger 1972). (a development of inverted Pareto coefficient  $b$  ( $b=a/(a-1)$ ) is consistent with the picture presented by top income shares. We observe substantially higher coefficient in industrial and urban regions (in Berlin 3.8, in Rhineland 3.4), which caused very high coefficient above 3 for the whole Prussia.)

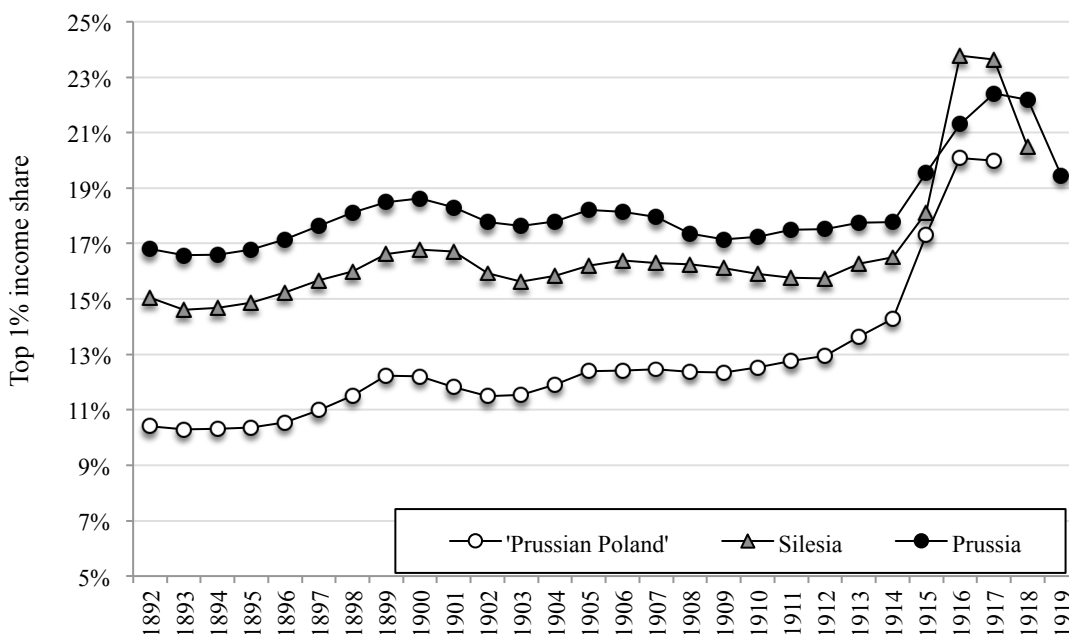


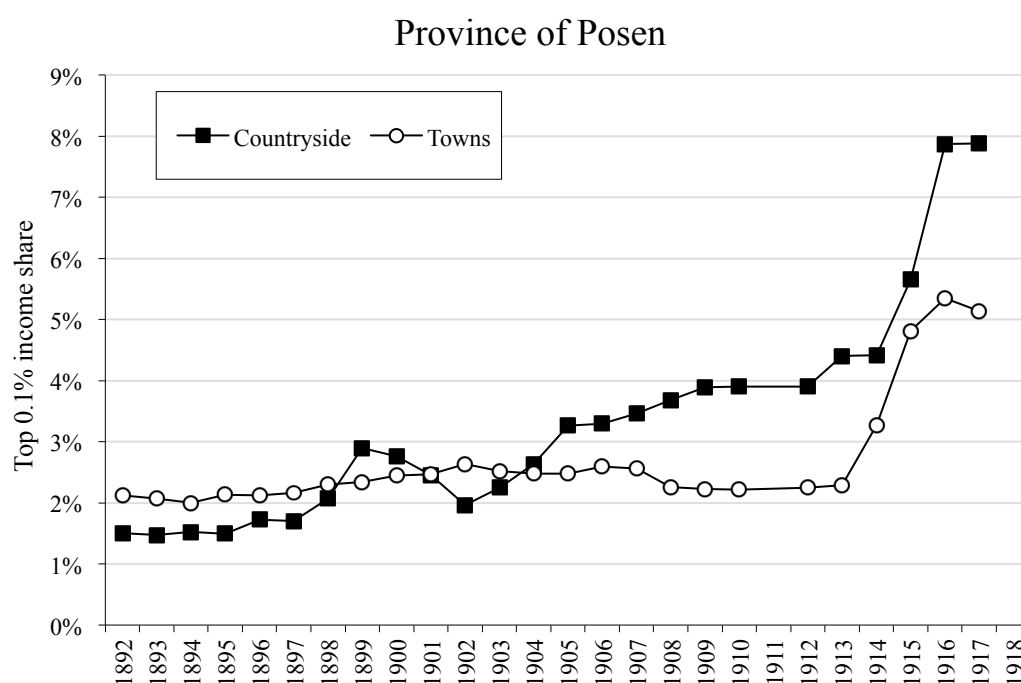
Figure 4: Top 1 per cent in Prussia, Silesia and the Polish part of Prussia (Province of Posen and West Prussia).

Source: authors' computation based on income tax statistics

The rise in top income shares in the Polish parts of Prussia was mostly driven by very high-income shares (see Figure A 1 and Table A3 in Appendix). In the Province of Posen, it can be seen that a sharp rise of the top 0.1 per cent was exclusively due to a rise of very high incomes in the rural areas, while shares of urban incomes remained surprisingly stable throughout the whole period under consideration (Figure 5). Top groups below, such as the top 1-0.1 per cent, were on the other hand predominantly composed of urban incomes, accounting for around 80 per cent of the income. The modest rise of these groups (Figure A 1) was due to the growth of urban incomes, with the stable share of rural income (see the Appendix Table A3).<sup>13</sup> This is in striking contrast to West Prussia where the rise in the top 0.1% income share until 1910 was mainly driven by urban areas (Figure 6).

<sup>13</sup> However, one should point that the distinction between urban and rural areas presented in the income tax statistics (that is, in towns (*Städte*) and in the countryside (*Land*)) - in particular if one wishes to account for different sources of income and wealth - could have been blurred by the formation of rich residential areas nearby towns, which law treated as rural areas even though its occupants could have dominantly obtained income from economic activities located in towns (Kaeble 1986, pp. 40-1). Moreover, many nouveaux riches coming from the lines of urban industrial and financial bourgeoisie were susceptible to the allure of rural life of aristocracy, and increasingly invested in large landed estates.

How to explain this development? Dumke (1991) singles out a rise of the capital share in agriculture as the leading cause of the rising inequality in Prussia. Likewise, we believe that an explanation for the documented rise of top income shares in the Prussian partition should be sought in the growth of the capital-intensive agriculture, which most likely led to the functional shift towards capital income, dominantly captured by the top of the distribution. Wolf (2006) shows that the impressive intensification of agriculture<sup>14</sup> in the two decades preceding WWI led to a spectacular improvement in productivity in the Prussian partition (surpassing that in the rest of Germany). For instance, the yield of potatoes and wheat in quintal per hectare doubled between 1878-1882 and 1909-1913 (Wolf 2006, p.39).

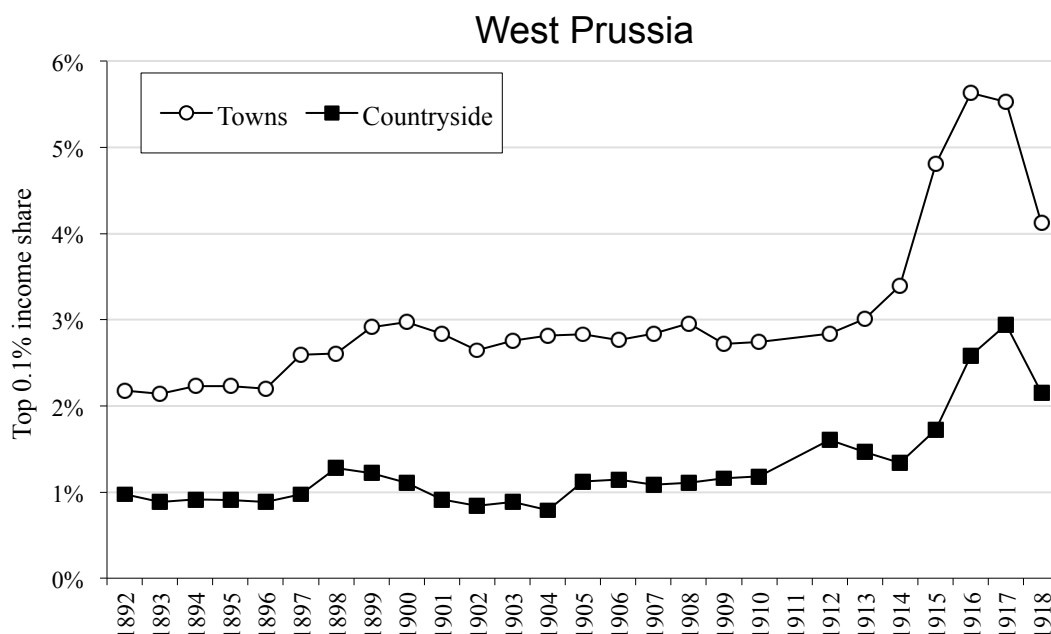


*Figure 5: The Province of Posen – decomposition of the top 0.1 percentile*

Source: authors' computation based on income tax statistics

<sup>14</sup> Through mechanization, an increase in the use of chemical fertilizers and generally in the supply of nutrients with the rise in livestock (Grant 2006).





*Figure 6: West Prussia – decomposition of the top 0.1 percentile*

Source: authors' computation based on income tax statistics

Distributional repercussions of these developments are, in our opinion, nicely captured by the income tax data. In the Province of Posen, only very high incomes obtained in rural areas induced a rise in top income shares (Figure 5), while for 'lower' top groups (those below the top 0.1 per cent) rural incomes were much less significant and remained quite stable. The importance of agriculture can be related to relatively high land inequality observed in the Prussian partition (Mieszczankowski 1960). Larger estates were more prevalent, and smallholdings to a great extent liquidated during the Prussian land reforms in the nineteenth century, which, by most accounts, benefited mainly noble (Junker) estates<sup>15</sup> and gave rise to a proliferation of rural working class (Perkins 1986; Grant 2005; Eddie 2013). Large estates were the driving force behind the structural transformation of agriculture in East Elbia, in what has often come to be generalised as the 'Prussian' road to industrialisation.<sup>16</sup> Eddie (2008) thus

<sup>15</sup> E.g. through enclosure of the public land, rural mortgage banks (*Landschaften*) favoured large estates, while the traditional system of administration in the east (*Gutsherrschaft*) gave nobles a substantial discretion during the land reforms, etc. (Grant 2005, pp. 34-38)

<sup>16</sup> Lenin's (1908) famously defined the 'Prussian' (or Junker) path of the capitalist development, where big landlords acted as the driving force in the transition from feudalism to capitalism (as opposed to the 'American' path driven by peasants). Actually, Lenin's distinction between the 'Prussian' and the 'American' road corresponds better to a divergent experience in eastern and western Prussia, respectively (which is a traditional view in the German agricultural historiography ever since Knapp (Perkins 1986)).

singles out the province of Posen (and Pomerania) as 'the real bastion' of large estates. Nevertheless, this process did not equally affect all 'Polish' provinces. The expansion of commercial agriculture in West Prussia seems to lag behind the province of Posen, which might be a result of different (inferior) land quality and different (lower) concentration of land estates in these two provinces (Eddie 2008). Consistent with this, Figure 7 presents the share of agriculture employment and productivity expressed as a percentage of the national average (Tipton 1976, p.106). The agriculture share in all eastern provinces, except Silesia, was higher than the country average, with the Province of Posen having the largest share and the strongest upward trend.<sup>17</sup> Productivity in the Polish provinces was initially below the national average (except Pomerania), but the modernization moved them ahead by 1907. Chlapowski points that marketed surplus more than doubled in Posen in this period (Eddie 2004, p. 83). The additional evidence of rising land income may be surmised from the sharp increase in land prices in Posen,<sup>18</sup> where a remarkable rise in yields and prices made the increase of land prices of 100 per cent quite normal (ibid.).

The emergence of agrarian capitalism in Prussian Poland, with a strong tendency to substitute labour for capital, was spurred by external and internal factors. Changes in terms of trade induced a shift from traditionally dominant grain production to capital-intensive industrial crops,<sup>19</sup> such as the sugar beet. Mass migrations from the east to industrial regions in western Germany and across Atlantic (*Ostflucht* or 'Flight from the East') led to the growing shortage of labour and subsequent rise in agricultural wages (Wolf 2006). At the same time, the economic nationalism of the Prussian government curbed immigration of the abundant cheap labour from the Russian partition and Galicia amid fears of 'Polonisation' of East Elbia, which reached its height in the Bismarck's *Kulturkampf* and the mass expulsion of Poles in 1885 (Olsson 1996). Despite the campaigns of Prussian landlords for looser immigration policy, the Prussian authorities endeavoured instead in alternatives such as providing eastern agriculture with additional capital (Wolf 2006).

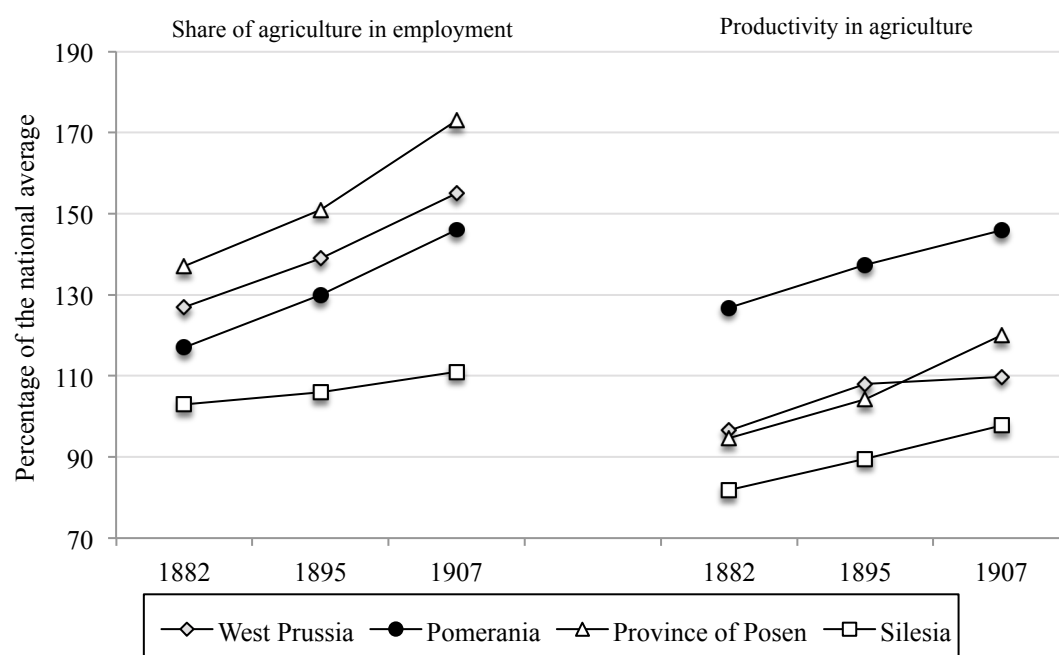
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<sup>17</sup> The actual shares for the Province of Posen were 68.2% in 1882 and 61% in 1907. For Pomerania - 57.1% and 51.5% respectively; Silesia - 51% and 39.2%; 63.1% and 54.6% (Tipton 1976, p.171-176).

<sup>18</sup> Based on the market prices paid by the Settlement Commission, Eddie (2004) finds that the Settlement Commission did not 'overpay' the land it purchased.

<sup>19</sup> This gradual turn from traditionally dominant grain production in the eastern provinces was largely motivated by the availability of the cheap grain import from the 'New World' and Russia, caused by a fall in transport costs, and the introduction of the grain tariffs could not have halted this trend (Wolf 2006). Germany gradually became the net importer of grain and lost in addition its traditional grain export markets as Britain.

Contrary to the conventional image of East Elbia as being characterized by the extensive agriculture and lacking any industrial base, Eddie (2008) points instead to the non-negligible level of rural industries. An expansion of commercial agriculture in the Prussian east stimulated a development of related industries, such as distilleries, grain and sugar mills, sugar factories, breweries, brickworks, industries producing machines for agriculture, etc. Perkins (1986) equally points to a frequent phenomenon of Junkers turning industrialists (see also Grant 2005).<sup>20</sup>



*Figure 7: Shares of agriculture in employment and Productivity in agriculture, as a percentage of the national average*

Source: the data from Tipton 1976, Table 6.2 (p.106); Grant 2002, Tab. 2 (net value added per full-time labour unit)

<sup>20</sup> 'Landed' industrialists were mainly 'enlisted' from the nobility, such as the Henckel von Donnersmarcks in Upper Silesia as the most well-known example (Tomaszewski 1983), but there was also a rising involvement of bourgeoisie as suggested by the case of non-noble Hermann Kennemann, who was the greatest landowner in the province of Posen (also one of the cofounders of *Deutscher Ostmarkenverein* (the German Eastern Marches Society), the radical organization promoting Germanization in East Elbia) (Tims 1941).

## Austrian Partition

Galicia was economically the least developed of the three 'partitioned' Polish regions. However, since the 1860s it was the only partition with a significant autonomy. The area was fully incorporated into Poland in 1918, but only the western part remained in the country after WWII.

A general picture of income distribution in Galicia is best understood by pointing to a contrast between predominant rural population, overwhelmingly living at the bare subsistence level, and less numerous but on average more prosperous urban population. We believe that the situation in Galicia fits well with the basic premises of the classical two-sector model as advanced by Lewis (1954) and Kuznets (1955), or rather its presumption about the initial conditions preceding the structural change.<sup>21</sup> In fact, the absence of the more substantial sectoral shift in Galicia could have precluded a significant rise in inequality as postulated by the traditional dualistic model. It was massive emigration that acted as the main safety valve to rural overpopulation.

As noted, the vast majority of the population in Galicia was employed in agriculture (77% in 1900), which in turn was under-invested and parcelled. Smallholdings remained the main characteristic of the Galician agriculture. In 1902, one-third of agricultural holdings were smaller than 2 hectares and 60% less than 5 hectares (only 1.2% larger than 20 hectares) (Bujak 1908). Coupled with prevailing backward agricultural techniques, such dwarf holdings could not secure even the minimum existential needs. Unlike in the Prussian partition, agrarian capitalism did not develop in Austrian Poland. Regional specialization in agricultural products was further impeded due to more efficient competition from Hungary and Moravia, as well as high tariffs in the Prussian and Russian partitions (Landau and Tomaszewski 1985, p. 16).<sup>22</sup>

On the other hand, the young Galician industry, which started to develop only at the end of the 19th century, was not able to offer alternative employment on a grander scale. Consequently, people had experienced one of the worst poverty rates in the Habsburg Empire, and at the beginning of the 20th century, over two million Galicians emigrated abroad. The population in rural areas was growing, the number of people with agriculture income increased from 114 per square km in 1850 to 162 per square km in 1930 (Zubrzycki 1953, p.253). As far as the general situation of peasants is considered, there had been little change from the time of the famous Rousseau's

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<sup>21</sup> Thus, one finds in Galicia, on the one hand, less productive and less unequal agricultural sector, and, on the other, more productive and more unequal urban/modern sector.

<sup>22</sup> Prussia hindered all attempts of Habsburgs to join the *Zollverein*.

account about three estates in Poland in *Considérations*: “the nobles who are everything, the townsmen who are nothing, and the peasants who are less than nothing”.<sup>23</sup>

Consequently, top incomes in Galicia were dominantly an urban phenomenon. We cannot ascertain income sources of particular top groups, as there is no source breakdown for specific brackets. Figure A 3 captures instead income sources of approximately 2-3 per cent of the population subject to the income tax. It might be surmised that besides few vast estates of grand Polish nobility (such as Potocki or Czartoryski families), most of the *szlachta* in Galicia were relatively poor, which explains the smaller proportion of land incomes in the total income of top groups. In contrast to aristocracy in the Prussian partition or Bohemia, nobles in Galicia rarely engaged in modern industrial enterprises. One could moreover argue that it probably did not take big modern companies to enter top groups such as the top percentile.<sup>24</sup> Figure A 4 shows that the Galician top 1 per cent were one of the least affluent in Cisleithania (in 1910, a half of average income of the top percentile in Bohemia). The predominance of employment income suggests that employees in towns, such as in banks or imperial administration, lived much better than the surrounding rural population. Similarly, top incomes presumably included modest business activities in cities, carried on dominantly by Jews engaged in commerce, handicraft and smaller-scale industry (McCagg 1989). There were only a few industries of some importance, such as the crude oil industry, salt mining or distilling. The former, in particular, was a source of never realized dreams of economic prosperity. Galicia produced in 1909 almost 5 per cent of the world output of crude oil and gave rise to several men of substantial wealth, such as industry pioneers Szczepanowski or McGarvey (Frank 2005). As we shall see below, the rural/urban contrast figured prominently during the interwar period. Among the Polish counties in 1927, those located in Galicia were characterized by the highest correlation between urbanisation ratio and top 1% income shares (see Table 3).

The top 1 per cent income share in Galicia shows somewhat turbulent evolution in the period from 1898 until 1912 (Figure 1). It increased by almost 3pp in the short period from 1898 until 1901, when it peaked at 14.3 per cent. Afterwards, it was falling until 1906, when it experienced a short-term bounce, but again slightly fell during the years preceding WW1. Figure 8 shows the

<sup>23</sup> *Considérations sur le gouvernement de Pologne* (Ch.6). English translation from Frank (2005, p. 30).

<sup>24</sup> For example, Galicia counted proportionally the smallest number of people that exceeded the minimum taxable income threshold in Imperial Austria.

evolution of the constituent groups of the top percentile. It can be seen that development of the top percentile was largely driven by the top 0.1 per cent share, while lower constituent groups displayed more stable pattern, especially after a moderate rise at the turn of the century. It is interesting to note that the 'boom and bust' development of the top percentile's share corresponds to the business cycle in Imperial Austria (a strong economic growth from 1895 until 1901, followed by the severe recession until 1906; see Good 1978). In this respect, one could speculate that the very top groups in Galicia were immersed in the imperial economy and mainly comprised of capital income, which generally exhibits more pro-cyclical features.

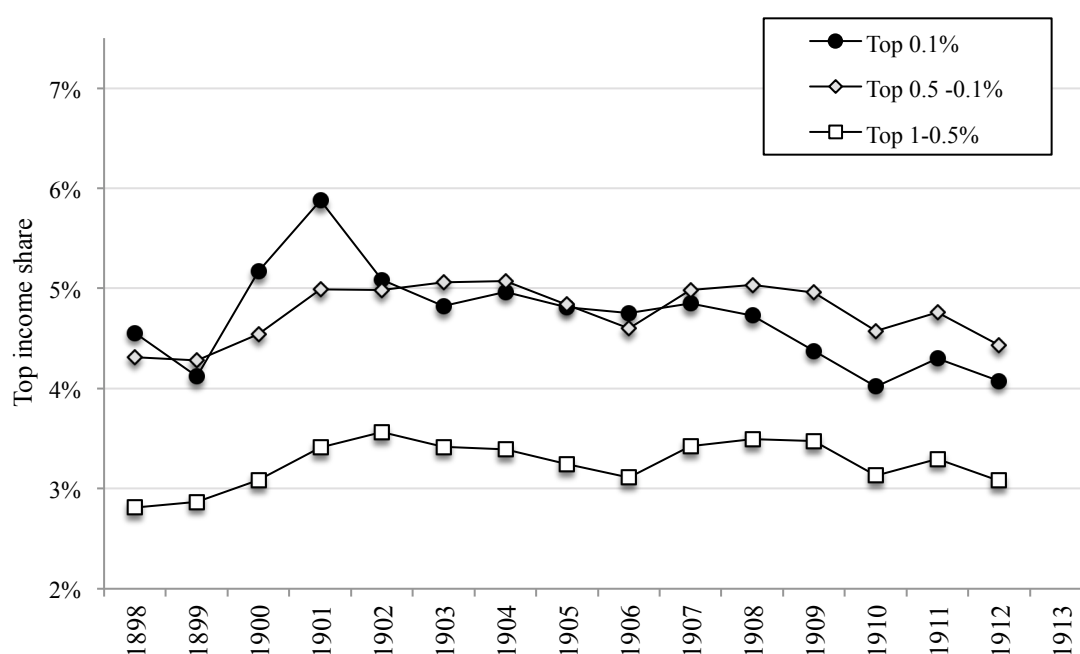


Figure 8: Galicia – decomposition of the top percentile

Source: authors' computation based on income tax statistics

The expansion of compulsory education at the end of the 19<sup>th</sup> century preceded the first signs of improvement in the Galician economy. The beginning of the 20th century saw a rapid growth in elementary and secondary education in Galicia, the share of elementary students in population almost tripled between 1880 and 1910 (GUS, 2003) whereas the secondary enrolment ratio in-

creased by 120% - the highest rise in Imperial Austria (Cohen, 1996).<sup>25</sup> Notably, there was a strong popular and political pressure to open advanced education to children from poorer strata, possibly increasing social mobility.

## Russian Partition

The modern income tax did not exist in the Russian Empire. Consequently, there is no comprehensive information on income distribution for the Russian partition until the unification of the country in 1918.<sup>26</sup> Załęski (1901) in his statistical description of the Congress Kingdom attempts to estimate the distribution of non-employees income using auxiliary data on the distribution of land (for farmers) and firm size (for entrepreneurs). He defines three ad-hoc income groups based on the land and firm size and calculates corresponding shares of non-employees. In 1901, over 41% of non-employees were classified as “poor”, 57% as “middle”, and 1.5% as “rich”. Importantly, Załęski conducts a similar exercise for Germany and claims that 28% of non-employees were “poor”, 69% were “middle” and 2.8% were “rich”. One can conclude, keeping in mind the simplicity of these estimates, that the income inequalities in the Russian partition were significantly lower than in the whole Prussia. Nevertheless, since the top income shares for the Prussian partition were also lower than in Prussia (Figure 4), it is impossible to evaluate relative inequalities in these two partitions.

One can obtain additional insight about inequalities in the Russian partition from the county-level analysis presented in the Interwar section below. In 1927 the Polish counties located in the former Russian partition displayed, on the average, top income shares in-between those from the former Austrian and Prussian partitions (see Figure 12). The across-county dispersion in inequalities, however, was visibly higher than in the other partitions. The eastern parts stood out in term of high top income shares, which could be linked with a traditional presence of land magnates, a social class of big and wealthy landowners of noble origin. The western counties of the former Russian partition (the central regions of the Interwar Poland), in turn, had relatively modest inequalities, but high mean income (see Figure 13). These were the most developed regions

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<sup>25</sup> The reform of the educational system was modeled on the Prussian solutions. In Prussia, the compulsory education laws were introduced much earlier - already in the 1860s the elementary school enrolment ratio in the Prussian Poland was above 90% (GUS, 2003).

<sup>26</sup> Note that the the Russian Ministry of Finance estimated top incomes in 50 European provinces of the Empire for 1905 and 1912, in the preparation for the potential introduction of the income tax (Gregory 1982; Lindert and Nafziger 2012), but it did not cover Polish provinces. The income tax was never introduced in pre-revolution Russia.

of the Russian Empire, with modern industries and cities. The variation within the Congress Kingdom, could be linked with the Kuznets curve, that is, an inverse U-shaped relationship between development and inequalities. We look at these issues in more detail below.

### 2.3.2. World War I

In 1914, the Partition Empires turned against each other and consequently placed the Polish lands at the centre of the four years conflict. World War I had tragic consequences for the Polish population and economy, but it also reshaped the political scene in Europe, leading to the unification of the Polish lands in 1918. It has been argued that social inequalities emerging during the war contributed to a growing popular unrest and consequently to revolutions, which brought down the old CEE Empires (Kocka 1973, Baten and Schulz 2005). The effect of World War I on income inequalities is complex – stretching from changing economic environment, trade blockades to direct impact of the military campaign. In this section, we focus on the Prussian partition and provide suggestive evidence for the importance of economic environment, especially armament and the Allied blockade of Germany. However, we do not claim to comprehensive understanding as the detailed investigation is beyond the scope of this paper.

Figure 4 documents the evolution of the top 1 per cent in Prussia, Silesia and “Prussian Poland” during World War I (1914-1919). Figure 5 presents a breakdown by rural and urban areas for the Province of Posen. World War I was characterised by an explosion in top shares, the strongest one occurring in Posen. Interestingly, 1914 and 1915 saw a substantial rise in urban incomes in Posen, which stabilised afterwards. A similar increase, although more profound and delayed, is observed in rural incomes. Remarkably, the surge of 1914-1917 constitutes a secular peak in top income shares in Poland (Figure 2).

The military campaign could directly affect the top income shares if income correlates with a likelihood of fighting or dying during the war. Around 700 000 Poles fought in the German army, which forced them to stop their economic activities. Assuming these were, on average, low or middle-income people, the top income shares will increase even if the earnings of top earners have not changed. Nevertheless, we argue that this scenario is unlikely. Firstly, top 1-0.5% shares were relatively stable, while the top 0.1% surged, suggesting that extraordinary profits of the latter group were the main driver (Figure A 1). Secondly, there is a surge in shares of very top groups in the whole Prussia and each eastern province. However, they were not



homogeneously exposed to the military campaign. Consequently, it is unlikely that the surge in top income share is solely due to the army conscription or war casualties.

Even though the GDP of Prussia dropped significantly during the war, the fall could be disproportionally distributed across income groups. War does not only favour arm sellers, but producers of goods, which become very scarce during wartime (e.g. food). Entrepreneurs might thus capture huge profits, even though the economy is in decline. Nevertheless, Baten and Schulz (2005) argue that only few German firms profiteered from the war, while majority experienced a decline in their incomes comparable to the reduction of workers' income. This is consistent with the observation that the increase in top income shares had been due to extraordinary profits of the top groups.

Figure 3 shows that the rise in top income shares during the war was stronger in Eastern provinces. The Allied blockade was the root cause of the German food problem, as this was to the largest extent caused by a plunge in food imports (Ritschl 2005). Food shortages led to a surge in prices, bringing, in turn, extraordinary profits to agricultural producers, which were, as we saw, proportionally more concentrated in Prussian Poland.<sup>27</sup> It may be thus indicative that the greatest increase in top income shares in Posen occurred in 1916. In that year, German food imports had collapsed due to a halt of imports from neutral countries, namely from Denmark and Netherlands, which were important supply source during the first two years of the war (Ritschl 2005, Hardach 1977).<sup>28</sup> In the same manner, it is conceivable that the shortage of raw materials, critical for the war economy, brought huge profits to Silesian mining industry and especially its 'coal barons' residing at the top of the income distribution. Note in this respect a surge in top income shares in neutral countries during WW1, such as Netherlands, Denmark or Sweden, who directly benefited from the boom in international food and commodity prices.<sup>29</sup>

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<sup>27</sup> The price fixing by districts at the start of the war was found to be quite ineffective as food wholesalers bypassed districts with price controls and virtually forced them to remove the controls (Hardach 1977, pp. 115-6)

<sup>28</sup> In the same manner, recovery of food imports with the seizure of Romania in 1918 might have alleviated the pressure on food prices (Ritschl 2005).

<sup>29</sup> For example, Swedish iron ore exports to Germany from Gällivare mines. See also Fig. 21.

### 2.3.3. Interwar Poland

The unification of Poland in 1918 is one of the pivotal events in the Polish history. Poland was established on the world map after 123 years under foreign dominions. This century-long dream had to be, however, realised in quite a tumultuous atmosphere. The new country faced a number of immediate burning challenges: the massive destructions and human losses of the Great War paralyzed economic activity and urged huge reconstruction demands, the military fighting continued during the first post-war years<sup>30</sup>, chaotic and radical political scenery, social and ethnic tensions, massive unemployment and big strikes, high inflation, rural poverty, etc. The major task was integrating various regions of notably different economic development with markedly various institutions and legislation (Wolf 2007). All this fuelled political radicalization and made the threat of the communist upheaval imminent. The potential materialisation of revolution pressured the new leadership of Poland into passing the new social legislation (eight-hour working day, trade unions, right to strike, etc.) (Davies 2005). Further, the social equilibrium turned against capital leading to the introduction of various anti-capital policies such as the land reform, sharp increase in tax progressivity, heavier taxation of capital than labour.<sup>31</sup> A unique combination of exogenous and endogenous events signified altogether a new page in the distributional history in comparison to the pre-WW1 social setting (e.g. Keynes 1919; Milanović 2016)<sup>32</sup>

Our starting point in the interwar period is 1925, which coincides with the lowest documented point in top income shares during the existence of interwar Poland. There are several arguments in favour of the lower top shares in the first half of the 1920s. First, Poland was among countries that suffered greatest losses during the First World War, both in the number of human casualties as well as in the extent of physical destruction. The level of industrial production in 1919 was less than 15 per cent of its 1913 level (Landau 1968). Deleterious effects of exogenous shocks to capital income in the interwar period are now well documented as the single most important

<sup>30</sup> Poland was engaged in six wars between 1919 and 1921 (Davies 2005, p. 292): the Ukrainian War, the Posnanian War, the Silesian War, the Lithuanian War, the Czechoslovak War, and the Soviet War.

<sup>31</sup> The top marginal rate of the income tax had equaled in pre-WW1 Austria 5%, in Prussia 4%, (while in Russia the income tax had never been introduced). In contrast, the top marginal rate on rate in interwar Poland was 40% on unearned income and 25% on earned income.

<sup>32</sup> Milanović (2016) has recently 'endogenized' a fall in inequality after WW1 by linking it to the old literature relating theories of imperialism and income distribution (or rather "domestic maldistribution of income"; Hobson 1909). Namely, very high inequality before WWI was the chief cause of the insufficient aggregate demand (oversaving of the top/underconsumption of the bottom), that induced the struggle for external markets/colonies and eventually led to WW1. This way, Milanović directly relates very high pre-war inequality to the war destructions leading to a fall in inequality.

reason behind the secular fall in top incomes initiated after the First World War. Initially proposing it for France, Piketty (2001, 2003) termed this trend 'capital income phenomenon'. Top incomes stumbled in France and other western countries as capital owners suffered from various shocks such as capital destruction, inflation or stock market crashes. To draw an analogy, it is only France that could match the level of wartime capital destruction experienced by Poland. One should add on top of that a tremendous effort of German and Russian troops in dismantling factories during their respective retreats (Davies 2005; Landau 1968).<sup>33</sup> Naturally, the loss of large and protected Russian market signified immense shock for the industry of the Kingdom of Poland (Russian partition), which exported as much as 90 per cent of its products to Russia before WWI (Landau and Tomaszewski 1985, Tab. 1.1, 1.2) and imported coal and raw materials. The Polish-Soviet war of 1919-1920 further disrupted the industrial production and broke the supply chains (Landau and Tomaszewski 1984).

If Poland resembled France in the extensiveness of capital destruction, it was similar to Germany when it comes to the experience of hyperinflation, another great shock of the period that adversely affected top income shares. Its decimating impact on the Prussian top incomes had been documented already by Kuznets (1955), and it is conceivable that the similar fate beset top incomes in parts of Prussia that would eventually become a part of interwar Poland. However, in contrast to the Weimar hyperinflation, there has been surprisingly little research done on the distributional effects of the Polish hyperinflation,<sup>34</sup> and its effects remain ambiguous (in particular between the post-war creeping inflation and the hyperinflation of 1923/4).

The hyperinflation, wartime destruction and political uncertainty naturally led to a lower credibility of the country and higher credit constraints for the Polish entrepreneurs, who could not obtain foreign currency to finance raw material purchases. Currency stabilization after 1924 alleviated this problem. Nevertheless, the severe depression of 1924-25 probably had more adverse effect on top incomes. In this respect, industrial capital tied in export sectors especially suffered, as the beginning of the Polish-German trade war caused an instant slump in exports, and currency sta-

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<sup>33</sup> For example, German army transferred complete factories from Łódź to Germany (Davies 2005, p. 130).

<sup>34</sup> As an exception see Van Thadden 1994. Von Thadden sees Polish inflation as beneficial to the post-war reconstruction via redistribution of wealth towards industrialists (1994 pp.116-17): "The dynamics of inflation involved a redistribution of wealth first from wage earners to industrialists between 1918 and 1921 and then from agriculture to industrialists between 1921 and 1923. Poland thus achieved a high savings quota which translated into economic growth. Inflation restricted consumption and gave a strong incentive to investment."

bilization negatively affected the international competitiveness of Polish products (Landau and Tomaszewski 1985, p. 77).

Further, the cabinet of the prime minister Władysław Grabski launched a whole set of stabilization policies placing the largest burden of their financing on the wealthy (e.g. the introduction of a progressive capital levy, the unification of the income tax, land redistribution, etc.). The 1920s also saw strong compression of earnings (Sztrum de Sztrem 1922; Derengowski 1930) largely as a result of the introduction of the social legislation.

The economic depression increased the concentration of industrial production. Between 1923 and 1926 the coal production decreased by 1.2%, while the number of collieries dropped by 25% (Landau 1981, p.183). The economy eventually stabilised in 1926, and the country experienced three years of steady growth, halted only by the advent of the Great Depression in 1929. The economic recovery brought better prospects for top incomes, which experienced an immediate improvement in 1926.<sup>35</sup> One important external event was the strike of British miners in 1926, leading to the rise in coal prices, which stimulated Polish coal exports. Figure 9 shows that the subsequent three years were characterised by the substantial increase in top income shares which outstripped the overall income rise. While economic growth 1926-1929 saw improvement of conditions for all groups, the rich benefited proportionally more (Landau and Tomaszewski 1985, p. 81)

When the tax data become available in the mid-1930s, top income shares re-emerge at substantially higher levels. All top income groups saw rising shares in this period, suggesting a rising dispersion between the top and the rest of the distribution (e.g. P0-99), rather than between top income groups (see Table A 2). Accordingly, it is plausible that this development indicates a deteriorating position of Polish farmers relative to other social groups. One should be reminded that interwar Poland was still predominantly agricultural, with almost two-thirds of the population made of small farmers and (quite often landless) peasants. Notwithstanding this, the share of rural population in national income was smaller than that of the rest of population (46.7 per cent of national income in 1929; see Landau 1963, p. 28). And it was agriculture that was most adversely affected by the Depression, in the first place due to a strong fall in agricultural prices (ac-

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<sup>35</sup> Consensus of historians has been that the May coup in 1926 (Landau 1977) was not motivated by class struggle, in line with Pilsudski's general disinterest with economic affairs.

tually, there was no fall in agricultural output during the depression) (Landau 1963). The deflationary trend (aggravated by the adherence to the Gold Standard until 1936) was, on the other hand, beneficial to high-salaried employees that were able to keep their job due to rigid salaries, making this group relative winner behind this development (Landau 1933). In the midst of the rising unemployment, this led to an increase in wage inequality. Kalecki and Landau (1935, p. 450) estimated that between 1929 and 1933 incomes of blue-collar works halved, while incomes of white-collar workers fell by 30 per cent.<sup>36</sup> Rentiers similarly benefited from deflation. In the same manner, (industrial) profits at the top were relatively safeguarded due to rapid cartelization, which prevented a fall in prices of industrial goods. The fall in industrial prices was much less steep than in agriculture. For example, prices of agricultural products in 1935 were only 33 per cent of their 1928 level, while those of industrial goods were 57 per cent. However, prices of cartelized products stood at 82 per cent of its 1928 level (Landau and Tomaszewski 1985, Tab. 2.6).

A proportionally much higher fall in prices of agricultural products ('price scissors') during the Great Depression led to a shift in national income towards the non-agricultural population. Landau (1963, p. 37) thus points that a fall in income of rural population between 1929 and 1934 was proportionally higher (62 per cent; from 46.7 per cent in 1929 to 39.6 per cent in 1934) than a fall in national income (52 per cent).<sup>37</sup> Thus, the drop in income of top income groups was smaller relative to a decline in total income caused principally by a plunge in farmers' income.<sup>38</sup> It should be noted that this referred predominantly to small farmers on the verge of existence, without any social protection and completely bypassed by the state aid in agriculture (aimed at large landowners; Landau 1963, p. 35-47).<sup>39</sup>

Figure 9 below shows the evolution of the average income of three top income groups constituting the top percentile together with the total average income during the interwar period. As can be seen, the Great Depression led to differential income fall for different top groups. The top 0.1 per cent saw a proportionally stronger fall at the start of the crisis (1929-1931) than the

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<sup>36</sup> This is obvious if we take those recently unemployed as having zero wages. For those that kept their job, we observe a stability in wage distribution (see Fig 13 below), which is an additional argument for wage rigidity.

<sup>37</sup> These estimates are from Klarner (1937).

<sup>38</sup> There were of course other afflicted groups beside (small) farmers, such as small handicrafts and other small self-employed, unemployed workers etc.

<sup>39</sup> Even the economic recovery in the late 1930s did not lead to the substantial improvement in the farmers' living standard (Landau and Tomaszewski 1985, p. 136)

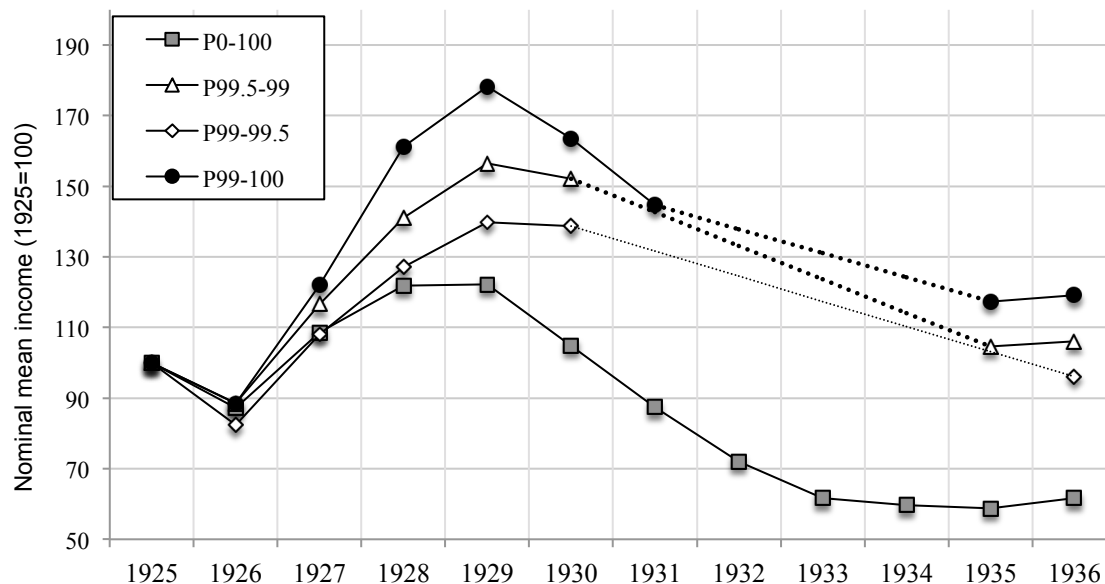
lower groups in the top percentile – following on the higher relative growth of the top 0.1 in the late 1920s. Yet, in 1935 (unfortunately, there is no data for three years after 1931) we find that top groups had managed to retain its relative standing, coming out from the crisis unscratched.<sup>40</sup> On the other hand, the average nominal income (P0-100) almost halved in the decade since 1925. The real mean income of top groups actually increased strongly during the crisis. Plausibly, the rapid cartelization should be identified as the main tool allowing top incomes to steer the crisis successfully. As noted above, prices of cartelized products fell only moderately, while rough estimates indicate that cartels controlled more than a half of the industrial output in the 1930s (Landau 1978). The chief aim of cartels was to safeguard profits – as Kalecki (1938, p. 111) points out, the cartels are more likely to be formed during slumps<sup>41</sup> - so the main beneficiaries should be searched among the capital income recipients. As we look next, these predominantly inhabited the very top – the top 0.1 per cent and above.

We can shed additional light on these issues by looking at income composition of top incomes. Figure 10 presents the split between earnings and other sources of income in 1929 and in 1936 (defined in the tax statistics as ‘unearned’ income, roughly corresponding to the broad definition of capital income including income from land, business profits and self-employment income, interests and dividends, rents, etc.). It can be seen that unearned income accounted for almost two-thirds of the top percentile’s total income in 1929 and that its importance increases with income rank. For the top 0.1 per cent group, for example, unearned income made as much as 80 per cent of the income, while earnings accounted for only 20 per cent of the total income. Although the proportion of earnings increased for top groups by 1936 - thus confirming our hypothesis that top salaries relatively benefited in the depression - top incomes still predominantly derived the bulk of their income from other-than-employment activities.

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<sup>40</sup> There could have been marked V shape of top 0.1% (as in Czechoslovakia), recovery in from mid-1930s.

<sup>41</sup> As has been noted above for the rising industrial concentration during 1923-6 depression,

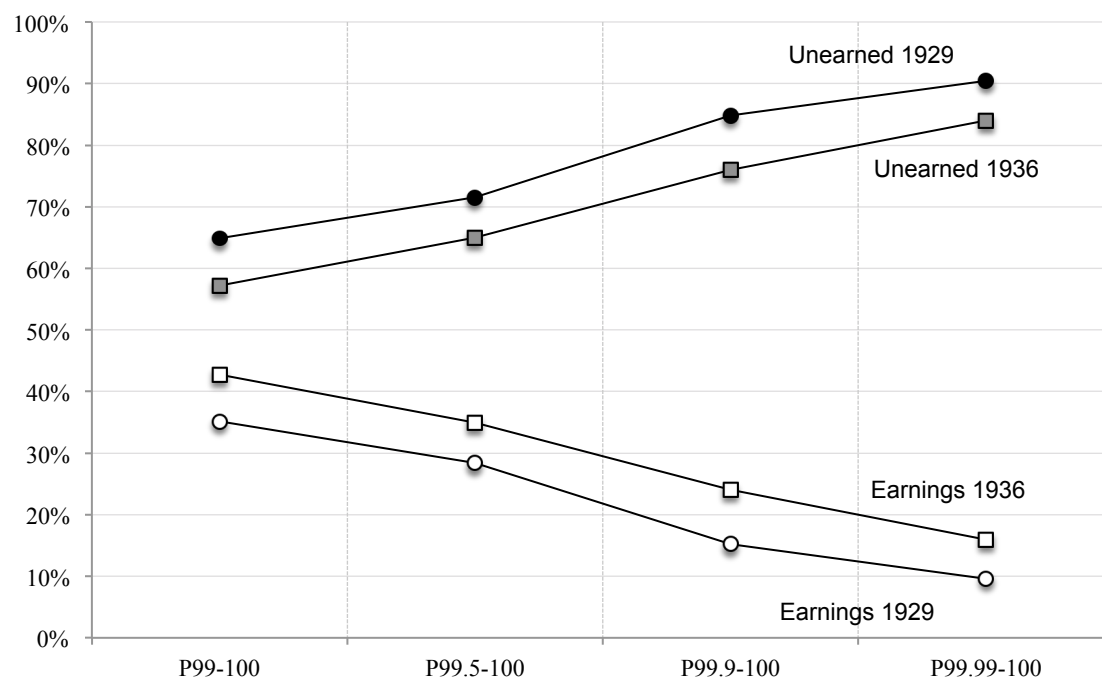


*Figure 9 : Evolution of average income of groups within the top percentile*

Source: authors' computations based on the income tax data

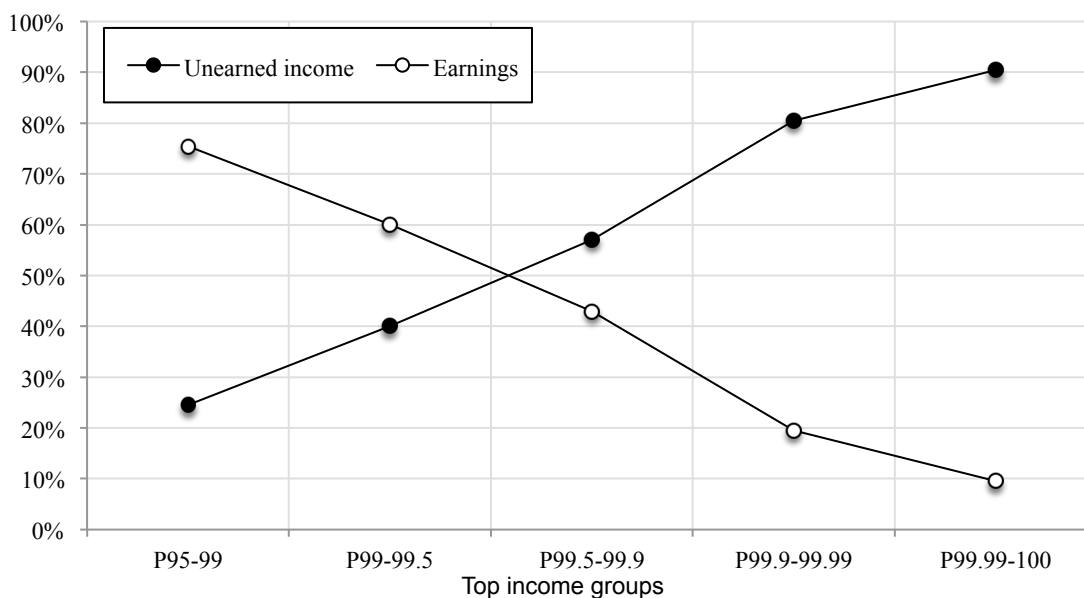
In general, this picture is in line with findings for other countries where capital income strongly dominated at the levels of the top percentile and above. Similarly, Leszczyńska and Lisiecka (2008) show that the very top of the income distribution in Poland was dominantly composed of capitalists and big landlords. While the former was found residing at the top in most of the studied countries in the first half of the twentieth century, one should not be surprised by the more extensive presence of the great landlords. It is well known that land ownership was highly concentrated in Poland (and generally in Central Eastern Europe) before the Second World War, especially in the former Prussian partition where commercial agriculture played a substantial role (Jezierski and Leszczyńska 2003, Eddie 2008). For example, according to 1921 census, the top 0.5 per cent of all landholdings owned almost a half of the total land (Mały Rocznik 1935, p. 32).

In addition, we were able to merge state employees with income tax statistics in 1929, which allows us an insight into the composition of 'lower' top income groups. Figure 11 thus shows that top income groups below the top percentile, such as the top 5-1 per cent, were dominantly composed of earnings.



*Figure 10: The composition of top groups by income source between earned and 'un-earned' income*

Source: author's computation based on income tax statistics



*Figure 11: The composition of the top 5 per cent, Poland in 1929*

Source: authors' computation based on income tax statistics; Note: State employees and pensioners added



### 2.3.4. County Analysis

We construct county-level top income shares using the income tax data for the interwar Poland. The details of the data and methodology can be found in the Appendix. Although we argue above that WWI was one of the key junctures in the long-run evolution of inequalities, we believe it could still be of help to understand top income patterns in the former partitions. In addition, we want to shed new light on plausibly the most interesting relationship in development economics, that between the (modern) economic growth and inequality (Kuznets 1955). In this respect, the unique experience of Poland makes almost an ideal research ground, since the economic development (or lack of it) assumed markedly different pace as well as the basic outline in various parts of the country.

Figure 11 presents the map of Polish counties in 1927; the upper panel displays county-level top 1% income shares (using county control population and total county income). The dashed line marks the former borders between the partitions. The geographic distribution of top income shares has a donut-shape, with high levels at the edges of the interwar Poland and relatively low in the centre. The largest inequalities are in the former Prussian partition (the west) and the eastern parts of the former Russian partition (the east). The picture is less clear for the former Austrian partition (the south and south-eastern parts), where there are no clusters of counties with high top income shares. Figure 12 displays a contribution of each county to the aggregate top 1% income. The map is almost a reverse of the previous one. The most developed counties from Silesia and the core of the former Russian Partition (Warszawa, Łódź) contribute the most to the aggregated top incomes. At the same time, these regions show comparatively lower top income shares, which might be either because they had already moved beyond the peak of the inverse U-curve, or simply Kuznets' theory does not hold. Institutions could matter as well. The social legislation introduced after World War I markedly improved situation of workers (Sztrum de Sztrem, 1922; Derengowski, 1930), which consisted a major part of the total income in these counties.

What was shaping the spatial distribution of inequalities in the interwar period? One robust finding in the literature has been that top income shares were at the very high levels in the first half of the 20<sup>th</sup> century due to the strong concentration of capital income at the top of the distribution (top income were therefore, 'capital income phenomenon'; Atkinson and Piketty 2007, 2010). Presumably, the industrialisation and the advancement of capitalism were

accompanied by the rising concentration of capital income. This could have resulted both from technological progress (Kaeble and Thoma 1991, p. 11)<sup>42</sup> and/or rising concentration of newly accumulated capital (e.g. Allen 2009). However, pre-industrial societies had been often characterised by high wealth inequality, especially of land as the main factor of production. Yet, as noted by Milanović et al. (2010), income inequality in low-income pre-industrial societies was always limited by the subsistence level (the ‘inequality possibility frontier’). It is only with the technological progress and hitherto unimaginable expansion of the production capacities that mean income and inequality entered into the positive relationship (Milanović 2016). Accordingly, we need to pay attention both to the rising importance of capital as the factor of production (functional distribution) and to its distribution.

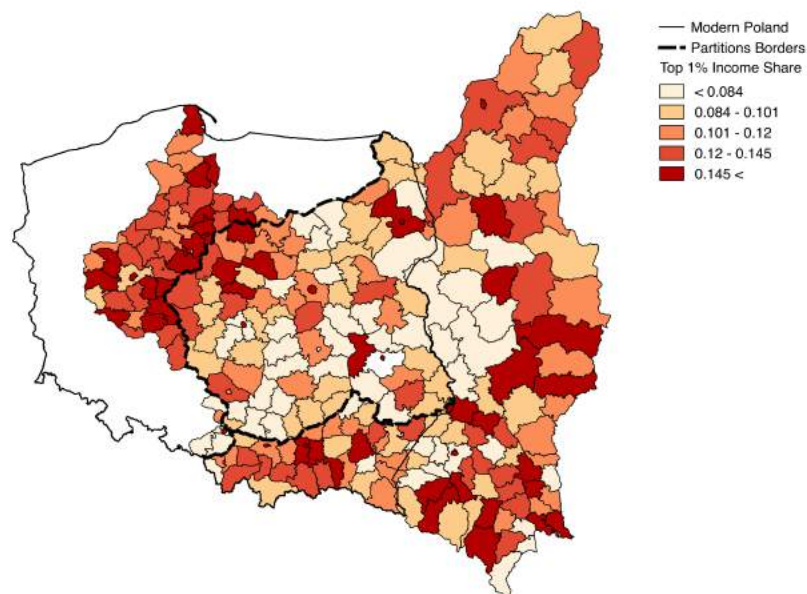
We provide suggestive evidence for the proposed explanations using the cross-section of counties. First, we look at the relationship between industrialisation and the level of top 1% income shares. We estimate two models,

$$(1) y_{ip} = \alpha + \beta IND_{ip} + \delta URB_{ip} + \mu_p + \varepsilon_{ip}$$

$$(2) y_{ip} = \alpha + \beta_{PRU} PRU \times IND_{ip} + \beta_{RUS} RUS \times IND_{ip} + \beta_{AUS} AUS \times IND_{ip} + \delta URB_{ip} + \mu_p + \varepsilon_{ip}$$

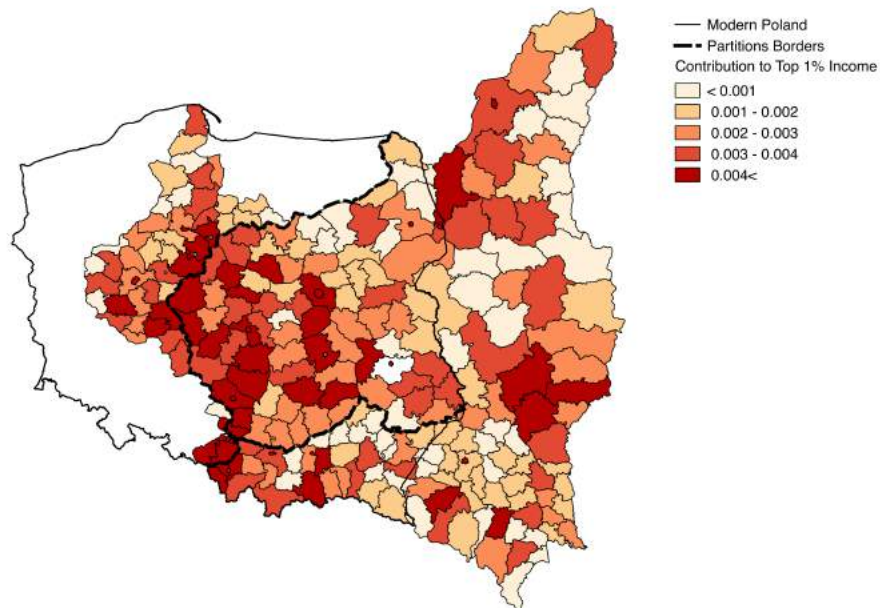
where  $y_{ip}$  is the top 1% income share in county  $i$  from partition  $p$ . We define our measure of industrialisation  $IND$  as the share of industry employees. In the first model,  $\beta$  captures the correlation for the whole country. In the second model, we allow it to vary across the partition by the inclusion of three interaction terms between the measure of industrialisation and the Russian, Austrian and Prussian partitions dummies.  $URB$  is the share of people living in urban areas,  $\mu_p$  are the partition fixed effects, and  $\varepsilon_{ip}$  denotes the error term. The model is estimated using a standard OLS with heteroscedasticity-robust standard errors.

<sup>42</sup> As we propose above for Prussian Poland.



*Figure 12: County-level top 1% income share*

Source: authors' computation (see Appendix)



*Figure 13: County-level contribution to the aggregate top 1% income.*

Source: authors' computation (see Appendix)

Table 2: The Top 1% Income Share and Agrarian Capitalism

## Panel A: Industrialisation

	Top 1% Income Share				
	(1)	(2)	(3)	(4)	(5)
Emp. Ind. Share	0,146 (0,039)***	-0,029 (0,049)	-0,132 (0,046)**		
Emp. Ind. Share				-0,066 (0,075)	<b>-0,225</b> (0,06)***
X Prussian Partition					
Emp. Ind. Share				0,132 (0,046)***	<b>-0,123</b> (0,05)**
X Russian Partition					
Emp. Ind. Share				0,315 (0,121)**	<b>0,01</b> (0,091)
X Austrian Partition					
Urbanisation		0,072 (0,017)***	0,087 (0,016)***		0,082 (0,015)***
Counties	256	256	256	256	256
Partition FE	No	No	Yes	Yes	Yes

## Panel B: Agriculture Workers

	Top 1% Income Share				
	(1)	(2)	(3)	(4)	(5)
Emp. Share in Agr.	0,230 (0,065)***	0,311 (0,056)***	0,329 (0,065)***		
Emp. Share in Agr.				0,229 (0,107)*	<b>0,498</b> (0,079)***
X Prussian Partition					
Emp. Share in Agr.				-0,073 (0,121)	<b>0,165</b> (0,086)*
X Russian Partition					
Emp. Share in Agr.				-0,713 (0,421)	<b>-0,277</b> (0,344)
X Austrian Partition					
Urbanisation		0,066 (0,018)***	0,067 (0,017)***		0,057 (0,015)***
Land Gini		0,042 (0,015)**	0,039 (0,015)**		0,035 (0,015)*
Counties	256	245	245	256	245
Partition FE	No	No	Yes	Yes	Yes

Note: robust standard errors in the parentheses. \*\*\* denotes significance at the 0.1% level, \*\* at the 1% level and \* at the 5% level.

Table 3: The Top 1% Income Share and Urbanisation

	Top 1% Income Share				
	(1)	(2)	(3)	(4)	(5)
Urbanisation	0.065 (0.011***)	0.082 (0.020)***	0.080 (0.018)***		
Urbanisation				0.047 (0.015)**	<b>0.087</b> (0.025)***
X Prussian Partition					
Urbanisation				0.049 (0.015)**	<b>0.041</b> (0.018)*
X Russian Partition					
Urbanisation				0.108 (0.022)***	<b>0.132</b> (0.026)***
X Austrian Partition					
Land Gini		0.047 (0.014)**	0.040 (0.015)***		0.036 (0.015)*
Emp. Ind. Share		-0.070 (0.033)*	-0.067 (0.032*)		-0.043 (0.037)
Emp. Share in Agr.		0.306 (0.054)***	0.296 (0.062)***		0.328 (0.064)***
Counties	256	245	245	256	245
Partition FE	No	No	Yes	Yes	Yes

Note: robust standard errors in the parentheses. \*\*\* denotes significance at the 0.1% level, \*\* at the 1% level and \* at the 5% level.

Table 2, Panel A, Columns 1 to 3 shows the estimates for the model without the interaction terms. 10pp increase in the share of industry workers in the total population is associated with 1.5pp increase in the top 1% income shares. However, this relationship is likely to be driven by the urbanisation rate, as inclusion of this variable drives  $\beta$  almost to zero (Columns 2 and 3). Columns 4 and 5 explore whether the relationship between industrialisation and inequalities differ across the former partitions. We find a *negative* correlation within the former Prussian partition, 10pp increase in the industry share means 2.3pp drop in the top income share. The correlation in the former Russian partition is also significant and negative, but much smaller in the absolute magnitude. In the former Austrian Partition, the correlation is small and not statistically different from zero.

Next, we regress the top 1% income share on the share of agriculture workers in the total population, which is a measure of agrarian capitalism. Table 2: The Top 1% Income Share and Agrarian Capitalism, Panel B, Column 1, shows that there is a positive but insignificant

correlation between the agriculture worker share and inequalities. Column 2 adds the urbanisation ratio and the Gini coefficient for land ownership, the association between the agrarian capitalism and top income shares increases and becomes significant. 10pp increase in the share of agriculture workers is associated with 2.3pp increase in the dependent variable. Columns 4 and 5 explore the heterogeneity across the former partition. The pattern is opposite as in the case of industrialisation, 10pp increase in the share of agriculture workers is associated with almost 5pp increase in the top income share in the former Prussian partition, 1.65pp increase in the former Kingdom of Poland and 2.77pp drop in Galicia (not significant).

Although these results are not causal, they provide suggestive evidence for the heterogeneous relationship between modernization and inequalities across the Polish lands. The role of agriculture in the development of the Prussian partition is underlined by the fact that top income shares are more connected there with agrarian capitalism than with classic industrialisation. Similar, but much smaller, correlations are reported in the Russian partition. We suspect that this might be driven by the eastern-most areas, with the high presence of land-based magnates. On the other hand, in the Austrian partition top income shares are negatively correlated with agrarian capitalism and do not seem to be related to industrialisation.

Finally, we look whether urbanisation is an important predictor of inequalities. Table 3 documents the correlation between county's share of population living in cities and the top 1% income shares. In general, 1pp increase in the urbanisation rates is associated with 0.06-0.08pp increase in the top income shares (Columns 1-3). The effect is heterogeneous across the former partitions (Columns 4-5). In the former Austrian lands, the coefficient is the highest at 0.13pp, while in the former Russian the magnitude is one-third of the Austrian effect. Given the previous discussion on the different roads to industrialisation, it is not surprising to find the strongest association between inequalities and urbanisation in Galicia.

### **2.3.5. World War II and Early Communism**

In order to understand the fall in top shares between 1936 and 1947 (Figure 1), one needs again to ascertain a development at the 'bottom' of the distribution. The post-WW2 years saw thus a relative improvement in the living conditions of the rural population in comparison to the devastating experience of the Great Depression. This came about in the first place through rising prices of agricultural products, the large land redistribution, debt release and the new social

legislation, such as the increased availability of education in the countryside (Landau and Tomaszewski 1985). In fact, the German occupation already brought about changes in the distribution of national income in favour of the rural population, primarily through the “reversal of price scissors” (ibid., p. 175).<sup>43</sup> At the same time, Nazis took measures in earnings equalisation, which basically implied a common immiseration and exploitation of all urban strata. Through the reduction of the skill differential, the Nazis also wanted to ensure higher accumulation funds<sup>44</sup> (a policy later pursued by communists).

The same reasoning - the primacy of accumulation needs in economic policy - implied that Nazis favoured concentration of capital (Sweezy 1939, 1941). As a matter of fact, the tax data for the post-WW2 years do not point to the dramatic deconcentration within the top groups. Tabulations for ‘unearned’ income were published in first years after the Second World War (1945, 1946 and 1947). However, both physical and legal persons are grouped, without providing separate presentations as before the war. But nationalisation of a large part of big (joint-stock) companies in Poland happened immediately after the war, thus relatively earlier than in other newly turned communist countries in Central Eastern Europe, and it is probable that the presence of the remaining legal forms had not distorted substantially the picture corresponding to physical persons only. Actually, Nazis had already expropriated largest corporations (not owned by Germans), which then the state took over after the war. Landau and Tomaszewski (1985, p. 196) thus note that right after the war state owned “all major enterprises in Poland, as in most cases their legal status had not been settled or they were treated as abandoned property... Sometimes their owners returned but could not afford the capital cost of reconstruction”.<sup>45</sup>

Figure 14 compares the shape of the upper tail of the distribution of unearned income before and after the Second World War by looking at the ratio of average income above the given threshold to that threshold. This concentration measure is useful for comparative purposes as it does not depend on changing income levels through time. Note that higher ratio implies higher concentration at the top, while it is constant if the distribution assumes Paretian form (inverted

<sup>43</sup> Of course, this relative improvement should not mislead us in idealizing the position of rural population during the occupation. But, the rise in prices of farm products allowed certain surplus that implied notable amelioration of farmers’ living standard in comparison to the 1930s.

<sup>44</sup> In addition to being an assault on Polish intelligentsia. But both the Nazis and the Soviets more often applied the extermination approach to deal with the Polish elites (e.g. Snyder 2015)

<sup>45</sup> Note that most of joint-stock companies were before WW2 in foreign ownership (Wellisz 1938, p. 144). The rapid nationalization of largest concerns after the war was in a large part motivated by reducing country’s dependance on foreign capital (Landau and Tomaszewski 1985, p. 198).

Pareto coefficient b). We present roughly 200 thousand top taxpayers<sup>46</sup> obtaining unearned income in 1936, 1946 and 1947. In addition, we show the ratio both for physical persons only as well as for all taxpayers (including also legal persons) in 1936. It can be seen that while the ratio is notably higher in 1936 when legal persons are included (due to their strong concentration at the very top), top concentration for physical persons before the war is quite similar to that observed immediately after the war. Once again, if the inclusion of legal forms does not critically affect the shape of the upper part of the distribution, it seems that the war and the occupation (as well as the immediate effects of the introduction of communism) did not dramatically affect top concentration patterns.<sup>47</sup>

The above results might suggest that the Second and the First World Wars differed in their impact on top income shares. The full explanation is beyond the scope of this paper, but we provide some intuition behind these results. After invading the USSR in 1941, the Nazi Germany considered the annexed Polish lands and the General Government as an important source of agricultural and industrial output for their economy. It was in the best interest of the Germans to take over the industrial establishments and keep them efficient and operational. A common strategy, for instance, was to consolidate industry by moving production from small to large entities. In addition, the resistance of the Polish workers and a fast progress of the Red Army during the final stages of the war limited the German attempts to move or destroy the factories (Landau and Tomaszewski 1985).

The post-war period was favourable for the quick recovery of the industry. The territorial changes brought a new resource base, and workers' almost heroic efforts enabled a fast launch of production. Already in 1946/1947, the industrial output was over 90% of its 1938 level. This is in striking contrast to the first years after the First World War, as in 1920 the industrial production was only 35% of the level in 1913 (Taylor 1952, p.181).

But it is indisputable that a fall in concentration of unearned income occurred eventually as communist strengthened the rule in the country, which led to an almost complete expropriation of capital income by the state. The turning point was 1947 when the most radical legislation in the direction of nationalisation was passed. The employment in the nationalised sector accounted for

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<sup>46</sup> It should be noted that comparison is not perfect, as clearly cumulative frequencies do not correspond to same shares of population (in particular, due to the huge human casualties).

<sup>47</sup> Note that this would be in accord with initial speculations of Pareto (1896), as it would suggest unchanging character of inequality, not depending on markedly different political and institutional arrangements.



86.8% of the total (Landau and Tomaszewski 1985, p.199). In the succeeding years, during the so-called Battle for Trade (*Bitwa o handel*), even the majority of small shops and crafts were nationalised. Private income was almost exclusively allowed in the smallholding agriculture. Unsurprisingly, 1947 is the last year for which tax tabulations are available. The next decisive episode was the currency reform in 1950 that virtually confiscated all personal financial wealth.

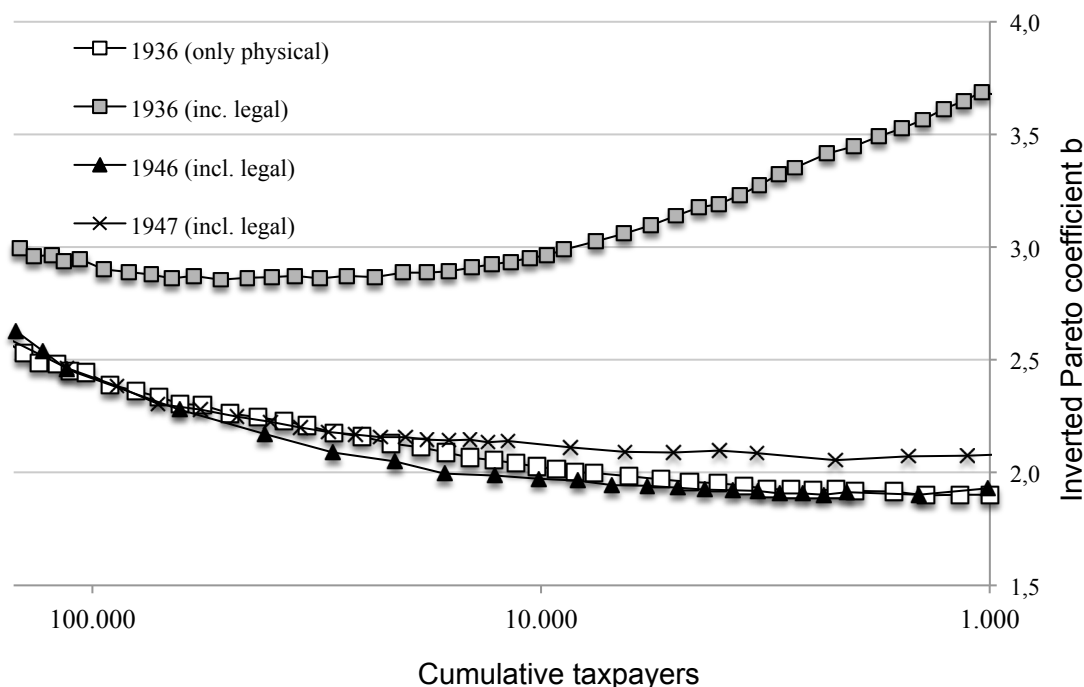


Figure 14: Inverted Pareto coefficient  $b$  for 'unearned' income

Note: dots on lines present the number of cumulated taxpayers above the specific bracket threshold

Communism also brought about a fall in earnings dispersion. Figure 15 thus presents the upper part of the earnings distribution, showing the evolution of 90th and 95th percentile (expressed as a proportion to median) from the late 1920s until today. It can be clearly seen that the top earnings concentration was substantially lower in the communism than in the interwar period. Consequently, shares of top income groups such as the top 5-1 per cent, mostly composed of earnings (Figure 11), fell.

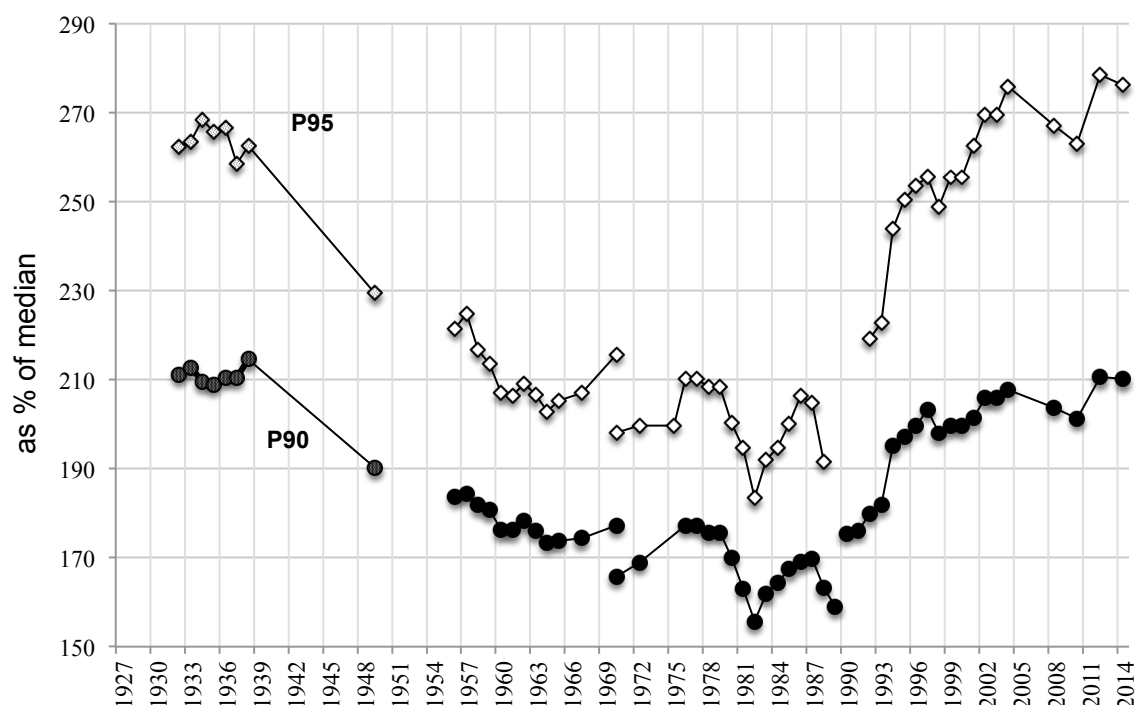
Kalecki (1964) and Beskid (1963, 1964) show that earnings compression was primarily caused by a decline in premium between white-collar and blue-collar workers. As mentioned above, this pattern was already induced by Nazis during the occupation in their attempts to maximise exploi-

tation of the Polish labour force by setting their real wages below the subsistence level (Homze 1967). The end of the German occupation did not reverse the trend in wage compression and moreover led to notable improvement in wages of manual workers in comparison to interwar years. This was an additional factor for the fall in top shares between 1936 and 1947, as Landau and Tomaszewski (1985, p. 211) note that “salaries...were much lower than before 1939, whereas the wages of lowest paid labourers grew considerably.” Figure 14 shows a notable fall in top earnings dispersion between 1939 and 1949. The fast industrialisation and urbanisation significantly improved living conditions of low and middle-income workers. In subsequent decades, the communist government used institutional factors, such as unionisation or centrally determined wages and prices, to control real wages.

Finally, communists affected another fundamental aspect of inequality, that of inequality in status. It is impossible to quantify this aspect, but it is conceivably one that was essential in shaping the social reality of Poland. Plausibly, these stark inequalities could be responsible for the pervasive anti-democratic elements in the political culture of Poland before WWII. This is actually the role that Dahrendorf (1968) attributed to Nazis in Germany, who made a sharp break with the (‘anti-modern’) forces in the German society – and (unintentionally) made possible, after their fall, an easier building of democratic society.<sup>48</sup> Ironically, it required radical totalitarian forces in Central Europe to break the fetters of the past.

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<sup>48</sup> See section on the Prussian partion above for a discussion on the *Sonderweg* and especially about the pervasive influence of the aristocracy (Junkers) in the Prussian East.



*Figure 15: The upper part of earnings distribution in Poland (90th and 95th percentile as proportion of median)*

Source: own construction: 1929-1949; 2008-2014; other years: Atkinson and Micklewright 1992; Rutkowski 2001; Atkinson 2008; (see Appendix); Note: 1955-1989: gross monthly wage for employees in socialized sector (1970-1988 net monthly wage); 1929-1949 gross weekly wage in industry for manual workers

### 2.3.6. Communist Poland

In theory, the distribution of income under a socialist state should be based on the rule “from each according to his ability, to each according to his labour” (Atkinson and Micklewright 1992). The rule does not imply an inequality-free society, even in the model version of socialism. More important from our standpoint is the abolition of the private ownership of the means of production. As capital ownership is very concentrated (Piketty 2014), nationalisation of business capital should inevitably lead to a more egalitarian distribution of income. At the same time, labour income and wage setting process become the main determinants of inequalities in a socialist society.

The wage structure in a socialist economy was an outcome of a macro-level centralised policy and micro-level incentive schemes. In general, a socialist economy is based on a plan which

sets compensation for major occupation groups/strata of workers, specifies targets and limits for production (Flakierski 1986). The central planner uses the wage structure as a macro policy tool, for instance, to provide incentives for people to invest in particular skills, to stimulate the economy by widening earnings differentials or to cool down social dissatisfaction by narrowing them (Atkinson and Micklewright 1992). At the micro level, the establishment wage bill depends on the fulfilment of the assigned plan.<sup>49</sup> Given the central wage structure, workers from highly productive companies should enjoy relatively higher compensation, whereas wages of those, which companies fall short of the plan, will be relatively smaller. In practice, the system proved to be highly inefficient as targets were set low and agents had no incentives to increase productivity. Even though the forces shaping earning differences should be theoretically similar as in a capitalist economy, the real determination of wages was often more dependent on the political power of workers, managers and industry groups (Brus 1974).

Figure 2 depicts the top 1% *labour* income shares during the communist period (see Appendix for more details on the methodology). As noted before, the top labour income approximates the total top income, because in the socialist economy the private income from capital was almost completely eliminated.<sup>50</sup> The inequalities slightly trended downward from 4.9% in 1956 to 3.4 % in 1988, and the average level in this period is roughly half of the total top income shares in 1946 or 1992. The low level of the top labour income share, and its stability owns to a lesser concentration of labour than capital and is consistent with the findings from Hungary (Mavridis and Mosberger 2016) and other capitalist countries (Piketty 2014).

The evolution of wage ratios, depicted in Figure 15, is more volatile than the top labour share, yet the relative levels and trend are similar. To understand better these changes, we now turn to a more detailed description of the events shaping inequalities in the socialist Poland.

The Polish version of the Stalinist economy gave exceptional power to the high-level managers (the “one-man-rule”) and worsened workers’ representation, along with their living standards (Brus 1974). Although the death of Stalin in 1952 opened the communist model for reconstruction, not much had changed. The popular dissatisfaction was growing and culminated

<sup>49</sup> In a socialist system with market-based mechanisms, the company-level compensation might depend on the after tax profits of a company, rather than realization of the plan. For more details see Flakierski (1986).

<sup>50</sup> Most agriculture remained in private hands, yet it was heavily constrained by the small maximum holding size and the maximum number of employees allowed. The published labour income also misses certain privileges of the political elite, e.g. access to high-quality real estate.

in massive and violent protests of workers in Poznan in June 1956.<sup>51</sup> In October the Party leadership was replaced and a set of reforms improving workers condition, and their representations were initiated. The move towards semi-independent unions is marked by the decline in the wage decile ratios (Figure 15). Interestingly, the P95/P50 ratio falls more abruptly than the P90/P50, possibly owing to the decline of the power of the high-level management.

The “thaw” was short-lived. In the early 1960s, the Party turned towards more centralised economy and scraped the independence of workers’ bodies, leading to a period of modest growth in the wage dispersion. The trend accelerated significantly in early 1970 (Figure 15) when the Party announced a new consumption-oriented direction of the economy, financed mostly by foreign loans. At the same time, limited marketization reforms strengthen the connection between worker’s performance and wages. Importantly, the change was due to the growth of within-industry wage dispersion and thus was not a result of a shift in industry composition (Flakierski 1986).

The loan-financed economic growth resulted in a profound economic crisis and substantial fall in real wages. The popular dissatisfaction was further reinforced by the high wage inequalities, leading to massive protests and emergence of the “Solidarność” movement in 1980. The same year is marked with a remarkable fall in the wage ratios, which could be an outcome of the government’s strategic policy to calm down the unrest with lower wage differentials (Flakierski 1986; Atkinson and Micklewright 1992).<sup>52</sup> Yet, the communists did not manage to stop the new democratic movement and, in 1989, they were forced to organise the first (partially) free elections in the socialist block. The landslide victory of “Solidarność” is a symbolic end of the communist rules in Poland.

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<sup>51</sup> The violent Budapest anti-communist uprising of October 1956, started as a support movement for the changes in Poland.

<sup>52</sup> The same authors also point that the drop in wage ratios could be a result of the poor data quality and collection, inevitable during the Martial Law (1981-83).

### 2.3.7. Top incomes after communism

The rise of top income shares after the fall of communism has been driven both by earnings dispersion and growing concentration of business income. Figure 16 and Figure 17 show that earnings have dominated for lower top groups constituting the top decile, such as the top 5-1 per cent, while higher top income groups were mostly composed of business income.

The rise of earnings dispersion at the top can be in addition clearly seen in Figure 15 above, being especially strong for the higher percentiles such as P95. As pointed by Atkinson (2008), there has been a 'fanning out' at the top, with the higher percentiles experiencing relatively larger rise.

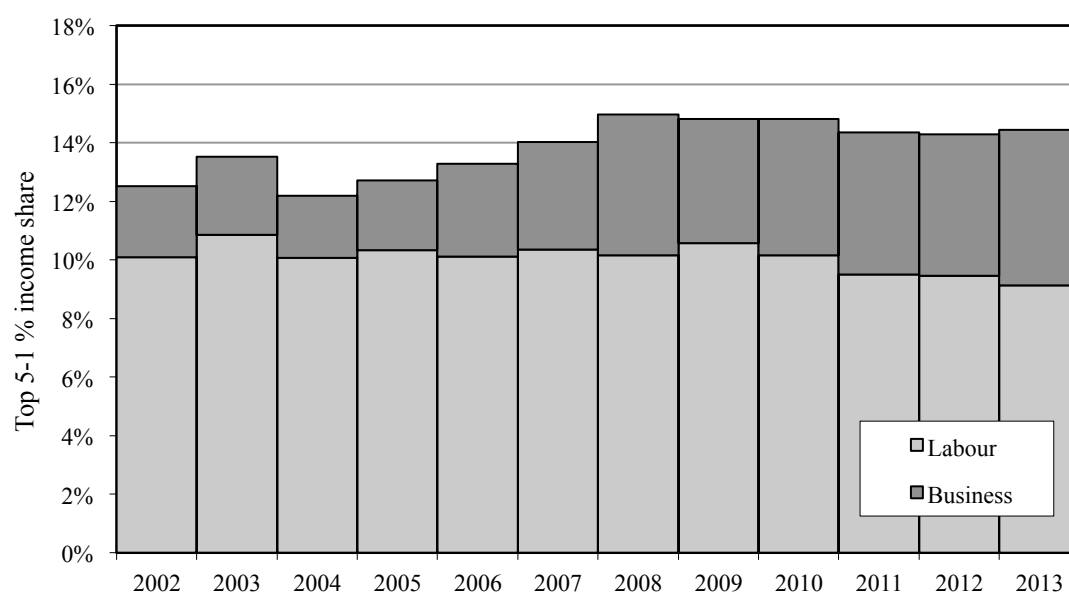
In general, rising earnings dispersion has been commonly identified as the main cause of rising income inequality in Central Eastern European countries.<sup>53</sup> Even though the share of wages in the total income dropped, rising wage concentration has spurred the overall inequality increase (Milanović 1999). Thus, it is not surprising that the evolution of earnings distribution displays the same pattern already documented for the income distribution. As summarised by Rutkowski (2001, p. 11): "In all CE countries the widening of the earnings distribution has taken place at its both ends. The relative position of workers in the bottom of the distribution has deteriorated while the position of those in the top has improved. However, the latter effect was dominant, that is the newly gained affluence of top paid workers was more pronounced than the impoverishment of the low paid workers."<sup>54</sup> The rising educational premium has been singled out as the main cause of rising wage inequality in Poland and other Central European countries (e.g. Rutkowski 2001, Brzeziński et al. 2014). Higher returns on education were driven largely by the decentralisation of wage setting process, both in private and public sector (Keane and Prasad 2006), with earnings becoming more indicative of productivity, as well as by the global trend of rising complementarity

<sup>53</sup> Mitra and Yemtsov (2006) identify six drivers of inequality in transition: wage decompression and growth of the private sector; restructuring and unemployment, reverting to subsistence economy; fiscal adjustment affecting Government expenditure and taxation, corruption; price liberalization, inflation and arrears; assets transfer, growth of private income; technological change, increased mobility and globalization.

<sup>54</sup> Several theories have been offered aiming to explain earnings dispersion in Poland and other transition countries. Thus, Milanović (1999) has proposed that a rise in earnings inequality in transition was induced by a shift of workers from the wage compressed state sector to the more wage-dispersed private sector. In this respect Rutkowski (2001, p. 18) confirms that the higher incidence of both high-paying and low paying jobs in Poland is more characteristic for the private sector. However, Keane and Prasad (2006) indicate that the reallocation mechanism was of secondary importance in Poland since earnings dispersion took place both within the public and the private sector, and thus within-sector inequalities were the dominant force behind the overall delevelling trend.

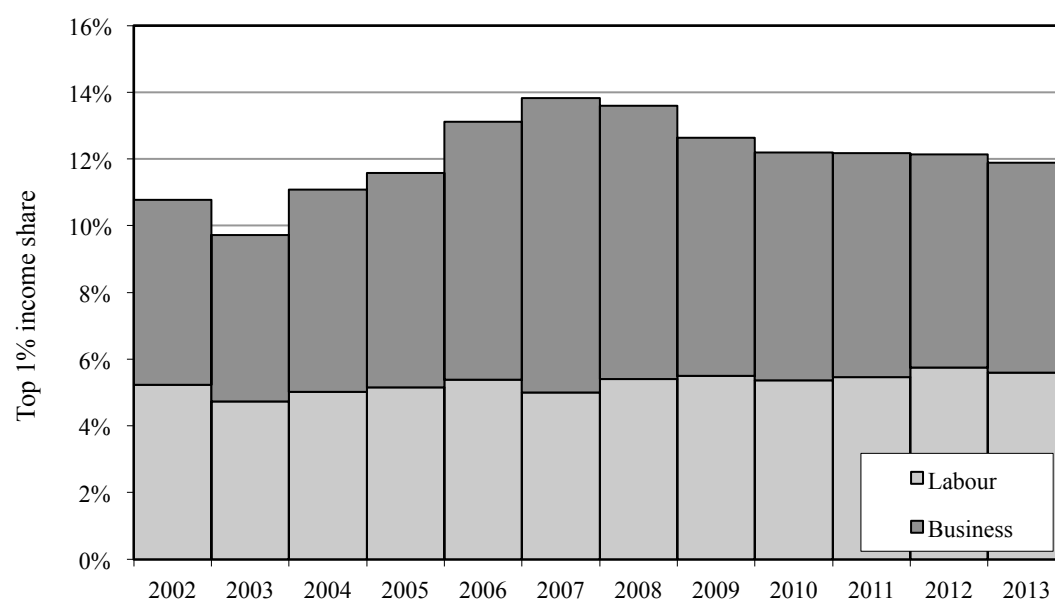
between skills and technology, or the so-called 'skill-biased technological change' (Brzeziński et al. 2014).

Next, rising concentration of business income has been especially important in driving an increase in top income shares. One should point to its strong prevalence at the level of the top percentile in Poland. For example, in the majority of countries studied thus far, employment income has been the dominant income source for the top income groups in the recent period. We can also ascertain that business income at the top has been pro-cyclical, and mostly driving the fluctuation of the top percentile. On the other hand, employment income has been more rigid and generally found to be more resilient to economic shocks. Thus, the largest upsurge in top income shares in the second half of the 2000s was exclusively driven by the rise in business income as evidenced by both Figure 8a and 8b. As a robustness check we look at estimates from income tax microdata for Lower Silesian region provided by Kosny (2012) (see Appendix). It should be noted that comparison is not perfect, as one can question the actual representativeness of Lower Silesia for the whole country, as well as the definition of top groups. But, there is a clear predominance of business income at the top percentile level as observed in whole Poland



**Figure 16: Top 5-1 per cent income decomposition between business and labour income**

Source: authors' computation based on income tax statistics, Note: labour income includes: income from employment, pensions, as well as other non-business income sources



*Figure 17: Top 1 per cent income decomposition between business and labour income*

Source: authors' computation based on income tax statistics; Note: labour income includes: income from employment, pensions, as well as other non-business income sources

### 2.3.8. Accounting for the Recent Rise in Top Shares

But first, one should bear in mind that using the tax data for the income distribution analysis includes various interpretational caveats. Most importantly, changes in the tax code could induce individual behavioural responses producing a strong impact on the reported income to tax authorities. Thus, should we interpret a strong fall in the top percentile share in 2003 as well as its immediate upswing in the following year partly in the light of this word of caution? While some part of the drop could be due to real top income phenomena, such as the early 2000s recession, we cannot exclude the possibility that it might be to a greater extent a response to the announced reform of 2004. Since the reform was introduced in November 2003 and it was widely discussed before (e.g. Antczak 2003), there was an incentive for business owners to postpone income for 2004 instead of 2003.<sup>55</sup> This would be generally in line with recent findings that a

<sup>55</sup> As discussed previously, before 2003 taxpayers reporting business income were taxed using either 32% or 40% tax rates. After the reform, they gained an option of reporting business income using the flat rate of 19%.



prompt response to tax incentives has been mostly a practice of the very high-income individuals, who show much higher overall elasticity of taxable income (Gruber and Saez 2002; Saez 2004).

Similarly, this raises a question whether a robust rise in top incomes in Poland from 2004 onwards was caused by the reform-induced increased reporting of business income to tax administration, for example, due to reduced tax avoidance and/or tax evasion, as proposed by Kopczuk (2012). A decrease in marginal top rates for business income below the top rates applicable to earnings might have induced substantial shifting of high earnings to business income (e.g. Gordon and Slemrod 1998). For example, Jäntti, Riihelä and Sundström (2010) relate a strong (driven by capital income) rise in top income shares in Finland in 1990s directly to the 1993 tax reform, which assumed the same contours as the Polish tax reform.<sup>56</sup> Yet, as they point (p. 403), “a relevant question to ask is whether this increase in top incomes could have occurred had the income tax system remained the same as before [1993].” Our answer is, although we believe that the reform did have material effects, that it is not the whole story, especially that the strongest rise occurred after 2005 and lasted four years.

A strong rise in business income after 2005 might not only indicate a cyclical fluctuation caused by exceptionally positive business environment leading to higher business profits – as first post-accession years undoubtedly were – but also a structural rise in top incomes driven by concentration of business income. This also calls for a more detailed study of the effect of factor shares (Figure 18). In general, the period after EU accession has been associated with capital deepening (see Gradzewicz et al. 2014) and rising capital share (falling labour share) (Growiec 2012). The most popular explanation has attributed a rising capital share to capital-augmenting technological change.<sup>57</sup> The attractiveness of technology argument lies in the fact that it can account in addition for increasing returns to skills, as recorded in rising wage inequality (e.g. Krusell et al. 2000). For example, one potential channel of capital-augmenting technology entering Poland has been strong foreign direct investment (FDI) inflow which accelerated with the EU accession.<sup>58</sup> This is probably related to processes accompanying the new globalization phase and

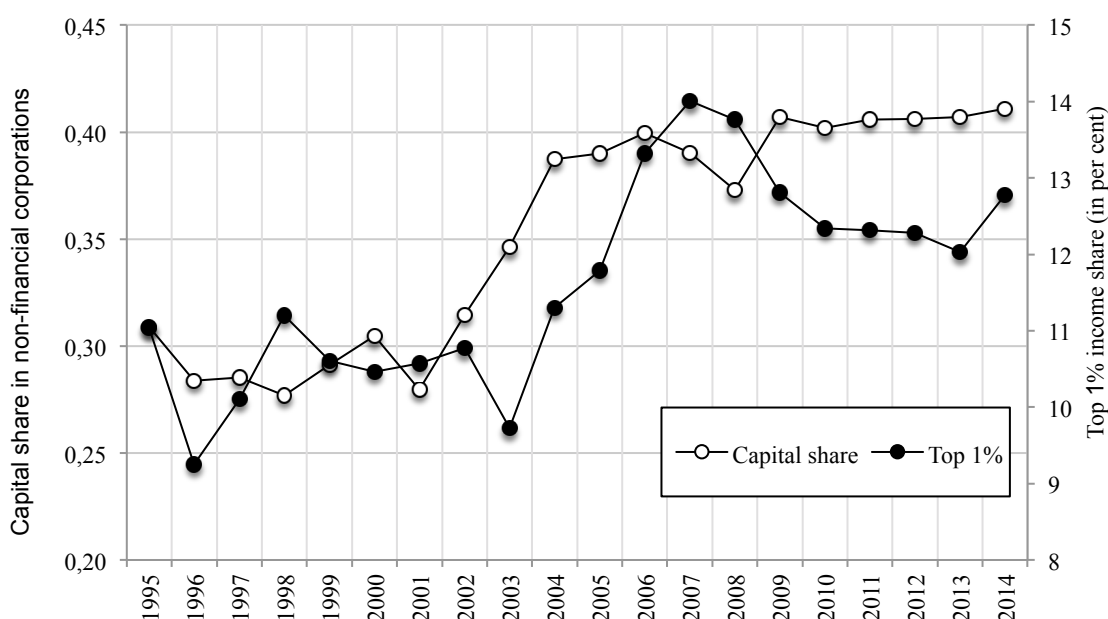
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<sup>56</sup> Jäntti, Riihelä and Sundström (2010) find both the increase in capital income concentration as well as the rise in the aggregate capital share (see more below).

<sup>57</sup> For an overview of theories aiming to explain the recent global rise (decline) in the capital (labour) see Giovannoni, 2014; Growiec 2009 for the most comprehensive account on Poland; or Rincon-Aznar et al. 2015 generally for CEE Europe.

<sup>58</sup> FDI is often seen as the principal tool of technological transfer that has been critical for successful restructuring after communism, and the largest part of FDI entered capital-intensive manufacturing industries (Olszewski, 2009).

Poland's increased participation in global value chains (GVC) (Baldwin 2016). There has been outsourcing of production process, notably from neighbouring Germany as the stronghold of European GVC (Timmer et al. 2012). This is evidenced in the strong rise of manufacturing output, so that Baldwin (2016) includes Poland among the constituent member of the 'Industrializing Six' developing countries.<sup>59</sup>



**Figure 18: The evolution of capital share in gross value added of non-financial corporations and the top 1 per cent income share, Poland 1995-2013**

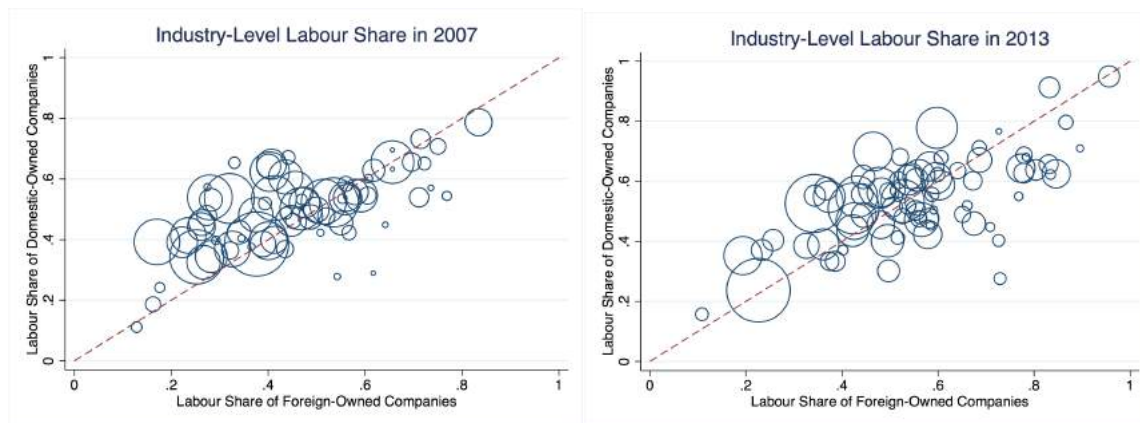
Note: capital income is calculated as 80 per cent of gross operating surplus in non-financial corporations. Capital share is the proportion of thus obtained capital income in factor-cost gross value added of non-financial corporations. We take 80 percent of gross operating surplus since Polish National Accounts place unincorporated enterprises with more than 10 employees in non-financial sector, and we assume that the part of its operating surplus should be attributed to labour income of owners and household members.

Source: Polish National Accounts; Eurostat

Figure 19 displays the industry-level labour share for foreign and domestic owned companies. The circle size denotes the value-added size of an industry. When a circle (industry) is above the 45-degrees line, the labour share of domestic-owned companies is higher than the labour-share of foreign-owned companies from the same industry. All circles located on the diagonal line thus represent industries, in which there is no difference in the labour share between the forms of ownership. The left graph presents the data from 2007; it is clear that the domestic-owned companies were relatively more labour-intensive, which is consistent with FDI favouring capital-

<sup>59</sup> Together with China, South Korea, India, Indonesia and Thailand.

intensive enterprises. Interestingly, this pattern is stronger for relatively capital-intensive industries (located closer to the axes origin). Conversely, relatively labour-intensive industries are located on the diagonal line. In 2013, the foreign-owned companies are no longer more capital-intensive, as most of the observations are located on the 45-degrees line. This is consistent with the FDI spillovers gradually leading domestic sector of the economy to shift towards the capital.



*Figure 19: The Industry-Level Labour Share*

Note: The graph presents the industry level ratio of labour compensation and value added, calculated separately for foreign and domestic owned companies. The circle size represents the value-added size of an industry. Source: The author's computation based on the Eurostat data.

Another likely explanation is a trade-induced shift towards capital-intensive sectors. Traditional labour-intensive industries, such as mining or textile manufacturing, have been exposed to the increasing competition from trade, especially after China joined the WTO in 2001. Similarly, the Russian crisis of 1998 might have disproportionately affected labour intensive sectors as there is a negative correlation between firm-level export orientation and capital share in value added (Growiec 2012). In Poland, business income is strongly concentrated at the top of the distribution, with the top 1 percent income group holding almost two-thirds of the total business income reported to the tax administration, and any notable change in the functional distribution (towards capital) could result in rising top concentration.<sup>60</sup>

<sup>60</sup> For general interpersonal inequality to grow with the rise of aggregate capital share, capital income should in general be more unequally distributed than labour income. Following Atkinson (2009, p. 10) and Atkinson and Bourguignon (2000, p. 9), we can look at this relation by taking coefficient of variation of income,  $V^2$ , as a measure of income inequality:  $V^2 = (1 - \pi)^2 V_w^2 + \pi^2 V_k^2 + 2\rho\pi(1 - \pi)V_k V_w$

It is interesting to note that the most affluent Poles are not top managers in large (commonly multinational and financial) corporations, but ‘homebred’ business owners and entrepreneurs. What are the implications, for example, for the growth-equity tradeoff? Especially, when this energetic first post-transition generation settles down, could it result in the slow-growth rentier-dominated society (Piketty 2014)? There is a clear need to look together at income and wealth distribution. Unfortunately, we cannot assess the importance of capital income (dividends and interest) for top incomes, but it is plausible that business income at the top also reflects in large part the return to capital. Entrepreneurial income clearly combines both the capital and the labour component.<sup>61</sup> Namely, the exact definition of business income in the tax code is far from straightforward. For example, the tax statistics mingles here both the owners of large unincorporated businesses and self-employed individuals mostly relying on their human capital.<sup>62</sup> However, as typical for tax legislation, this distinction depends on definitions and is somewhat blurred by the prevailing corporate form. Unincorporated enterprises are quite frequent business types in Poland, often including those with substantial capital (Johnson 1994, p. 265).<sup>63</sup> Kopczuk (2012, p. 6) points in addition that benefits of incorporated organisations such as limited liability can still be in practice combined with personal income taxation under business income (e.g. in the case of *spółka komandytowa*). This option thus equally allows for ‘silent partners’ (earning ‘passive’ capital income) to be subject to PIT with business income. On the other hand, corporations distributing profits in the form of dividends are less frequent, predominantly in foreign-owned enterprises. For example, the Polish national accounts point that dividends make less than 10 per cent of distributed profits of corporations received by households, while the rest refers to distributed profits from unincorporated enterprises (Figure

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where  $\pi$  is capital share,  $V_k$  and  $V_w$  present the dispersion of capital and labour income respectively, and  $\rho$  stands for correlation between capital and labour income. For example, as further pointed by Atkinson (2009, p. 10), in a case of pure (‘Ricardian’) class system (where  $\rho$  is equal to -1), personal distribution of income will become more unequal as a result of rising capital share if  $\pi > 1/(1 + \frac{V_k}{V_w})$ . And the conventional belief that  $V_k$  is greater than  $V_w$  probably still corresponds well with reality, even with rapidly rising returns to human capital. Glyn (2009) thus argues: “despite the spread of “popular capitalism”, wealth and especially high-yielding wealth is still extremely unevenly distributed”.

<sup>61</sup> Meaning that in addition to the pure return on used capital, a part of profits is generated by entrepreneurial talent and skills of business owners which should be characterised as labour income. Business owners moreover have certain discretion in deciding whether to designate income as retained and withdrawn profits or in the form of wage compensation (notably to themselves and their family).

<sup>62</sup> In this respect, one faces a similar conceptual problem as when attributing entrepreneurial and self-employed income in determining the factor shares in national income (see in particular Krueger 1999, Elsby et al. 2013). Kosny (2012) wonders whether the importance of business income at the top in Poland is actually exaggerated by actually reporting some earnings income in the form of business income to tax authorities.

<sup>63</sup> As pointed by Johnson (1994, p. 266), unincorporated form was more preferable at the outset of transition since taxation was heavier for incorporated firms.

20). This could be attributed to the influence of German corporate law. Dell (2007), for example, points that in Germany top capital incomes generally take the form of business income of unincorporated enterprises<sup>64</sup> (see also Bach et al. 2009). In Italy, similarly, many large businesses are of unincorporated form.

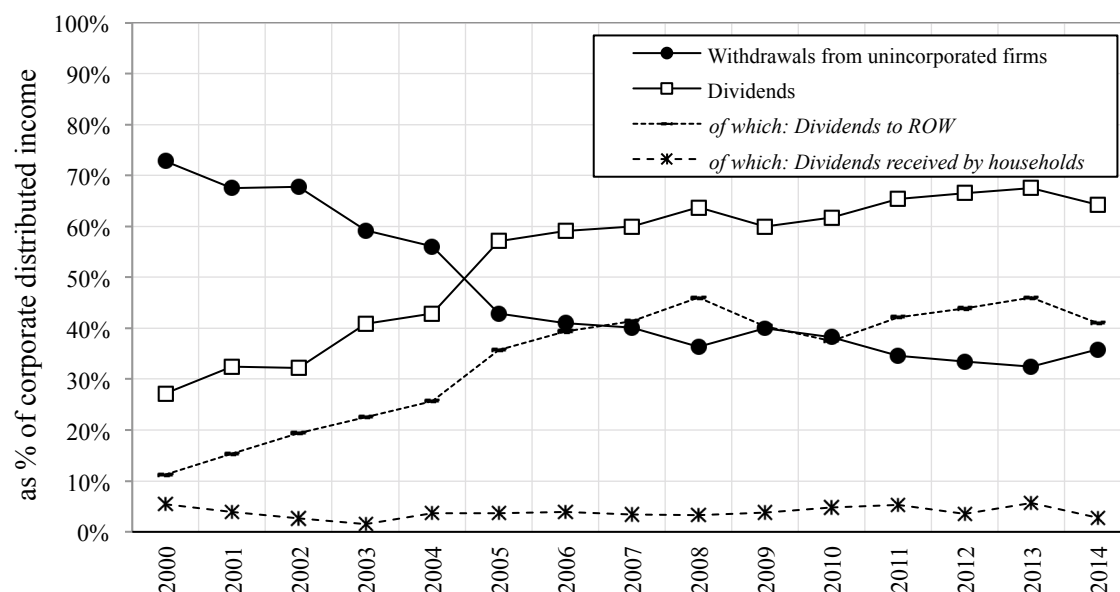


Figure 20: Distributed income from corporations

Source: Central Statistical Office of Poland, National Accounts

Note: 'withdrawals' from unincorporated firms is received in total by households

Figure 20 also indicates that from the total capital income generated in the country, the capital income received by foreigners is almost as important as the capital income received by the Polish households. Moreover, the Financial Balance Sheets of the Bank of Poland show that the rest of the world sector has become the largest ownership sector of the Polish corporations.<sup>65</sup> This discloses to a large extent the general convergence strategy pursued in CE Europe, relying,

<sup>64</sup> Dell (2007) points that "the German tax law registers as 'business income' (Einkünfte aus dem Gewerbebetrieb) incomes that would, for example in France, be recorded as capital income. This phenomenon still exists today and is related to the fact that public corporations (Aktiengesellschaften) which pay dividends which are in turn taxed under the category 'capital income' was until recently quite rare in Germany. Other legal forms for societies (Kommanditengesellschaft or Offene Handelsgesellschaft) seem to have been much more widespread and even encouraged by corporate and business tax law."

Polish equivalents are: spółka jawna for Offene Handelsgesellschaft, spółka komandytowa for Kommanditengesellschaft, and spółka komandytowo-akcyjna for Kommanditengesellschaft auf Aktien.

<sup>65</sup> Measured by equity holdings (AF.5) of households (S14), general government (S13) and the rest-of-the-world (S2).

as we saw, on foreign technology and know-how transfers. Yet, this has clear effect on inequality by removing a large part of the (high-yielding) property income from interpersonal (resident) income distribution. As capital income has been usually concentrated at the top, foreign-owned countries - such as Poland - display, other things equal, lower inequality than countries with positive foreign capital balance – such as Germany. Importantly, a considerable part of foreign ownership might be actually owned by Poles from tax havens (Zucman 2015).

### 2.3.9. Business Income Concentration

The concentration of business income at the top could suggest higher inequality of ownership over productive assets in Poland and calls for studying wealth distribution. Moreover, as suggested by Glyn (2009), this is a part of wealth obtaining higher returns, and potential inequality in its distribution can have a critical impact. The wealth survey conducted by the National Bank of Poland in 2014 (*Zasobność Gospodarstw Domowych w Polsce*)<sup>66</sup> offers a limited insight into the level and structure of wealth possessed by the richest. Unsurprisingly, there is a positive correlation between wealth and income (0.42). The top 10% richest individuals in the sample has 37% of the total wealth from the sample and earns 23% of total income (NBP 2015). Business wealth accounts for more than a quarter of their wealth, which is the highest among the decile groups and above average for EU countries. This is consistent with our results showing that over 40% of the top 5% income in 2013 originates from business.

In a stylised framework, a high concentration of business assets in the hands of entrepreneurs could be seen as a precondition for entrepreneurial activity. For example, Hubbard (2001) has proposed, building on the important contribution of Fazzari, Hubbard and Petersen (1988), that with costly external financing self-selection into entrepreneurship crucially depends on the disproportionate ownership of wealth.<sup>67</sup> In the context of a transition country with still underdeveloped capital markets and asymmetric information in the credit market, a reliance on initial wealth and internal funds could indeed present a decisive ingredient for starting a business and securing its perpetuation, especially when it comes to undertaking investment activity. As Kalecki fa-

<sup>66</sup> The survey is a part of European Central Bank's Household Finance and Consumption Network. The sample in 2014 consists of 3500 observations out of 7000 initial sample (52% response rate). By design there is an overrepresentation of the richest. The main measure of wealth is Private Net Worth (a sum of real estate, cars, items, business wealth, financial assets, minus loans).

<sup>67</sup> Also on models such as that of Evans and Jovanovic 1989.

mously noted: “the most important prerequisite for becoming an entrepreneur is the ownership of capital”.

The link between financial market imperfections and the (initial) wealth distribution and growth has been widely studied (for example, the possibility of poverty traps; e.g. Galor and Zeira 1993, Banerjee and Newman 1993). In the development context, which could also be applied for transition countries, the existence of credit constraints could lead to Kuznets’ inverse-U interplay between wealth inequality and growth. In initial stages wealth concentration drives growth through capital accumulation, and in later stages wealth inequality falls, either spontaneously (e.g. Aghion and Bolton 1997) or through redistribution. In Poland specifically, several studies have indicated that borrowing constraints have been especially pervasive (Błaszczyk and Woodward (1999),<sup>68</sup> Neneman and Piwowarski (2004, p. 25); or Stiglitz (1999) in general for former socialist countries in CE Europe).

And, as also pointed by Hubbard (2003), the higher saving rate of entrepreneurs coupled with higher available returns on business activity could have led to further concentration of wealth. It has been found that saving rate in transition has been strongly correlated with income level. Denziger, Wolf and Ying (2000) found that saving rate rose strongly with income in Poland, Hungary and Bulgaria.<sup>69</sup> As they point, it seems that the effect of precautionary savings motive (which declines with income) was greatly reduced since “the transition has pushed a significant fraction of households close to subsistence, reducing their savings capacity”.

In general, one should be reminded that economic theory on wealth accumulation is of little help in explaining how self-made fortunes are created. Here is quite useful to quote Davies and Shorrocks (2000, p. 628) who point: “casual empiricism suggests that [self-fortunes] are linked inextricably with entrepreneurial activity, and that, although ability and ambition play a part, the size of the fortune depends largely on “being in the right place at the right time” – in other words, luck. In effect, social and technological developments create opportunities for fortunes to be made, which specific individuals exploit with varying degrees of success.” Privatization is probably the

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<sup>68</sup> For example, Błaszczyk and Woodward (1999, p. 42) point: “The analysis of ... enterprises points to striving at self-reliance given the high interest rate on credits.”

<sup>69</sup> See similar conclusion by Guriev and Rachinsky (2008, p. 138-9) who point to the findings of Foley and Pyle (2005) for Russia.

most straightforward example of these social developments.<sup>70</sup> A certain dose of good luck and knowing the 'right people' obviously played a role in more favourable access to public wealth. And here, Poland and other transition countries are no exceptions.<sup>71</sup> For example, the creation of new enterprises in Poland had been closely linked to the liquidation of state-owned enterprises (SOEs).<sup>72</sup>

The evolution of the top 5 per cent in Poland points in addition to the relevance of top incomes for the analysis of distributional effects of growth. For example, it can be clearly seen from Figure 21 that years of Polish 'miracle growth' in 2004-2008 were at the same time years that indicated the largest rise in top income concentration. Top 5 per cent group captured as much as half of the total real income rise during this period, while the bottom 95 per cent captured the other half of the rise. Therefore, by looking at top incomes, we can understand the quite divergent experience of the strong Polish growth among the population.

<sup>70</sup> As Davies and Shorrocks (2000, p. 628) further note: "Recently in the UK, for instance, a number of large fortunes can be traced to the privatization of publicly owned enterprises during the 1980s and 1990s."

<sup>71</sup> To put it briefly, it is possible that those owners of private enterprises who initially benefited from the privatization, have been responsible for the observed concentration of business income in Poland. As suggested by findings of several studies (e.g. Mitra and Yemtsov 2006; Milanovic 1999), it is exactly this early phase of transition that brought about strongest concentration of business income, being at the same time the principal reason behind the overall rise in inequality in the early 1990s. Besides, the inequality of business income might have been especially exacerbated by the fact that the rest of small enterprises have actually been characterised by low or negligible income generating power, and have served at best as the buffer against unemployment (Surdej 2000, Scase 2000).

<sup>72</sup> Importantly, one of the characteristic features of the Polish privatization program was that liquidation of SOEs, followed by the private acquisition of capital assets of liquidated companies, was quite widespread form of disposing public capital (rather than by prolonged mass privatization) (Kolodko and Nuti 1997, T.5). This practice, made possible by Article 19 of 1981 Law of State Enterprises, was quite widespread and certainly contributed to the establishment of many SMEs in the general condition of private capital scarcity. Moreover, it has been often suggested that this was the principal method how public productive assets were acquired for quite low prices, and that many SOEs were deliberately liquidated exactly for this purpose (Krajewski and Piasecki 1999). Additional privatization channel contributing to the rise of SMEs, facilitated by similar favourable access to capital stock of former SOEs, was the so-called 'leasing' (Article 37 of the 1990 Privatization Law), according to which private enterprises could lease a part or the whole SOEs intended as restructuring/liquidating measure, with the future prospect of buying the leased property (Uvalic 2003; Kolodko and Nuti 1997). Moreover, since private firms with employee ownership had precedence in leasing of SOEs, one should take seriously the possibility that this benefited primarily managers of employee-owned companies as most likely the dominant insider group in the ownership structure of these companies (Belka et al. 1995; Kozarzewski 1999). This could, at least in theory, be a way for the so-called 'enfranchisement of nomenklatura' (Kowalik 2011; Eyal, Szelenyi and Townsley 2000). Kondratowicz and Okolski (1993) thus pointed that 'nomenklatura' primarily targeted the most profitable operations of former SOEs.



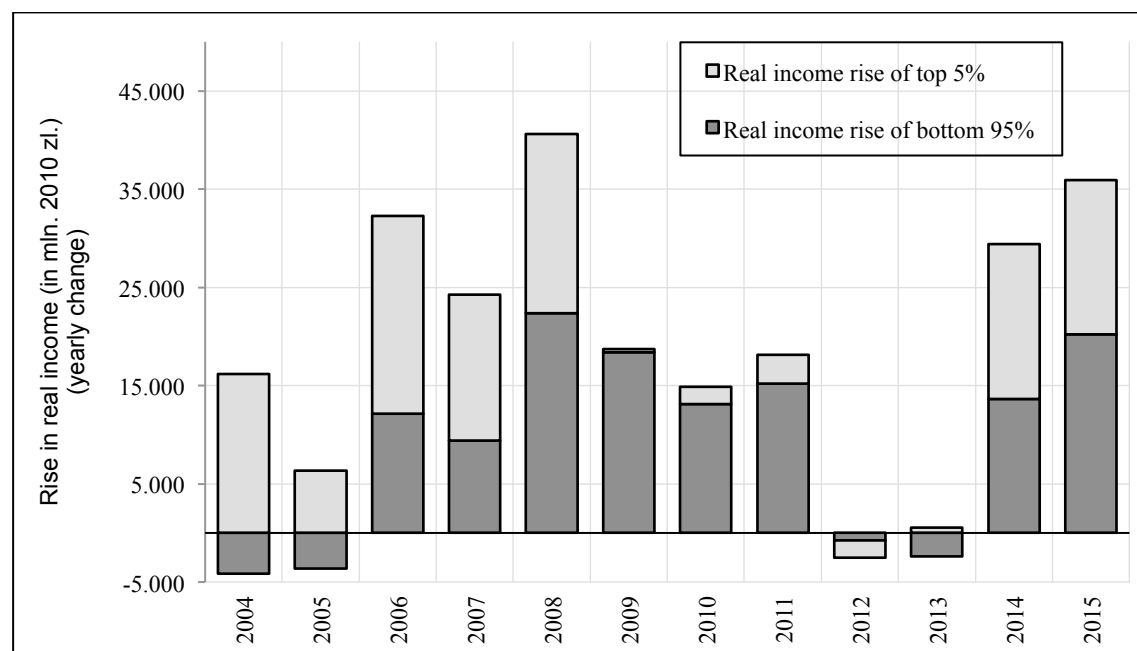
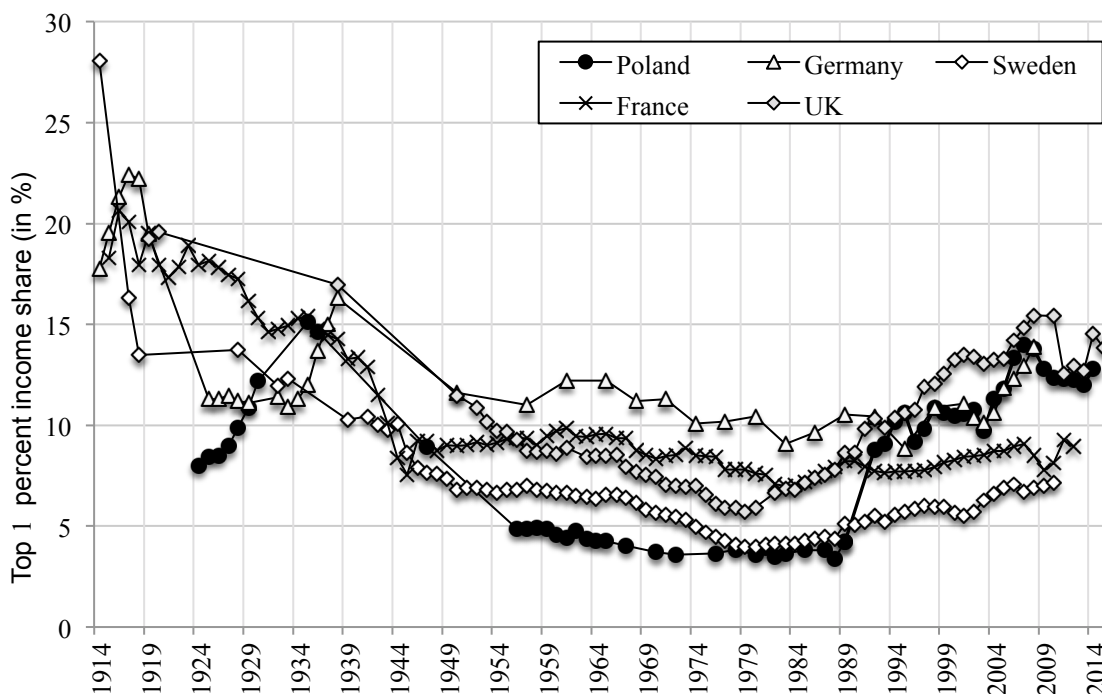


Figure 21: Rise in real income by income groups

Source: authors' computation based on income tax statistics and the Polish national accounts

## 2.4. International comparison

Figure 22 compares top 1 per cent share in Poland together with that in Germany, the UK, France and Sweden. During the interwar period, top percentile share in Poland experienced a strong rise, and in comparison to other presented countries, only Germany saw an increase of a similar magnitude in the 1930s. Top shares in France and Sweden experienced a steady decline between the two wars. It is now well documented that the evolution of the very top shares in developed countries during the interwar period reveals the fate of top capital incomes. Thus, top capital incomes in Germany recovered from Weimar shocks during the Nazi state economy amid growing war preparations, while, for example, in Sweden, they were adversely affected due to the Depression shocks such as the well-known Kreuger crash. However, in still dominantly agricultural Poland, although industry suffered even more in comparison to other countries, the rise of top shares during the Great Depression should be explained by the deterioration of Polish farmers relative to top incomes composed dominantly of non-agricultural groups (or to put it alternatively, income of top groups fell less than for the rest of the population dominantly made of farmers).



*Figure 22: Top 1 per cent in Poland, Germany, France and Sweden, 1914-2014*

Source: Poland: authors' computation based on income tax statistics, other countries: WID

While the introduction of communism reduced and kept top incomes in Poland below the levels observed in western European countries, the top percentile strongly increased in Poland from 1992 to 2015, to reach the levels characteristic for more unequal European countries, notably the UK and Germany. The first two years of the transition were characterised by relatively constant share of the top 1% income shares of around 9% - for example, a level slightly above that of France, but significantly larger than Sweden. Already in 1995, there is a 2 pp increase, after which the top share stabilises for several years. However, the most dramatic change in the top 1% income share started in 2004 – the year of the EU accession – and lasted until 2008. Throughout this period the proportion of total income attributed to the top percentile increased from 11% to almost 14% and placed Poland significantly above estimates for the group of continental and southern European countries (e.g. Atkinson, Piketty and Saez 2011), such as France or Spain. From 2009 onwards, similarly as in the other countries, the estimates dropped slightly and stabilised at around 13%.

Furthermore, we can see that countries displaying a higher level of top income shares, such as the UK or Germany, have also exhibited greater fluctuation in the evolution of top shares. On the other hand, countries characterised by a relatively lower top income shares, such as France, have shown a considerable stability of top shares throughout the whole period since the beginning of the 1990s. Moreover, it is interesting to point to the similar evolution of the top percentile income share observed in Poland to that found in Germany and the UK (see Figure 22). In all three countries, the evolution of top incomes has exhibited a strong pro-cyclical character.

Causes of divergent experience of the two mentioned groups of countries are complex and beyond the scope of this paper (e.g. see Atkinson, Piketty and Saez 2011). As we have examined it in more detail above, it seems that Polish top incomes follow more closely macroeconomic conditions due to the relatively high concentration of business income, which generally displays more pro-cyclical character. In addition, it is well known that economies in Central Europe are especially sensitive to economic developments in Germany, which is their largest trading partner and direct investor. Thus, Germany is by far the most important Poland's trading partner, for example, being a destination for almost a third of total Polish exports (in this respect, the UK comes second in importance, receiving slightly less than 10 percent of total Polish exports). But in general, it is difficult to say whether this could serve as an indicator that Polish top incomes are more export dependent or that they are in higher degree included in international supply chains.<sup>73</sup> As we noted, an increasing participation of Poland in German-led GVC might have also contributed to the synchronization of top shares in two countries.

Figure 23 presents estimates of the top 5% income shares. Poland had a lower share of the top 5% income than France or Spain during the period of 1992 – 1997. This changed in the decade after 2004, when the top 5% income share in Poland was 22% higher than in Spain and 55% greater than in Sweden.

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<sup>73</sup> For example, Saez and Veall (2007) believe that the recent rise in Canadian top incomes is closely connected to the corresponding rise of top incomes in the US.

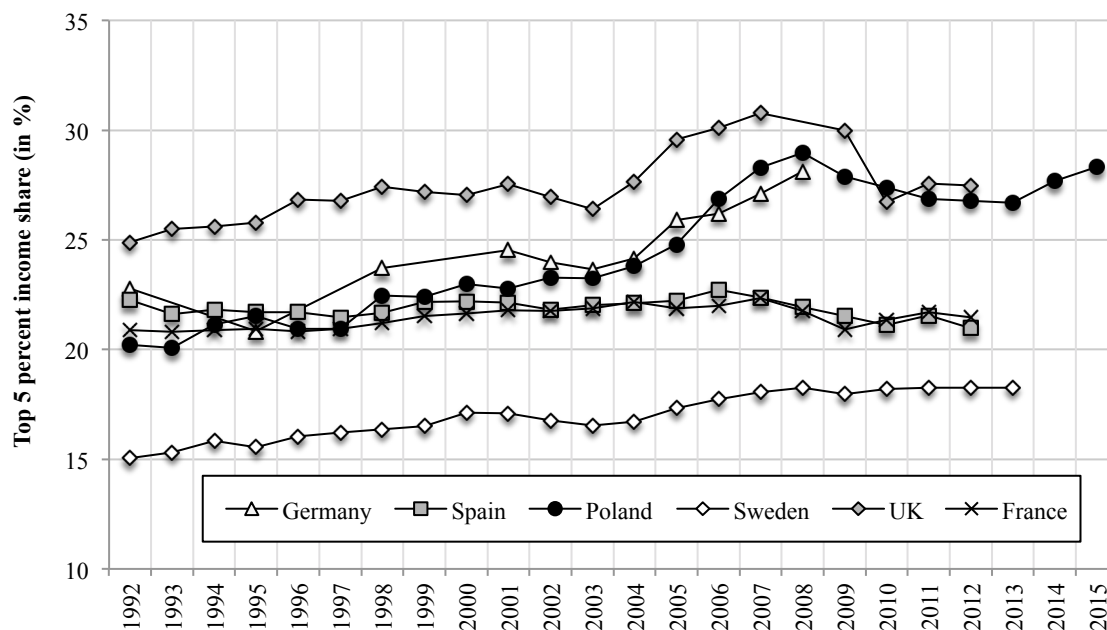


Figure 23: Top 5 percent income share in Poland and selected European countries

Source: Poland: authors' computation based on income tax statistics, other countries: WID

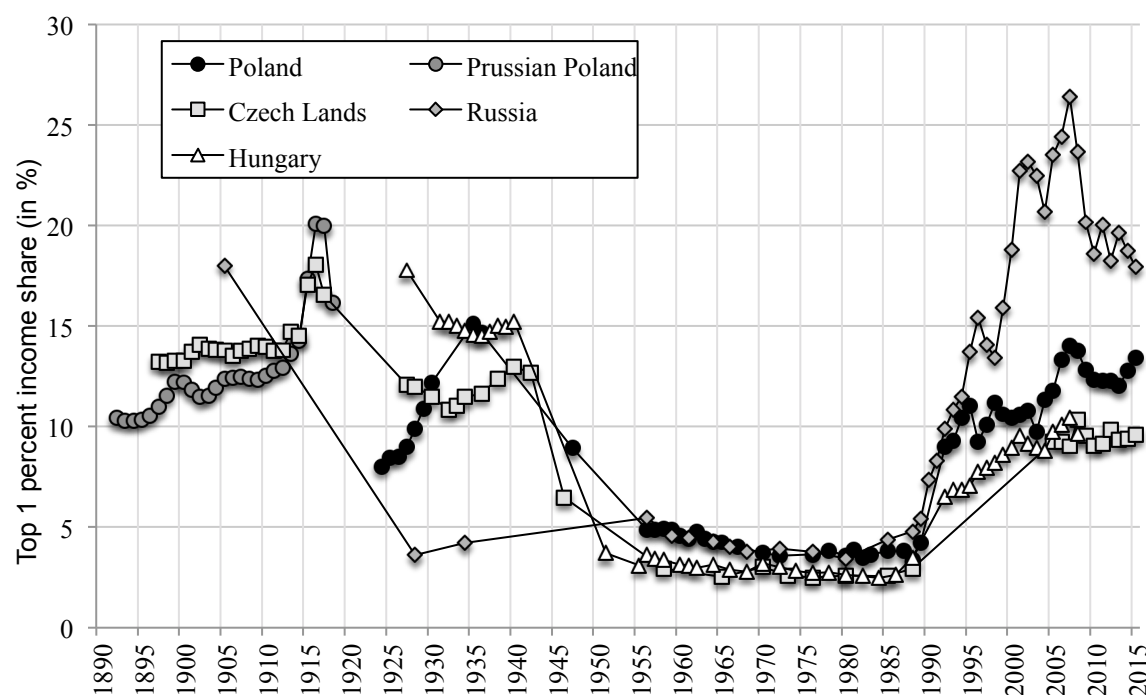


Figure 24: Top 1 per cent income share in former communist countries (fiscal income)

Source: Poland: authors' computation based on income tax statistics, other countries: WID

Further, it is of particular interest to compare the experience of Poland to that of other ex-communist countries in Easter Europe. Figure 24 shows the evolution of the top 1% from the end of the 19<sup>th</sup> century until today in Poland, Hungary, the Czech Republic and Russia. It can be seen that the introduction of communism sharply reduced top income shares in all countries. However, the return to the market economy saw quite divergent development of inequality in Russia in comparison to countries in Central Eastern Europe. Top percentile share in Russia surged to levels around 20 per cent, while in the latter countries it stabilised at levels between 9-14 per cent – with Poland at the upper end of the spectrum and the Czech Republic and Hungary at the lower end.

## 2.5. Comparison to other studies of Income Inequalities in Poland

This chapter reviews estimates of income inequalities in Poland since the beginning of the transition until the present day. First, we focus on the survey-based estimates of the Gini index, which remains one of the most popular measures of income inequalities. Next, we compare our estimates of the top income shares, with those reported in other studies. We argue that the tax-based top income shares shed new light on the existing findings, which are usually based on data from the Household Budget Survey (HBS), UNICEF TransMONEE, CBOS and EU-SILC.<sup>74</sup>

After the breakdown of the communist rule, all former socialist countries in Central and Eastern Europe experienced a rise in income inequality. Before the transition, as reported by Atkinson and Micklewright (1992), the HBS estimates of income dispersion were consistently placing Poland in the middle of the Central – Eastern European countries and the last years of the communist period witnessed a decline in the level of inequalities. Nevertheless, during the early 90s' economic transition we observe a significant rise in income dispersion. Milanović (1999) uses the HBS data on gross income to estimate a 5% increase in the Gini index during the early transformation period 1988-1992. Using adjusted HBS data on earnings<sup>75</sup> Keane and Prasad (2006) show an 18% increase in the Gini index and a 15% increase in the 90<sup>th</sup>/10<sup>th</sup> -income

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<sup>74</sup>The HBS, CBOS and EU-SILC data are based on a sample of households and individuals, who are asked about their income. UNICEF TransMONEE is conducted on a sample of employers, who provide information about earnings of their employees.

<sup>75</sup>In 1993 HBS had a major change in its methodology. It became representative for Poland and the frequency of household rotation was modified. Hence, a raw comparison of HBS household income for the expanded time window might be misleading (Brzeziński et al. 2014).

decile ratio between 1988 and 1996. On the other hand, using UNICEF TransMONEE employer data on monthly gross wages, Rutkowski (2001) documents a 43% increase in the Gini index for the period 1989-1996. Overall, the presented studies suggest a rapid growth in inequalities before 1996, which slows down after 1996 and peaks around 2004 - the year of EU accession.

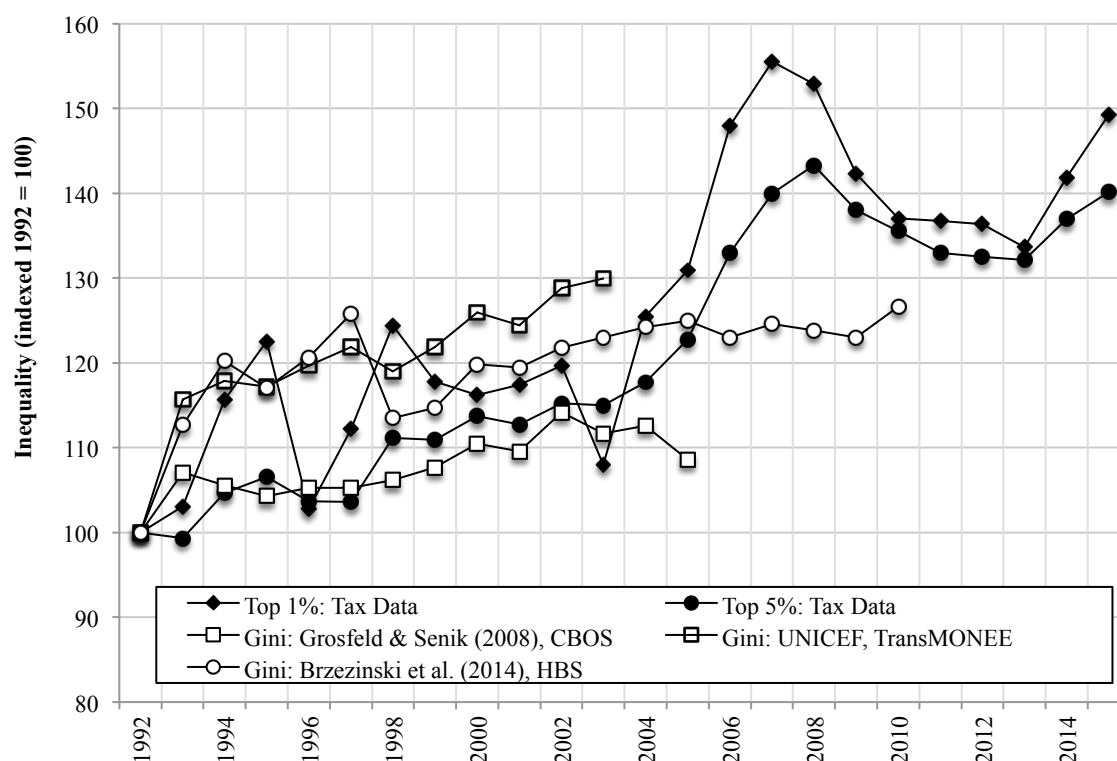
A comparison of the Gini index with our measures of income inequalities is far from straightforward. Besides obvious methodological differences, economic changes might have heterogeneous effects for the top 5% and the bottom 95% of the income distribution. A plausible scenario is that, because of the prominent role of business income for top earners, the 'shock therapy' in the early transition period could have been detrimental to them due to worsening of the general economic condition.<sup>76</sup> At the same time, the rise of the inflation-adjusted wages might drive inequalities in the middle parts of the distribution. In addition, the top of income distributions is very poorly captured by the survey data due to big non-response at the top and missing information of capital gains (Atkinson et al. 2011, Kosny 2012, Burkhauser et al. 2012).<sup>77</sup> Figure 25 plots the evolution of the tax data estimates of the top income share (black markers) and the survey-based estimates of the Gini index (white markers). Given the methodological differences it might be not surprising that we document a relative stability of the top 1% income share and a decline in the top 5% share between 1992 and 1996, while the Gini indexes calculated by Grosfeld and Senik (2008), Brzeziński et al. (2014) and UNICEF consistently show that this period was characterized by an increase in inequalities. On the other hand, after 2004 the top income shares increase dramatically, while the Gini indexes remain stable or even fall.

Few studies are looking at the top income shares in Poland. Brzeziński (2010), Brzeziński et al. (2014) and the World Bank (only the top 10%) use the HBS, Kosny (2012) uses the individual tax data for the Lower Silesia region in Poland (only the top 1%) and UNU-WIDER reports top income using the EU-SILC. In addition to our estimates using the tax data we also use EU-SILC to calculate the top income shares from 2005 until 2013. In these data, incomes from wages, self-employment and pensions are at the individual, while incomes from capital and rentals at the household level. For our upper bound estimates, we assume that adults are the units of observation and we assign all household-level income to the top earner within each household.

<sup>76</sup> As Rutkowski (2001) and Keane and Prasad (2006) focus on labor earnings, their estimates might be to a lesser extent affected by pro-cyclicality of business income.

<sup>77</sup> Additionally, Eurostat (2003) and Szulc (2000) point out to a higher income measurement error in the Polish HBS during the 90s, as the income verification procedure was cancelled in 1993.

The lower bound estimates assume the household as a unit of observation and aggregate all income earned by household's members. The appendix section describes our calculations of the EU-SILC top income shares in more detail.



*Figure 25: Evolution of the Top Income Shares and Gini index for Poland according to various sources*

Source: Gini: Brzezinski et al. (2014) use the Household Budget Survey data published by the CSO of Poland; Grosfeld & Senik (2008) use the CBOS data; UNICEF database use UNICEF TransMONEE data. The top income shares: authors' computation based on income tax statistics.

Figure 26 and Figure 27 show the top 1% and 5% income shares as reported by various sources. The black markers represent our estimates of the top income shares based on either the tax data and EU-SILC. The white markers depict other studies. The first important observation is that the survey-based estimates of the top income shares are consistently below the tax-based estimates. This holds both for the HBS and EU-SILC data. The likely reason for the difference in levels is under coverage of the top income in the survey data. Underreporting, right-censoring and sparse observation make the survey data unreliable, and the top earner's participation refusal leads to underrepresentation of the top parts of the distribution. The second observation is that the evolution of the series differs after 2004. The tax-based estimations, by the authors and Kosny (2012), show an increase, a peak around 2007 and then decline. The

survey-based estimates, by the authors, Brzeziński (2010)<sup>78</sup> and UNU WIDER, suggest that the top income shares were stable or falling after 2004.

Next, Figure 28 looks at the income composition of the top percentile estimated from EU-SILC (adult based). It can be seen that the markedly lower contribution of self-employment income in the survey is a likely source of the level discrepancy in comparison to the tax data based estimates.

Overall, this section points out to the importance of the top income shares in analysing inequalities. The different evolutions of the tax-based top income shares and the survey-based Gini indexes stress that various methodological approaches are needed to capture the nature of inequalities fully. In particular, the economic transformation of the 1990s and the EU accession in the second half of the 2000s might have heterogeneous effects on the different parts of the income distribution. At the same time, this section testifies for the importance of the tax data. The large differences between the tax and survey data for the top income shares estimates suggest that the latter might significantly undercover the top earners.

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<sup>78</sup> Fall in survey based top incomes in 1998 documented in Brzeziński's series is most likely due to change in HSB methodology in the same year



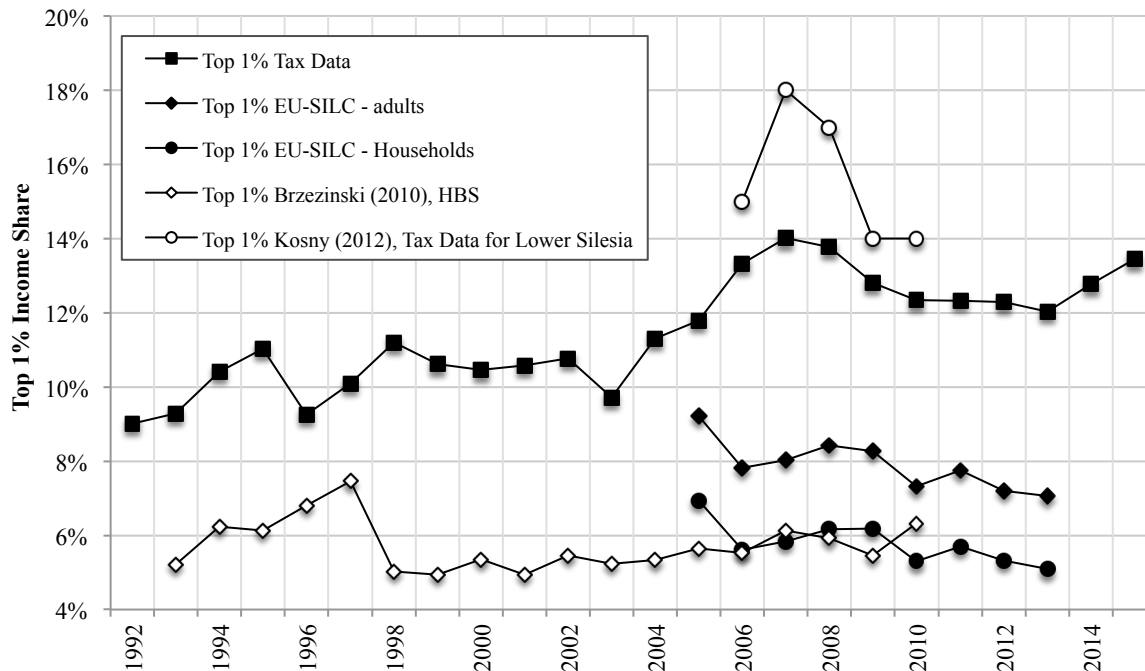


Figure 26: Top 1 per cent income share in Poland estimated from different sources, 1992-2014

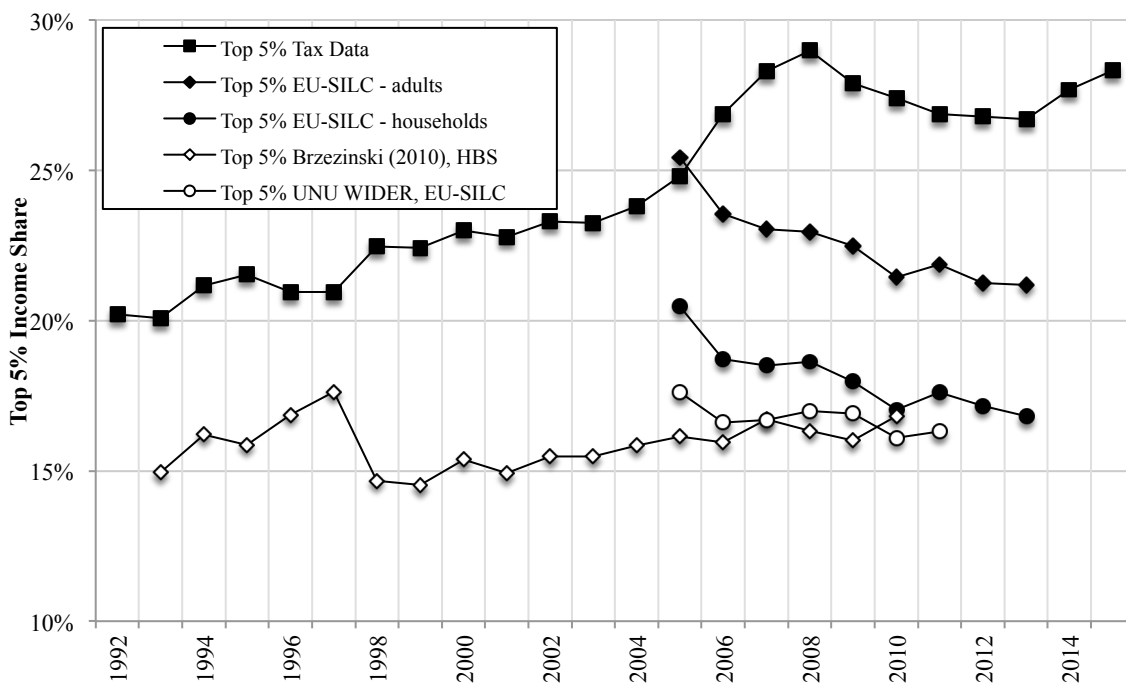
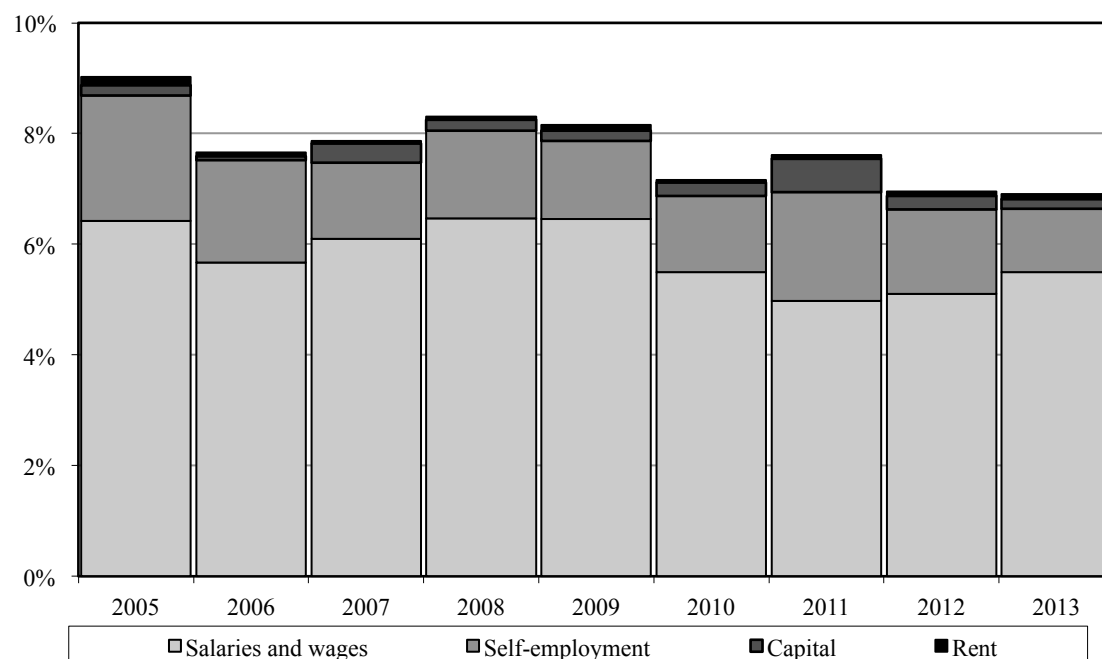


Figure 27: Top 5 per cent income share in Poland estimated from different sources, 1992-2014



*Figure 28: Top 1% composition in EU-SILC (individuals)*

Source: authors' computation based on EU-SILC. Note: capital income includes also shares in profit in unincorporated businesses

## 2.6. Conclusions

This paper provides the first estimates of the evolution of top income shares in Poland from the end of the 19th century until today. We find that inequality substantially fell in Poland throughout the 20th century. It was high in the first half of the 20<sup>th</sup> century due to strong concentration of capital income at the top of the distribution. As documented now in many countries, the downward trend was induced by the fall in capital income concentration. The introduction of communism signified comparatively greater shock to capital incomes relative to other countries, by literally eliminating private capital income with nationalizations and expropriations, while in addition it implied strong reduction of top labour incomes. During the four decades of the communist rule, top income shares displayed notable stability at these lower levels.

After the fall of communism the Polish top incomes experienced a substantial and steady rise and today are at the level of more unequal European countries. The initial upward adjustment during the transition of the 1990s was induced both by the rise of top capital and labour incomes,

which can be explained as decentralization of communist compressed earning structure and the rising concentration of private income with the emergence of the private sector and privatization. The highest increase in top shares took place after Poland joined the EU in 2004 and was driven solely by the rise in top capital incomes, which make the dominant income source at the top. We link this growth with the rise of the capital share in Poland from the 2000s, itself associated with the new globalization-induced phase in the Polish economic development. The beginning of the 2010s marks a stabilisation, yet in the most recent period, we again document a growing trend in top income shares.

The top income groups have been main beneficiaries of strong Polish growth in the 2000s. In 2003-2008 almost half of the real income growth was obtained by the top 5%. Therefore, by looking at top incomes we can understand often quite divergent experience of the strong Polish growth among the population (Grosfeld and Senik 2010). But, clearly, inequality it is not anathema anymore after the bankruptcy of communist egalitarian ideology. Indeed, for this very reason the ideology may have gravitated to the opposite standpoint – with today's "psychological conditions", to paraphrase Keynes (1919) – being more tolerant of higher inequality, seeing it as beneficial to innovation, motivation and economic growth, or (amid binding credit constraints) important for starting and securing entrepreneurial activity. Undoubtedly, a relatively successful economic transition, accompanied by a notable growth and in the absence of major privatization trauma,<sup>79</sup> has played a role in accepting higher inequality.<sup>80</sup> Yet, whether benefits will spread to the rest of the population (Kuznets 1955), or could it result in the slow-growth rentier-dominated society (Piketty 2014), remains to be seen.

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<sup>79</sup> At least there is no general perception of large-scale plunder (e.g., in contrast to Russia). Moreover, it seems that ownership transfer in Poland largely resulted in 'asset redeployment' rather than in 'asset stripping'.

<sup>80</sup> The more so if this process leads to a creation of a class of domestic capitalists as champions of country's economic strength, that would assumedly be more prone to Polish national interests. Especially in the light of the historical experience, when relating economic weakness was related to the loss of political sovereignty.

## Appendix A.1: Income Tax Data – Tables

*Table A 1: Top income shares (in %) in the Partitioned Poland 1890s -1917*

	Top 1%	Top 0.5%	Top 0.1%	Top 0.01%	Top 1-0.1%	Top 0.1-0.01%
Galicia						
1898	11.7	8.9	4.6	1.6	7.1	2.9
1899	11.3	8.4	4.1	1.5	7.1	2.7
1900	12.8	9.7	5.2	2.3	7.6	2.8
1901	14.3	10.9	5.9	2.7	8.4	3.2
1902	13.6	10.1	5.1	2.0	8.5	3.1
1903	13.3	9.9	4.8	1.8	8.5	3.0
1904	13.4	10.0	5.0	1.8	8.5	3.1
1905	12.9	9.6	4.8	1.8	8.1	3.0
1906	12.5	9.4	4.8		7.7	
1907	13.3	9.8	4.9	1.8	8.4	3.0
1908	13.3	9.8	4.7	1.1	8.5	3.6
1909	12.8	9.3	4.4	1.5	8.4	2.9
1910	11.7	8.6	4.0	1.3	7.7	2.7
1911	12.4	9.1	4.3	1.5	8.1	2.8
1912	11.6	8.5	4.1	1.4	7.5	2.7
Province of Posen and Western Prus- sia						
1892	10.4		3.5		6.9	
1893	10.3		3.4		6.9	
1894	10.3		3.5		6.9	
1895	10.4		3.5		6.8	
1896	10.5		3.6		6.9	
1897	11.0		3.8		7.1	
1898	11.5		4.2		7.3	
1899	12.2		4.8		7.4	
1900	12.2		4.7		7.5	
1901	11.8		4.5		7.4	
1902	11.5		4.1		7.4	
1903	11.5					
1904	11.9					
1905	12.4		5.0		7.4	
1906	12.4		5.0		7.4	
1907	12.5		5.1		7.3	
1908	12.4		5.1		7.2	
1909	12.3		5.2		7.2	
1910	12.5		5.2		7.4	
1911	12.8		5.4		7.4	
1912	13.0		5.4		7.5	
1913	13.6		5.7		7.9	
1914	14.3		6.4		7.9	
1915	17.3		8.8		8.5	
1916	20.1		11.1		9.0	
1917	20.0		11.2		8.7	

Source: authors' computation based on income tax statistics

*Table A 2: Top income shares (in %) in Poland 1925-2015*

	P95-100	P99-100	P99.5-100	P99.9-100	P99.99-100	P95-99	P99-99.5	P99.5-P99.9
1925		10.5	7.2	3.1	0.9		3.3	4.2
1926		10.8	7.6	3.3	0.9		3.1	4.4
1927		11.8	8.4	3.6	1.0		3.5	4.8
1928		11.9	8.6	4.0	1.2		3.3	4.7
1929	27.0	12.0	8.5	3.8	1.2	15.0	3.5	4.7
1930				4.3	1.3			
1931								
1935			11.6	5.3	1.6			6.4
1936		15.6	11.3	5.1	1.5		4.4	6.1
1992	19.7	8.8	6.5	3.1		10.9	2.3	3.3
1993	19.6	9.1	6.8	3.7		10.5	2.2	3.1
1994	20.7	10.2				10.5		
1995	20.7	10.6				10.1		
1996	20.8	9.2				11.6		
1997	20.4	9.8				10.5		
1998	21.8	10.9				10.9		
1999	22.4	10.6				11.8		
2000	23.0	10.5				12.5		
2001	22.8	10.6				12.2		
2002	23.3	10.8				12.5		
2003	23.2	9.7				13.5		
2004	23.8	11.3				12.5		
2005	24.8	11.8				13.0		
2006	26.9	13.3	*			13.5		
2007	28.3	14.0	*			14.3		
2008	29.0	13.8	*			15.2		
2009	27.9	12.8	*			15.1		
2010	27.3	12.3	*			15.0		
2011	27.2	12.5	*			14.8		
2012	27.2	12.5	*			14.7		
2013	27.2	12.1	*			15.1		
2014	27.7	12.8	*			14.9		
2015	28.3	13.4	*			14.9		

Note: \* indicates extrapolation into the open interval; Source: authors' computations based on income tax statistics

Table A 3: Top income shares (in %) in the Prussian Poland 1892-1918

	West Prus- sia	Province of Posen	Silesia	West Prus- sia	Province of Posen	Silesia
1892	10.4	10.3	15.0	3.15	3.63	6.95
1893	10.2	10.2	14.6	3.03	3.54	6.68
1894	10.3	10.2	14.7	3.15	3.52	6.70
1895	10.3	10.3	14.9	3.14	3.62	6.76
1896	10.3	10.6	15.2	3.08	3.85	6.91
1897	11.0	10.9	15.7	3.57	3.87	7.16
1898	11.4	11.6	16.0	3.89	4.37	7.35
1899	11.7	12.6	16.6	4.13	5.24	7.88
1900	11.7	12.6	16.8	4.08	5.20	8.04
1901	11.2	12.3	16.7	3.75	4.92	8.08
1902	11.0	12.0	15.9	3.49	4.60	7.25
1903		12.0			4.78	
1904		12.6			5.11	
1905	11.6	13.4	16.2	3.96	5.74	7.52
1906	11.4	13.6	16.4	3.91	5.88	7.71
1907	11.3	13.8	16.3	3.92	6.02	7.77
1908	11.3	13.6	16.3	4.06	5.93	7.85
1909	11.1	13.6	16.1	3.88	6.11	7.90
1910	11.3	13.8	15.9	3.93	6.12	7.54
1911						
1912						
1913	12.2	14.8	16.3	4.48	6.70	7.75
1914	12.5	15.8	16.5	4.73	7.70	8.05
1915	15.1	19.4	18.1		10.46	9.11
1916	17.4	22.6	23.8		13.23	14.09
1917	17.2	22.4	23.6		13.02	13.52
1918	13.9		20.5			11.22

Source: authors' computation based on income tax statistics

## Appendix A.2: Income Tax Data - Figures

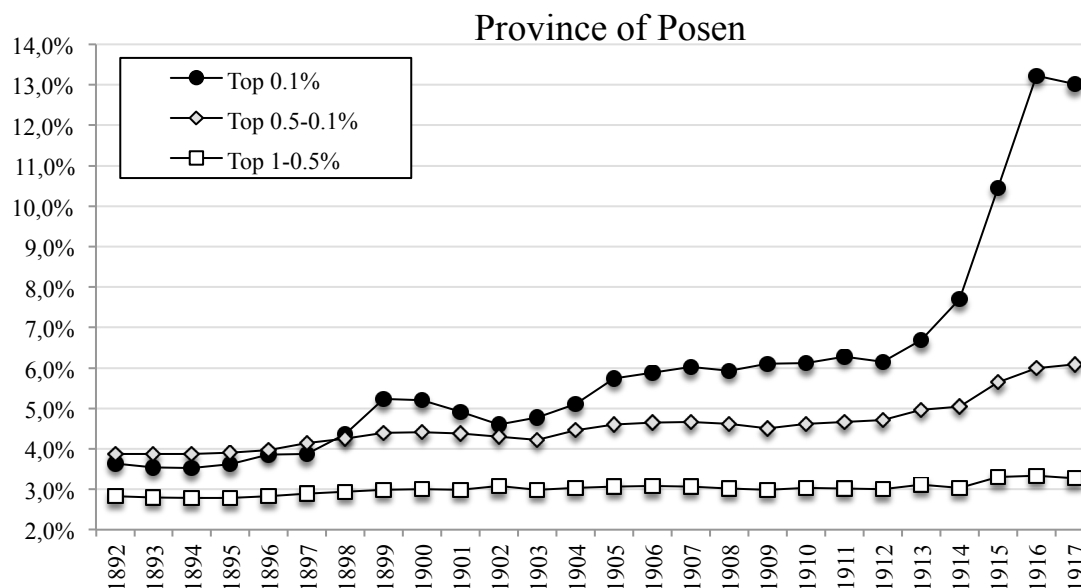


Figure A 1: The Province of Posen – decomposition of the top percentile

Source: authors' computation based on income tax statistics

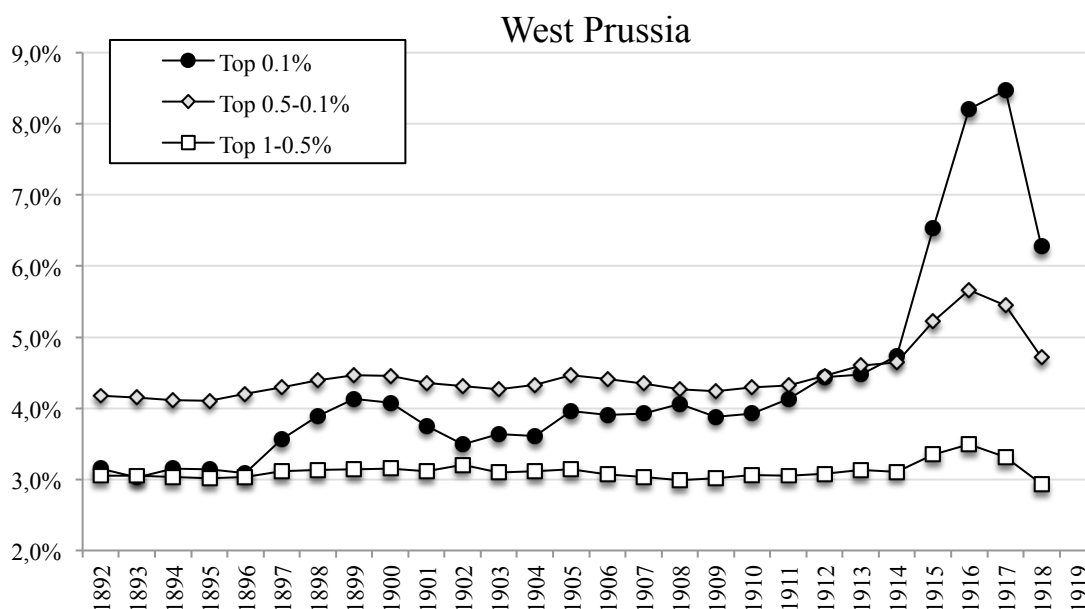


Figure A 2: West Prussia – decomposition of the top percentile

Source: authors' computation based on income tax statistics

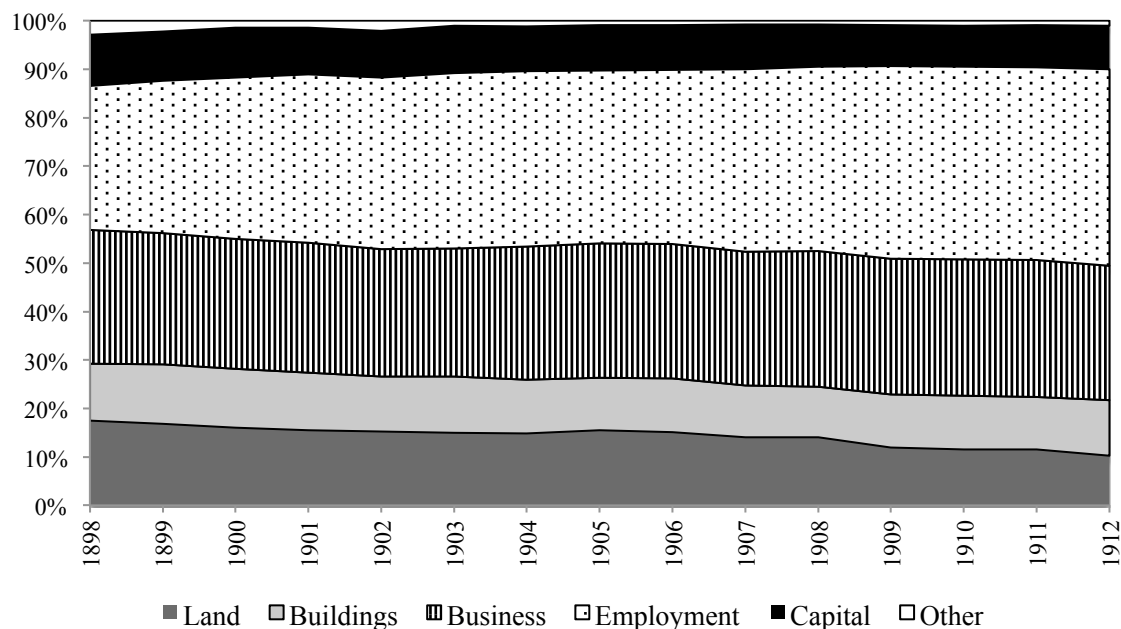


Figure A 3 Galicia – total taxed income by sources.

Source: authors' computation based on income tax statistics

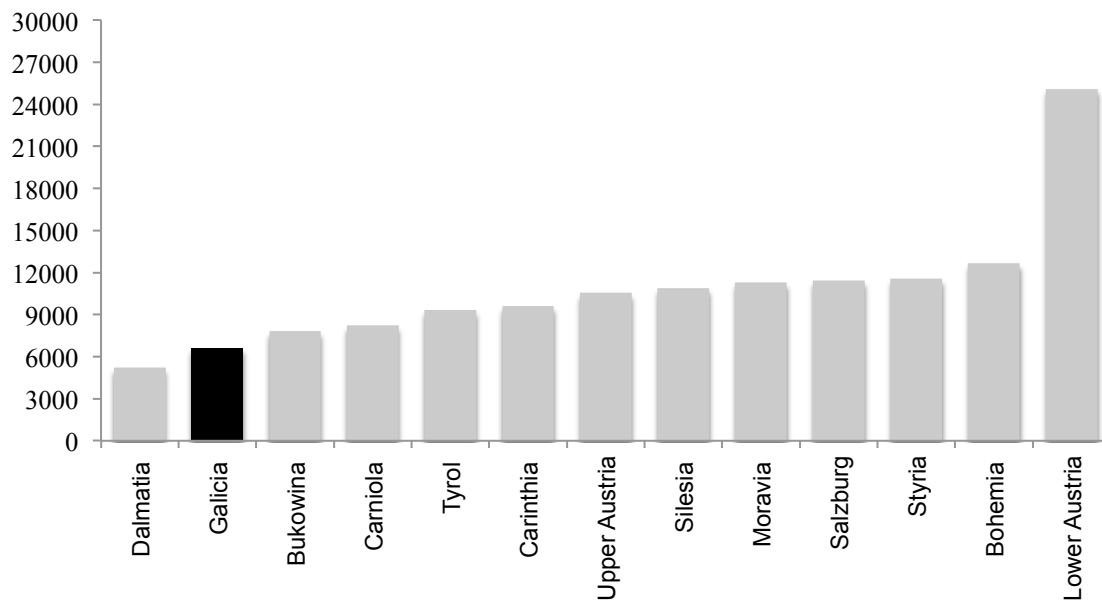


Figure A 4: Average income (in crowns) of top 1% in provinces of Cisleithania in 1913



## Appendix A.3: Data Sources

### The Prussian Partition 1890-1918

#### Data

Data for Prussian Poland come from the annual Statistics of income tax assessment (*Statistik der preußischen Einkommensteuer-Veranlagung*). We use available tabulations for provinces (*Provinzen*) and districts (*Regierungsbezirke*) to construct top income shares for Prussian provinces with predominantly (or significant) Polish population, which formed after WWI the Second Polish Republic (1918-1939). Top income shares are constructed for provinces of Posen, West Prussia and Silesia. The latter should be, however, distinguished from the first two provinces, as Germans accounted there for the predominant part of the population in the pre-WWI period, and only the district Oppeln joined the interwar Poland (as Upper Silesia). The region itself did not form a part of Polish-Lithuanian Commonwealth (moreover, it became a part of Prussia only after Frederick the Great had taken it from Habsburgs during the so-called Silesian Wars) and it was included in Poland after the Second World War. As a result, we generally focus our attention on the district Oppeln (Opole). Parts of ancient Prussian provinces of Pomerania and East Prussia are today within the Polish borders (the other parts of the former are in Germany, of the later in Russia and Lithuania), but we do not investigate them separately as these were not generally identified as ‘historic Polish lands’,<sup>81</sup> and use them in analysis for comparative purposes.

Published tabulations are ranged according to brackets of gross income, giving for each bracket the number of taxpayers and the corresponding tax obligation. Statistics at the level of districts is quite detailed comprising almost seventy brackets, and districts, in turn, could be combined to arrive at the provincial level. In addition, there are separate reports for the number of taxpayers in towns and in the countryside at the provincial and the district level (these were ranged by six brackets), which allowed us decomposition of top income shares into the corresponding categories. However, the sources of income are not available at the bracket level, but only in total for all taxpayers.

#### Population Control

The tax unit in Prussia was household, defined as the married couple with dependants. The total number of households in provinces is estimated from the Population Census (*Die Volkszählung im deutschen Reich*) and the Statistical Yearbook (*Statistisches Handbuch für den Preussischen Staat; Statistisches Jahrbuch für das deutsche Reich*)

#### Income Control

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<sup>81</sup> For example, Prussians never included them in widely used term of ‘our Polish provinces’ Davies (1983, p. 83)

The income control totals for provinces in Prussian Poland have been obtained by estimating the income of those exempt from the income tax ('non-filers') (e.g. Procopovitch 1926). The statistics provide both the total number of taxpayers (filers) and non-filers for each province and district. With the reported total income of taxpayers, it remains to estimate the total income of non-filers. We assumed that non-filers in each province had the same average income as in Prussia on the whole. The figures for Prussia are obtained from Hoffman and Müller (1959, Tab. 35), who in turn had estimated them based on *Statistische Reichsamt* (1932). The latter also estimated the income of tax exempt at the provincial level for 1900, 1907 and 1913. The available estimates for these years are very close to those obtained by the above method. Hoffman and Müller (1959) do not cover the 1914-1918 period, so we take the average income of non-filers in Prussia from Dell (2008), who followed the methodology of the former authors.

## The Austrian Partition 1890-1914

### Data

Top income shares in Galicia are constructed from income tax statistics for Imperial Austria. After the income tax was introduced in 1898, the fiscal administration had been publishing tabulations of income taxpayers in each province of Cisleithania. Income definition was quite broad allowing very few exemptions. Income below 1,200 crowns was tax exempt. It defined income from following sources: from land, from buildings, from business and self-employment, from capital and other sources. Capital gains were not taxed. Tax unit was a family with the total income of family members ascribed to the head of a family.

Data come from Statistical Yearbooks of Imperial Austria (*Österreichisches Statistisches Handbuch für die im Reichsrathe vertretenen Königreiche und Länder*) as well from Annual Report of Ministry of Finance (*Mitteilungen des K. K. Finanzministeriums*).

### Population Control

The tax unit in Imperial Austria was household, defined as the married couple with dependants. The total number of households in Galicia is estimated as the number of adults (above 18 years of age) minus the number of married female. The data come from censuses held in Austria-Hungary in 1890, 1900 and 1910 (*Die Ergebnisse der Volkszählung in den im Reichsrathe vertretenen Königreichen und Ländern*).

### Income Control

The control total for income for Galicia during the Habsburg era was derived as follows. We take as our starting point Schulze's (2007) estimates of regional GDP in Austria-Hungary. Schulze provides estimates for 1870, 1880, 1890, 1900 and 1910, expressed in 1990 Geary-Khamis international dollars. In order to convert estimates for Galicia into current Austrian-Hungarian

crowns, we take the following steps. First, we convert these estimates to 1913 crowns by applying the exchange rate Schulze used (namely 3.36 GK dollars per crown; see Schulze 1997, p. 14). To obtain GDP for other years (for those between 1890, 1900 and 1910), we apply real growth rates of GDP for Galicia taken from Ciccarelli and Missiaia (2014). Next, nominal values were obtained by using regional living cost indices in Austria-Hungary estimated by Cvrcek (2014). Finally, we take 60 per cent of nominal GDP as our total control income.

## The Interwar Poland 1918-1939

### Tax Data

The tax data come from the official publications of interwar Ministry of Finance, the Central Statistical Office of Poland, as well as Ministry's archives in Archiwum Akt Nowych in Warsaw. For more details see the table below.

Source Name:	Data available:	Publisher and Comments
Rocznik Ministerstwa Skarbu 1928 (Yearbook of the Ministry of Finance 1928)	1924, 1925, 1926	The Ministry of Treasure / The Ministry of Finance
Rocznik Ministerstwa Skarbu 1927-1930 (Yearbook of the Ministry of Finance 1927-1930)	1925, 1926, 1927, 1928	The Ministry of Treasure / The Ministry of Finance
Statystyka Podatków Bezpośrednich, Opłat Stemplowych i Danin Pośrednich 1931	1925, 1926, 1927, 1928	The Ministry of Treasure / The Ministry of Finance
Statystyka Wymiaru Państwowego Podatku Dochodowego za Rok Podatkowy 1927	1927	The Central Statistical Office of Poland
Witold Bernhard, "Obciążenie Państwowymi Podatkami Bezpośrednimi", Kwartalnik Statystyczny VIII (4) 1931, p.901-919	1929	The Central Statistical Office of Poland
Statystyka Skarbowa 1933	1929, 1930	The Central Statistical Office of Poland; the data do not separate legal and psychical persons
Statystyka Wymiaru Państwowego Podatku Dochodowego za Rok Podatkowy 1936	1936	The Central Statistical Office of Poland

Ministry's archives in Archiwum Akt  
Nowych in Warsaw

1929, 1936, 1938 Incomplete, only earnings.

The tax code defined two general types of income: unearned (*fundowany*) and earned (*niefundowany*). The unearned category includes income earned by either legal or psychical person, whose economic activity is independent, for instance, capitalists, entrepreneurs, self-employed, artisans, farmers or petty bourgeoisie. A broad range of activities was taxed this way, including agriculture, forestry, land and real estate rents, business activities, capital income (e.g. interests, dividends), royalties. Non-monetary income, such as natural consumption or imputed rents of owner-occupiers was not subject to taxation. Earned income was obtained by employed or retired physical persons. Importantly, state workers and state pensioners do not appear in the tax statistics, even though they were liable to the personal income tax.

For psychical persons only annual income above 1500zł for unearned income and 2500zł for earned income had to be reported. In contrast, all legal persons had to submit the tax report, regardless of their actual income. Legal persons included joint-stock companies and private limited companies.<sup>82</sup> Since in this paper we study the distribution of income among psychical persons, we do not analyse the income reported by legal persons.

Unearned and earned incomes were subject to different tax scheme, and thus tax statistics provides separate tabulations for each type. However, this implies that psychical persons who earned both unearned and earned incomes were reported twice. Similarly, a person was reported multiple times if her earned income came from more than one employer in different tax catchment areas. To our best knowledge, it is impossible to separate these individuals. Therefore, we assume 'Ricardian' system of distinct classes, that is, that of zero overlap between unearned and earned taxpayers at the top and we ignore the multiple employer problem.

The interwar period tax covered a very broad range of economic activities. The only exceptions were incomes coming from inheritance, property selling, an income of non-profit oriented entities, lotteries and others. From the total income, a taxpayer could deduct paid interests on loans, rents and permanent financial obligations originating from the legal requirements, social security (up to 300zł), insurance benefits (up to 300zł per individual or 600zł per household) and other taxes. For unearned income, the reported income could be assumed as more representative for those taxpayers who had accounting books. For others, the administrations simply assumed specific income based on a set of payer's characteristics.

The interwar period tax used both the household and individual level as a definition of the tax unit. An individual reported income if it comes from self-employment, pensions or wages. A household is a tax unit for all other types of income. The problem is that with unearned and earned breakdown, self-employment belongs to the former category, while pensions and wages

<sup>82</sup> Obviously, legal persons could only report unearned income. Wiśniewski (1934) reports that in 1930 there were 12729 legal persons (1784 joint-stock companies).

to the later. Hence, the tax unit in the case of unearned income could be either household or individual, whereas in the case of earned income it is always individual.<sup>83</sup>

Tabulations are ranged according to income before tax and personal deductions, containing the number of taxpayers, the assigned fixed amount of tax to each bracket, and the total tax actually paid in a given bracket. Namely, all incomes falling within ranges of the specific bracket paid the fixed tax amount. For example, the tax liability of all individuals that earned any income between 10 thousand and 11 thousand zloty in 1928 was fixed at 605 zloty (the total income within a bracket could be in theory approximated by the following formula:  $tax = 0.018 * income^{3/2}$  (Wiśniewski 1934)). But it can be observed that the number of taxpayers in each bracket times the corresponding fixed tax amount does not equal to the total tax paid within each bracket. This is due to available deductions. For instance, someone with ('gross') income in 6.3th zl bracket and with three children might end up paying tax assigned to 3.2th zl bracket, but he/she still will be reported in the 6.3th zl bracket (an example from Wiśniewski 1934). However, for our analysis is central that taxpayers are actually reported in the brackets of their obtained gross income. We then simply estimate the total income in each bracket by assuming Pareto distribution (see below), but brackets' range is quite narrow, and our estimates do not depend on particular distributional assumption.

We should also note that tabulations contain only taxpayers that had eventually paid personal income tax. Therefore, potential taxpayers with income close to the minimum filing threshold using personal and other deductions - which make their taxable income fall below the threshold - are not reported in tabulations. For example, there are around 87 thousand taxpayers in the very bottom brackets (1.5-3.2 thousand zloty) who used deductions, which effectively reduced their taxable income below the 1.5<sup>th</sup> zl threshold - this is 18 per cent of all taxpayers with income between 1.5th-3.2th zloty (the summary tables, on the other hand, are not conditional on people paying taxes, and they capture all taxpayers with income above 1.5 thousand zloty). However, we look at fractiles whose thresholds are much higher than the minimum filing threshold, and consequently, this does not lead to underestimation of top income shares.

For years 1925 and 1926 both physical and legal persons reporting unearned income (*fundowany*) are presented together, without providing separate reports for each category of taxpayers. We estimated the number of physical persons in each bracket of unearned tax schedule in 1925 and 1926 by taking the proportion of physical persons in all 'unearned taxpayers' observed in 1927 (note that bracket ranges were unchanged throughout the years).

In general, the proportion of legal persons in total unearned taxpayers is very small, corresponding to less than 1% of all unearned taxpayers (0.8% in 1927, 0.7% in 1928 and 1929), but these are dominantly concentrated at the very top of the income distribution. However, the proportion

<sup>83</sup> Wiśniewski (1934) unfortunately does not discuss this issue in detail. Using the census data, for *fundowany* income he estimates the control population assuming that the tax unit are: agriculture holdings, for-profit entrepreneurs, self-employed, petty bourgeoisie. For *niefundowany* income he distinguishes between agricultural workers and other workers

of legal persons is quite stable throughout the years. For example, when the proportion of physical persons in the total taxpayers in 1926 is taken to correspond that observed in 1927, the top 1 per cent (the top 0.1 per cent) share is 11.68% (3.56%). When the proportion from 1928 is taken instead, the top share is 11.78% (3.65%). Even when we apply the proportion documented a decade later, in 1936, our estimates are not significantly affected (11.57% (3.49%)). These margins of error seem reasonable enough to use our estimates for 1925 and 1926 without raising too much unease.

The same approach is taken for 1930 and 1935 - for which equally the statistics on unearned income does not distinguish between personal and legal persons - by taking the proportions of physical persons in all unearned taxpayers documented in 1929 and 1936, respectively. Unfortunately for these years, the statistics on earned income (*niefundowany*) is also lacking. However, as unearned income accounts for the predominant part of income at the very top (for example, it made almost 90 per cent of income for the top 0.1 per cent and above) and rises with income rank, we provide estimates for the top 0.1 per cent and the groups above by simply taking the number of taxpayers reporting earned income in 1929 and 1936 in the corresponding top brackets. In addition, as top earnings exhibited certain rigidity during the depression, it is probable that the 'crisis years' of 1930 and 1935 saw similar earnings distribution at the very top as in the immediate neighbouring years for which the statistics are available.

### Population Control

The definition of the control total for the population is based on the definition of the tax unit in the tax code. The tax unit in interwar Poland was both household and individual depending on the income source obtained. Namely, someone obtaining employment income was individually taxed, while for other sources incomes of all family members were combined and attributed to the 'head of family'. We take as our population control a hybrid construct defined as the total number of adults minus the number of married women not employed or self-employed. Our definition thus treats working females as separate tax units, but note that most of them were actually not married (according to 1931 census, less than 15 per cent of employed females outside agriculture were married (Maly Rocznik 1939, p. 260, Tab. 5)), and therefore the total reference roughly corresponds to the total number of married couples plus singles.

The number of adults is taken from population censuses (and annual figures from the statistics on the Movement of the Population), while the number of non-working females is equally found in censuses and linearly interpolated for in-between years.

### Income Control

To arrive at the total control for income, we take the estimate of Kalecki and Landau (1933) for 1929 as our starting point. This estimate has remained the main reference point for all subsequent estimation of national income in interwar Poland up to present day. Kalecki and Landau (K&L) estimate is gross of depreciation, roughly corresponding to GDP. K&L used the expenditure approach to estimate GDP. K&L extended their calculations only for 1933 (Kalecki and Lan-

dau 1935), so we have relied on studies of Klarner (1937) and Petyniak-Sanecki (1939) for other years in the 1929-1936 period for which the tax data is available. The latter authors followed closely the methodological approach used by K&L (Landau 1976, pp. 110-1).

However, no subsequent study focused on the years before 1929. We adopted the following approach to estimate total income in 1927 and 1928. K&L provide indices of the real development of the national income for the period 1927-1934 (1935, Tab. 116)<sup>84</sup>. We take K&L's GDP for 1929 and apply the corresponding growth rates to obtain real GDP figures in 1927 and 1928. We checked the K&L indices by comparing them with the real GDP growth rates in Maddison (2001) (available for 1929 to 1938; from Laski (1956)), and find quite close development. This should come as no surprise since Maddison takes the estimates of the Institute of Economic Sciences of the Polish Academy of Sciences, which are based on the work of K&L. Finally, to obtain the nominal level, we use the average of the wholesale price index and the retail price index (Maly Rocznik Statystyczny for 1933, Tab. 1, p. 93).

The next step in using the 'top-bottom' approach for the total income control consists in subtracting from GDP items not included in personal income such as the consumption of fixed capital, public sector income, retained earnings of corporate sector, or non-taxable personal income. Due to the general lack of detailed historical national accounts, especially with respect to the income method, the usual practice for estimating personal income has been to assume some fixed fraction of GDP (Atkinson and Piketty 2007, 2010). Wisniewski (1934) in the study on income distribution in Poland in 1929 estimated the total taxable income as equaling 82 per cent of the K&L national aggregate. However, Wisniewski's total income does not only add the income below the minimum exemption level (that is, the income of non-filers) to the total reported income of filers, but he 'corrects' the tax data through the whole distribution by using alternative sources (such as the distribution of agricultural holdings from the land tax in order to account for the assumed misreporting of income derived from the land). Consequently, we take a smaller proportion of GDP than Wisniewski did, namely 75 per cent of GDP.

For 1925 and 1926 we exploit the available estimates of national income. These are net of depreciation, so we assumed that the total control for income equals 80 per cent of national income. Following Secomski, consumption of fixed capital is taken as 5 per cent of GDP (Landau 1976, p. 110). Landau (1976) reports dozens of national income estimates of various authors for the 1923-5 period. The range of estimates is quite large, including even sporadic observations in Seym. Those that explicitly refer to 1925<sup>85</sup> are in a range between 15 and 20 million zł (in 1927 parity), and as a middle ground, we take 17,5 mil zloty as an estimate of national income. The year 1926 was the last year of post-inflation depression (Landau and Tomaszewski 1985) and we assume no real growth between the years.

<sup>84</sup> The methodology was developed within the Institute for the Study of Business Cycles and Price []. These series are not based on comprehensive estimates of consumption and investment as for the 1929 and 1933 (see Kalecki and Landau 1935).

<sup>85</sup> As stated by Landau (1976, p. 105): «In many cases, it is also difficult to determine precisely for which year the estimate was made. We know that they relate to the years 1923—1925.»

One should just note that in 1927 there was a change in parity of zloty to gold franc, with one zloty of 1924 worth 1.72 zloty of 1927. However, the tax statistics for 1924-6 was published from 1927 onwards, and taxpayers in the mentioned years are ranged according to the brackets denominated according to the new parity. Consequently, when estimating the total control income for 1924-6 one needs to convert available estimates of national income from 1924 parity to 1927 parity.

## **The Interwar Period – County Analysis**

### **Data**

The 1927 Income Tax Statistics published by the Ministry of Finance provides the detailed tables of earned and unearned income for each administrative unit of tax authority in Poland. For the rural areas, the administrative units overlap with counties, for the urban areas, they are usually smaller, in which case we aggregate the units to the county level. In three cases, Gniezno, Inowrocław and Lublin, the tax unit is larger than the corresponding county as it covers the rural and urban counties. We merge these counties to match the tax unit.

Since the data on population and income controls is from the 1931 census, we match the 1927 tax units with the 1931 counties. In the majority of cases, it was straightforward, except counties, which changed the borders or were liquidated between 1927 and 1931. In these cases, we assign a tax unit to a 1931 county, which received the largest portion of a 1927 county. We drop Konstantynów and Królewska Huta counties in which cases it was impossible to determine a corresponding 1931 county.

Similarly, as in the aggregate tax tables, the highest bracket for unearned income is open. To determine the average income of the richest, we apply the Pareto extrapolation to each county separately. Finally, to obtain the total amount of income we assume that unearned and earned income taxpayers are different individuals and merge their number for each bracket. The thresholds of earned income brackets are usually narrower than of unearned income, in which cases we combine the earned brackets to match the unearned ones.

### **Population Control**

Similarly, as for the country-level analysis, we take as our population control the total number of adults minus the number of married women not employed or self-employed. The county-level data comes from the 1931 census.

### **Income Control**

We construct control income for each county to match the reported taxable income from the 1927 Income Tax Statistics published by the Ministry of Finance. We separately estimate the



earned income of agriculture and non-agriculture workers; the exempted unearned income of independent in agriculture and non-agriculture activities. We discuss the details of each part of the control income below.

**Earned (niefundowany) Income of Non-Agriculture Workers.** The data on the voivodship-level total compensation of industrial workers in nine industries (mineral, metal, electro technical, chemical, textile, paper, tannery, wood and food) comes from the 1931 Industry Statistics (Statystyka Przemysłowa 1931, Główny Urząd Statystyczny). The county-level data on the number of workers in fifteen industries and non-manufacturing sectors comes from the 1931 census of population. To obtain the total earned non-agriculture income for each county, we calculate the average compensation for each voivodship-industry cell and multiply it by the county-level number of workers in the corresponding industry (Drugi Powszechny Spis Ludności z Dn. 9.XII 1931 r. [the 1931 Census]). For the industries not covered by the 1931 Industry Statistics we use the average voivodship-level compensation; for domestic servants, we use one-third of the average; for public administration workers we use 2/3 of the average, and for the remaining workers we assume 1/2 of the average. In other words, we assume that each in voivodship-industry earns the same average compensation. To obtain the total earned non-agriculture income we add the estimated earned income of industry workers, domestic servants, public administration workers and others. In addition, we increase the total amount by 50% to match the country total.

**Earned (niefundowany) Income of Agriculture Workers.** We calculate the average income of agriculture workers and the average income of agriculture 'white collar' workers (dozorca) for each voivodship using the data from Gerlicz (1929). As the original data is in the quintals of rye, we use The Statistics of Prices 1929 (Statystyka Cen, 1927-37, Główny Urząd Statystyczny) to translate the numbers into the Polish Złoty. Next, for each county, we multiply the number of agriculture 'blue collar' workers by the voivodeship average and the number of agriculture 'white collar' workers by the voivodeship average for 'white collar' occupations. To obtain the total earned income of agriculture workers we sum up the total income of ordinary and 'white collar' workers.

**Exempted Unearned (fundowany) Non-Agriculture Income.** The 1931 census (Drugi Powszechny Spis Ludności z Dn. 9.XII 1931 r. [the 1931 Census]) provides the county-level number of non-agriculture independents, which we multiply by one-third of the average unearned taxed income. Unfortunately, to the best of our knowledge, there is no available separate data on the income of independents in non-agricultural sectors.

**Exempted Unearned (fundowany) Agriculture Income.** First, based on the estimates from the Puławy Institute and Wisniewski (1931) we assume that all landholdings smaller than 5ha did not pay the income tax. The total number of these landholdings is taken from the 1927 land tax. Second, we assume that only in certain counties landholdings between 5-10ha paid the income tax. In particular, we take the number of landholdings from the 5-10ha band in the 1927 land tax,

if it is smaller than the difference between the hypothetical number of exempted agriculture independent<sup>86</sup> and the number of landholdings smaller than 5ha. Otherwise, we use the difference. Finally, we multiply the number of landholdings in each band by 2/3 of the average voivodship-level agriculture income reported by the Puławy Institute. We take the fraction of the income because the estimates are believed to be upward biased (Wisniewski, 1931)

To obtain the total county-level control income, we sum up the earned agriculture income, the earned non-agriculture income, the exempted unearned agriculture income, the exempted unearned non-agriculture income and the unearned taxed income.

## The Communist Poland 1945-1989

### Data

The design of income tax during the first years after the end of WW2 was similar to the Interwar regulations. The major change, however, was to exempt earned and agriculture incomes, and tax only non-agriculture unearned income. In addition, the socialised sector was not a subject of taxation, and the law set a relatively high-income threshold. Consequently, with continuous government's attempts to limit private entrepreneurship, the income tax *de facto* lost its economic importance.

Tabulations of taxpayers obtaining unearned income are available for three years in the late 1940s: for 1945, 1946 and 1947. Unfortunately, there are no corresponding tabulations for earnings. But in order to provide an indication of the post-war development of top income shares, we combine the income tax statistics on unearned income for 1947 with the earnings data from employer survey in 1949. Obviously, the critical assumption has been that earnings distribution remained stable between 1947 and 1949.

Earnings survey provides tabulations of employees in industry and construction, respectively, ranged according to monthly earnings. Separate reports are given for manual and white-collar workers (ranged, in turn, separately for technicians and office workers). We merge particular tabulations according to worker's qualification, and then of all workers in industry and construction. The resulting joint distribution accounts for roughly 70 per cent of employees covered by social insurance in firms with more than 5 employees (exclusive of agriculture). We assume that the remaining 30 per cent of employees (e.g. in telecommunication, wholesale or retail trade, accommodation) is distributed in the same manner as those in (combined) industry and construction. On the other hand, it is assumed that employees in firms with less than 5 employees, or employees in agriculture as well as in those not covered by social insurance, do

<sup>86</sup> The number of hypothetical exempted agriculture independents is calculated using the 1937 tax data, which reported the number of taxpayers and income for the total unearned sector and for unearned agriculture. We relate two ratios, the agriculture taxpayers/agriculture income and total taxpayers/total income. Next we apply this relationship to the 1927 tax data to obtain the number of agriculture taxpayers (which is not reported). Finally, we subtract this value from the total number of smallholdings from the 1927 land tax.

not end up in higher earnings brackets, and thus do not make up top income shares. We adjust earnings bands in 1949 to the price level of 1947 by using the available retail price index.<sup>87</sup> Annual earnings were obtained by multiplying bracket middle point by twelve. For the earnings in the open top bracket, we assumed that two top brackets follow Pareto distribution. Finally, as in the interwar period, we assumed no overlap between individuals obtaining unearned income and earnings.

In order to construct top income estimates for the 1956-1990 period (Figure 2) we have used enterprise wage surveys, covering employees in the socialized sector (for sources and details see Appendix A.6). Namely, it has been assumed that only wage earners constituted top income groups in this period since 'unearned' income was to the greatest extent expropriated by the state after a thorough nationalisation wave and the land reform in the late 1940s, coupled with the currency reform in 1950. The remaining non-wage private income was largely concentrated in the small-scale agriculture, characterised by the low productivity and the small earning potential, and thus plausibly did not contribute to top incomes.

### Population Control

For the population control in 1947, we used the same definition as for the interwar period. The population unit in the 1956-1990 period is individual. The data is taken from the population censuses and the Demographic Yearbook of Poland (*Rocznik Demograficzny*)

### Income Control

To arrive at the total income for 1947, we use the official estimate for the national income (*Rocznik Statystyczny* 1949, p. 27, Tab. 1). This figure, however, refers to the Marxist concept of national income,<sup>88</sup> corresponding to the net material product (thus exclusive of services, or 'non-productive' activities such as housing, education, administration, etc.). We increase this figure by 15 percent to obtain the estimate of national income according to SNA, as this proportion has been often found to account for services (according to GUS 1949), services in the interwar period accounted for 17 percent of national income).

We take 65 per cent of this adjusted figure to correspond to the total income control. This is somewhat lower proportion than used in the interwar period, because the communist accession to power resulted in the increase of the so-called 'social income' (and thus a fall in personal income) in national income, especially through a rise in retained profits of nationalised enterprises (a fall in the wage fund) needed for investment.

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<sup>87</sup> However, as we are aware, this is available only for Warsaw.

<sup>88</sup> Accounting system in communist countries was the Material Product System (MPS)

## Poland 1992-2015

### Tax Data

Data for the 1992-2015 is found in the following publications:

Informacja dotycząca rozliczenia... od osób fizycznych za 1992 rok	p. 2
Informacja dotycząca rozliczenia... od osób fizycznych za 1993 rok	p. 4
Informacja dotycząca rozliczenia... od osób fizycznych za 1994 rok	Biuletyn Skarbowy 3/1995: p. 6
Informacja dotycząca rozliczenia... od osób fizycznych za 1995 rok	p. 2; Tab. 1.1 (p. 6)
Informacja dotycząca rozliczenia... od osób fizycznych za 1996 rok	Biuletyn Skarbowy 6/1997: p. 3; Tab. 1.1 (p. 5)
Informacja dotycząca rozliczenia... od osób fizycznych za 1997 rok	Biuletyn Skarbowy 6/1998: p. 7; Tab. 1.1 (p. 9)
Informacja dotycząca rozliczenia... od osób fizycznych za 1998 rok	Biuletyn Skarbowy 5/1999: p. 5; Tab. 1.1 (p. 7)
Informacja dotycząca rozliczenia... od osób fizycznych za 1999 rok	Biuletyn Skarbowy 5/2000: p. 9; Tab. 1.3 (p. 11)
Informacja dotycząca rozliczenia... od osób fizycznych za 2000 rok	p. 4; Tab. 1.3 (p. 6)
Informacja dotycząca rozliczenia... od osób fizycznych za 2001 rok	p. 5; Tab. 1.3, (p. 8)
Informacja dotycząca rozliczenia... od osób fizycznych za 2002 rok	p. 5; Tab. 1.3 (p. 8)
Informacja dotycząca rozliczenia... od osób fizycznych za 2003 rok	p. 5; Tab. 1.3 (p. 8)
Informacja dotycząca rozliczenia... od osób fizycznych za 2004 rok	p. 5; Tab. 4.4 (p. 10); p. 23
Informacja dotycząca rozliczenia... od osób fizycznych za 2005 rok	p. 5 ; Tab. 4.4 (p. 10); p. 39
Informacja dotycząca rozliczenia... od osób fizycznych za 2006 rok	p.5 ; Tab. 4.4 (p. 11); p. 40
Informacja dotycząca rozliczenia... od osób fizycznych za 2007 rok	p. 5 ; Tab. 4.4 (p. 11); p. 40
Informacja dotycząca rozliczenia... od osób fizycznych za 2008 rok	p. 5 ; Tab. 4.4 (p. 11); p. 36
Informacja dotycząca rozliczenia... od osób fizycznych za 2009 rok	p. 5 ; Tab. 4.4 (p. 11); p. 36
Informacja dotycząca rozliczenia... od osób fizycznych za 2010 rok	p. 5 ; Tab. 4.4 (p. 12); p. 46
Informacja dotycząca rozliczenia... od osób fizycznych za 2011 rok	p. 5 ; Tab. 4.4 (p. 11); p. 38
Informacja dotycząca rozliczenia... od osób fizycznych za 2012 rok	p. 5 ; Tab. 4.4 (p. 11); p. 34
Informacja dotycząca rozliczenia... od osób fizycznych za 2013 rok	p. 5 ; Tab. 4.4 (p. 11); p. 33
Informacja dotycząca rozliczenia... od osób fizycznych za 2014 rok	p. 5 ; Tab. 4.4 (p. 10); p. 30
Informacja dotycząca rozliczenia... od osób fizycznych za 2015 rok	p. 5 ; Tab. 4.4 (p. 10); p. 30

It should be noted that tabulations are presented by ranges of taxable income (thus, after deductions) rather than gross income. But, the total income is provided for each interval (both for income before and after employee social security contributions). We apply our preferred income concept and adjust interval thresholds by multiplicative factors. The amount of deductions is negligible and should not affect our estimates in any significant way.

The tax law has been reformed several times since 1992. Because each such event changes the definition of reported income, all modifications have to be taken into consideration when analysing the tax statistics. Here we just describe two major reforms, in 2001 and 2004. From 2001/2002 the tax law introduced taxation of capital revenue (interest and dividends) and capital gains (i.e. from selling company's shares, stocks, derivatives). While the former needs to be taxed using the presumptive tax and is not reported in the statistics, the latter is taxed using the progressive scale and thus will appear in the tax tables. Note that both were absent from the

reports before 2001. The details of the capital income taxation are outlined in Appendix below. The reform of 2004 introduced an option for business income from non-agricultural business activity (further referred as business income) to be taxed separately at the flat rate. We deal with the assumptions concerning the imputation of the business income taxed at the flat rate to the top income shares in the next section. Similarly, capital gains can also be taxed at the linear rate.

In our estimations of the top income shares, we exclude capital gains and income from real estate. The reasons are twofold. Firstly, these sources of income are negligible. The tax statistics show that, for instance, between 2004 and 2013 the average income from capital gains was less than 1% (min 0.5%, max 2%) of the total income. At the same time, merging these sources of income with the progressive schedule would involve a lot of ad hoc assumptions. Secondly, we want to make our estimates consistent across years as much as possible. Since capital gains were not taxed before 2001, and the real estate income before 2009, their inclusion would distort comparison of the top income shares across the period of interest.

### **Merging income across tax regimes after 2004**

Poland engaged in the flat tax reform in 2004. In comparison to some other countries in Central and Eastern Europe that introduced a flat income tax, the extent of the reform in Poland was less comprehensive and consisted 'only' in the introduction of the flat rate option for certain categories of personal income. Most importantly, individuals obtaining business income could after that choose between taxation of this income separately at the flat rate or at the progressive scale with the rest of their income as before.<sup>89</sup>

Until 2009 there were three brackets in the progressive schedule with the respective marginal rates of 19, 30 and 40 percent, and afterwards, they were reduced to two with the respective marginal rates of 18 and 32 percent.

Each individual, who earned a taxable income (even when it is below the tax exemption threshold), is obliged to submit the tax form individually or ask her employment institution (or social security agency) to do so. An individual submits only one form (PIT 36 or PIT 37, depending on the source of income) if she wants to be taxed on the progressive tax scale. However, since 2004, if she decides to tax her business income (or specialised agriculture) using the flat tax, she needs to submit an additional form (PIT 36L). Also, if her income comes from either the capital gains or the real estate sales, she needs to tax it using the flat rate and submit additional forms for each of the sources (PIT 38 and PIT 39 respectively). Therefore, the same individual might appear several times in the tax reports, but she will only appear once in the progressive tax part.

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<sup>89</sup> This option has been allowed additionally for rental income.

*Table A 4: Percentiles and Average Income; Poland 1992-2015*

		P95	P99	P95-100	P99-100
1992	*	5,247	9,865	10,041	22,366
1993	*	7,709	13,416	14,095	32,571
1994	*	10,699	21,180	20,973	51,588
1995		14,472	28,567	27,476	70,393
1996		18,297	36,436	31,062	68,571
1997		21,330	42,698	39,918	96,270
1998		24,952	56,939	50,979	127,142
1999		25,740	65,075	55,975	132,475
2000		32,974	75,902	62,949	143,217
2001		34,937	69,634	66,452	154,212
2002		34,977	74,661	67,406	155,967
2003		34,662	72,503	64,111	134,063
2004		37,101	81,568	75,429	179,129
2005		38,753	87,422	80,303	190,793
2006		42,767	99,717	92,061	228,251
2007		46,749	112,818	102,764	254,346
2008		56,983	131,783	118,355	281,276
2009		62,313	139,280	122,555	281,497
2010		65,452	143,479	125,513	282,741
2011		67,524	150,548	132,030	302,500
2012		69,341	154,694	135,560	310,778
2013		71,826	157,471	137,304	309,338
2014		72,812	163,514	143,270	330,627
2015		75,053	173,297	152,809	362,580

Note: In current PLN \* amounts should be multiplied by 10000

As a result, the personal income tax statistics has provided distinct reports for the tax returns submitted under the respective tax schedules from 2004 onwards. This has raised a number of methodological challenges when merging the data from the two reports. As the first step in the merging procedure, it should be acknowledged that choosing a flat rate option entails a trade-off (Kopczuk 2012), because on the one hand, the high-income individuals could benefit from lower marginal tax rate, but on the other, it would imply a broader tax base since they would thus give up the right to tax allowances and tax credits as well as the option of joint filling for spouses. This trade-off is presented in Figure A5: Simulated Tax Liabilities in the Progressive and Flat

Tax Schemes before 2009 below. It is a replication from Kopczuk (2012, Fig. 0) who explains in detail the incentives behind opting for flat tax rate regime, and the following discussion is closely based on his exposition.

The dashed vertical lines indicate the tax-free threshold and the bracket thresholds of the progressive schedule. Black lines indicate the tax liability under the progressive tax rule when using the tax credit only (the solid line), the tax credit and taxable income deductions (the dash-dotted line), and previous plus the benefits of filling jointly with no income spouse (the dashed line). The red line indicates tax liability under the flat rate schedule. The tax optimizing behaviour suggests that taxpayers would choose the flat rate option only if their business income exceeds a certain breakeven point (black points) where the benefits of the lower marginal tax rate outweigh the associated costs of losing tax preferences, and the overall tax liability is consequently reduced. Most importantly, Figure shows that the flat rate benefits become dominant only at the income levels above the middle bracket threshold and rise depending on the use of available tax preferences.

Figure A6: Simulated Tax Liabilities in the Progressive and Flat Tax Schemes after 2009 depicts analogous trade-off between the progressive and flat regimes, after the reform of 2009. Note that in this case there are only two income brackets (indicated by the vertical dashed lines). In all the income scenarios outlined above, the breakeven points lie above the top income thresholds. In other words, it is profitable to switch to the flat regime only if the business income exceeds the top bracket threshold.

Merging income across the tax regimes is straightforward after 2009, as we simply join the income taxed using the flat tax to the income from the progressive top bracket. The situation is more complicated before 2009 when the break-even point of switching to the flat tax regime might be located within the middle bracket. Fortunately, we can support some important assumptions by the insight into the descriptive statistics of the income tax microdata. These are provided by Kopczuk (2012) who used a large sample from the Polish personal income tax returns covering the 2002-2005 period.

First, using descriptive statistics from Kopczuk (2012, Table 1), we estimate that 30% of flat tax fillers have their income within the range of the middle bracket of the progressive schedule. Then, by assuming that these individuals earn middle bracket's average income (which is likely to be under-estimation), this results that business income of these flat tax fillers accounts for 10 percent of the total business income taxed at the flat rate (a proportion that is remarkably constant throughout the years). The remaining 70 percent of flat tax fillers are placed in the top bracket of the progressive schedule with the remaining 90 percent of total business income taxed at the flat rate.

This number is also supported once we look at changes in the reported flat tax income just before and after the reform of 2009. The rationale is that the reform motivated people with the business income within the range of the previous middle bracket, to switch from the flat to the progressive regime. Assuming a counterfactual increase of business income by 6%, the

comparison reveals a drop in the flat tax income of around 15%. However, this is likely to be over-estimation as this drop can be attributed not only to people switching to the new bottom progressive bracket (old medium), but also to the new top progressive bracket (old top) (Figure A5: Simulated Tax Liabilities in the Progressive and Flat Tax Schemes before 2009 and Figure A6: Simulated Tax Liabilities in the Progressive and Flat Tax Schemes after 2009).

## **Underlying Assumptions of the Preferred Series**

### Proportion of Overlapping Individuals

- 80% of the individuals reporting their income in the flat regime report also income in the progressive schedule.

In 2003, 2561 thousand submitted the business income tax forms (PIT 36), among which 344 thousand people reported only business income. It means that around 87%  $((2561-344)/2561)$  of the business tax forms were submitted with other forms. Assuming that these were only the progressive schedule (PIT37) forms and that the proportion is the same among the post-2004 flat tax fillers, these would suggest that the proportion of overlapping individuals is 87%. This estimate will be an overestimate if, for instance, those with only business income are on average earning much higher income than those with mixed income and thus are more likely to switch to the flat-rate regime. Since this is a likely scenario, we decide to assume that the overlapping individuals are 80% of the flat tax fillers.

### Distribution of tax-fillers income

- 20% of the individuals reporting their income in the flat regime does not appear in the progressive tax reports. We move 70% of these individuals to the top bracket and the remaining 30% to the medium bracket (the bottom after 2009).

Kopczuk (2012, Table 1) reports that in 2005 there were 4138 flat tax fillers who had the total income within the middle bracket thresholds. Similarly, there were 9095 flat tax fillers within the top bracket thresholds. Hence, the share of flat tax fillers, who earn the income within the middle bracket range is 30% and within the top bracket range is 70%.<sup>90</sup> We use this number also for 2004 and the further years. Note that after 2009, the middle bracket was joined with the bottom bracket.

- The income taxed using the progressive schedule of those who use the flat tax (overlapping individuals) is located in the bottom bracket (both before and after 2009). We move 70% of them to top bracket, with 60% of the bracket's average income. Before

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<sup>90</sup>In 2005 there were no flat tax fillers with the total income within the bottom bracket.



(after) 2009, we move the remaining 30% of them to the middle bracket (we keep them in the bottom bracket).

Based on data from Kopczuk (2012, Table 2), the average wage of flat tax filers for 2002-2005 makes respectively 67, 58, 50 and 52 percent of the average income of the bottom bracket. This might be because the wage of business owners falls as a part of the wages is turned to business income. It seems reasonable to use a proportion of 60%, in order to account for the possibility of other source of income besides wage in the progressive schedule. On the other hand, the average wage of flat tax filers makes 60, 51, 44 and 46 percent of the weighted average income of the bottom and middle bracket for 2002-2005. These suggest that from 2009 onwards a reasonable proportion is 50% of the weighted average income.

## Taxation of Capital Income

Income originating from capital is taxed using two exclusive methods, the presumptive tax and the flat tax. The former method is used for capital income, whereas the later for capital gains. Capital income, taxed using the 19% presumptive tax include interest rates from savings accounts, bonds and provided loans, investment funds income and dividends. Capital gains, taxed using the flat 19% tax (PIT 38 form), include gains from selling company's shares and stocks, gains from selling other securities, gains from derivatives.

Some forms of capital income are exempted from the capital income tax, in particular, income from selling government bonds bought before 2003 and local government bonds issued after 1997, gains from selling company's shares, stocks, securities bought before 2004, gains from securities bought before 2004, income from investment funds bought before 2001, income interest rates from savings accounts, bonds and provided loans if the transaction took place before 2001. Copyright income is taxed using either progressive or flat rate (since 2014 only progressive).

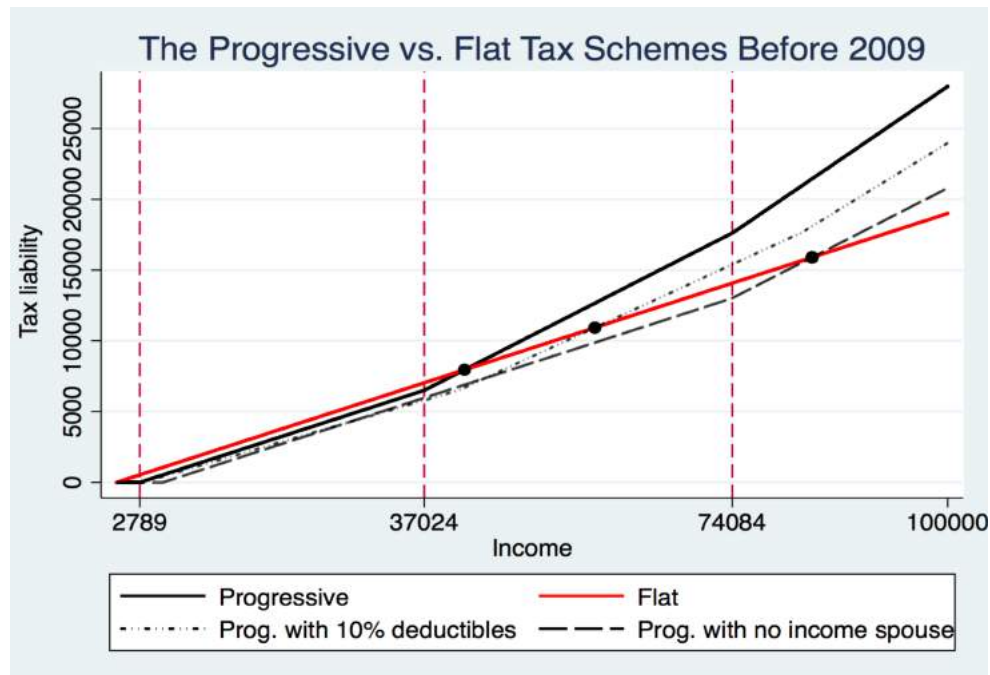


Figure A5: Simulated Tax Liabilities in the Progressive and Flat Tax Schemes before 2009

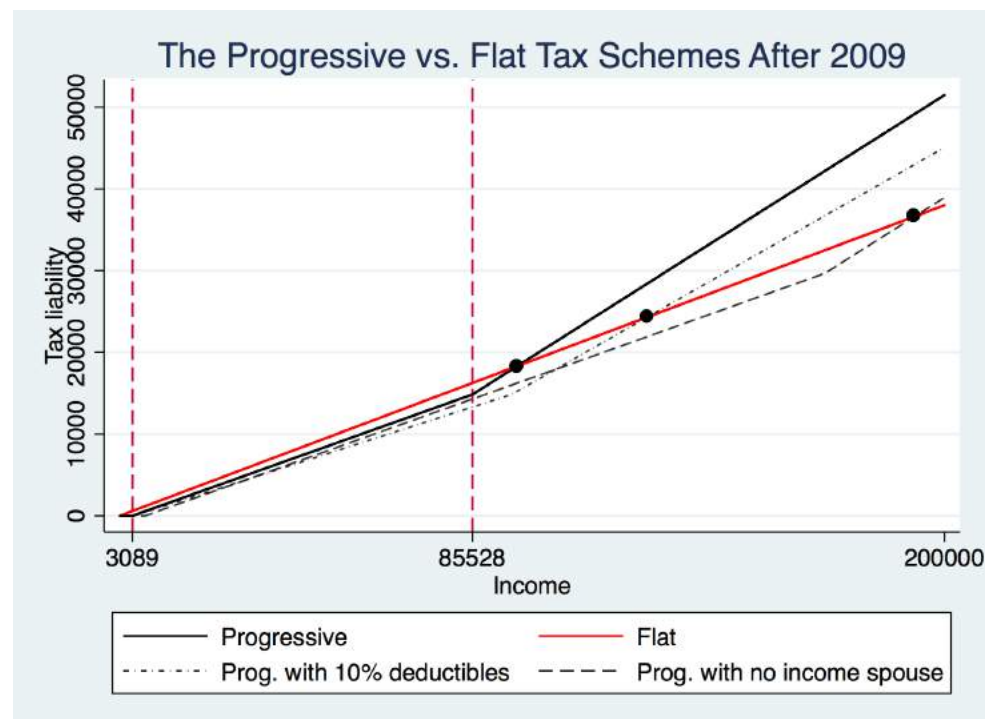


Figure A6: Simulated Tax Liabilities in the Progressive and Flat Tax Schemes after 2009

In our estimations of the top income shares, we exclude the capital gains. The reasons are twofold. Firstly, these sources of income are negligible. At the same time, merging these sources of income with the progressive schedule, would involve a lot of ad hoc assumption. Secondly, we want to make our estimates consistent across years as much as possible. Since capital gains were not taxed before 2001 their inclusion would distort comparison of the top income shares across the period of interest.

Because the presumptive tax is collected at the source (e.g., bank) capital income is not reported in the tax reports and thus does not appear in the tax reports. Unfortunately, we are not aware of any publication, which would provide comprehensive data on the capital income. The only available data comes from the press publication (*Gazeta Wyborcza*) and present the tax revenues originating from capital income. Based on these we estimated that capital income between 2007 and 2014 is on average 3.6% of the total progressive income. One solution is to exclude this income from the control income when capital income based on revenues is distributed similarly to the observed income, this strategy should not seriously bias the top income share estimates.

### Joint taxation

Married couples and single parents have a right to submit a joint tax form under the standard set of conditions. From the calculation of the control income, an important condition is that neither of spouses (or a single parent) taxes his/her income using the flat rate or the presumptive tax. Since the joint report yields tax benefits, married individuals (and single parents) might be thus more reluctant to use the flat regime or the presumptive tax, than unmarried people (without kids).

In the case of married couples, the reported joint taxable income is a sum of each spouse's income divided by two. A similar construction is used for the single parents, with an exception that the sum consists of parent's and child's income (if any).

### Population Control

From 1992, the tax unit has been individual. However, when an individual uses both types of tax regime (the progressive or the flat) or her income comes from specified sources, she has to submit multiple tax forms.<sup>91</sup> We describe the multiple reporting problem and the way to deal with it in the special section. Regardless of the method of merging income across the tax regimes, a good candidate for the relevant control total for the population is the total number of individuals, adjusted for the following tax reporting eligibility criteria:

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<sup>91</sup> For instance, when the individual uses either the progressive or flat tax regime she submits only one tax form and she appears only once in the statistics. When she uses both regimes, she needs to submit a multiple tax forms and thus will be reported two times. In theory one could submit up to four tax reports.

- People younger than 18 years old submit a tax form only when their income comes from an employment contract, scholarships, internships or a sale of items. In all other cases their income is reported through their parent's form.
- People older than 18 years old, who do not earn any taxable income, are not obliged to submit any tax form. The most important group which falls into this category are individual farmers (unless they receive income from a taxable source).

## Income Control

In order to approach the total income denominator for the 1992-2015 period, we use National Accounts figures. We add the following items to approach the aggregate that corresponds as closely to the concept of income reported in the tax statistics:

(i) wages and salaries received by households, net of employers' and employees' social security contributions, plus (ii) social security benefits in cash, plus (iii) 50% of profits of household unincorporated enterprises (taken as household operating surplus net of depreciation, net of primary income in agriculture and net of imputed rents of owners' occupiers), plus (iv) withdrawals from income of quasi-corporations received by households plus 30% of retained earnings of non-financial corporations.

Income denominator obtained this way results on average in 80 per cent of households' primary incomes. We take only half of the income of household's unincorporated enterprises because the Central Statistical Office publishes the national accounts figures corrected for the concealed activity, which is in the same manner concealed from the tax authorities. Moreover, the scope of the non-observed economy was especially worrisome for the transition economies. According to official estimates, concealed activity in Poland has been the most prevalent in the household sector, for example accounting for as much as 7 per cent of GDP in 1998 (United Nations 2003, p. 188).

*Table A5: Population and Income Control Total, Poland 1992-2015*

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Total tax units (in thd.)	Total population (in thd.)	(1)/(2) %	Total income (mill. PLN)	Total income (2010 mill. PLN)	Average income (2010 PLN) (5)/(1)	CPI 2010=100
1992	*	26,139	38,203	68%	66,462	373,384	14,284	18
1993	*	26,349	38,239	69%	94,674	388,010	14,726	24
1994	*	26,523	38,265	69%	134,547	413,991	15,609	33
1995		26,699	38,284	70%	173,282	415,544	15,564	42
1996		26,864	38,294	70%	204,866	410,554	15,283	50
1997		27,023	38,290	71%	262,782	457,808	16,942	57
1998		27,178	38,277	71%	315,471	491,387	18,081	64
1999		27,202	38,263	71%	337,896	491,128	18,055	69
2000		27,474	38,254	72%	371,729	490,408	17,850	76
2001		27,793	38,242	73%	404,779	506,607	18,228	80
2002		28,178	38,219	74%	406,035	498,814	17,702	81
2003		28,336	38,191	74%	416,707	507,560	17,912	82
2004		28,577	38,174	75%	441,645	519,582	18,182	85
2005		28,782	38,157	75%	453,337	522,277	18,146	87
2006		29,244	38,126	77%	486,912	554,570	18,964	88
2007		29,419	38,116	77%	520,345	578,804	19,674	90
2008		29,545	38,136	77%	580,996	619,399	20,965	94
2009		29,679	38,167	78%	621,502	638,092	21,500	97
2010		30,035	38,530	78%	652,950	652,950	21,740	100
2011		30,251	38,538	78%	699,969	671,112	22,185	104
2012		30,222	38,533	78%	722,072	668,586	22,122	108
2013		30,230	38,496	79%	727,425	666,751	22,056	109
2014		31,399	38,479	82%	760,176	696,132	22,171	109
2015		31,365	38,437	82%	791,372	732,074	23,341	108

Taken these together, the reasonable strategy for the control population is to use the size of population who are older than 18 years old and subtract the number of individual farmers.<sup>92</sup> The current levels of population (with a breakdown by age) are reported annually by *GUS*. The share of people working in agriculture is available from the censuses conducted in 2002 and 2011 and these are extrapolated for the remaining years.

It should be noted that in Polish national accounts enterprises smaller than ten employees are included in the household sector, while those with ten and above employees in the non-financial corporate sector. We take 'withdrawals from income of quasi-corporations' as a measure of distributed income of unincorporated enterprises in the corporate sector, as the CSO only estimates 'withdrawals' paid by non-financial corporations, and add 30 per cent of retained earnings of non-financial corporations (as unincorporated firms are as 'pass-through' entities taxed with their whole profits under PIT). Moreover, using the firm-level micro data from the Bureau van Dijk Amadeus database, we estimate that only between 2% to 13% of profits earned by companies larger than ten employees can be attributed to unincorporated enterprises.

It is interesting to note that distributed income from unincorporated enterprises accounts for the predominant form of distributed income received by Polish households, far surpassing dividends in magnitude. In fact, income from unincorporated enterprises ('business income') accounts for the largest part of the property income of households. This could be related to the relatively more frequent use of non-corporate business forms in comparison to companies that pay dividends (probably the business form used more by foreign investments). We should probably trace this practice to the influence of the German commercial law.

For years 1992-1994 we lack comparable external controls for total income to use the method described above. Instead, we use an alternative method to obtain total income control, which starts from the total income of taxpayers reported in tax statistics and add to it the total income of 'non-filers' (Atkinson 2007). Using this approach depends on the proportion of the population that files income tax returns. Today in Poland the majority of the population actually files personal income tax (either by themselves or by tax remitters such as employers or social insurance institutions), in average 85 per cent of our reference for the total population, which makes, in theory, this method a reliable alternative. For years 1992-4 we estimate total control for income by assuming that the total reported income of filers makes 85 per cent of the total income and consequently the total income of non-filers 15 per cent of the total income. This proportion is chosen based on the proportion of the income of filers in the total income in the late 1990s. The data on sectoral national accounts is available from the CSO of Poland and Eurostat.

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<sup>92</sup>Analyze of micro-data on source of incomes, might provide insights on the share of individual farmers who are receiving income also from taxable sources. This information can be used to adjust the number of subtracted individual farmers.

## Appendix 4: Estimation of income in tax brackets

For most of the years in the interwar period, only the number of taxpayers in specific brackets of gross income is reported without providing their corresponding income. We estimate income in each bracket by assuming that top incomes follow Pareto distribution.

Pareto cumulative distribution function  $F(y)$  for income  $y$  is:

$$1 - F(y) = (k/y)^a$$

where  $1 - F(y)$  is the proportion of tax units with income above  $y$ . Parameters  $k$  and  $a$  are given;  $k$  presents the minimum income to which the Pareto distribution is applicable ( $k > 0$ ), and  $a$  presents the slope of distribution ( $a > 1$ ) (Feenberg and Poterba 1993, p. 172).

In order to estimate amounts in bracket  $(s, t)$ , it is assumed that income in each bracket is distributed according to Pareto law. Let  $p$  present the proportion of tax units above  $s$  and  $q$  the proportion of tax units above  $t$ , then:

$$\begin{aligned} p &= (k/s)^a \\ q &= (k/t)^a \end{aligned}$$

From these equations, we obtain parameters  $a$  and  $k$ :

$$a = \log [(p/q)] / \log [t/s]$$

$$k = sp^{(1/a)}$$

We allow for variation of coefficients through the distribution, and accordingly estimate  $a$  and  $k$  for each bracket. Finally, the income in bracket  $(s, t)$  is estimated as

$$Y = N \int_s^t y dF(y)$$

where  $N$  is the total number of tax units.

However, this method cannot be applied to the top bracket. We assume that Pareto coefficient in the top bracket to be the same as the bracket immediately below it.

## Appendix 5: Interpolation

Up to 2006, the top bracket contains approximately 1 percent of the control population, making accordingly estimates constructed using this information quite robust to distributional form assumptions. However, the number of taxpayers in the top bracket rises steadily afterwards, containing more than 2 per cent of the population from 2008 and reaching 3 per cent in the recent years.

Therefore, we had to extrapolate using the specific distribution form in order to estimate the top 1 per cent income share for these years. As discussed in Section 2.5., the upper tail of income

distribution is quite well approximated by Pareto distribution, whose basic feature is that the ratio of average income above the certain threshold  $y$  and the threshold  $y$  is constant. This ratio is often termed as the inverted Pareto coefficient  $b$ . Thus, by assuming the constant Pareto  $b$ , it is straightforward to estimate top shares of specific fractiles.

However, in practice coefficient  $b$  can slightly vary with income even for the top of distribution in a given year, making the extrapolation into the open interval sensitive to the extent of this variation. Because we observe for preceding years (1992-2005) that Pareto coefficient  $b$  rises slightly with income as we move from the middle bracket to the top bracket threshold, extrapolation in order to obtain the top 1 percent income share would quite likely result in the underestimation of the top percentile. But since there is a fairly similar year-to-year change of Pareto  $b$  both for the middle and the top bracket observed in the preceding years, we obtain instead Pareto  $b$  coefficient for the top percentile in the 2009-2013 (when we have only two brackets) period by taking the Pareto  $b$  for the top percentile in 2008 as the starting point to which we apply the growth rate of Pareto  $b$  for the upper bracket from 2008 to 2013.<sup>93</sup>

## Appendix 6: Distribution of Earnings

For the interwar period, estimates of the upper part of distribution are based on annual enterprise surveys of workers in medium-sized and large enterprises in processing and energy industries (those with more than 20 employees, divided into three groups: enterprises up to 49 employees, enterprises with 50 to 199 employees, and enterprises above 200 employees). The Central Statistical Office and the Ministry of Industry and Trade conducted the survey quarterly in the months of February, May, August and November. Results were published in the form of tabulations ranged by the weekly wage. Published tabulations also provide earning bands by gender, by the size of the enterprise, by employees covered by collective agreements, by specific industry and by regions.

It should be noted that indicated dispersion in the upper part of the distribution should be seen as a lower bound since small enterprises not covered by the survey generally paid much smaller wages (Landau 1933, p. 118). Czajkowski (1934) thus estimated earnings distribution for all workers in 1934. Dispersion at the top is higher than in the case where only industrial workers in middle and large enterprises are covered, in the first place because of the now lower median wage. This corresponds to the Landau's observation mentioned above.

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<sup>93</sup> The same procedure when applied for 2006-2008 taking 2005 as the start year results in very close values of Pareto  $b$  as those observed in the data, so we do not make corresponding adjustments.



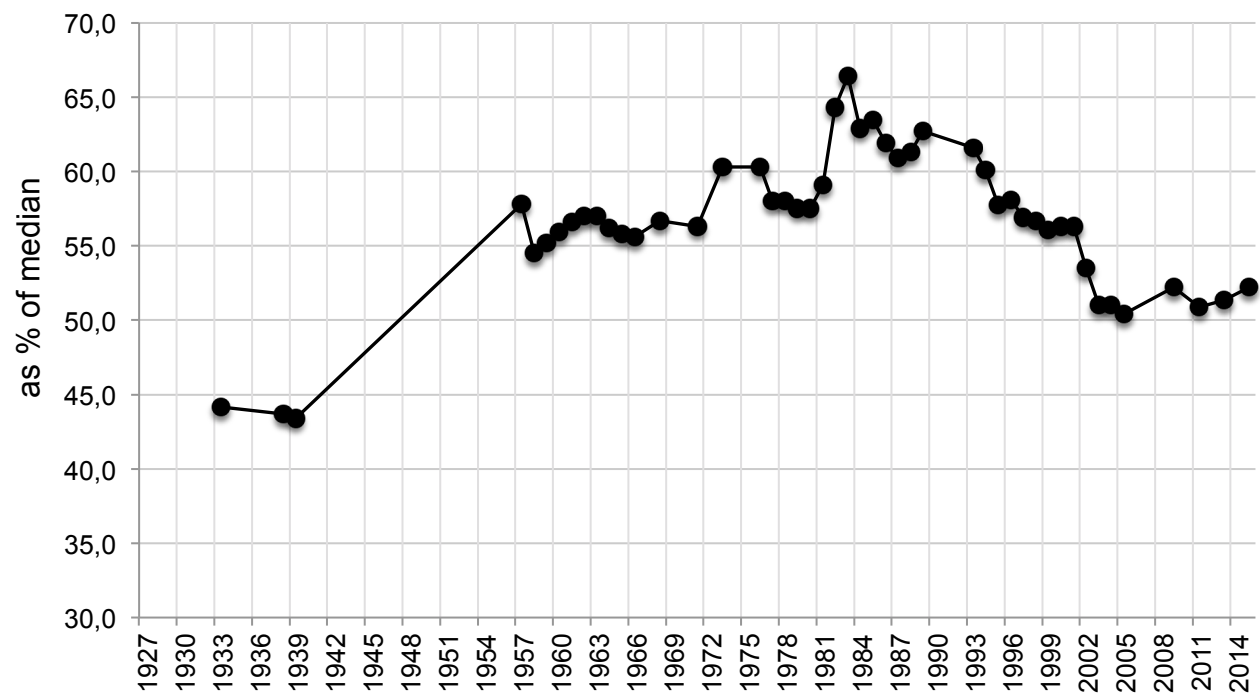


Figure A 7:P10 of the earning distribution in Poland

In socialist Poland the enterprise survey was conducted annually in the period from 1949 until 1989. The survey assessed earnings of full-time employees in September in socialized sector covering state-owned and cooperative enterprises. This covered around two-thirds of the total workforce, while excluded were self-employed and those working in the private sector. The predominant part of self-employed and employees in private sector was found in agriculture (Atkinson and Micklewright 1992, p. 257). The survey only included full-time workers in the month of September. Definition of earnings referred to gross monthly earnings (inclusive of bonuses and allowances) in the period from 1955 until 1970, while from 1970 the concept of net earnings was used instead Atkinson and Micklewright (1992, p. 257). However, Figure shows that in 1970, for which both concepts were published, upper percentiles show markedly higher level (as proportion to median) when using gross concept (Atkinson 2008, p. 320). From 1991 the private sector is covered as well (firms with more than six employees; Atkinson 2008, p. 320), and the gross concept of earnings is used.

## **Appendix 10: Top shares from EU-SILC**

The EU statistics on income and living conditions (EU-SILC) is survey data on income distribution collected by Eurostat. The reference population is all private households and their members aged above sixteen. For Poland, the sample consists of 6000 households and 15000 individuals every year and the available data spans from 2005 until 2013. For our analysis, we only look at people older than twenty years old. The income from capital and rental is defined at the household level, whereas income from employment, self-employment and pension benefits is collected for each individual separately.

In order to make the definition of income comparable to the tax data, we include income from employment, self-employment, pension, capital (interests, dividends, profit from capital investments in unincorporated business) and rental of a property or land. Employment income consists of employee cash or near cash income and non-cash employee income. Self-employment is defined as cash benefits or losses from self-employment (including royalties).

Since the tax data is at the individual level, our preferable unit of analysis is also an individual. We decided to assign the household-level income (capital and rental) to a household member who has the highest income from employment and self-employment. This way we obtain upper bound estimates of the top income shares. Alternatively, we also assume the household level as the unit of analysis, and we sum up all the income sources across the household members.

*Table A 6: Top income shares estimated from EU-SILC (unit of analysis are adults)*

	10%	5%	1%	0.5%	0.1%	10-5%	5-1%	1-.5%	.5-.1%	0.1%
2005	38.90	25.42	9.21	5.97	2.10	13.47	16.21	3.24	3.87	2.10
2006	36.46	23.55	7.82	4.66	1.21	12.91	15.73	3.16	3.45	1.21
2007	35.50	23.04	8.03	5.04	1.65	12.46	15.01	3.00	3.39	1.65
2008	35.12	22.96	8.43	5.45	1.80	12.16	14.53	2.98	3.65	1.80
2009	34.51	22.48	8.27	5.51	1.87	12.03	14.21	2.76	3.64	1.87
2010	33.83	21.43	7.32	4.61	1.30	12.40	14.11	2.71	3.31	1.30
2011	33.99	21.86	7.75	4.98	1.75	12.13	14.10	2.77	3.23	1.75
2012	33.47	21.25	7.20	4.55	1.40	12.22	14.05	2.66	3.14	1.40
2013	33.28	21.17	7.06	4.38	1.19	12.10	14.11	2.68	3.19	1.19

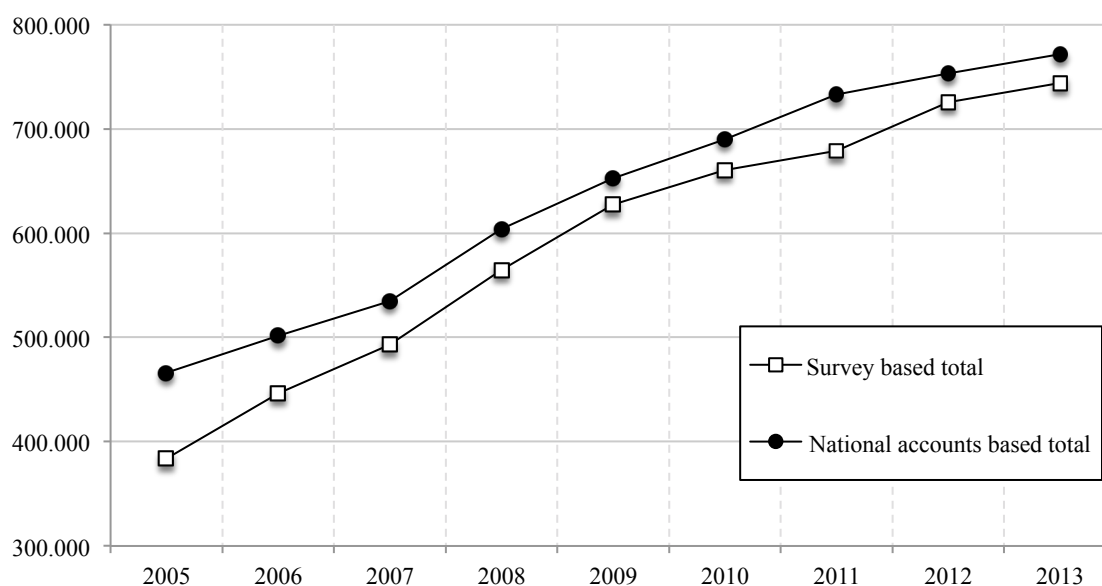
*Table A 7: Top income shares estimated from EU-SILC (unit of analysis are households)*

	10%	5%	1%	0.5%	0.1%	10-5%	5-1%	1-.5%	.5-.1%	0.1%
2005	32.5	20.5	6.9	4.4	1.4	12.0	13.5	2.5	3.1	1.4
2006	30.5	18.7	5.6	3.3	0.9	11.8	13.1	2.3	2.4	0.9
2007	30.0	18.5	5.8	3.6	1.2	11.5	12.7	2.3	2.4	1.2
2008	29.9	18.6	6.2	3.8	1.3	11.3	12.5	2.3	2.5	1.3
2009	29.0	18.0	6.2	3.9	1.3	11.0	11.8	2.3	2.6	1.3
2010	28.0	17.0	5.3	3.3	0.8	11.0	11.7	2.0	2.4	0.8
2011	28.7	17.6	5.7	3.6	1.1	11.1	11.9	2.1	2.5	1.1
2012	28.3	17.2	5.3	3.3	1.0	11.1	11.8	2.0	2.3	1.0
2013	28.1	16.8	5.1	3.0	0.7	11.2	11.7	2.1	2.3	0.7

*Table A 8: Average income and percentiles estimated from EU-SILC (unit of analysis are adults)*

	Average in- come						Threshold					
	All	10%	5%	1%	0.5%	0.1%	10%	5%	1%	0.5%	0.1%	
2005	13,394	52,084	68,094	123,302	159,991	322,273	31,442	42,221	78,000	100,826	230,400	
2006	15,477	56,425	72,896	120,732	143,515	205,465	34,716	46,708	87,520	111,540	173,302	
2007	17,012	60,391	78,390	136,461	170,696	362,170	37,334	49,605	90,798	118,885	244,490	
2008	19,388	68,060	88,955	163,088	208,834	389,945	41,429	55,026	103,270	136,853	276,339	
2009	21,501	74,185	96,600	177,744	236,669	558,282	45,312	60,000	107,592	137,017	408,675	
2010	22,554	76,283	96,657	164,800	206,128	419,332	49,393	64,661	112,305	134,765	314,062	
2011	23,069	78,397	100,808	178,474	229,593	479,823	49,695	64,580	115,997	145,226	308,256	
2012	24,288	81,287	103,237	174,805	219,374	460,996	52,030	68,489	118,990	148,081	271,404	
2013	24,932	82,964	105,552	175,022	217,319	379,163	52,961	70,188	120,706	152,174	286,428	

Note: amounts in zloty; average income for all taxpayers in million zloty



*Figure A7: Total controls in the estimated from national accounts and survey based*

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**References:**

Aghion P, and Bolton P. (1997). "A theory of trickle-down growth and development", *Review of Economic Studies*, 64, 151-72

Alvaredo, F., Atkinson, A. B., Piketty, T., & Saez, E. (2013). The top 1 percent in international and historical perspective. *The Journal of Economic Perspectives*, 27(3), 3-20.

Atkinson, A. B. (2007). "Measuring Top Incomes: Methodological Issues." In A. B. Atkinson and T. Piketty (Eds.), *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries* (pp. 18–42), Oxford University Press.

Atkinson, A. B., and Micklewright, J. (1992). *Economic Transformation in Eastern Europe and the Distribution of Income*. Cambridge: Cambridge University Press.

Atkinson, A. B., and Piketty, T. (2007). *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries* (Eds.), Oxford: Oxford University Press.

Atkinson, A. B., and Piketty, T. (2010). *Top Incomes: A Global Perspective* (Eds.), Oxford: Oxford University Press.

Atkinson, A. B., Piketty, T., and Saez, E. (2011). "Top Incomes in the Long Run of History". *Journal of Economic Literature*, 49(1), 3-71.

Baldwin, R. E. (2016). *The great convergence: information technology and the new globalization*, Cambridge: The Belknap Press of Harvard University Press

Banerjee, A. V., and Newman A. F. (1993). "Occupational choice and the process of development". *Journal of Political Economy*, 101, 274-298

Baten, J., and Schulz, R. (2005). "Making Profits in Wartime: Corporate Profits, Inequality, and GDP in Germany during the First World War". *The Economic History Review*, 58(1), 34-56.

Błaszczuk, B., and Woodward, R. (1999). "Privatization and Company Restructuring in Poland", *Case Reports* 18

Brus, W. (1974). Income Distribution and Economic Reforms in Poland. *Il Politico*, 39(1), 5-28

Bujak, F. (1908). *Galicja, t. I.—II*. Lviv, H. Altenberg

Ciccarelli, C., & Missiaia, A. (2014). Business fluctuations in Imperial Austria's regions, 1867-1913: new evidence. LSE Economic History Working Papers No: 186/2014

Clark, C. M. (2006). *Iron kingdom: the rise and downfall of Prussia, 1600-1947*. Cambridge MA: Belknap Press of Harvard University

Cvrcek, T. (2013). Wages, prices, and living standards in the Habsburg empire, 1827–1910. *The Journal of Economic History*, 73(1), 1-37.

Czajkowski, T. (1934), “Proba szacunkowego obliczenia zarobkow robotniczych w Polsce”, *Statystyka Pracy*, (4), 225-236.

Dahrendorf, R. (1968). *Society and democracy in Germany*, London: Weidenfeld and Nicolson

Davies, J. B. and Shorrocks, A. F. (2000). The distribution of wealth. In A. B. Atkinson and F. Bourguignon (Eds.), *Handbook of income distribution*, Volume 16 of *Handbooks in economics*, pp. 605–675. Amsterdam , New York: Elviesier

Dell, F. (2007). “Top Income in Germany throughout the Twentieth Century: 1891–1998”. In A. B. Atkinson and T. Piketty (eds.), *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries*, (pp. 365-425), Oxford University Press.

Derengowski, J. (1930). Płace robotników przemysłowych w Polsce w latach 1924–1929. *Statystyka Pracy*, (1), 118-122.

Djankov, S., and Murrell, P. (2002). “Enterprise Restructuring in Transition: A Quantitative Survey”, *Journal of Economic Literature*, 40, pp. 739–792

Dumke, R. (1991). “Income Inequality and Industrialisation: the Kuznets curve re-examined” in Brenner, Y., Kaelbe, H. and Thomas M. eds., *Income Distribution in Historical Perspective*, Cambridge: CUP

Eckert M. (1990). *Historia Polski 1914-1939*, WSIP Warszawa

Eddie, S. A. (2008). *Landownership in Eastern Germany before the Great War: a quantitative analysis*. Oxford: Oxford University Press 2008

Eddie, S. A. (2013). *Freedom's price: serfdom, subjection, and reform in Prussia, 1648-1848*. Oxford: Oxford University Press

Eyal, G., Szélényi, I. and Townsley E. (1998). *Making capitalism without capitalists: class formation and elite struggles in post-communist Central Europe*. London: Verso

Fazzari, S. M., Hubbard, G. R., and Petersen, B. C. (1998). "Financing Constraints and Corporate Investment", *Brookings Papers on Economic Activity* 1

Frank, A. F. (2005). *Oil Empire: Visions of Prosperity in Austrian Galicia*. Cambridge, Mass.: Harvard University Press

Flakierski, H. (1986). *Economic Reform & Income Distribution: A Case Study of Hungary and Poland*. Armonk, New York/London: M.E Sharpe

Galor O, and Zeira J, (1993). "Income distribution and macroeconomics", *Review of Economic Studies*, 60, 30-52

Gerlicz R. (1929). *Praca Najemna na Roli w Większej Własności Ziemskiej*, Wydawnictwo Rady Naczelnej Organizacji Ziemiańskich, Warszawa

Gerschenkron, A. (1943). *Bread and democracy in Germany*. Berkeley: University of California press

Glyn, A. (2009). "Functional Distribution and Inequality", In W. Salverda, B. Nolan, and T. M. Smeeding (eds), *Oxford Handbook of Economic Inequality*, Oxford: Oxford University Press

Gollin, D. (2002), "Getting Income Shares Right", *Journal of Political Economy* 110(2), 458-474.

Gradzewicz, M., Growiec, J., Kolasa, M., Postek, Ł., and Strzelecki P. (2014). "Poland's exceptional performance during the world economic crisis: New growth accounting evidence". *NBP Working Paper No. 186*

Grant, O. (2002). "Productivity in German agriculture: estimates of agricultural productivity from regional accounts for 21 German regions: 1880/4, 1893/7 and 1905/9", *University of Oxford Discussion Papers in Economic and Social History*, 47

Grant, O. (2005). *Migration and inequality in Germany, 1870-1913*. Oxford: Oxford University Press

- Grosfeld, I., and Senik, C. (2010). "The Emerging Aversion to Inequality". *Economics of Transition*, 18(1), pp. 1–26.
- Growiec, J. (2012). "Determinants of the labor share: evidence from a panel of firms". *Eastern European Economics*, 50(5), 23-65.
- Gruber, J., and Saez, E. (2002). "The elasticity of taxable income: evidence and implications", *Journal of Public Economics*, 84(1), 1-32
- Guriev, S., and Rachinsky, A. (2005). "The Role of Oligarchs in Russian Capitalism", *Journal of Economic Perspectives*, 19(1), 131-150
- GUS. (1949). *Dochód Narodowy Polski 1947*, Główny Urząd Statystyczny. Statystyka Polski ; seria D, Warszawa.
- GUS. (2003). *Historia Polski w Liczbach - Państwo i Społeczeństwo*, Główny Urząd Statystyczny, Warszawa.
- Haines, M. R. (1982). "Agriculture and Development in Prussian Upper Silesia, 1846-1913". *The Journal of Economic History*, 42(2), pp. 355-384.
- Hardach, G. (1977). *The First World War: 1914-1918*. London: Allen Lane
- Hoffmann, W. G., and Müller, J. H. (1959). *Das deutsche Volkseinkommen: 1851-1957*. Tübingen: J. C. B. Mohr
- Homze, E. L. (1967). *Foreign Labor in Nazi Germany*. Princeton UP
- Hubbard, G. (2001). "Entrepreneurial Saving Decisions and Wealth Inequality". In K. A. Hasset and G. Hubbard, eds., *Inequality and Tax Policy*, Washington: AEI Press
- Jäntti, M., Riihelä, M., Sullström, R. and Tuomala, M. (2010). "Trends in Top Income Shares in Finland", In A. B. Atkinson and T. Piketty, *Top Incomes: A Global Perspective* (Eds.), Oxford: Oxford University Press
- Jacks, D. S. (2005). Intra-and international commodity market integration in the Atlantic economy, 1800–1913. *Explorations in Economic History*, 42(3), 381-413.
- Jędruszczak, H. (1964). *Płace robotników przemysłowych w Polsce w latach 1924-1939*. Warszawa.
- Jezierski, A.(1967). *Handel zagraniczny Królestwa Polskiego 1815-1914*, Warsaw 1967



Jezierski, A. (1984), *Problemy Rozwoju gospodarczego ziem Polskich w XIX i XX wieku*, Warsaw

Jezierski, A. and Leszczyńska, C. (2003), *Historia Gospodarcza Polski*, Wydawnictwo Key Text, Warsaw

Johnson, S. (1994). "Private Business in Eastern Europe". In Blanchard, O., Froot, K., and Sachs, J. (Eds.), *Transition in Eastern Europe, Volume 2*, University of Chicago Press

Kaelble, H. (1986). *Industrialisation and Social Inequality in Nineteenth Century Europe*, Leamington Spa: Berg

Kalecki M., and Landau, L. (1934). *Szacunek dochodu społecznego w r. 1929*, Instytut Badania Koniunktur Gospodarczych i Cen, Badania nad dochodem społecznym w Polsce, t. 1. Warszawa.

Kalecki M., and Landau, L. (1935). "Social income in 1933 and the foundations of periodic studies on changes of income". In J. Osiatyński (Ed.), *Collected works of Michał Kalecki, Vol. VI, Studies in Applied Economics*, Oxford: Clarendon press, 1996, 436-483.

Kalecki, M. (1938) "The Determinants of Distribution of the National Income", *Econometrica*, 6(2), 97-112

Karabarbounis, L., & Neiman, B. (2014). The global decline of the labor share. *The Quarterly Journal of Economics*, 129(1), 61-103.

Keane, M. P., and Prasad, E. S. (2002). "Inequality, transfers, and growth: New evidence from the economic transition in Poland." *The Review of Economics and Statistics*, 84, pp. 324–341.

Keane, M. P. and Prasad, E. S. (2006), "Changes in the structure of earnings during the Polish transition," *Journal of Development Economics*, vol. 80(2), pp. 389-427.

Klarner, C. (1937), *Dochód społeczny wsi i miast w Polsce w okresie prze silenia gospodarczego 1929—1936*, Lwów

Kocka, J. (1978). *Klassengesellschaft im Krieg: deutsche Sozialgeschichte 1914—1918* (Vol. 8). Vandenhoeck & Ruprecht

Kolasa, M. (2008). "Productivity, innovation and convergence in Poland". *Economics of Transition*, 16(3), 467–501

Kolodko, G. W., and Nuti, M. (1997). "The Polish Alternative. Old Myths, Hard Facts and New Strategies in the Successful Transformation of the Polish Economy", *UNU/Wider Research for Action* No. 33

Kolodko, G. W. (2009). "A Two-thirds Rate of Success. Polish Transformation and Economic Development, 1989-2008", *UNU/Wider Research Paper* No. 2009/14

Kondratowicz, A., and Okolski, M. (1993). "The Polish Economy on the Eve of the Solidarity Take-Over", In H. Kierzkowski, M. Okolski and S. Wellisz (eds.), *Stabilization and structural adjustment in Poland*, London; New York: Routledge

Kopczuk, W. (2012). "The Polish business "flat" tax and its effect on reported incomes: a Pareto improving tax reform?", *Working paper*

Kośny, M. (2012). "Upper Tail of the Income Distribution in Tax Records and Survey Data: Evidence from Poland", *Paper Prepared for the 32nd General Conference of the International Association for Research in Income and Wealth*

Kowalik, T. (2011). *From Solidarity to sell-out: the restoration of capitalism in Poland*. New York: Monthly Review Press

Krusell, P., Ohanian, L. Rios-Rull, J.V., and Violante, G., (2000), "Capital–Skill Complementarity and Inequality: A Macroeconomic Analysis", *Econometrica* 68(5), 1029–1053.

Kuznets, S. (1953). *Shares of upper income groups in income and savings*. New York: National Bureau of Economic Research.

Kuznets, S. (1955). "Economic growth and income inequality". *American Economic Review* 45, 1-28.

Landau, L. (1933). *Płace w Polsce w związku z rozwojem gospodarczym*. Warszawa.

Landau, Z. (1963). "Polish Countryside in the Years 1929-1935", *Acta Poloniae Historica* 9

Landau, Z. (1968). "The reconstruction of Polish industry after World War I", *Acta Poloniae Historica* 18

Landau, Z. (1976). "National income in historical research (On material from the period of interwar Poland)", *Acta Poloniae Historica* 33

Landau, Z. (1978). "The extent of cartelization of industries in Poland, 1918-1939", *Acta Poloniae Historica* 38

Landau, Z. and Tomaszewski, J. (1984). "Spory o ocenę tendencji rozwoju gospodarki polskiej w latach 1918-1939", *Przegląd Historyczny: dwumiesięcznik naukowy*, 75(4), 723-746.

Landau, Z., and Tomaszewski, J. (1985). *The Polish economy in the twentieth century*, London: Croom Helm

Lindert, P., Milanović, B., and Williamson, J. (2010). "Pre-Industrial Inequality". *The Economic Journal*, 121(551), 255-272

Marcus, J. (1983). *Social and political history of the Jews in Poland, 1919-1939*. New York: Mouton

McCagg, W. O. (1989). *A History of Habsburg Jews, 1670-1918*. Bloomington: Indiana university press

Machin, S., and Van Reenen, J. (2007). "Changes in wage inequality". CEP LSE Special Report No.8

Mavridis, D., and Mosberger, P. (2016). "Income Inequality and Incentives The Quasi-Natural Experiment of Hungary, 1914-2008", mimeo.

Mieszczankowski, M. (1960). *Struktura agrarna Polski międzywojennej*. Warszawa: Państwowe Wydawn. Naukowe

Milanović, B., (1998). *Income, Inequality, and Poverty During the Transition from Planned to Market Economy*. Washington DC: The World Bank.

Milanović, B. (1999). "Explaining the increase in inequality during Transition". *Economics of Transition*, 7(2), 299-341.

Milanović, B. (2016). *Global Inequality. A New Approach for the Age of Globalization*. Cambridge. Massachusetts: The Belknap Press of Harvard University Press

Mitra, P., and Yemtsov, R. (2006). "Increasing inequality in transition economies: Is there more to come?", *Policy Research Working Paper Series 4007*, The World Bank.

Neneman, J., and Piwowarski, R. (2004). Jaki system podatkowy. CASE – Centrum Analiz Społeczno-Ekonomicznych, Warszawa

Newell, A. and Socha, M. W. (2007), "The Polish wage inequality explosion," *Economics of Transition* 15, 733-758.

NBP (Narodowy Bank Polski). (2015), *Zasobność gospodarstw domowych w Polsce. Raport z badania pilotażowego w 2014 r.* Departament Stabilności Finansowej, Warszawa

Olsson, L. (1996). "Labor Migration as a Prelude to World War I". *The International Migration Review*, 30(4), 875-900

Petyniak-Sanecki, K. (1939), *Współczesne zagadnienia gospodarcze*, Part II, Lwów

Piketty, T. (2014). *Capital in the 21st century*, Belknap, Cambridge, MA.

Prokopovitch, S. (1926), "The Distribution of National Income", *Economic Journal*, 36, 69–82.

Ritschl, A. (2005). "The pity of peace: Germany's economy at war, 1914-1918 and beyond". In S. Broadberry and M. Harrison (Eds.), *The Economics of World War I* (pp. ), Cambridge University Press.

Roine, J., and Waldenström, D. (2009). Top incomes in Sweden over the twentieth century. *Top Incomes: A Global Perspective*, 2.

Roine, J., and Waldenström, D. (2015). "Long-Run Trends in the Distribution of Income and Wealth", In A.B. Atkinson and F. Bourguignon, eds., *Handbook of Income Distribution*, Vol. 2, Amsterdam: North-Holland

Rudolph, R., L. (1995). "Major issues in the study of the European peasant family, economy and society". In R., L. Rudolph (ed.), *The European peasant family and society: historical studies* (pp. 6-25), Liverpool University Press.

Saez, E. (2004) "Reported Incomes and Marginal Tax Rates, 1960-2000: Evidence and Policy Implications." In J. Poterba, ed., *Tax Policy and the Economy*, 18, 117-74. Cambridge and London: MIT Press.

Scase, R. (1998) "The Role of Small Businesses in the Economic Transformation of Eastern Europe: Real But Relatively Unimportant?", *International Small Business Journal* 16(1), 13-21.

Scheve, K. and Stasavage, D. (2010). "The Conscription of Wealth: Mass Warfare and the Demand for Progressive Taxation", *International Organization*, 64(4), 529-561

Snyder, T. (2015). *Black earth: the Holocaust as history and warning*. New York: Tim Duggan Books

Stiglitz, J. (1999). "Whither Reform? Ten Years of the Transition," presented at Annual Bank Conference on Devel. Econ., World Bank, Washington DC.

Sweezy, M. Y. (1939), "Distribution of Wealth and Income under the Nazis", *The Review of Economics and Statistics*, 21(4), 178-184

Szturm de Sztrem, T. (1922). Walka o place zarobkowe. GUS

Szulc, A. (2000). "Economic transition, poverty and inequality: Poland in the 1990s." *Statistics in Transition*, 4, pp. 997–1017.

Szulc, A. (2006). "Poverty in Poland during the 1990s: Are the results robust?", *Review of Income and Wealth*, 52, 423–448.

Szulc, A. (2008). "Checking the consistency of poverty in Poland: 1997–2003 evidence." *Post-Communist Economies*, 20, 33–55.

Surdej, A. (2000). "Small- and Medium-Sized Enterprise Development in Poland after 1990", *UNU/Wider Working Papers* No. 216.

Taussig, F. W. (1915). *Some Aspects of the Tariff Question*. Cambridge, MA: Harvard University Press

Tims, R. W. (1941). *Germanizing Prussian Poland, the H-K-T society and the struggle for the Eastern marches in the German Empire, 1894-1919*, New York: Columbia University press

Tinbergen, J. (1974). "Substitution of Graduate by Other Labour." *Kyklos* 27 (2): 217–26

Tipton, F. B. (1976). *Regional variations in the economic development of Germany during the nineteenth century*. Wesleyan University Press.

Tomaszewski, J. (1983). "German Capital in Silesian Industry in Poland between the two World Wars". In Teichova, A. and Cottrell, P. L. (Eds.), *International Business and Central Europe, 1918-1939* (pp. 227-247). Leicester: Leicester University Press

Uvalić, M. (2003) "Privatization approaches: effects on SME creation and performance", In R. J. McIntyre and B. Dallago, eds., *Small and Medium Enterprises in Transitional Economies*, Palgrave Macmillan, pp. 171-184

Wellisz, L. (1938), *Foreign Capital in Poland*, London: Georg Allen and Unwin.

Wiśniewski, J. (1934). *Rozkład dochodów według wysokości w r. 1929*, Instytut Badań Koniunktur Gospodarczych i Cen, Badania nad dochodem społecznym w Polsce. t. III. Warszawa.

Wolf, N. (2006). "Local Comparative Advantage: Agriculture and Economic Development in Poland, 1870-1970", Working paper

Wolf, N. (2007). "Endowments vs. market potential: What explains the relocation of industry after the Polish reunification in 1918?", *Explorations in Economic history*, 44(1), 22-42.

Załęski, W. (1901). *Królestwo Polskie pod względem statystycznym*. Skład Główny w Księgarni Jana Fiszera.

Zubrzycki, J. (1953). "Emigration from Poland in the nineteenth and twentieth centuries," *Population Studies*, 6 (3), 248–272.

Zucman, G. (2015). *The Hidden Wealth of Nations. The Scourge of Tax Havens*. Chicago: The University of Chicago Press

# Chapter 3. Inequality in the Pre-industrial Country, Bulgaria 1911-1945: Evidence from Dynamic Social Tables and Top Income Shares

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## Abstract.

We construct two novel datasets in order to estimate income inequality in pre-communist Bulgaria: the dynamic social tables and top income shares. According to both data sources, inequality was relatively low in Bulgaria. We explain this in the framework of the sectoral development of the country and the absence of the structural change. In predominantly agricultural Bulgaria, poor and egalitarian primary sector, characterized by the markedly egalitarian land distribution and unskilled labour, constrained inequality in line with the logic of the 'inequality possibility frontier'. The inequality dynamics was largely driven by changes in the urban-rural income gap due to higher mean incomes in the non-agricultural sector. The strongest rise of inequality occurred during the Great Depression when the urban rural-gap surged as a result of 'price scissors'. The relatively lower levels of top incomes shares and their pronounced stability in Bulgaria are explained by the absence of large capital incomes, which itself was a consequence of the absence of structural change. We also find that the the Great Depression signified a turn toward growing étatism. This is reflected in the geographical redistribution of top incomes, which became predominantly concentrated in the capital, Sofia.

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\* This chapter is co-authored with Stefan Nikolić. Parts of the chapter are based on my master thesis (Novokmet 2011).

### 3.1. Introduction

This chapter turns our attention to pre-communist South-Eastern Europe. We look at the income inequality in Bulgaria from the end of the 19<sup>th</sup> century until the communist accession to power. The main motivation is to spark the interest in historical patterns of income inequality in Eastern Europe. In general, very little is known on historical income inequality in Eastern Europe, and, in particular, there is a strong dissatisfaction with the current state of research for the pre-socialist period. While socialism and accompanying transitional phase have received a substantial attention, for earlier periods we are left in an almost complete dark. In recent years a number of influential studies have made considerable progress on charting the evolution of inequality in the past, but these have rarely dealt with or altogether bypassed Eastern Europe. The dearth of research is nicely illustrated by the need of Bourguignon and Morrisson (2002) to proxy interwar inequality in the whole of Eastern Europe based on estimates for Russia and Germany only. Recently, Lindert and Nafziger (2014) have studied inequality in pre-revolution Russia, but overall, economic historians have been guilty of serious neglect.

We have addressed this issue by using two independent methodological approaches to construct annual estimates of income inequality in Bulgaria in the first half of the 20<sup>th</sup> century: the social tables and top income shares. Thus, rather than looking at different inequality measures in isolation, we emphasize the need for combining various historical sources in order to obtain more comprehensive coverage of the income distribution. As we show, the approaches are highly complementary and help to deepen our understanding of the historical inequality dynamics.

In the absence of modern household surveys or fiscal data, social tables have been used in economic history as a source of information about the income distribution (Lindert and Williamson 1982, 1983, 2016; Milanovic et al. 2011). The social tables order active population according to social categories (e.g. workers, employees, employers, etc.) and their incomes. Using a new data set constructed from numerous scattered national sources, we construct the so-called 'dynamic' (time-series) social tables (Milanovic 2016, Rodriguez Weber 2014) for the first half of the 20<sup>th</sup> century, by keeping social categories fixed over time but allowing their characteristics (occupational structure, income) to vary. The series are then used to investigate both the levels and trends of income inequality using different inequality measures. The evidence from dynamic social tables is compared to top income estimates and placed in the



international comparative perspective.

Top incomes shares are constructed by combining income tax data with external sources on population and income control totals (Kuznets 1953, Pikety 2001, Atkinson and Piketty 2007, 2010). Top income series have been critical for charting long-run evolution of inequality, thus providing the empirical basis for path-breaking theories in the field (Kuznets 1955; Piketty 2014). We present new top income shares series in Bulgaria for the period 1919-1945. The series use homogenous methodology and therefore allow comparison in the international context.

The obtained inequality measures from social tables and top incomes provide the consistent picture of inequality in Bulgaria in the first half of the 20<sup>th</sup> century. Both suggest that inequality in Bulgaria was relatively low. In order to explain this, we point to the pre-industrial character of the country and the central role of sectoral development in shaping inequality. The inequality levels in poor pre-industrial Bulgaria are explained in the logic of 'inequality possibility frontier' (Milanović et al. 2011, Milanović 2016). In the predominantly agricultural Bulgaria, more than three-fourths of population was employed in agriculture, which predominantly functioned in the subsistence manner. A markedly egalitarian distribution of land ownership and the uniform unskilled labour made the dispersion in the agricultural sector quite modest. The non-agricultural sector displayed larger income dispersion due to higher productivity, and as a result, the sectoral income gap between the agriculture and the non-agricultural sector played the main role in driving inequality. However, its impact on inequality levels was limited due to the very small non-agricultural sector. In the same framework, fluctuation in inequality was driven by the 'idiosyncratic' events that affected urban-rural gap, such as the 'price scissors' during the Great Depression, which resulted in the devastating shock to peasants' living standard.

Several recent reassessments of economic historians have emphasized positive aspects of the Bulgarian development before WWII, such as the moderate agricultural intensification, the demographic transition, or the spread of universal literacy (Ivanov and Tooze 2007). However, these achievements rather made the asset for the future, and the actual record had been that of disappointing growth, rural overpopulation, backward agriculture and failed industrialization. The absence of structural change might have precluded the prolonged increase in income inequality along the development path envisaged by the Kuznets' (inverse-U) curve.

The absence of structural change also explains notably lower top income shares observed in interwar Bulgaria than in contemporary developed countries. We explain lower top incomes shares in interwar Bulgaria largely by the absence of large capital incomes, which are in turn seen as a consequence of the absence of structural change. Here, it is important to emphasize that Kuznets (1955) proposed the rising capital concentration as an (often overlooked) alternative force inducing the increase in inequality along the development trajectory (Atkinson et al. 2011, p. 57).<sup>1</sup> Accordingly, the industrialization and the advancement of capitalism with the capital deepening are accompanied by the rising concentration of the newly accumulated capital (Allen 2009; Ohlsson et al. 2010; Roine and Waldenstrom 2015). Indeed, the literature on top incomes explains very high levels of top income shares in advanced countries in the first half of the 20th century by the strong concentration of capital income at the top of the distribution (high top incomes were, accordingly, ‘capital income phenomenon’; Atkinson and Piketty 2007, 2010). This indicates the need to pay attention both to the rising importance of capital as the factor of production (functional income distribution) and to its distribution. Accordingly, the scarce capital in the country and the egalitarian land distribution made the Bulgarian top incomes notably lower than in the advanced capitalist countries.

Bulgarian top income shares displayed a notable stability in the first half of the 20<sup>th</sup> century, quite unusual for this turbulent historical era, when top incomes in industrial countries were exceedingly hurt by political and institutional shocks such as the World Wars, the Great Depression, stock market crashes, anti-capitalist policies, etc. We believe that the absence of large capital incomes equally explains why Bulgarian top incomes did not experience dramatic shocks. The great fortunes – associated with the (advancement) of capitalism – were lacking in Bulgaria, and their absence explains both lower levels of top income shares as well as their pronounced stability in Bulgaria during the great turmoil of the global capitalism in the first half of the 20<sup>th</sup> century. Bulgaria was a country of small peasants, without grand bourgeoisie or landed nobility. The stability in Bulgaria's series during the shocks of the interwar period may be attributed to inflexible wages of burgeoning public sector.

This paper wishes to contribute methodologically to the research on the historical evolution of inequality in South-Eastern Europe. We have presented the two novel datasets allowing the assessment of the historical evolution of inequality: the dynamic social tables and top income

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<sup>1</sup> The exact mechanism is concentration of savings among the rich (Kuznets 1955)

shares. We show that it is important to combine various sources in to ascertain broader picture of inequality in the specific historical context.

### **3.2. Historical overview: Bulgarian economic development from the Independence to Communism**

The story of the Bulgarian development from the time of obtaining its independence from the Ottoman rule<sup>2</sup> until the Communist accession to power gives an impression of, as Palairret (1997) termed it, the 'evolution without development' (Figure 1). Gerschenkron (1962) has made the strongest case for the failed modernization in the pre-WWII Bulgaria. He pointed out that in the case of Bulgaria, the failure to industrialize lies in "the absence of structural change rather than absence of (industrial) growth" (p. 213). In his terminology, Bulgaria did not find its unique 'substitutes for prerequisites', since it failed to implement Danish industrialization model (Lampe 1986, p. 71) and was not able to follow the Soviet authoritarian example because of the stronger political influence of the peasant population.<sup>3</sup> The Gerschenkronian pessimistic picture of failed modernization has cast a shadow over the narrative of the Bulgarian economic development before WWII, and although some of its aspects have been rightfully challenged (such as the 'peasant traditionalism'; see below), there is an undeniable evidence of the lack of major economic improvement (Ivanov 2006, Ivanov and Tooze 2007), leaving the pessimistic view as the dominant historical discourse.<sup>4</sup>

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<sup>2</sup> Bulgaria was de facto independent as Principality of Bulgaria since the Russo-Turkish War of 1877/8 and the Treaty of San Stefano, and officially from 1908.

<sup>3</sup> Gerschenkron thus pointed out that Bulgarian governments couldn't "pursue an economic policy that involved placing, for the sake of industrialization, major burdens upon the peasant population of the country" (most notably in the "radical populism of Stamboliiski" (Gerschenkron 1962, p.213))

<sup>4</sup> For example, recent major accounts in Bulgarian of Rumen Avramov and Rumen Daskalov (Ivanov and Tooze 2007, p. 674)

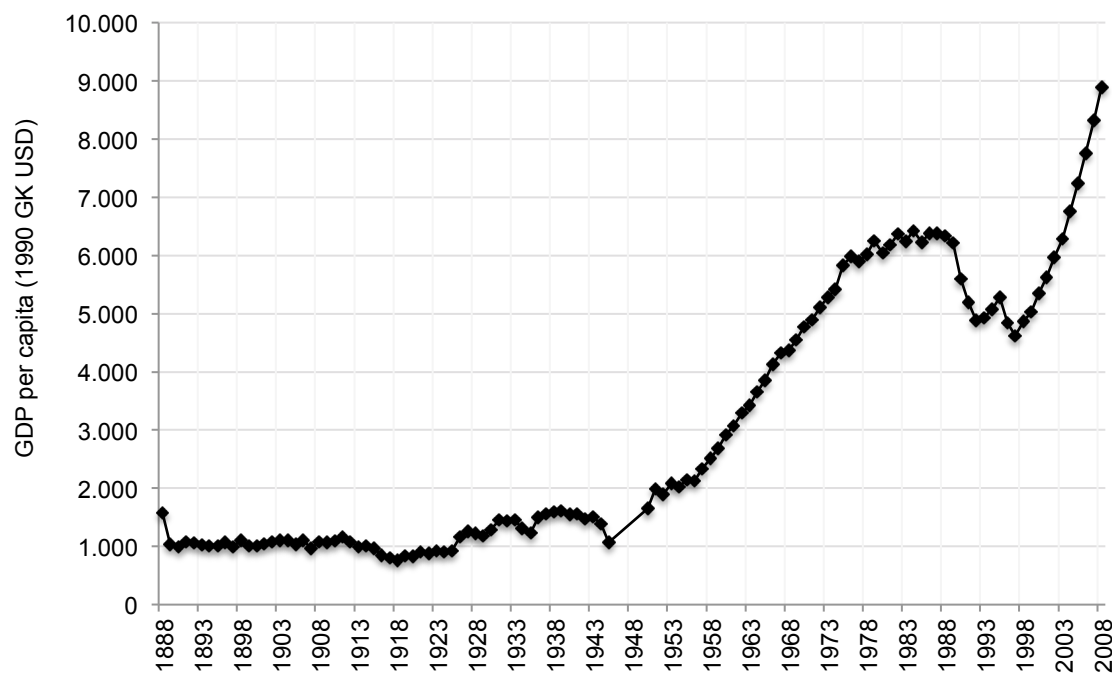


Figure 1: Long term development in Bulgaria

Source: Maddison 2013; the series before 1924 extended from Ivanov (2006)

The sectoral development clearly points to the absence of the major structural change in Bulgaria. Figure 2 shows the shares of employment in industry and the real GDP per capita in European countries in the interwar period. It can be seen that Bulgaria bottoms the list. Bulgaria was among the poorest and the least industrialized European countries during the interwar period. In South Eastern European countries – Bulgaria, Yugoslavia and Romania – the share of employment in agriculture was around eighty per cent and only ten percent of the labour force was employed in industry (Buys and Franaszek 2010, pp. 209-10). The subsistence agriculture and the most severe rural overpopulation, coupled with the very small industrial sector, kept Bulgaria in the low-growth equilibrium and made the exigency of major structural change.<sup>5</sup> For example, if the cross-country presentation in Figure 2 is used to sketch out the hypothetical development path, indicated by the grey line, then Bulgaria's bottom position would entail high marginal returns of industrialization.

<sup>5</sup> The natural rate had to be halved in order to avoid Malthusian catastrophe (Lampe and Jackson 1982).

The sectoral development has adequate explanatory power to assess the inequality dynamics in pre-communist Bulgaria, in the first place due to the huge, backward and egalitarian primary sector. Equally, it can account for the cross-country difference in inequality. For example, in Czechoslovakia, which we take as our comparison benchmark (see below), the sectoral development was evenly distributed, with a third of population employed in agriculture, industry and services, respectively.<sup>6</sup> The sectoral development underlying the hypothetical curve on Figure 1 is the convenient framework to consider the differences in income inequality in Bulgaria and Central European countries in the interwar period (especially in countries where Communists obtained power after WW2).

Furthermore, note that when the country is moving over time along the 'hypothetical' curve from the Bulgaria's to the Czechoslovakia's position in Figure 1, it makes the benchmark case of the Kuznets' (1955) scenario of the rising part of the inverse-U curve (for the early stages of development) amid the structural change,<sup>7</sup> and one can deliberate over the counterfactual evolution of inequality in Bulgaria if the industrialization and urbanization had not been eventually made by communists. It is impossible to tell whether the implications of the Kuznets' (1955) model for the inequality dynamics would have been validated in this case (see in general Ahluwalia 1976, Anand and Kanbur.1993; or Milanović et al. 2011 and Milanović 2016 for the 'inequality possibility frontier' framework (see below)), yet the communists obviously believed that they would be, so they made sure to avoid it.

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<sup>6</sup> This division closely corresponds to the contemporaneous distribution in Western Europe. It can be seen (as we looked in a more detail in chapter 1) that the Czechoslovakia's economy was quite similar to Central European countries, in the first place to Germany and Austria, and stands in stark contrast to countries in South Eastern Europe.

<sup>7</sup> Moreover, since interwar Bulgaria with low income and egalitarian agricultural sectors meets the model's initial conditions. The standard interpretation has been that the sectoral shift of the labour from less unequal and less productive agricultural sector to more unequal and more productive non-agricultural (industrial/urban) sector underlines the increase in inequality in the early stages of growth, and eventually falls due to the income compression in the non-agricultural sector.

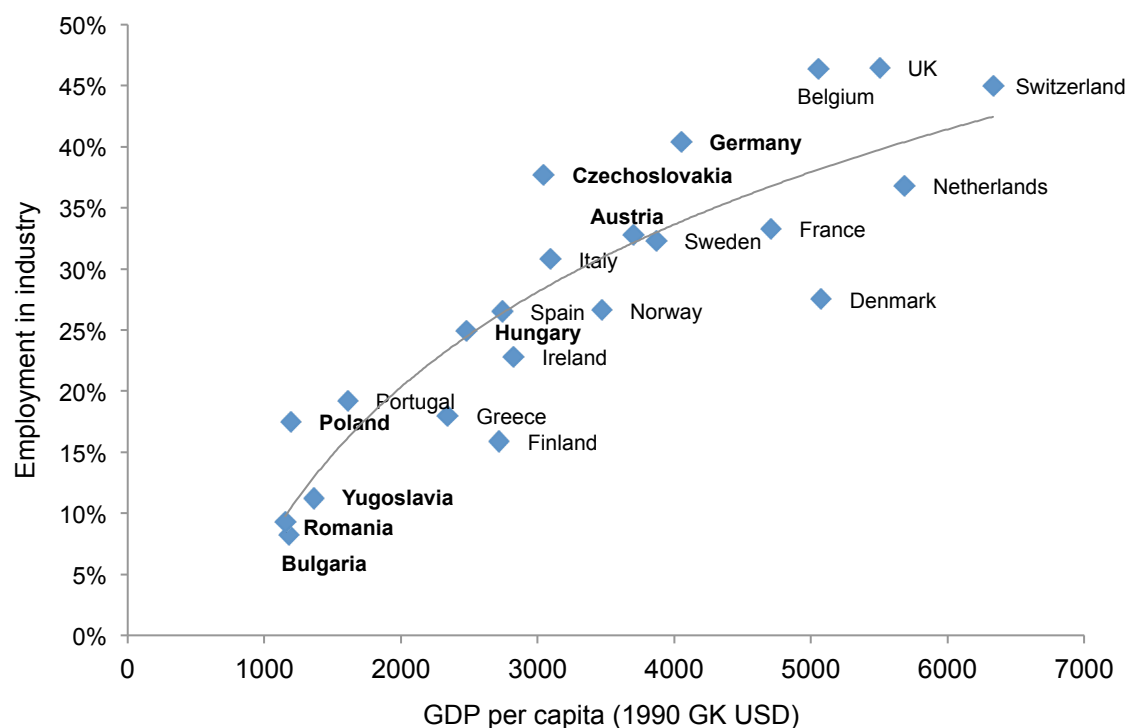


Figure 2: Share of employment in industry and GDP per capita in Europe in the interwar period

Source: Share of employment in industry: Buyst and Franaszek (2010), Table 9.1, p. 210. GDP per capita: Roses and Wolf (2010), Table 8.3, p. 190.

Note: Shares of employment in industry are for 1930; GDP per capita for 1929 (in 1990 int. Geary-Khamis dollars)

The Bulgarian development before WWII gives a picture of stagnating income per capita (Chakalov 1946, Ivanov 2006) and the convergence discourse is dominated by the failed modernization. After 1945, the Communists implemented huge industrialization and urbanization (actually guided by the simple logic underlying the curve in Figure 2; see chapter 5, Box 1) and achieved the strong growth of income per capita until the beginning of the 1980s (Figure 1).<sup>8</sup> There is a broad consensus in the literature with respect to the exigency of the massive structural change before WWII for the convergence, and the disagreement has to do more with appreciating certain achievements not visible in the economic 'accounting'. Even these 'revisionists' views acknowledge the Bulgaria's sluggish economic performance, and they point instead to the notable success in creating preconditions for the development. In the words of Ivanov and Tooze (2007, p. 698): "though performance in per capita income terms in the 1920s and 1930s was indeed disappointing, Bulgarian society underwent three key shifts", or "three

<sup>8</sup> When the 'orthodox' growth model ran into diminishing (and often negative) marginal returns. As suggestive from Figure 1, moving from Czechoslovak to Swiss levels is clearly related to 'soft' mechanisms driving the economic growth often used middle income traps

vital preconditions for accelerated growth” (ibid.). Here they refer to a switch from a decades-long extensive agricultural development towards intensive production, the demographic transition and the universal literacy. They conclude that the “preconditions for growth, sometimes attributed to Communism, were in place well before 1945” (p. 672). In short, they play down the effectiveness of the communist ‘Big push’,<sup>9</sup> as well as propose that these major improvements (e.g. in human capital) made the welfare gains of the eventual migration out of agriculture material.

Especially important contributions have been made regarding the positive reassessment of the role of agriculture and peasants in general (Lampe and Jackson 1982, Ivanov and Tooze 2007, Ivanov and Kopsidis 2015). The traditional narrative has identified it as the main obstacle to the Bulgaria’s modernization. Ivanov and Kopsidis (2015) summarize the Gerschenkronian negative assessment: “the absence of structural change... can mainly be attributed to a low productive, backward, inherently subsistence-oriented and market-hostile small peasant agriculture”. Palairot (1997) sees the ‘peasantization’ of South Eastern European countries after national liberation as a step back from the Ottoman liberal reforms, leading to the fall in productivity and land fragmentation. Further, it was argued that the peasant ‘traditionalism’ was imbued with ‘irrationalism’ and the anti-market culture and unwillingness to change. For example, it has been often argued that the Bulgarian peasant was even extraordinary by the regional standards in their contempt for the market economy and the profit motive. Gerschenkron blamed ‘ethos of equality’ among peasants, as well as “radical populism of Stamboliiski” for the failed modernization. But, most of this criticism has been unfounded. Peasant responded rationally to constraints they faced.<sup>10</sup> There are also positive reassessments of ‘radical’ Stamboliiski’s populism (Bell 1977). As a bottom line, it was not agriculture that was to blame for failed modernization (Ivanov and Kopsidis 2015).

There are many indication that positive advancements in agriculture were happening in the very unfavourable macroeconomic conditions (Kopsidis 2012).<sup>11</sup> Financial situation was bleak, Kingdom of Bulgaria entered in a turbulent decade that was marked by the two Balkan Wars and WW1, and left the country economically exhausted. As a consequence of finding itself on the

<sup>9</sup> Note that Rosenstein-Rodan (1943) actually has in mind South Eastern Europe.

<sup>10</sup> As Theodore Schulz pointed out in his Nobel lecture: «People who are rich find it hard to understand the behaviour of poor people. Economists are no exception, for they too find it difficult to comprehend the preferences and scarcity constraints that determine the choices that poor people make.»

<sup>11</sup> For example, as was the case for ‘northern’ European agriculture in the 19th century (Kopsidis 2012)

losing side, war reparations were enforced on Bulgaria under the Treaty of Neuilly-sur-Seine of 1919.<sup>12</sup> Bulgaria was eager to respect its international obligations<sup>13</sup> and to stabilize its currency by returning and faithfully adhering to gold standard. In order to understand this eagerness, it is important to emphasize the hopelessness of the situation that Bulgaria found itself in. As the only regional loser in WW1, Bulgaria was devoid of help of Western countries (Lampe 1986, p. 51),<sup>14</sup> which basically meant that it was hard to get international loans that the country so desperately needed. The Bulgarian government, as pointed by Lampe (1986, p. 63), “hoped in vain that adherence to the standard would give the Bulgarian government access to international loans and the ‘room to live’”. The wartime suspension of convertibility was in accordance with the contingent rule (‘escape clause’) under the gold standard (Bordo and Kydland 1995, Nenovsky 2006), and the return was hoped to bring “good housekeeping seal of approval” (Bordo and Rockoff 1996). Furthermore, Bulgaria was a kind of ‘collateral victim’ of gold standard mentality that dominated the western economic ideology (Eichengreen 1992; Lampe 1986, p. 64). This relative isolationism coupled with the world crisis of the 1930s prompted Bulgarian economy to rely heavily on trade with Germany in the 1930s, and eventually its ill-fated alliance with Germany in WW2.

### 3.3. Data and Methodology

#### 3.3.1. 'Dynamic' social tables

Social tables describe society according to social categories and income. In the absence of modern household surveys or fiscal data, social tables have been used in economic history as a source of information about the income distribution. For example, social tables have been (re)constructed for England and Wales 1688-1913 (Lindert and Williamson, 1982, 1983) as well as for the USA 1774-1870 (Lindert and Williamson, 2013, 2016). A recent development has been the construction of so-called “dynamic” social tables (Bertola 2005, Milanovic 2016,

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<sup>12</sup> Bulgaria was expected to pay 2.25 billion gold francs at 5 percent annual interest rate over 37 years beginning 1 January 1921 (Lampe 1986, p. 61). War reparation obligation ended under Mushanov Democratic Party in 1931, primarily because of the Bulgaria’s inability to pay (Lampe 1986, p. 80).

<sup>13</sup> In a large part pressured by foreign (monetary) interests (Lampe 1986, p. 60).

<sup>14</sup> In contrast to countries that surrounded it, namely Romania, Yugoslavia, and Greece.



Rodriguez Weber 2014). Dynamics are introduced by keeping social categories (e.g. workers, employees, employers) fixed, but allowing their characteristics (occupational structure, income) to vary over time. Contrary to “static” social tables which are produced for benchmark years, “dynamic” social tables offer a time-series perspective on inequality.

Dynamic social tables for Bulgaria (1911-1945) are constructed by combining data on occupational structure and income. Population (occupational) censuses categorize active population according to social categories – workers, employees, assistants and independents. In turn, each social category is further divided according to economic branches and gender. Income is assigned to each member of the labour force differentiating between four social categories, 21 economic branches, and gender. With data for 22 years, this results in more than 4000 observations.

Population censuses provide the data on occupational structure in 1910, 1920, 1926 and 1934. Occupational structures are kept fixed between these benchmark years and after 1934. For 1910 and 1920 the category “assistants and employees” is disaggregated into two separate categories applying 1926 weights. Economic branches are aggregated so as to ensure comparability across census years. The resulting economic branches cover all three economic sectors - agriculture, industry and services.

Income data comes from various national sources – primarily statistical yearbooks and national income studies (Chakalov 1946, Ivanov 2006). Incomes for all social categories in economic branches of the service sector are from Chakalov (1946) and Ivanov (2006). The incomes of workers in various branches of industry are estimated based on data from statistical yearbooks. The incomes of employees, assistants and independents are estimated by multiplying workers’ incomes by the relevant skill premium calculated based on Chakalov (1946) and Ivanov (2006). An industry average gender premium is applied in both industry and services in order to estimate differences in incomes of males and females.

Incomes of workers in agriculture are available from Chakalov (1946). The incomes of other social categories are, however, unknown. Since agriculture accounted for the highest share of national income in Bulgaria, it is crucial to capture within inequality in agricultural incomes as precise as possible. Following Rodriguez-Weber (2014) income from labour is assigned to each social category. It is assumed that independents and an equivalent amount of assistants

considered to be the spouses of the independents earned 90% of the income of workers. The remaining assistants – other helping family members (e.g. children) – earned 70% of the income of workers. Employees (the number of which was negligible) earned the same income as workers. Total income from labour is then subtracted from national income in agriculture. The residual is distributed to independents and their assistants using land distribution from agricultural censuses.

### 3.3.2. Top income shares

**Personal income taxation.** Faced with burdensome public finances and an ambitious reform agenda, the Agrarian government of Aleksandar Stamboliiski introduced progressive income tax in 1920.<sup>15</sup> We can trace origins of income tax in Bulgaria to the *Temetuat-Vergissi* tax from the Ottoman period that was collected at the fixed (3 percent) rate from every source of income. The tax was transformed at the end of the nineteenth century into the ‘tax on professions’ with the progressive assessment (Nedkov 1938, p. 243). But, the Bulgarian administration was greatly unprepared for such a demanding task. After the assassination of Stamboliiski and the overthrow of the Agrarian government, the tax was repealed in 1925 under the right-wing government of Aleksandar Tsankov (1923-1926) and ‘Supplementary Tax on Total Income’ was introduced instead. The filing threshold was raised to 100,000 Bulgarian leva.<sup>16</sup> We identify this change as the answer to the problem of inadequate tax collecting system (see below).

**Income Tax Data.** Data used to estimate top income shares for Bulgaria come from the statistics of the *Supplementary Tax over Total Income* (bg. *Допълнител. Данък върху общия доходъ*). The statistics was published annually from 1925 to 1946 in the Statistical Yearbook of the Kingdom of Bulgaria. Nedkov (1938, p. 248) effectively summarizes the main characteristics of the tax: “the income tax was introduced as a supplementary tax on the total income of physical persons, when the latter is in excess of 100,000 leva per annum, the grand total of the income of all members of a family being taken as a basis. The assessment is made on the basis of the income acquired in the course of the preceding year, according to a declaration filed by the taxpayer, based on a progressive sliding scale commencing with 2% on income between

<sup>15</sup> Alongside the Agrarians’ long standing advocacy of progressive income tax (Bell 1977, pp. 72, 81), the additional motivation behind it was a fiscal need.

<sup>16</sup> This is a high exemption level if we take into account that Bulgarian GDP per capita fluctuated between 5,000 and 10,000 leva in the interwar period (or between 15,000 and 25,000 leva per tax unit).

100,000 and 150,000 leva and climbing up to 36% on income in excess of 2,000,000 leva.” The high exemption level limits our analysis to 0.2 per cent of control population (minimum proportion covered through all years).

The statistics comes in the tabulation form, with taxpayers ranged by income brackets according to specific tax rate of the progressive schedule. The number of brackets varies over the period from ten to twelve.<sup>17</sup> Each income bracket contains number of tax units and the corresponding tax obligation. The information on total income by bracket was not reported for most of the years. For the period from 1942 to 1945, we have information both on the number of tax units and on the corresponding total income, and, fortunately, Nedkov (1938) reports assessed incomes for 1927 and 1929-1934 (provided by the Ministry of Finance). For years where there is reported only the number of taxpayers, we estimated the corresponding incomes in brackets by assuming Pareto distribution for high incomes. We provide robustness checks, which indicate the approach to be quite effective (see Appendix).

The tabulations are ranged by the gross income concept (income before personal deductions and income taxes), which is the income concept of our interest. It is important to point to changes in the supplementary income tax which were intended as the anti-crisis measures during the Great Depression. In 1934 all incomes derived from eggs exports were excluded from the authority of the supplementary income tax, and more importantly, in 1936 all incomes from the tobacco leaves sale (Nedkov 1938). We look at this break in data later in the section presenting results.

**Methodology.** Top income shares series are constructed by taking the following steps. First, we estimate total income in each bracket of income tax tabulations for years where the number of tax units is reported only and information on the associated income are missing. .. by assuming that top incomes follow the Pareto distribution. Second, we estimate the control total for population following definitions of tax units specified by tax law and reported in tabulations. The tax unit was defined as household and the total number of households is estimated as the number of adults minus the number of married females. The data are found in population censuses. Third, we estimate the total income denominator. This is based on historical national

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<sup>17</sup> It was twelve for 1925-1929; ten for 1930-1941; eleven 1942-1945. In 1933, the minimum filing level was reduced from 100,000 to 80,000 leva, and the top rate was applied to incomes above 1,200,000 leva (Nedkov 1938, p. 249).

accounts (Chakalov 1946; Ivanov 2006). Finally, we use Pareto interpolation to arrive at income shares of the specific percentages of population. For all details see Appendix.

Few sentences should be devoted to the issue of the tax evasion. This is without doubt one of the most worrying aspects for the application of the tax data for the distributional analysis, especially for the earlier periods and for countries in South-eastern Europe, which have built a questionable reputation in this respect. Lampe (1986, p. 65) has pointed to the widely accepted sentiment among historians that places suspicion on the honesty and efficiency of the huge Bulgarian bureaucracy. Crime rate among state employees was very high, to the point that they accounted for nearly a quarter of all crimes in the country. Especially bribes to tax officials were quite common (Lampe 1986, p. 65). Accordingly, the tax evasion was no doubt a serious problem, but a turn from 'general' tax to 'supplementary' tax, that is, from the taxation of masses to the taxation of rich, can be seen with some as a sign of reassurance. As Alvaredo and Saez (2009, p.1147) have suggested for Spain, where suspicion of evasion was also present and which also had high exemption level, this meant that the limited number of people could be efficiently identified and supervised (p. 1147).<sup>18</sup> Thus, this shift might be intended as the solution to the problem of evasion (that was more prevalent on the 'lower' levels) and inadequate tax collecting system.

### 3.4. Results

Figure 3 presents our main results. The figure shows together the Gini coefficient estimated from the social tables and the top 0.1 per cent share of the total income estimated from the income tax data. The two main observations are in order. First, both indicators display quite similar evolution and are found to be strongly correlated, and, second, both indicators show relatively lower inequality in the international perspective (e.g. for social tables Rodriguez Weber 2014, Milanović 2016; De Jong and Gomez 2017; for top income shares see Atkinson and Piketty 2007, 2010; and other chapters in the thesis).

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<sup>18</sup> Alvaredo and Saez note: "The rich are identifiable because they are well known in each locality and they derive their incomes from large and modern businesses or financial institutions with verifiable accounts, or from highly paid (and verifiable) salaried positions, or property income from publicly known assets (such as large land estates with regular rental income)"

The Gini coefficient does not reveal any clear trend during the period under consideration. Income inequality fell moderately between 1911 and 1921, and a gradual decline resumed in the early 1920s. Inequality then stabilized in the mid-1920s, and stagnated until the end of the decade. The strongest increase in inequality occurred during the Great Depression, when Gini reached its high point during the interwar period. However, it fell equally rapid to its pre-depression levels. It stagnated at these levels until well into WWII, when a sharp fall occurred, but the end of the war brought about the an upswing in Gini. Interestingly, top incomes show quite similar evolution after the end of WWI, when the top income share series starts. The fall in 1920s should be, however, taken with caveat, as there was in 1924 change from general income tax to the supplementary income tax. Afterwards, we observe the same pattern as for the Gini index: the stability of top income shares in the mid 1920s, then a significant increase during the Great Depression, with a peak in 1934, and a decline of the proportionate magnitude from 1934 until 1936. Therafter, the top 0.1 income share stagnated until WWII, when it fell sharply from 1942 until 1944. Equally as for the Gini index, there was an upswing in 1945.

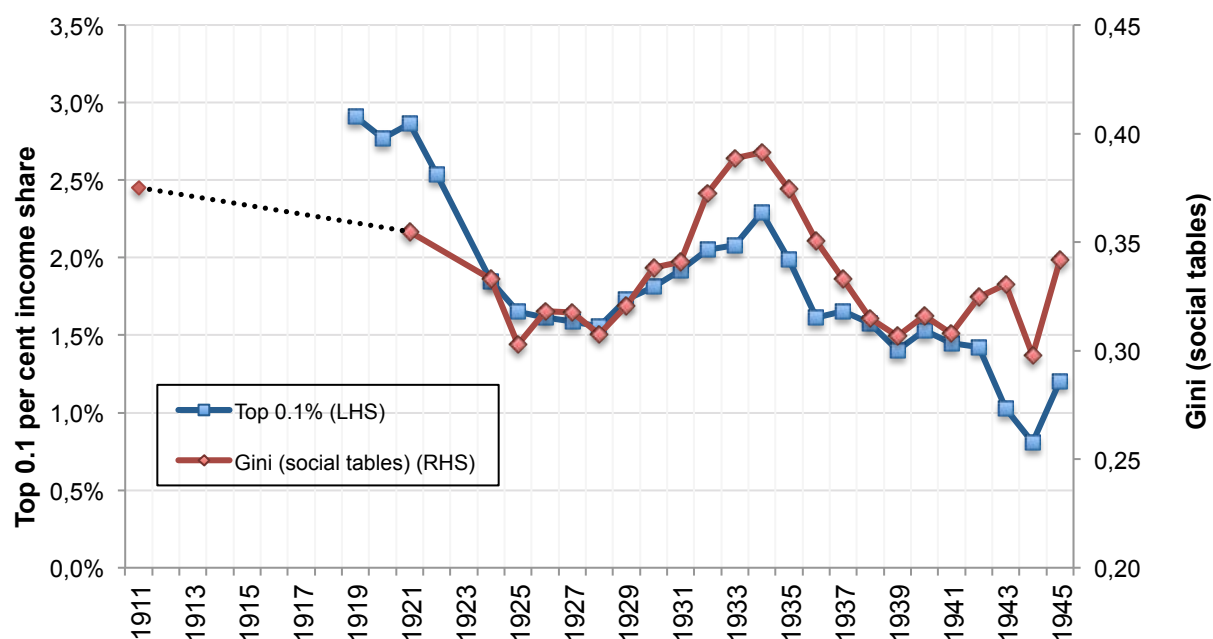


Figure 3: Gini coefficient from the dynamic social tables and top 0.1 per cent

Source: author's computation (see Appendix)

### What was driving income inequality

This 'synchronization' of inequality indicators suggests that the development of both indicators were driven by same forces. We believe that the answer could be read from the Figure 4. The figure displays the evolution of the urban-rural income gap, together with the top 0.1 income share series. The evolution of the ratio is remarkably similar to that of the Gini index and top income shares. The urban-rural income gap was, in our opinion, the main source of income inequality in Bulgaria.

The strong positive correlation with both inequality indicators should not come as a surprise. Very low variability of incomes in the large primary sector implied that inequality between sectors was the major source of inequality.<sup>19</sup> In the case of top incomes shares, the positive correlation could be explained by the fact that the development of the bottom 99% share, (or here the bottom 99.9%) was largely shaped by incomes of the primary sector (which made the predominant part of the total income), and of the top 1% (or top 0.1%) by urban incomes. Top incomes were thus an 'urban' phenomenon.

We also show the evolution of the ratio of public sector wage to agricultural wage as the alternative indicator of the urban-rural gap. The agricultural wage is good proxy for the mean income of the primary sector, due to fairly uniform wages of the dominantly unskilled labour in the agriculture. The sheer fact that the public sector wage is the most representative of the urban incomes communicates the state of urban sector's underdevelopment (see more below). It is interesting is that the top 0.1 share series shows a higher correlation to the public wage development than, for example, to the industrial wage or to the employers' income.

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<sup>19</sup> The contribution of the within-inequality in the more dispersed urban sector was overshadowed by the sheer size of the primary sector.

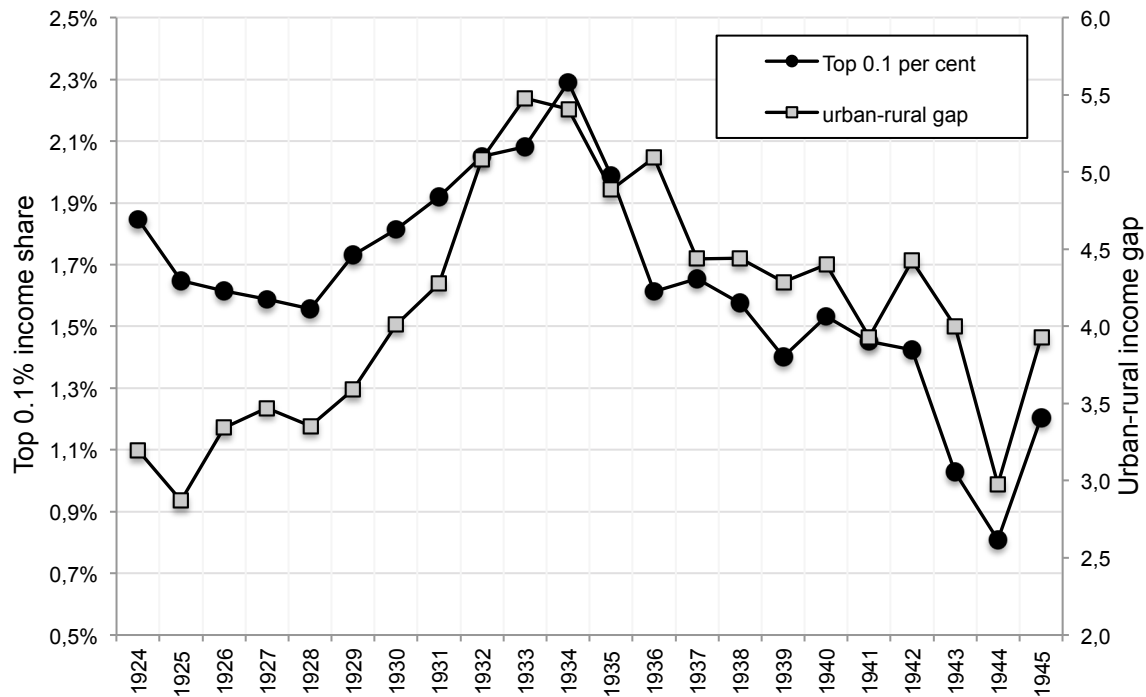


Figure 4: Urban-rural gap and top 0.1 per cent income share

source: Chakalov (1946)

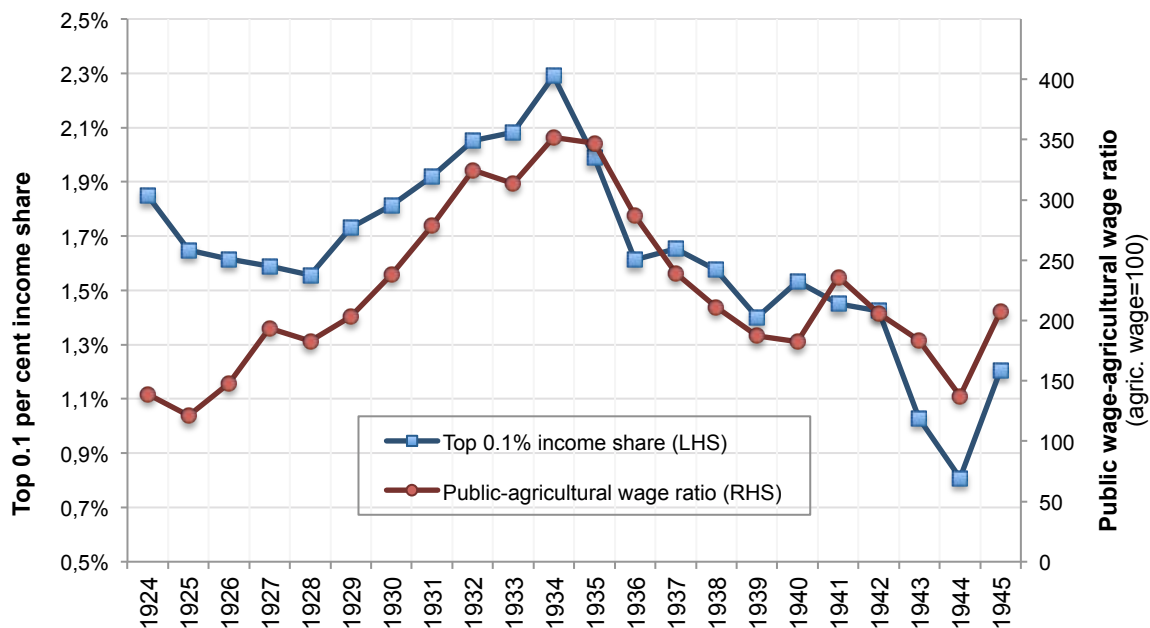


Figure 5: The top 0.1 per cent income share and public-agricultural wage ratio

Source: see appendix

Thus, Bulgaria shows patterns of inequality with the urban-rural gap as the main source of inequality. This is quite well-known phenomenon for developing countries and urban-rural gap in living standards makes the ingredient of development debates. The relatively higher urban-rural gap in pre-communist Bulgaria is explained by the higher productivity in non-agricultural sector. Vinski (1967) estimates 4.5 times higher labour productivity in the non-agricultural sector in contemporary Yugoslavia and finds it be related to the higher capital intensity (also different sectoral demand for skills (e.g. see Young 2013)).

As a result, in order to explain the fluctuation in inequality we need to understand the forces underlying the development of urban-rural gap. Here, the most important force behind the urban-rural gap was the effect of the so-called 'price scissors'. The phenomenon of 'price scissors' is probably the best known for the disastrous effects it had on the peasant countries in Eastern Europe during the Great Depression.<sup>20</sup> We already saw its ruinous impact on the living standard of the Polish peasantry during the Great Depression in the chapter 2, where, equally, we identified a surge in the urban-rural gap as the major source of the sharp rise in income inequality during the depression. The experience of Bulgarian peasants was similarly disastrous. The sharp drop in agricultural prices relative to steady, or more moderate, fall in industrial prices (therefore 'scissors') disproportionately aggravated rural living standards.<sup>21</sup> In the period when we document the sharpest increase in inequality, between 1929 and 1934, the income of peasant more than halved as a result (Chakalov 1946).

Figure 6 shows the evolution of the relative prices and the top 0.1 per cent. As noted, the strong positive correlation between the evolution of the top 0.1% income share and relative prices is due to the 'omitted' variable in the figure: the urban-rural income gap. The episode of 'price scissors' is visible from the evolution of terms of trade and the ratio of industrial to agricultural prices. The terms of trade are presented as the ratio of import to export prices, and, therefore, a rise of the ratio indicates deteriorating terms of trade. A sharp drop in international agricultural prices during the Great Depression hit especially hard the net exporters of agricultural products (importers of industrial products), in the first place the countries in South Eastern Europe. The overreliance on agricultural exports (imports of industrial goods) as their convergence strategy

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<sup>20</sup> In addition to the Soviet Industrialization Debate (or the Preobrazhensky debate).

<sup>21</sup> And it especially hindered the peasants' debt repayment.



made these countries excessively vulnerable to shocks in international prices.<sup>22</sup> The ratio of industrial to agricultural prices shows less fluctuation than terms of trade. It shows three clearly identifiable phases. First, a notable drop in the ratio in the 1920s, then a sharp increase during the depression, and, finally, the prolonged decline from the mid 1930s until the end of WW2. The evolution of the ratio suggests that the rise-and-fall pattern in the 1930s (that drove the urban-rural gap and, in consequence, the development of inequality) was preceded by a notably higher rise of the agricultural prices in the 1920s (or even a 'bubble' by many accounts). Although the agricultural price boom did not affect urban-rural price gap (both groups fared similarly well during this period),<sup>23</sup> it could have affected the social and regional composition of top incomes, as we look below.



Figure 6: Evolution of relative prices and the top 0.1 per cent income share

Sources: Prices: Statistical Yearbook of Bulgaria (1940, 1942, 1946/7)

<sup>22</sup> On the other hand, a more moderate fall in international industrial prices was often coupled with domestic monopolistic pricing for industrial goods.

<sup>23</sup> For example, Rangelova (2000) points out that in the 1920s the industrial production doubled.

### 3.5. Pre-industrial inequality

We return to the importance of the sectoral development for the levels and the evolution of inequality in pre-communist Bulgaria. We saw that the Bulgaria's experience to a large extent corresponded to the assumptions of the Kuznets' model regarding the initial sectoral conditions preceding the structural change, with, on the one hand, huge, low-productive and markedly egalitarian agricultural sector, and, on the other, small and more productive non-agricultural sector. The overarching backward agriculture was at the same time the source of low mean income and constrained inequality in line with the logic of the 'inequality possibility frontier'.

Milanović et al. (2010) have introduced the concept of the 'inequality possibility frontier', which posits that in poor pre-industrial societies inequality was always constrained by the subsistence level and the relatively modest remaining 'surplus' (that could be theoretically 'extracted'). It is only with the sustained economic progress, these authors argue, that mean income and inequality entered into the positive relationship and potential for inequality increased. For example, if we replace 'the employment in industry' on the vertical axis in Figure 2 with the inequality measure such as the Gini coefficient, our 'hypothetical' development curve becomes the 'inequality possibility frontier' (the 'frontier' equally takes the concave shape with decreasing slope),<sup>24</sup> indicating the relationship between growth and inequality on the development path. We find that inequality in pre-industrial Bulgaria - characterized by 'stagnant mean incomes' - was relatively low. Equally, our inequality series do not exhibit any trend-like movement. Inequality in pre-communist Bulgaria was rather shaped by 'idiosyncratic events' (Milanović 2016, ch. 2). The most illustrative example was the effect of 'price scissors' that increased between-sector inequality by increasing the urban-rural income gap.

Equally in line with the Kuznets' model, we find that the inequality in the non-agricultural sector was notably higher than in the agricultural sector. Figure 7 shows Gini for agricultural and non-agricultural sectors in Bulgaria from 1911 until 1945. It is reassuring that these levels are consistent with findings for Yugoslavia. Vinski (1967, 1970) has constructed remarkably detailed social tables for Yugoslavia in 1939, and he equally finds higher inequality in non-agricultural sector: Gini in non-agricultural sector was 0.45 and Gini in agricultural sector in 0.19.<sup>25</sup> As the

<sup>24</sup> Obviously, the ordering of countries in Figure 2 does not (have to) remain the same.

<sup>25</sup> Vinski (1970, p. 262) remarks that this "indicates that capitalism in Yugoslavia in 1938 was more advanced in the non-agricultural sector compared with agricultural".

neighbouring (peasant) country, characterized by the similar sectoral development (Figure 2), Yugoslavia, unsurprisingly, exhibits the main features of the 'pre-industrial' country observed in Bulgaria. However, note that even in countries with more extractive elites, such as the Tsarist Russia, the logic of the inequality possibility frontier precluded high inequality. Thus, Lindert and Nafziger (2014) find that Gini in Russia in 1905 was equal to 0.37

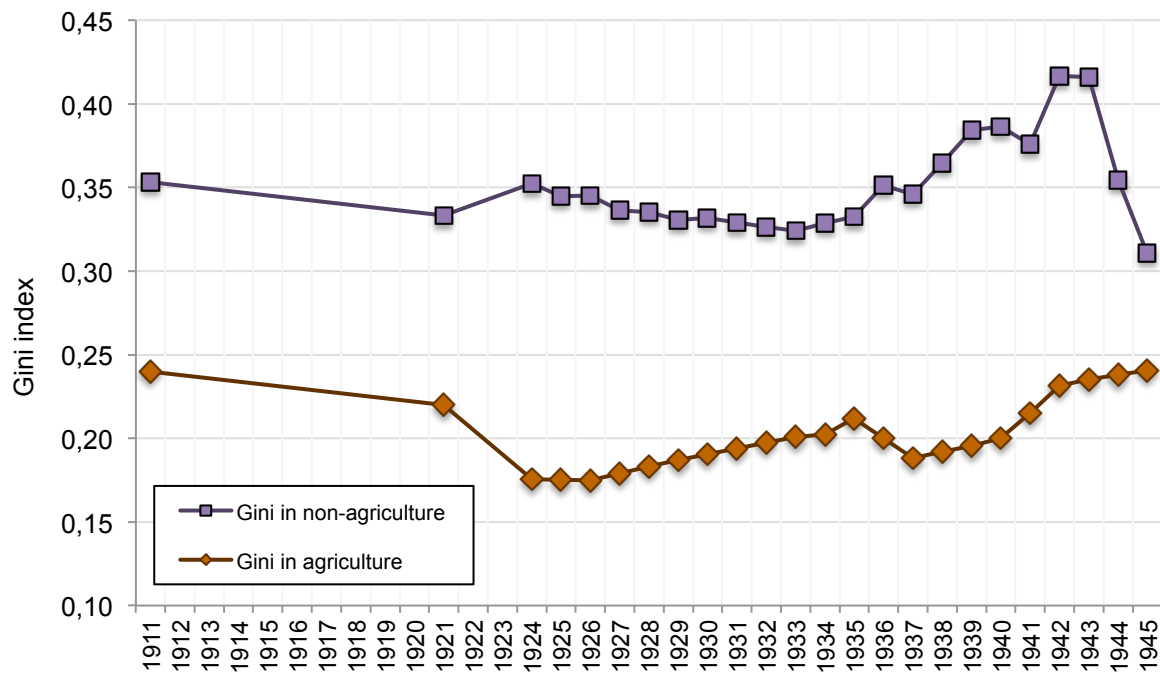


Figure 7: Gini index in agricultural and non-agricultural sector

Source: social tables (see appendix)

This contrast between sectors makes the standard interpretation of the dynamics driving the inequality on the development path. According to Kuznets (1955), it is the sectoral shift of the workforce from less unequal and less productive agricultural sector to more unequal and more productive industrial/urban sector that underlies the increase in inequality in the early stages of growth. But as noted above, there is no clear evidence that the sectoral labour shift – despite being a favourite of development economists – actually brought about a rise in inequality as postulated by the Kuznets curve. Morrisson (2000) points out that only a development in Prussia and Saxony in the 19<sup>th</sup> century exhibits patterns resembling the inverse-U curve (see chapter 1).

And we equally saw that the Central European course (see especially chapter 2) showed rather different mechanism of rising inequality in the early stages of growth, that of functional shift of income towards capital, corresponding to the 'classical' view (Chapter 1, Box 1). This theory posits that the initial benefits of the growth were captured by the capitalists (while wages stagnated; Allen (2009) called it the Engel's Pause). Accordingly, this narrative of the inequality development along the growth trajectory attaches much explanatory weight on the top of distribution, where the chief beneficiaries resided.

For this reason, we look at top incomes in order to place the Bulgarian inequality experience in the development context. We should point out that in this respect, the mechanism driving top incomes on the development path is related to the concentration of capital. Allen (2009), for instance, follows on the functional shift towards capital and notes that "the rise in profits, in turn, sustained the industrial revolution by financing the necessary capital accumulation". Kuznets (1955) also saw the accumulation channel – with savings concentrated among the rich – as the alternative force inducing the increase in inequality on the development path (Atkinson et al 2011, p. 59).<sup>26</sup> Accordingly, the industrialization and the advancement of capitalism with the capital deepening were accompanied by the rising concentration of capital. As Keynes (1919) noted: "the immense accumulations of fixed capital... could never have come about in a society where wealth was divided equitably". Indeed, the literature on top incomes explains very high levels of top income shares in advanced countries in the first half of the 20th century by the strong concentration of capital income at the top of the distribution (high top incomes were, accordingly, 'capital income phenomenon'; Atkinson and Piketty 2007, 2010).

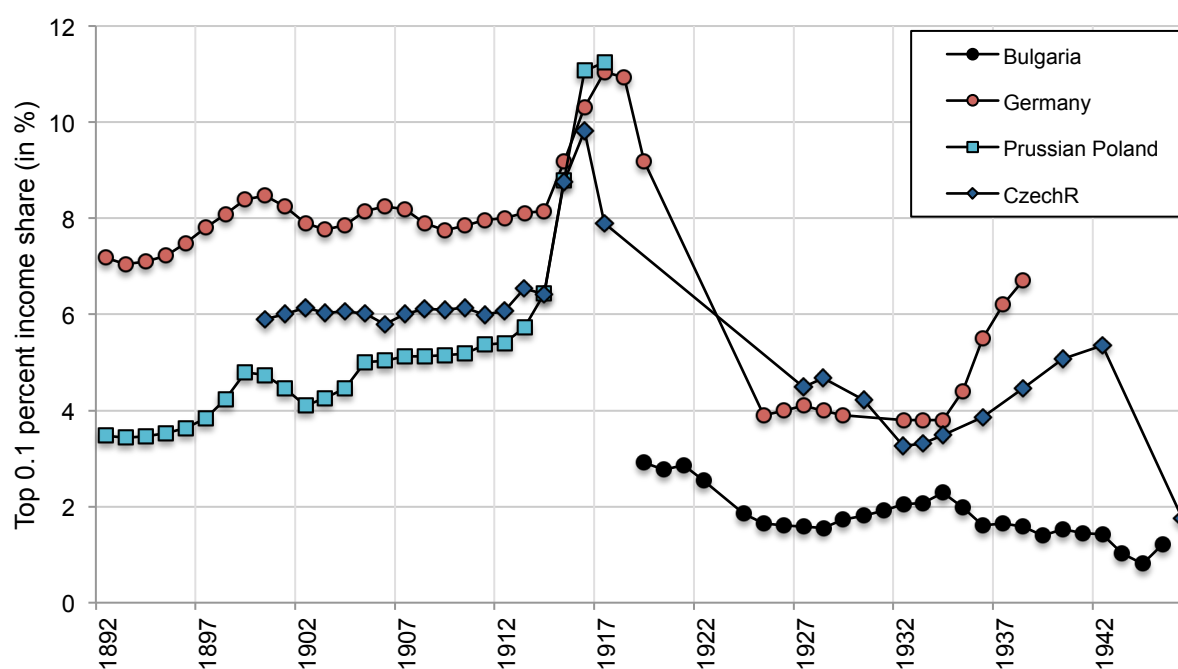
Figure 8 compares the top 0.1 per cent in Bulgaria and Central Europe, presented by Germany (Prussia until 1919), Prussian Poland and the Czech Lands. As noted above, Prussia is the most frequently used example that validates the rising part of the Kuznets curve during the industrialization. Dell (2007) has directly related the observed rise of Prussian top income shares in the 1890s to the final stage of the rising part of the Kuznets curve (see Figure 8). Grant (2002) also ascertains the mid-1900s as the peak of the Prussian Kuznets curve. The concurrent timing of the stabilization of inequality has been proposed in the case of the Czech Lands (chapter 1), while we saw that the relatively later development in Prussian Poland was accompanied by the rising inequality until WW1 (the advancement of 'agricultural capitalism' led to the increasing

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<sup>26</sup> For example, see models of Meade (1964) or Stiglitz (1967).

concentration of capital income at the top; chapter 2). After a surge in top shares during WW1, top incomes in Central Europe were hurt by large post-war shocks and display a notable fluctuation, which is often seen as the beginning of the secular fall of the (political) Kuznets curve. Bulgaria, on the other hand, shows notably lower shares and much lower fluctuation.<sup>27</sup>

Staying in the development framework, we explain lower top incomes shares in interwar Bulgaria largely by the absence of large capital incomes,<sup>28</sup> which are in turn seen as a consequence of the absence of structural change. Accordingly, higher top income shares in Central European countries are explained by the stronger concentration of capital income at the top of the distribution. Similarly, the absence of large capital incomes explains why Bulgarian top incomes did not experience dramatic shocks found in Central European and other industrialised countries in the interwar period. Here we build on Novokmet (2011), who compares top income shares in Bulgaria to industrially advanced Czechoslovakia, and finds that in the latter both the high level of top income shares as well as large fluctuations were due to the stronger concentration of capital income at very top of the income distribution, for example, in the hands of the top 0.1 percent (chapter 1).



<sup>27</sup> Although data income tax data is not available for pre-WW1 period, inequality patterns from social tables do not suggest a high concentration in pre-war Bulgaria).

<sup>28</sup> We take here as well capital income to include dividends, business profits, interests, rents, land income, etc.

Figure 8: Top 0.1 per cent income share in Central Europe and Bulgaria

Source: Bulgaria: author's computation based on the income tax data; other countries: see chapters 1 and 2

Similarly, could the comparison of pre-industrial South-Eastern and industrial Central Europe be indicative of the country's motion along the 'inequality possibility frontier'? Here one should be careful not to repeat old orthodoxies, which disregard any heterogeneity in countries' initial conditions and specific traits. For example, one cannot simply posit that Central Europe presents Bulgaria's 'road not taken' on the development path, since the industrialization in Central Europe had been related to the emergence of the 'agrarian capitalism' (the 'Prussian' road), which assumed markedly different contours, from the land distribution to social relations in the agriculture. Inequality in the agriculture in Central Europe was very high. Figure 9 compares the land distribution in Bulgaria and Bohemia at the end of the 19<sup>th</sup> century. We can see that land inequality in Bulgaria was much lower than in Bohemia, which is representative of the striking land concentration in Central Europe.

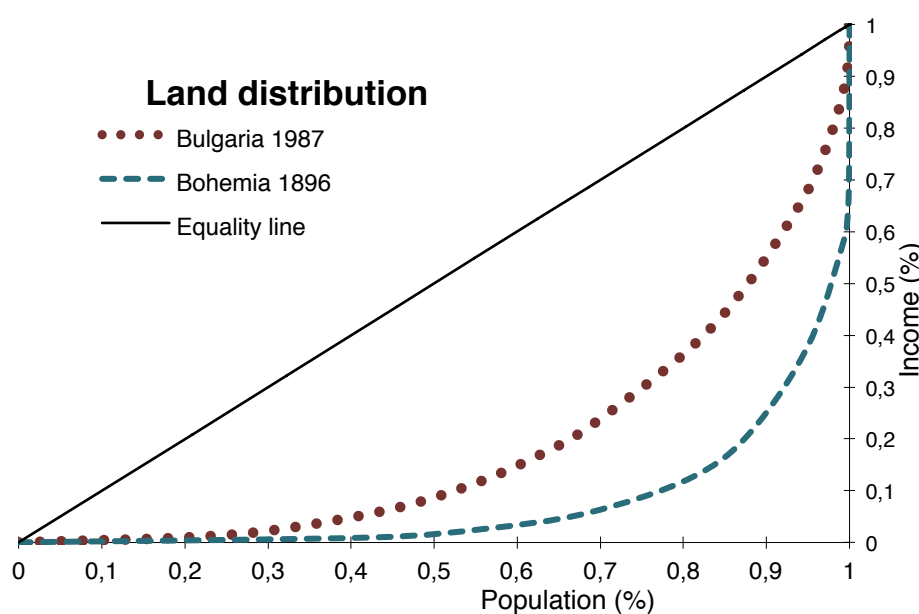


Figure 9: Land inequality in Bulgaria (1897) and Bohemia (1896)

Notes: Source: Author's computation based on: Bulgaria: Bouroff 1925 ; Bohemia: see chapter 1

It is true that historians have often found germs of the 'Prussian road' in the pre-industrial development of the Balkan countries. Most importantly, it has been often advanced that the so-called *chiflik* (tur. *çiftlik*) estates in the late Ottoman period (generally on the *ciflik* debate see Inalcik 1991, Veinstein 1991, Stoianovich 1953) showed certain similarities to commercial demesnes in Central Europe, such as the Prussian *Gutscherrschaft*, in their assumed export orientation, bonded labour or capital accumulation. According to these arguments, the eventual development of *chiflik* could have altered class and property relations in agriculture (as Brenner 1982 famously propounded for England) – implying the structural change especially harmful for small peasant societies – and at the same time further industrialization. However, *chifliks* were of much smaller size than Central European *Gutscherrschaften*<sup>29</sup> and their commercial orientation was quite modest. The commercial orientation of *chifliks* has been rightfully challenged in the case of Bulgaria, where they mainly developed in order to secure the additional revenue of the Ottoman elites.<sup>30</sup>

However, this contrast between Bulgaria and Central European countries has still proved useful to show that the pre-industrial inequality did not always conform to benchmark features of the model displayed by Bulgaria. The contrast also demonstrates the importance of institutional factors in shaping inequality, both in the pre-industrial and industrial societies. Closely related to our discussion, Malinowski and Van Zanden (2017) have pointed exactly to pre-industrial Poland as the clear illustration where some assumptions of the exemplar pre-industrial inequality, such as lower rural than urban inequality, did not hold. However, notwithstanding much more extractive elites during the Polish serfdom, even there the 'inequality possibility frontier' restrained inequality due to low mean incomes. But institutions matter, since with the potential of the larger 'cake' to be extracted, landed elites in Central Europe or England wholeheartedly engaged in enclosures, expropriations, discriminatory law making, etc. Therefore, blaming relatively higher political strength of peasants in South Eastern Europe, which precluded this scenario, does not resonate to the modern historical analysis (Ivanov and Kopsidis 2015).

<sup>29</sup> On the other hand, Lampe and Jackson point out (1982, p. 135) that at the beginning of the 19th century, *chiflik* estates made less than 20 per cent of cultivated land and employed less than 10 per cent of the total peasant labour in Bulgaria, which, are, as they suggest, highly inflated figures for the situation found at the end of the century.

<sup>30</sup> Ottoman notables were chiefly engaged in public administration and they increasingly abandoned *chifliks* after the centralization of the tax collection, which as Lampe and Jackson (1982, p. 137) note, "sent still more Turkish *chiflik* holders back to Istanbul in search of profitable positions elsewhere in the Empire."

Finally, the eventual implementation of communism in Czechoslovakia and Bulgaria vividly shows the critical role of institutions in shaping inequality. Countries that previously displayed notably different inequality levels, all of a sudden became characterized by the most egalitarian income distribution during the decades following WWII.<sup>31</sup> This ‘convergence’ is already indicated in Figure 9 by the abrupt reduction in the Czechoslovak inequality in 1946.

### 3.6. Wealthy before Communism

The fact that pre-communist Bulgaria was a pre-industrial country makes the industrialization axis the natural comparison framework. Both the lower level of inequality and the more stable pattern are visible when Bulgarian series is plotted against top income shares in industrial countries. Figure 10 follows on Figure 8 and compares the top 0.1 per cent income share in Bulgaria to major advanced industrial countries: France, the UK and the US.<sup>32</sup> Apart from the immediate impression that Bulgaria was much more egalitarian than industrial countries (before fall in rich countries during WW2), it can be clearly discerned that even the greatest shocks to Bulgarian top incomes were minute in comparison to western active combatants.

In industrial countries, higher top income shares were a result of the high concentration of the capital income at the top of the income distribution (Atkinson and Piketty 2007, 2010). At the same time, dramatic changes in the top incomes shares were principally driven by the fluctuation of the capital income. To put it simple, the great fortunes – associated with the (advancement) of capitalism – were lacking in Bulgaria. Their absence explains both lower top income shares in Bulgaria than found in the contemporary industrial countries, as well as the more pronounced stability of top income shares in Bulgaria during the great turmoil of the global capitalism in the first half of the 20<sup>th</sup> century.

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<sup>31</sup> I want to thank to Branko Milanović for this comment during one conversation.

<sup>32</sup> For which there is also available every observation for the same twenty-year period



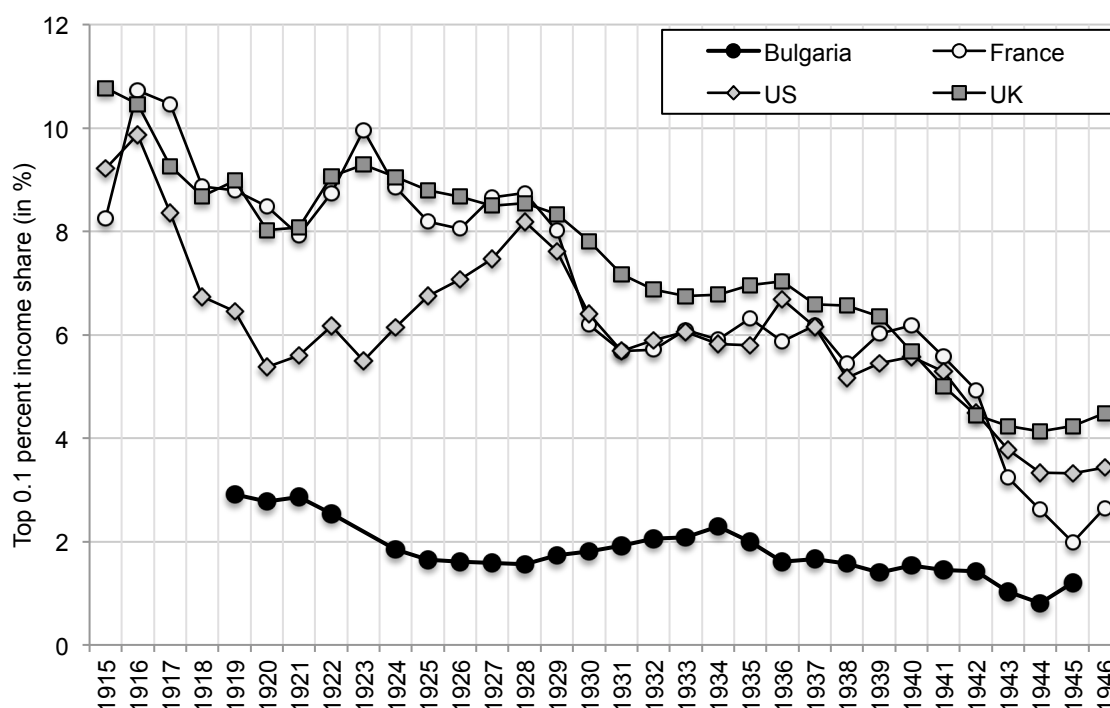


Figure 10: Income shares of top 0.1 per cent in Bulgaria and advanced industrial countries (fiscal income, excluding capital gains)

Source: Bulgaria based on author's computation; France, the UK, and the US from WID

The absence of large capital incomes might thus explain why Bulgaria's top incomes were not hurt by the dramatic shocks documented for industrialised countries. Although Bulgaria suffered severely during the Big War,<sup>33</sup> war destructions are less devastating in the case when land is the chief mean of production (at least, in the monetary terms; e.g., with the traditional warfare of crop burning) than destructions of the industrial fixed capital. Equally, international crises disproportionately affect great fortunes. For example, Bulgaria did not have its counterparts to Ivar Kreuger, whose industrialist empire could explain higher income shares for Sweden, but at the same time, more pronounced shock to the Great Depression (Roine and Waldenström 2008). Bulgaria did not possess the great bourgeoisie of the Western European type, and small crafts and manufacturing had been the main feature of the Bulgarian 'capitalist' phase. For example, the town of Gabrovo, sometimes labelled the 'Bulgarian Manchester' due to its sizeable textile manufacturing, had only one prominent industrial family, that of Berov's (Laferrère 1989, p. 43). Even this was a rare phenomenon of the truly capitalistic dynasties in

<sup>33</sup> Often the Balkan Wars and WW1 are labelled together simply as the Big War.

Bulgaria. Additional peculiarity was the absence of the (feudal noble) landed elite. Bulgaria was a country of small peasants and practically without large estates in the country since the expulsion of Turks. As noted above, there was no home-grown landed elites such as Polish *szlachta*, Prussian *Junkers*, or *Boyars* in neighboring Romania.

But who were then the Bulgaria's super-rich? Unfortunately, Bulgarian tax statistics does not provide an insight into the different sources of income of the people at the top, which has been critical in previous chapters to identify and analyse both economic and social mechanisms at the top. Still, since the largest share of national income was produced in agriculture, it is natural first to ponder over undertakings related to it, such as the production and sale of tobacco or wine. Could the 'merchant capitalism' underline the Bulgarian pre-communist social structures and the elite composition (e.g., Braudel 1979, Wallerstein 1974)? Big merchants, for example, could have benefited from economies of scale (especially in the export of agricultural goods)<sup>34</sup> when the majority of producers were small peasant holding. The importance of this source for the very top might be conveyed by the break in the income coverage of the income tax. Namely, in 1934 there was an exclusion of eggs export income and in 1935 an exclusion of income from the tobacco leaves sale from the scope of the supplementary income tax (Figure A2). Eggs and tobacco, along with grain, were the most important Bulgarian products, and the exclusion itself, intended as an anti-crisis measure in order to tax these activities more heavily under the professional tax (Nedkov 1938, pp. 249-50), shows their importance. Nedkov (1938) explicitly points out that the income derived from these two sources, and especially from tobacco leaves sale, "represent a considerable portion of the large incomes" (p. 250). It is also worth pointing out that tobacco was the main export commodity to Central Europe, namely to Germany and Czechoslovakia, and eventually with the striking intensification of bilateral trade with Germany in the late 1930s, it made up for almost a half of Bulgarian exports to the *Reich* (Lampe 1986, pp. 89-90). There was in fact a decline in top income shares from 1934 to 1936 (Figure 3), exactly when the exclusions of income from eggs exports and from tobacco leaves sale occurred. However, other indicators, such as Gini in Figure 3 (itself not affected by these specific legislative measures) suggest that there was a genuine fall in inequality in these years, and we believe that in this light we should also explain the fall in top 0.1% income share in these years. But, as we look below, the importance of 'merchant' capitalism might have been more

<sup>34</sup> Bourguignon and Morrisson (1990, p. 1125) have found in a cross-country analysis that high share of agricultural exports increases inequality, but warn that this variable must be observed together with the distribution of land ownership.

pronounced during the agricultural price boom and strong exports in the 1920s. The geographical distribution of the top 0.1 per cent indicates more notable presence of regions with higher importance of agriculture (especially of tobacco) during the period of favourable conditions in agriculture.

Looking further at the different manifestations of the 'immature' capitalism, another potential candidate for the top concentration was usury, which was flourishing at the turn of the twentieth century and, in consequence, the masses of over indebted peasants lost their land. But as Gerschenkron (1962; p. 222) remarked, it lost its importance already before the interwar period due to the establishment of state sponsored rural credit cooperatives and the high inflation of the 'Big War' (Mouzelis 1976, p. 96; Crampton 1987, p. 75).

But in general, it is quite probable that the Bulgarian largest fortunes combined traditional sources of income from land and trade with salaries from the burgeoning public sector. Note that this 'versatility' was nothing new in South Eastern Europe. During the Ottoman period, the ruling Turkish elites had traditionally relied on administrative incomes as the primary income source (especially from the tax collecting), and combined it with additional rental and commercial revenues (for example, see above in the context of the *ciflik* debate). In the same manner, the traditional local rural elite, or the so-called *chorbadzhii*, had established their material status by performing administrative functions for the Ottoman rulers. *Chorbadzhii* used these incomes and associated privileges to buy land, to engage in usury or in mercantile pursuits (Daskalov 2004, pp. 126-130). Later, it became quite common for statesmen (including ministers or even monarchs) to heavily invest in land estates as a source of supplementary rental income, or to engage in commercial pursuits in agriculture or (encouraged) industries, etc.

The political variable should be thus taken into account. For example, the stability in top income shares could be attributed to inflexible wages of burgeoning public sector. Overall, the larger proportion of labour income at the top could have resulted in greater stability of top incomes. In particular, a deflationary process in the early 1930s could have been beneficial for labour incomes at the top due to the wage rigidity (and, vice versa, inflation detrimental during WW2). The fact that the ratio of the public wage to agricultural wage shows the strong positive correlation to the evolution of the income inequality (Figure 5) should suffice to take the public sector income seriously. In addition, the rental income benefited from deflation. As noted, *homines politici* traditionally (from ancient times) made this as the important additional income

source. Lampe and Jackson (1982) point out that larger land proprietors largely leased out their plots. In general, they note that big estates were less productive, and more often assumed rental than the entrepreneurial outlook.

Furthermore, the widespread misuse of political offices has often been seen as something particularly inherent to relatively young states in South Eastern Europe after the liberation from the Ottoman rule (also a phenomenon reoccurring in the post-communist countries, see chapter 4). For example, Crampton (2007; p. 157) points out that during the depression “the ministers...were engaged in a grotesque exercise of self-enrichment accompanied by the most unseemly squabbles over the spoils of office”. For example, we can speculate to what extent were various protectionist measures (especially during the depression) exploited by the Bulgarian political elites.

The overarching importance of the state in the economy in South Eastern European countries has been well known to historians. This has, conceivably, facilitated the adaptation of the communist central planning. In pre-communist South Eastern Europe, the overcentralization and the huge bureaucracy made the capital cities exceedingly important in the national life. Sofia, that “unfortunately chosen capital”, as Lampe and Jackson (1982, p. 240) remark, owes its national pre-eminence primarily to the ‘state building’, rather than to the evolutionary growth. A general lack of skilled labour and of the entrepreneurial prowess resulted in disproportionately extensive concentration of the ‘developmental’ or ‘entrepreneurial’ state functions in the capital city. The same authors add that Sofia “owed the survival of most of its struggling factories to government contracts and credits” (ibid.).

The Great Depression, in particular, was a major turning point, with comprehensive government interventionist measures pushing the *étatisme* one step further (e.g., monopolistic industries, state agricultural purchase agencies, state-controlled banking sector, etc.).<sup>35</sup> Figure 11 looks whether this shift was reflected in the top income composition. It can be seen that while a third of the total income of the top 0.1 per cent came from Sofia in the mid-1920s, the capital's proportions rise to 60 per cent from the early 1930s.<sup>36</sup> As noted above, one reason might be a diminishing role of big merchants and entrepreneurs at the top with the end of the international agricultural boom and surging exports in the late 1920s. Namely, the international conditions in the 1920s might

<sup>35</sup> Lampe and Jackson (1982, p. 435) quote an observation that class “interwar measures the genesis of *étatisme*”.

<sup>36</sup> Unfortunately, the data is not available for the 1929-1932 when this balance tilted towards Sofia, but we could not find that this change has been caused by some administrative territorial change.

have especially favoured the traditional 'trade capitals' of Bulgaria, such as Plovdiv (especially due to the concentration of tobacco growing regions in the south; Beshkov 1940) or other major trade centres (such as Ruse on the Danube, or Varna and Burgas on the Black Sea coast). On the other hand, Sofia barely participated in the agricultural trading even though the agriculture had made the country's most important export sector (Lampe and Jackson 1982, p. 240).<sup>37</sup> In general, the long-run trend of centralization in the capital and stagnation of once thriving regional commercial centres was visible. Lampe and Jackson (1982, p. 240) comment that "previous economic centres suffered ... for being far from the seat of political power". The 1930s might be thus rather seen as the final stage in the process from the 'merchant capitalism' toward the 'state capitalism'.

The 1930s saw pronounced economic centralization and interventionism, accompanied by the political extremism. After the frequent political violence and military coups (such as Zveno coup), the leading role was assumed by the king. In this period monarchical elements strengthened all over the South Eastern Europe. However, from all monarch in charge in South Eastern Europe, the king Boris of Bulgaria 'the most enlightened' economic policies (Lampe and Jackson 1982, p. 326).<sup>38</sup> In addition, increasing war preparations, and eventually the war itself, implied yet stronger intermingling of political and economic spheres, especially in the rising importance of the armament industry (as clearly seen in interwar Czechoslovakia in chapter 1). Top income shares display certain stability until 1943, which marked a turning point of the Bulgaria's participation in the war. The king Boris, who had managed to keep Bulgaria out of the Nazi war effort, suddenly died. Bulgaria became actively involved in military fighting and the war came physically into the country. The allied air raids ensued and as a consequence of the need to finance war, top incomes were hit by the increased fiscal burden. Most importantly, top labour incomes were adversely affected by the galloping inflation that accelerated due to Filov's pressing machines. Probably, the recovery in 1945 is related with the end of inflation (already in the late 1944, Bagryanov almost doubled salaries of public servants; Miller 1975, p. 179). But in general, fluctuation in the Bulgarian series (with standard deviation of around 0.3 per cent) should not be exaggerated. Even the decline during WW2 was experienced relatively late, namely in 1943 and 1944.

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<sup>37</sup> Lampe and Jackson point out (1982, p. 246) that in contrast to other capitals in South Eastern Europe, Sofia did not extensively participate in traditional industries, such as textiles (as noted above, textile manufacturing was concentrated in Gabrovo region).

<sup>38</sup> However, from all monarch in charge in South Eastern Europe, the king Boris of Bulgaria 'the most enlightened' economic policies

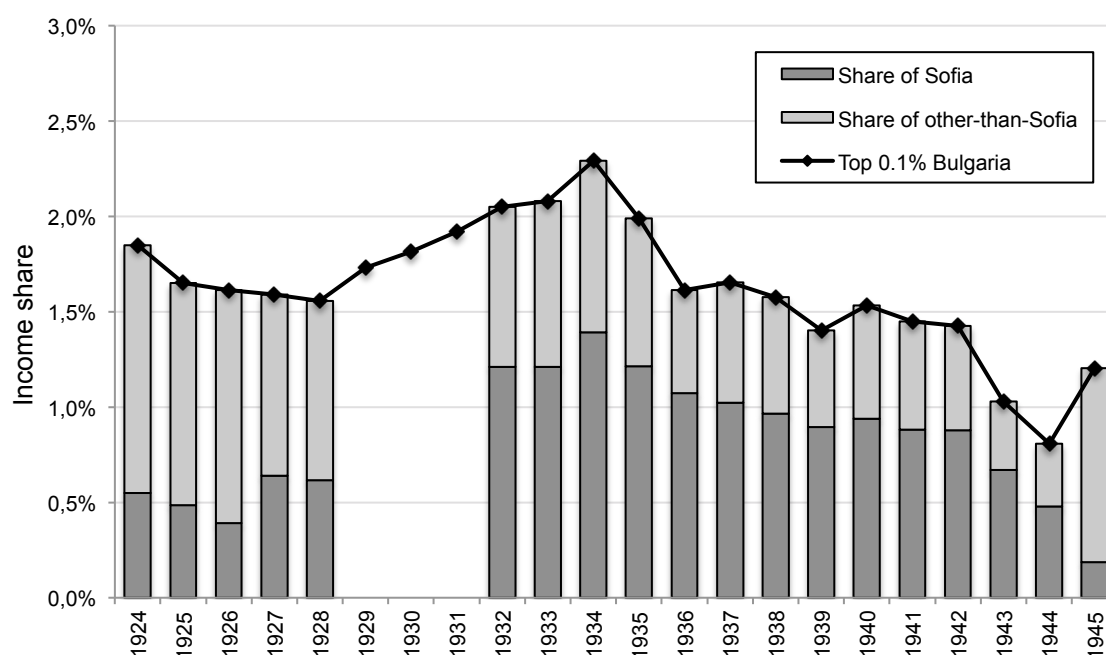


Figure 11: From 'merchant' to 'state' capitalism

Source: author's calculation based on the income tax data

Finally, how to explain the sharp drop in Sofia's incomes in the top 0.1 per cent in 1945? The fact 1945 is the year of the end of WW2 and the Communist capture of power raises the possibility that this is related to the political shocks that accompanied this power transition. Very tentative explanation, but consistent with the conjectured importance of the state bureaucracy in top incomes discussed above, might be that exactly in 1945 the Communists liquidated the whole former political establishment, from royal bureaucracy, the last assembly of subranie (the National Assembly), every government members since 1941, etc. (Crampton 2007, p. 182).<sup>39</sup>

<sup>39</sup> Crampton (2007, p. 182) thus notes: "For the communists the problem was that the local intelligentsia and political establishment had not been decimated by the Gestapo or its local equivalent, and therefore the potential pool of opposition was greater than in other states; the Bulgarian intelligentsia and political classes were paying now for their relatively easy war ... A major payment was made in February 1945."

### 3.7. Conclusion

We have presented the two novel datasets that allow the assessment of the historical evolution of inequality in Bulgaria in the first half of the 20th century: dynamic social tables and top income shares. We find that inequality in poor pre-industrial Bulgaria was low and explain it in the framework of the 'inequality possibility frontier'. The absence of structural change made the capital scarce in the country, which explains the lower top income shares and their pronounced stability in comparison to contemporary industrial countries. Bulgaria seems as the almost ideal fit for the 'benchmark' scenario of pre-industrial countries in the 'inequality frontier framework', with majority population comprised of rural poor, without large surplus to be extracted and, distinctively, without 'extractive' elites, whether home-grown landed nobility, foreign ruling administrative strata, or national grand bourgeoisie. In the end, the question why Bulgaria and other South Eastern countries did not manage to embark on the structural change before Communism, or whether the alternative development path to communism would have been accompanied by the rise of inequality, has remained well beyond the scope of this work. We rather stress the need for more studies on historical inequality.

## APPENDIX

### A.1. DYNAMIC SOCIAL TABLES

**Table A.1.1. Estimations and sources of income by economic branches and social categories**

No.	Economic branch	Workers	Employees	Assistants	Independents	Notes	Sources
1	Agriculture, horticulture and animal husbandry	Income of workers in agriculture	Income of workers in agriculture	Income of workers in agriculture * 0.7	Income of workers in agriculture * 0.9 + income from land	For income from land see text	Income of workers in agriculture from Chakalov (1946, table 110)
2	Mining	Income of workers in given industry	Income of workers in given industry * Employee premium industry	Income of workers in given industry * Assistant premium industry	Income of workers in given industry * Employer premium industry	Employee premium industry = Employee and personnel income in big industry / Workmen income in big industry; Assistant premium industry = Assistant income in arts and crafts / Workmen income in arts and crafts; Employer premium industry = Employer income in petty industry / Workmen income in petty industry	Worker income from Statistical Yearbooks (1915, 1925, 1927, 1929, 1931, 1934, 1938, 1941, 1947); Employee, assistant and employer premia for 1924-1945 from Chakalov 1946 (tables 58-59, 52, 60); premia pre 1924 = 1924
3	Quarrying						
4	Saltworks						
5	Metal industry						
6	Ceramics						
7	Furniture industry						
8	Textile						
9	Hides, skins and other hard materials derived from animals						
10	Food and beverages						
11	Chemicals and related products						
12	Luxury goods, science, art and letters industry						
13	Construction industry						
14	Production and distribution of physical forces						
15	Construction of transport equipment	Income of workers in metal industry					



16	Clothing, footwear and dressing industry	Income of workers in textile industry					
17	Transport and Communication	Income of workers in transport services	Income of employees in (automobile and other) transport services	Income of assistants in (automobile) transport services	Income of workers in transport services * Merchant premium	Merchant premium = Income of merchants / Income of assistants and workmen engaged in commerce	Incomes 1924-1945 from Chakalov (1946, table 71, 73); incomes pre 1924 of workers and employees from Ivanov (2006, table AE), incomes of assistants and independents proxied based on change in income of employees
18	Commerce, credit, insurance	Income of assistants and workmen engaged in commerce	Income of office personnel, managers and directors engaged in commerce	Income of assistants and workmen engaged in commerce	Income of merchants		Incomes 1924-1945 from Chakalov (1946, table 80, 81); incomes pre 1924 proxied based on change in transport and communication
19	Liberal professions	Average income					Incomes 1924-1945 from Chakalov (1946, table 90); incomes pre 1924 from Ivanov (2006, table AI)
20	Public administration (administration in general, justice, army, social care)	Income of municipal servants	Income of state servants	n.a.	n.a.		Incomes 1924-1945 from Chakalov (1946, tables 95, 96); incomes pre 1924 proxied based on change in transport and communication
21	Domestic work	Income in textile * 0.6	n.a.	n.a.	n.a.		Assumption based on Vinski (1970)

**Table A.1.2. Example of social table for 1934**

No.	Economic branch	Social group	Gender	Number	Income
1	Agriculture, animal husbandry, forestry, hunting and fishing	Independents 1	male = female	474958	5896
		Independents 2	male = female	206565	6683
		Independents 3	male = female	181825	7253
		Independents 4	male = female	154761	7841
		Independents 5	male = female	357737	9391
		Independents 6	male = female	90367	12675
		Independents 7	male = female	26023	16164
		Independents 8	male = female	15920	26530
		Assistants	male = female	1095497	4253
		Employees	male = female	1.105	6075
		Workers	male = female	140.169	6075
2	Mining	Independents	male	42	44811
		Assistants		1	20993
		Employees		181	37209
		Workers		6587	14938
		Independents	female	4	28834
		Assistants		0	13508
		Employees		0	23942
		Workers		25	9612
3	Quarrying	Independents	male	208	44811
		Assistants		11	20993
		Employees		8	37209
		Workers		1119	14938
		Independents	female	0	28834
		Assistants		0	13508
		Employees		0	23942
		Workers		1	9612
4	Saltworks	Independents	male	18	44811
		Assistants		3	20993
		Employees		1	37209
		Workers		136	14938
		Independents	female	9	28834
		Assistants		2	13508
		Employees		0	23942
		Workers		0	9612
5	Metal industry	Independents	male	14606	46654
		Assistants		3874	21857
		Employees		234	38739

		Workers		15495	15552
		Independents	female	8	30020
		Assistants		2222	14064
		Employees		0	24927
		Workers		511	10007
6	Ceramics	Independents	male	2999	35250
		Assistants		532	16514
		Employees		2	29270
		Workers		4914	11750
		Independents	female	12	22682
		Assistants		314	10626
		Employees		0	18834
		Workers		463	7561
7	Furniture industry	Independents	male	11293	40722
		Assistants		2057	19078
		Employees		0	33813
		Workers		18216	13574
		Independents	female	190	26203
		Assistants		3669	12276
		Employees		0	21757
		Workers		135	8735
8	Textile	Independents	male	2658	42334
		Assistants		347	19833
		Employees		178	35152
		Workers		7284	14112
		Independents	female	3278	27240
		Assistants		575	12762
		Employees		14	22619
		Workers		13571	9080
9	Hides, skins and other hard materials derived from animals	Independents	male	1648	48094
		Assistants		189	22531
		Employees		12	39935
		Workers		3055	16032
		Independents	female	4	30946
		Assistants		49	14498
		Employees		0	25696
		Workers		147	10316
10	Food and beverages	Independents	male	8237	46011
		Assistants		1207	21556
		Employees		291	38205
		Workers		19274	15338
		Independents	female	208	29606
		Assistants		901	13870
		Employees		0	24583
		Workers		8921	9869

11	Chemicals and related products	Independents	male	240	43314
		Assistants		18	20292
		Employees		295	35965
		Workers		1136	14438
		Independents	female	7	27870
		Assistants		8	13057
		Employees		42	23142
		Workers		312	9290
12	Luxury goods, science, art and letters industry	Independents	male	1095	37920
		Assistants		74	17765
		Employees		34	31486
		Workers		3467	12640
		Independents	female	18	24399
		Assistants		31	11431
		Employees		0	20260
		Workers		1247	8133
13	Construction industry	Independents	male	2662	36647
		Assistants		56	17168
		Employees		2198	30429
		Workers		26763	12216
		Independents	female	10	23580
		Assistants		0	11047
		Employees		8	19580
		Workers		0	7860
14	Production and distribution of physical forces	Independents	male	30	21624
		Assistants		4	10131
		Employees		19	17956
		Workers		3240	7208
		Independents	female	0	13914
		Assistants		0	6519
		Employees		0	11554
		Workers		3	4638
15	Construction of transport equipment	Independents	male	4642	46654
		Assistants		479	21857
		Employees		0	38739
		Workers		3886	15552
		Independents	female	0	30020
		Assistants		10	14064
		Employees		0	24927
		Workers		6	10007
16	Clothing, footwear and dressing industry	Independents	male	16777	42334
		Assistants		1036	19833
		Employees		0	35152
		Workers		22544	14112
		Independents	female	2741	27240

		Assistants		501	12762
		Employees		0	22619
		Workers		5464	9080
17	Transport and Communication	Independents	male	11517	14583
		Assistants		528	13000
		Employees		6125	19500
		Workers		23816	9508
		Independents	female	20	9383
		Assistants		0	8365
		Employees		1246	12547
		Workers		137	6118
18	Commerce, credit, insurance	Independents	male	40382	25000
		Assistants		3696	16300
		Employees		16573	46000
		Workers		13986	16300
		Independents	female	1480	16086
		Assistants		2356	10488
		Employees		1459	29599
		Workers		972	10488
19	Liberal professions	Independents, assistants, employees, and workers	male	25493	28298
			female	15450	18208
20	Public administration (administration in general, justice, army, social care)	Employees	male	29076	32731
		Workers		40367	21379
		Employees	female	1673	21061
		Workers		1160	13756
21	Domestic work	Workers	female	29551	8254

## A.2. TOP INCOME SHARES

In order to construct top income shares series we take the following steps. First, we estimate total income in each bracket for years where number of tax units is only reported and information on amounts are missing (ten years). In connection to this, we test the effectiveness of method in years when both the number and the amount of income were reported. Second, we estimate the control total for population by adjusting population data to definition of tax units specified by tax law and reported in tabulations. Third, we focus on the share of total household income in national income as an appropriate measure for the control total for income. Finally, we interpolate in order to derive specific percentages of population.

**Table A.1.2. Top income shares in Bulgaria**

year	0.5%	0.2%	0.1%	0.05%	0.01%
1919	7,59	5,01	2,91	1,91	0,73
1920	7,20	4,19	2,77	1,83	0,67
1921	7,73	4,41	2,87	1,86	0,69
1922	6,66	3,85	2,54	1,67	0,65
1924		2,90	1,85	1,15	0,34
1925		2,54	1,65	1,03	0,30
1926		2,49	1,62	1,02	0,32
1927		2,46	1,59	1,00	0,33
1928		2,46	1,56	0,96	0,28
1929		2,64	1,73	1,13	0,38
1930		2,72	1,81	1,19	0,43
1931		2,85	1,92	1,25	0,44
1932		3,06	2,05	1,35	0,49
1933		3,17	2,08	1,36	0,50
1934		3,35	2,29	1,55	0,60
1935		2,94	1,99	1,34	0,51
1936		2,40	1,61	1,08	0,41
1937		2,40	1,65	1,13	0,44
1938		2,29	1,58	1,08	0,42
1939		2,05	1,40	0,96	0,38
1940		2,14	1,53	1,09	0,48
1941		2,05	1,45	1,06	0,50
1942	3,21	2,03	1,42	1,00	0,40
1943	2,46	1,52	1,03	0,69	0,24
1944	2,00	1,19	0,81	0,53	0,19
1945	2,91	1,75	1,21	0,83	0,35

**Estimating income of reported tax units**

Income tax tabulations usually contained both the number of tax returns and the amount of corresponding income. Unfortunately, in the Bulgarian official statistics, only the number of tax returns is reported for most of the years. But, this information is still very useful since the upper part of the income distribution follows closely Pareto distribution. This has been empirically proven many times since the original insight of Vilfredo Pareto (Atkinson, Piketty, and Saez 2011, p. 14). Thus, we estimate income in brackets by assuming that the distribution of high incomes in Bulgaria corresponds to Pareto distribution. Next, we

make a robustness check by using the methodology for the years when assessed income is reported beside tax units.

The following methodology is taken from Piketty and Saez (2007), Feenberg and Poterba (1993) and Atkinson (2007). Pareto cumulative distribution function  $F(y)$  for income  $y$  is:

$$1 - F(y) = (k/y)^a \quad (1)$$

where  $1 - F(y)$  is the proportion of tax units with income above  $y$ . Parameters  $k$  and  $a$  are given;  $k$  presents the minimum income to which the Pareto distribution is applicable ( $k > 0$ ), and  $a$  presents the slope of distribution ( $a > 1$ ) (Feenberg and Poterba 1993, p. 172).

In order to estimate amounts in bracket  $(s, t)$ , it is assumed that income in each bracket is distributed according to Pareto law. Let  $p$  present the proportion of tax units above  $s$  and  $q$  the proportion of tax units above  $t$ , then:

$$\begin{aligned} p &= (k/s)^a \\ q &= (k/t)^a \end{aligned}$$

From these equations, we obtain parameters  $a$  and  $k$ :

$$\begin{aligned} a &= \log [(p/q)] / \log [t/s] \\ k &= sp^{(\frac{1}{a})} \end{aligned}$$

We allow for variation of coefficients through the distribution, and accordingly estimate  $a$  and  $k$  for each bracket. Finally, the income in bracket  $(s, t)$  is estimated as

$$Y = N \int_s^t y dF(y) \quad (2)$$

where  $N$  is the total number of tax units.

However, this method cannot be applied for the top bracket. Piketty and Saez (2007) take the top bracket to be the same as the bracket below. This might be well justified in the case when Pareto coefficients are stable through the whole distribution, but in the case of Bulgaria, coefficients experience more variations, and this can cause problem especially if the variation is stronger in the bracket immediately below the top bracket. In order to deal with this, we set the mean income in the top bracket to 1,666,667 leva, which results that the Pareto coefficient  $a$  for the top bracket takes the average value of all Pareto coefficients below.

To check how amounts estimated by this method correspond to actual reported amounts, we make an exercise with data from Atkinson, Piketty and Saez (2011, p. 13). This presents a random choice since these data are provided in a general overview as an example of how income tax tabulations look like (Table 1). We calculate the total income assessed by using only the reported number of tax units in

brackets and by assuming Pareto distribution. The comparisons are presented in the Table 1. The amounts estimated solely on the basis of tax units in the brackets are strikingly close to the actual reported amount, as in total so for each bracket separately.

(1)		(2)	(3)	
Income class		Reported income	Estimated income	(3) / (2)
At least	but less than			
£5.000	£10.000	£52.810.069	£52.758.037	99,9%
£10.000	£15.000	£24.765.153	£24.771.672	100,0%
£15.000	£20.000	£13.742.318	£13.714.613	99,8%
£20.000	£25.000	£9.653.890	£9.719.927	100,7%
£25.000	£35.000	£11.385.691	£11.321.198	99,4%
£35.000	£45.000	£7.464.861	£7.408.913	99,3%
£45.000	£55.000	£5.274.658	£5.247.047	99,5%
£55.000	£65.000	£3.295.110	£3.338.167	101,3%
£65.000	£75.000	£2.590.606	£2.577.439	99,5%
£75.000	£100.000	£4.929.787	£4.795.561	97,3%
£100.000		£12.183.724	£12.389.474	101,7%
Total		£148.095.867	£148.042.048	100,0%

Table A.2.2.: Comparison of reported and estimated income for the UK

Source: Reported income: Atkinson et al. (2011), Table 2, p. 13; Estimated income: Author's computation

Fortunately, we can check how amounts estimated by this method correspond to actual reported amounts for Bulgaria. As noted above, for years from 1942 to 1945 we have both the number of tax units as well as the amounts. Thus, we compare the amounts derived by the method described above with those reported in statistics. The comparison for 1945 is provided in Table A.2.3. below. We can see that amounts again are close to each other.



(1)		(2)	(3)	
Income class		Reported income	Estimated income	(3) / (2)
At least	but less than			
80.000	100.000	631.170	622.552	98,6%
100.000	150.000	1.194.397	1.176.760	98,5%
150.000	200.000	514.296	534.273	103,9%
200.000	250.000	328.799	332.373	101,1%
250.000	300.000	212.964	207.998	97,7%
300.000	400.000	238.619	242.297	101,5%
400.000	500.000	162.116	159.748	98,5%
500.000	600.000	109.816	111.573	101,6%
600.000	800.000	118.829	117.271	98,7%
800.000	1.000.000	67.184	64.505	96,0%
1.000.000		92.214	92.302	100,1%
Total		3.670.404	3.661.653	99,8%

Table A.2.3: The comparison of reported and estimated income for Bulgaria

Note: all amounts in '000 Lev

Source: Author's computation based on income tax statistics

Most importantly, we get almost the same percentile shares when using either of amounts. In Table 3 we compare shares of 0.1 per cent derived by both income distributions.

Income shares of 0.1 percent estimated by:	1941	1942	1943	1944	1945
reported amounts	1.45%	1.42%	1.03%	0.81%	1.21%
estimated amounts	1.47%	1.42%	1.04%	0.80%	1.19%

Table 3: Comparison of income share of top 0.1 per cent

Source: Author's computation based on income tax statistics

### Control total for population

In order to estimate control total for population, the first step is to define tax unit (household or individual). In Bulgaria, the tax unit was household (married couple with dependents). Therefore, we estimate the number of total households in country as the number of adults minus the number of married females (the assumption is that the number of non-adults that filled their tax returns separately was negligible)<sup>40</sup>. This data are found in population censuses that took place in 1920, 1926, 1934 and 1946 in Bulgaria. From this we subtract the number of married females.

<sup>40</sup> As in other studies (Atkinson 2007)

Estimates for the years between censuses are derived as follows. Proportions of adults to total population are linearly interpolated between the census years and applied to number of total population from the official reports in the *Movement of Population*. Proportions of married females in adult population were constant in census years. We believe that the use of linear interpolation is well justified, since when we linearly interpolate the number of total population between the census years, we arrive at the closely the same number as found in the yearly *Movement of Population*. Estimates are presented in appendix.

### **Control total for income**

The next step is to estimate the external control for the total income. We start from the figures of gross national income. For the interwar period we rely on historical national accounting. Interwar period is often seen as the golden era of Bulgarian economic research. As put by Ivanov (2006, p.6), Bulgaria “was among the first ten countries in the world with an estimate of national income”. In this rich tradition, the name of Asen Chakalov is probably the most familiar to economic historians. His estimates of national income for the period from 1924 to 1945 (Chakalov 1946) are widely used and “correspond closely to modern definitions of gross national product” (Ivanov 2006, p.7;). Angus Maddison (2000) included them in his database without any notable alterations (Ivanov 2006, p. 8). Chakalov’s estimates are used here for the period under consideration. We use GNP at current prices, and to come to total household income as the appropriate denominator (we are interested in income that would have been reported if all tax units had to fill tax returns), for example, excluding corporate retained earnings, income of government sector and non-profit institutions (Atkinson 2007).

Due to the lack of detailed information in historical national accounts, we rely on Leigh’s (2007) conclusion, based on studies compiled in Atkinson and Piketty (2007), that the personal income control total is about two-thirds of GNP. He adds that “this ratio appears quite similar across countries, and shows no systematic trends, either upwards or downwards” (Leigh 2007, p.F623). This proportion is applied here. But we should keep in mind the predominantly agricultural nature of Bulgarian economy in the interwar period, and thus take with small reservation the supposed constancy of the ratio, due to substantially different social and economic conditions through time and across countries. Sensitivity analysis for top 0.1 per cent shows in average 0.3 per cent lower income share when using the ratio of 80 per cent for personal income in GNP, or 0.4 per cent lower income share for 90 per cent ratio. This relative robustness shows that results were not strongly altered by this assumption.

### **Interpolation**

The final step in the construction of top income shares is to estimate specific percentage of population in which we are interested, such as the top 1 per cent or the top 0.1 per cent. To arrive at these measures,

we apply Pareto interpolation. This is justified by the fact that top incomes follow Pareto distribution, as we have shown already. For example, Pareto distribution assumes linear relationship of logarithms of the cumulative population and logarithms of cumulative income. Interpolate then fits straight line to logarithms (Kuznets 1953, p.281) using end points of the interval between which concerned per cent of population lies.

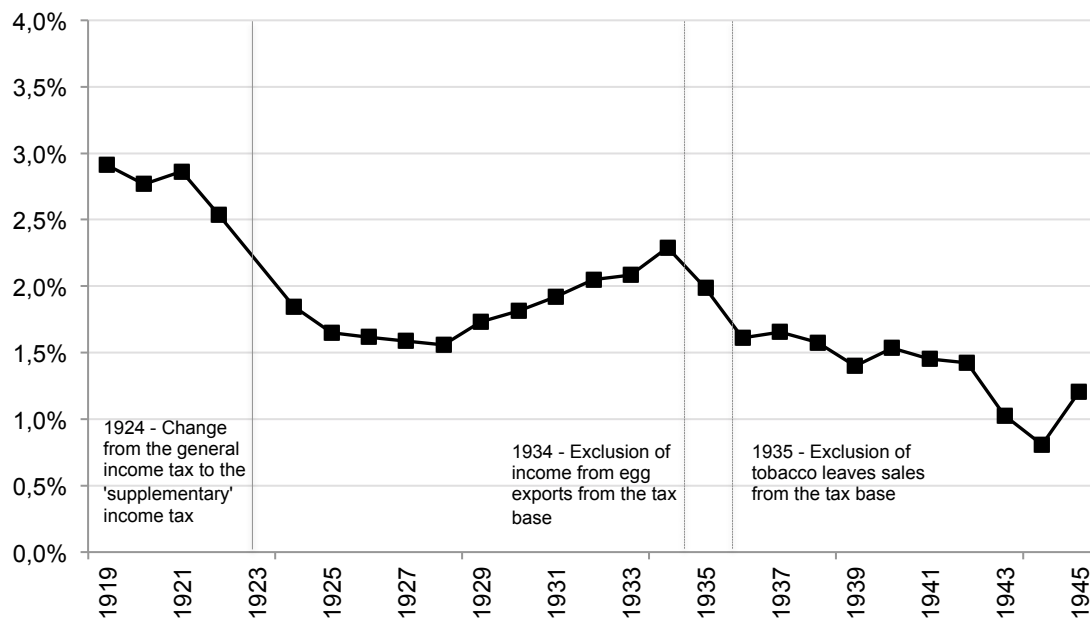


Figure A1: Top 0.1 income share and legislative breaks in the income tax code (vertical lines)

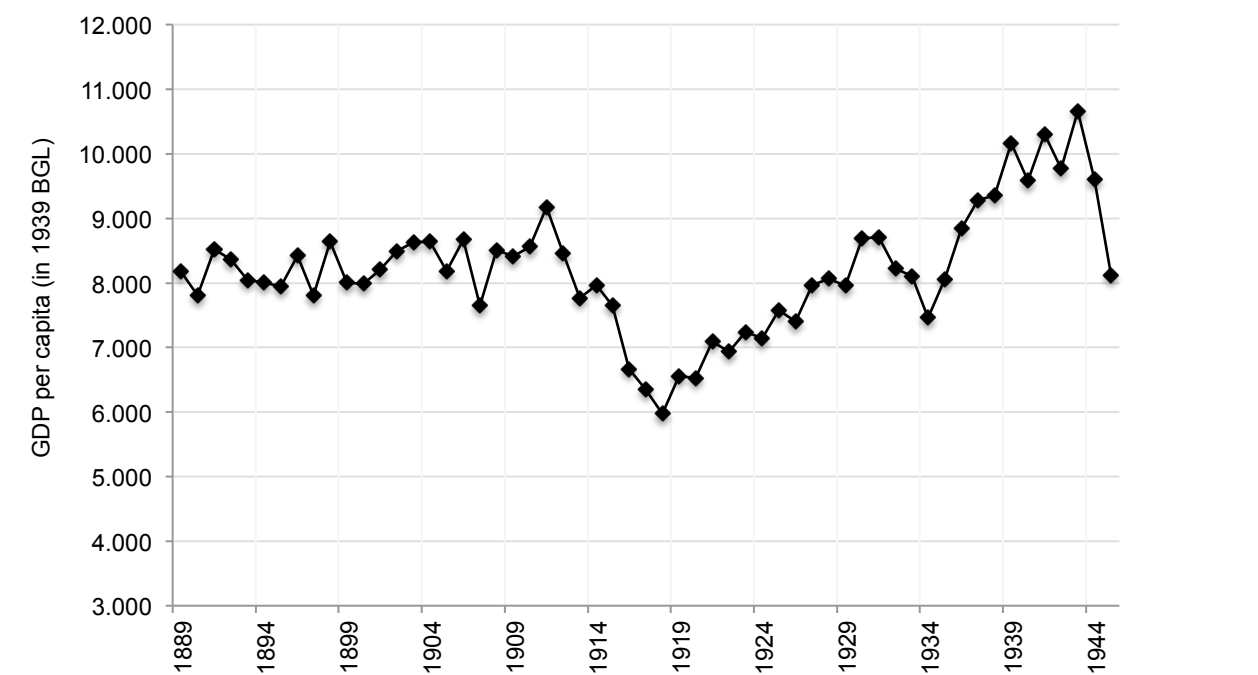


Figure A2 : Real GDP per capita in Bulgaria, 1889-1945

Source: Chakalov (1946), Ivanov (2006)

## Reference:

Anand, S., and Kandbur, S. M. R. (1993). "The Kuznets process and the inequality- development relationship". *Journal of Development Economics*, 40, 25-52.

Allen, R. C. (1992). *Enclosure and the Yeoman*, Oxford: Clarendon Press

Allen, R.C. (2016). "Revising England's Social Tables Once Again". *Oxford Discussion Papers in Economic and Social History*.

Alvaredo, F. (2009). "Top Incomes and Earnings in Portugal 1936–2005." *Explorations in Economic History*, 46(4): 404–17.

Alvaredo, F., and Saez, E. (2009). "Income and Wealth Concentration in Spain from a Historical and Fiscal Perspective." *Journal of the European Economic Association*, 7(5), pp. 1140–67.

Atkinson, A. B. 2005. "Top Incomes in the UK over the 20th Century." *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 168(2), pp. 325–43

Atkinson, A. B., Piketty, T. (eds.) (2007). *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries*, Anthony B. Atkinson and Thomas Piketty, 18–42. Oxford and New York: Oxford University Press

Atkinson, A. B. (2007). "Measuring Top Incomes: Methodological Issues." In *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries*, ed. Anthony B. Atkinson and Thomas Piketty, 18–42. Oxford and New York: Oxford University Press

Atkinson, A. B., Piketty, T., Saez, E. (2011). "Top Incomes in the Long Run of History". *Journal of Economic Literature*, 49(1), pp. 3-71

Bell, J. D..(1977). *Peasants in power: Alexander Stamboliski and the Bulgarian Agrarian National Union, 1899-1923*. Princeton: Princeton University Press

Berend, I. (1985). "Agriculture", In M. Kaser, (ed.), *The Economic History of Eastern Europe 1919- 1975, Vol. 1*, Oxford: Clarendon Press, pp. 148-209.

Berov, Lj. (1968). *Polozhenieto na rabotnicheskata klasa v Bŭlgariia pri kapitalizma*. Sofia: Profizdat

Berov, Lj. (1979). "Wages in the Balkan Lands During the Period of Manufacturing Capitalism and the Industrial Revolution", *Bulgarian Historical Review*, 7(1), pp. 91- 115.

Berov, Lj. (1987). "Trends in the Level and Structure of the Incomes of the Working People in the Balkan Countries in the Eighteenth and Nineteenth Centuries up to 1912", *Bulgarian Historical Review*, 15(4), pp. 65-83.

Beshkov, A. (1940). "Tobacco in Bulgaria", *Economic Geography*, 16(2), pp. 188-194

Bordo, M. D., and Kydland, F. E. (1995). "The Gold Standard as a Rule: An Essay in Exploration". *Explorations in Economic History*, 32(4), pp. 423-64.

Bourguignon, F., and Morrisson, C. (1990). "Income Distribution, Development and Foreign Trade: A Cross-Sectional Analysis". *European Economic Review*, 34, 1113-1132.

Bourguignon, F., and Morrisson, C. (2002). "Inequality among world citizens: 1820–1992". *The American Economic Review*, 92(4), pp. 727–744.

Bouroff, Tz. (1925). *La Réforme agraire en Bulgarie (1921-1924)* Université de Paris, Faculté de droit: Thèse pour le doctorat en droit

Bordo, M. D., and Kydland, F. E. (1995). "The Gold Standard as a Rule: An Essay in Exploration". *Explorations in Economic History*, 32(4), 423-64.

Bordo, M. D., and Rockoff, H. (1996). "The Gold Standard as a "Good Housekeeping Seal of Approval". *The Journal of Economic History*, 56(2), 389-428.

Braudel, F. (1979). *Civilisation matérielle, économie et capitalisme, XVe-XVIIIe siècle*. Paris: Armand Colin

Buys, E., Franaszek, P. (2010). "Sectoral developments". In *The Cambridge Economic History of Modern Europe, Volume 2: 1870 to the Present*, ed. Stephen Broadberry and Kevin H. O'Rourke, 208-231. Cambridge University Press.

Chakalov, A. (1946). *The National Income and Outlay of Bulgaria for 1924–1945*, Sofia: Knipegraf (in Bulgarian)

Crampton, R. J. (2007). *A concise history of Bulgaria*. Cambridge; New York: Cambridge University Press (2nd ed.)

Daskalov, R. (2004). *The Making of a Nation in the Balkans: Historiography of the Bulgarian Revival*. Budapest: Central European University Press

Feenberg, D. R., Poterba J. M. (1993). "Income Inequality and the Incomes of Very High-Income Taxpayers: Evidence from Tax Returns." In J. M. Poterba (ed.), *Tax Policy and the Economy*, 7. Cambridge and London: MIT Press, pp. 145–77

Inalcik, H. (1991). "The Emergence of Big Farms, Ciftliks: State, Landlords and Tenants", In C. Keyder and F. Tabak (eds.), *Landholding and commercial agriculture in Middle East*. Albany N.Y.: State university of New York press

Ivanov, M. (2006). "Bulgarian National Income between 1892 and 1924". *Bulgarian National Bank Discussion Papers*, 54

Ivanov, M. and Tooze, A. (2007). "Convergence or Decline on Europe's Southeastern Periphery? Agriculture, Population, and GNP in Bulgaria, 1892-1945". *The Journal of Economic History*, 67(3), pp. 672-704

Ivanov, M., and Kopsidis, M. (2015). "Was Gerschenkron right? Bulgarian agricultural growth during the Interwar period in light of modern development economics", *EHES Working Papers in Economic History*, 82

Kemilev, A. (1947). *National Income in Bulgaria 1936-1946*. Sofia (in Bulgarian)

Kopsidis, M. (2012). "Missed Opportunity or Inevitable Failure? The Search for Industrialization in Southeast Europe 1870-1940", *EHES Working Papers in Economic History*, 19

Kula, W. (1976). *An economic theory of the feudal system*. London: Western Printing Services

Kuznets, S. (1953). *Shares of upper income groups in income and savings*. New York: National Bureau of Economic Research

Laferrière, M. (1989). "L'industrie textile en Bulgarie", *Annales de Géographie*, 545, pp. 24-50.

Lampe, J. (1986). *The Bulgarian economy in the twentieth century*. London: Croom Helm

Lampe J., and Jackson, M. (1982). "Balkan Economic History, 1550-1950", Bloomington: Indiana University Press

Leigh, A. (2007). "How Closely Do Top Income Shares Track Other Measures of Inequality?" *Economic Journal*, 117(524): F619–33.

Lewis, A. W. (1954). "Economic Development with Unlimited Supplies of Labor," *The Manchester School of Economic and Social Studies*, 22, pp. 139-191.

Lindert, P. H., and Nafziger, S. (2014). "Russian inequality on the eve of revolution". *The Journal of Economic History*, 74 (3), pp. 767–798.

Lindert, P. H., and Williamson, J. G. (1982). "Revising England's social tables 1688–1812". *Explorations in Economic History*, 19 (4), pp. 385–408.

Lindert, P. H., and Williamson, J. G. (1983). "Reinterpreting Britain's social tables, 1688–1913". *Explorations in Economic History*, 20(1), 94–109.

Lindert, P. H., and Williamson, J. G. (2016). *Unequal Gains: American Growth and Inequality since 1700*. Princeton: Princeton University Press.

Maddison, A. (2000). *Monitoring the World Economy 1820–1992*, Paris: OECD

Milanovic, B. (2015). "The level and distribution of income in mid-eighteenth-century France, according to François Quesnay". *Journal of the History of Economic Thought*, 37, pp. 17-37

Milanovic, B. (2016). *Global inequality: A new approach for the age of globalization*. Harvard University Press

Milanovic, B., Lindert, P. H., and Williamson, J. G. (2011). "Pre-industrial inequality". *The Economic Journal*, 121(551), pp. 255–272

Miller, M. L. (1975). *Bulgaria during the Second World War*. Stanford: Stanford university press

Morrisson, C., and Snyder, W. (2000). "The income inequality of France in historical perspective", *European Review of Economic History*, 4, pp. 59-83

Nedkov, B. (1938). *Развитие на българската финансова система през последното десетилетие*. Development of the financial system of Bulgaria during the last decade. Sofia.

Nenovsky, N. (2006). «Exchange rate and infaltion: France and Bulgaria in the Interwar Period and the Contribution of Albert Aftalion (1874-1966)». Bulgarian National Bank working paper.

Palairot, M. (1997). *The Balkan Economics, c. 1800-1914*, Cambridge: Cambridge University Press.

Piketty, T. (2001). *Les hauts revenus en France au Xx<sup>e</sup> siècle: Inegalites et redistributions 1901–1998*. Paris: Grasset.

Piketty, Thomas. 2007. "Top Incomes over the Twentieth Century: A Summary of Main Findings." In *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries*, ed. Anthony B. Atkinson and Thomas Piketty, 18–42. Oxford and New York: Oxford University Press

Piketty, T., and Saez E. (2003). "Income inequality in the United States 1913-1998". *Quarterly Journal of Economics*, 118(1), pp. 1-39



Piketty, T., and Saez, E. (2007). "Top incomes in the United States". In A. B. Atkinson and T. Piketty (eds.), *Top Incomes over the Twentieth Century: A Contrast between Continental European and English-Speaking Countries*, Oxford and New York: Oxford University Press, pp. 18–42.

Popoff, K. (1920). *La Bulgarie économique, 1879-1911: études statistiques*. Sofia.

Prados de la Escosura, L. (2008). "Inequality, Poverty and the Kuznets Curve in Spain, 1850–2000". *European Review of Economic History*, 12(3), pp. 287–324.

Rangelova, R. (2000). "Bulgaria's National Income and Economic Growth 1913–1945." *Review of Income and Wealth*, 46, pp. 231–248.

Ránki, G. and Tomaszewski, J. (1986): "The role of the state in industry, banking and trade", In M. C. Kaser, and E. A. Radice (eds.), *The Economic History of Eastern Europe 1919-1975, Vol. 2*, Oxford: Clarendon Press, pp. 3–48.

Rodriguez Weber, J. E. (2014). *La economía política de la desigualdad de ingreso en Chile, 1850-2009*. Tesis de Doctorado en Historia Economica, Programa de Historia Economica y Social. Facultad de Ciencias Sociales, Universidad de la Republica, Uruguay

Roine, J., and Waldenström, D. 2008. "The Evolution of Top Incomes in an Egalitarian Society: Sweden, 1903–2004." *Journal of Public Economics*, 92(1–2), pp. 366–87.

Roses, J.R., and Wolf N. (2010). "Aggregate Growth 1913–1950". In S. Broadberry and K. H. O'Rourke (eds.) *The Cambridge Economic History of Modern Europe, Volume 2: 1870 to the Present*, Cambridge University Press, pp. 181–207

Rossi, N., Toniolo, G., and Vecchi, G. (2001). "Is the Kuznets Curve Still Alive? Evidence from Italian Household Budgets, 1881–1961". *The Journal of Economic History*, 61(4), 904–925.

Stewart, C. T. (1961). "Land and Income Distribution in Peasant Countries", *Land Economics*, 37(4), pp. 337–346

Statistics Directorate General (1920 to 1945). *Statistical Yearbook of Kingdom of Bulgaria*. Sofia: Dürzhavna pechatnitsa (in Bulgarian and French)

Statistics Directorate General. [Glavna direktsiia na statistikata] (1926). *Obshti rezultati ot prebroiavane na naselenieto v Tsarstvo Bŭlgariia na 31 dekemvri 1920 god (Résultats généraux du recensement de la population dans le royaume de Bulgarie au 31 décembre 1920)*. Sofia: Dürzhavna pechatnitsa.

Statistics Directorate General. [Glavna direktsiia na statistikata] (1931). *Obshti rezultati ot prebroiavane na nacelenieto v Tsarstvo Bŭlgariia na 31 dekemvri 1926 god (Résultats généraux*

*du recensement de la population dans le Royaume de Bulgarie au 31 Décembre 1926*). Sofia: Dŭrzhavna pechatnitsa.

Statistics Directorate General. [Glavna direktsiia na statistikata] (1937). *Prebroiavane na naselenieto na 31 dekmvri 1934: obshti rezultati*. Sofia: Dŭrzhavna pechatnitsa.

Tsentralno statisticheskoto upravlenie (1959). *Prebroiavane na naselenieto na 1 dekmvri 1956 god. : obshti rezultati*. Sofia: Nauka i izkustvo

Stoianovich, T. (1953). "Land Tenure and Related Sectors of the Balkan Economy, 1600-1800", *The Journal of Economic History*, 13(4), pp. 398-411

Stoyanov, P. (1926). *Basic principles of financial economics*. Sofia (in Bulgarian)

Van Zanden, J. L. (1995). "Tracing the beginning of the Kuznets' Curve". *Economic History Review*, 48(4), pp. 643–664

Vinski, I. (1967). "The distribution of Yugoslavia's national income by social classes in 1938", *Review of Income and Wealth*. 3, pp. 259-281.

Veinstein, G. (1991). "On the Ciftlik Debate", In C. Keyder and F. Tabak (eds.), *Landholding and commercial agriculture in Middle East*. Albany N.Y.: State university of New York press

Wallerstein, I. (). *The Modern World-System* (4 vol.)

Young, A. (2013). "Inequality, the Urban-Rural Gap, and Migration". *The Quarterly Journal of Economics*, 128(4), pp. 1727–1785.

# Chapter 4. After ‘self-management’: Top incomes in Croatia and Slovenia, from 1960s until today

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## Abstract

The income tax data are used to show that the transition to the market economy has led to a moderate increase in income inequality in Croatia and Slovenia. Inequality increased in the 1990s and stabilized afterwards, with the increase in inequality being mainly driven by the rising shares of top income groups. This development is explained by the ‘gradualist’ transition course. In both Slovenia and Croatia, the slow privatization and the large public sector have contributed to the emergence of labour market institutions that procured low inequality social equilibrium. This institutional setting and the inclusive social dialogue have ingrained legacies of the Yugoslav self-management. We look at social groups at the top during the Yugoslav self-management in order to understand how the power relations and conflicts might have influenced the specific transition path and the emerging institutions, therefore making a more comprehensive social science approach in evaluating inequality patterns. Finally, the substantial importance of the state ownership of the corporate sector in Slovenia and the foreign and state ownership in Croatia has made the concentration of private capital income less pronounced at the top of the income distribution.

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\* I am grateful to Tine Stanovnik, Nataša Kump, Ivica Urban, Thomas Piketty, and Branko Milanović for the help in obtaining the data for this chapter. Special acknowledgments go to Mirna Valinger, Gordana Marić and Zlatana Kvesić from the Croatian Tax Administration for the preparation of the Croatian income tax data used in this chapter. I am also grateful to Ivana Kuhar in the Croatian State Archives in Zagreb and Branko Radulović in the Archives of the Republic of Slovenia in Ljubljana for the help in locating the archival material used in this chapter. Special thanks go to Leonard Kukić for helpful discussion. All errors are of ours

## 4.1. Introduction

The fall of socialism in Eastern Europe has been one of the key junctures in recent world history. A decades-long sharp world dichotomy into two economic blocks ended, and some claimed that the world has reached the 'end of the history'. But in whichever direction the historical progress has been heading to, the fall of socialism signified in former Yugoslavia yet another in line of the twentieth century upheavals. The country became the sight of the greatest violent struggle in Europe after the Second World War. Following its breakup, seven new countries emerged on the world map.<sup>1</sup>

Former Yugoslavia makes an especially compelling case to study the evolution and determinants of inequality. The list of motivating questions is extensive, spanning from the country's unique socialist experience to its tragic end. The specific institutional design of the Yugoslav socialism or the institutional change to the market economy make Yugoslavia an interesting historical case study that might shed new light on the relationship between institutions and inequality (Acemoglu, Johnson and Robinson 2005; Acemoglu and Robinson 2012). Further, the experience of Yugoslavia is interesting in the development context, as the country was characterized by considerable regional income disparities and displayed thus distributional patterns documented in the recent research on global inequality (Bourguignon 2015; Milanović 2016). The fact that these large disparities coincided with ethnic divisions, and that social cohesion was generally weak along many dimensions, makes the country's experience relevant for understanding many challenges that Europe is facing today.

This work analyses the evolution of inequality in two of once constituent Yugoslav republics, Croatia and Slovenia in the period from the 1960s until today. Croatia and Slovenia made a more developed north-western part of the country, with Slovenia enjoying the highest living standard in Yugoslavia and subsequently. Countries share many institutional and cultural traits, and many similarities in their experience allow us to use (for the most of the period) the uniform analytical framework.<sup>2</sup> The focus on Croatia and Slovenia has been primarily influenced by the availability of data (hopefully, this work will be extended to whole Yugoslavia and to other former republics), but, nonetheless, their experience is in general representative of the Yugoslav socialism.

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<sup>1</sup> Namely, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, Serbia and Slovenia.

<sup>2</sup> The countries are of similar area and population size, and until 1918 were a part of the Habsburg Monarchy. Both countries are today members of the European Union.

The Yugoslav socialism is especially interesting due to the outstanding reforms in the 1960s. Yugoslavia embarked on its own 'road to socialism', launching the greatest decentralization and democratization reform among former socialist countries.<sup>3</sup> Yugoslavia introduced the famous worker's self-management, which attracted substantial international interest, and to many searching for the 'third way' between communism and capitalism, or a system to promote greater workers' participation and industrial democracy, Yugoslavia presented a promising alternative. The impact of 'market socialism' on income inequality had been a prominent issue in Yugoslavia and other socialist countries. As a matter of fact, the 'laissez-faire socialism' assumedly came abruptly to its end in the early 1970s exactly because it aggravated income inequality beyond limits that the system could tolerate and induced social changes that turned out to be too dangerous to the one-party rule.

We construct top income shares series for the period from the 1960s until today, covering thus the socialist period, the transition and its aftermath. To our knowledge, this is the first time that fiscal data have been used to analyse top incomes during the socialist phase in Eastern Europe.<sup>4</sup> Top incomes had been a concealed category in the socialist countries. No information was published and the subject was hence rarely treated. Yugoslavia was the only socialist country in Eastern Europe that had introduced the comprehensive income tax (on high incomes). We have found the corresponding statistics of this tax in the national archives in Croatia and Slovenia.<sup>5</sup> Top income shares for the post-socialist period are estimated from the income tax microdata. Further, the analysis covers the important time period, comprising the rise and fall of the 'market' reforms in socialist Yugoslavia, the crisis of the 1980s culminating with the breakup of Yugoslavia and the war in Croatia, and the transition to the market economy.

We find that top income shares in Croatia and Slovenia moderately increased in the course of the transition to the market economy. During socialism, the top 1 per cent income share increased following the 'marketization' reforms in the late 1960s, and more notably declined with the termination of reforms in the early 1970s. Looking at the development within the top percentile, we find that income shares of lower constituent groups of the top percentile (the top 1-0.5 per cent or top 0.5-0.1 per cent) largely induced this fluctuation, while the very top income groups (the top 0.1 per cent), showed marked stability. To shed light on this

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<sup>3</sup> Earning the label, as Bergson (1968) put it, of the 'venturesome' country.

<sup>4</sup> The income tax data for China are available from 2006, and have been exploited by Piketty, Yang and Zucman (2017).

<sup>5</sup> I am especially grateful to Tony Atkinson and Branko Milanović for making me aware of this tax in former Yugoslavia. Hopefully, this work will be extended to whole Yugoslavia and to other former republics, once the data of the former Federal Ministry of Finance are available in the Archive of Yugoslavia in Belgrade. They were not available to researchers at the moment of writing this chapter.

development, the tax data have proved to be especially useful, since it provides an insight into the social composition of top incomes in the socialist period,<sup>6</sup> allowing us to identify top social groups in socialist Yugoslavia, such as the political *nomenklatura*, the managerial-technocracy, intelligentsia, etc. We find that 'lower' top groups predominantly comprised occupations in the real economy, in the first 'managerial-technocracy', while the top 0.1 was composed of occupations in the administrative sphere, such as political bureaucracy, intelligentsia, cultural elite etc. We relate this composition, as well as differences in evolution of top incomes, to the institutional design of the Yugoslav socialism. On the other hand the transition was featured by the most moderate increase in top incomes among socialist countries. It was mainly induced by the growing wage dispersion. The upward adjustment of top shares was immediate in Slovenia, while in Croatia the increase occurred in the late 1990s. Top incomes have stabilized in both countries from the early 2000s.

In order to explain the observed development from the 1960s until today, we believe that the inadequacy of standardly used economic arguments makes it necessary to stretch into the area of other social sciences, such as political science or sociology (Acemoglu and Robinson 2006, 2012, 2015; Roland 2017; Olson 1982; etc.). A stronger interrelation of political, economic, and cultural structures in socialism impacted top incomes in qualitatively different way than in capitalism (Michels 1911, Djilas 1957, Szelenyi et al. 1998; Bourdieu 1986, etc.). We thus aim to understand the context of power relations and elites, especially for their role in shaping the specific institutional outcomes and, in turn, inequality.<sup>7</sup> For example, we take the balance between communist bureaucracy and the so-called 'technocracy' in top incomes to be indicative of the prevailing power relations, which we show that assumed in Yugoslavia the 'middle way' between the hard-line communism of the USSR and the laissez-faire capitalism of the United States. We believe that changes in the balance of power between managers and bureaucracy shaped the institutional design of the Yugoslav self-management and underlined the evolution of top income shares.

We suggest that higher bargaining power of technocracy implied that the socialist structures had not collapsed with the end of the socialist Yugoslavia (Roland 2017), and that in countries like Slovenia, they led the transition path, which implied less sharp break with the socialist legacy. In the light of the most 'gradualist' transition among former socialist countries in Eastern Europe, we should understand the emergence of the specific institutions that have

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<sup>6</sup> The tax data provide more comprehensive coverage of top incomes, including social groups missing in the alternative sources.

<sup>7</sup> Accordingly, a dynamic role of the elites as propounded by Schumpeter (1955), or the Bourdieu's (1986) concept of capital conversion, are potential mechanisms to understand changes in inequality during the transition to the market economy (e.g. Szelenyi et al. 1998).

contributed to the moderate rise in inequality during the transition. The slow privatization and still substantial state ownership of the corporate sector (the highest among former socialist countries), have plausibly contributed to the emerging institutional setting, which in turn, coupled with the legacy of the social dialogue from the self-management and strong social partnership, procured low inequality equilibrium in Slovenia and Croatia. Finally, the substantial importance of the state ownership of the corporate sector in Slovenia and the foreign and state ownership in Croatia has made the concentration of private capital income less pronounced at the top of the income distribution. Relatively lower capital share may be also related to the higher bargaining power of labour.

This chapter is organized as follows. Section 2 describes the data and the methodology used. Section 3 presents results on income inequality trends. In Section 4 describes the main contours of the Yugoslav institutional setting and delineates top income composition during socialist period. Section 5 analyses distributional patterns in Croatia and Slovenia after the break-up of Yugoslavia and offers explanations of the observed patterns. Section 6 presents a technical analysis of top incomes. In Section 7 we compare the income tax data and survey data. Section 8 provides international comparison. Section 9 concludes.

## 4.2. Data and methodology

Top income shares series for Croatia and Slovenia are constructed from the income tax data. The data for the period of socialist Yugoslavia come from the statistics of the tax on the total personal income of citizens. This was the only tax on the total income in the former socialist block (Jelčić 1983, p. 219). In Yugoslavia, specific income sources were subject to schedular taxation, but individuals whose total income exceeded certain exemption threshold<sup>8</sup> were subject in addition to the personal income tax on their total income. This, however, implied that only a limited number of individuals were subject to the tax, and as a result reported in the tax statistics, compelling us to focus on income shares of groups at the top of the income distribution. Schedular taxation of personal incomes was proportional, in line with the dictum “to each according to his work” (itself included as a constitutional category), while the tax on total income had steep progressive structure (assuming thus redistributive role;<sup>9</sup> with rates ranging from 3% to the top marginal rate of 70%). For the post-socialist period, we use

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<sup>8</sup> Two times the average wage in the social sector until 1979; three times afterwards.

<sup>9</sup> The tax on the total income aroused much public interest, which was largely concerned with the equity issues (Jelčić 1983). Although distributional concerns were the main reason of its introduction, the number of taxpayers subject to the tax has been falling with time.

personal income tax microdata. Croatian series are constructed from the micro files of PIT taxpayers for the 1997-2013 period.<sup>10</sup> For Slovenia, we use top income shares series for the 1991-2012 period, constructed by Kump and Novokmet (in progress) from the PIT microdata and tabulations of all PIT taxpayers.<sup>11</sup>

The tax unit in Croatia and Slovenia, both in the socialist and the post-socialist period, has been the individual. Top income groups are defined in proportion to the total number of adults (above 18 years of age) in each country. The corresponding data is found in censuses and the annual statistics of population. Our preferred income concept is that of gross income, before personal deductions and personal income taxes. The total annual income during socialism (hr. *ukupni godišnji čisti prihod*; sl. *skupni dohodek občanov*) was defined as the sum of all personal incomes after social contribution and schedular taxes, but before taxes on the total personal income of citizens. However, schedular taxation of personal incomes applied proportional rates,<sup>12</sup> thus preserving the monotonic relationship to the gross income distribution.<sup>13</sup> The access to the microdata for the recent period allow us the use of various income concepts, as well as the estimation of both the pre-tax and the post-tax income shares. The coverage of income sources did not undergo a fundamental change with the change of the political regime. The new income tax legislation in the 1990s replaced the dominant schedular taxation with the taxation of the comprehensive (Haig-Simons) income concept, previously applied only to top incomes. As a result, there is continuity in the coverage of the top incomes.

Taxable income in the socialist period comprised income from employment, part-time work, pensions, income from agriculture, income from crafts and other independent activities, income from intellectual services and authorship rights, income from buildings and other property, and income from property rights. Slovenia introduced the taxation of capital income (dividends and share in profits, capital gains) with the 1991 tax reform, while Croatia taxed capital income only during the period from 2001-4 and since 2012. Additional details are explained in the appendix.

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<sup>10</sup> We are especially grateful to Ivica Urban from the Institute for Public Finance in Zagreb, who made the estimates for 1997 and 1999 on the basis of personal income taxpayers samples (see Urban 2006).

<sup>11</sup> See appendix for the explanation of the data sources.

<sup>12</sup> Roughly similar on different income sources (see Appendix)

<sup>13</sup> Thus, not raising the problem of re-ranking.



### 4.3. The long-term evolution of income inequality

Figure 1 presents the long-term evolution of national income per adult in Croatia and Slovenia together with the average for Austria, Germany and Italy (termed Western Europe) – countries with which both Croatia and Slovenia have traditionally had the most intense economic relations. Today, living standards in Croatia and Slovenia are respectively 55% and 75% per cent of the Western European levels. The growth experience since the fall of socialism has been especially disappointing in Croatia, where the pre-transition level was only reached in the early 2000s. In general, the absence of convergence to Western European levels has been one frustrating feature of the transition process to the market economy and its aftermath. In fact, the income gap between Western Europe and Croatia and Slovenia is roughly the same as it had been in the late 1970s (thereafter the socialist growth came to a halt and the gap widened). After the ‘transformation’ recession, growth rates in Croatia and Slovenia have not been high enough for them to catch up with Western Europe. Compared to other former socialist economies, Slovenia and Croatia once enjoyed comparatively high living standards, but not anymore, as most former socialist countries in Central Eastern Europe have surpassed (Croatia) or almost caught up (Slovenia) with them.

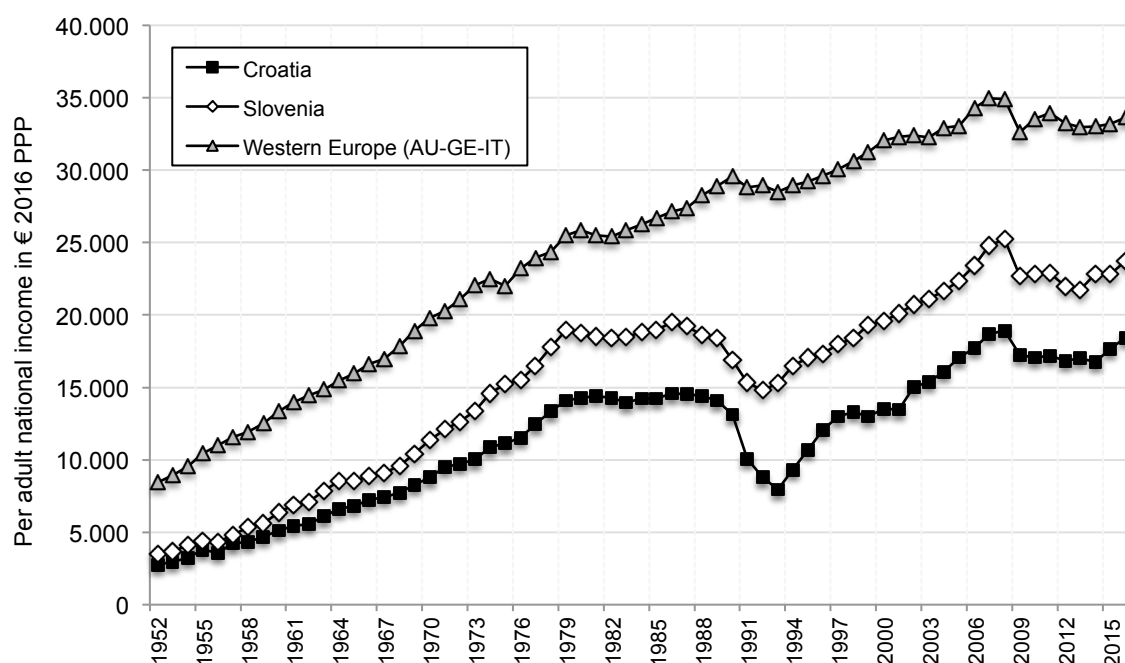


Figure 1: The long-term growth of national income per capital

Source: Croatia and Slovenia: 1990-2016 WID; backward extrapolation from Maddison (2013)

Note: Western Europe: unweighted average of Austria, Germany and Italy

The sluggish convergence is familiar from former Yugoslavia, where once poorer Yugoslav regions could not catch up with richer Slovenia and Croatia. Namely, Yugoslavia was characterized by considerable differences in economic development between its republics and various regions. As a result, the income inequality was to greatest extent determined by large regional income disparities, with the ratio of 7 to 1 between the most developed Slovenia and the least developed Kosovo (Milanović 1990). Thus, while income inequality was, as a consequence, higher in Yugoslavia than in socialist countries in Central Eastern Europe, inequality in Slovenia or Croatia did not differ substantially from that in Hungary, Czechoslovakia or Poland (Atkinson and Micklewright 1992).<sup>14</sup> In particular, the state policy aimed to neutralise regional differences by pushing for greater equality in more developed republics and enterprises (Flakierski 1989; Orazem and Vodopivec 1995). Although constitutional changes in the 1970s gave republics considerable autonomy in economic and fiscal matters, this largely meant only a transfer of authority from federal to republic party organs, and the state intervention into the economy and income distribution remained pervasive.

Figure 2 shows the evolution of the income distribution in the Slovenia since 1991 until today. It can be seen that inequality in Slovenia was relatively low at the outset of transition. During the transition, the major changes occurred at the top and the bottom of the distribution, while middle 40 per cent income share has remained stable (the income share of the middle 40 per cent equalled 45% at the outset of the transition to market economy as in 2012). The top 10 per cent gained what the bottom 50 per cent lost. This is in line with findings of Milanovic and Ersado (2010), who find that in the transition countries an increase in shares of top deciles and a decline of bottom deciles, while intermediate deciles were generally not affected. But modest growth performance should be kept in mind when analysing the development of inequality, especially perceptions or egalitarian leanings.<sup>15</sup>

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<sup>14</sup> Accordingly, relatively higher income inequality in the Soviet Union was similarly to considerable extent due to greater regional differences in average income.

<sup>15</sup> For example, egalitarian attitudes are presumably still ingrained in social norms in Slovenia and Croatia (Malnar 2011; Burić and Štulhofer 2016), and it would be interesting to know to what extent this is due to some older legacies and their long-term persistence (Županov 1977), or if it is related to new experiences of the post-transition societies. For example, there is a notably higher divergence between (low) measured and (high) perceived inequality in former socialist countries (Gimpelson and Treisman 2015). In Croatia, for example, despite a moderate increase in inequality, a sluggish growth and traumatic experiences of the war, the transformation and non-transparent privatization could have translated into higher sensitivity and negative perceptions of top incomes as unfair and undeserved (Nestić 2002, p. 612; Franičević 2004). This work shows that this divergence is not due to critical mismeasurement of top incomes in surveys.

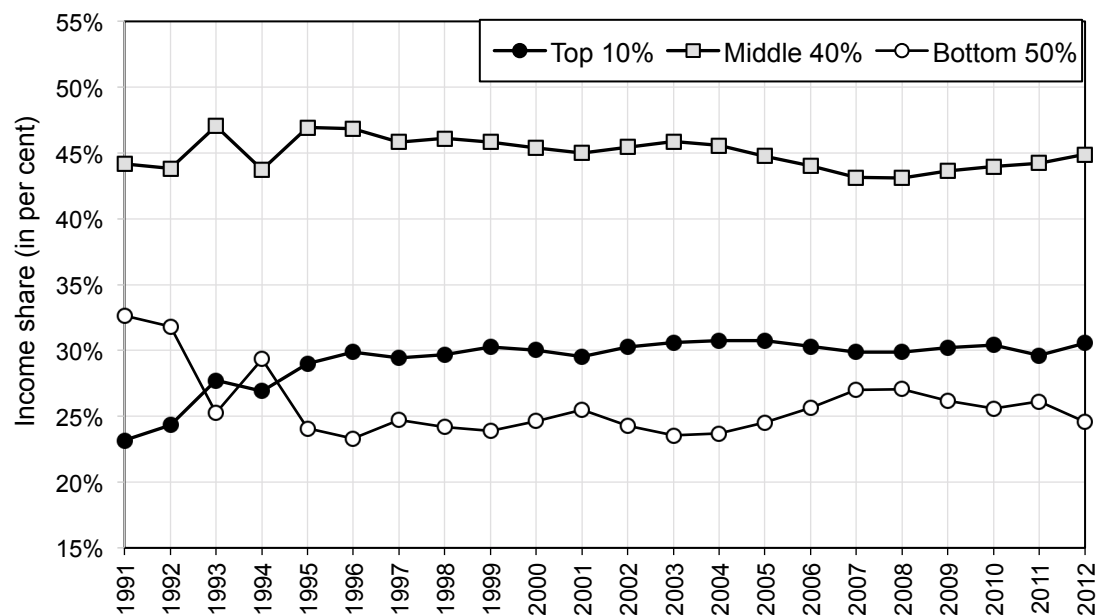


Figure 2: The evolution of the income distribution in Slovenia

Source: author's computations based on the income tax data

Figure 3 shows the long-term evolution of the top 1 per cent income share in Croatia and Slovenia from the end of the 19<sup>th</sup> century until today. In the course of the 20<sup>th</sup> century, inequality in Croatia and Slovenia followed more closely the L-shaped evolution (Atkinson and Piketty 2007). The socialism reduced the pre-WW2 inequalities and there was a moderate rise after its fall. There is an indication that top 1% slightly rose following the 'marketization' reforms in the late 1960s, and fell more notably with the termination of reforms in the early 1970s.

The evolution of the top percentile share in Slovenia suggests that the transition from socialism to the market economy was accompanied by the immediate rise in top shares. It further shows that the increase in top shares was sharpest during the first transition years (1991-4). The top 1 per cent share continued to rise throughout the late 1990s and stabilized eventually in the 2000s. Data for Croatia are not available for the early 1990s, and we observe only a more notable rise from 1997 until 1999, while - as in Slovenia - the top 1 per cent stabilized from the early 2000s. During socialism, on the other hand, the Croatian top percentile saw a more notable fall after the termination of marketization reforms and in the course of the subsequent institutional change of the system.

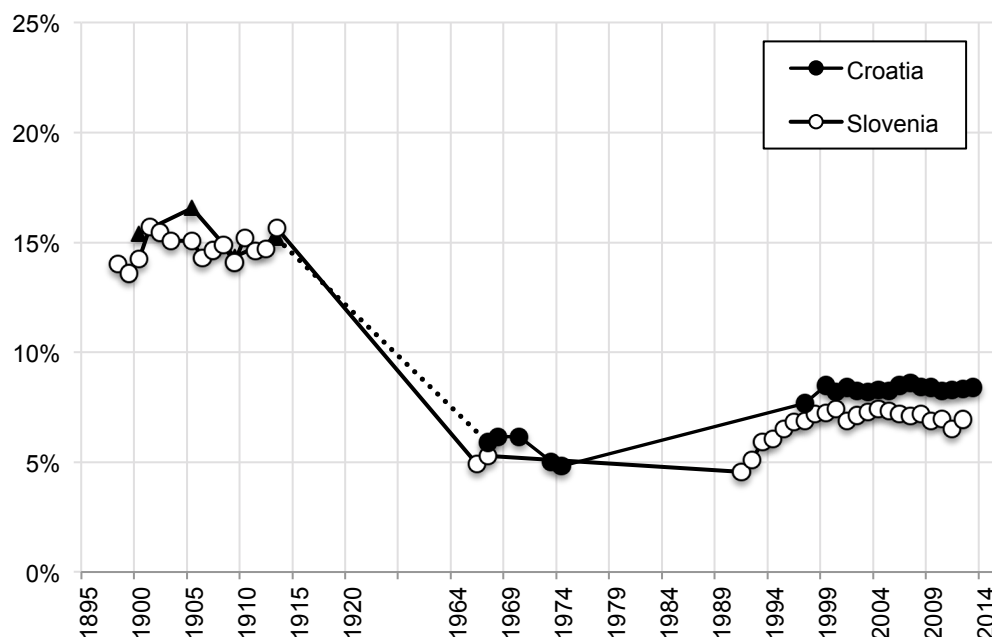


Figure 3: The long-run evolution of top 1% income shares in Slovenia and Croatia

Source: author's computations based on the income tax data

Note: Series for Slovenia before WW1 refers to the Habsburg province of Carniola; for Croatia to the Habsburg province of Dalmatia

Figure 4 looks at the constituent groups of the top percentile in Croatia from 1970 until today. The figure suggests a divergent experience. The evolution of the top 0.1 per cent in Croatia shows greater stability during the socialist period. There was a relatively smaller fall in the early 1970s, a slight recovery in the late 1970s, and the general stability throughout 1980s. Both in Croatia and Slovenia the top 0.1 per cent experienced the strongest rise during the transition in the 1990s. The 'bottom' constituent groups of the top percentile experienced a more notable fall in the early 1970s than the top 0.1 per cent.

In general, we stress that it is important to look at the evolutions of specific top income groups, as these were representative of different social groups. A different social composition of top incomes in the socialism implied that the peculiar idiosyncratic character of the Yugoslav institutional framework affected top income groups in quite heterogeneous manner. As noted above, socialist systems exerted quite divergent extent of the government wage administration and/or intervention to specific social groups. As we look in more detail below, it appears that top income groups directly engaged in the real economy were more susceptible to abrupt state intervention than those in the 'administrative' sphere, which dominantly made the top 0.1 per cent (we pay special attention to the social composition of these groups). Similarly, the mentioned stability of top income shares during the crisis of the

1980s should be understood in the light of the pervasive state administration and intervention.<sup>16</sup>

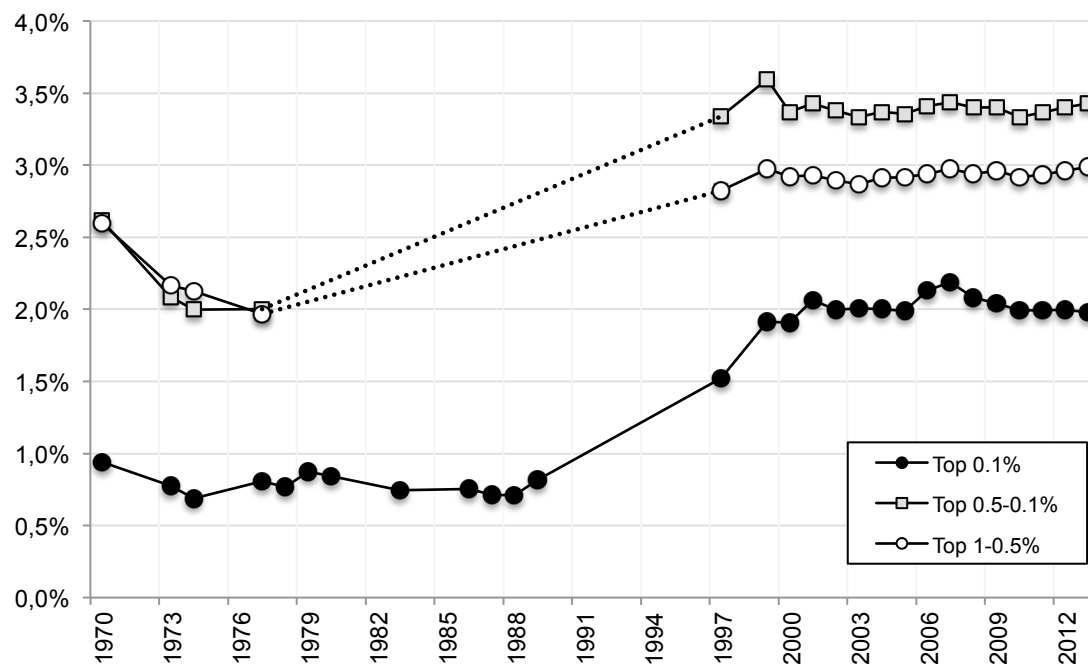


Figure 4: Top income shares in Croatia: top 1-0.5, top 0.5-0.1 and top 0.1 per cent

Source: author's computation based on the income tax data

Returning to the long-term development of inequality, Figure 3 shows that top income shares were at notably higher level at the beginning of the 20<sup>th</sup> century, and overall displayed L-shaped long-run development. As a robustness check we also look at the evolution of the inverted Pareto-Lorenz coefficient (the Pareto coefficient estimated from the Lorenz curve; see Atkinson 2007), which is a good indicator of changes in top income shares (Atkinson et al. 2011). The shape of the top tail has changed more in line with L-evolution evolution, with a moderate increase after the fall of socialism.<sup>17</sup> In order to explain higher top income shares at the beginning of the 20th century, it is useful to look at the income composition of top shares. Figure A3 compares the composition of the top 5% in Slovenia at the beginning of

<sup>16</sup> Milanović (1990b, p. 4) thus remarks that economic crises in socialism had smaller impact on income distribution than in capitalist countries (as well as on poverty due to job security), because more business-cycle responsive capital income is not privately owned. Consequently, one expects stronger effects of economic crisis/fluctuations today than during the socialism due to more widespread market determination of earnings and higher prevalence of capital income at the top.

<sup>17</sup> As a robustness check, we look only at the concentration at the top. In Slovenia inverted Pareto coefficient equalled 2.3 at the beginning of the century, 1.3 during socialism, and rose to 1.65 in the recent decade.

the 20<sup>th</sup> century, in 1910, and right at its end, in 2000.<sup>18</sup> Besides assuming higher level (around 30% in the 1900s, 20% today), a half of top quintile's incomes during the Habsburg period were derived from unearned sources, or roughly capital income, while today, in contrast, almost 90 per cent of top quintile's income is made of earnings.<sup>19</sup> This would be consistent with the top incomes literature, which finds that top income shares were at very high levels at the beginning of the 20th century due to strong concentration of capital income at the top of the income distribution. Furthermore, it is plausible to assume that capital income accounted for still more important part of the income of the higher income groups before WWI.<sup>20</sup> For example, although the land income made one tenth of the income in Slovenia (Carniola), the huge land inequality in the hands of the Habsburg nobility (such as the Auersperg family) made it concentrated at the top. The nobles had regularly augmented it by assuming important roles in industrial branches such as mining and metallurgy (especially ironworks)<sup>21</sup> (Hočevár 1965). In particular, the construction of the Vienna-Trieste railway in the middle of the 19<sup>th</sup> century stimulated commercial exploitation of the rich Slovenia's ore and coal deposits (Lampe and Jackson 1982, p. 74).<sup>22</sup> In Dalmatia, on the other hand, elites were largely constituted of the urban merchant strata (Novak 1943; Allcock 2000, p. 173).

#### 4.4. The socialist period

The Second Yugoslavia was created after the Second World War under the communist rule. The immediate post-war arrangement closely imitated the Soviet model.<sup>23</sup> As a result, the Yugoslav communists engaged wholeheartedly in creating preconditions for the construction of the socialist society. The private property ownership was largely abolished in the post-war nationalizations, expropriations and the land reform. A tight central control of the economy made possible the sharp earnings compression.

<sup>18</sup> For the pre-WWI period there is only reported income sources for all taxpayers. We have chosen 1910 because in that year the number of taxpayers subject to personal income tax equaled 5 per cent of the total control population.

<sup>19</sup> Furthermore, it is plausible to assume that capital income accounted for still more important part of the income of the higher income groups before WWI. This might be concluded from the lower proportion of earnings in the total taxpayers' income in previous years, when the smaller proportion taxpayers was subject to the personal income tax.

<sup>20</sup> This might be concluded from the lower proportion of earnings in the total taxpayers' income in previous years, when the smaller proportion taxpayers was subject to the personal income tax.

<sup>21</sup> Usually on their own estates.

<sup>22</sup> Unfortunately, we could not find tax data for Croatia-Slavonia (then in the Hungarian part of Austria-Hungary), but it is plausible that there were many similarities to Slovenia, with even more pronounced commercial orientation of the big landlords (Stojsavljević 1965, 1973).

<sup>23</sup> For example, the first Five-Year plan (1946-51)

The social structure in Yugoslavia markedly changed after WWII. For example, social tables for interwar Yugoslavia (Vinski 1967, 1970) could be used to ascertain changes in income distribution in comparison to pre-WWII period (Figure A4). Thus, a decisive impact of the communist accession to power on concentration at the top may be inferred from the fact that affluent social groups were literally wiped out from the socialist reality. This is evident in the case of the *haute bourgeoisie*, which occupied the top of the distribution in the First Yugoslavia, but was wholly expropriated after WWII. The same fate beset middle and small entrepreneurs, while the new land reform eliminated large and middle-size landholdings. The private sector was allowed exclusively in the small-size agriculture (the size of the private landholdings was limited to 10ha) and the small-scale self-employment (limited to five non-family employees).<sup>24</sup>

High-salaried social groups were also hit strongly by the communist policies. In general, the post-WWII decades saw a reduction in top earnings internationally (e.g., Lydall 1968; Atkinson 2008),<sup>25</sup> as a result of the combination of market and non-market forces, from the wartime wage compression (e.g. the 'Great compression' in the US; Goldin and Margo 1992), systematization of wage scales, stronger trade unions, expansion of education, etc. But it is not controversial to say that non-market elements, such as the state intervention in the economy, were proportionally more important in the socialist countries, and to a great extent determined (top) remunerations in socialist Yugoslavia. Immediately following their accession to power, the communists enacted policies that led to strong earnings equalization. These were motivated both by the immediate economic challenges, such as providing means for the reconstruct and expand industry, as well as to eliminate 'unjust' inequalities from the pre-war period.

Further, there was especially sharp compression in the pay differential of civil servants and other white-collar workers, such that, as pointed by Flakierski (1989, p. 4), "manual workers achieved near-parity of pay" with them. Civil servants commanded high differential in the interwar period, both due to the generally scarce skilled labour as well due to their traditionally high status, in accordance to observations of authors as Tocqueville or Mill.<sup>26</sup>

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<sup>24</sup> Yet, as Lydall (1984, p. 272) notes, the average size of the private farm in Yugoslavia was much smaller than the maximum of 10 ha and self-employed very rarely employed the non-family labour. The latter (the 'petty-bourgeoisie') were in addition strongly discouraged and subject to constant ideological attacks (see below).

<sup>25</sup> Atkinson (2008, pp. 53-67) distinguishes three general trends in the earnings distribution from the 1930s to the 1980s (based on the experience of the United States, the United Kingdom, Canada, France and Germany). First, there had been general earnings compression in 1930s and 1940s. This was followed by the rise in top decile from the 1950s to mid-1960s. Afterwards, there was further wage compression in the late 1960s and in the 1970s.

<sup>26</sup> Already in the 19th century, thinkers as Alexis de Tocqueville or John Stuart Mill had argued that relatively higher earnings of civil servants in the 19th century Europe had little to do with the market forces, and in the age

Phelps Brown (1977) thus conjectures that communists were actually the ('modernist') force that finally put an end to these traditional privileges in Eastern Europe. Besides, the mass education and large-scale industrialization benefited mostly manual workers, which made the support base of the new regime. One could argue that the 'pact of friendship' between the workers and the Party was still further cemented by the introduction of the self-management and egalitarian ideology set down as its seal of approval. The Party assumed for itself the role of defending the interests of workers, and for this aim, it did not refrain from the constant interference into the economy. In consequence, tendencies towards income dispersion were reluctantly accepted, and as we saw, condemned as a deviation from the ideals underpinning the Yugoslav self-management.

'Yugoslav egalitarianism' was a complex amalgam of institutional arrangements, prevailing social norms, historical legacies and the political control. Socialism undoubtedly showed lower toleration for wider income dispersion, but egalitarian tendencies could be also seen in part as institutional arrangements underlying the 'pact of friendship between party and workers', ideological 'indoctrination' (e.g. Kornai 1992, p. 311), even a reaction to quite idiosyncratic income determination process in the Yugoslav self-management, or a tool of political control.<sup>27</sup> Therefore, it is important to understand the historical setting of self-management, at which we look next.

#### **4.4.1. Workers' self-management and the income distribution: The historical overview**

The Tito-Stalin conflict led to Yugoslavia's distancing from the Soviet bloc. Yugoslavia abandoned the centralist economic model and started from the early 1950s the famous 'Yugoslav experiment' with the self-government socialism. It was argued henceforth that the Soviet socialism had become a perversion of the authentic socialist ideal, as conceived by (young) Marx, and that it was yet another manifestation of workers' 'alienation'. Soviet state socialism was identified as 'state capitalism' (*etatism*), and the extreme centralization of the state ownership and decision-making had made it exceedingly bureaucratised.<sup>28</sup> The Soviet state bureaucracy, the criticism went on, had become a new ('red') elite and merely replaced

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of expanding education and general training were only a consequence of the higher status traditionally attached to this group (Scitovsky 1966; Phelps Brown 1977).

<sup>27</sup> A sort of 'Shigalyovism' as depicted by Dostoevsky in *Demons*.

<sup>28</sup> Reminiscent of critiques of Trotsky or Bakunin.



the bourgeoisie as the force of labour exploitation, appropriating for itself the 'surplus value'. Instead empowering workers as direct owners of means of production,<sup>29</sup> would lead to a 'withering of the state'.<sup>30</sup> This course was assumedly coincidental with the authentic socialism, with humanistic features, that would overcome workers' alienation and ensure their direct participation through workers' councils as bastions of direct democracy (see generally Horvat 1982).

In line with this anti-statist manifesto, the Yugoslav leadership embarked on the economic reforms in the direction of reducing the state's role in the economic life.<sup>31</sup> Most importantly, the greater decentralization entailed greater autonomy of labour-managed firms, and called for a greater role of markets in the economy, to a large extent induced by the rising integration into the international economy (primarily through the expanding trade with market economies in Western Europe (West Germany and Italy)<sup>32</sup> and the prominent role played by the American assistance (Lampe 1996, pp. 271-8; Woodward 1995).<sup>33</sup> It should be also seen as a part of broader economic reforms in socialist countries, aimed at improving productivity after limits of extensive growth had been reached.

The income distribution turned out to be much discussed aspect of the workers' self-management, since the autonomy in the wage policy and the free disposal over net income were perceived as the centrepiece of the enterprise's independence, well in accordance with the premises of the self-management. After series of partial reforms in the 1950s, the reform of 1961 laid down most of the groundwork for much greater enterprise's discretion in income distribution. The category of personal incomes formally replaced wages and salaries as the form of work remuneration. Income from work was no longer treated as the operative cost, but was determined *ex-post*, depending on the obtained net income of the individual enterprise, in line with the workers' new role as co-owners (and risk-bearers). Most importantly, workers' income became directly related to the success of the enterprises

<sup>29</sup> From introduction of the New Economic System (NES) in 1953, there was a strict distinction between the Yugoslav 'social ownership' as opposed to the Soviet 'state ownership'.

<sup>30</sup> Probably Yugoslav leaders were not influenced by Proudhon's writings on cooperatives (Lydall 1984, p. 21). On the other hand, Djilas - attributing indirectly the idea to himself - points to the pragmatic intentions behind it: "Soon after the outbreak of the quarrel with Stalin, in 1949, as far as I remember, I began to reread Marx's *Capital*, this time with much greater care, to see if I could find the answer to the riddle of why, to put it in simplistic terms, Stalinism was bad and Yugoslavia was good" (Djilas 1969, pp. 157-8; quoted also in Lydall (1984, p. 69)). Horvat (1971, p. 6) notes that rereading Marx and Engels showed "... a worker is free only when he becomes the owner of his means of production."

<sup>31</sup> Officially heralded along the ideal that Rudolf Bičanić labelled as 'four Ds': decentralisation, de-étatisation, de-politicisation and democratisation (Rusinow 1978, p. 222).

<sup>32</sup> Lampe 1996, Tab. 9.2; Yugoslavia equally joined IMF, GAAT, and was the partner of the European community.

<sup>33</sup> Bičanić noted that reformers' chief aim was to "to build a model of a socialist system for a developed country, one which will be able to stand the competition of other developed countries without the constant tutelage of government machinery" (cited from Horvat 1971, p. 15).

(Bičanić 1973, pp. 107-110). The 1961 reform resulted in an increase in the skill differential, as greater degree of marketization led to higher competition for skills, widening the income distribution (Estrin 1981; Phelps Brown 1977).

However, the comprehensive reform of the system in 1965 had a truly material impact on the labour-managed enterprise's autonomy in income distribution, in the first place by leaving notably higher income in the enterprise.<sup>34</sup> Flakierski (1989, p. 9) thus notes that "under the new arrangement enterprises not only had more formal discretion over the distribution of their income, they also had more income at their disposal". The repercussions of the 1965 reform on the income distribution were peculiar to the Yugoslav economic model by primarily aggravating inter-firm inequality.

The reform granted enterprises a full discretion in deciding how net value added was to be distributed between workers' income and new saving (enterprise funds). The proportion distributed as workers' incomes increased as a result, prompting enterprises to reduce internal saving and rely more on external bank financing.<sup>35</sup> Since personal income pay-outs under the new arrangement depended on the enterprise's commercial result, this gave rise to the permanent tendency to aggravate inter-firm (or inter-branch) inequality. Many critics rightly emphasized that higher incomes in certain enterprises/branches could not be justified on mere economic grounds, such as due to higher productivity or effort, since differentials could stem from the market power, market fluctuations, foreign trade, etc. (Sirc 1979; Nove 1983).

One of the most prominent arguments in this respect, as well as in the workers' self-management literature in general, has related high inter-branch inequality in Yugoslavia to the different level of capital intensity. The argument has been, in a nutshell, that pervasive capital market imperfections in Yugoslavia, where labour-managed firms obtained capital for free (when it was accumulated previously)<sup>36</sup> or severely underpriced (when obtained from external finance due to very low interest rates), allowed workers in more capital-intensive branches to appropriate the capital return as 'quasi-rent' (Vanek and Jovicic 1975).

<sup>34</sup> In this respect, the taxation of enterprise net income was altogether abolished, charges on fixed assets reduced (and eventually also abolished), producers' turnover tax replaced by the sales tax, foreign exchange retention quotas increased (an issue figuring prominently in Croatian demands for the reform), etc. (Lydall 1984; Flakierski 1989).

<sup>35</sup> This resulted in the increased importance of banks. It is general in line with Kornai's 'soft budget constraint' (Uvalić 1992, p. 157). Although, in order to preclude underinvestment and inflation, due to unrestrained personal income (wage) rises, the 'principle' was laid that these should rise in line with the labour productivity.

<sup>36</sup> It was often taken over from the nationalized firms or accumulated in the course of the socialist industrialization policy (Flakierski 1989, p. 57).

Moreover, it was claimed that workers displayed short-term ('truncated') horizon and favoured immediate pay-outs, because the lack of property rights entailed that workers benefited from the 'quasi-rent' only as long as they had worked in the enterprise (Furubotn and Pejović 1970, 1973; Sirc 1979)<sup>37</sup>. Since the maximand of labour-managed firms was income per worker (rather than profit as in capitalist firm), the practice was to pay as much as possible. This was often unrelated to any rational criteria, giving the system a flavour of idiosyncrasy. For example, the same job was paid several times more in different sectors.<sup>38</sup> Lydall (1984, p. 240) is characteristically penetrating when noting: "the correct determination of the level of personal incomes is an impossible task. How, for example, is one to distinguish between the effects of good and bad management and the effects of market power, or speculation? How is one to assess the impact of administrative decisions? And even if these effects could be excluded, how is one to determine what part of total income is due to natural resources, the stock of capital, and the contribution of labour".

The resulting tendency toward 'restricting membership' limited inter-firm labour mobility (Lydall 1984, p. 218)<sup>39</sup>, which contributed (coupled with the strong capital-intensive bias of the Yugoslav industrialization) to the suboptimal level of employment in the country (especially pronounced difference in unemployment rates between republics; Woodward 1995). This added additional dimension to generally low social cohesion in Yugoslavia (north-south; ethnic, republic, etc.). The rise in personal income in enterprise income outstripped the rise in productivity and led to inflation (Sirc 1979).

Figure 5 looks at the relationship between the evolution of the upper end of earnings distribution and the proportion of distributed income in socialist enterprises from the late 1960s. A reform-induced rise in dispersion of the upper part of the distribution was limited. One can indeed notice an immediate increase in dispersion at the top after 1965, but it was rather short-lived, and on the whole coincided with the 'laissez-faire' phase of the Yugoslav socialism (1965-72). Nevertheless, even this moderate increase was regarded as an alarm call,<sup>40</sup> especially as other aspects of the reform proved disappointing. Rusinow (1978, p. 202) notes in this respect that "it seemed as if the only goal of the reform to be fully realised was its politically least desirable one – the growth in individual, sectoral and regional disparities in

<sup>37</sup> That is, workers were not co-owners "who invested their own capital and could sell their stakes upon retirement or switching jobs" (Sirc 1979; Furubotn and Pejović 1973)

<sup>38</sup> One cannot speak about the 'segregation of workers by skill' in different firms (Kremer and Maskin 1996).

<sup>39</sup> Workers often displayed no proletarian solidarity. The framework of Furubotn and Pejović (1973, p. 275) suggests that "inherent in the special structure of property rights in Yugoslavia are forces conducive to conflict between the interests of society as a whole and the interests of labor-managed firm". Horvat (1984) moreover suggests widespread *anomie*.

<sup>40</sup> Note also that there was an improvement in peasant incomes due to the rise in prices.

income”.<sup>41</sup> A considerable public outcry against the reform – manifested, for example, in the Belgrade student riots in 1968 or in the overt intellectual critique from the (‘new’) left<sup>42</sup> was, first and foremost, directed against the rising inequality and social differentiation. The criticism singled out ‘marketization reform’ as the root cause of the deviation from the socialist egalitarian ideal. A diffusion of market elements was blamed for diminishing the workers’ participation in running the enterprises and thus undermining the very foundations of the self-management.

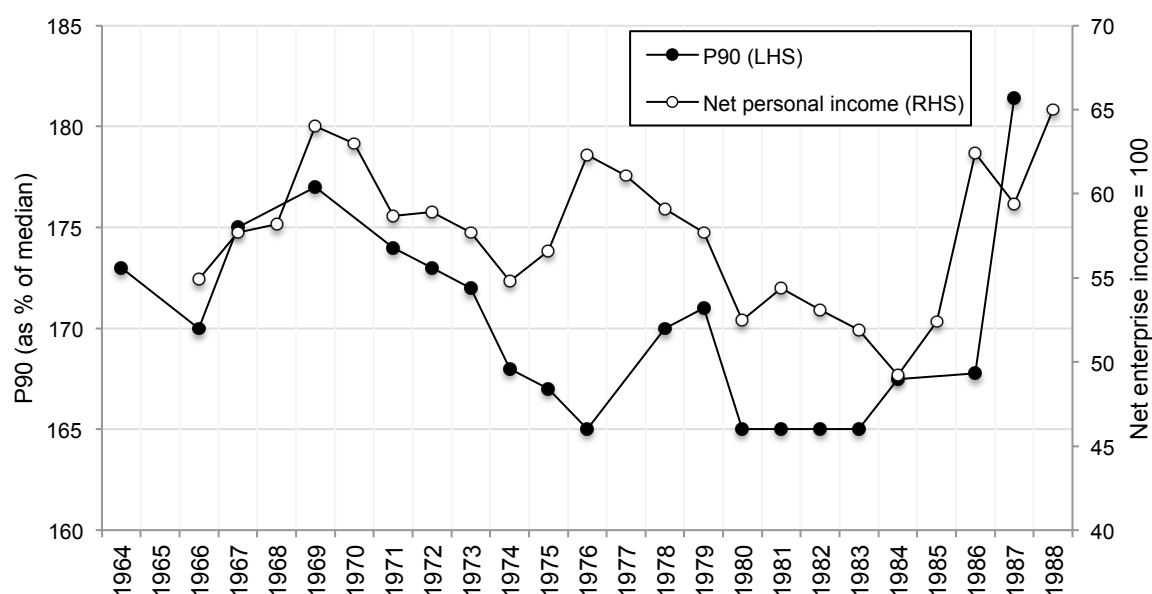


Figure 5: The 90th percentile of the earnings distribution (left-hand scale) and net personal incomes in net enterprise income (right-hand scale)

Note: Net personal income: the remaining part up to 100 of the net enterprise income refers to gross saving (the sum of depreciation allowances and ‘enterprise funds’ (net saving))<sup>43</sup>; Earnings distribution: 90<sup>th</sup> percentile of the net distribution in the social sector in Yugoslavia

Source: P90: 1964-1983 from Flakierski 1989 (Tab. 1); own calculation 1984-1987 (from *Statistički Godišnjak Jugoslavije*); net personal incomes from Uvalić 1992; Tab. 5A.4

The aftermath of the reform left the Party leadership deeply anxious. The economic results were disappointing. There was a slowdown of economic growth, a rise in unemployment, inflation, and foreign indebtedness (Flakierski 1989, p. 11). But more importantly, the Party felt that its monopoly was under a threat. A decentralization of the economic and the political

<sup>41</sup> Russinow (1978, p. 202) adds “which the reformers had reluctantly accepted, despite socialist abhorrence, as an inevitable side effect of an otherwise desirable genuine market economy”.

<sup>42</sup> For example, in universities and centred around the philosophical journal *Praxis*.

<sup>43</sup> Net savings are used for interest payments on investment credits and self-financed investment. Net enterprise income is after taxes and contributions, and before interests on credits.

sphere brought suddenly the new group to the spotlight: the enterprise managers. The rising importance of managers and technicians (popularly dubbed as 'technocrats') in the economy was a logical follow-up to the 1965 reform, as decentralization and the greater business autonomy directly called for an increased personal initiative, expertise, and responsibility for major business decisions<sup>44</sup> (Lydall 1984, pp. 90, 121). There was, in addition, a mounting dissatisfaction within the Party (especially within its centralist wing) at the loss of the control in enterprises.

Furthermore, the political decentralization and growing de-federalization (providing republics with more legislative and executive power) allowed within-party elections, which increasingly installed the managerial strata into the party ranks. This group, perceived as the embodiment of liberal ideas, stood in stark contrast to the traditional 'conservative' Party's base, made of peasants and manual workers (ILO 1982).<sup>45</sup> The Party was taken aback by the political repercussions of marketization and had to check the influence of managers to preserve its political monopoly. The Party leadership<sup>46</sup> concluded that everything went too far, and on the wave of public discontent, decided to strike. The ensuing backlash primarily targeted 'liberalism' in republics, and consequently the Party liberals that pushed forward the reform, and were thus held accountable for the rise of 'technocrats' and inequality, the lack of social concern, as well as for the outburst of 'deviations' such as the leftism and the nationalist excesses. The change of course materialized from 1972 and was sanctioned by the 1974 Constitution. This scenario of failed 'marketization' reforms was thus similar in many socialist countries in Eastern Europe, where limited democratization challenged the Party's monopoly and induced Party's reaction.

The reaction was stirred with a characteristic, ideologically imbued publicity, now technocrats branded as 'inner enemies', 'capitalist forces' or 'bourgeois mentality' (Rusinow 1978). Their patrons – the liberal party leaderships in the republics – were everywhere removed by 1972.<sup>47</sup> Enterprises were divided into smaller units, the so-called 'basic organisations of

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<sup>44</sup> Workers were generally found to be quite risk-averse.

<sup>45</sup> The changing composition of the League of Communists membership is suggestive from the falling proportion of farmers, which made 50% of members in 1946 to 7.4% in 1977 and 4.8% in 1977 of the (ILO 1982, Tab. 12 and 13).

<sup>46</sup> Here we mean in the first place Josip Broz Tito, as the indisputable Party leader, and the politically resurrected Kardelj (the two left from the former 'big four', after the removal of Djilas and Ranković). Kardelj was the chief force behind the 1974 Constitution.

<sup>47</sup> For example, the fall of the Slovenian liberal functionary Kavčič in 1972 was accompanied by the accusations of 'technocratism', 'anarcho-liberalism', including even the accusations of being 'pro-Bavarian' (Rusinow 1978, p. 215; Lampe 1996, p. 304).

associated labour', formed with the intention to reinstall the workers' control.<sup>48</sup> Yet, in line with the above mentioned, the Party also wanted to re-establish its control over the economy. Lydall (1984, p. 114) succinctly summarizes the actual state of affairs: "despite all the rhetoric about 'workers' self-management' the real position is that major business decisions are taken by one or another (or both) of two groups: the Party and the managers. The history of Yugoslav self-management can only be understood correctly if it is viewed as a series of shifts in the relative strength of these two groups."<sup>49</sup>

Steps were accordingly taken in the direction to strengthen the Party's authority, or at least to establish a more 'cooperative' relationship between the two dominant groups. The market mechanism was to be significantly curbed, and the inter-firm 'competition' that it induced, would be replaced with the ideologically more acceptable practice of 'cooperation'.<sup>50</sup> In a subsequent shift "from half-market to contractual economy" (Lampe 1996, p. 308), the enterprise's autonomy was limited and its activity directed through the so-called 'self-managed agreements' and 'social compacts' stipulating relationships between firms, sectors, etc.<sup>51</sup> The Party reaffirmed the dominant position in the economy primarily through its close control of the banking sector, by making the access to banking credits highly politicized, and through the control of internal 'informal structures' (Lydall 1984, p. 115).

The new institutional arrangement fostered egalitarianism and led to an immediate income levelling. Flakierski (1989, p. 13) thus comments that "by 1972 the state organs had imposed controls over the distribution of income per worker between personal income and internal funds, and over the distribution of net personal income among employees." As a result, there was a compression of the income distribution and the fall of top inequality after 1971 (Figure 5). The republics did not push in the direction of further marketization once the federal power was substantially restrained. The system of taxation was fully decentralized, while attempts to restore some of the federal authority faced resistance from the republics. The Party, through its republic and local organs, regained control of the economy.

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<sup>48</sup> Whether motivated by the genuine concern for workers' participation or resulting from the power struggle (or both), the result of fragmentation was the loss of efficiency.

<sup>49</sup> The real participation of workers was a subject of voluminous literature. See Županov (1966) for the existence of strong hierarchical structures, quite similar as in western industrial countries.

<sup>50</sup> One should also be aware of the 'anarchistic' origins of the workers self-management idea, especially regarding the cooperation/competition dichotomy (e.g. Bakunin, Kropotkin's *Fields, Factories and Workshops*, etc.).

<sup>51</sup> Kornai (1992, p. 470) called this the 'ethical coordination'.

### 4.4.2. Socialist elites

"It's good, Leonid. But what if the Reds come back?"<sup>52</sup>

The communist rule after WWII critically impacted the long-term evolution of inequality in Yugoslavia. The new institutional arrangement overturned the social structures of interwar Yugoslavia. The communist policies hit especially hard the top and improved the living standard of those at the bottom of the distribution. The Party's attack on former 'bourgeois' privileges had been widely heralded, but eventually the Party itself came under the spotlight. The growing concentration of power in the hands of bureaucracy in the socialist countries called into question the reality of the 'classless society', and concerns were raised about the metamorphosis of the ruling elites into the new 'exploiters'. These social phenomena were famously discussed in the work of Milovan Djilas (1957), a former Yugoslav high-ranking Party insider, whose concept of the 'New Class' gained international acclaim.<sup>53</sup> Prominent sociological theories had already emphasized the 'illusion' of the classless society and the eventual necessity of minority elites entailed by the requirement of organizing and administering the society (such as Michels' 'Iron Law of Oligarchy').<sup>54</sup> This had been particularly sensitive issue in the socialist countries, and not seldom used as the ammunition in political and ideological struggles. For example, we saw that it had figured prominently in the Yugoslav leadership's distancing from the Soviet *étatisme*, but equally during the reaction against the marketization reforms.

Figure 6 provides a snapshot on the socialist elites in Yugoslavia. The figure shows the occupational structure of the constituent groups of top 1 per cent in Yugoslavia in 1975. The bottom grey area roughly indicates individuals working in the so-called 'productive' sphere, the middle-white area those working in the 'non-productive' sphere, while the dark areas at the top present political *nomenklatura*, the army and the police.<sup>55</sup> The figure provides quite nuanced view of top incomes and covers sufficiently small groups to satisfy exclusivity conditions necessary to define an elite. It can be seen that while managers, engineers, technicians and other high-skilled workers are the most represented groups, and their

<sup>52</sup> A popular anecdote attributing the comment to the aged Brezhev's mother after her son's display of wealth (from Filtzer 2014)

<sup>53</sup> Djilas (1957) thus points out that: "The new class may be said to be made up of those who have special privileges and economic preference because of the administrative monopoly they hold."

<sup>54</sup> Especially in the so-called 'Italian' school, such as Pareto's notion of the elite circulation or the work of Gaetano Mosca (1939).

<sup>55</sup> Roughly along these lines – stressing (but also misapplying) the Marxist distinction between productive and non-productive sphere – operates Šušar's (1970) stratification model, the so-called *klasa/kontraklasa* ('working class/'counter-class') model (see Allcock 2000, pp. 187-9).

earning accounts for almost a half of the income of the lower groups of the top percentile (P99-99.5), their share in the total income of the top groups falls with income rank, and they are replaced by intellectuals (notably, university professors) and the cultural elite as the dominant group at the very top (P99.9). While the issue of non-monetary benefits and privileges was arguably more important in the socialist countries,<sup>56</sup> these were to a certain degree related to monetary incomes and the high-paid occupations (more on this below).<sup>57</sup>

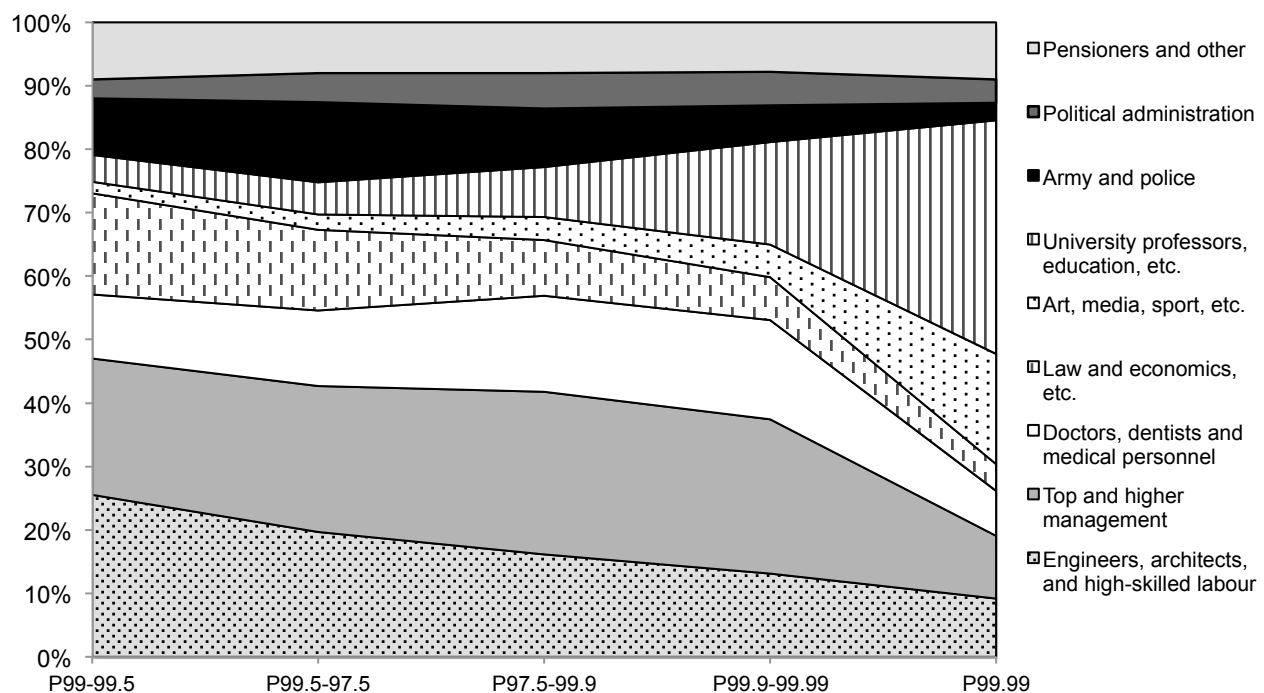


Figure 6: Occupations of the top 1 per cent in Yugoslavia in 1975

Note: excluding 'small economy' excluding Slovenia.

The occupational breakdown in Figure 6 is useful to ascertain the heterogeneous evolution in income shares of various top groups in Croatia before the fall of communism (Figure 4). The Croatian series seems to suggest that the greater stability in the shares of the very top groups, such as the top 0.1 per cent, was due to the fact that these groups were dominantly composed of occupations not directly engaged in the so-called real economy (or in 'the economy', to use the actual term used in Yugoslavia). Remunerations of these occupations were to a greater extent administratively determined,<sup>58</sup> and at the same time less subject to abrupt administrative upheavals of the labour market. On the other hand, 'lower' top groups

<sup>56</sup> E.g., housing, privileged shopping, etc. As in Soviet Union, Yugoslav communist established special stores for officials and bureaucrats immediately after gaining power, but these were soon abolished (Djilas 1985).

<sup>57</sup> Bergson (1984, p. 1094) notes the correlation between monetary income and special privileges for high incomes in the Soviet Union.

<sup>58</sup> That is, in smaller degree determined by market forces.



of the top percentile (the top 1-0.1 per cent) comprised relatively higher proportion of occupations engaged in the real economy, whose incomes were largely determined on the market, or rather – having in mind the protean nature of the market in Yugoslavia – outside the tight state regulation. This was, for example, apparent in the rising skill differential during the ‘laissez-faire’ interlude in the 1960s, when the inter-firm competition for the generally scarce skilled labour increased (Bičanić 1973, Ch. 6; Estrin 1981). However, earnings in real economy were also more vulnerable to sudden political alterations, whenever these were considered excessive, as was the case in the reaction to (and the eventual defeat of) the ‘marketization’ reforms. A more discernable fall in top shares after 1970 may be thus attributed to the (re)introduction of egalitarian policies in enterprises.<sup>59</sup> In short, a greater fluctuation in income shares of lower constituent groups of the top percentile (Figure 4) stemmed from the idiosyncratic developments of the institutional framework in Yugoslavia<sup>60</sup>

The international comparison of the occupation composition at the top is of particular interest in order to put the Yugoslavia’s experience in the broader context. Figure 7 presents the occupational breakdown of the top 0.1 per cent in Yugoslavia and in the United States in the 1970s. The attention is immediately captured by the predominance of managerial occupations in the US, and its notably smaller importance in Yugoslavia. Top executives and managers in the non-financial sector accounted for almost a half of the occupants of the US top 0.1 per cent in 1979, and the proportion rises to 60 per cent when the management in the financial sector is included. Here one should bear in mind that the comparability might be distorted since the category of executives and managers in the US also includes self-employed (‘working for themselves’) business owners, who are in turn more appropriately labelled as entrepreneurs. However, Bakija et al. (2012) show that the vast majority of managers in the top income groups in 1979 worked in large publicly traded companies (rather than in closely-held companies), and could be thus plausibly defined as genuine ‘salaried’ employees. The predominance of ‘salaried’ over ‘self-employed’ managers (or over other entrepreneurs) in the US could be also taken as a tentative indicator of larger separation of ownership and control in the 1970s, which was a popular issue in the literature at the time (Berle and Means 1932; Burnham 1943; Dahrendorf 1959; Galbraith 1967; Baran and Sweezy 1968). In Yugoslavia, in contrast, the management in the non-financial sector<sup>61</sup> accounted for less than 15 per cent of the occupations in the top 0.1 per cent. Although

<sup>59</sup> For example, Flakierski (1989, p. 14) notes that enterprises were given ‘guidelines’ on maximum skill differentials, such that the earnings of the highest skill worker could be at maximum three times higher than earnings of the unskilled worker.

<sup>60</sup> Often resembling what Horvat (1971) labelled as the ‘go and stop’ character of the Yugoslavia’s economic strategy.

<sup>61</sup> Approximated by the so-called productive (material) sphere.

enterprises obtained larger independence as a result of the reforms, it seems that the 'managerial revolution' did not fully extend to the very top income echelons in Yugoslavia.

Similarly, a relatively lower proportion of enterprise managers (or higher of *nomenklatura*) at the very top in Yugoslavia might suggest that the separation of ownership and control was less pronounced in socialist countries (if we define, following Pryor (1973, pp. 122-6), the 'separation' to mean, in the absence of explicit property rights, a dissociation of the economic and the political sphere).<sup>62</sup> In Yugoslavia, as we saw, tendencies toward greater separation induced the Party's reaction against the enterprise's autonomy. The political bureaucracy in Eastern European centralist-planning countries interweaved yet more firmly the 'implicit' ownership and control, leaving managers with quite limited autonomy (see below). On the other hand, Figure 7 shows the virtual absence of the political administration among the top groups in the US.

Overall, there was a significant imbalance in the importance of administrative (or 'non-productive' in the Marxist terminology) occupations in the top 0.1 per cent between the two countries, with notably greater weight in Yugoslavia.<sup>63</sup> A difference in the proportion of professors and scientists is striking. While professors practically did not end up among the top 0.1 per cent in the US, they were the most dominant occupation at the top in Yugoslavia.

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<sup>62</sup> Such as decentralization of the decision-making in the economy.

<sup>63</sup> Flakierski 1989, p. 25: "Yugoslavia is the only country where average pay is higher in the nonmaterial than in the material sphere" ... p. 24: "The higher levels of inequality in the nonmaterial sphere are a reflection of the special privileges enjoyed by the upper echelons of the administration and the top party apparatus on the one hand, and the very low pay received by clerical personnel on the other."

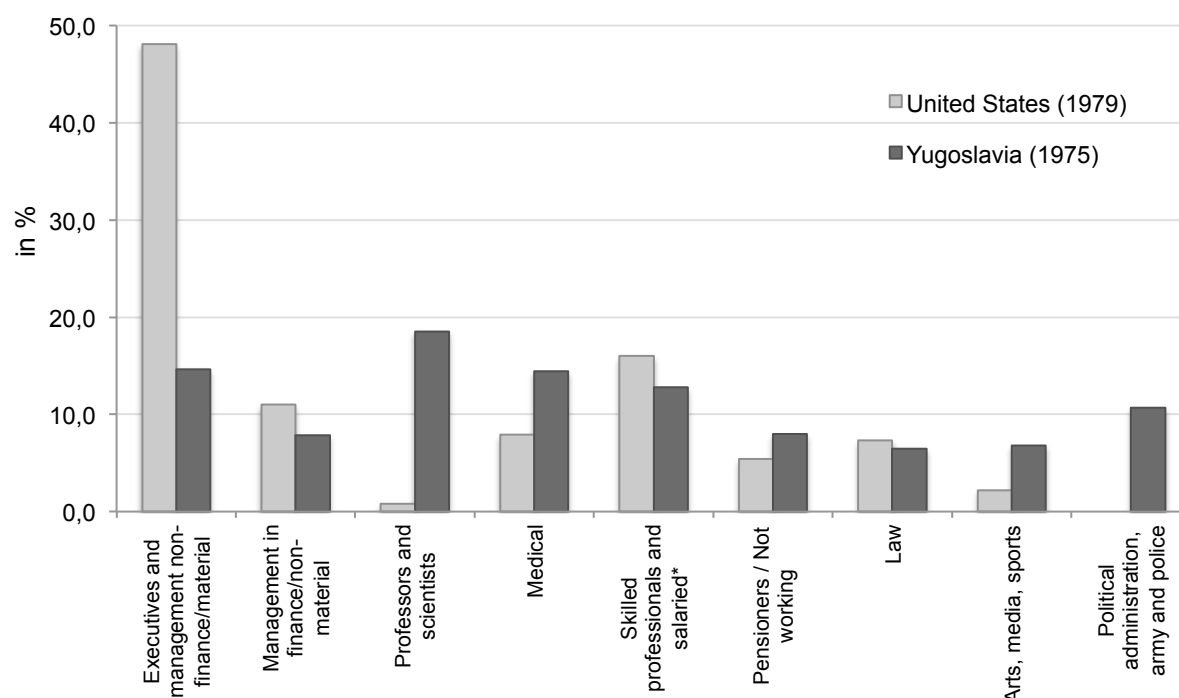


Figure 7: Occupations of the 0.1 per cent in the US in 1979 and Yugoslavia in 1975

Source: Yugoslavia: own computations based on income tax data; US from Bakija et al. (2012); Yugoslavia, excluding Slovenia

Conveniently, we can extend the comparison to the Soviet Union, a paragon of the orthodox communism. Matthews (1978) reconstructs Soviet elites in the seventies, combining emigre interviews and scattered official evidence (Bergson 1984, p. 1085), and one should, therefore, bear in mind that the Soviet elite delineation ('hypothetical', as Matthews acknowledges) is much less reliable than the one presented for Yugoslavia and for the United States based on the income tax statistics. According to Matthews, the Soviet elites comprised 227 thousands individuals,<sup>64</sup> which roughly corresponds to the top 0.1 per cent of the adult population,<sup>65</sup> allowing thus a rough comparison to the above countries. Figure 8 shows an equivalent comparison of the top 0.1 percent occupation structure in Yugoslavia and the Soviet Union. The striking predominance of the state apparatus – the party and government officials – in the Soviet Union is obviously a distinguishing feature of the Soviet

<sup>64</sup> Clearly, as mentioned repeatedly, we do not capture various nomenklatura privileges in socialist countries. As Matthews remarks in this respect: "Dollar is much better measure of elitism in America than the ruble is in Russia"

<sup>65</sup> Matthews' data refer to individuals in 1971-1973. If we take that in this period the total population of USSR was 245 million, and that 62 per cent were those above 20 years of age (Narhoz 1975), we arrive at figure of 150 million for the adult population – this makes 227 thousand individuals, indicated by Matthews, roughly equivalent to 0.15 per cent of total adults.

communist system. This picture does not seem improbable in the light of what is known about the social fabric of the Soviet communism (Bergson 1984).<sup>66</sup>

The Matthews' account for the Soviet Union unfailingly demonstrates a contrasting elite composition in the contemporaneous economic systems: the US and the USSR on the opposite poles of the spectrum, and Yugoslavia in-between. It reflects markedly different organization and the administration of the economy. The occupations of the top 0.1 per cent in Yugoslavia – with significantly lower proportion of state bureaucracy and more balanced proportion of 'technocrats' and intelligentsia – indicates its peculiar position between the capitalist and communist model, in line with its pursued 'middle way'. On the other hand, the prominence of bureaucracy or 'state managers' is peculiar to the hard-line communism of the USSR. The importance of the state bureaucracy falls from the dominant position in the command economy of the USSR, to an intermediate in Yugoslavia, where market forces assumed more notable role, and finally to a negligible one in *civitate* of the market economy, in the United States.

Clearly, a contrast between countries is to some extent overplayed as most of high-management functions in the capitalism were carried out in the Soviet Union by the state bureaucracy (Bergson 1984, p. 1088). McAulay (1979, p. 237), for instance, points out that "the Soviet director is essentially only a plant manager; higher managerial functions lie in the central bureaucracy". Consequently, a higher responsibility (manifested in the hierarchy) meant in both systems higher remunerations. This can maybe explain the documented gradient in earnings of top party officials among socialist countries, where top party officials in countries characterized by the larger centralization, such as the Soviet Union or Czechoslovakia, earned relatively higher incomes.<sup>67</sup>

<sup>66</sup> For example, the moderate share of enterprise directors, the virtual absence of technocracy, or the small number of professors and scientists (especially if one considers international reputation of Soviet scientists).

<sup>67</sup> For example, sporadic evidence for Czechoslovakia suggest there the highest differential of top party officials among former socialist countries, roughly between ten (Mathews 1978) to fifteen times the average wage (Krejčí 1982, p. 43). In contrast, Matthews points out that Hungarian top officials earned only 2 to 4 times average wage.

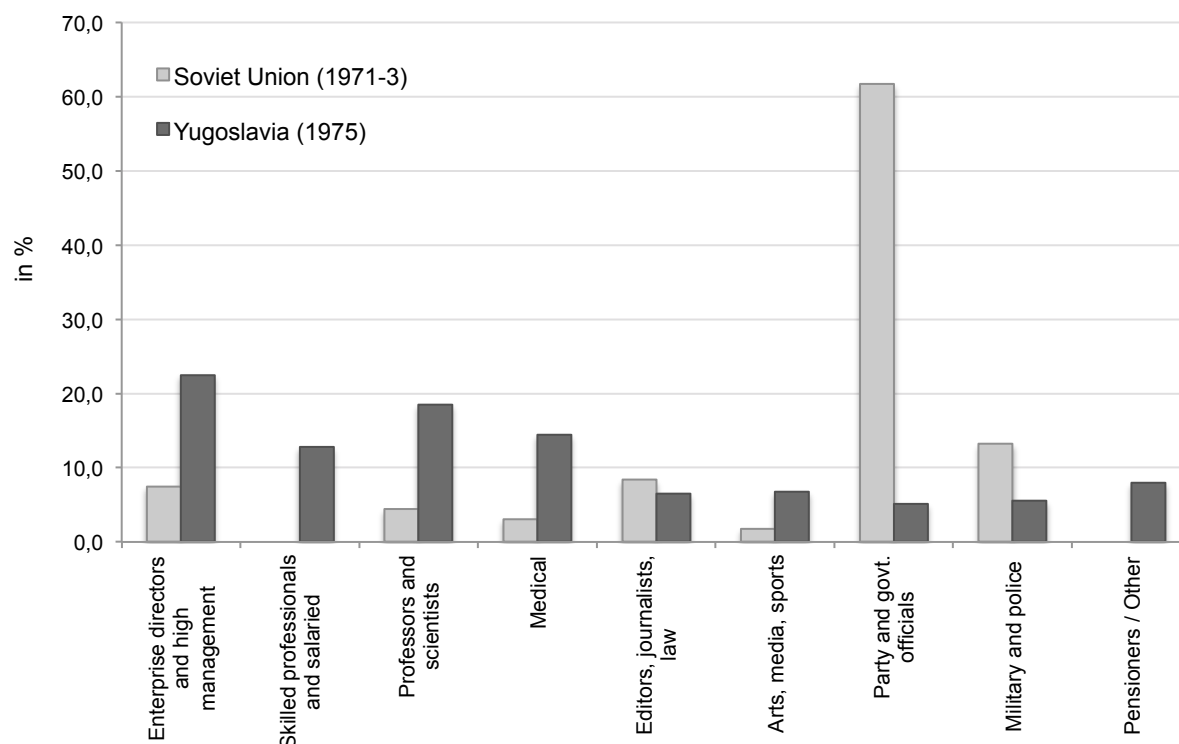


Figure 8: Occupations of the 0.1 per cent in the US in 1979 and Yugoslavia in 1975

Source: Yugoslavia own computations based on income tax data (excl. Slovenia) ; Soviet Union: Mathews 1978, Tab. 1.8

### ***Uneasy cohabitation:***

#### **Social structure at the top in socialist Yugoslavia**

The elite occupational breakdown has revealed a distinct organization and administration of the economy in Yugoslavia, the US and the USSR. We look next at the specific elite occupations in socialist Yugoslavia (Figure 6), in particular, at the relationship between political elites (*nomenklatura*), managers-technocrats and intelligentsia. These social groups, according to the vast sociological literature, made the power triptych in the political constellation of the East European socialism, and we believe that the understanding of their interdependence and underlying conflict is also important to grasp the workings of the Yugoslav socialism. Szelenyi et al. (1998), for instance, argue that these groups were the chief actors initiating the fall of communism and the start of the transformation to capitalism in Eastern Europe. Broadly speaking, these authors claim that the transition was to a considerable extent a project 'premeditated at the top'. Social mechanisms are, in consequence, especially useful for analysing top incomes during socialism.

The so-called 'marketization' reforms in Eastern Europe gave rise to this tripartite elite structure (Szelenyi et al. 1998, p. 81). As suggested above, there had been a fragile balance

between power groups in Yugoslavia. Lydall (1984, p. 114) commented that the history of self-management in Yugoslavia was marked by the constant “series of shifts in the relative strength” of the party and managers. On the other hand, the (left) intellectuals,<sup>68</sup> whose importance increased with time, often took it upon themselves to promote the interest of workers.<sup>69</sup> The ruling *nomenklatura* in socialist countries was in the constant tension between efficiency and equity concerns, only reluctantly accepting the aggravation of the later as an integral part of the former.<sup>70</sup> As we saw, decentralization of decision making and the gradual extension of market elements induced a rise of inequality by calling for more responsibility and making high skills and expertise more valuable. Managers, in particular, progressively formed group consciousness and formulated their vision of more efficient (or just more decentralized) economy, unburdened by the state interference and where the work is properly rewarded. However, strong forces worked in the opposite direction, in the first place the socialist egalitarian ideology – underlying the ‘pact of party and workers’ and often promoted by intellectuals – and the party’s anxiety about the loss of its political monopoly. Party saw its losing grip on the economy to shake the very foundations of the communist regime.<sup>71</sup> As Polanyi (1957, p. 71) had argued, it is exactly a de-bureaucratization and a clear separation of political and economic sphere that presuppose the emergence of the market economy.

If one thinks of Kornai’s (1992) definition of the socialist system, then Yugoslavia went furthest away from the ideal socialism. Here, a technocracy is a central actor challenging all three conditions, from promoting market coordination, decision-making decentralization (challenging party’s political monopoly) or even public ownership (Szelenyi et al 1998). Obviously, straying away from the ideal conditions in Yugoslavia than in the USSR meant that power relations were more often at the breaking point in Yugoslavia than what would have been allowed in the Soviet Union.

The marketization sharpened the conflict between elite groups. But the Party maintained its role at the helm. In the sphere of income distribution, this meant the reintroduction of the pervasive state intervention in the economy. Thus, even if Yugoslavia went furthest in the

<sup>68</sup> Because no other ideological orientation had been tolerated in communist regimes.

<sup>69</sup> This self-imposed public role of the intellectuals in the self-management has often been criticized on the grounds of their supposed misperception of the reality. For example, Bahro points to the unrealistic picture of workers painted by Marxist intellectuals (Nove 1983). Lydall is quite sharp when he notes for Yugoslav intellectuals: «

<sup>70</sup> All the way since the creation of the Soviet Union, such as Lenin’s concessions to technical (‘bourgeois’) specialists (or the NEP as a whole), or Stalin’s attack on *uravnilovka* and the introduction of the Stakhanovite movement, etc.

<sup>71</sup> Jože Menciger thus wrote that “the market proved socially and politically less neutral than it is assumed in the traditional Langean theory of the socialist market economy” (cited from Flakierski 1989, p. 11).

realization of the market socialism, the administrative interference in the labour market remained substantial and of discretionary character, and to a considerable extent restrained the market forces. Returns on education and higher skills in Yugoslavia were lower than in contemporaneous western countries (Estrin 1981; Lydall 1984; Flakierski 1989). Most importantly, differences in top salaries accounted for the critical difference for lower inequality in socialist than in capitalist countries (Lydall 1973).<sup>72</sup> Although prevailing social norms (e.g. Galbraith 1967) restrained excessive earning worldwide - to some extent influenced by the threat of communist contagion at the time of the sharp bloc polarization<sup>73</sup> - the fetters of the socialist ideology made their enactment stricter in the socialist countries.

**Managers (“technocracy”).** In consequence, one reason for comparatively lower shares in Yugoslavia was that the manager’s pay differential was generally low with respect to the required qualifications, expertise and the responsibility of their job (Lydall 1984, p. 249). The ‘market socialism’ created almost insuperable incentive problem stemming from the countervailing effects of the considerable extension of manager’s responsibilities and the low pay differentials.<sup>74</sup> It is fair to say that this problem had not been solved until the end of Yugoslavia.<sup>75</sup> As noted above, the proper pay determination was notoriously difficult in Yugoslavia. Managers equally did not have time to boost their incomes from part-time sources.<sup>76</sup> The tax data show that directors earned by far the lowest proportion of income from out-of-work activity, barely 1.5 per cent (Anketa 1976, p.19).

Lydall (1968), for example, writing in the period preceding the economic reforms in Eastern Europe, explains the west-east dichotomy in top earnings exactly by the different position of managers in two systems. In his ‘hierarchical model’, earnings are determined according to the responsibility attached to the specific position in the hierarchy (p. 126). Lydall shows that if the income in the specific hierarchical rank is a constant multiple of the income in the rank right below it, and each supervisor controls the same number of individuals, then the upper part of the distribution approximates the Pareto form (Lydall 1959, 1968, Atkinson 2008, p.

<sup>72</sup> Although the existence of private property income in the capitalist countries (elimination in socialist) has often been singled out as the main explanation for higher inequality in the West (due to the fact that capital income has been more unequally distributed), this dichotomy explains a (smaller) part of the difference, and the greater difference actually stemmed from more dispersed earning distribution in western countries (e.g. Atkinson 2008; Pryor 1972). As Lydal (1973) notes for East-West earnings dispersion: «Since the dispersion of earnings of male manual workers, taken separately, does not seem to be very different in the two types of country, the main difference must arise from the structure of earnings of higher-paid non-manual workers.

<sup>73</sup> For example, see Albuquerque Sant’Anna 2015 (from Milanović 2016)

<sup>74</sup> In many cases, the job of a manager implied greater responsibility for the business success and required considerable effort and creativity, without differential material reward or social recognition (Lydall 1984, p. 242).

<sup>75</sup> Bergson (1967, p. 657) had equally foretold that the actual ‘success criterion’ for managers would prove to be the most difficult obstacle to achieve Lange’s competitive solution in market socialism.

<sup>76</sup> Or from ‘moonlighting’, which was quite widespread practice in Yugoslavia (Granick 1975; Lydall 1984, p. 249).

77).<sup>77</sup> In this respect, Lydall (1968) conjectures, substantial deviations of the top tail from the Paretian form observed for communist countries in Eastern Europe in the early 1960s, could be explained by the fact that the rigid pre-reform central planning provided managers in socialist countries with considerably less responsibility than in capitalist countries (where, in turn, the tail of the earning distribution did follow the Pareto shape).<sup>78</sup> Yet, Lydall (1968, p. 130) had believed at the time that the gap with the western countries would soon be closed, because the reform would bring about a considerable increase in manager's income as a result of placing "much greater responsibility for the success or failure of an enterprise on its managerial staff". But the rise in top compensations was short-lived and largely negated by the Party's reaction against the reform. In the long run, the extended responsibility was not accompanied by the rising manager pay differential, and Lydall (1984, p. 247) would later see managers' situation as that of "responsibility without authority".

Many critics blamed poor incentives, such as low pay differentials, and too much political obtrusion for the failure to ensure quality management in Yugoslavia. The peculiarities of the Yugoslav self-management placed managers in the precarious position between the bureaucracy and workers, compelling them to balance constant pressures coming from these 'stakeholders',<sup>79</sup> and at the same time to ensure the efficient running of the business. Consequently, managers had to possess both advanced political skills and make populist moves, and often simultaneously act as 'party apparatchiks' and 'workers representatives' (Kornai 1992, p. 470).<sup>80</sup> The pervasive political interference typically led to the installation of politically suitable cadre (often through nepotism or corruption),<sup>81</sup> and the system, as a result, rationalized the negative status attached to the managerial occupation. At the same time, the general negative attitude frustrated those who did their job dedicatedly, as well as put off many capable individuals in pursuing this career (Lydall 1984).

The above outlined precarious position aroused discontent among managers, and turned them into an important anti-communist group, that contributed to the eventual fall of the communist regime in Eastern Europe.

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<sup>77</sup> Responsibility is quantified by the number of individuals supervised, while the number of persons each manager supervises is the same.

<sup>78</sup> Thus, Lydall continues, there was no need to pay them according to their responsibility (the number of people below them), but rather according to their 'ability' (Lydall's marks).

<sup>79</sup> The workers in Yugoslavia had larger influence/voice (plus high job security) than in other socialist countries, which curbed the traditional management's overseeing/disciplining role and its general authority.

<sup>80</sup> Horvat (1971, p. 30) cites Leman's remark that: «the director is expected to play the triple role of a local politician, a manager and an executive».

<sup>81</sup> One should keep in mind that bureaucratic installation had been the predominant channel of the top management recruitment in socialist countries (Kornai 1992).



***Intelligentsia and the cultural elite.*** Intelligentsia assumed a prominent place in the socialist countries. The high standing of university professors in Yugoslavia, as the dominant occupation of the P99.99 (Figures 6 and 7), should not come as a surprise, since education was highly esteemed in socialist countries. Communists saw themselves as the ‘modernist’ force in the tradition of the Enlightenment, at least when it comes to their strong belief in science and progress.<sup>82</sup> There were accordingly large efforts to increase the general education level of the population, which was still overwhelmingly illiterate on the eve of WWII.<sup>83</sup> As a result, relatively higher incomes of country’s most distinguished educators also reflect the greater social value that the society attached to these occupations.<sup>84</sup> In contrast to managers, academicians and professors had much greater scope to earn extra income on top of their regular pay. Finally, one should keep in mind a relatively higher importance of education as a channel of social advancement in socialist countries (e.g. for elite reproduction; see Connor 1979) as well as its important (‘Orwellian’) ideological role.

The cultural elite was of limited size and made a more notable presence at the very top (Figure 6). On average, jobs in culture were not especially well paid (and seldom made the top percentile), and the relatively higher number at the very top only suggests pronounced inequality within this group.<sup>85</sup> The position of the ‘cultural cream’ seems to have been particularly advantageous all over the former socialist block (Mathews 1978).<sup>86</sup> Higher within-inequality of this group in Yugoslavia is partly due to the fact that this category also included the so-called ‘superstars’, such as movie stars and directors, renowned artists, musicians or sportsmen.<sup>87</sup> In accordance with Rosen’s (1981) theory of superstars, the rent of ‘top performers’ might have increased with the substantial extension of the market for their talent (see Atkinson 2008, pp. 76-7) – notably with the spread of the general availability of television and radio sets, and mass publishing in Yugoslavia. To the certain extent, this was one of the rare instances of the market reward (but, still relatively limited) in former socialist countries (Kornai 1992, p. 331).

<sup>82</sup> Even if it could be defined in the quite dogmatic way in communist countries.

<sup>83</sup> Quite impressive results were achieved in this sphere, as evidenced in new schools built, literacy rates, student enrolment, etc.

<sup>84</sup> It is interesting that their social status was often retained even when they assumed the position of the so-called ‘dissidents’, and guaranteed their material existence such as pay or social housing. For example, Lydall (1984) notes that professors that initiated the attack on the reform (‘Belgrade eight’) continued to receive salaries after their removal from the university.

<sup>85</sup> For example, the number of taxpayer in this category was higher in the top 0.1 per cent than in the top 1-0.1 per cent

<sup>86</sup> Matthews (1978; Tab. 4.2) provides the exceptional press release of tabulations of creative workers’ wages in the USSR in 1937, showing the very highest earnings as much as forty times the average wage. Matthews similarly mentions the self-report of the Bulgarian writer, who said that he earned 30 times the average pay in the late 1960s.

<sup>87</sup> For example, the occupation data for Slovenia and Croatia in the late 1960s show that composers and those working in sport organizations had the highest average income among the personal income taxpayers.

However, this is only a part of the story. It is conceivable that with the one-party rule, placing so much weight on the promotion of the ruling ideology (being at the same time the monopoly provider of finance), this group inevitably comprised also those who cashed-in their creative talent to preserve the ‘cultural hegemony’ (including those who might have had squandered their genuine talent this way (e.g. see Milosz’s *Captive Mind*)). For this, they were well rewarded, both in monetary terms and in various non-pecuniary privileges.<sup>88</sup> Well-known examples are the Creative unions in the Soviet Union who unambiguously served – to paraphrase Althusser – the ideological state apparatus (for example, one is reminded of MASSOLIT members’ cravings for material privileges satirized in Bulgakov’s *Master and Margarita*). But, clearly, one should not trivialize the actual trade-off faced by intellectuals/artists during the Great Terror in the Soviet Union, where stakes often meant staying alive.<sup>89</sup> The position of intelligentsia in socialist countries significantly improved after the end of Stalinist oppressions, and it was without doubt much safer in socialist Yugoslavia (often enjoying there what their counterparts in other socialist countries were deprived of, from less extensive censorship, free traveling, richer cultural public life, etc.), turning them frequently into a prominent voice of the open opposition<sup>90</sup> and continuous ‘nuisance’ in spreading discontent. The regime, in turn, employed more subtle means to discipline intellectuals, such as intimidating them by material insecurity and degradation of their social status (Krejči 1968 p. 195; Ramet 1996).<sup>91</sup> Intellectuals became especially important social group in bringing the eventual fall of socialism in Eastern Europe by calling for democratization.

**State apparatus.** There was a higher presence of the political bureaucracy in top income groups in Yugoslavia than in western countries (Figure 7). Today it is not uncontroversial to acknowledge the existence of socialist elites, or indeed classes (e.g. Djilas 1957), even if the outright ownership of economic capital was largely abolished. It is equally uncontroversial that monetary incomes reported in the tax data underestimate the true welfare of the governing elite due to various non-monetary privileges (better housing, vacations, high

<sup>88</sup> Fitzpatrick (2000) points out for the Soviet socialism that privileges were actually often rationalized on the grounds that the most cultured strata should be also the one that is most esteemed. Soon, the ‘patron-client’ relationship developed between creative intelligentsia and the politburo. The obligation to ‘patrons’ is famously condensed in the remark of the Union’s chairman, Alexander Fadeyev, who branded Stalin as “the greatest humanist the world has ever known” (Bennett 2017, p. 98).

<sup>89</sup> Alexei Tolstoy, one of the assumed ‘Soviet millionaires’ in the 1930s, allegedly exclaimed “I am flatly a cynic... I write what they want” (Berend 1998)

<sup>90</sup> Especially by exposing regime’s crimes, such as political prison camps or ‘show trials’, etc.

<sup>91</sup> For example, Bacevic (2016) sees vocation-oriented educational reform of 1974 in Yugoslavia, among other things, as Party’s attempt to “reduce the appeal of intellectual professions was also a way to erode the status of intellectuals in Yugoslav society”.

pensions,<sup>92</sup> privileged shopping, etc.). Including these would give a greater weight to these groups in top shares, but it would not change the general picture, such as to raise top income shares above levels found in the capitalist countries at the time (e.g. Phelps Brown 1988, pp. 303-4)<sup>93</sup> (since major privileges were generally reserved for the relatively small circle). In practice, *nomenklatura*, as a non-competing group setting its own wages, was not hindered from seizing the larger share of the total income. Yet egalitarian pressures were strong. The fact that incomes of the state apparatus had never been disclosed in socialist countries is an obvious indicator how delicate the issue had been.<sup>94</sup>

On the other hand, the concentration of political power in the hands of the communist bureaucracy – something not manifested in earnings – was greater than in the capitalist countries. Conceivably, a greater share of the army and the police among top incomes might suggest a greater regime's reliance on the repressive apparatus.<sup>95</sup> Figure 9 shows the most frequent occupations of the Yugoslav top 1% in former republics and autonomous provinces, and it is interesting that the army and the police were the most frequent occupations of the Yugoslavia's top 1% residing in Serbia,<sup>96</sup> which should be probably related to the notable presence of the high-ranking army and police personnel in the country's capital, Belgrade.

However, the apparatus could have not precluded a collapse of the communist regime once the prolonged economic crisis (and a rise of unemployment put an end to 'the pact between workers and the party' (Woodward 1995)). Communists eventually lost its legitimacy among the working class. Stronger liberal forces within party again revived.

<sup>92</sup> For example, we place pensioners right beside government officials and the military in Figure 6, as plausibly very high pensions required to enter into the top percentiles were privileged of state apparatus.

<sup>93</sup> There were several attempts to correct the distributions for the benefits of *nomenklatura* (Morrison 1973, Atkinson and Micklewright 1992); or estimate them independently (Mathews 1978)).

<sup>94</sup> Krejčí (1982, pp. 43-4) notes for Czechoslovakia: "what the popular feeling about these differences may be can be judged from the fact that employees of the party apparatus, army and police were not allowed to disclose their salaries, whereas such information was officially required from all other people"

<sup>95</sup> Moreover, under regime's direct control (and not under Moscow as in most other former socialist countries).

<sup>96</sup> That is, of those in the Yugoslav top 1% (excluding Slovenia) residing in Serbia.

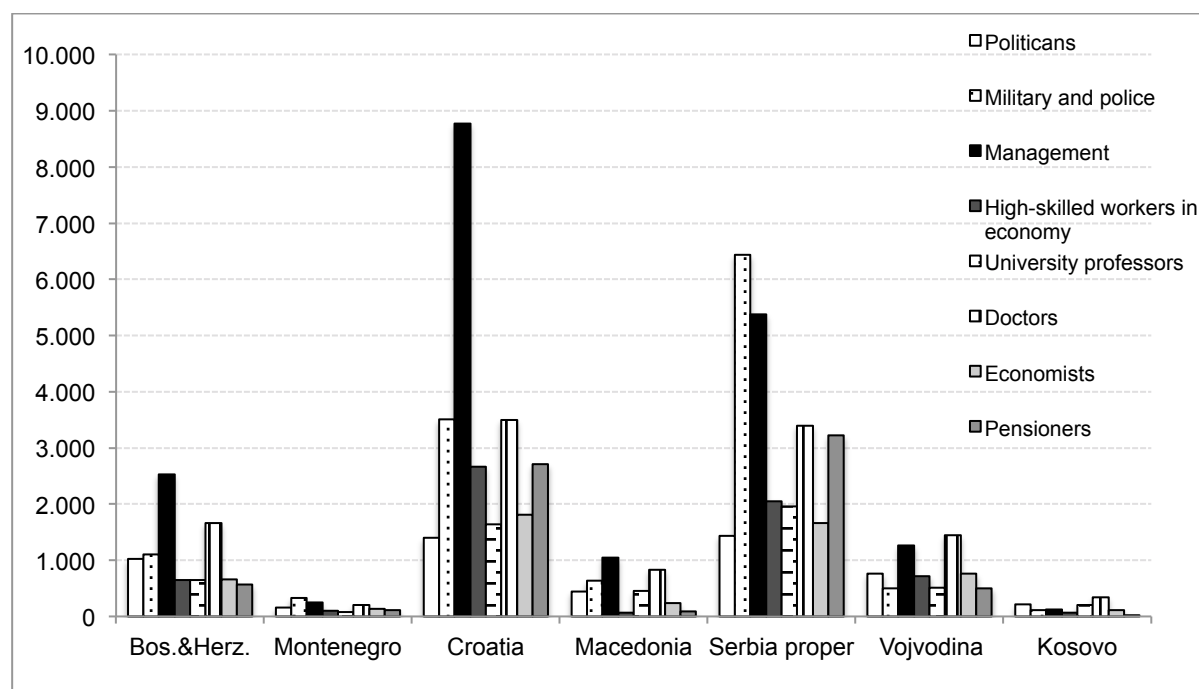


Figure 9: The most frequent occupations of top 1 per cent in Yugoslavia in 1975 arranged by the republics

Note: top 1 per cent is estimated without Slovenia

**Private sector.** Finally, the private sector was most widespread in the private agriculture and the so-called small economy – including small crafts, catering, tourism, repair of durables, transport, etc. It was initially under heavy ideological pressure (in line with Lenin’s notion that they “give birth to capitalism every day and every hour” (Lydall 1984, p. 272)). Its position improved over time, by giving it a role to fill the niches bypassed by the socialist sector, as well as seen as mean to reduce the unemployment in the country. The private economy was the most important in the most developed Slovenia, but there was also an impetus in Croatia with the development of tourism. But its presence seems to be modest at the top (see table A3 in Appendix). An interesting form was established in Slovenia in the 1970s, the so-called *contractual organisations of associated labour*, which was a blend of private undertaking and self-management (Sirc 1979, p. 121), but it is difficult to say whether such forms had the potential to carry on the transition to market economy.<sup>97</sup>

Broadly speaking, the potential of the ‘small economy’ to take the leading role in the transition, through building the ‘capitalism from below’, seems to be limited. Here, Szelenyi et al. (1998) offer again an unambiguous answer, asserting that the building of capitalism from

<sup>97</sup> We cannot ascertain their effect on top income shares, as unfortunately, income tax data for Slovenia in 1970s and 1980s is still lacking in national archives. Sirc (1979) notes that it remained quite limited, with only 30 documented in Slovenia in 1977.

below, as pursued in China, was not possible in Eastern Europe due to then-existing constellation of powers, namely relatively stronger position of socialist managers and technocrats vis-à-vis the communist bureaucracy in Eastern Europe than in China. Technocrats in Eastern Europe pushed for the building capitalism from the top, and more forcefully with the gradual loss of communists' authority in the 1980s. On the other hand, the bureaucracy in China had the technocracy under its firm grip and implemented the 'bottom-up' strategy (which Chinese Party had been actually learning from the Central Eastern European experience with 'small economy') (ibid., p. 185-6). It would be interesting to know how has this equilibrium developed in China in recent two decades, and hopefully new studies will tackle these important issues (e.g., Roland 2017).

### **A follow-up: the new elites?**

A dissection of social groups at the top of the income distribution has been revealing in many respects, yet it cannot capture causal mechanisms underlying the actual dynamics between the top groups. It would be equally gross oversimplification to insist on identifying clearly defined, or hermetically closed, social strata as winners or losers in the transition. As noted, the 'marketization' reforms crystalized top elite groups, largely formed in the opposition to the communist nomenklatura. The termination of the reform and the purge of 'liberals' from the party was a temporary victory of the centralist forces (see above). However, the communists rapidly lost general support amid the prolonged economic hardship (e.g., massive strikes in the late 1980s), which paved a way for party's re-liberalization and gradual democratization.<sup>98</sup> It led eventually to pluralistic elections. The liberal party leadership of Slovenia in the 1980s actually played a key role in achieving the independence of Slovenia,<sup>99</sup> and probably this was a key for its political legitimation and eventual election successes.<sup>100</sup>

It would be thus oversimplification to deduce that bureaucracy lost and technocracy won with the end of socialism. Some of the former communist bureaucracy did retreat disillusioned, but many survived on the political scene and skilfully adapted to the new realities (Kornai

<sup>98</sup> It is generally believed that one unifying feature in the 1980s is that there was a power "vacuum" (in Yugoslavia perceived after Tito's death)

<sup>99</sup> Slovenia and Croatia party leadership that came out with the 1990s confederation proposal.

<sup>100</sup> For example, the two most prominent members of the Slovenian party in the 1980s, Milan Kučan and Janez Drnovšek, continued to dominate the political scene in Slovenia in the 1990s. Probably the failure of the former Croatian party leadership (as well as of the 'liberals' from the late 1960s) at the first elections in Croatia was that they did not advance strong enough demands for the independence, which opened the way to the Croatian Democratic Union (*Hrvatska Demokratska Zajednica*) to win at the elections by a landslide.

2006).<sup>101</sup> At the same time, the institutional and legislation vacuum provided politicians substantial discretionary powers in managing the privatization and the remaining state assets. Many socialist managers and technocrats teamed up with the political elite in the distribution of spoils. Allcock (2000, p. 209) has thus discerned in former Yugoslav republics “a moving together of the political and economic leadership groups rather than their disintegration”, and further adds that “in fact, freed from the constraints of the socialist ideology, it is perhaps only now that the “new class” is coming to be just that”.<sup>102</sup>

The process of privatization in Eastern Europe, and in particular its give-away character amid the scarcity of private accumulated savings, has been central for the creation of post-socialist power elites.<sup>103</sup> The possession of the economic capital became thus directly dependant on the political capital. As a result, the economic capital did not displace political capital in the economy and in certain respects they have become yet more interwoven (economy remained largely ‘embedded’, to refer to Polanyi again; see Szelenyi 2014).

In Slovenia, the privatization strategy to be taken turned into a heated dispute, at “the root of the matter being who should control the economy” (Mencinger 2004, p. 111). In a struggle between the so-called insider versus outsider privatization models, the former prevailed, advanced by the political parties succeeding the communist party and state managers (Plešković and Sachs 1993, Mencinger 2004).<sup>104</sup> This way, Slovenia decided on the gradualist path through the transition to the market economy. Rather than taking the radical break with the socialist past, as the competing (big-bang) approach advanced, Slovenia made a deliberate choice of continuing on many legacies (e.g., self-management), with its

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<sup>101</sup> Often embracing nationalistic ideology that filled the political vacuum left by the bankruptcy of the communist ideology.

<sup>102</sup> Allcock has made this observation as a critique of Pusić (1992), who singled out the socialist managerial elite as the main transformation asset in Croatia, who should also lead the political transition on grounds of their professional competence and possession of skills that were assumedly compatible to the requirements of the market economy. Allcock denied to socialist managers either special adaptability or the necessary foresight, as well as the independence from the political bureaucracy.

<sup>103</sup> In former communist countries in Eastern Europe, in general, once the majority saw the fall of socialism as an accomplished fact and irreversible, many tried to procure better starting positions in the new system. If one is allowed to speak of the transition as being premeditated at the top (Szelenyi et al. 1998), then one manifestation was that numerous actors attempted to legalize their former implicit rights. Sociologists have often built on the Bourdieu’s (1986) distinction between various forms of capital to explain the conversion of relatively salient forms of capital under socialism (social, cultural or political capital) into the economic capital, that is, into the private property as the quintessence of the market economy.

<sup>104</sup> This has remained the favorite ammunition in political in Slovenia, where usually right-wing parties point out that the economy is controlled by the old communist elite (e.g. by the so-called ‘*strici iz ozadja*’ (‘uncles behind the scene’)). But similar phenomena is observed throughout the ex-communist countries, such as calls by conservative party in Poland for “moral revolution” against the assumedly entrenched networks of communist elites of managers and politicians.

positive and negative implications. We consider below its importance for the development of top incomes after the fall of socialism.

One aspect is clearly that the transition from the top precluded ‘transition from below’, as mentioned above, to have been the case in China (Szelenyi 1988, Szelenyi et al. 1998). Former ‘small economy’ generally remained exactly just that, often a mean to survive rather than an avenue to grand bourgeoisie. But, it probably would not be far from the truth to state that intelligentsia was one clear loser in the transition, who saw a notable drop in its social status (and often living standards). If there was ever anything like a tendency of intellectuals “on the road to power” (Konrad and Szelenyi 1979), or the new *Bildungsbürgertum*<sup>105</sup> in Eastern Europe (Szelenyi et al. 1998), it certainly did not materialize.<sup>106</sup> The position of (public) intellectuals has often become more in line with the Nozick’s (1998) or Stiegler’s (1963) cynical description.

#### 4.5. The Transition and its Aftermath

The approaching end of socialism in Eastern Europe was probably inevitable once it became clear that the race with the capitalist world was lost. There was a widespread support for the return to capitalism. The long stagnation of the 1980s and the everyday experience of the system’s flaws had persuaded majority that no future is possible of reforming the system. To the vast majority of people the change was rationalized by the recognition of what Kornai (2006, p. 211) believes to be a robust fact, that “capitalism is more productive, more innovative, with a faster growth rate that produced a higher increase in the standard of living”. On the other hand, some countries related the fall of communism with the national independence, a description that fits to a large extent the experience of Croatia and Slovenia. The majority of the population in Croatia and Slovenia believed that they were in discriminated or forlorn position and shared many grievances against the union. These feelings eventually led to independence from Yugoslavia.

A development of the income distribution in transition economies was equally complex and shaped by a multitude of factors (e.g., Mitra and Yemtsov 2006). To put it simply, it was

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<sup>105</sup> Szelenyi et al. (1998) sees intellectuals (the so called *Bildungsbürgertum* or the ‘cultural bourgeoisie’) as the driving force in social changes in Central and Eastern Europe, such as driving the national revival and the modernization in the 19<sup>th</sup> and early 20<sup>th</sup> century, as well as the transition from socialism to capitalism.

<sup>106</sup> Despite sporadic occurrences (e.g. as the presidency of Vaclav Havel). Filtzer (2014, p. 520) actually sees them as the greatest losers in the (Russian) transformation.

influenced both by the rising earnings dispersion and the concentration of the private property income.<sup>107</sup> Milanović (1999) shows that the rising wage concentration was the most important factor behind the increase in income inequality during the transition. Although the share of wages in the total personal income decreased, the wage concentration sharply increased. Compressed socialist wage grids were abruptly loosened, and market forces acted on labour market distortions. Rutkowski (2001, p. 33) finds that developments at the distribution tails caused a rise in earnings inequality during the transition, but that the overshooting of the top tail had the dominant effect. Most importantly, the rising income shares of the top groups largely induced an increase in income inequality (Milanović and Ersado 2010). Consequently, top incomes have assumed the most prominent role in the development of inequality during the transition from socialism to capitalism.

This is consistent with the finding that top incomes shares saw the largest increase in Slovenia during the transition to market economy (Figures 2 and 3). Figure 10 shows that earnings have been the main income source of top income shares, as well as the main driver of top income development in Slovenia. Business and property income,<sup>108</sup> on the other hand, make relatively small part of the top percentile's income. The figure further suggests that top earnings rose until 2000 and stabilized afterwards. Other researchers have equally documented stability of the income distribution from the 2000s, in the first place Stanovnik and Verbič (2014), who use the same data source.

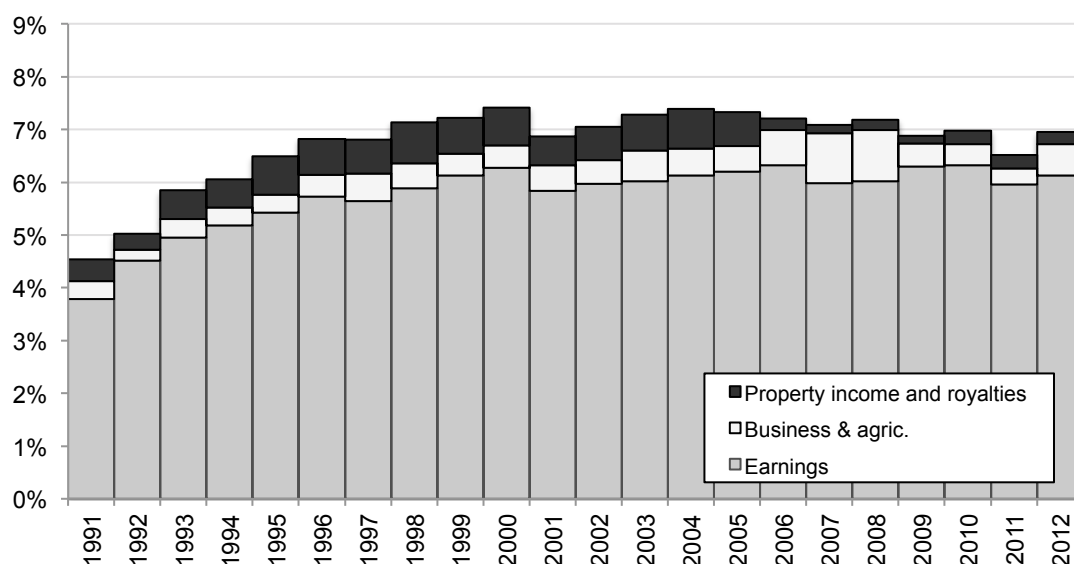


Figure 10: Income sources of the top 1 per cent in Slovenia

Source: author's computation based on the income tax data

<sup>107</sup> Notwithstanding different privatization strategies (e.g., see for property income Grosfeld and Hashi 2003; for earnings Rutkowski 2001)

<sup>108</sup> Royalties make almost all 'property income and royalties' at the start of the transition, and still half of it in mid-2000.



Note: property income does not include dividends from 2006

A similar picture is documented in Croatia (Figures 3 and 4). Figure 11 shows the composition of the top decile by the specific income source in Croatia. Here equally the employment income has been the predominant income source for top income groups. It accounts for almost 90 per cent of the top 10-5% income and its importance declines fairly moderately with income rank, still accounting for almost 70% of the income of the top 0.1-0.01 per cent group. Wages are displaced by capital income (excluding capital gains) as the dominant income source only for the top 0.1 per cent and higher groups. Although the very richest Croatians rely dominantly on capital income, they still derive over a third of their income from employment.

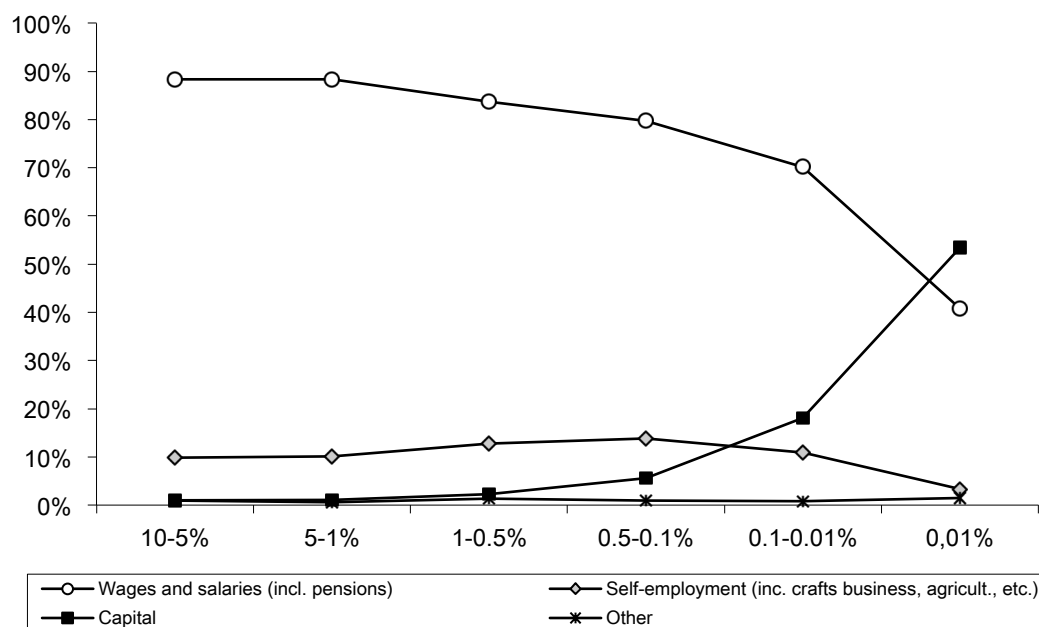


Figure 11: Income composition of the top decile, Croatia in 2013

Source: author's computation based on the income tax data

Note: Wages and salaries are after SSC paid by employees

### Wage distribution development

Having identified rising wage dispersion as the main force behind the rise in top income shares in Slovenia and Croatia, we next look in more detail at its development. Enterprise survey is especially revealing source on the long-run wage distribution (see appendix). Figure 12 shows the evolution of the upper and the lower part of the wage distribution from the employer survey in Slovenia since the 1960s – the upper tail depicted by the evolution of the 90th percentile (P90) and the 95th percentile (P95), and the lower by the evolution of the

10th percentile (P10) (percentiles are expressed as a percentage of the median wage P50). The series for the socialist period show the wage compression after the termination of 'marketization' in the early 1970s, primarily induced by the reduced dispersion of the upper part of the distribution.<sup>109</sup> The largest increase in wage inequality occurred from 1987 until 1991/2, when there had been both a sharp rise in P90 and P95, and a fall in P10. The bottom part of the distribution stabilized afterwards, but we observe a 'fanning out of the top', with the rise of P95 outpacing that of P90. Orazem and Vodopivec (1995) explain a substantial rise of inequality during 1987-91 by the "dismantling of government controls". The evolution of P90 and P95 indicates indeed a broad stability since the start of the present century, as observed in the tax data. Both data sources seem to suggest that earnings distribution already reached new equilibrium level by the late 1990s.

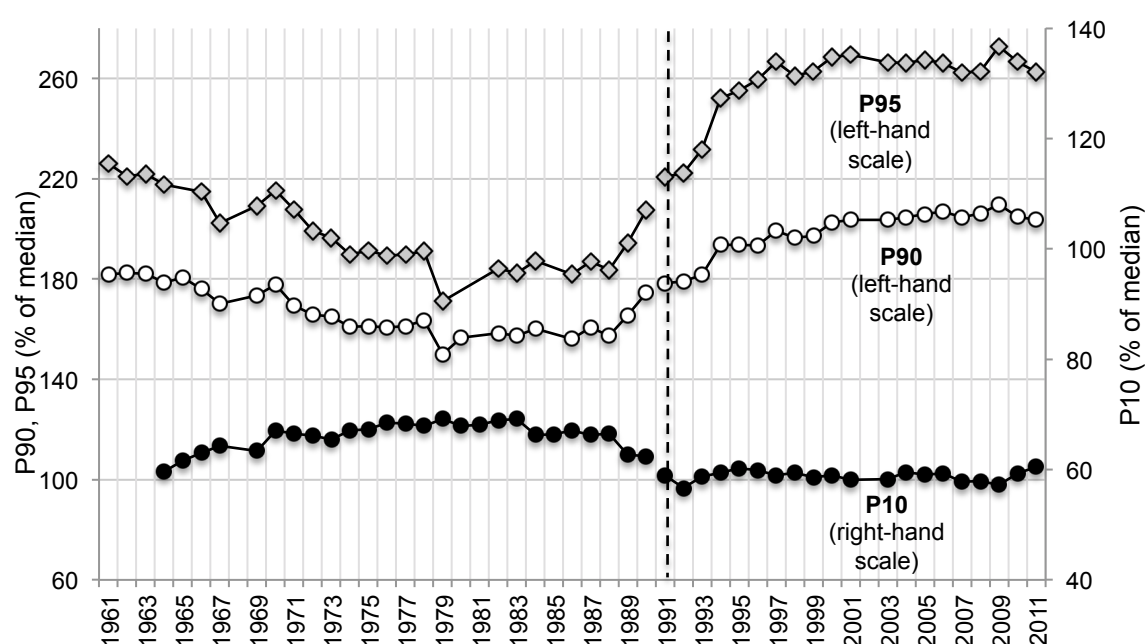


Figure 12: Earnings distribution in Slovenia based on the Employer survey

Source: The Statistical Yearbook of Slovenia (various eds.)

Note: The break indicates shift from net to gross earnings distribution (see Appendix)

For Croatia, unfortunately, the earnings survey according to gross earning concept is not available for the post-socialist period. However, the alternative evidence suggests similar evolution of the wage distribution in Croatia and Slovenia (see appendix). And equally as found in Slovenia, there has been the fanning out of the top in Croatia. Top earnings constructed from the income tax data show that the growth of real average earnings in Croatia was stronger for higher earnings shares (Figure 13; see in Table A4 quite similar top wage shares in Croatia and Slovenia). The growth of earnings of the very top earning groups, such as the top 0.1% or the top 0.01%, significantly outpaced the rise of the 'lower' top

<sup>109</sup> This is also consistent with patterns for top incomes documented in Croatia from 1970 (Figure 4)

earnings groups. In general, these trends are in line with the fanning out of the top documented worldwide (Atkinson 2008).

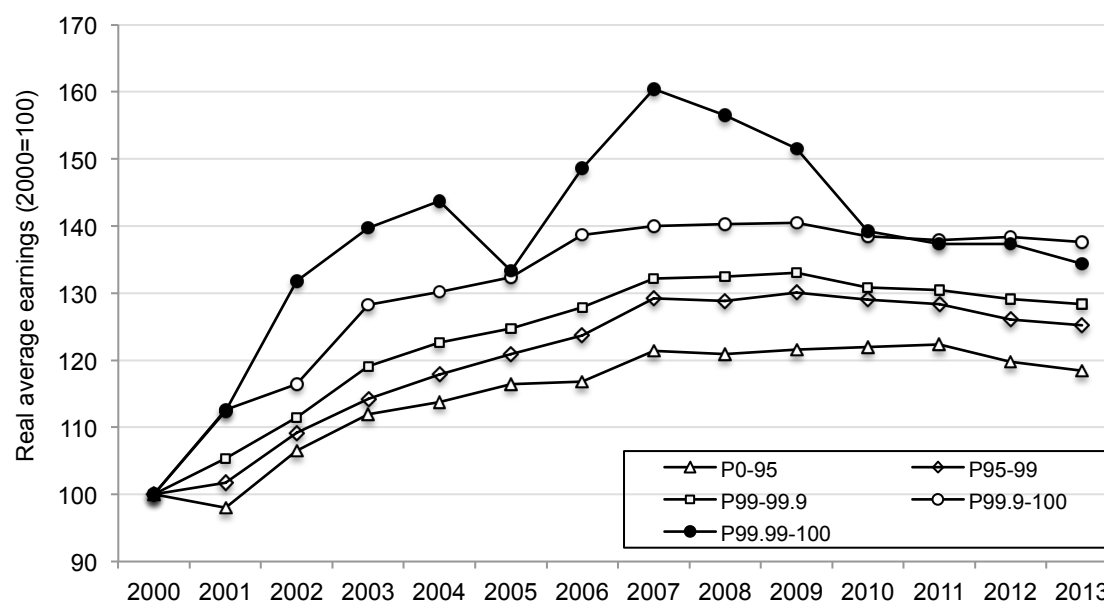


Figure 13: Development of real average earnings of top earning shares, Croatia 2000-13

Source: author's calculation based on income tax data; deflator

In the international comparison, it is especially interesting to compare the wage distribution development in Slovenia and Croatia to that in other ex-communist countries in Central Eastern Europe. As noted, comprehensive enterprise surveys carried out in socialist countries allow us to chart the wage distribution over the longer time span (Atkinson and Micklewright 1992; Atkinson 2008; Rutkowski 2001). Figures 14a and 14b show that the top earnings decile saw an immediate adjustment in Central European countries with the inception of the transition to the market economy. We can see that the top decile (relative to median) assumes today in Slovenia, together with Poland, an intermediary position, above the Czech Republic but below Hungary. But there has been equally a rising dispersion in countries that pursued the 'gradual' privatization, such as Poland or Slovenia, and the 'big bang' privatization, such as the Czech Republic. As noted above, probably the common factor has been the relaxation of the government controls in the wage setting.<sup>110</sup> On the other hand, the lower part of the distribution has been less dispersed in Slovenia than in other countries. This should be related to institutional framework and government measures (e.g., a stronger increase in minimum wage in 2010), at which we look below. Similarly, the higher volatility of P10 in Hungary after 2000 is related to the government interventions (e.g., doubling of minimum wage in 2000/1; Atkinson 2008, p. 245).

<sup>110</sup> A sharp rise of P90 relative to median in Slovenia and Poland in the late 1980s was probably in part related to the hyperinflation in former Yugoslavia and Poland (Bulir 2001; Orazem and Vodopivec 1995, p. 228).

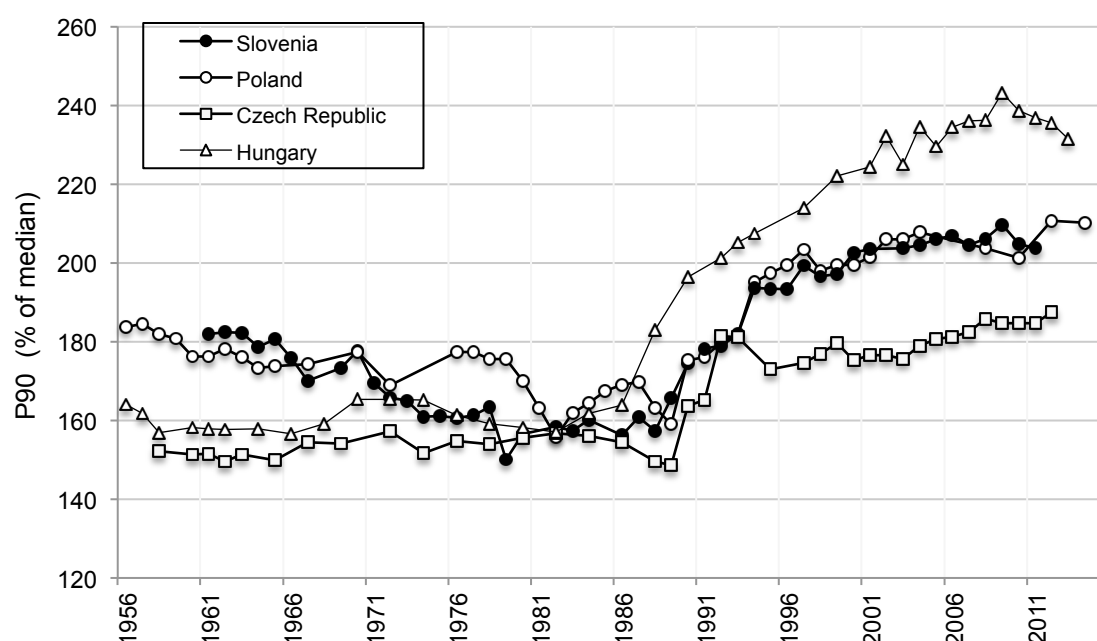


Figure 14a: The upper part of the earnings distribution in CEE countries, 1956-2014

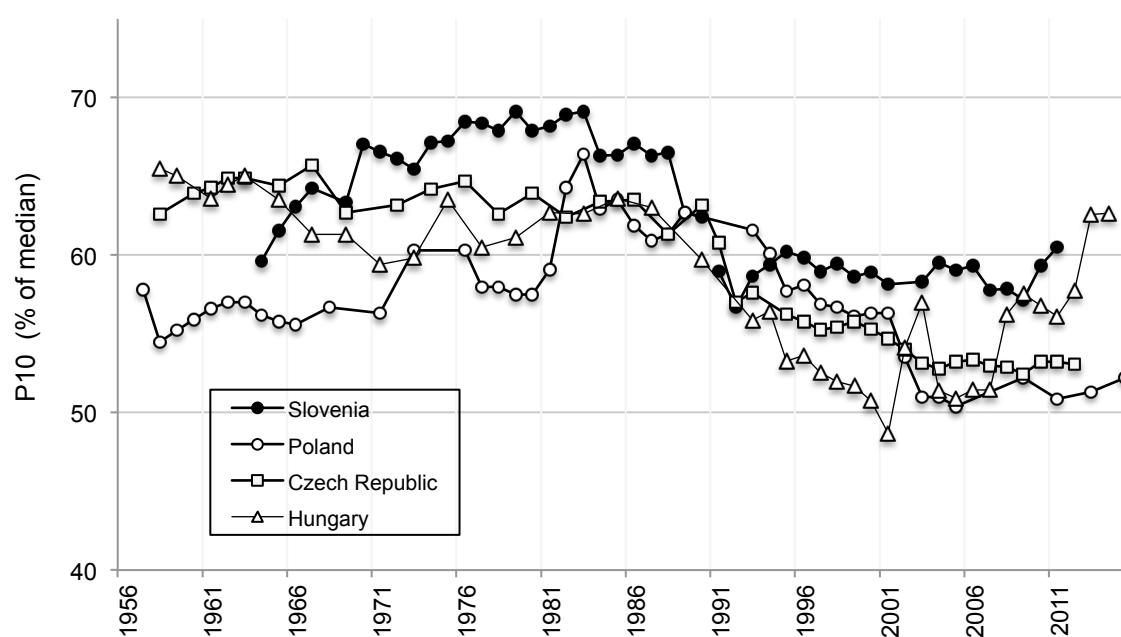


Figure 14b: The lower part of distribution in CEE countries, 1956-2014

Note: gross earnings distribution; Slovenia 1961-1990 and Poland 1970-1990 net earnings distribution

Source: Slovenia: own computation using Pareto interpolation; other countries: Atkinson and Micklewright 1992, Atkinson 2008, OECD database

### **Looking for explanations:**

#### **The ownership structure and labour market institutions**

The most popular explanation of the rising earnings dispersion during the transition to market economy has been that decentralization of the wage setting process substantially increased educational returns, strongly suppressed during the socialist period (Orazem and Vodopivec 1995, Švejnar et al. 2000, Keane and Prasad 2006). To the point that higher education is translated into higher productivity, the transition implied that earnings became more indicative of productivity. Today earnings are linked to the productivity for much larger proportion of workers than was the case during socialism.

Milanović (1999) sees a large shift of labour from the relatively equal public sector to the more unequal private sector as a common factor behind the rising earnings dispersion in transition countries. However, the growing wage dispersion occurred both in the private and the public sector (Svejnar et al. 2000, Rutkowski 2001; Keane and Prasad 2006). For example, a more notable rise in top incomes in Croatia between 1997 and 1999 (Figure 4) might be attributed to the substantial increase in public sector wages, accompanied by the loosening of wage grids (World Bank 2001, p. xii). Vodopivec (2004, p. 310) points out that wages did not differ significantly between public and private sector in Slovenia, and as we look below, it seems that public sector has been leading the way with the private sector adjusting.

Further, the earnings dispersion was reinforced by the labour shift from the manufacturing to more dispersed financial and services sectors. Primarily foreign firms initiated the practice of individualized pay for the top management (at least in Croatia; see below), while bringing at the same time the steeper hierarchical pay structure and making thus a sharp break with egalitarian compensation practices from the socialism. A strong rise in top wages in Croatia in the early 2000s (Figure 13) might be thus related to the strong inflow of foreign investment at the beginning of the century. Bičanić et al. (2010, pp. 22-3) point out that exactly FDI-privatized sectors experienced the largest rise of inequality in Croatia. They note that “this sector is known for employing foreign managers and for having boards dominated by foreigners and may, thus, be less constrained by domestic social norms.” Furthermore, they point to the financial sector as the most representative of these developments (which is almost wholly in the foreign ownership). This is consistent with the disproportional contribution of the financial sector to the rising top concentration internationally (Bakija et al. 2012; Phillipon and Reshef 2009).

This brings us to the important issue of the ownership structure of the corporate sector, that is, the relative importance of the private, public and foreign control in the economy. In this respect, a determining factor has been the outline and the pace of the privatization of the former state owned enterprises (SOE). Slovenia is the outstanding example of the ‘gradualist’ transformation course and we may ask how has the slow gradualism, as practised in Slovenia, affected the evolution of top earnings. For example, the rise of the private or especially foreign ownership (e.g. multinationals) of the corporate sector could have affected social norms on top remunerations, or increased the bargaining power of top managers. For example, it has been often claimed that the corporate governance in the private sector with dispersed small shareholders provides managers with more bargaining power; similarly, we saw that the bargaining power of managers was weaker with the ‘social’ property during the self-management (see the previous section for the ‘separation of ownership and control’ issue).

Figure 15 approaches these issues by looking at the equity holdings of households, the government and the rest of the world in Croatia and Slovenia from the turn of the century.<sup>111</sup> It is interesting that there is still notable state ownership of the corporate sector in Croatia and Slovenia. In fact, the state has been the dominant corporate owner in Slovenia according to the market valuation of the equity. Equity holdings of the private sector have equalled around 30% of the national income, which in 2015 was lower than the market value of government and foreign equity in both countries.<sup>112</sup> In Croatia, foreigners have become the dominant corporate owner from the mid-2000s. The increasing prominence of foreign ownership in Croatia might be related to the rise of the very top wages, as indicated by a positive correlation between development of very top wages (Figure 13) with the market value of the foreign equity (Figure 15). There has been a rise in top wages until the global economic crisis and stagnation afterwards.

It is plausible that the substantial state ownership of the corporations facilitated the specific development of the Slovenian labour market. In the words of Schleifer and Vishny (1994, p. 193): “when the government controls firms, it has considerably more ability to convince them to pursue its political objectives than when the government must persuade private shareholders”. The large public sector and specific labour market institutions have prevented a more notable rise of earnings inequality in Slovenia (Stanovnik and Verbič 2014). Overall,

<sup>111</sup> Excluding the corporate cross-ownership.

<sup>112</sup> Here one should be careful with respect to the official data on market value of household equity holdings, since this might be also due to the fact that the equity in smaller non-listed companies underestimated (by their book values), while larger foreign and state companies are usually listed with easily observed market price.

the wage distribution has remained compressed in Slovenia in the last two decades, especially of the bottom part of the distribution (Figure 14b). It has been frequently argued that Slovenia has succeeded in developing well-functioning 'neo-corporatist' institutions with the substantial inclusion of labour. Crowley and Stanojević (2011) trace the inclusive social dialogue in Slovenia to the legacy of the self-management.<sup>113</sup> One should probably also add to this a deliberate policy choice to fashion its labour market institutions in resemblance to corporatist institutional setting in neighbouring Austria or in Germany ('codetermination').<sup>114</sup> Inclusive social partnership has remained an important feature of the labour negotiation and wage setting in Slovenia (the negotiation has been made through Economic and Social Council (ESS) consisting of trade unions, employers and the government). Stanovnik and Verbič (2014) attribute exactly to the strong social partnership and the accompanying legislation the stabilization of the inequality from the mid-1990s. The timing of the inequality stabilization seems to be right (ESS was established in 1994, the introduction of minimum wage in 1995, etc.). In line of what has been considered above, Stanovnik and Verbič (2014, p. 461) ask whether "a large and strongly wage-regulated public sector...could act as a 'wage-setter' also for the private sector". As noted above, wages have not differed in the public and private sector in Slovenia (Vodopivec 2004).

The broad institutional framework expounded for Slovenia is discernable in Croatia.<sup>115</sup> Shared historical legacy of self-management – as pondered over for Slovenia – may have been important for the specific development of the labour market in Croatia. The fact that countries shared similar institutions during socialist Yugoslavia, and indications of their recent convergence, has probably underlined similar long-term evolution of the earnings distribution (Appendix ). Croatia and Slovenia are characterized by the more extensive coverage of employees by the collective agreements. In this respect, Slovenia has been unrivalled in Europe, with almost all labour force covered by the collective bargaining (see EIRO).<sup>116</sup> Trade union density is still relatively high in the international context (although constantly falling,

<sup>113</sup> Bohle and Greskovits (2007, pp. 452-3) point out along these lines that "Slovenia had a long experience of relatively autonomous self-management that added a level of participatory decision-making unknown in other state socialist countries, and produced managers, unionists, and bureaucrats who had the skills and were habituated to seeking accommodation between economic and social considerations".

<sup>114</sup> Crowley and Stanojević (2011) dismiss the persistence of Austro-Hungarian corporatism in shaping the current neo-corporatist institutions in Slovenia. Their argument chiefly rests on the assumed lack of neo-corporatism in the Czech Republic, which would be the natural candidate for the neocorporatism today if the 'Habsburg' persistence mattered (the Czech lands were industrially the most developed Habsburg province with the strong labour movement). They further emphasize that the greatest industrialization spur in Slovenia actually occurred during socialism.

<sup>115</sup> Although its development has lagged in many respects behind Slovenia.

<sup>116</sup> The proportion of employees covered by the collective bargaining in Croatia is around 60%, while in Slovenia is as much as 90%. This proportion is the highest among former socialist countries (see <http://www.worker-participation.eu/>).

especially after joining EU). Holzner and Leitner (2009, p. 10) see very high coverage of collective agreements and union density as being critical in securing relatively low inequality in Croatia. Further, Croatia and Slovenia have relatively higher minimum wage (for example, in comparison to other former transition countries).

### **Capital transformation: From ‘social’ to state ownership**

The ownership structure is further indicative of the importance of the capital and business income source in top income shares. The strong concentration of capital income at the top of the income distribution made it the predominant income source in top incomes and was the major source of high top income shares in the first half of the 20<sup>th</sup> century (Atkinson and Piketty 2007, 2010). The communist nationalizations and expropriations eliminated the largest part of the private capital income, and it had been almost a commonplace to see the absence of capital income as the chief reason behind the relatively lower inequality in socialist that in contemporary capitalist countries (Atkinson and Micklewright 1992, pp. 30-2).

Transition implied, in theory, a return of this inequality channel. The transfer of public to private capital has been the main avenue to create new riches in former socialist countries – and it can be quantitatively important, as evidenced by the rise of the so-called oligarchs in Russia (see chapter 6). Great fortunes are reflected in high capital incomes, yet Figures 10 and 11 does not show large share of capital or business income in the top 1% share in Slovenia and Croatia.

How to explain this seemingly lower concentration of capital income at the top in Croatia and Slovenia? We believe that it is again important to point to the ownership structure of the corporate sector. The fact that the government ownership of the corporate sector is substantial in Slovenia (or the foreign ownership in Croatia) means that the corresponding top capital incomes are not concentrated in the hands of resident individuals. It is usually the financial corporate and business wealth that is strongly concentrated and makes the dominant part of the portfolio of the richest (Roine and Waldenstrom 2015; Saez and Zucman 2015). Thus, countries with most valuable companies in foreign or state ownership will have, *ceteris paribus*, lower (interpersonal resident) inequality than countries with most valuable companies in the private ownership (note as well that the pronounced concentration of the corporate ownership among the small number of private owners (usually families) is a feature of many developing countries (La Porta et al. 1999)). Having rather state as the ‘ultimate’



capitalist, or foreigners as holders of highest capital incomes, reduces the capital income inequality channel (especially since the big state companies are sizeable due to socialist ‘giantism’ and were often monopolists during the socialist era, and many have remained so). For example, Kessler and Wolf (1991) attributed lower documented wealth inequality in France than in the US in 1980s primarily to the fact that higher level of non-private (in this case state ownership) of the corporate stock in France than in the US.

With respect to the accumulation channel, there has not been enough time to amass private great fortunes on the grander scale by reinvesting. Of course, one needs to have caveats in mind, especially regarding the offshore wealth (Zucman 2015).<sup>117</sup>

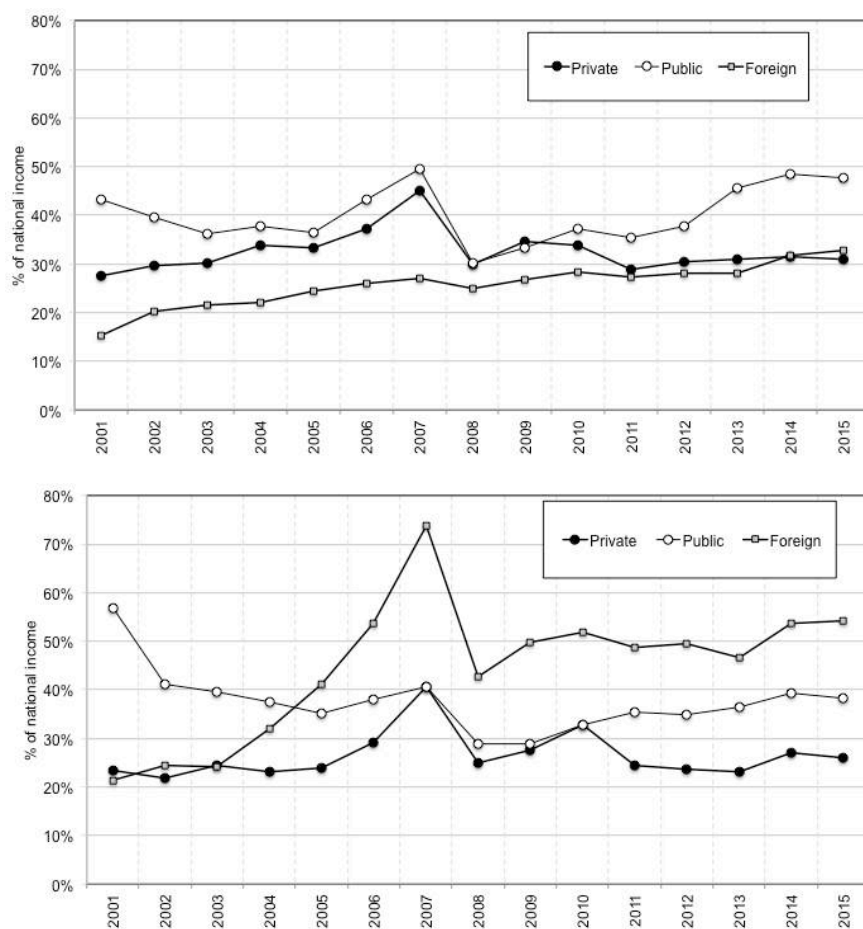


Figure 15: Equity of corporations in Croatia (top figure) and Slovenia (bottom figure)

Source: *Financial Accounts: Croatian National Bank and Slovenian National Bank*

Figure 16 looks at the importance of capital income in the Slovenia’s economy. The capital share is relatively low in international comparison (Piketty and Zucman 2014). For example, the capital share in the corporate net value added has recently been less than 15 per cent,

<sup>117</sup> However, there is no reason that rich in Croatia and Slovenia have been more proportionally successful in this than their counterparts internationally.

which is notably lower than documented in the case of the Czech or Polish corporate sector (see chapters 2 and 5). It has increased since the mid-1990s, when it was artificially low, conceivably due to the transition-related plunge in the profitability (and large losses related to restructuring). But rather than deducing that Slovenian corporations are relatively more labour-intensive,<sup>118</sup> we may hypothesize, in line with the above argument, that relatively higher bargaining power of labour versus capital might have ensured higher labour share, primarily due to the extensive state corporate ownership.<sup>119</sup> The lower levels of capital share, without exhibiting a clear trend, are thus in opposition to prevalent fall in the labor share internationally. Thus, when Glyn (2009, p. 116) points out that “the prime suspects for the decline in labor’s share are factors that have weakened the bargaining position of labor – globalization, deregulation... – and technological shift that have reduced the demand for unskilled labor”, it might have been the case that the decline was precluded in Slovenia due to inclusive labour market institutions, as well as to the limited inflow of foreign capital (which, as we saw in the case of the Czech Republic, has led to the sharp fall of labor share in the corporate sector). However, this issue requires further investigation.

In addition, the ratio of the property income received by households (dividends, interests and rents) to wages and salaries has been also relatively low. The ratio foreseeably increased from the 1990s, reached a peak before the financial crisis, then fell and stabilized around 6-7%. Therefore, the lower concentration of private capital income is not only due to egalitarian distribution of the private wealth (as suggested by sources such as HFCS), but also due to the lower capital share (see Piketty 2001).

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<sup>118</sup> In fact, industrialization in Slovenia had been rather capital intensive, especially in Yugoslavia). High depreciation rates of corporate capital (consumption of fixed capital in the corporate sector is on average 25% of the corporate gross value added) equally do not suggest

<sup>119</sup> Here another evocation of self-management is brought to mind, namely the practice that real wage often exceeded productivity (see Glyn 2009 for a simple model), which is also in line with the experience of the ‘profit squeeze’ in Western Europe in the 1970s, when higher bargaining power of labour pushed for wages increases amid productivity slowdown (Glyn 2006; Eichengreen 2007).

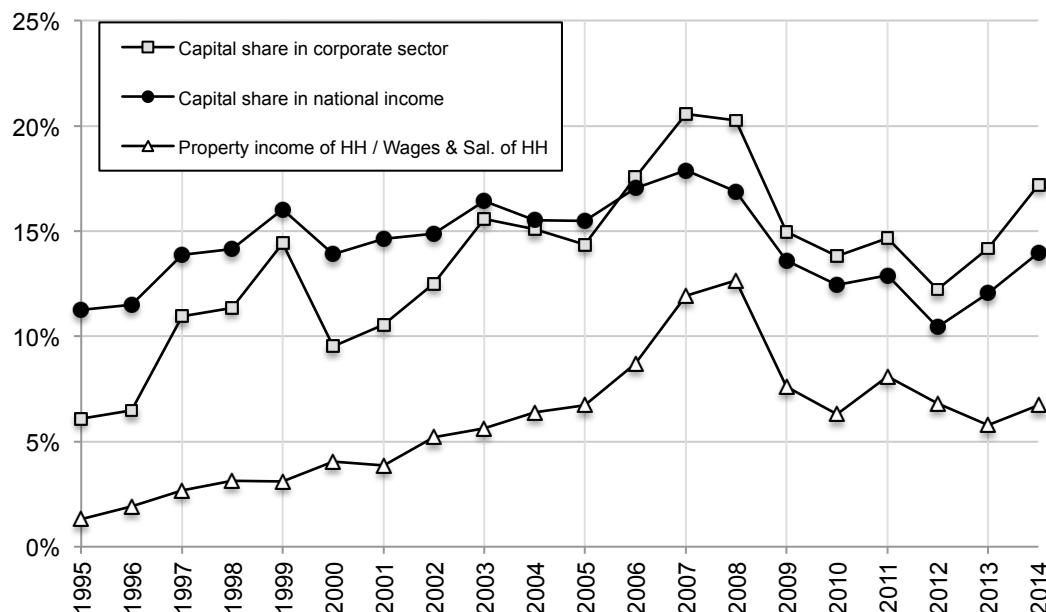


Figure 16: The importance of the capital income in Slovenia

Source: author's computation based on the National Accounts of Slovenia

Note: 1) '*Capital share in national income*': capital share in factor cost national income (it is assumed that product taxes are equally paid by capital and labour); capital income is estimated as equal to the net operating surplus plus a part of capital income in the net mixed income of the households sector (net mixed income in the household sector is split between capital and labour income as observed in the corporate sector); 2) '*Capital share in corporate sector*': capital share in net value added of the corporate sector; capital income is estimated as equal to net operating surplus of the corporate sector 3) '*Property income of households / Wages and salaries of households*': ratio of property income (dividends, interests and rents) received by households to wages and salaries (not including social security contributions paid by employers) received by households

The relatively substantial government ownership of the corporate sector almost three decades after the official end of the socialism is a distinguishing feature of the Slovenian economy in comparison to other former socialist countries (see chapter 5). Slovenia has also been an 'outlier' in terms of quite limited foreign ownership.<sup>120</sup> In order to explain this, we should return once more to the 'gradualist' strategy pursued in Slovenia. Slovenia largely disregarded the 'Washington consensus' prescriptions since it embarked on the transition with fairly liberalized prices, relatively decentralized decision-making and a number of Slovenian firms were competitive in the western market (Plešković and Sachs 1993, p. 193). Between the two competing privatization strategies, the gradualist approach prevailed over the so-called 'big-bang'. In the majority of cases, the privatization of large SOEs was postponed for later period and the government remained an important corporate owner. Slovenia has repeatedly advertised a 'transparent withdrawal of the state from the economy', but Mencinger (2010) remarks that the reality has been the opposite: the government has actually increased its role in the economy (especially through two major state-owned funds) (see Figure 15).

<sup>120</sup> For example, it is the only ex-communist country where the banking sector has remained dominantly in the government rather than in the foreign ownership.

The so-called 'tyconization' of the 1990s generally led to wealth destruction rather than wealth concentration (see chapter 5). This phenomenon was especially prominent in Croatia, where the popular perception has linked privatization with the large-scale plunder.<sup>121</sup> In many cases, tycoons siphoned funds and ruined companies, eventually returning shares to the government.<sup>122</sup> The government received back companies in still worse condition. Further, many former SOEs were distressed by the 'creative destruction' and deindustrialization. Rather than engaging in much needed restructuring, the government has often cling to old practices such as subsidization of ailing firms/industries and soft budget constraints, all resulting in the gradual loss of competitiveness of the Croatian economy (World Bank 2000).

But, it should be noted that the state ownership of the corporate sector is not bad in itself (e.g. Mazzucato 2013), despite all the usual rhetoric,<sup>123</sup> and most of assumedly inherent inefficiencies can be equally applied to private sectors. But, the growing evidence of the collusion of political and economic elites in Croatia and Slovenia has thrown negative light on concepts of 'entrepreneurial' or 'developmental' state. There is especially concern of adverse effect on the entrepreneurship and hindering a development of the vibrant private sector. Criticisms have been often heard both in Slovenia and Croatia that slow privatization reflected intentions of the old elites to retain the control of the economy. Higher government ownership can perpetuate well-known conflicts from socialist Yugoslavia (see above). For example, Mencinger points out that the governments in Slovenia have often used this stronger position to install managers according to loyalty rather than competence. Simoneti et al. (2004, p. 234) further note that state-controlled funds are frequently used for political interference in the decision making of corporate sector. In still bleaker scenario, the pervasive state becomes the source of clientelism and corruption (Acemoglu and Robinson 2012; Milanović 2017; Szeleny (2014), for example, sees Croatia (together with Bulgaria, Romania and Serbia) as a typical representative of the 'neoprebendalism').<sup>124</sup> In this light, one can in part try to understand the recent public manifestations of discontent (in particular, 2012–13 Slovenian protest marches against both right- and left-wing parties that have dominated the government).

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<sup>121</sup> By many accounts, there were attempts in Croatia to create the national capitalist class by simply giving firms to political loyalists. The push for privatization moreover occurred with the war raging in the country amid weak institutional framework (lacking thus minimum transparency in most deals). The economy assumed contours of the 'crony capitalism', characterized by kleptocracy, corruption and rent-seeking (Bičanić and Franičević 2004).

<sup>122</sup> Shares in the Croatian fund for privatization sharply increased in the late of the 1990s for exactly this reason.

<sup>123</sup> One clear example is the public investment in scientific research and technological progress (Atkinson 2014), and one should not forget certain achievements in Slovenia and Croatia during the socialist Yugoslavia.

<sup>124</sup> Szelenyi explains 'neoprebendalism' as "an on-going process of the reallocation of property rights after repeated loyalty tests"

## 4.6. TOP INCOMES: FURTHER INSIGHTS

### Robustness of estimates: shares within shares and inverted Pareto coefficient

An additional insight into the concentration at the top could be obtained by looking at ‘shares within shares’ (e.g. see Atkinson 2007a), which, as the name suggests, look at the distribution within the top groups (while ‘top shares’ indicate the importance of top groups in the whole population). As the computation of this measure consists solely in identifying top groups in the population, and refrains from relating the income of these groups to external controls of total income, it circumvents the uncertainty that often accompanies estimates for the total income (Atkinson 2007). Thus, ‘shares within shares’ provide quite useful robustness check, especially with respect to short-term developments. Figure 17 depicts the share of 1% in the share of top 10% in Croatia and Slovenia and the share of the top 0.1% in the share of top 1% in Croatia. Shares within shares are similar in two countries, which is consistent with similar levels of top income shares. We can see that shares of top 1% in top 10% and of top 0.1% in top 1% in Croatia experienced quite similar development (suggesting that the top of distribution follows Pareto distribution). A rise from 2012 indicated by intermittent lines was driven by the inclusion of capital income into the taxable base, which is found to be highly concentrated and leading to higher inequality within top income groups. Shares within shares provide more nuanced picture, but confirm the general finding of broad stability in the top concentration.

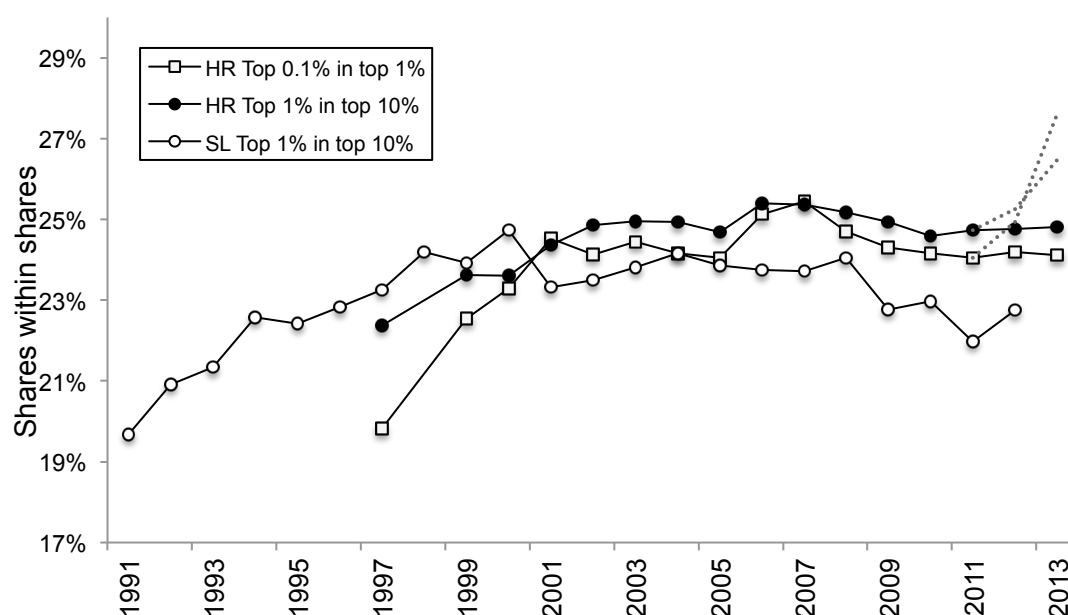


Figure 17: Shares within shares, Croatia and Slovenia

Source: author's calculation based on income tax data

Note: dashed lines indicate estimates including capital income in Croatia after 2012

We can also look at the inverted Pareto-Lorenz coefficient (in further text Pareto coefficient  $b$ ) as an alternative indicator of concentration (Atkinson et al, 2011). It is a well-established empirical observation that the upper tail of the income (and wealth) distribution could be well approximated by the Pareto distribution. Just a brief reminder on the Pareto distribution: the cumulative distribution function  $F(y)$  for income  $y$  is given by  $1 - F(y) = (k/y)^a$ , where  $1 - F(y)$  is the proportion of individuals with income above  $y$ . Parameters  $k$  and  $a$  are constant;  $k$  stands for minimal amount to which power law is applicable while  $a$  is Pareto coefficient. An important feature of Pareto distribution is that the average income above a certain threshold is proportional to that threshold (van der Wijk law). This constant is referred as Pareto coefficient  $b$ , and indicates the fatness of the upper tail of the income distribution. Thus, higher Pareto  $b$  points to higher inequality at the top. While it has been found that Pareto coefficient  $b$  is constant for the largest part of the top tail of the income distribution in a given year, its value varies between countries and over time. Atkinson et al. (2011, pp. 13-15) point out that Pareto coefficient  $b$  has generally taken values between 1.5 and 3, with lower limit indicating relatively lower top inequality.

Figure 18 shows Pareto  $b$  for the top tail of income distribution in Croatia in 2013. It can be seen that it is roughly constant for the largest part of the top tail, and that the relation breaks down only for the very top incomes within the top percentile. The observed value of coefficient between 1.7 and 1.8 indicates comparatively lower inequality in the international context, with similar levels documented recently in less unequal countries such as France, Italy, or Spain. This also provides some reassurance concerning our estimates of top income shares, which are similarly found to be close as in the mentioned countries (Atkinson and Piketty 2007, 2010).

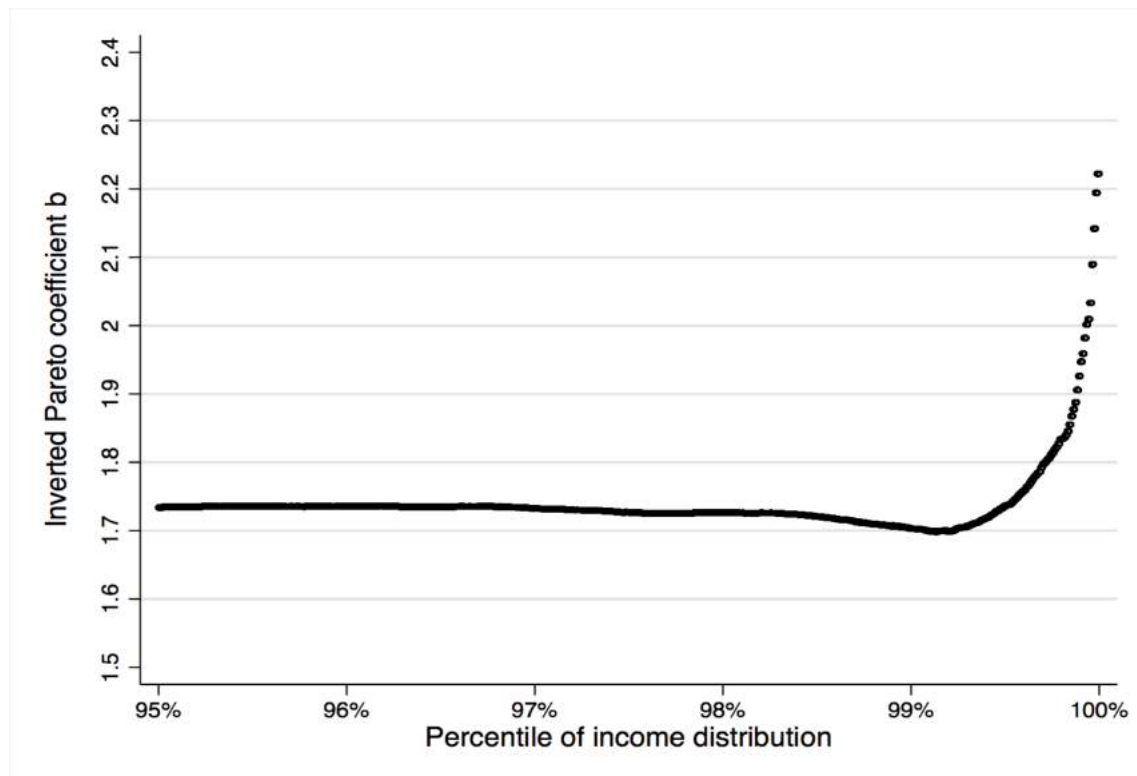


Figure 18: Inverted Pareto coefficient in Croatia in 2013

Source: author's computation from the income tax data

### Top mobility

To what extent are annual measures of inequality, such as top income shares, reliable indicators of mid-term and longer-term inequality? It has been frequently argued that inequality estimates obtained from the annual cross-sectional data could be misleading since they do not take into account lifetime (permanent) income of individuals and are strongly influenced by the transitory component. One needs, therefore, to analyse income mobility and understand how individual's income is correlated over time. For example, Gottschalk (1997, p. 24) pointed out that: "without information on mobility it is impossible to tell what proportion of low earners in one cross-section also had low earnings in a subsequent cross-section. If many low earners in one year have high earnings in other years, then the cross-sectional earnings distribution is not very informative." Consequently, in order to account for these issues there is a growing need for panel data which follow individuals over a longer time period (see Jäntti and Jenkins (2013) for detailed overview).

Saez and Vaell (2005) use Canadian income tax panel data and document quite modest mobility within top income groups in Canada since the 1980s. Kopczuk, Saez and Song

(2010) use the social security panel data to assess the mobility of high-earning individuals in the US in the last three decades, and equally find rather limited mobility at the top. Both studies conclude that a surge in wage concentration in North America has not been caused by rising top mobility.

Croatian income tax data allow us to track individuals through years.<sup>125</sup> Following the above-mentioned studies, we look at the probability of staying in the top income groups after specified number of years.<sup>126</sup> Thus, Figure 19 shows that in recent years the probability to be still in the top percentile after one year is as high as 80%, it is 65% after three years and 55% after five years. One could argue that mobility at the top in Croatia is low, characterized by modest dynamism and rigidity, and that top income shares are fairly good indicator of (at least) mid-term inequality. Moreover, Figure 19 reveals that the top mobility has actually slightly declined since the mid-2000s.

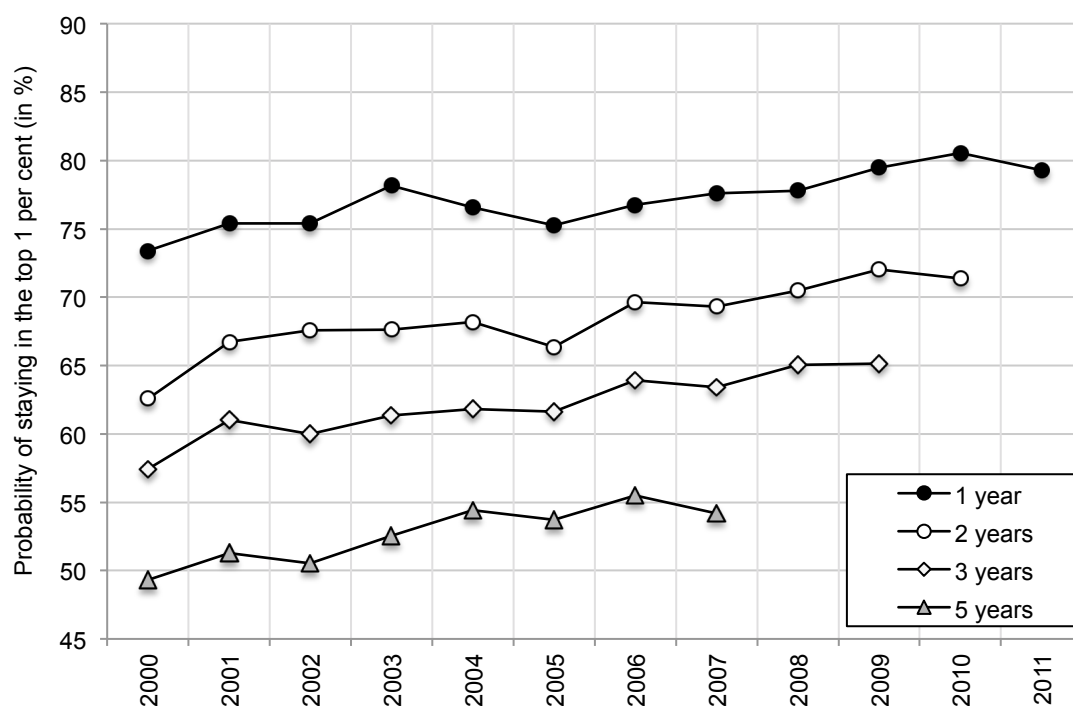


Figure 19: Probability of staying in the top 1 per cent of income distribution after indicated number of years, Croatia 2000-11

Source: own computation based on income tax data

<sup>125</sup> Individuals in microdata keep the same identifier over the whole period under consideration.

<sup>126</sup> see Kopczuk, Saez and Song 2010, Fig. VIb



## Gender

We further look at the gender composition of top incomes. Atkinson et al. (2016) have recently brought attention to the gender dimension of top incomes, by looking at the female representation at the top. Figure 20 shows the share of women in top income groups in Slovenia in the period from 1991 until 2012. There was a steady increase in the female share in top groups since 1991, rising from 30% to 40% in the top 10 per cent income group, and from 20% to 30% per cent in the top 1 per cent income groups. As documented for other countries, the female share in top groups falls with the income rank. However, this is the highest proportion among the studied countries (Atkinson et al. 2016), so in this aspect as well, Slovenia shows to be the most egalitarian country (this is backed by of the lowest gender wage gaps; see OECD 2017). It is interesting that the proportion of women in top income groups increased during the crisis.

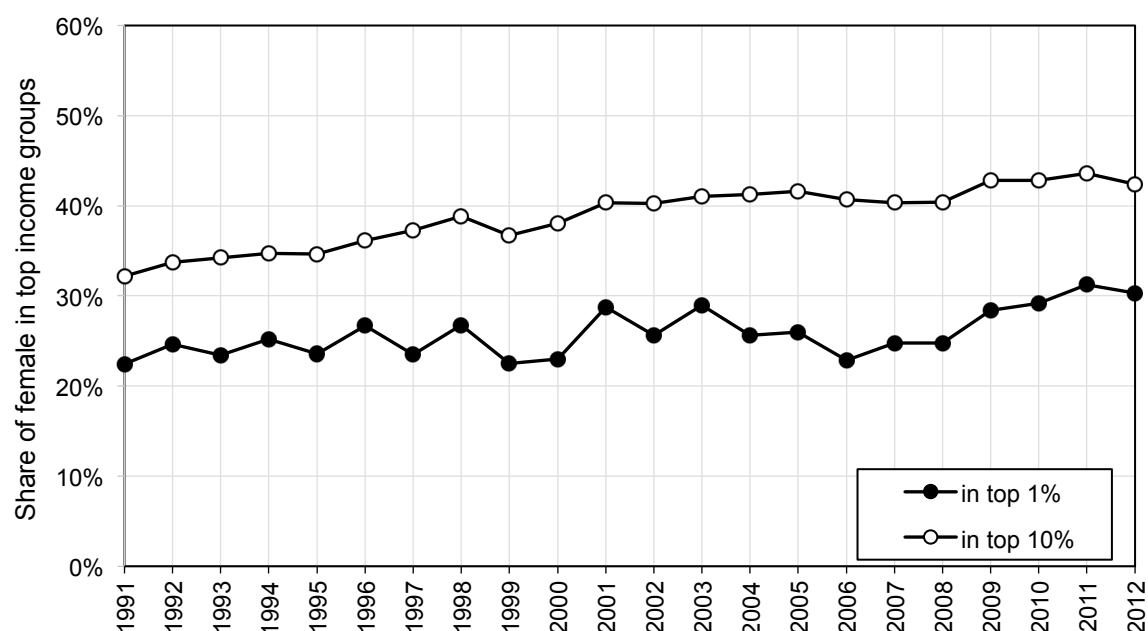


Figure 20: Share of female in top 1% and top 10% in Slovenia, 1991-2012

Source: author's computation based on the income tax data

## Taxation

We turn next to the taxation of top incomes. Up this point we have looked at the distribution of gross or before-tax income<sup>127</sup>, but it is important to determine the impact of taxation and redistribution on top income shares. Croatia and Slovenia have maintained the progressive

<sup>127</sup> Also including pensions

structure of the personal income tax during the whole period under considerations<sup>128</sup>, which should imply in theory that high-income groups bear the largest burden of personal income taxation. But in practice, looking only at the legislative tax design, such as statutory marginal tax rates, is an imperfect indicator of the actual tax burden, since the gap between the two could be substantial, depending in the first place on the extent of the tax base erosion due to available tax exemptions, allowances or reliefs. In addition, different tax schedules are increasingly applied to different income sources. This has primarily been the case for the capital income taxed proportionally at considerably lower rates.

A special appeal of the Croatian dataset lies in the fact that we deal with actual taxpayers (all taxpayers at the top in Croatia), so we can see how their reliance on tax preferences correlates with income and, most importantly, how much tax different high-income individuals eventually end up paying. Figure 21 presents estimates of average tax rate for different top income groups in Croatia in 2013. Average tax rate is calculated as the total tax liability (includes personal income tax and surcharge, as well as social security contributions paid by employee) divided by the total gross income of the particular top income group.

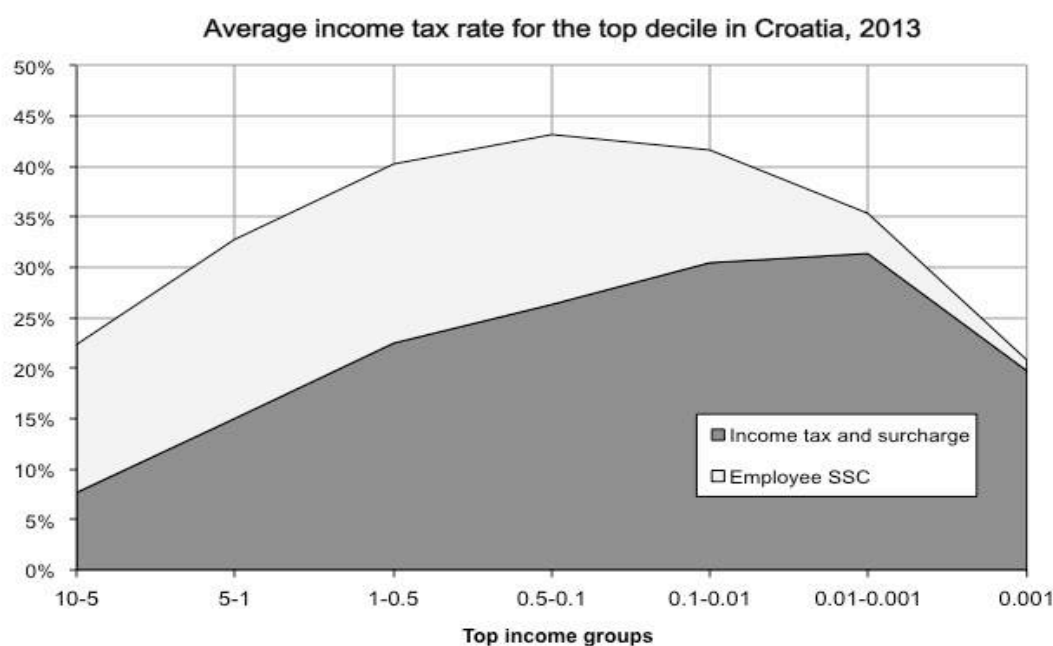


Figure 21: Average effective tax rate for the groups constituting the top decile

Source: own computation based on the income tax data

Note: Gross income is taken after social security contributions paid by employers, while the liability used to calculate the average effective tax rate does not include social security contributions paid by the employer

<sup>128</sup> In fact, since the first post-communist income tax legislation was introduced in 1994.

One first notices that the average income tax rate (dark grey area) rises with income until the very top of the distribution. Personal income tax ceases to be progressive above the level of the top 0.01-0.001 per cent (or until the top 0.1 per cent as shown in Table 1). In line with the results of the previous section, this should be explained by the predominance of capital income at the highest income echelons. As capital income is taxed at the flat rate of 12% (while the top statutory marginal tax rate for progressive schedule is 40%), we observe a sharp drop in the average effective tax rate at levels where the income composition shifts from employment towards capital income.<sup>129</sup> Moreover, capital income was until recently entirely exempt from the personal income tax,<sup>130</sup> and this should be singled out as the main source of the tax base erosion for high-income individuals. In contrast to some other exempt income, such as imputed rents of owner-occupiers, the importance of capital income rises with the rank of gross income. Finally, let us note that the progressivity at the top has been little affected by various personal deductions and reliefs due to steady broadening of the tax base in the recent years.

Table : Average tax rates paid by top income groups in 2013

Top group	PIT	Employee SSC	Top group	PIT	Employee SSC
Top 10%	15,7	16,1	Top 10-5%	7,7	14,7
Top 5%	19,3	16,7	Top 5-1%	15,0	17,8
Top 1%	25,8	14,8	Top 1-0.5%	22,6	17,6
Top 0.5%	27,5	13,4	Top 0.5-0.1%	26,3	16,9
Top 0.1%	29,3	8,4	Top 0.1-0.01%	30,5	11,0
Top 0.01%	26,8	2,8	Top 0.01-0.001%	31,4	4,0
Top 0.001%	19,8	0,9	Top 0.001%	19,8	0,9

Table 1: Average tax rate for the groups constituting the top decile

Source: own computation

Figure 21 shows that social security contributions paid by employees become equally regressive at the top. Almost a flat structure is observed until the top 0.5-0.1 per cent (however, it is slightly lower for the top 10-5%, probably due to larger prevalence of pensioners in this group relative to higher groups), above which it breaks down as the cap on

<sup>129</sup> We look here only at the personal income tax burden and do not consider how imputing corporate income tax to individuals (e.g. see Feldstein 1988) would affect tax progressivity at the top of the income distribution. However, it would be misleading to automatically assume that capital income bears the burden of corporate income taxes, since corporate income tax could be (and often is) shifted towards employees in the form of lower wages, or towards consumers in the form of higher prices (Harberger 1962).

<sup>130</sup> Capital income was exempt on dividends and profit shares until March 2012, on interests until January 2015 and on capital gains from a disposal of financial assets from January 2016.

employees' SSC becomes operative,<sup>131</sup> as well as due to the above mentioned shift in income composition from salaries and wages for the very top income groups.

The combined impact of personal income tax and employees' SSC on top income shares is presented in Figure 22, which shows top shares of disposable (or after-tax) income as the proportion of before-tax income shares, ranked by the level of gross income (see Atkinson 2007b). As can be seen, top groups from the top 0.1-0.01 per cent and above were disproportionately less impacted by the taxation due to the lack of progressivity at the very top.

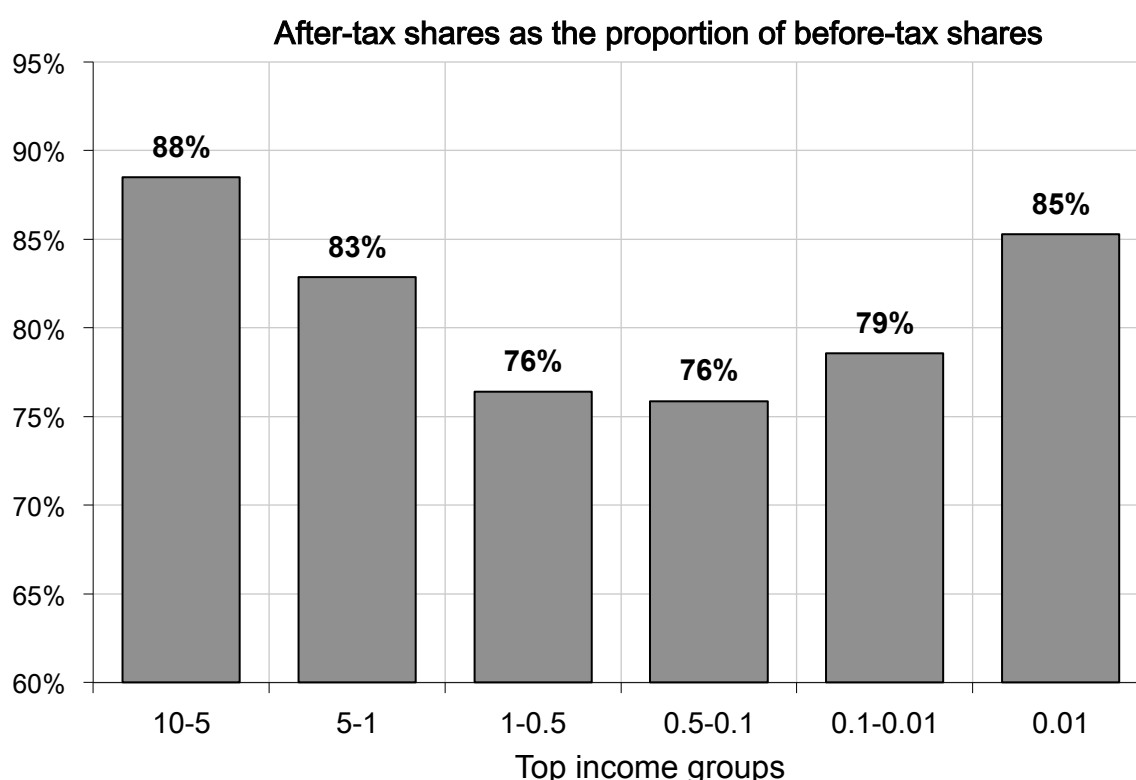


Figure 22: After-tax shares as the proportion of before-tax shares in 2013 in Croatia

Source: author's computation from the tax data

Note: after social security contributions paid by employees and personal income tax

## 4.7. Comparison to survey data

Tax data have proven to be particularly useful in portraying the upper end of the income distribution. At the same time, it is often emphasized that exactly the coverage of the top of distribution stands for the weakest point of household surveys. For example, surveys are prone to misrepresent the top of income distribution due to higher non-response and under-reporting among the richer respondents, as well as due to specific survey collection

<sup>131</sup> The annual cap on employees' SSC was set to 556,424 HRK in 2013.

constraints and top coding (UN 2011, p. 93). Occasionally, changes at the upper end of income distribution documented in the tax data can critically impact the overall distribution, for example, as famously showed in the case of the US by Piketty and Saez (2003). As pointed in Canberra Group Report (UN 2011, p. 96): "... studies based on tax records point to patterns that are large enough to change the analyst appreciation of what is happening to income distribution. They highlight that care must be taken to assess trends in the upper end of the distribution based on survey results alone, particularly if there is evidence that these may not be totally representative of the population."

Recently, and in part to overcome this difficulty, data collection for sources on income and poverty has started combining traditional survey methods, such as interview, with administrative (or 'register') data, such as tax data and social security data. The well known application of this approach has been in the EU Statistics on Income and Living conditions (EU-SILC) (see Jäntti, Törmälehto and Marlier 2013), where several participating countries use register data for income variables in combination with surveys, which provide, in turn, more extensive information on demographic characteristics.<sup>132</sup> Surveys, in addition, generally provide more comprehensive coverage of the population than the tax data, in particular by additionally including the population of non-filers.

Croatia has been participating in EU-SILC since 2010 and should be regarded as a 'pure' survey country as it relies exclusively on survey interview as the data collection method. Therefore, we assess how 'accurately' is the top of income distribution captured by the survey and whether more reliable estimates could be obtained in combination with the tax data. First, we adjust the EU-SILC data to make it comparable to income tax data. We take adults as our unit of observation (as the number of all potential taxpayers) and apply income definition corresponding to taxable income in the tax data.<sup>133</sup> Income available only at the household level in the survey, such as capital income and rents, is imputed to the highest earning adult in the household (thus making it an upper bound).

Table 2 compares estimates obtained from the EU-SILC and income tax data in 2013.<sup>134</sup> As expected, total income obtained from survey is lower than the reference income used to construct top income shares from the tax data (which is estimated from national accounts). It can be seen that 90<sup>th</sup> percentile as well as the average and the total income of the top 10-5 per cent group are quite close in the survey as found in the tax data, and the divergence between estimates based on two sources becomes more substantial as we move upwards

<sup>132</sup> 'Register' countries include Denmark, Finland, Iceland, the Netherlands, Slovenia and Sweden

<sup>133</sup> As a measure of pension in the EU-SILC we take i) old-age benefits plus ii) survivor benefits plus iii) disability benefits.

<sup>134</sup> Which is the year when the most comprehensive definition of income is available in the tax data.

the distribution.<sup>135</sup> The top 1 per cent income share estimated from the tax data is 3 percentage points higher than the top percentile share estimated from the EU-SILC (9,2% versus 6,3%).

Income group	EU-SILC				Tax data			
	Threshold (in HRK)	Average income (in HRK)	Total income (in mln. HRK)	Income share (in HRK)	Threshold (in HRK)	Average income (in HRK)	Total income (in mln. HRK)	Income share (in HRK)
P0-100	0	42.825	143.539		0	49.739	168.067	
P90-95	98.273	109.073	18.226	12,7%	100.278	112.722	19.059	11,4%
P95-99	119.900	148.062	19.693	13,7%	134.155	172.146	23.285	14,2%
P99-99.5	197.657	219.918	3.555	2,5%	268.693	304.769	5.153	3,1%
P99.5-99.9	236.858	292.534	3.922	2,7%	351.421	446.759	6.043	3,6%
P99.9-100	388.755	507.504	1.568	1,1%	648.871	1.263.059	4.272	2,5%

Table 2: Comparison of the estimates at the top of distribution in the EU-SILC and income tax data, Croatia in 2010

If we assume that tax data better capture the top of the distribution, while surveys, on the other hand, are thought to be more representative of the lower parts of the distribution, one is tempted to combine two sources in order to obtain more reliable estimate of the overall distribution. Since, as we saw, the main divergence between tax-based and survey-based estimates occurs roughly in the upper half of the top decile, we consider the impact of adjusting the very top of the survey distribution with the tax data. But which criteria, besides comparison to alternative data sources as in Table 2, should be used to pinpoint levels where incomes reported in surveys become unrepresentative of the underlying population? In the absence of the specific criterion, one can check (by eye) whether data exhibit some statistical regularity.

Figure 23 displays the top of the income distribution observed in the EU-SILC in 2013, with the log of the population share on the y-axis (complementary cdf) and the log of income on the x-axis (the so-called Zipf plot). This relationship is linear if the underlying distribution conforms to Paretian form, and the slope of the straight line then corresponds to Pareto coefficient  $\alpha$ , as indicated in the section.<sup>136</sup> Thus, if the observed data display linearity on the double logarithmic plot, one might be inclined to conclude that it obeys a power law and simply estimate parameter  $\alpha$  by ordinary least squares.<sup>137</sup> However, OLS might result in

<sup>135</sup> See Burkhauser et al. (2009) for the US.

<sup>136</sup> One should point immediately to many caveats in assuming Pareto distribution simply based on graphical inspection; see Cirilo (2013).

<sup>137</sup> As cddf is  $1 - F(y) = (k/y)^a$ , then  $\log(1 - F(y)) = \log(k) - a \log(y)$ . Pareto  $\alpha$  is simply the negative of the regression coefficient.

biased estimates and maximum likelihood method is preferred instead to detect the power law in the empirical data (Clauset et al. 2009). Here we use maximum likelihood estimation to fit the Pareto distribution to the survey data.<sup>138</sup>

Figure 23 points that the deviations from the Pareto fit become marked slightly above P99, and it seems reasonable to assume that it is quite likely that the upper tail containing the top percentile is poorly represented in the survey. As already discussed, the higher prevalence of non-response for higher incomes gives a distorted picture of this section of the distribution. Furthermore, it can be seen that reported top incomes are substantially lower than observed in the tax data (Table 2), thus providing a direct evidence of missing high-earning individuals in the survey. For example, the top observations in the survey have incomes well below 1 million HRK, while Figure 24 clearly shows that this is not the case.

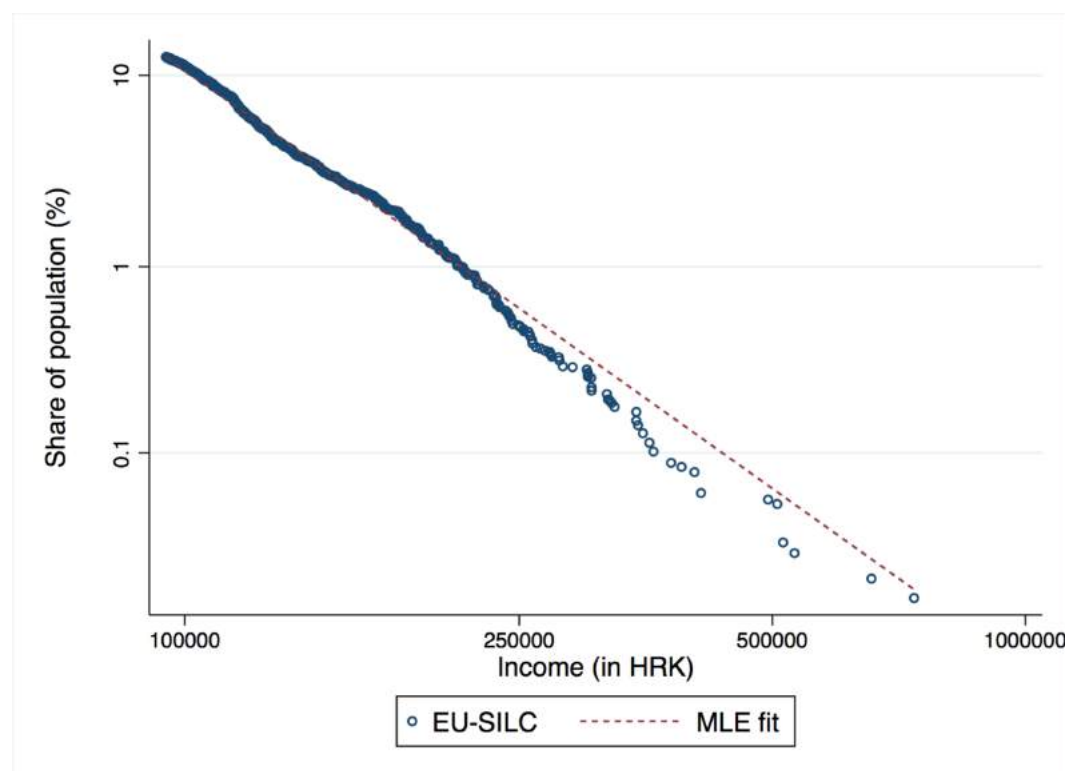


Figure 23: Top of the income distribution in EU-SILC, Croatia in 2013 (log-log scale)  
Source: own computation from EU-SILC

We replace all observations in the EU-SILC above 200 thousand HRK with observations from the tax data above that amount. The underlying assumption is that many top incomes are missing from the survey, while all survey observations above that level are contained in the

<sup>138</sup> See Vermuellen (2014)

Pareto distribution is fitted to values above the 90thd HRK threshold, which is simply chosen by the visual inspection.

tax data. Figure 24 displays the resulting upper tail of the distribution. Note that besides the obvious elongation of the tail, the line becomes less steep, indicating higher concentration. The slope of the line equates to the exponent  $a$ , which falls from 3.0 to 2.4, and corresponds by definition to values around 1.7 for inverted Pareto coefficient  $b$  ( $b = a/(a - 1)$ ) observed in Figure 18. The rise in concentration from the P99.99 is indicated by falling  $a$  in Figure 24 or rising  $b$  in Figure 18.<sup>139</sup>

There is under-coverage of the top in the survey, but relatively low top inequality documented in the tax data makes correction is not huge.

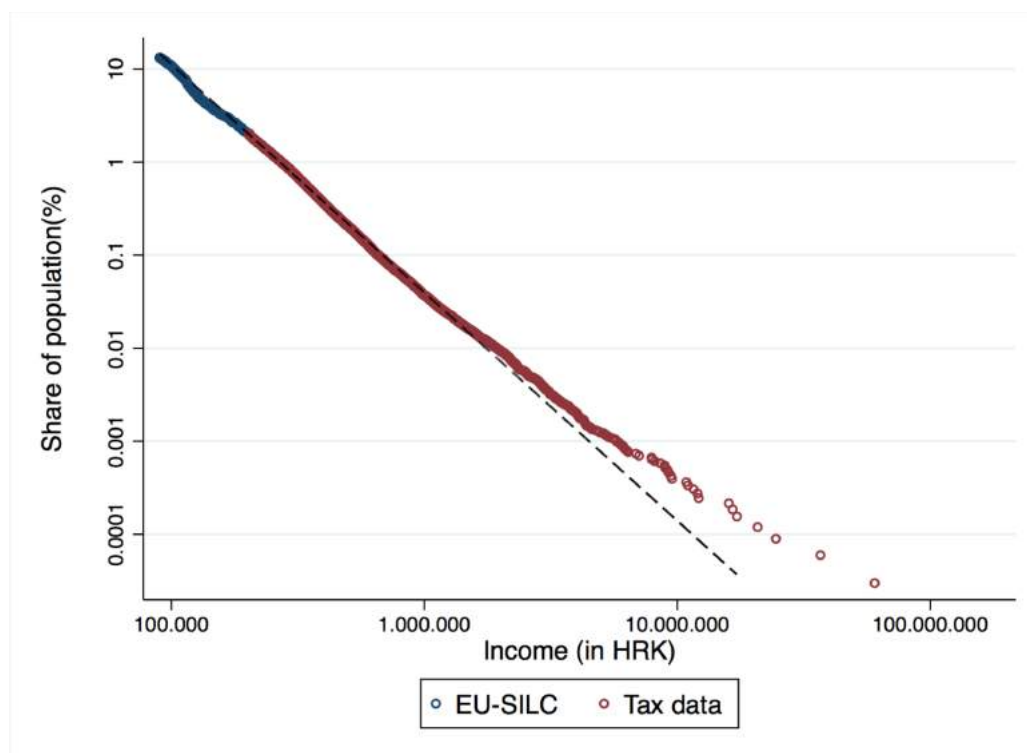


Figure 24: Top of income distribution in Croatia: survey (EU-SILC) adjusted for income tax data

Source: own computation

Note: the highest point above 100 million HRK is not seen in the figure

## 4.8. International comparison

Figure 25 presents the evolution of the top 1 per cent income share in Croatia and Slovenia together with several larger European countries. The figure shows that the top percentile's share in Croatia and Slovenia has in recent years been similar to relatively less unequal group of European countries, settling between levels of Sweden and France. The figure

<sup>139</sup> This is roughly the level where capital income becomes the predominant income source.



suggests a somewhat different trajectory of the top concentration observed in other larger European countries, such as the UK or Germany, with the gap reaching 5 percentage points in recent years.<sup>140</sup> The latter group of countries shows both higher concentration at the top as well as greater fluctuation in the development of top income shares. In particular, in Germany and the UK the evolution of top incomes has displayed a strong pro-cyclical character. On the other hand, one can observe broad stability of top income shares in all Croatia and Slovenia since 2000.

The available estimates for Croatia during the socialist period show a certain similarity to the development of top incomes in Sweden and the UK in the period between 1965 and 1980. The top 1% per cent in Croatia assumed almost equivalent levels as in Sweden for the available years. The top percentile's share in the UK was slightly higher, but the evolution is quite similar until 1980. As noted above, this should be in largest part explained by the strong bargaining power of labor in these countries in the 1960s and 1970s. With respect to the egalitarianism in the wage setting, Yugoslav self-management shared many similarities to the social democracy in Sweden.<sup>141</sup> This social equilibrium was dissolved in the 1980s and 1990s, and, as can be seen, it was more abrupt in the UK following the Thatcherist policies than during the transition to market economy in Croatia and Slovenia. Figure 26 further suggests that top 0.1 in Croatia and Slovenia experienced quite similar evolution as in Sweden since the 1960s.

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<sup>140</sup> However, one should be careful in pointing to the clear-cut distinction between (two groups of) countries due to well-known peculiarities of the tax data, primarily caused by the numerous complexities in the workings of the tax code across countries (such as the extent of taxable income) as well as due to potential computation errors. For example, Atkinson et al. (2011, p. 48) identify different patterns in the evolution at the top between Anglo-Saxon countries, Continental European countries and Japan, Southern European and Nordic countries, but note that the frontier "is somewhat arbitrary and should not be overstressed".

<sup>141</sup> Note in addition that the timing of the end of marketization and the introduction of egalitarian 'social compacts' in Yugoslavia coincides in development in Sweden, where "wage solidarity took a more radical egalitarian form" (Hibbs 1992, cited from Atkinson 2008, p. 349). Edin and Homlund (1995) take 1968 as the beginning of the dramatic changes in wage distribution in Sweden (Atkinson 2008, p. 349).

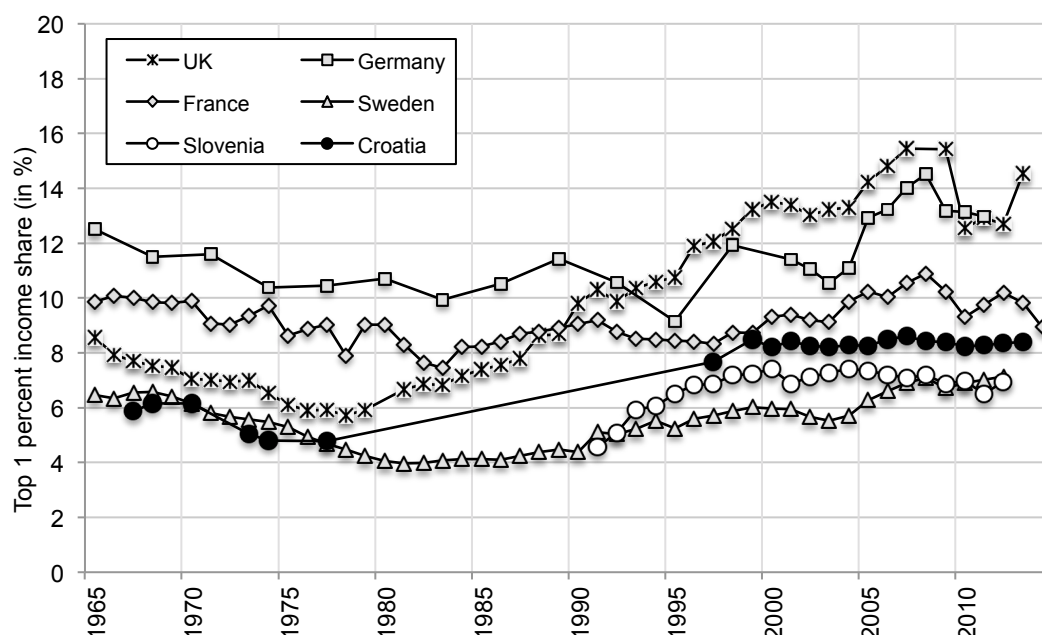


Figure 25: Top 1% income share in Croatia and Slovenia and selected European countries (fiscal income, not including capital gains)

Source: author's computation for Croatia and Slovenia; other countries WID

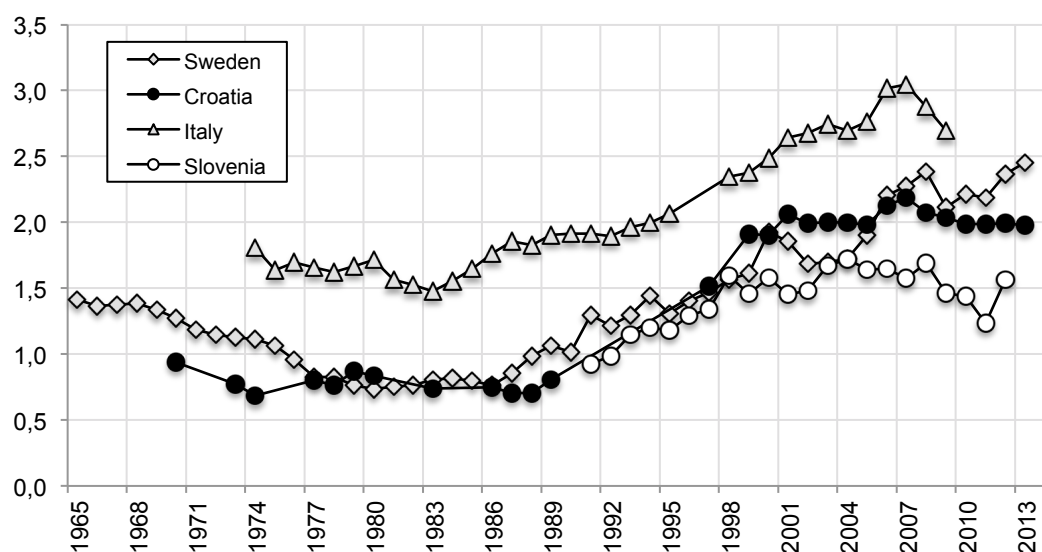


Figure 26: Top 0.1 income share in Croatia, Slovenia, Italy and Sweden (fiscal income, not including capital gains)

Source: author's computation for Croatia and Slovenia; other countries WID

It has been hinted already that the stability in the Croatian and Slovenian series could be attributed to the stability of the wage distribution in the last fifteen years. Similarly, it has been noted that the general rise of top wages has been of more moderate magnitude in continental and southern Europe (in sharp contrast to the US and other Anglo-Saxon countries), and that it has stabilized in the recent decade. Wage income has often manifested certain rigidity in its

response to economic shocks, and one could tentatively argue that the predominance of wage income (as opposed to capital and business income) at the top has made top income shares more resilient to economic fluctuations in Croatia and Slovenia. Most notably, it can be seen that the recent financial crisis has not brought about significant disruption in concentration patterns at the top in countries that have been especially adversely affected by the crisis, such as Croatia or Slovenia.<sup>142</sup> In line with this argument one finds indeed a growing share of business income at the top percentile level in countries which experienced more sizeable fluctuations in top income shares, such as Germany (Dell, 2007; Bach et al. 2009) or Poland (chapter 2).

The comparison to ex-communist countries in Eastern Europe is of particular interest. Figure 27 show top 1% income share in Croatia, Slovenia, the Czech Republic, Hungary, Poland and Russia since the early 1990s. It can be seen that Slovenia has assumed the bottom position and Russia the top position, with other countries placing in-between. The stark contrast between Russia and Slovenia is a fitting way to finish our journey, since differences in the transition course between Russia and Slovenia, and markedly different inequality equilibrium, give to the institutional argument an additional weight. Similarly, we can think to what extent have markedly different power relations during socialism in the Soviet Union and Yugoslavia (Figure 10) influenced these different institutional outcomes (Roland 2017).

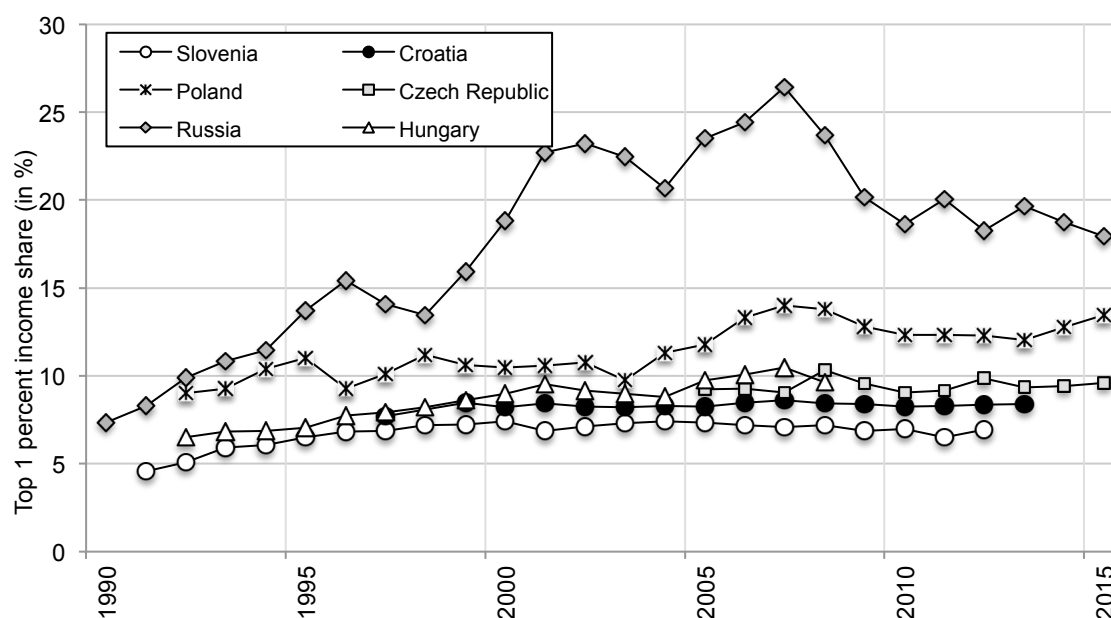


Figure 27: Top 1 per cent income share in former socialist countries (fiscal income)

Source: Czech Republic (chapter 1), Poland (chapter 2), Russia (chapter 6); Hungary: Mavridis and Mosberger (2017)

<sup>142</sup> To the extent that income of top groups has not fallen relatively more than the total income.

## 4.9. Conclusion

We have used income tax data to chart income inequality patterns in Croatia and Slovenia since the breakup of Yugoslavia until the present day. In both countries, inequality has increased moderately during the transition. Inequality increased in the 1990s and stabilized afterwards. An increase in inequality was largely driven by rising wage concentration. We relate this experience to the most 'gradualist' privatization path among the former socialist countries in Central and Eastern Europe. This has included slow privatization and labour market institutions that precluded more notable rise of inequality. This absence of the 'withering out of the state' has preserved and ingrained legacies of self-management in the emergent institutional framework. We have suggested that specific power relations in Yugoslavia underlined the specific transition course in Slovenia and Croatia, which resulted in the specific institutional design. Next, the substantial importance of the state ownership of the corporate sector in Slovenia and the foreign and state ownership in Croatia has made the concentration of private capital income less pronounced at the top of the income distribution. Finally, it remains to be seen how the low-inequality social equilibrium faces challenges posed by the globalization.

## APPENDIX

### A.1. Top income shares – Tables

Table A.1.: Income distribution in Slovenia, 1991-2012

	Bottom 50%	Middle 40%	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%
1991	32,7	44,2	23,2	14,2	4,6	2,8	0,9
1992	31,8	43,8	24,3	15,3	5,1	3,1	1,0
1993	25,3	47,0	27,7	17,5	5,9	3,6	1,2
1994	29,4	43,7	26,9	17,4	6,1	3,8	1,2
1995	24,1	46,9	29,0	18,8	6,5	3,9	1,2
1996	23,3	46,8	29,9	19,5	6,8	4,2	1,3
1997	24,7	45,8	29,5	19,3	6,8	4,2	1,3
1998	24,2	46,1	29,7	19,5	7,2	4,6	1,6
1999	23,9	45,8	30,3	20,0	7,2	4,5	1,5
2000	24,6	45,4	30,0	19,8	7,4	4,7	1,6
2001	25,5	45,0	29,5	19,3	6,9	4,3	1,5
2002	24,3	45,4	30,3	19,8	7,1	4,5	1,5
2003	23,5	45,9	30,6	20,0	7,3	4,7	1,7
2004	23,7	45,6	30,7	20,2	7,4	4,8	1,7
2005	24,5	44,7	30,8	20,2	7,3	4,7	1,6
2006	25,6	44,0	30,3	19,8	7,2	4,6	1,7
2007	27,0	43,2	29,9	19,5	7,1	4,5	1,6
2008	27,1	43,1	29,9	19,6	7,2	4,6	1,7
2009	26,2	43,6	30,2	19,5	6,9	4,3	1,5
2010	25,6	44,0	30,4	19,7	7,0	4,4	1,4
2011	26,1	44,2	29,6	19,0	6,5	4,0	1,2
2012	24,6	44,9	30,5	19,6	7,0	4,4	1,6

Source: authors' computation based on the income tax data

Table A.2.: Top income shares in Croatia

	Top 10%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.01%	Top 0.001%
1997	34,4	22,0	7,69	4,86	1,52		
1999	35,9	23,0	8,48	5,51	1,91		
2000	34,7	22,7	8,20	5,28	1,91	0,50	0,14
2001	34,6	22,6	8,42	5,49	2,06	0,53	0,13
2002	33,2	21,9	8,27	5,37	2,00	0,53	0,15
2003	32,9	21,8	8,21	5,34	2,01	0,53	0,13
2004	33,2	22,0	8,28	5,37	2,00	0,54	0,14
2005	33,4	22,1	8,26	5,34	1,99	0,50	0,12
2006	33,4	22,2	8,48	5,54	2,13	0,58	0,15
2007	33,9	22,5	8,60	5,63	2,19	0,64	0,19
2008	33,5	22,2	8,42	5,48	2,08	0,57	0,15
2009	33,7	22,2	8,40	5,44	2,04	0,56	0,15
2010	33,5	22,1	8,24	5,32	1,99	0,54	0,13
2011	33,5	22,1	8,29	5,36	1,99	0,54	0,13
2012	33,8	22,3	8,36	5,40	2,00	0,51	0,12
2013	33,8	22,4	8,40	5,41	1,98	0,50	0,12

Source: authors' computation based on the income tax data

## A2. Personal income tax in Yugoslavia

The first 'version' of the personal income tax in socialist Yugoslavia was introduced in 1958 as the 'tax on personal income of citizens' (hr. *porez na osobni prihod građana*;). The taxpayer was defined as the individual with the total net income (*čisti prihod*) above 500.000 dinars. However, to arrive at the tax base specific incomes already subject to the so-called 'income tax' (introduced in 1952; hr. *porez na dohodak*, sl. *dohodnina*) were subtracted from the total net income, as these were already taxed at progressive rates under the 'income tax'. Incomes subject to the 'income tax' were: incomes from land, income from buildings, income from private activity, and from property and property rights.<sup>143</sup> Thus, the tax on personal income of citizens predominantly taxed high personal incomes from work (regular and part-time work, pensions, etc.). The tax applied progressive rates.

A major legislation change took place in 1964 (*Osnovni zakon o porezima i doprinosima građana*), when the taxation of physical persons had come to be realized through various

<sup>143</sup> The activities subject to the 'income tax' were in fact penalized on the ideological grounds. On the other hand, personal income from work had not been altogether taxed in the period from 1950 to 1957 (Šimović 1989, p. 37).

schedular taxes (Jelčić 1983).<sup>144</sup> The 'income tax' was abolished, and the 'tax on total income of citizens' (hr. *porez na ukupni prihod građana*; sl. *davek od skupnega dohodka občanov*)<sup>145</sup> was now applied to the total net income, defined as the sum of all personal incomes. In contrast to its predecessor, it included all income sources (in addition to income from employment). The tax base of the 'tax on total income of citizens' consisted from: personal incomes from work, from agriculture, from crafts and other independent activities, from intellectual services and authorship rights, income from buildings and other property, and income from property rights.

The exemption threshold was set at two times the average wage in social sector, while from 1979 the exemption threshold was increased to three times the average wage in the social sector. The exemption level was annually adjusted. The total net income was defined as the sum of all personal incomes, net of taxes and contributions paid through schedular taxes. Proportional taxes on personal incomes, at roughly similar effective rates, imply that the distribution of gross income (before schedular taxes) corresponds to the distribution of the net income (after schedular taxes). On the other hand, income subject to the 'tax on total income of citizens' was taxed progressively, with rates starting from 3% and climbing to the top marginal rate of 70%.

The most important category of net income were *personal incomes of workers*, comprising income of workers in social sector, workers employed in private sector as well as pensions. The vast majority of workers (always close to 100 per cent) were employed in the social sector, due to large legal restrictions placed on the private sector (e.g. maximum of 5 employees).<sup>146</sup> Schedular tax on personal incomes from work applied flat tax rate, which differed for economic branches in range from 1.2% to 3.5% (3.5% was applied to finance and insurance, banking and saving institutions; *Financijska politika općina za 1975*, p. 79)

The personal income from independent agricultural activities was determined as the cadastral net income (gross yield per m<sup>2</sup> reduced for operating costs; it comprised incomes from the crop production and the animal husbandry)<sup>147</sup>, or the actual income if it substantially

<sup>144</sup> personal income taxes consisted of the following schedular taxes (Jelčić 1983)

- from personal income of workers (*porez iz osobnog dohotka radnika*),
- personal income from independent agricultural activities
- personal income from independent non-agricultural activities (*porez iz osobnog dohotka od samostalnog obavljanja djelatnosti*)
- from authorship rights, patents and technical advancements (*porez iz osobnog dohotka od autorskih prava, патената i tehničkih unapređenja*)
- on income from property (*porez na prihod od imovine*) (porez na zgrade)
- on inheritance and gifts (*porez na nasljedstva i darove*)
- on gains from lottery (*porez na dobitke od igara na sreću*)
- on total income of citizens (*porez iz ukupnog prihoda građana*)

<sup>145</sup> until it was termed as contributions (*doprinosi*), since (Jelčić 1983)

<sup>146</sup> As noted above, the official terminology distinguished personal incomes from work from salaries and wages, since the workers' self-management in Yugoslavia implied that workers were not hired by enterprises, but acted instead as their managers/operators. Accordingly, their incomes were not treated as (fixed) operating costs (Bičanić 1963, p. 108; Lydall 1984, pp. 94-5)

<sup>147</sup> It did not matter whether the land was actually cultivated.

exceeds specified cadastral yields.<sup>148</sup> A revaluation of cadastral yields was implemented regularly, mainly in response to a rise in the agricultural prices and the production costs.<sup>149</sup>

Personal income from independent non-agricultural activities (the so-called «small economy» (*mala privreda*)) referred to incomes from crafts, hotel and restaurant activity, transport and other activity. It was determined either as a percentage on every income receipt of, as a lump sum amount, or according to actual income.

### Income tax statistics in Yugoslavia

The statistics of the tax on the total income of citizens for Croatia is found in the Croatian State Archives (*Hrvatski državni arhiv*) in Zagreb, Croatia:

- fund: **HR HDA 1692** *Republički sekretarijat za financije Socijalističke republike Hrvatske (serija: Opći poslovi)*

The corresponding statistics for Slovenia is found in the Archives of the Republic of Slovenia (*Arhiv Republike Slovenije*) in Ljubljana, Slovenia.

- fund: **SI AS 2104** *Republiški sekretariat za finance Socialistične republike Slovenije (serija O: poročila o odmeri davkov – prometnega davka, dohodnine, davka na dohodek od raznih dejavnosti)*

The data for Yugoslavia in 1975 (used in Figures 8-11) come from:

Savezni zavod za statistiku (1976). *Obveznici poreza iz ukupnog prihoda građana u 1975. godini*. Beograd

Income tax statistics for the socialist period come in the form of tabulations. The number of ranges in tabulations generally correspond to the number of tax rates in the progressive schedule. Income tax statistics shows in addition occupations of the taxpayers. It is reported only for all taxpayers (not reported for specific income ranges). Table A3 shows major occupational groups in which we have grouped more than 20 reported occupations in the statistics.

<sup>148</sup> For example, if it stems from the cultivation of high-yielding crops which did not enter into the estimation of the average yield in the specific municipality the law determined levels of income above which a taxpayer was taxed according to actual income

<sup>149</sup> In the case of 'more permanent' cooperation (more than three years; where farmers joined their land, work and/or assets) with work organizations of associated labour (*organizacije udruženog rada* (OUR); the agricultural cooperatives), the taxpayer could opt between being taxed on the cadastral net income or taxed instead as a 'member' of OUR. However, the number of taxpayers that chose this option was negligible. For example, in 1984 only 33 farmers in Croatia established more permanent cooperation with OURs, while 1.206.175 had been subject to the tax according to cadastral net income (of which 797.491 actually paying tax) (Izveštajni podaci 1983/4, HR-HDA-1692/42-20/338/1985).



*Control for income and population total in Yugoslavia.* The total income control for Croatia and Slovenia is constructed as follows. We take 90 per cent of personal income in material and non-material social sector; plus 50 per cent of private income (referring mostly to agricultural income); plus social transfers (pensions (old-age and invalidity)). As the population total control, we take all adults above 18 years. The corresponding data is found in the Statistical Yearbook of Yugoslavia, Statistical Yearbook of Croatia and Statistical Yearbook of Slovenia.

Table A3.: Top occupations in Croatia and Slovenia (% of total paying income tax)

Occupations:	Slovenia (1967)	Croatia (1970)
Members of representative bodies (incl. in municipalities)	0,8	1,0
Heads and managing personnel of state organs and socio-political organizations	2,9	3,9
Directors in the 'economy'	7,0	13,7
Engineers, architects and technicians	27,5	24,9
Other workers*	47,4	37,4
Doctors and veterinarians	8,4	9,5
Culture (novelists, sculptors, painters, composers, film directors, etc.)	1,5	2,7
Professor and scientists	3,5	5,5
Self-employment (lawyers, crafts, tourism, catering, travel, agriculture, etc.)	0,9	1,1

Note: the taxpayers in Slovenia refer to the top 2.3% income group, while in Croatia to top 1.5% income group

### A.3. Income tax data in Croatia and Slovenia

We use income tax data to construct top income shares in Croatia for the period from 1997 to 2013. Micro-data of all individual income tax returns were combined with individual files of high earners from the database of withholding tax of income from employment, in order to account for the fact that many (high-earning) employees do not in practice submit the tax return since the tax obligation settled by employers (and other tax-remitting institutions such as pension insurance for pensioners) is considered as final. Unless an employee obtains employment income from two or more employers or additional income for which there is an obligation to submit the tax return; or if an employee wants to claim allowances not allowed by the withholding tax. Note that in order to claim the basic personal allowance, individual is not required to submit the tax return.

Merging two datasets thus allows a detailed coverage of the top of income distribution.<sup>150</sup> In addition, for the years starting with 2006 we were also able to include other (non-employment) taxable income deducted at source, which does not need to be declared in the tax return.<sup>151</sup> This primarily allowed the inclusion of different types of income from the independent work (chiefly from the category of 'other income')<sup>152</sup> as well as capital income withheld at source.

We define income as 'gross income' before personal deductions and personal income taxes. Gross income includes income from employment (wages and salaries, plus pensions), self-employment income (including income of small unincorporated businesses (crafts businesses) and free-lance occupations), income from property and property right, capital income, insurance income and other income. Employment income is defined after social contributions paid by the employer but before social security contributions paid by the employee. Employers pay 15% of gross wage for health insurance, while employee pay 20% of gross wage for pension insurance.

However, several issues require further explanation. Only small unincorporated enterprises are in practice subject to personal income tax (acting as pass-through entities) while larger ones pay corporate income tax instead. Unincorporated enterprises can voluntarily apply to corporate income taxation, and generally had an incentive to switch as it implied more favourable tax treatment in practice.<sup>153</sup> The tax code in addition requires that large(r) unincorporated enterprises switch to corporate income taxation (those with more than 15 employees or with revenues/income above a certain level). But, from 2012 distributed profit of unincorporated businesses that switched to corporate income taxations system are present in the tax data as capital income (share in profit).

The coverage of capital income has undergone substantial changes in the last two decades. Distributed profits (dividends and profit shares) were taxed in the 2001-2005 period, and became a part of taxable income again in 2012. Unfortunately, as the database for the tax deducted at source (other than for employment) is available only from 2006, we cannot assess the importance of distributed profits for top incomes in the period 2001-2005.<sup>154</sup> Next, taxable interest income included only interests on given loans and credits, while interest on savings were exempt until 2014. Capital gains are only taxed from the sale of real estate if the holding period is less than 3 years. From 2016 capital gains from the disposal of financial assets became part of personal income tax base.

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<sup>150</sup> As individual files were only provided for high incomes subject to withholding tax on employment income.

<sup>151</sup> The corresponding database is available in the electronic form only from 2006.

<sup>152</sup> Such as compensations to management and supervisory board members, or to independent free-lance professions as journalists or artists.

<sup>153</sup> As the tax code allows them (as well as to other self-employed individuals) to choose to be taxed under the corporate income tax which was found to be more attractive due to flat corporate income tax rate (20%), as well as until 2012 exemption of distributed profit shares from personal income tax base.

<sup>154</sup> In the period from 2006-2012 only dividends and profit shares were taxed for profits obtained before 2005.

### **A.4. Controls for total income and population**

Methodology used to construct top income shares was instigated by Kuznets (1953) who first connected tax statistics with the external population and income totals. Since Piketty's (2001) research on France, this methodological approach has been consistently applied across all studies (Atkinson and Piketty 2007, 2010), resulting in homogenous and long run series.

Our top groups are defined in relation to all potential tax units. Tax unit in Croatia and Slovenia is individual and we take all adults above 18 years as our control total for population. The corresponding data are published by the Central Statistical Office (as well as Eurostat).

Next, the total income control aims to approach the aggregate that corresponds to the concept of income defined by the tax law and reported consequently to tax authorities. We construct from National accounts the following measure of the total 'personal income': (i) wages and salaries, plus (ii) social benefits other than social transfers in kind, plus (iii) 50 per cent of profits of household unincorporated enterprises (taken as net operating surplus plus net mixed income of the household sector)<sup>155</sup>. The resulting series makes around 57% of GDP, or 90% of net household balance of primary incomes (according to SNA definition).

As an alternative measure for reference income, we start from the total income of filers as reported in the tax statistics and estimate as income of 'non-filers' 20% of average income of filers (e.g. see Piketty and Saez 2003). These series results in 90% of the 'total personal income' estimated from the National Accounts, indicating that our constructed 'total personal income' most likely overestimates our targeted reference total. Thus, as a reasonable guess we choose to take 90% of the constructed National Accounts 'total personal income' estimate as our reference income total (for example, the same approach is adopted by Roine and Waldenström (2010) for Sweden).

### **A.5. Top earning shares in Croatia and Slovenia**

Further insights are obtained by comparing top earnings shares in Croatia and Slovenia. We construct top earnings shares in Croatia from 2000 until 2013. Comparable estimates for Slovenia based on the tax data have been constructed by Stanovnik and Verbič (2013) from 1991 up to 2012. Top earnings shares could be used to throw additional light on the development of top earnings in the early transition. It can be seen that in 2000, when estimates for Croatia become available, top percentile was one percentage point higher in Slovenia. Series then converged until 2005, after which we see rising divergence until 2009, with the Croatian top percentile overtaking the Slovenian.

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<sup>155</sup> We take only half of profits of household unincorporated enterprises because the national accounts figures are corrected for the concealed activity, which is in the same manner concealed from the tax authorities. Moreover, the scope of the non-observed economy was especially worrisome for Croatia and other transition economies (e.g. see Ott 2002).

	<u>Slovenia</u>		<u>Croatia</u>				
	Top 5%	Top 1%	Top 5%	Top 1%	Top 0.5%	Top 0.1%	Top 0.01%
1991	14,2	4,5					
1992	15,6	5,2					
1993	16,0	5,3					
1994	16,9	5,7					
1995	17,1	5,5					
1996	17,6	5,9					
1997	17,8	5,9					
1998	18,0	6,3					
1999	18,6	6,4					
2000	18,8	6,7	16,5	5,8	3,6	1,3	0,3
2001	17,9	6,1	17,5	6,4	4,1	1,5	0,4
2002	18,2	6,2	17,0	6,1	3,9	1,5	0,4
2003	18,0	6,3	17,2	6,4	4,2	1,6	0,4
2004	18,3	6,5	17,6	6,5	4,2	1,6	0,4
2005	18,1	6,4	17,5	6,4	4,1	1,5	0,4
2006	17,6	6,2	18,1	6,7	4,3	1,7	0,4
2007	17,5	6,0	18,4	6,7	4,4	1,7	0,5
2008	17,6	6,1	18,5	6,8	4,4	1,7	0,5
2009	17,3	5,9	18,6	6,8	4,4	1,7	0,4
2010	17,3	5,9	18,2	6,5	4,2	1,6	0,4
2011	16,6	5,5	18,1	6,5	4,2	1,6	0,4
2012	16,6	5,6	18,3	6,6	4,3	1,6	0,4
2013			18,0	6,5	4,2	1,6	0,4

Table A.4 : Top earnings shares in Croatia and Slovenia

Source: Slovenia: Stanovnik and Verbič (2014, Tab. 7); Croatia: author's computation from the income tax data

## A.6. Employer survey in Slovenia and Croatia

The employer survey has been available since the 1960s and allows a longer perspective on earnings distribution. The Central Statistical Offices in Croatia and Slovenia have conducted the survey annually, which covered all employees working full-time in September (enterprises in the social sector before 1991; in Croatia after 1996 in March).

The results of employer survey in Slovenia started to be reported according to the gross concept after 1991. In Slovenia, enterprises and other organization (private enterprises with 3 or more employees) are surveyed covering both full-time and part-time workers. The army is covered from 1992 and the police from 1993. The exact earning concept used is the

following: “Average monthly earnings are composed of income received by persons in paid employment. In addition to income earned for work actually done during regular working hours, all other income is counted, and is set out on the following basis: income from overtime, supplements for annual leave, sickness pay for up to 30 days, slowdown through no fault of their own of the persons in paid employment, public holidays, performing of national duties, paid leave and similar, awards, premiums, income for past work, incentive bonuses and bonuses after periodic and final balance sheets.” (Statistical Yearbook of Slovenia, various eds.)

Croatia still uses net wage concept (gross earnings after social security contributions and PIT, or net take-home wage), which complicates the comparison between the series. For the wage analysis, the gross concept is generally preferred as it is more indicative of labour market outcomes, before the redistributive activity of the state is taken into account.<sup>156</sup> An additional drawback in relying only on the estimates for net income is limited comparability in the international context, as most countries have published reports on the distribution of gross earnings. This especially limits the historical analysis (for example, Lydall (1968, 1984) already pointed to this issue concerning the comparability of Yugoslav data on earnings distribution with other countries). The progressive structure of the Croatian tax system, with the largest income tax burden borne by high-earning individuals (Urban 2006), could have affected relative patterns of net earnings to gross earnings.

Figure A1 shows the evolution of the upper and the lower part of the net earnings distribution in Croatia since 1966 observed in the employer survey, with the upper tail portrayed by the evolution of the 90th percentile (P90) and the 95th percentile (P95), and the lower by the evolution of the 10th percentile (P10) (percentiles are expressed as a percentage of the median wage P50).

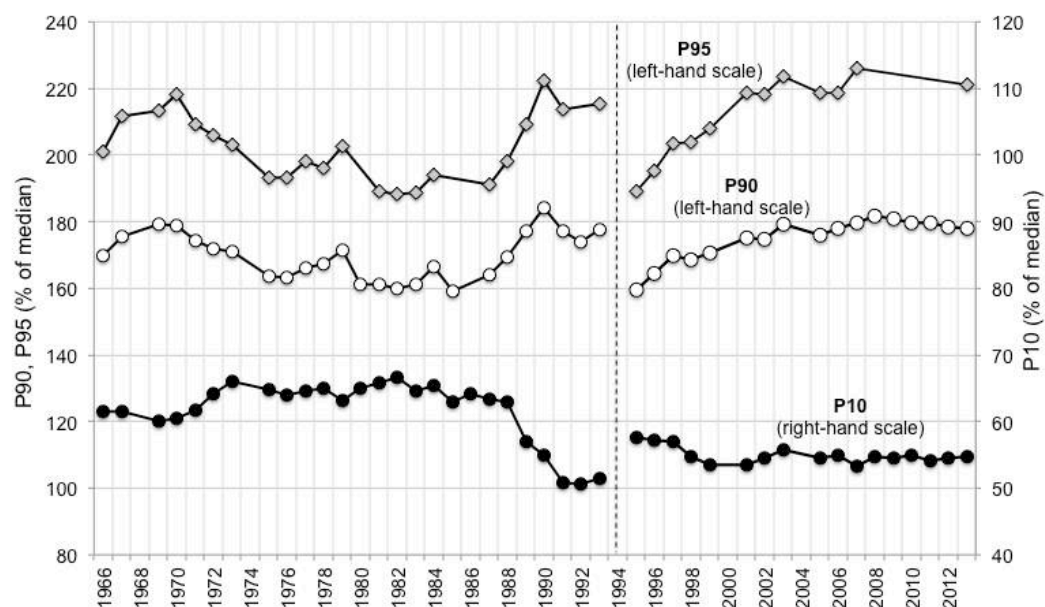


Figure A1: Percentiles of net earnings distribution from Employer Survey in Croatia

Source: author's computation (the intermittent line indicates a break with the introduction of the progressive income tax in 1994)

<sup>156</sup> Of course, it is ideal to have an insight into both gross and net distribution.

But Figure A2 suggests that Croatia and Slovenia exhibited quite similar trend in earnings dispersion in socialist Yugoslavia (with Croatia displaying slightly higher earnings concentration throughout the whole socialist period) and recent available estimates on net wage in Slovenia, as well as our calculation from EU-SILC indicate that countries display a similar dispersion of the upper tail.

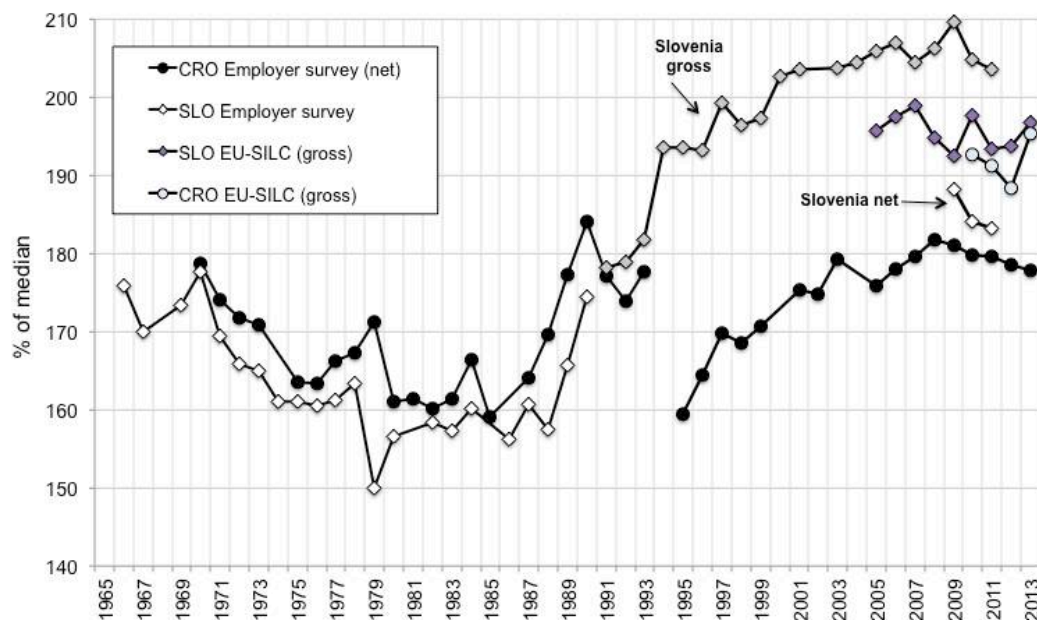


Figure A2: The upper part of earnings distribution in Croatia and Slovenia

Source: own calculation from indicated sources

### Top income shares in Habsburg Monarchy

**Data.** Top income shares in Carniola and Dalmatia are constructed from the income tax statistics for Imperial Austria. After the income tax was introduced in 1898, the fiscal administration had been publishing tabulations of income taxpayers in each province of Cisleithania. Income definition was quite broad allowing very few exemptions. Income below 1,200 crowns was tax exempt. It defined income from following sources: from land, from buildings, from business and self-employment, from capital and other sources. Capital gains were not taxed. Tax unit was a family with the total income of family members ascribed to the head of a family.

Data come from Statistical Yearbooks of Imperial Austria (Österreichisches Statistisches Handbuch für die im Reichsrathe vertretenen Königreiche und Länder) as well from Annual Report of Ministry of Finance (Mitteilungen des K. K. Finanzministeriums).

**Population Control.** The tax unit in Imperial Austria was household, defined as the married couple with dependants. The total number of households in Carniola and Dalmatia is estimated as the number of adults (above 18 years of age) minus the number of married female. The data come from censuses held in Austria-Hungary in 1890, 1900 and 1910 (*Die Ergebnisse der Volkszählung in den im Reichsrathe vertretenen Königreichen und Ländern*)

**Income Control** The control total for income for Carniola and Dalmatia during the Habsburg era was derived as follows. We take as our starting point Schulze's (2007) estimates of regional GDP in Austria-Hungary. Schulze provides estimates for 1870, 1880, 1890, 1900 and 1910, expressed in 1990 Geary-Khamis international dollars. In order to convert estimates for Galicia into current Austrian-Hungarian crowns, we take the following steps. First, we convert these estimates to 1913 crowns by applying the exchange rate Schulze used (namely 3.36 GK dollars per crown; see Schulze 1997, p. 14). To obtain GDP for other years (for those between 1890, 1900 and 1910), we apply real growth rates of GDP for Carniola and Dalmatia, respectively taken from Ciccarelli and Missiaia (2014). Next, nominal values were obtained by using regional living cost indices in Austria-Hungary estimated by Cvrcek (2014). Finally, we take 60 per cent of nominal GDP as our total control income.

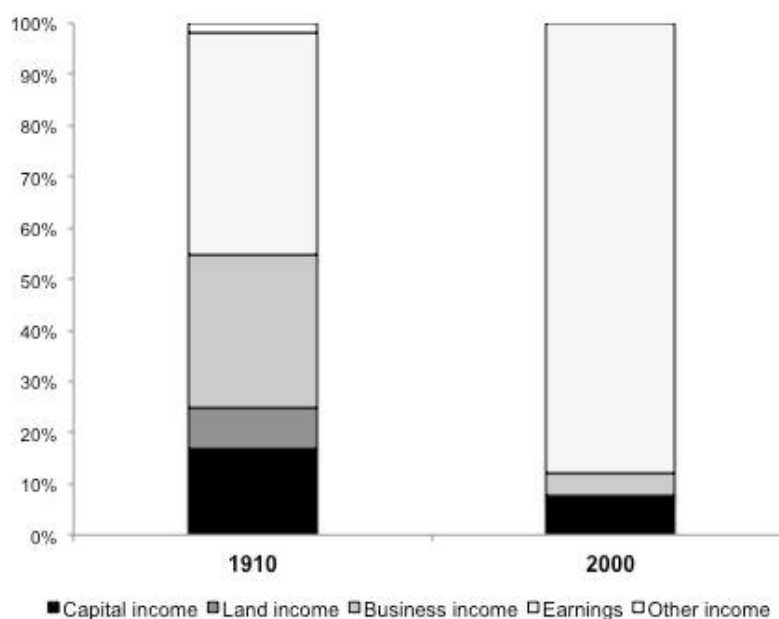


Figure A3: The income composition of the top 5 per cent in Slovenia in 1910 and 2000

Note: 1910 refers to the Habsburg province Carniola; capital income includes also rental income; in 2000 capital income is made from income from royalties 70%, while dividends and rental income the remaining 30%

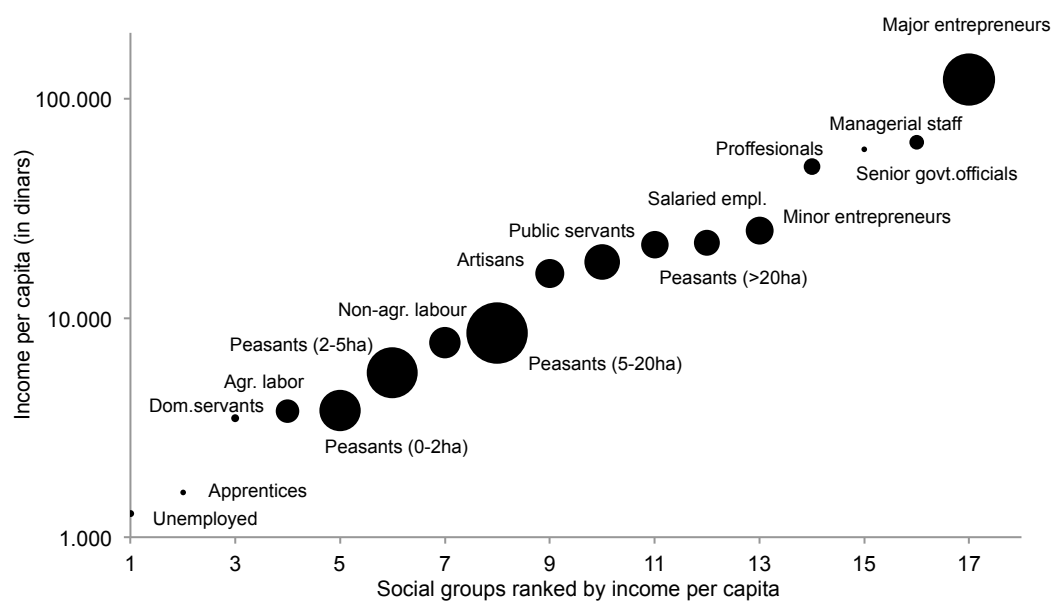


Figure A4: Distribution of the national income according to social groups, Yugoslavia in 1938

Source: Vinski 1967, Table 10

Note: the size of the bubble indicates the income share of the specific group in the national income



**References:**

**Acemoglu, D., Johnson, S. and Robinson J. A. (2005).** "Institutions as Fundamental Determinants of Long-Run Growth", In P. Aghion and S. Durlauf (eds.), *Handbook of Economic Growth, Volume 1A*, Amsterdam: North-Holland, pp. 385-472.

**Acemoglu, D. and Robinson, J. A. (2015).** "The Rise and Fall of General Laws of Capitalism". *Journal of Economic Perspectives*, 29(1), pp. 3–28.

**Allcock, J. B. (2000).** *Explaining Yugoslavia*. London: Hurst & Company

**Atkinson, A. B. (2008).** *The Changing Distribution of Earnings in OECD Countries*. Oxford: Oxford University Press.

**Atkinson, A. B., Casarico A., and Voitchovsky, S. (2016).** "Top incomes and the gender divide", LSE International Inequalities Institute Working paper 5

**Bacevic, J. (2016).** "Education, conflict and class reproduction in socialist Yugoslavia" in R. Archer, I. Duda and P. Stubbs (eds.), *Social Inequalities and Discontent in Yugoslav Socialism*. London: Routledge, pp. 77-93.

**Bakija, J., Cole, A., and Heim, B. T. (2012).** "Jobs and Income Growth of Top Earners and the Causes of Changing Income Inequality: Evidence from U.S. Tax Return Data". Accessed via <https://web.williams.edu/Economics/wp/BakijaColeHeimJobsIncomeGrowthTopEarners.pdf>

**Bandelj, N. (2008).** *From communists to foreign capitalists: the social foundations of foreign direct investment in postsocialist Europe*, Princeton, NJ: Princeton University Press

**Baran, P.A, and Sweezy, P. M. (1968).** *Monopoly capital: an essay on the American economic and social order*, Harmondsworth: Penguin Books

**Bejaković, P., and Jelčić, B. (2012).** *Razvoj i perspektive oporezivanja u Hrvatskoj*. Zagreb: HAZU

**Bennet, J. (2017).** *Subsidizing Culture: Taxpayer Enrichment of the Creative Class*. Routledge

**Bergson, A. (1967).** "Market Socialism Revisited", *Journal of Political Economy*, 75(5), pp. 655-673

**Bergson, A. (1984).** "Income inequality under Soviet Socialism", *Journal of Economic Literature*, pp. 1052-1099.

**Berend, I. T. (1998).** *Decades of crisis: Central and Eastern Europe before World War II*. Berkeley: University of California press

**Bičanić, R. (1973).** *Economic Policy in Socialist Yugoslavia*. Cambridge: Cambridge University Press

**Bičanić, I., and Franičević, V. (2004).** "Understanding reform: the case of Croatia", *The wiid Balkan Observatory*, 33

**Bičanić, I., Hoffman, S. D., and Vukoja, O. (2010).** "Croatian wage inequality and wage differentials, 1970-2008: measurement and determinants", University of Delaware Working Paper no. 2010-03

**Bohle, D., and Greskovits, B. (2007).** "Neoliberalism, embedded neoliberalism and neocorporatism: Towards transnational capitalism in Central-Eastern Europe", *West European Politics*, 30(3), pp. 443-466

**Borak, N. (2000).** "Economic background to national conflicts in Yugoslavia", In H. Matis, J. Pátek, and A. Teichova (eds.), *Economic change and the national question in twentieth-century Europe*, Cambridge, New York: Cambridge University Press

**Bourdieu, P. (1986).** "The Forms of Capital." In J. Richardson (ed.), *Handbook of Theory and Research for the Sociology of Education*. New York: Greenwood Press, pp. 241-258

**Bulir, A. (2001).** "Income Inequality: Does Inflation Matter?", *IMF Staff Papers*, 48(1), pp. 139-59.

**Burić, I., and Štulhofer, A. (2016).** "In search of the egalitarian syndrome: cultural inertia in Croatia", *Financial Theory and Practice*, 40(4), pp. 361-382

**Burnham, J. (1943).** *The Managerial revolution or what is happening in the world now*, Harmondsworth: Penguin Books

**Cohen, L. (1989).** *The socialist pyramid: elites and power in Yugoslavia*. London: Tri-Service

**Crowley, S., and Stanojevic, M. (2011).** "Varieties of capitalism, power resources, and historical legacies: Explaining the Slovenian exception", *Politics & Society*, 39(2), pp. 268-295.

**Čok, M., and Urban, I. (2005).** "Distribution of income and taxes in Slovenia and Croatia", *University of Ljubljana Economic Faculty Working Paper*, 180

**Dyker, D. (1990).** *Yugoslavia: Socialism, Development and Debt*. London: Routledge.

**Đilas, M. (1957).** *The New Class*. London: Unwin Books.

**Đilas, M. (1985).** *Rise and Fall*. London: Macmillan

**Djokić, D. (2007).** *Elusive Compromise: A History of Interwar Yugoslavia*. London: Hurst & Company

**Eichengreen, B. (2007).** *The European economy since 1945: coordinated capitalism and beyond*. Princeton: Princeton University Press

**Erić, M. (1958).** *Agrarna reforma u Jugoslaviji: 1918-1941.g.*, Sarajevo: Veselin Maleša

**Estrin, S. (1981).** "Income Dispersion in a Self-Managed Economy", *Economica, New Series*, 48(190), pp. 181-194

**Filipovič Hrast, M., and Ignjatović, M. (2013).** "Growing inequalities and their impact in Slovenia". *Gini country report*

**Filtzer, D. (2014).** "Privilege and inequality in communist society", In S. A. Smith (ed.), *The Oxford handbook of the history of communism*, Oxford: Oxford University Press

**Fitzpatrick, S. (1999).** *Everyday Stalinism. Ordinary life in extraordinary times: Soviet Russia in the 1930s*. New York: Oxford University Press

**Flakierski, H. (1989).** *The Economic System and Income Distribution in Yugoslavia*. Armonk, N.Y. and London: M.E. Sharpe.

**Franičević, V. (2004).** "Real and Perceived Inequality, Poverty and Well-being in South East Europe: Challenges of the Welfare State and Democracy", In T. Hayashi (ed.), *Democracy and Market Economics in Central and Eastern Europe: Are New Institutions Being Consolidated?*, Sapporo: Slavic Research Center, Hokkaido University, pp. 221- 248

**Furubotn, E. G., and Pejovic, S. (1970).** "Property Rights and the Behavior of the Firm in a Socialist State: The Example of Yugoslavia," *Zeitschrift für Nationalökonomie*, 30, 430-54.

**Furubotn, E. G., and Pejovic, S. (1973).** "Property Rights, Economic Decentralization, and the Evolution of the Yugoslav Firm, 1965-1972," *Journal of Law and Economics*, 16(2), pp. 275-302

**Galbraith, J. K. (1967).** *The new industrial state*, London: Hamish Hamilton

**Gimpelson, V., and Treisman, D. (2015).** "Misperceiving inequality", *NBER Working Paper* 21174

**Glyn, A. (2006).** *Capitalism unleashed: finance globalization and welfare*. Oxford and New York: Oxford University Press

**Glyn, A. (2009).** "Functional Distribution and Inequality", In W. Salverda, B. Nolan and T. M. Smeeding (eds.), *The Oxford Handbook of Economic Inequality*, Oxford; New York: Oxford University Press

**Gottschalk, P. (1997).** "Inequality, Income Growth, and Mobility: The Basic Facts." *Journal of Economic Perspectives*, 11(2), pp. 21-40.

**Grosfeld, I., and Hashi, I. (2003).** "Mass privatisation, corporate governance and endogenous ownership structure", *William Davidson Institute Working Paper* 596.

**Guardiancich, I. (2017).** "Rebuilding social dialogue in Slovenia: A complex task for the post-crisis period", In I. Guardiancich and O. Molina (eds.), *Talking through the crisis. Social dialogue and industrial relations trends in selected EU countries*. Geneva: International Labour Organization

**Hočevar, T. (1963).** *The structure of the Slovenian economy, 1848-1963*. New York: Studia Slovenica

**Holzner, M., and Leitner, S. (2009).** "Inequality in Croatia in Comparison", *wiiw Research Reports*, 355

**Horvat, B. (1971).** "Yugoslav Economic Policy in the Post-War Period: Problems, Ideas, Institutional Developments," *American Economic Review: Papers and Proceedings*, 61(3), pp. 71–169.

**Horvat, B. (1976).** *The Yugoslav Economic System*. White Plains, N.Y.: International Arts and Science Press

**Horvat, B. (1982).** *The Political Economy of Socialism*. New York: M. E. Sharpe

**Horvat, B. (1984).** Two Widespread Ideological Deviations in Contemporary Yugoslav Society. *Eastern European Economics*, 23(1), pp. 45-57.

**International Labour Organisation (1982).** *Workers' Management in Yugoslavia. Recent Developments and Trends*. International Labour Office: Geneva

**Iveljić, I. (2007).** *Očevi i sinovi. Privredna elita Zagreba u drugoj polovici 19. stoljeća*. Zagreb: Leykam International

**Jäntti, M., Törmälehto V., and Marlier, E. (eds). (2013)** "The use of registers in the context of EU–SILC: challenges and opportunities", *Statistical working papers*

**Jäntti, M., and Jenkins, S. P. (2013).** "Income Mobility", In A. B. Atkinson and F. Bourguignon (eds.), *Handbook of Income Distribution, Volume 2A-2B*, Burlington: Elsevier Science

**Jelčić, B. (1983).** *Nauka o financijama i financijsko pravo*. Zagreb: Informator

**Konrád, G., and Szelényi, I. (1979).** *The intellectuals on the road to class power*. Brighton: Harvester Press

**Kopczuk, W., Saez, E., and Song, J. (2010).** "Earnings Inequality and Mobility in the United States: Evidence from Social Security Data since 1937." *Quarterly Journal of Economics*, 125(1), pp. 91-128.

**Kornai, J. (1992).** *The Socialist System*. Oxford: Oxford University Press.

**Kornai, J. (2006).** "The great transformation of Central Eastern Europe. Success and disappointment". *Economics of Transition*, 14(2), pp. 207–244.

**Krejčí, J. (1972).** *Social change and stratification in postwar Czechoslovakia*, London: MacMillan

**Krejčí, J. (1982).** *National income and outlay in Czechoslovakia, Poland, and Yugoslavia*, New York: St. Martin's Press

**Lampe, J. (1996).** *Yugoslavia as History: Twice There Was a Country*. Cambridge: Cambridge University Press

**Lampe, J., and Jackson, M. (1982).** *Balkan economic history, 1550-1950: from imperial borderlands to developing nations*. Bloomington: Indiana University Press

**La Porta, R., Lopez-de-Silanes, F., and Shleifer, A. (1999).** "Corporate Ownership around the World." *Journal of Finance*, 54(2), pp. 471–517.

**Lydall, H. (1968).** *The structure of earnings*. Oxford: Clarendon

**Lydall, H. (1984).** *Yugoslav socialism: theory and practice*. Oxford: Clarendon

**Lydall, H. (1989).** *Yugoslavia in Crisis*. Gloucestershire: Clarendon Press.

**Matthews, M (1978).** *Privilege in the Soviet Union: a study of elite life-styles under Communism*. London: Allen and Unwin

**Mazzucato, M. (2013).** *The entrepreneurial state: debunking public vs. private sector myths*, London: Anthem Press

**Meade, J. (1972).** "The Theory of Labour-Managed Firms and of Profit Sharing", *Economic Journal*, 82(326), pp. 402–428.

**Mencinger, J. (2004).** "Transition to a National and a Market Economy: A Gradualist Approach". In M. Mrak, M. Rojec, and C. Silva-Jáuregui (eds.), *Slovenia: From Yugoslavia to the European Union*, Washington DC: The International Bank for Reconstruction and Development/The World Bank, pp. 68-82

**Milanović, B. (1990a).** *Ekonomska nejednakost u Jugoslaviji*. Beograd: Ekonomika Institut ekonomskih nauka

**Milanović, B. (1990b).** "Poverty in Poland, Hungary, and Yugoslavia in the Years of Crisis, 1978-87", *World Bank Policy Research and External Affairs Working Papers*

**Milanović, B. (1998).** *Income, Inequality, and Poverty During the Transition from Planned to Market Economy*. Washington DC: The World Bank.

**Milanović, B. (1999).** "Explaining the increase in inequality during Transition". *Economics of Transition*, 7(2), 299-341.

**Milanovic, B., and Ersado, L. (2010).** "Reform and inequality during the transition: An analysis using panel household survey data, 1990-2005", UNU-WIDER, 2010/62

**Milanović, B. (2016).** *Global Inequality. A New Approach for the Age of Globalization*. Cambridge. Massachusetts: The Belknap Press of Harvard University Press

**Milenkovitch, D. (1971).** *Plan and Market in Yugoslav Economic Thought*. New Haven: Yale University Press

**Milenkovitch, D. (1977).** "The Case of Yugoslavia". *The American Economic Review*, Vol. 67, No. 1, *Papers and Proceedings of the Eighty-ninth Annual Meeting of the American Economic Association*, pp. 55-60

**Mitra, P., and Yemtsov, R. (2006).** "Increasing Inequality in Transition Economies: Is There More to Come?", *World Bank Policy Research Working Paper*, 4007

**Morrisson, C. (1984).** "Income Distribution in East European and Western Countries" , *Journal of Comparative Economics*, 8, pp. 121-38.

**Mosca, G. (1939).** *The Ruling class*. New York: McGraw-Hill.

**Mrak, M., Rojec, M., and Silva-Jáuregui, C. (eds.) (2004).** *Slovenia: From Yugoslavia to the European Union*, Washington DC: The International Bank for Reconstruction and Development/The World Bank

**Nestić, D. (2002).** "Ekonomске nejednakosti u Hrvatskoj 1973-1998". *Financijska teorija i praksa*, 26 (3), pp. 595-613.

**Nikić, G. (1979).** *Karakteristike formiranja i upotrebe raspoloživih sredstava stanovništva u Jugoslaviji*. Zagreb: Ekonomski institute

**North, D. C. (1990).** *Institutions, Institutional change and Economic Performance*. New York: Cambridge University Press.

**Novak, G. (1944).** *Prošlost Dalmacije*. Zagreb: Hrvatski izdavački bibliografski zavod

**Nove, A. (1983).** *The economics of feasible socialism*. London: Allen & Unwin

**Olson, M.C. (1982).** *The Rise and decline of Nations: Economic growth, stagflation and social rigidities*. New Haven: Yale University Press.

**Ott, K. (2002).** "Neslužbeno gospodarstvo u Republici Hrvatskoj 1990-2000" (The underground economy in Croatia 1990-2000); *Financijska teorija i praksa*: 31(1); pp: 1-30.

**Phelps Brown, H. (1977).** *The inequality of pay*, Oxford: Oxford University Press

**Phelps Brown, H. (1988).** *Egalitarianism and the generation of inequality*, Oxford: Clarendon



**Pleskovic, B., and Sachs, J. (1994).** "Political Independence and Economic Reform in Slovenia." In O. Blanchard, K. A. Froot, and J. D. Sachs, (eds.), *Transition in Eastern Europe. Country Studies (1)*. Chicago: University of Chicago Press.

**Polanyi, K. (1957).** *The Great Transformation*. Boston: Beacon Press

**Popović, M. (ed.) (1987).** *Društvene nejednakosti*. Beograd: Institut za sociološka istraživanja Filozofskog fakulteta

**Pryor, F. (1972).** *Property and industrial organization in communist and capitalist nations*, Bloomington London: Indiana University Press

**Pusić, V. (1992).** *Vladaoci i upravljači*, Zagreb: Novi Liber

**Ramet, S. P. (1996).** *Balkan babel: the disintegration of Yugoslavia from the death of Tito to ethnic war*. Boulder: Westview Press, (2<sup>nd</sup> ed.)

**Roine, J., and Waldenström, D. (2008).** "The Evolution of Top Incomes in an Egalitarian Society: Sweden, 1903–2004." *Journal of Public Economics*, 92(1–2), 366–87.

**Roland, G. (2017).** The evolution of post-communist systems: Eastern Europe versus China, mimeo

**Rosen, S. (1981).** "The economics of superstars". *American Economic Review*, 71, pp. 845–58.

**Rusinow, D. (1977).** *The Yugoslav Experiment 1948-1974*. London: Hurst and the Royal Institute for International Affairs

**Saez, E., and Veall, M. (2005).** "The Evolution of High Incomes in Northern America: Lessons from Canadian Evidence." *The American Economic Review*, 95(3), pp. 831-849.

**Schleifer, A., and Visny, R. (1994).** "The politics of market socialism", *Journal of Economic Perspectives*, 8(2), pp. 165-176.

**Schrenk, M., Ardalan, C. and El Tatawy, N. A. (1979).** *Yugoslavia, Self-Management Socialism and the Challenge of Development (Report of a mission sent to Yugoslavia by the World Bank)*. Baltimore and London: John Hopkins University Press

**Scitovsky, T. (1966).** "An International Comparison of the Trend of Professional Earnings", *The American Economic Review*, 56(1/2), pp. 25-42

**Simoneti, M., Rojec, M, and Gregorič, A. (2004).** "Privatization, Restructuring, and Corporate Governance of the Enterprise Sector", In M. Mrak, M. Rojec, and C. Silva-Jáuregui (eds.), *Slovenia: From Yugoslavia to the European Union*, Washington DC: The International Bank for Reconstruction and Development/The World Bank, pp. 224-243.

**Singleton, F. (1976).** *Twentieth-Century Yugoslavia*. New York: Columbia University Press

**Singleton, F. (1982).** *The economy of Yugoslavia*. London: Croom Helm

**Sirc, Lj. (1979).** *The Yugoslav economy under self-management*. London: Macmillan

**Stanovnik, T., and Verbič, M. (2014).** "Personal income tax reforms and tax progressivity in Slovenia, 1991-2012", *Financial Theory and Practice*, 38(4), pp. 441-463.

**Stojsavljević, B. (1965).** *Prodiranje kapitalizma u selo (1919-1929)*, Zagreb: Institut za historiju radničkog pokreta

**Stojsavljević, B. (1973).** *Povijest sela: Hrvatska, Slavonija, Dalmacija 1848-1918*. Zagreb: Prosvjeta

**Szelenyi, I., Eyal, G., and Townsley, E. (1998).** *Making Capitalism Without Capitalists*. London: Verso.

**Szelenyi, I. (2014).** "Varieties of Social Structure During and After Socialism Russia, East Europe, and China", *Chinese Sociological Review*, 46(2), pp. 3–31.

**Šimović, J. (1989).** *Porezni sistem i porezna politika općina u Jugoslaviji*. Zagreb: Institut za javne financije

**Šuvar, S. (1970).** *Sociološki presjek jugoslavenskog društva*. Zagreb: Školska knjiga

**Tomašević, J. (1955).** *Peasants, Politics, and Economic Change in Yugoslavia*. Stanford: Stanford University Press

**Uratnik, F. (1933).** *Pogledi na družabno in gospodarsko struktura Slovenije*. Ljubljana: Tiskovna zadruga

**Urban, I. (2006).** "Dekompozicija indeksa progresivnosti poreza na dohodak u Hrvatskoj". Magistarski rad, Sveučilište u Zagrebu: Ekonomski fakultet

**Uvalić, M. (1992).** *Investment and Property Rights in Yugoslavia*. Cambridge: Cambridge University Press

**Vanek, J., and Jovičić, M. (1975).** "Capital Market and Income Distribution in Yugoslavia: A Theoretical and Empirical Analysis," *Quarterly Journal of Economics*, 89(3), pp. 432–443.

**Vinski, I. (1959).** *Procjena nacionalnog bogatstva po područjima Jugoslavije*. Zagreb: Ekonomski institut

**Vinski, I. (1967).** "The distribution of Yugoslavia's national income by social classes in 1938", *The Review of Income and Wealth*, 13(3), pp. 259-284

**Vinski, I. (1970).** *Klasna podjela stanovništva i nacionalnog dohotka Jugoslavije u 1938*. Zagreb: Ekonomski institut

**Ward, B. (1958).** "The Firm in Illyria: Market Syndicalism," *American Economic Review*, 48(4), pp. 566–589.

**Woodward, S. L. (1995).** *Socialist Unemployment: The Political Economy of Yugoslavia, 1945-1990*. Princeton, NJ: Princeton University Press

**World Bank (2001).** *Croatia: Economic Vulnerability and Welfare Study*, Washington DC: The World Bank,

**World Bank (2007).** *Croatia Living Standards Assessment: Promoting Social Inclusion and Regional Equity*, Washington DC: The World Bank

**Županov, J. (1978).** *Sociologija i samoupravljanje*. Zagreb: Školska Knjiga

# Chapter 5. From Communism to the New Globalization: ‘Capital transformation’ in the Czech Republic, 1970-2015

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## Abstract

‘Capital transformation’ has been the centrepiece of the transition from the central planning to the market economy in Central Eastern Europe. We use the national accounting framework to analyze the evolution of the national, private, public and foreign wealth in the Czech Republic from 1970 until 2015. We find that the national wealth-income ratio in the Czech Republic has strongly declined after the end of communism as a result of a sharp drop in the public wealth-income ratio. The Soviet-style high-investment policy during communism led to the over-accumulation of the ill-suited capital for the market environment, leading to the phenomenon we have termed the ‘communist bubble’. The ‘creative destruction’, deficient restructuring and negative manifestations of the privatization led to a sharp downward market value adjustments and divestitures in the form of widespread bankruptcies and liquidations and resulted in the generally low market valuation. As a result, the mass give-away privatization of state enterprises has not enriched the Czech households. A brief episode of the ‘Czech capitalism’ was succeeded by the ‘global’ capitalism, with convergence based on the foreign capital. Foreigners have obtained positive real capital gains on their wealth, suggesting more successful restructuring and higher productivity gains of foreign-owned firms. On the other hand, the housing privatization and marketization have been the main building blocks for the formation of the private wealth. We believe that the distinction between high-yielding foreign corporate wealth and more equally distributed housing is critical for the evolution of wealth and income inequality after the fall of communism.

## 1. Introduction

Capital has returned to the center of the economic analysis. After being assigned a subordinate role for more than a half of the century, it notably resurged in the public discourse with the recent Piketty's seminal contribution (2014). Suggestively, the work bears the same evocative title as Marx's *opus magnum*, and the time span (of a century and half) separating the two authors is similarly indicative, as the recent research by Piketty and Zucman (2014) has found that the wealth-income ratio in developed countries experienced a U-shape evolution from the time of Marx's writing until today. It was at historically high levels, equivalent to as much as seven years of national income until the twentieth century, when it fell strongly during the First World War and amid the interwar shocks, to reach its bottom in decades following the Second World War. Since the 1970s it has been strongly rising towards pre-WW1 levels, assumedly driven by two forces, the slowdown of growth and the recovery of asset prices (Piketty and Zucman 2014). Implications of this trend are strong as it goes against the stylized fact of constant capital-output ratio, and raises a broad range of issues such as the rising capital share or the impact on interpersonal inequality.

In this work we present the evolution of wealth-income ratio in the Czech Republic from 1970 until today. The particular case of the Czech Republic is especially interesting. Obviously, the experience of communism denoted in theory fundamentally different patterns of capital ownership and accumulation in comparison to advanced countries. In this respect, the balance between public and private capital has indeed exhibited a unique pattern. The Czech wealth trajectory provides unparalleled examples of shifts between public and private wealth, as evident in the post-WW2 communist nationalization and the recent reversed process of privatization with the return to the market economy. While Piketty and Zucman (2014) clearly show that the evolution of national wealth in developed countries has been shaped primarily by the evolution of the private wealth, it was public capital that assumed the principal role in the wealth accumulation in communist countries. Thus, understanding the aggregate wealth evolution in the former communist country can shed additional light on the range of (long-term) development issues, from industrialization to the sustained growth.

The post-communist transition – frequently labelled the capital transformation – was a landmark event in the historical evolution of capital, and it is thus critical to understand divergent outcomes

of the process between various countries, regarding both the efficiency and welfare implications. Notably, there has been a marked difference, or the 'Great Divide' (Berglof and Bolton 2002), in the transition process between the Central-Eastern (CE) European countries on the one hand, and Russia and the former Soviet countries on the other, suggesting that institutional factors play quite important role in shaping wealth trajectories (Acemoglu and Robinson 2015). This has been especially evident in strikingly different outcomes in wealth inequality between the two groups of countries (see chapter 6; or Credit Suisse Wealth Reports).

Our analysis is based on the national balance sheets, consisting of all non-financial assets and financial assets and liabilities, and covering all sectors of the economy. Official (retrospective) balance sheets, fully in accordance with the SNA 2008 standard, are available since 1992 and present the core of the analysis, allowing the analysis of national, private and public wealth. In order to understand a change from central planning to market economy, we extend the series back to 1970 by using the available data of non-financial and financial stocks. Moreover, this allows us a comparison to the experience of advanced countries covered in the research of Piketty and Zucman (2014). Equally following this strand of research (and international accounting standards), as well as influenced by our research goals, we take market valuation as the national wealth benchmark. However, due to the obvious reason of missing markets, socialist estimates of the capital stock are mostly based instead on replacement values. Former Czechoslovakia was unique in the extremely high proportion of state-owned (non-marketable) capital and the firm government control over every aspect of economic activity and exchange. We provide various robustness checks to approach the meaningful valuation of the non-tradable capital.

A focus on this time period places a 'transitional' capital transformation in the center of the analysis, enclosed by two apparently antithetical economic systems.<sup>1</sup> Consequently, an encompassing structural change presents a considerable methodological and conceptual challenge, and we believe that market valuation is the most suitable concept to approach it. In particular, our interest in welfare implications of the transition process, for example, with respect to altered prospects of firms' earning potential or housing affordability, or income and wealth inequality and tax capacity, make the market values a preferable measure. Market values are also the most appropriate for the international comparison.

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<sup>1</sup> In this respect, the year 1990 could be seen as still representing the full-scale communist system at work.

The obtained results reveal many distinctive patterns in the evolution of the wealth-income ratio in the Czech Republic. First, the national wealth-income ratio was higher than in advanced countries during the socialist period. This could be understood as a consequence of the Soviet style high investment policy and lower productivity in comparison to advanced countries. National wealth-income ratio steadily rose in the last decade of the communist rule, especially at the outset of the transition to market economy, which coincided with the stumbling of the growth. The national wealth-income ratio has been steadily falling since then, converging to similar levels as documented in advanced countries. Today it is equivalent to roughly five years of national income.<sup>2</sup>

Private and public wealth-income ratios have similarly displayed distinctive evolutions. Private wealth-income ratio experienced a jump in the early transition, as a result of the marketization of the real estate sector and the large-scale (giveaway) privatization of the housing stock and public enterprises. But since then, it has remained stable at levels equivalent to three years of national income. This stands in contrast to the robust growth of private wealth-income ratio in advanced countries in this period, but, interestingly, we document quite similar levels and the evolution in other CE European countries. On the other hand, the public wealth-income ratio unsurprisingly displayed record levels during the communist era. It has experienced a huge fall since the start of the transition, being the main cause behind the fall in national wealth-income ratio, but it is still substantially higher than in other countries. This may be attributed to relatively low government debt and as an outcome of high public investment during the communism.

We also look at the respective importance of volume and price effects in driving wealth accumulation. Piketty and Zucman (2014) find that in the long run wealth accumulation is reasonably well explained by new savings, while revaluation effects play an important role over shorter time periods. The all-embracing character of the 'capital transformation' that accompanied a change from the socialist to the market economy entailed both effects. Price liberalization was one such short-term price effect, yet critical for the evolution of relative prices. With the emergence of asset markets, such as the real estate and the stock market, market forces acted to eliminate omnipresent price distortions. The revaluations stemming from the price liberalization and marketization could be, in effect, broadly understood as market

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<sup>2</sup> The general downward trend could be understood as a long-term tendency consistent with the Harrod-Domar-Solow formula ( $\beta = s/g$ ) (Piketty and Zucman 2014), induced by a fall in the national saving rate after the socialist era and the convergence-induced acceleration of growth.



'corrections' of inherited conditions from the socialist period, from suppressed inflation in housing or non-marketable urban land to well known deficiencies of centrally planned economies, such as inefficient and misallocated (over)investment, neglected demand, inventories hoarding, etc. Afterwards equally, we find that real capital losses were the main driver of the wealth evolution during the first transition decade, due to the downward price corrections of obsolete capital inherited from the socialist era, or the burst of the 'communist bubble' manifested in burst of the stock market bubble. Widespread privatization misuses (such as the notorious 'tunnelling') and weak institutional framework (e.g. poor investors' protection, low general liquidity, etc.) further depressed stock prices.

On the other hand, the privatization has been the most discussed manifestation of the so-called 'volume' effect, related in particular to the formation of the private wealth. This entailed primarily free or below-market price capital transfers from the government to the private sector, through privatization of the public housing, enterprises and land. The housing privatization, in particular, was central for the creation of private wealth all over the former Eastern bloc. For example, according to the World Bank study, "the change in ownership of the housing stock was one of the largest wealth transfers in history... [and] in many cases housing represents the only substantial asset individuals salvaged from the old systems" (World Bank 2000, pp. I, 4). Former Czechoslovakia had the largest share of public housing in the former socialist bloc, and there, as a result, restitutions and ownership transfer to sitting tenants were comparatively more important.

In a certain respect, a rise of the private wealth-income ratio in the Czech Republic and other former socialist countries in Central Eastern Europe during the transition could be regarded as a more far-reaching and more immediate manifestation of the same tendencies inducing the rising pattern observed in advanced countries since the 1970s, from privatization of state corporations<sup>3</sup> or the global recovery of real house prices (Piketty 2014; Knoll et al. 2014; Girouard et al. 2006). Along the same lines, globalization and the rising financial integration have been changing the nature of the modern capitalism. Thus, the capital transformation in Eastern Europe has further implied the rising importance of foreign capital, especially for small economies where foreign investments have been the principal medium in transferring technology and know-how needed for restructuring and enhancing competitiveness. Accordingly, we document deterioration in the

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<sup>3</sup> Vaclav Klaus assumedly said that "it took Margaret Thatcher one year to privatize three or four enterprises, while it took us one day to denationalize twice as many enterprises"

net foreign asset position of the Czech Republic since the country's international opening after the breakdown of communism, and the dominant role of foreign investment in driving this trend suggests the robustness of convergence argument. Notwithstanding its undisputed positive transformation role, the prominent role of foreign capital also raises new concerns. Large net foreign capital income indicates very high returns on net foreign assets, which brings unease concerning the sustainability of current account. Similarly, as capital is generally quite unequally distributed, and corporate capital in particular strongly concentrated, these large returns suggest that foreigners own a substantial proportion of high-yielding wealth in the country.<sup>4</sup>

As a result, a turn towards foreign-based restructuring after a failure to build the 'Czech capitalism' (Myant 2003) made ways to alternative institutional models. One such contender (at the level of abstraction, at least), is the so-called 'Rhenish' capitalism (Albert 1993; Piketty 2014; Esping-Andersen 1990), seemingly expanding in Central Europe through German corporate legislation, foreign investments and participation in (German-led) global value chains, might be important, as we look later, for corporate valuation or the prominent role played by the foreign capital.

Finally, one needs to address the question raised by Piketty (2014) concerning the effect of the rising wealth-income ratio on income and wealth distributional patterns. Even though the importance of aggregate wealth in the Czech Republic and other former socialist countries in Eastern Europe has been on a decline due to the structural change and the convergence-induced higher growth, one could argue that these countries only need time.<sup>5 6</sup> Especially, since the advance of the slow-growth regime is becoming a reality (Gordon 2016), with the convergence spur coming to its end. A robust logic of  $\beta = s/g$  further suggests that the rise is to be expected (Piketty 2014). However, it is not entirely clear whether (corporate) capital is just valued low - and a rebound in assets prices would hasten the rise in the wealth-income ratio - or lost for good.

Obviously, a relatively lower private-wealth income ratio does not have to signify a lower level of wealth inequality, and the most suggestive example is Russia with its oligarchs (chapter 6).

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<sup>4</sup> There are similarly related issues of spillover effects on domestic firms and potentially rising monopoly power, impact on political process, etc.

<sup>5</sup> As claimed by Marx that «the industrially more developed country presents to less developed country a picture of the latter's future».

<sup>6</sup> The more so as transition from 'dynamically inefficient' socialist economy ( $r < g$ ) (for discussion see section 7.1 ) to dynamically efficient ( $r \geq g$ ) suggests a rise in inequality (Piketty 2014)

Previously, with the predominant public ownership of wealth during communism, capital income was wholly appropriated by the state, and nominally thus not raising issues of interpersonal inequality (Atkinson and Micklewright 1992). A strong shift from public to private wealth clearly opens potential of rising wealth inequality, and especially privatization often creates opportunities for rapid emergence of substantial personal wealth (Davies and Shorrocks 2000). A rise of housing wealth and a fall of other domestic capital, most notably of the corporate capital, should not have resulted, in theory, in comparatively more inequitable wealth distribution in the international context. In particular, the rising foreign ownership of high-yielding corporate capital places in fact larger emphasis on cross-country inequality.<sup>7</sup> In relation to this, large net outflows of capital income 'remove' this important factor frequently aggravating interpersonal income inequality in the country.

## 2. Data and Methodology

National wealth estimates for 1992 until 2015 period are constructed from detailed balance sheets published by Czech Statistical Office (CZSO). These are fully based on the UN System of National Accounts (SNA).<sup>8</sup> Balance sheets are available for each SNA sector: households, non-profit institutions serving household (NPISH), corporations (non-financial and financial) and the general government.

Net wealth is defined as the sum of all financial and non-financial assets minus liabilities. Non-financial assets are composed of produced and non-produced assets. The former are result of the production process and include dwellings and other buildings, equipment, machines, livestock, etc.,<sup>9</sup> while latter generally refer to land and mineral resources. Financial assets include currency, deposits, shares, life insurance and pension funds. Following the SNA standards, consumer durables are not included in the measure of wealth.

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<sup>7</sup> For example, Kessler and Wolf (1991) have attributed lower documented wealth inequality in France than in the US in 1980s primarily to the fact that higher level of non-private (in this case state ownership) of the corporate stock in France than in the US.

<sup>8</sup> And accordingly on European methodology of national accounts ESA 2010

<sup>9</sup> That is, fixed assets, inventories and valuables in the national accounting vocabulary

We follow Piketty and Zucman (2014) in definitions of the wealth used. The focus is primarily on the 'market value' national wealth  $W_t$ , defined as the sum of private  $W_{pt}$  and government wealth  $W_{gt}$ . The private wealth refers to the net worth of the households and NPISH sector ('personal wealth' is applied when we speak solely of households' wealth, and 'non-profit wealth' when referring to the wealth of NPISH). Equally, government (or public) wealth corresponds to the net worth of the general government sector. In the 'market value' definition corporations are valued by their liabilities through (market valued) equity holdings of households, government and the foreign sector. The Central bank is included in the financial corporate sector. Alternatively, one can look at national wealth as the sum of non-financial assets and net foreign asset position.

Alternative wealth concept is the 'book value' national wealth  $W_{bt}$ , which includes in addition the net worth of corporations,<sup>10</sup> or the 'residual' corporate wealth  $W_{ct}$ , which is the difference between corporate book value equity - defined as the corporate non-financial and financial assets minus non-equity liabilities - and market value of their equity. The two measures of national wealth coincide when  $W_{ct}$  is zero, or equivalently, when Tobin's  $q$  is equal to 1. However, it is not straightforward to opt whether a 'market' or a 'book' wealth concept should be preferred.<sup>11</sup> And when the two measures differ more substantially, the choice can matter a great deal.

Tobin's  $q$  is substantially below 1 (that is, the residual corporate wealth  $W_{ct}$  is positive) in the Czech Republic after the fall of socialism, and there is a marked gap between book value and market value national wealth. As noted above, we take market valuation as our wealth benchmark since, in our opinion, it can better account for the structural change in the economy. It is thus conceivable that book values of corporate non-financial assets have been simply overestimated by the perpetual inventory method (PIM), something that has been often emphasized as its major limitation. This, however, becomes critical in the transition setting. For example, it is well known that PIM does not adequately account for discarded assets of liquidated firms<sup>12</sup> (Piketty and Zucman 2014b, p. 9), which is obviously problematic in the environment of widespread liquidations characteristic for the early transition. Equally, the extent of 'transitional' privatization, itself unprecedented in historical proportions, made it difficult to account for all transactions and ownership changes on the second-hand market in the statistics

<sup>10</sup> 'Book value' national wealth corresponds to the SNA concept of the net worth of the total economy, which is the sum of the net worth of households, NPISH, corporate and the general government sector.

<sup>11</sup> As noted by Piketty and Zucman (2014, p.1269), both measures "have some merit". See discussion below.

<sup>12</sup> And in effect keeps them 'alive' in the stock until their (accounting) retirement.

of capital formation and discards.<sup>13</sup> But probably the most important issue is PIM's inability to capture the technical change.<sup>14</sup> Yet, a profound impact of rapid technical change presents in a way the essence of the restructuring process, or the so-called 'capital transformation', and without doubt resulted in all-pervasive premature capital scrapping (of technologically outdated assets from communism). It is the economic obsolescence that is most characteristic of the transitional experience of capital. Even with the remarkable efforts of Czech statisticians to tackle these challenges, in which they have gone furthest ahead among former transition countries, it is quite difficult to encompass the fundamental change of the capital during the transition.

However, the most problematic conceptual issue is that of the comparability of the wealth series between the socialist and the market economy period. Due to the obvious reason of missing markets, socialist estimates of the capital stock are mostly based instead on replacement values (e.g. Goldsmith and Lipsey 1963, ch. 2). Former Czechoslovakia was unique in the extremely high proportion of state-owned (non-marketable) capital and the firm government control over every aspect of economic activity and exchange.<sup>15</sup> Having in mind the markedly different pricing in two systems, one may ask whether it makes sense to compare the wealth estimates in the first place. In general, prices in communist countries were mainly determined on the basis of the (average) production costs, whereas interaction between demand and supply played limited, and quite often, no role at all in the official price setting] (Pryor 1973, Adam 1974; Kornai 1992). On the one hand, we cannot ignore that the massive accumulation in communist Czechoslovakia took place (there were lot of buildings, machines, etc., that they were producing goods). And it were book prices that served as a yardstick for market prices in the first transition years, when market lacked any other means to put a price on them (actually, this is our notion of communist bubble).

Finally, sometimes-heard criticisms of the statistical procedures underlying the socialist wealth estimates (especially during the Cold War, when the Soviet capital data had been in the spotlight), are, in our opinion, to some extent unjustified, especially if one takes contemporary western measurements as the standard. Besides, socialist wealth estimates were based on the

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<sup>13</sup> It is true that the statistical offices produced new series of fixed assets initiated PIM after the fall of communism (generally in mid-1990s), it is still plausible to assume its inadequacy to tackle the rapidly changing environment and its effect on the capital stock.

<sup>14</sup> Note in addition that socialist accounting accounted for the 'economic depreciation' due to technical obsolescence only with respect to new advancement in domestic technology (e.g. Kaplan for the USSR), while transition implied that comparison should be made with, depreciation rose sharply

<sup>15</sup> Even the real estate market, which had functioned to some (limited) extent in other socialist countries, was practically non-existent in Czechoslovakia, with most of the housing stock in public ownership and under thorough state regulation.

regular censuses of the capital stock, whose comprehensive scope was unimaginable in contemporaneous capitalist countries (UN 1979; Goldsmith 1985). For the socialist period we assume the value of Tobin's  $q$  equal to 1. More specifically, it is assumed that government equity equals government-owned corporate non-financial assets (e.g. Goldsmith 1964, p. 94).

Next, we define income, as our second ingredient of the wealth-income ratio. We take net national income  $Y_t$ , which is the net-of-depreciation domestic product  $Y_{dt} = F(K_t, L_t)$  plus net foreign income  $NFI_t$  (current external balance). Finally, we can define national market-value wealth-national income ratio  $\beta_{nt} = W_{nt}/Y_t$ . Equally, we look at private wealth-income ratio  $\beta_{pt} = W_{pt}/Y_t$  and public wealth-income ratio  $\beta_{gt} = W_{gt}/Y_t$ .

$$\beta_{nt} = \beta_{kt} + NFA_t$$

Net (of depreciation) wealth is more meaningful concept for our purpose, due to its welfare underlining (e.g. Weitzman 1976), rather than the productive emphasis accompanying the gross concept (the so-called 'one hoss shay').

Finally, private saving is defined as the sum of household savings and corporate savings (retained earnings). But there is also a risk of overestimating private saving flow if a substantial part of corporate savings is made by corporations in foreign and public ownership. We account for this as follows. With respect to the saving of foreigners, national accounts have recently started to attribute retained earnings of foreign owned enterprises to foreign owners in proportion to their stake in enterprise through the imputed category of 'reinvested earnings on foreign direct investment'. Thus, we assumed that corporate savings of foreigners are directly reduced by the imputed amount.<sup>16</sup> We ascribe all savings of public non-financial corporations to the government saving flow.

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<sup>16</sup> These are treated as distributed to their owners and, as the term implies, reinvested in the enterprise (the counterpart balance is recognized in financial account). For example, if the foreign direct investor wholly owns the enterprise, it is assumed that all profits are remitted to foreign shareholders and retained earnings are zero. The uncertainty surrounding this measure is well recognized, but it is a positive step forward allowing additional information on the extent of the control between domestic and foreign sector.

## Wealth accumulation model

Wealth today comes either from savings in previous periods (volume effect) or capital gains, that is, an increase in price of wealth relative to the general price level (relative price effect), or:

$$W_{t+1} = W_t + S_t + KG_t$$

where  $W_t$  is the market value of aggregate wealth at time  $t$ , and  $S_t = s_t Y_t$  is the net saving flow between time  $t$  and time  $t + 1$ ,  $KG_t$  is the capital gain or loss between time  $t$  and time  $t + 1$ . If one assumes one-good wealth accumulation model, with constant relative price between capital and consumption good ( $KG_t = 0$ ), then the new wealth stems only from new savings  $W_{t+1} = W_t + S_t$ . Accordingly, the evolution of wealth-income ratio is given by:

$$\beta_{t+1} = \frac{(1+g_{wst})}{(1+g_t)} \beta_t,$$

where  $1 + g_{wst} = 1 + \frac{s_t}{\beta_t}$  is saving-induced wealth growth rate and  $1 + g_t$  is the rate of growth of national income, and  $s_t$  is net-of-depreciation saving rate. In the long run, with constant  $s$  and  $g$ , steady state level of  $\beta$  is determined by Harrod-Domar-Solow formula  $\beta_t \rightarrow \beta = s/g$ . Piketty and Zucman (2014) point that wealth-income ratio over longer period could be reasonably well approximated by the Harrod-Domar-Solow formula, suggesting that saving drives wealth accumulation in the long-run.

As we want to distinguish between the importance of savings and capital gains for the wealth accumulation, we consider, following Piketty and Zucman (2014), the two goods wealth accumulation model, where the assumption of constant relative price between capital and consumption good is dropped and the change in wealth could now come either from net saving or real capital gains (losses). It is straightforward to see that the evolution of wealth income ratio follows in this case:

$$\beta_{t+1} = \frac{(1+g_{wst})(1+q_t)}{(1+g_t)} \beta_t,$$

where  $1 + q_t$  is capital gains-induced wealth growth rate and is estimated as residual.

### 3. The development of wealth-income ratio

#### National wealth-income ratio

Figure 1 shows a development of the national wealth income ratio in the Czech Republic from 1970 until 2015, together with the group of developed countries reported by Piketty and Zucman (2014). National market-value wealth-income ratio in the Czech Republic reached levels as high as 700 per cent in the early 1990s. This was almost two times the level observed in other countries at the time, equaling only that of Japan at the peak of its asset bubble. The peak itself should be primarily related to the large revaluation of real estate. It was further aggravated by the stumbling of the growth in the early 1990s, an experience shared by all former communist countries that initiated structural transformation to the market economy.<sup>17</sup> For example, real national income fell by more than 10 per cent between 1990 and 1992.

Immediately since the onset of transition a strong fall in wealth-income ratio was set in motion. Similarly, the magnitude of the fall in the national wealth-income ratio between 1992 and 1997 could only be compared the drop in the Japanese wealth-income ratio after the burst of asset price the bubble in 1991. After being stable for few years following the Russian financial crisis of 1997, national wealth-income ratio declined for as much as one year of national income in the early 2000s, and stabilized again with the advent of the recent global financial crisis. Today it is equivalent to five years of national income, which is a level comparable to that found in developed countries (Figure 1).

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<sup>17</sup> By construction,  $\beta$  is determined endogenously and negatively related to the growth rate of national income.



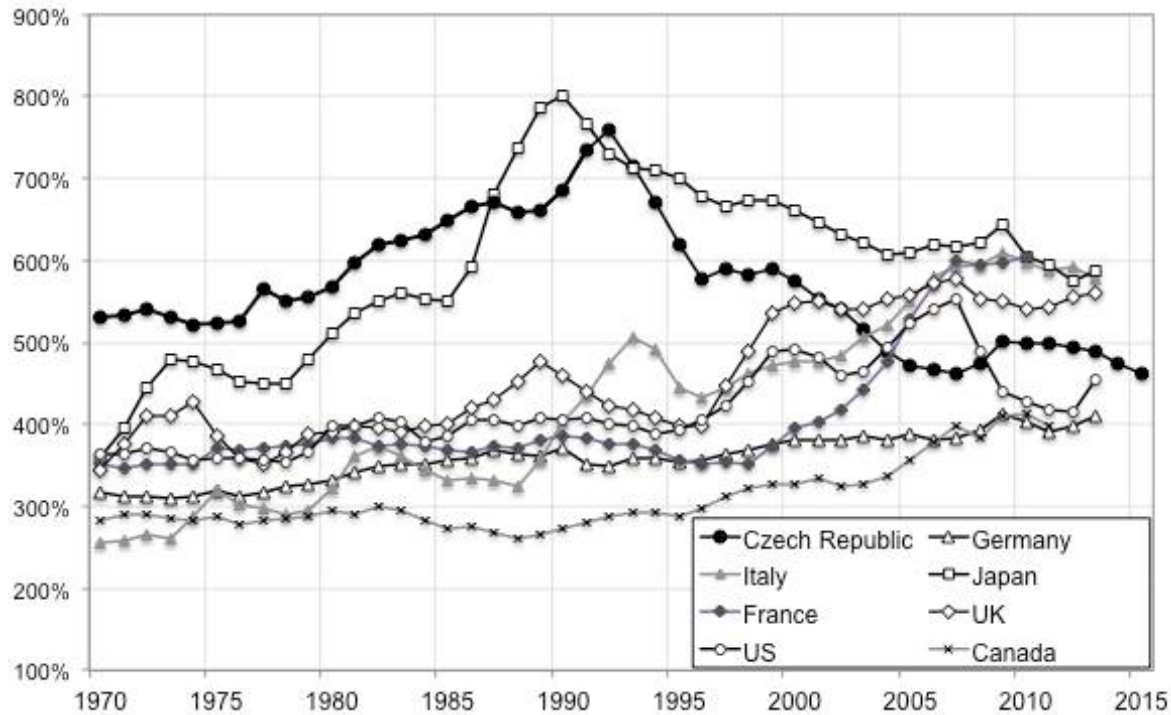


Figure 1: The development of national wealth income ratio in the Czech Republic

Source: author's computation for the Czech Republic; other countries from WID

### Public and private wealth

The evolution of the national wealth-income ratio is further decomposed into particular trajectories of the of private and public wealth evolution. It is of outmost importance to distinguish how these two constituent categories of national wealth evolved during the transition from predominantly state-owned socialist system to the market economy based on the private ownership. Figures 2a and 2b depict the respective evolutions of private and public wealth income ratio in the Czech Republic. It is useful again to look at them in the international perspective. Thus, one can see that Czech private and public wealth-income ratios have assumed today 'outlier' positions in comparison to advanced countries. While private wealth bottoms the list, public wealth as a proportion of national income is by far the highest among the observed countries. But it nonetheless unfailingly captures the reality that public wealth accounted for the predominant part of the national wealth in communist Czechoslovakia, probably representing a unique proportion in history.

Trajectories of public and private wealth have been equally distinct. Public wealth fell from more than five years of national income in the early nineties to around a year and a half in 2015. The

reduction in public wealth, equivalent to three years of national income, corresponds roughly to the overall fall in national wealth-income ratio observed in Figure 1. Private wealth, on the other hand, after a remarkable boost at the very outset of transition, declined initially after 1992 and has stabilized at around three years of national income.

The Czech wealth trajectory seems thus unique in comparison to other countries in the sample. Although there has been a steady fall in the government wealth in advanced countries since the 1970s, it was never of fundamental character as in the former communist country. Equally, an impressive rise in the private wealth in rich countries in last decades, as evidenced by Piketty and Zucman (2014), did not imply literal *de novo* creation of the private sector as in the Czech Republic.

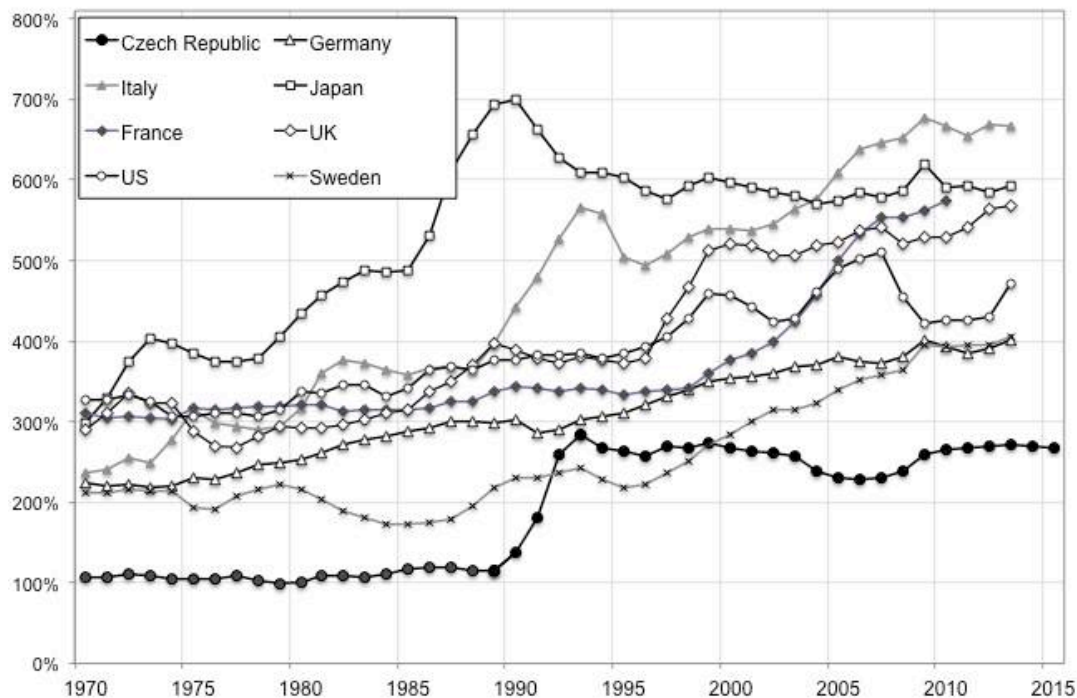


Figure 2a: The private wealth (as percentage of national income)

Source: author's computation for the Czech Republic; other countries from WID

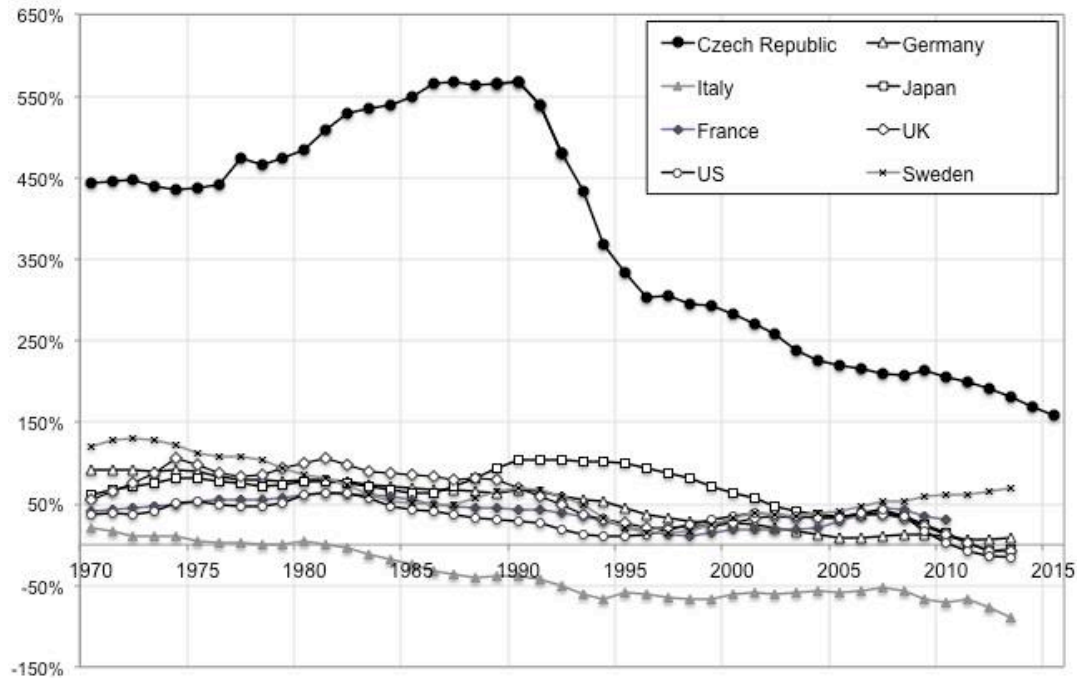


Figure 2b: The government wealth (as percentage of national income)

Source: author's computation for the Czech Republic; other countries from WID

**Private wealth.** The origins of the private wealth in the Czech Republic in the post-communist period should be in a large part sought in the privatization of housing and in the large-scale (voucher) privatization of public enterprises, as well as in the marketization of the real estate. The bulk of the housing stock in public ownership was swiftly transferred to private sector, either through sales at favourable terms to sitting tenants or restitutions, resulting in relatively high homeownership rates and (more limited) increase of the rental property market (Lux 2009). However, one should distinguish between volume effects related to (generally free or below-market price) transfers of ownership, and revaluation-induced effects on these same assets. A documented jump in the private wealth during the first transition years was largely a consequence of the 'price effect' for housing (see below).<sup>18</sup> With the emergence of the real estate market, market forces acted to eliminate distortions, leading in turn to the sharp recovery of the long-suppressed housing prices. In particular, the marketization of urban land has been the critical for the increase in housing wealth, with location playing the key role.<sup>19</sup>

<sup>18</sup> As noted above, the socialist period was plagued by omnipresent price distortions, assuming the most acute dimension in housing.

<sup>19</sup> In socialism, residential land had been centrally allotted, see ch.

Figure 2a suggests, moreover, that the rise was in no way limited to the Czech Republic, or for that matter to former socialist countries, as we find a concurrent rise in the private wealth-income ratio in Italy (a rise from 350 to 550 per cent of national income) and Japan (from 500 to 700 per cent), or few years later in France or in the UK. A general feature of this strong rise was a price-induced increase in the housing component (Brandolini and el. 2004, Piketty and Zucman 2014). Thus, the rapid adjustment in the Czech ratio was also induced by the country's inclusion into the global economy, where, on the whole, there has been a robust and steady growth of real house prices from the 1990s (Girouard et al. 2006; Knoll et al. 2015). The global housing appreciation is by and large explained by fundamentals, even if one finds sporadic occurrences of the housing bubbles.<sup>20</sup> Besides, housing prices were suppressed in the decades after WW2 (e.g. rent controls), and this broad pattern might be also seen as indicating a general recovery (Piketty 2014). The experience of transition countries was featured by the more immediate adjustment, as the real estate market emerged practically overnight, and was followed by the exhaustive transformation of its every aspect, such as the rental or the mortgage market.

Figure 2a shows that the combined effect of privatization transfers and the residential real estate revaluation made Czech households in the mid-1990s as rich in proportion to national income as households in Germany or Sweden at the time (note, however, that this is also due to the fall in the income growth in the early 1990s). But while the latter countries have attained since then structurally higher level of private wealth-income ratio, the Czech ratio remained stable throughout the whole period. Although, as we shall see, equilibrium condition  $\beta_p = s_p/g$  similarly suggested a rise in the private wealth-income ratio in the Czech Republic,<sup>21</sup> one tentative explanation is that the implied rise was postponed due to the 'transitional' restructuring. Markets became exceedingly pessimistic regarding the earning potential and the eventual successful restructuring of the old communist industries. Namely, a great quantity of capital inherited from the communist period was obsolete, which resulted in disposals, bankruptcies and in real capital losses (see section 5). Thus, subsequent large transfers of ownership from public to private sector after 1992 (for example, when the second wave of voucher privatization took place) did not lead to further rise of private wealth-income ratio (the real private wealth actually declined), but only to less pronounced fall than observed for the public wealth-income ratio.

<sup>20</sup> Obviously in Japan amid the general asset bubble, a decade later in Spain, or, according to some indicators, also in the Czech Republic in the early 1990s.

<sup>21</sup> Once again, this equation should be understood as the long-term tendency.

Low market valuation of corporation could be also explained by other factors. The most problematic one would be if it were simply a statistical artefact (namely, that statisticians have not assessed the market valuation of corporations properly). For example, one can question whether a large discrepancy between market and book value national wealth could be an indicator of this, that is, if book (replacement) values of corporate capital are more indicative of its actual market value.<sup>22</sup> As often the case, the truth may lie somewhere in between, but we believe that official estimates are realistic, if not perfect, estimation of prevailing market values of corporations. The evidence on the evolution of stock prices (PX price index) gives some backing to this argument. Equally, relatively lower market valuation is found in other former socialist countries in Eastern Europe. Interestingly, in the on-going research we find that the private-wealth income ratio in two other former socialist countries in Central Europe - Hungary and Slovenia - has converged to similar levels documented in the Czech Republic (although countries differed in the extent of public ownership during the communism and pursued different privatization strategies). We equally find for Hungary and Slovenia less than unity Tobin's  $q$ . We look in more detail at Russia in chapter 6.

One tentative explanation for low market valuation in former socialist countries may lie in the relative 'stakeholder vs. shareholder' control. For example, Boycko et al. (1993, pp. 157-162) believe it to be the main reason behind the extremely low market values of Russian corporations at the beginning of the privatization ('expropriation of shareholders by stakeholder'). They pinpoint three major stakeholders - employees, managers, and the government – who had 'skimmed off' the shareholders' value. The greatest similarity of the Czech and the Russian mass ('voucher') privatizations, and, above all, their shared negative manifestations (such as notorious 'tunneling', weak investor protection, etc.) (e.g. Black et al. 1999, pp. 55-65), suggest that market reaction could be similar (see chapter 6).

We repeatedly return to these issues in the following chapters. But as a bottom line, it is clear that an improvement in statistical procedures is needed in order to account for these issues. This brief overview has pointed that a cross-country comparison can be a fruitful approach to analyze the wealth evolution in former socialist countries, especially in the context of presumed economic convergence with advanced countries.

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<sup>22</sup> We construct alternative estimates of private, public and foreign wealth by dividing the 'residual' corporate value (positive net worth of corporations) among private, public and foreign owners (see appendix). In order to get a grasp on potential magnitude, Figure A shows that private wealth in the Czech Republic would be higher for one year of national income, thus equivalent to the German or the Swedish ratio.

Finally, it may be pointed out that the evolution of private wealth-income ratio in the Czech Republic experienced the same rising pattern as documented in advanced countries since the 1970s, while recognizing fundamental differences along this path. The rise itself was not driven by the accumulation in the framework of the one-good wealth accumulation model described above.<sup>23</sup> The official ideology at least always claimed that present sacrifices are made for the future collective benefit. And the widespread legitimization of the privatization process required that its character should be inclusive and equitable.

**Public wealth.** On the other hand, public wealth-income ratio in the Czech Republic has been strongly falling since the beginning of the transition, but it is still disproportionally higher than reported in other countries (Figure 2b). A fall in the public wealth-income ratio, amounting to more than four years of national income since the early nineties, has been truly remarkable. In addition to the above mentioned large capital transfers and negative revaluations, the fall should be understood as a long-term tendency in accordance with  $\beta_g = s_g/g$  logic driven by the plunge in the government saving rate following the change of the economic regime. Figure 2b further indicates that public wealth experienced less dramatic revaluation induced rise at the outset of transition in comparison to the private wealth (as this dominantly affected real estate, most of which has been already transferred into the private hands).

Still relatively high level of  $\beta_g$  might be attributed to the high investment-policy of the socialist period, as this high level stems mostly from the higher level of non-financial assets.<sup>24</sup> In this respect, the Czech Republic is similar to 'extensive developers' in East Asia, such as Japan or South Korea, where one also observes relatively higher level of non-financial assets than in the rest of the sample. But, while the Japanese net public wealth is close to zero due to its huge public debt, the rise of the Czech public debt has been rather moderate (see more below).

Finally, we should add that subsoil assets owned by government are not directly included in the market value wealth estimates (but indirectly through equity of corporations (including public)). As these are today according to official estimates equivalent to as much as two and a half years of national income, this exclusion requires additional attention (see more below).

<sup>23</sup> But to some extent, one could regard it as an outcome of the accumulation process, since the large accumulation of public wealth during the communism was financed by constantly suppressed private consumption.

<sup>24</sup> However, there may be an overestimation by PIM, and due to the lack of comparable market prices

## 4. Wealth composition, 1970-2015

Figure 4 presents main components of the private wealth in the Czech Republic from 1970 up to 2015. The most important change was an increase in the housing ratio in the early 1990s, equivalent to almost a year of national income. We argue that the concurrent large-scale privatization and marketization of housing was the most important device for the private wealth formation in the Czech Republic, and is treated in more detail in the following sections. Non-financial assets (housing, agricultural land and other domestic capital) make today the dominant component of private wealth, accounting for more than 60 per cent of total private assets. Among these, there is a strong predominance of housing assets, which make more than 80 per cent of private non-financial assets.

Housing as a proportion of national income remained relatively stable following this ‘one-time adjustment’. On the other hand, a strong rise in prices from 2005 was stalled from 2010, and one observes larger incurrence of household debt from the beginning of 2000s. In addition relatively regulated rental market (Lux 2009, pp. 102-110) might have limited steeper increase in house prices (a feature shared with its largest neighbor, Germany, equally characterized by more extensive rent regulation). In general, there has been a notably smaller increase in house prices than in other former socialist countries, in comparison to which the Czech Republic has by far the largest rental market. A sufficient reservoir of affordable rental housing implied a weaker demand pressure on housing appreciation than in countries with negligible (and expensive) rental market, where home-ownership has remained the sole tenure alternative. Hungary, for instance, is one typical example of the latter model, displaying in consequence much higher rise in the price-to-rent ratio than observed in the Czech Republic (Hegedus et al. 2011, pp. 315-322).<sup>25</sup>

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<sup>25</sup> Among other factors limiting the rise in house prices was a quite limited inflow of ‘hot money’ in the construction sector, prudent lending policy of the Czech banks, and more risk-averse Czech households (e.g. fixed interest rates and the absence of foreign denominated loans), etc.

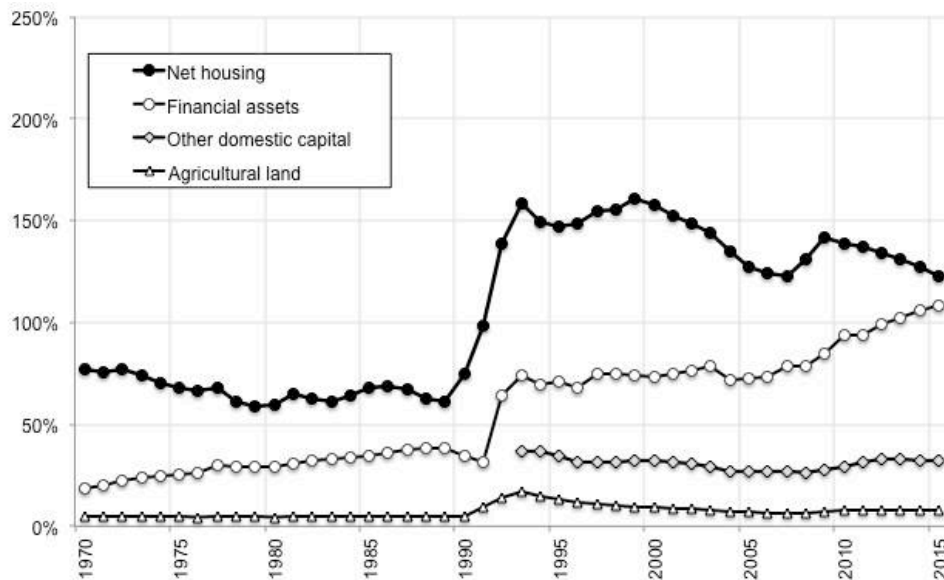


Figure 4: The components of the private wealth (as per cent of national income)

Note: Net housing after household debt

Private financial assets experienced a sharp and sudden rise at the outset of transition. In the course of the last decade financial assets have surpassed the housing wealth (net of liabilities) as the most important component of the private wealth. An emphasis is on safer financial instruments such as currency and deposits. In this respect, the Czech Republic is more similar to continental European countries than to the United States or the United Kingdom, as latter show higher preference for equity instruments. An initial prominence of equity among financial assets, indicated in Figure 5, should be mainly related to the large-scale ('voucher') privatization, which implied a large transfer of corporate equities from public to private sector and sparked in addition an early stock market bubble.<sup>26</sup>

<sup>26</sup> Another important factor was a marketization of the housing cooperative sector, with ownership claims on cooperative flats swiftly transferred (at below market prices) to cooperatives members (Lux 2009, p. 109). The housing cooperatives became relatively important type of tenure since the 1970s in Czechoslovakia, which explains relatively larger equities-to-national income ratio than observed in other transition countries at the start of the transition (Figure 6a). The housing cooperatives thus owned more than 20 per cent of the housing stock in the early 1990s (Sykora 1996), while the same proportion was negligible in countries with substantially higher home-ownership rates (above 90 per cent), such as Hungary or Bulgaria.



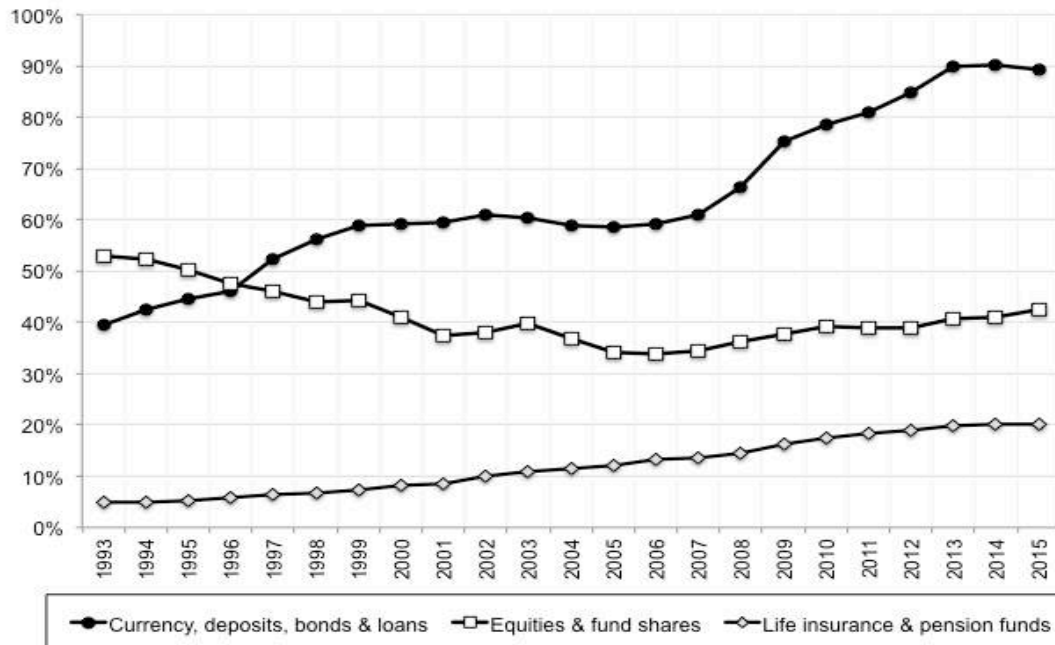


Figure 5: private financial assets (% of national income)

Figure 6a shows in addition that the ‘big-bang’ privatization practiced in the Czech Republic resulted in an instantaneous emergence of the capital market and initially relatively higher equity to national income ratio,<sup>27 28</sup> while the privatization process in Hungary started few years earlier and proceeded in a more gradual manner.<sup>29</sup> From the middle of 1990s, the ratio of equity holdings to national income has undergone a divergent evolution in the two countries. It fell in the Czech Republic in the late 1990s and has been stagnating since. In Hungary, in contrast, the ratio has been continuously rising, and today it is above the level observed in the Czech Republic. The Czech ‘stagnation’ pattern was set in motion by the burst of the stock market bubble, followed by the private sellout of equities and large foreign purchases (especially after joining EU), as well as the steady privatization of the housing cooperatives. In general, the divergent outcome between countries could be attributed to the chief privatization method pursued (Roland 2000). The ‘gradualist’ method, as pursued in Hungary or Poland, initially led to

<sup>27</sup> Note that the private ownership of enterprises is accounted for either through household *equity holdings* in the case of incorporated corporations and the so-called ‘quasi-corporations’ (whose capital stock is included in the corporate sector) or through *other domestic capital*, which refers primarily to capital stock (inclusive of inventories) of unincorporated enterprises included in the household sector. ‘Quasi-corporations’ are unincorporated enterprises included in corporate sector, in which case household ownership is established by the equity holdings.

<sup>28</sup> The Czech Republic showed as a result by far the largest number of listed companies in the early 1990s (see Berglof and Bolton 2002, Tab. 5)

<sup>29</sup> In Hungary, state firms could be transformed to joint stock companies from 1989.

more stable capital market, whereas ‘big-bang’ approach generated poor regulatory framework and poor investor’s protection, low liquidity, etc.

Against this background, we can attempt to explain a more conservative portfolio of Czech households (Allen and Šmídková 1998), whose sudden shareholder episode proved as disappointing and who show (as a result) higher preference for safer financial instruments than their Hungarian counterparts (Figure 6b). Thus, currencies and deposits account today for 80 per cent of national income, which is a level twice as large than found in Hungary. Equally, bank deposits (predominantly in domestic currency) were the sole category of private monetary assets during the socialist period, and frequently the sole saving alternative available.

The observed fall from 1989 to 1991 should be attributed to the effects of inflation, which featured initial phases of the transition all over Central and Eastern Europe. In Czechoslovakia, however, ‘transitional’ inflation was relatively modest in comparison to some other transition countries, such as Poland, where it assumed the contours of hyperinflation. Moreover, it has been argued that this ‘inflation tax’ was one of the chief reasons for implementing the give-away privatization scheme as it implied a redistribution of wealth from private (net lender) to corporate (net creditor) sector, and consequently reduced available private resources. A rise in the currency and deposits category since the outset of financial crisis in 2009 is partly related to deflationary tendencies in the Czech economy.

Pension funds, due to obvious reasons, start from very low levels but its rise has been relatively strong (Figure 5). Lastly, Figure 4 indicates that the indebtedness of Czech households (a difference between gross and net housing) is relatively small in the international setting.

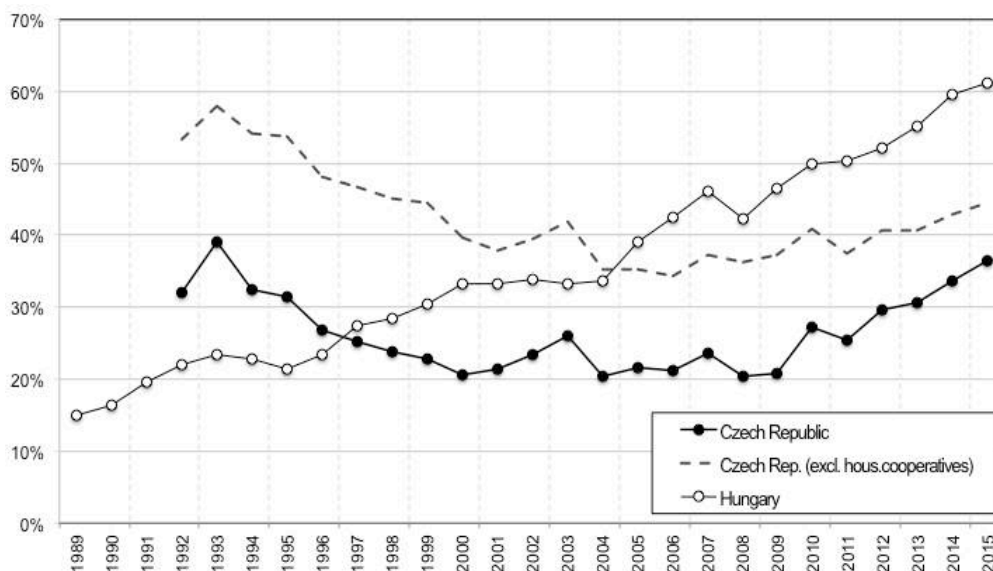


Figure 6a: Equity and shares in the private ownership (as % of national income); the Czech Republic and Hungary 1989-2015

Note: share of cooperative housing estimated on the basis of market value of corporate housing (see Appendix)

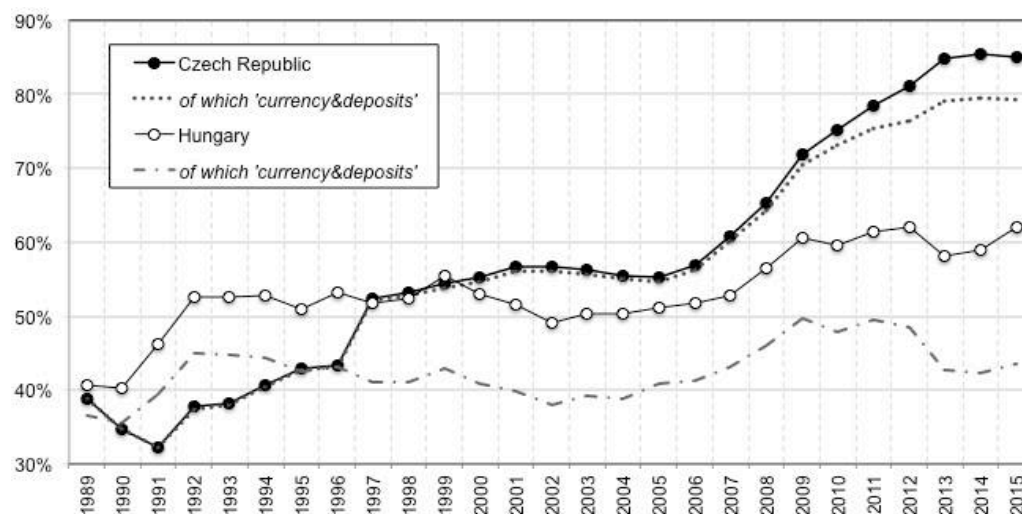


Figure 6b: Currency, deposits, bonds and loans (as percentage of national income)

The ownership of national equity and shares between different sectors<sup>30</sup> reveals two clearly distinctive patterns in the former socialist countries (Figures 7a and 7b). First, there was a strong drop in the public ownership after the fall of communism, and, second, a steady rise of foreign equity, turning eventually the 'rest of the world' into the dominant ownership sector. The foreign equity to national income ratio is today twice as large than the corresponding private ratio. The evolution in the Czech Republic and Hungary differed markedly in the early transition, when private equity in the Czech Republic significantly exceeded foreign holdings. As discussed above, this should be related to different privatization methods practiced in various countries. From the late 1990s, and especially with the accession to the EU, we see quite robust growth of foreign equity in both countries. Myant (2007, Tab. 5.1.), for example, sees business environment in the Czech Republic today as "dominated by subsidiaries of multinational companies and smaller Czech-owned firms". In addition, as Berglof and Bolton (2002, p. 88) note, the best companies in transition countries have often opted for established and more liquid western stock markets. In particular, they point that «companies listed in Germany accounted for

<sup>30</sup> Note that we assumed that private and public wealth is dominantly invested in domestic corporations, and similarly, that foreign investments are not of pass-through character.

most of domestic market capitalization in Hungary and the Czech Republic.» (p. 88). Plausibly, foreign-owned firms engage more often in cross-listing.

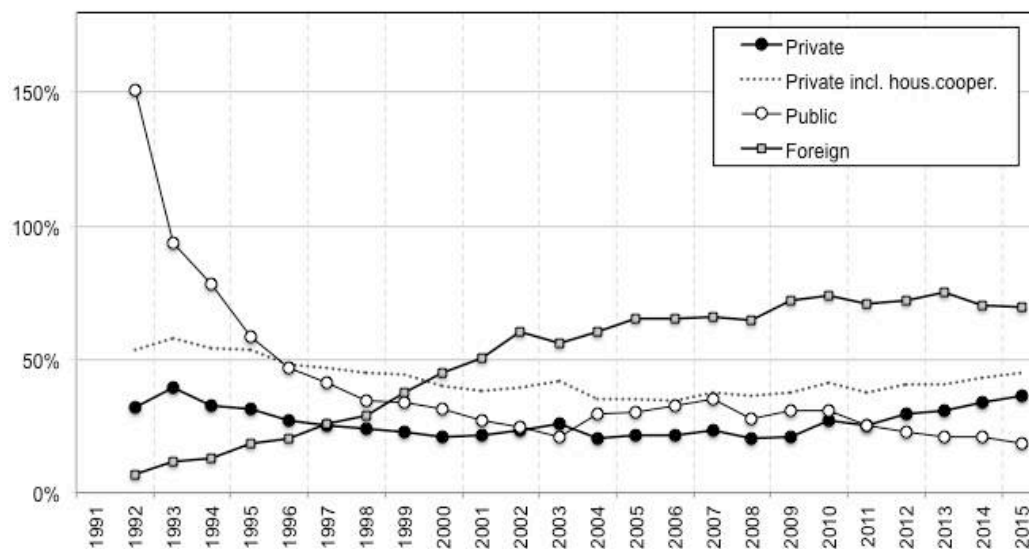


Figure 7a: Equity holdings Czech Republic

note: own estimate of private equity holdings after subtraction of shares in housing association (see Appendix)

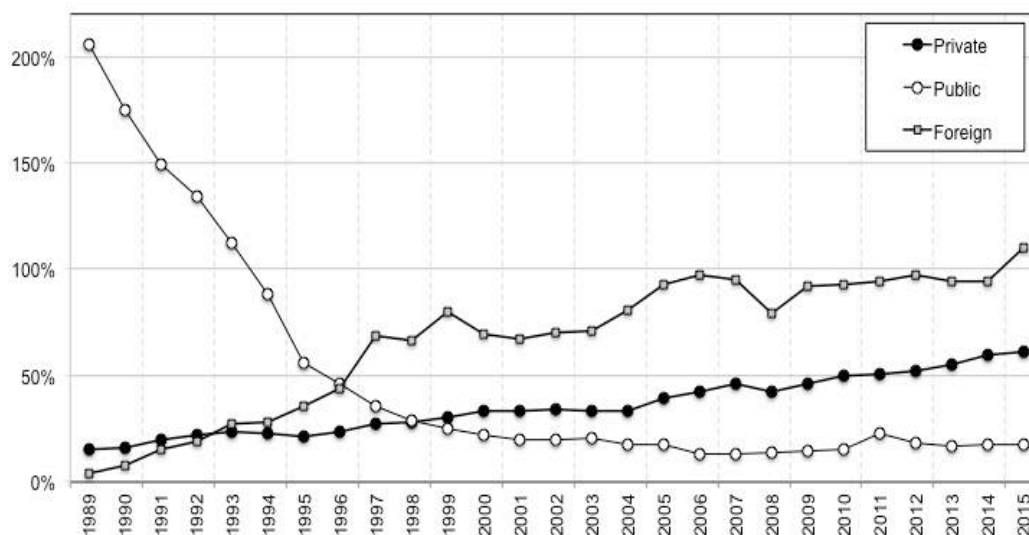


Figure 7b: Equity holdings Hungary

Source: own construction from official financial balance sheet

A strong decline in public wealth was primarily caused by privatization-related ownership transfers, dominantly of a giveaway character, as evidenced by the strong fall in government

equity holdings and other domestic capital. Equally, there was strong dissaving in the form bankruptcies and write-offs, as well as negative revaluations.

As for the main components of the government wealth, produced non-financial assets in the Czech Republic are roughly 200% of national income. This is by far the largest ratio observed among countries for which the wealth series have been constructed (Piketty and Zucman 2014). The predominant part of it, of roughly 80 per cent, refers to the public infrastructure<sup>31</sup> (non-residential buildings, other structures and land improvements), while inventories, dwellings and other non-produced assets<sup>32</sup> make for the remaining 20 per cent. this very high level could be traced to consistently high public investment during the communist period, discussed at some length below. Similarities in this respect to Asian 'extensive' growers (such as Japan or Korea), which also display a high ratio of government non-financial assets (e.g. IMF GFS database), provide some support to this line of argument.<sup>33</sup> Naturally, an overwhelming role of the public sector in the economic life during socialism (e.g. public sector produced 97% of output in 1986; Milanović 1989) has implied that the stretch of privatization has not encompassed every aspect of public wealth in the course of the last two decades.

In this respect, public non-financial assets are frequently regarded as a potential source of government financing, especially in order to relieve increasing debt burdens (e.g. Bova et al. 2013). But this question naturally goes well beyond strictly economic reasoning (even the most banal one, concerned with obtaining money fast), and includes important trade-offs, such as potential efficiency gains from privatization versus a society's preference for public service provision (e.g. health care, education, transportation, etc.).

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<sup>31</sup> To the accounting category of 'other buildings and structure' (AN.112 category in SNA; NACE 751 - *Public administration and defence services*; compulsory social security service (for example, National Property Fund has been included here)

<sup>32</sup> E.g., such as weapons system and cultivated biological resources.

<sup>33</sup> But equally, due to the lack of market prices for most of public assets, it should be recognized that there is an uncertainty surrounding the estimates obtained by the perpetual inventory method.

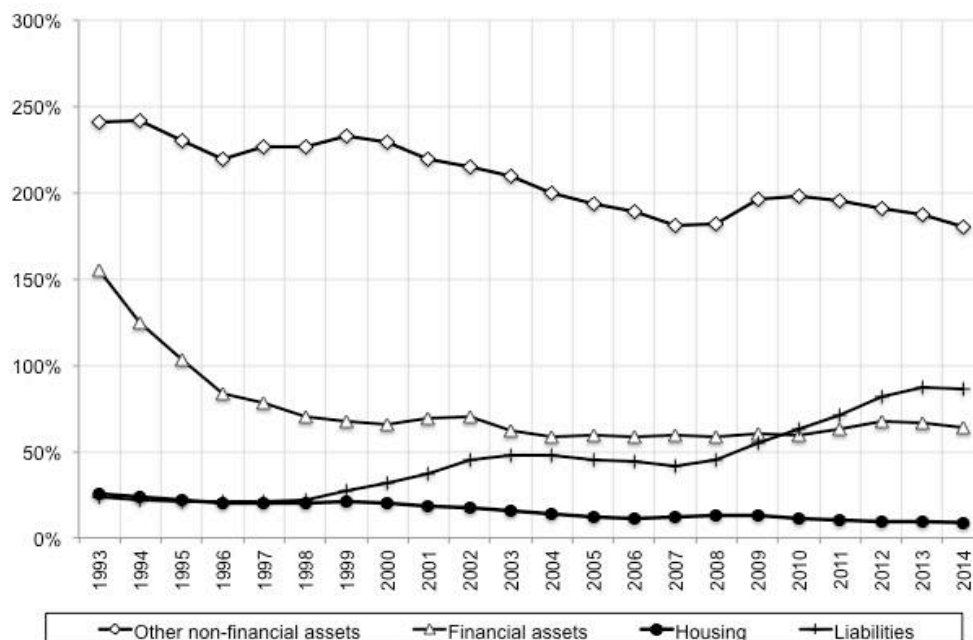


Figure 8: public wealth components as % of national income

Until recently, debt sustainability has not been a prime concern in the Czech public discourse. But the government debt has attained more notable levels since the start of the global financial crisis, when it doubled in size (from 40 to 80 per cent of national income) in the period of only five years. This should be in greatest part related to the increased deficit spending during the recent crisis. But, in general, future prospects are not reassuring for former socialist countries in Central Eastern Europe, as the low growth regime, induced by productivity slowdown (with convergence benefits exhausted) and alarming demographic trends, is expected to exert additional budget pressures. However, the observed levels are still relatively low in the international context (for example, when compared with other OECD countries). Figure 9 shows that the government debt in the Czech Republic started transition from relatively low levels in comparison to neighbouring Hungary. Former Czechoslovakia was among the lowest indebted socialist countries, in stark contrast to Hungary or Poland which incurred massive foreign debts. On the other hand, privatization process in the 1990s affected favourably the public debt evolution, especially in Hungary where privatization revenues led to a drop in public debt of almost 50 per cent by 2000 (IMF 1997). In the Czech Republic, it plateaued at the level of 20 per cent of national income. Again, one should point to different privatization methods as the most important cause of apparently dissimilar patterns, with direct sales in Hungary actually bringing

cash to the government in contrast to the dominantly give-away character of the Czech privatization.

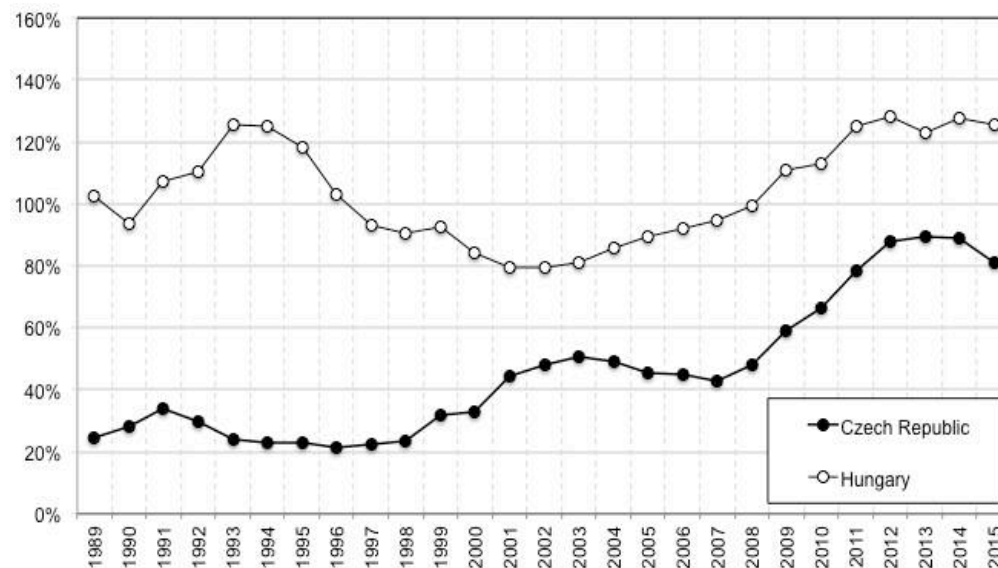


Figure 9: government debt in the Czech Republic and Hungary, 1989-2015

Note: Czech government debt before 1992 taken to equal gross external debt (from IMF )

### Domestic and foreign capital

National wealth can be alternatively defined as equalling the sum of domestic capital and the net foreign asset position. In a closed economy national wealth corresponds to domestic capital, as all domestic financial claims are offset by domestic financial liabilities. In an open economy, on the other hand, national wealth also includes net position toward foreigners, that is, the difference between residents' claim on assets abroad and foreigners claim on domestic assets.

Figure 10 shows that the domestic capital in the Czech Republic is predominantly composed of domestic capital other than housing, while housing itself accounts for a third of the domestic capital stock. Interestingly, as already noted, there has been no proportional rise in the housing component in the last two decades. Agricultural land makes today a negligible part of the country's capital stock.<sup>34</sup> A high proportion of other domestic capital refers primarily to the

<sup>34</sup> Note that land underlying dwellings is included in the housing stock. Only virgin forests are included in agricultural land, while timber forest is included under other domestic capital (in inventories).

government's capital stock, such as the public infrastructure (equivalent to two years of national income), and in smaller part to (market-valued) corporate capital.

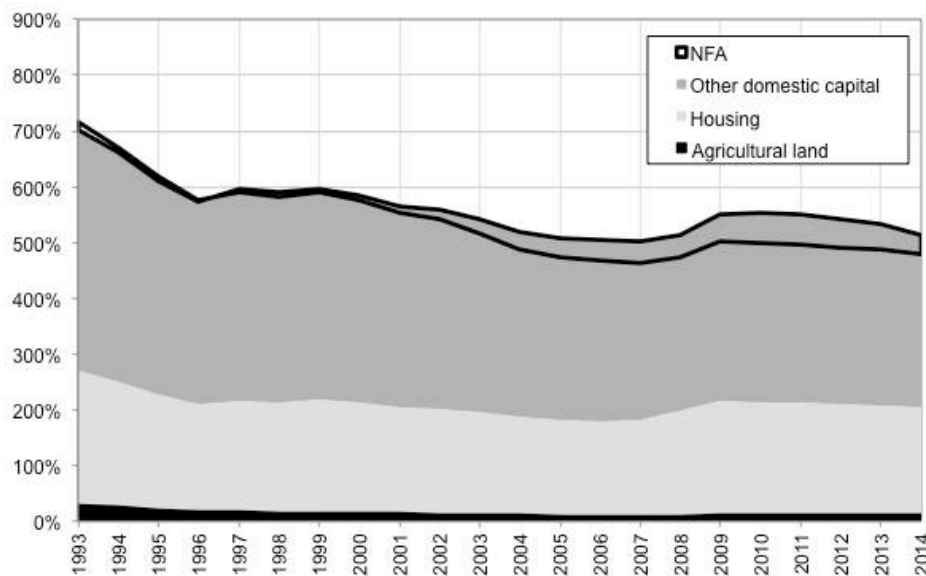


Figure 10: Domestic capital and net foreign assets in the Czech Republic, 1993-2013

Note:

In section 2 we discussed some difficulties concerning the valuation of domestic capital, in particular in the context of documented divergence of estimates according to market and book values, impacting primarily a valuation of corporations. Closely related issue, resulting in the same difficulty, is how to account for the subsoil assets. These refer to mineral and energy resources such as reserves of coal, oil, gas, and other minerals that are economically exploitable given current technology and relative prices. National accounts record them as fully owned by the Czech government. However, as pointed by Piketty and Zucman (2014b, p. 16), subsoil assets are in large part exploited by the corporate sector (including public corporations) and should be in theory capitalized in the equity value of these corporations. Consequently, there is a risk of double counting. On the other hand, the government receives rents (royalties) in return for granting extraction rights. However, these are very small in comparison to the values of subsoil assets, suggesting considerable government subsidies. The most recent revaluation of subsoil assets values them equivalent to two and the half years of national income, which is by far the highest ratio observed among advanced countries.<sup>35</sup>

<sup>35</sup> The recent upward revaluation was solely due to price effect (see Ondruš 2015, p. 5). This very high level of subsoil assets in proportion to national income in the international comparative context requires further investigation.



We opted in the end to value subsoil assets by the market value of corporate equity, which means that we did not include the value of subsoil assets reported in government balance sheets in our measure of national wealth. In addition to the ‘double counting’ argument, the primary reason in proceeding this way is of practical nature. We wanted to make the Czech series as comparable to other countries in Piketty and Zucman (2014). And in general, only few countries estimate the value of subsoil assets, which has additionally influenced these authors to rely on the market valuation.

Figure 10 shows that net foreign position of the Czech Republic has steadily deteriorated in the last fifteen years, and today is negative around 40 per cent of the national income. Thus, a larger decline in national wealth-income ratio,  $\beta_{nt}$ , relative to capital-output ratio,  $\beta_{kt}$ , has been caused by a rise in the foreign ownership of the domestic capital. This has been in a largest part a consequence of strong inflow of foreign direct investment (FDI) in the early 2000s, especially after the accession to EU. FDI have been perceived as a tool to hasten convergence with developed countries (in particular, acting as technology transfer) as transition economies needed to renovate its capital stock, make it more productive and adapt it to challenges of modern economy. The Czech Republic in particular has been successful in attracting foreign investment (in clear opposition to the ‘Lucas paradox’). Importantly, one should note that the worsening of net foreign position was not a result of inflow of ‘hot money’ in real estate sector as in some other countries in Central-Eastern Europe or, more notably, in Mediterranean countries.

At first, the sheer extent of the negative foreign position does not look alarming when considered in international perspective. But the importance of foreign capital has been definitely on the rise. Net capital income has reached negative levels equivalent to as much as 10 per cent of national income (Figure 11a). As can be seen, a further deterioration of the net foreign position has been only counterbalanced by the large trade balance surplus. Consequently, substantial negative net foreign capital income imply very high returns on net foreign assets (Figure 11b). This could be generally in line with higher capital intensity in the Czech Republic as evidenced by high capital-output ratio, suggesting that foreign capital entered capital (and resource) intensive industries. Some of it may be attributed to negative valuation effects (e.g. losses on foreign reserves due to strong koruna), but nonetheless should be taken as a robust indicator of very large profits made by foreigners. There is also, as we saw, some indication that foreign equities are strongly underestimated in national balance sheets and future corrections might result in larger negative net foreign asset position.

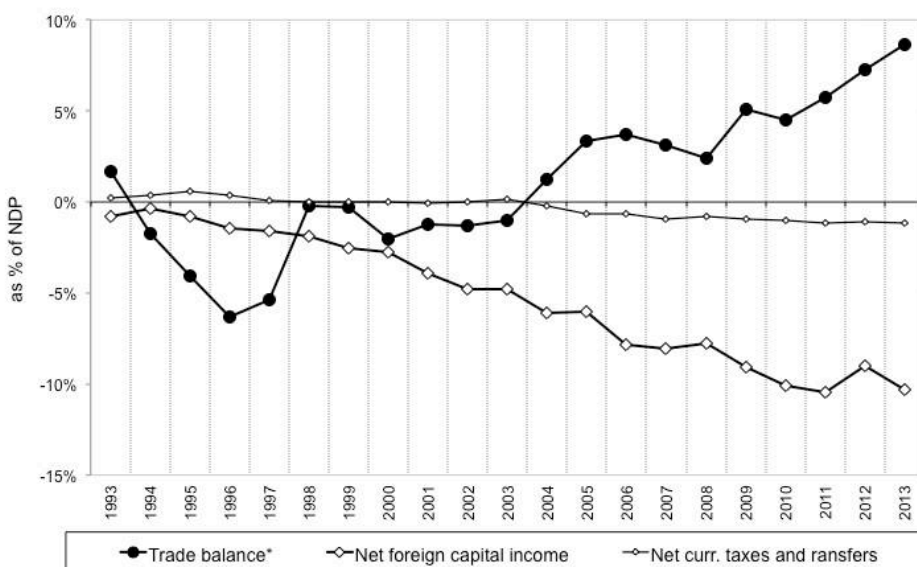


Figure 11a: current account in the Czech Republic

Note: net foreign labour income included in trade balance; net foreign capital income includes reinvested earnings on foreign direct investment (imputed category)

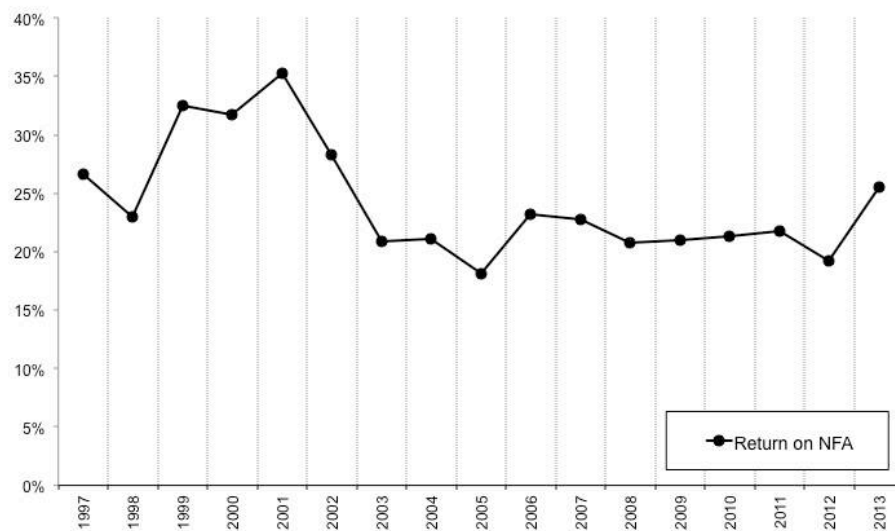


Figure 11b: Return on net foreign assets

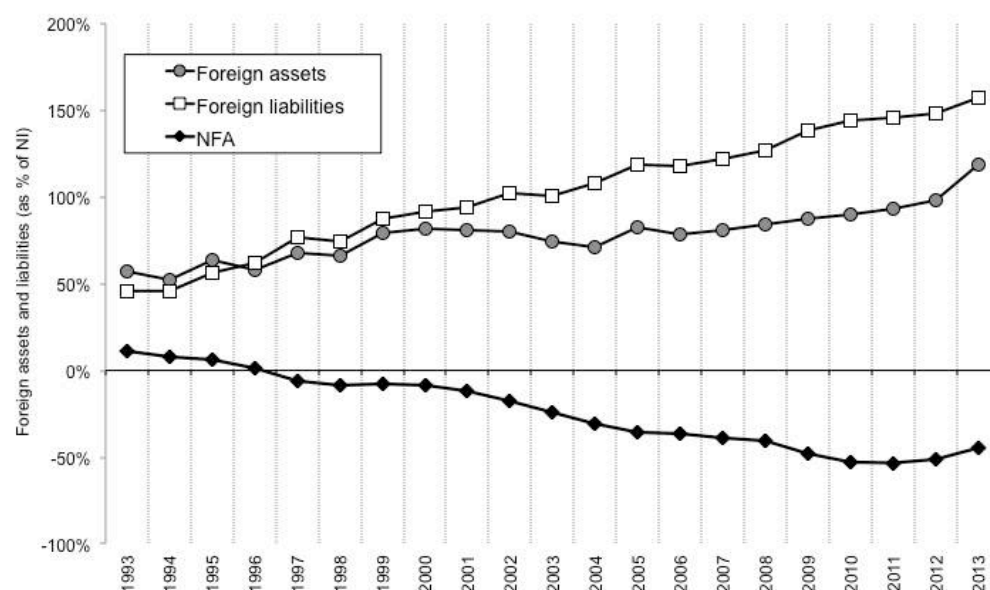


Figure 12a: Foreign assets and liabilities in the Czech Republic

## 5. Wealth decomposition

We look next at determinants of wealth accumulation. Piketty and Zucman (2014) find that in the long run the evolution of wealth-income ratio is reasonably well explained by the one-good wealth accumulation model, according to which the evolution of wealth-income ratio is shaped by the saving rate and the growth rate of national income. However, over shorter time periods real capital gains and losses typically play an important role.

Table 1 presents the growth rate and the private saving rate since 1990. The growth rate of national income in the Czech Republic has been in average 2 per cent, while savings rate has been 8.3 per cent. Taking a look at growth components in isolation, we can see that the growth of national income in Czech Republic has been solely driven by the rise in productivity (that is, in growth of per capita output), with practically zero population growth. The table also shows that

the strong productivity growth has been similar to that observed in Anglo-Saxon countries,<sup>36</sup> while the poor record of population growth has even outdone that of low-fertility countries such as Japan or Italy. An extremely low population growth is a well-known and worrying feature of post-socialist Eastern Europe. On the other hand, fairly robust productivity growth should be principally attributed to the positive effect of economic convergence with the developed countries after the breakdown of communism. Private saving rate has been lower than in 'Old Europe' and Japan. The difference is especially notable if one takes only personal saving rate, for which western European countries display rates more than double in size. As a reminder, private saving rate, shown in Table 1, is defined as the sum of household and corporate savings, that is, we assumed that corporate savings<sup>37</sup> contribute to private wealth accumulation. Relatively higher corporate component of private saving would suggest that corporations in the Czech Republic have relatively higher reinvestment rates than their counterparts in the Western Europe, which could be plausible for a faster growing economy.

	Real growth of national income	Population growth rate	Productivity growth rate	Net private saving rate (personal + corporate)	Personal saving rate	Corporate saving rate
Czech Republic	2,0	0,1	1,9	8,3	4,3	4,0
Germany	1,8	1,3	0,5	11,9	8,9	3,0
France	1,5	0,5	1,0	11,1	8,2	2,9
Italy	0,9	0,3	0,6	12,0	10,4	1,6
Japan	0,6	0,2	0,4	12,1	4,4	7,7
United Kingdom	2,2	0,3	1,9	7,4	1,9	5,5
United States	2,5	1,1	1,4	6,3	3,3	3,0
Canada	2,4	1,1	1,3	10,3	4,9	5,4
Australia	3,2	1,3	1,9	7,3	2,9	4,4

Table 1: Growth rate and saving rate decomposition in the Czech Republic and selected countries

Note: Czech Republic 1992-2013; other countries 1990-2010

<sup>36</sup> Note that the lower productivity growth in continental Europe and Japan is only observed when looking at average growth rates since 1990. Since 1970 all countries reported by Piketty and Zucman (2014), have exhibited similar productivity rise around 1.8 per cent, and all difference in growth stems from the population growth.

<sup>37</sup> Retained earnings [see note to Table 3a]

	(1) Net national saving	(2) Net private saving	(3) incl. personal saving	(4) incl. corporate saving	(5) Net government saving	(6) <i>Personal net capital transfers</i>	(7) <i>Government net capital transfers</i>
1993 - 2013	9,4%	8,3%	4,3%	4,0%	1,1%	2,0%	-3,4%
1993 - 1999	9,9%	9,4%	3,3%	6,1%	0,5%	4,0%	-7,8%
2000 - 2009	10,0%	8,9%	4,7%	4,2%	1,2%	1,2%	-2,6%
2010 - 2013	10,2%	8,6%	4,4%	4,1%	1,7%	1,4%	-0,7%

Table 2: Decomposition of national saving rate between private and public saving component

Note: saving expressed as a percentage of national income; note that capital transfers are not included

Table 2 presents a decomposition of national saving rate between private and public saving component. National savings consists dominantly of private savings, and public saving contributes for only a small part. Note that respective private and public saving flows do not include net capital transfers. We chose to show them separately due to their exceptional role during the transition, as these made an important source of private wealth accumulation (accounting for free or below market price transfers during the privatization) as well as assumed the main role in the large public dissaving. Consequently, we isolate them in the wealth accumulation decomposition, which is presented next.

Table 3a presents decomposition of the private wealth into savings and capital gains component for the period from 1992 to 2013. We can see that the real growth rate of private wealth (1.9 per cent) in this period was smaller than the growth rate of national income (2.3 per cent), which resulted that the private wealth-income ratio fell in two decades from 341 per cent to 311 per cent. Note, however, that the private savings flow would imply the growth of private wealth of 3.5 per cent a year, that is, much stronger than what is actually observed. This suggests that real capital losses, obtained as residual, were as high as 1.6 per cent a year on average.<sup>38</sup> The table shows that these huge negative revaluation effects mostly stem from the 1990s, when they were equivalent to 4 per cent a year. Private saving flow (including free and below-market price transfers) for 1992-2000 suggests saving-induced growth rate of private wealth equivalent to 4.2 per cent, while the real private wealth barely rose 0.2 per cent a year in this period.

<sup>38</sup> Note that other volume changes are included saving flow and hence do not to interfere with capital gains estimated as residual.

Even if one assumes that private savings is overestimated by the inclusion of corporate savings and takes instead only personal saving flow, the general message remains. Although now smaller in magnitude, real capital losses were still the main determinant of the real private wealth evolution in the 1990s.

Period	Start of period $\beta$	End of period $\beta$	Real growth rate of national income	Real growth rate of private wealth	Saving induced growth rate	<i>of which:</i>		Real capital gains induced growth rate
						<i>Savings</i>	<i>Capital transfers</i>	
<i><u>Private savings</u></i>								
<b><u>1992-2015:</u></b>	341	311	2,3	1,9	3,5	2,7	0,9	-1,6
1992 - 2000	341	301	2,0	0,2	4,2	2,4	1,8	-4,0
2000 - 2010	301	288	2,8	2,3	3,4	3,0	0,4	-1,1
2010 - 2015	288	311	1,8	3,1	3,0	2,5	0,5	0,1
<i><u>Personal savings</u></i>								
<b><u>1992-2015:</u></b>	341	311	2,3	1,9	2,6	1,8	0,9	-0,8
1992 - 2000	341	301	2,0	0,2	3,0	1,3	1,8	-2,9
2000 - 2010	301	288	2,8	2,3	2,4	1,9	0,4	-0,1
2010 - 2015	288	311	1,8	3,1	2,7	2,2	0,5	0,3

Table 3a: Private wealth decomposition, 1992-2015

Note: other changes in volume included in saving; *private saving defined as personal saving + retained earnings of private non-financial corporations + 50% of retained earnings of financial corporations + 20% of retained earnings in foreign-controlled non-financial corporations*

Table 4 shows decomposition into the volume and the price effect for the public wealth. Following the same logic, it can be seen that the negative revaluation effects have been the main determinant of public wealth development. Public wealth fell strongly at the rate of 2.2 per cent a year, while based on the public dissaving alone the fall should have been equivalent to the rate of 0.5 per cent a year. Consequently, a residual rate of real capital loss is estimated at 1.6 per cent a year. Equally as in the case of private wealth, negative revaluation effects were especially prominent in driving a huge decline in real public wealth in the 1990s, which fell on average at the rate of 3.7 per cent a year. Thus, the public dissaving (induced primarily by privatization transfers) explains 60 per cent of the decline in public wealth in the 1990s, while residual real capital losses the remaining 40 per cent.

	Start of period $\beta$	End of period $\beta$	Real growth rate of national income	Real growth rate of public wealth	Saving induced growth rate	<i>of which:</i>		Real capital gains induced growth rate
						<i>Savings</i>	<i>Capital transfers</i>	
<b>1992-2015:</b>	444	160	2,3	-2,2	-0,5	0,8	-1,3	-1,6
1992 - 1999	444	296	2,0	-3,7	-2,3	0,4	-2,7	-1,4
1999 - 2009	296	211	2,8	-0,6	-0,4	0,7	-1,2	-0,2
2009 -2015	211	160	1,8	-2,9	1,5	1,5	0,0	-4,3

Table 4: Public wealth decomposition

Finally, a prominent role assumed by the negative revaluation effects calls for their further decomposition into the domestic and the foreign component (see Piketty and Zucman 2014, Tab. 6). Table 5 shows real capital losses on the national wealth were predominantly experienced on the domestic wealth. This was notably the case during the transition in the 1990s when real capital losses played the key role in driving the evolution of national wealth.

One also finds capital losses on net foreign assets. These were driven both by losses on foreign assets as well as the rest of the world's gains on their investments in the Czech Republic. Losses on foreign assets were incurred primarily on foreign exchange reserves and, largely as a result of the steady appreciation of the Czech crown in the course of the last two decades (Rybaček, p. 511).<sup>39</sup> On the other hand, foreigners experienced strongest capital gains in the 2000s. When hopes of the 'Czech capitalism' were shattered in the late 1990s, culminating with the Russian financial crisis, foreign direct investments poured in more substantial volume, and especially intensified after the EU accession. This could be a sign of higher productivity gains of foreign-owned firms but also of relatively cheap privatization deals.<sup>40</sup> One should note that the direct sales to foreigners (for example, the most well-known is the sale of Škoda to Volkswagen) were in theory based on market values, determined by 'independent' valuation (UN 1993; Frydman et al 1993), but it is illusory to think that these could be (Arrow 2000)

<sup>39</sup> From 2014 CNB has embarked on monetary easing through foreign exchange interventions; subsequent depreciation of koruna might lead to the improvement of NFA position

<sup>40</sup>

Period:	<b>Real capital gains/losses</b> (% of end of period NI)	<i>of which:</i> on domestic capital	<i>of which:</i> on foreign capital
1990 - 2015	-135%	-122% <b>90%</b>	-13% <b>10%</b>
1990 - 2000	-122%	-115%	-7%
2000 - 2010	-32%	-10%	-21%
2010 - 2015	-27%	-38%	11%

Table 5: real capital gains/losses on national wealth

In sum, this exercise suggests a greater importance of negative revaluation effects for the wealth accumulation in comparison to developed countries, for example, even surpassing those stemming from the burst of the Japanese bubble in the 1990s. It is tempting to relate it to the restructuring during the transition. As capital inherited from the socialism was largely obsolete and unproductive, it was critical to renovate it and to adapt it to the challenges of modern economy.<sup>41</sup> However, privatization strategy practiced in the early 1990s did not produce positive results as had been expected, and markets became less excited at the prospects of genuinely effective restructuring. The stock market crash occurred already in 1994 and reached a nadir during the Russian financial crisis.

But, capital gains in this model are obtained as residual and are hence subject to measurement errors (note that losses and bankruptcies are captured by other volume changes, thus as dissaving). However, as pointed above, we prefer market valuation as the wealth benchmark for the very reason that, in our opinion, it might better encapsulate a comprehensive structural change during the transition. In this respect, an alternative wealth concept of the so-called book values, based on the replacement values of corporate physical capital, seems less satisfactory. The latter is based on PIM, whose well-known deficiencies are especially problematic for the 'quality' transformation during the transition (see section 2).

Accordingly, one finds consistently higher book-value national wealth, and the gap has been increasing with the passing of time. Having addressed these issues in more detail in the section

<sup>41</sup> For example, we see negative revaluations of inventories, which were kept in communism above rational levels.



2, here it suffices to point that this divergence is communicated by the evolution of Tobin's (equity)  $q$  ratio, which has been steadily falling from levels *close to 1* (indicating equality between book and market values) in the early transition to 0.5 today. It is conceivable that the in the state of general uncertainty and the lack of information in the first transition years, book values presented a reasonable yardstick for market valuation. But this initially closer correspondence actually implied substantial overvaluation, and the strong downward adjustment ensued (Toscovsky, p. 167). The evidence on asset price development in the Czech Republic since the 1990s do not contradict residually obtained negative revaluation. For example, Prague stock exchange PX index recorded a dramatic fall in 1994 and practically did not experience any recovery until the early 2000s.

Conceivably, statisticians might have equally underestimated the value of equity. This could be particularly problematic for unquoted shares in relatively young market economies with low market capitalization, and where statisticians still need to develop more sophisticated methods to impute market values to unlisted firms.<sup>42</sup> However, this raises additional questions, such as whose equity is actually underestimated, that of private, public or foreign sector? We have attributed the 'residual' corporate equity (of firms according to ownership control: national private controlled, public controlled, foreign controlled) to respective sectors<sup>43</sup>, and this would, for example significantly raise the level of private wealth, making Czech households almost as rich as a proportion of national income to households in advanced countries, and in consequence much richer than in other former socialist countries. On the other hand, the ROW's holdings would similarly increase, explaining in part a puzzle of very high returns on the foreign position, and potentially turn into a burning political issue. We recognize this as the important direction for further data improvement, but at the moment it is still unclear how reliable is this approach. [See appendix]

Here, one should also mention a 'stakeholder' explanation of less-than-one Tobin's  $q$  proposed by Piketty (2011), who pointed to a notable difference in the extent of ownership control between Anglo-Saxon and continental European countries. In the latter countries, most notably in Germany, shareholders have less control over company's assets (e.g. due to voting rights of workers representatives and regional governments) than in the former, and consequently the market value lags behind the book value (the opposite being true for Anglo-Saxon countries

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<sup>42</sup> See appendix for methodology applied by the Czech Statistical Office

<sup>43</sup>

such as the US and the UK). As noted by Piketty and Zucman (2014), according to the “stakeholder” view, book value is closer to value for all stakeholders.<sup>44</sup>

Yet, it is still not clear why afterwards, especially after joining EU, there was no substantial rebound in stock prices. The Czech Republic’s proximity and similar institutional framework as in Germany (for example, the influence of German corporate law) could possibly account in part for the less than one Tobin’s  $q$ , at least when it comes to the absence of recovery since the turn of the century. Moreover, Germany is the largest foreign investor in the Czech Republic,<sup>45</sup> and FDI may present an important channel in strengthening the institutional link between two countries (and promote the expansion of ‘Rhenish’ capitalism; Albert 1993, Piketty 2014).

In the case of housing, we saw that the critical event was marketization and price liberalization in the first transition years. The location has assumed the main role, especially with marketization of land, which had previously been centrally allocated for construction use and was not a part of private ownership. In this respect, the rise in private wealth is similar to global trend of real rising house prices, which is the most important contributor to positive revaluation effects in the majority of developed countries.

A subsequent stronger increase was hindered by quite limited inflow of ‘hot money’ in real estate sector, in contrast to some other Central-Eastern European countries or notably Mediterranean countries (such as Spain or Greece). Additional limiting factor could be attributed to still relatively controlled rental market in the Czech Republic. In this respect, one could draw again a parallel to Germany, which stands as an exception among developed countries by experiencing negative revaluation effects, and where Piketty and Zucman (2014) equally hypothesize that the strong rent controls could have hindered a real estate price recovery documented in other developed countries.

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<sup>44</sup> As mentioned above, Boycko et al. (1993, pp. 157-162) saw relatively stronger stakeholder control as the main reason behind the extremely low market values of Russian corporations at the beginning of the privatization (what they call ‘expropriation of shareholders by stakeholder’). They pinpoint three major stakeholders - employees, managers, and the government – who had ‘skimmed off’ the shareholders’ value. The greatest similarity of the Czech and the Russian mass (‘voucher’) privatizations. Obviously, in the early transition, with weak institutional framework and poor investors’ protection fears of eventual expropriation/nationalization were quite rational.

<sup>45</sup> A high prominence of direct investment from Netherlands may be seen as ‘shell’ companies.

## 6. The long-run wealth structure in Eastern Europe

Figure 13 provides a glance at the century-long evolution of the aggregate wealth in the Czech Republic, by showing the composition of domestic capital into agricultural land, housing and other domestic capital (Piketty and Zucman 2014). This period has been marked by the exceptional turbulence as evident by unprecedented alterations of institutional settings and changing political units, which have profoundly affected wealth trajectories.

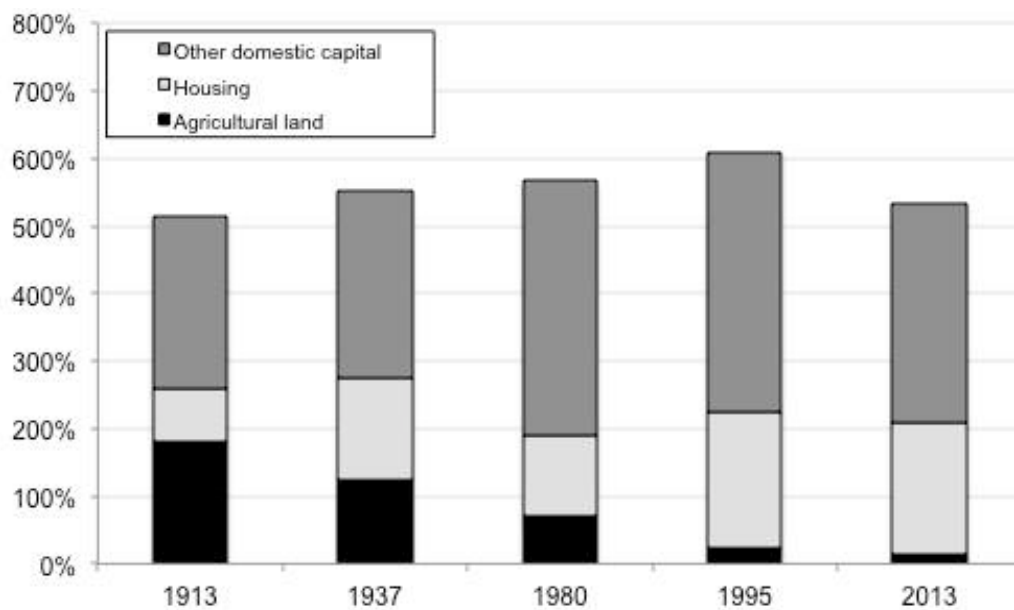


Figure 13: Domestic capital as percentage of national income

Source: estimated from: 1911-13: Bibl (1927); 1937: Stadnik (1968); 1980, 1993 and 2013: own estimates

Pre-WWI estimates are roughly around 500% of national income, thus somewhat smaller than observed in developed countries, which were between 600% and 700% at the time. Further, in contrast to the evolution of series in developed countries reported by Piketty and Zucman (2014), there was apparently no spectacular fall in the national wealth-income ratio in the interwar period. However, it is almost certain that the U-shape development did occur between 1913 and 1937, but in all likelihood it was less spectacular than in majority of countries in the sample. First, the war activities during the World War I were not extensive in the Czech Lands, and, consequently, a war related destruction did not take its toll on the country's capital. But it should be pointed that war destructions even in war struck France, as pointed by Piketty (2011, p. 1094), explain only a small part of the dramatic fall in  $\beta$  between 1913 and 1949 (just 10% of

the documented fall), and real capital losses account instead for the most of the French wealth obliteration in this period. The early 1920s were the scenery of the most dramatic fall of wealth-income ratio in the European countries. The period was characterized by unparalleled capital shocks, such as hyperinflation or the introduction of variety of anti-capitalist policies (Piketty 2011). While these tendencies were equally present in Czechoslovakia (e.g., strong rent control introduced during WWI, a general capital levy in 1919, the land reform, etc.), it seems that the corresponding experience was less dramatic, whether we take as indicators successful currency stabilization that kept inflation under control (which achieved epidemic proportions in the region),<sup>46</sup> rent deregulation, or pro-capital policies of the Czechoslovak interwar government promoting a rise of the national (Czech) bourgeoisie (such as the 'nostrification' of former German/Austrian capital, lower taxation etc.). Finally, a robust recovery in the stock prices took place in the second half of the 1930s (Berentzwiller 1936), equally documented in developed countries such as the United Kingdom or France.<sup>47</sup>

Figure 13 shows that an increase in the housing component presented a major change in the capital composition between 1913 and 1937. Historical evidence indeed point to a construction boom in the period from 1920 until 1938, strongly supported by the government (Poláková 2006; Čákr 1936, p. 345). On the other hand, the housing shortage (and the poor quality of the existing housing stock) was a serious problem during the Habsburg era, in part as a consequence of very high buildings tax in urban areas, which discouraged new construction<sup>48</sup> (Mildschuh 1909; Van Sickle 1931, p. 14). Thus, the new construction (volume effect) should be identified as the dominant force behind this rise. In addition, rent controls, introduced during the War, were largely removed in the late 1920s (Krejčí 1972), leading to the recovery of real estate prices by 1937.<sup>49</sup>

Housing continued to play a critical role in the long-term evolution of the aggregate wealth. Figure 13 suggests that the importance of housing in the total wealth decreased in communism

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<sup>46</sup> This was a remarkable achievement (personified by the Minister of Finance, Alois Rašín) when taken into consideration that inflation assumed unprecedented historical levels in the neighboring countries (Austria, Germany and Hungary, Poland).

<sup>47</sup> For example, in the UK, beta fell from 679% in 1913 to 253% in 1920, but recovered to 428% in 1935; in France it fell from 671% in 1913 to 226% in 1925, and then to 430% in 1938 (Piketty and Zucman 2014)

<sup>48</sup> Similarly in the countryside due to more favorable treatment of undeveloped building land than improved building sites, as the former was taxed as "the immediately adjacent agricultural or forest land" while the later as than in large urban centers (Van Sickle 1931, p. 16).

<sup>49</sup> Willis (1950, p. 73) notes that the rent decontrol in post-WWI Czechoslovakia was quite extensive in the international comparison (which was closely related to the lower inflation in interwar Czechoslovakia, as noted above).

relative to the First Republic. This resulted from the combination of the volume and the price effect, the latter however assuming the dominant role. Global prices were generally depressed in post-WWII decades (Piketty 2014; Knoll et al. 2015).

The communists nationalized largest part of the housing stock in towns on ideological grounds.<sup>50</sup> Private ownership was allowed only in the countryside and suburbs. The housing policy was guided by the principles of the universally accessible and affordable housing, designated as the basic human need. This goal was to be achieved through the all-embracing state control over each aspect of housing sector, from construction to allocation and renting (Sykora 1996, p. 272). The state owned as a result the greatest share of the housing stock among all socialist countries.

Communist rule largely suppressed real estate market, and we had to resort instead to replacement cost estimates of housing (see appendix). Conceptually, this procedure is to certain degree warranted because the officially set prices based on housing construction costs<sup>51</sup> were legally fixed as the selling price during communism,<sup>52</sup> for on the whole rare property transactions between private individuals (family and vacation houses in personal ownership could be traded) or for orders of co-operative housing (provided only by state construction companies) (see Sýkora and Šimonícková 1996, p. 76). The purchase price of cooperative housing was certainly closer to market-clearing price (than state allocation), yet it was still heavily subsidized.<sup>53</sup> Transaction prices on the grey market substantially exceeded official prices, indicating thus excess demand, but we focus here only on legal prices.

The communist period was plagued by suppressed inflation in housing, with supply strongly lagging behind demand. The excess demand was induced by extremely low rentals (coupled

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<sup>50</sup> One should be reminded of the famous Marx and Engels quote: “when the capitalist mode of production is destroyed, a solution to the housing problem can be found” (quoted from CIA (1955), Housing policies in the Soviet Union).

<sup>51</sup> These correspond to ‘estimate prices’ in Soviet parlance, and were, by all accounts, significantly underestimated (certainly well-below market clearing prices)

<sup>52</sup> Sykora and Šimonícková (1996, p. 76) thus point out that “sale prices were regulated by the state through property valuations that reflected “brick and mortar” rather than willingness of people to purchase.”

<sup>53</sup> Buckley et al. (1994, p. 9) specify: “Construction cost in the [former socialist countries] was directly lowered by four “capital” subsidies: land was provided for residential use by the state at little or no cost; the price of labor and materials contained substantial subsidies; direct grants from the state budget were provided to finance construction of both owner-occupier housing and state cooperative development; and long-term mortgage financing for cooperative and owner-occupied housing was provided at below market rates.”

with high tenure protection, corresponding to 'quasi-ownership'<sup>54</sup>), which were kept artificially low throughout the whole socialist era due to the special treatment of housing as the social good<sup>55</sup> (for example, rent on state flats remained unchanged from 1964 until 1991; see Lux 2009, p. 96). Buckley et al. (1994) thus note that the price distortion was actually largest in the case of rents, while Kingsley and Stryuk (1992) show this to be an even more acute issue in Czechoslovakia than in other communist countries.<sup>56</sup> The housing sector, in consequence, manifested standard corollaries of price ceilings, such as housing shortages, long waiting lists and queuing, low housing quality (such as well-known *panelaky* or panel buildings) and poor maintenance, inefficient allocation<sup>57</sup>, bribery, etc. (Michalovic 1992). On the other hand, the provision of housing was almost entirely assumed by the state (with giant construction monopolies created for this purpose)<sup>58</sup>, but despite recurrent official proclamations placing housing as the top party's priority, its share in the total investment was rather modest and declining as time passed. On the other hand, the building land for housing constructions was administratively allocated for use and could not be a part of the private ownership (Sýkora and Šimonícková 1994, p. 76). In Prague, for instance, the so-called STOP prices were used for the inter-firm allocation. These were established already in the 1930s (as their name implies, to stop the sharp rise of urban land prices), then notably reduced in 1953, to remain practically unchanged for the following three decades (ibid.).

As noted, asset markets were generally quite limited or altogether missing in the socialist countries. This was more pronounced in countries with the extensive state ownership, such as in former Czechoslovakia and the Soviet Union. Thus, whenever available, we use the evidence on market prices in other socialist countries to compare replacement values with market values

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<sup>54</sup> Lux and Mikeszova (2012, p. 78) thus note that "tenants who were allotted flats by the state obtained unlimited occupancy rights. No one spoke about 'renting' but about 'use' of a flat." This resulted in the practice of 'life-long' tenancy (and inheritance), which strongly limited labor mobility.

<sup>55</sup> Rents could not cover operating and maintenance cost, thus large state subsidies were needed. These were primarily financed from wage taxes, and although lowered income reduced demand, large disequilibrium still persevered.

<sup>56</sup> For example, in Czechoslovakia rent equaled 2.3 per cent of income, while it was 3.5 per cent in Poland, or 4.5 per cent in Hungary and Bulgaria (Kingsley and Stryuk 1992, p. 11). Consequently, a 100 per cent increase in rent in 1991 was still well below market levels (Kingsley et al. 1993, p. 231).

<sup>57</sup> Allocation policy did not target lower income families (priority was given to party and army personnel (Lux 2009, p. 96)). Moreover, everyone paid equal rents, regardless of location or tenant's income.

<sup>58</sup> There was markedly larger private construction of family houses in Slovakia than in the Czech Lands (e.g. in the late 1960s family houses in Slovakia accounted for 60% of housing construction, while the corresponding proportion was only 15% in Bohemia), because higher-quality public construction was less available in Slovakia, as well as, according to Michalovic (1992, p. 41), due to traditionally stronger status concerns attached to homeownership in Slovakia.

(e.g. Goldsmith and Lipsey 1963, p. 21). For example, the real estate market was more extensive in former Yugoslavia, and Figure 14 compares market value estimates of housing in two former Yugoslav republics, Croatia and Slovenia (Kukić and Novokmet 2017) to our series for the Czech Republic. It can be seen that the housing as proportion of national income was quite similar in two countries during socialism, furthermore suggesting compatibility between replacement and market values (on the equilibrium between asset market and replacement values, see DiPasquale and Wheaton 1992).

The overall evidence for other socialist countries endorse the picture presented above – of relatively lesser share of housing in the total wealth. Figure 15 provides the composition of the domestic capital in Czechoslovakia, Hungary, the Soviet Union and Slovenia, and it can be seen that in all countries the housing accounts for relatively smaller portion of national wealth. Goldsmith (1985), for instance, takes notice of much lower share of residential structures in the total wealth in socialist countries in comparison to western countries, which he regards as “evidence of poor housing conditions and the result of the low position of housing in the planners’ utility function” (p. 287).

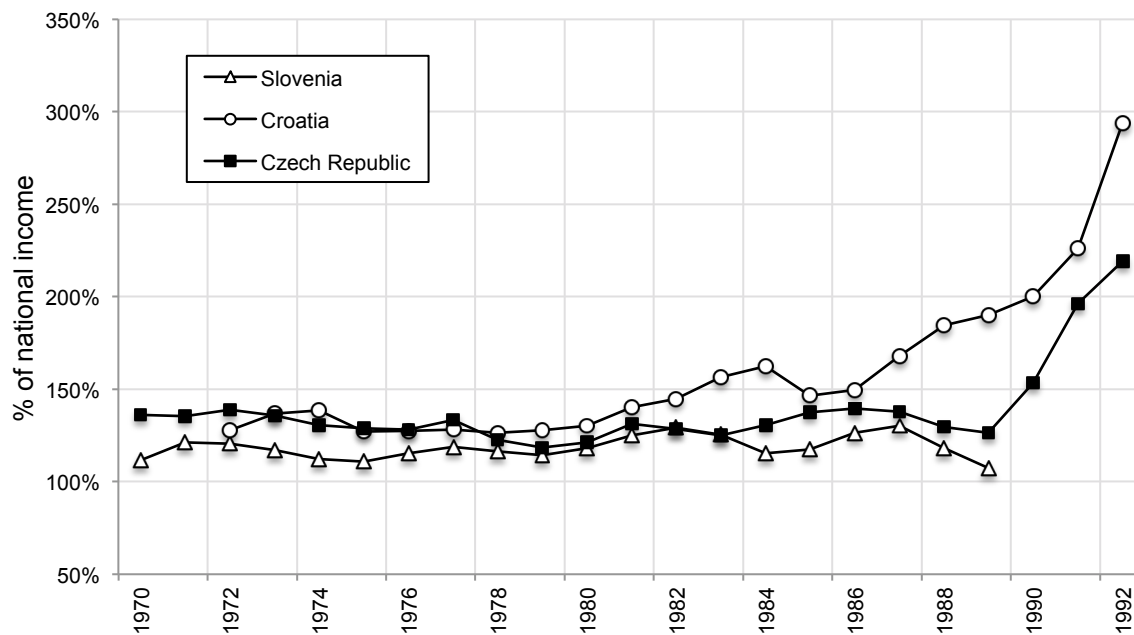


Figure 14: Housing in the Czech Republic, Croatia, and Slovenia

Source: Croatia and Slovenia from Kukić and Novokmet (2017)

A rise in the value of housing is obviously one of the key issues in transition. It produced the greatest impact on the formation of private wealth in transition economies.<sup>59</sup> Liberalization and the emergence of real estate market and in the early 1990s led to the rapid housing price inflation. The overshooting of real estate prices over the general price level might be explained by the liberalization of the housing sector, which had displayed the largest price distortion during the communist era. Residential land in particular became the most important pricing component, and the location differential became critical.<sup>60</sup> A surge in demand created the 'housing bubble' in many areas, especially in large cities, notably in Prague (as well in other East European capitals, e.g. for Budapest see Alm and Buckley 1994), the more so as there was a sluggish response in new construction due to a strong rise in construction costs (a hike in the material, energy, labour costs, in interest rates, in land prices, etc.)

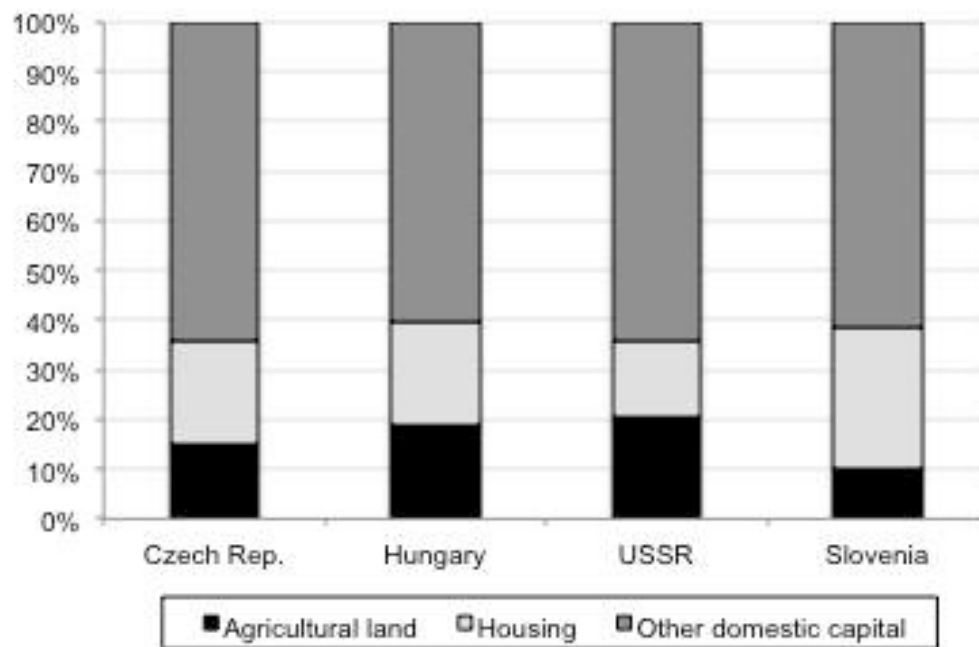


Figure 15: at the end of the 1970s

Source: Hungary and USSR: Goldsmith (1985,); Slovenia (Flajs 1986)

<sup>59</sup> Former socialist countries have home ownership rates above 80 per cent, while in advanced economies this proportion is on average 50-60 per cent. The homeownership rate in the Czech Republic is somewhat lower than in other CEE countries (around 50% of the housing stock) such as Bulgaria, Slovenia or Hungary (around 90% of the housing stock), but the share of housing cooperatives in the Czech Republic is more important (around 15% of the housing stock; also in Slovakia and Poland); and whose members enjoy similar rights as in the case of homeownership. With respect to the share of rental housing, the Czech Republic came second in importance behind Latvia around 2000 (the respective proportions of the housing stock are 29% in the Czech Republic and 30% in Latvia) (see Lux 2009, Table 2.1).

<sup>60</sup> See in appendix that construction cost moved in line with the general prices.



Figure 13 further shows a fall in the importance of the agricultural land in the total wealth as another critical change in the long-term structure of wealth. This has been a universal experience along the development path. While in 1913 agricultural land still accounted for almost a half of the national wealth, its proportion has become negligible a century later.

But one should not look at the decline in the importance of agriculture in the 20<sup>th</sup> century as the natural process overcoming backwardness in the country's economic development. Actually, the transformation of agriculture played a decisive role in bringing about capitalist development in the Czech Lands in the 19<sup>th</sup> century, which assumed in turn a specific 'industrial-agricultural' character (chapter 1). The commercial agriculture had been almost as important to country's economy and export potential as its strong industry. During the interwar period cultivated land accounted for relatively high proportion of the total land in comparison to other European countries (Teichova 1988)<sup>61</sup> with the important share devoted to 'industrial' crops such as sugar beet, hop or potatoes. A switch to communism replaced this successful model, resting on the market-oriented private farms, with the complete land collectivization and the central planning. In consequence, this led to a fall in productivity (Lazarcik 1963)<sup>62</sup>, and, as lamented by Teichova (1988), to a demise of "one of the most productive European agricultures".

Notwithstanding this negative productivity shock, it seems that the relatively important weight of the agricultural land in the total wealth was rather artificially kept alive during the communism (relatively longer than was the case in the advanced countries). Figure 15 further suggests this to be a common feature of the communist countries.<sup>63</sup> It might be conjectured that the policy of agricultural self-sufficiency imposed an oversized agricultural sector during socialism.<sup>64</sup> Accordingly, the fall of communism indeed caused a major disruption in the agriculture of

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<sup>61</sup> For example, in interwar Czechoslovakia cultivated land accounted for a substantial part of the total country's area (around 43 per cent of its total surface in 1928 (see *Aperçu statistique* 1930, p.65, Tab. 1)

<sup>62</sup> Ellman calls it diseconomies of scale in agriculture.

<sup>63</sup> Goldsmith (1985) shows that socialist countries covered in his analysis exhibit higher proportion of agricultural land in the total wealth in comparison to capitalist countries.

<sup>64</sup> A strong determination for food self-sufficiency was critical for the organization of the vastly oversized agriculture (especially after the Soviet Union could not ensure any longer needed grain amounts in the late 1960s, while the country had been facing unfavorable world prices). This politics led to strong concentration of cooperative and state farms, the extension of cultivation and further intensification of agriculture. The production was pushed further notwithstanding the fact that it was frequently cost inefficient, while detrimental effects on the environment were altogether ignored. It is generally acknowledged that the agricultural production assumed artificially high production levels (e.g. see Liefert and Swinnen 2002), supported only by the extensive government subsidies (state paid to agricultural producers much higher prices than consumers paid). In comparison to western countries, there was much larger proportion of employment in agriculture in early 1990s, around 12% of workforce (Roland 2000).

transition economies. Thus, agricultural land underwent in transition an opposite development in comparison to housing, as discussed above.

However, a frailty of estimates for land and other non-produced assets has long been recognized as the Achilles heel of the national wealth accounting, and this pertains even more to socialist countries. The communist accession to power led to the complete collectivization of agriculture in Czechoslovakia<sup>65</sup>, and in the resulting absence of land market, indirect methods, such as capitalizing the land rent needed to be employed for the land valuation (see appendix for details). This method results in quite stable proportion of agricultural land to national income, equivalent to 50%, in the period from 1970 until 1990. Obviously, one should not dwell too much on the meaningfulness of these estimates. Clearly, estimates based on 'economic' values (related to the potential land productivity) could be far removed from market values<sup>66</sup>. In addition, especially problematic are assumptions regarding the estimation of the land rent and the appropriate capitalization factor (e.g. Goldsmith 1964). The only socialist country with unusually rich evidence on market land prices is Poland. We have used these data to construct the series for market value agricultural land. Figure 16 shows that the ratio of agricultural land to national income was steadily falling from the late 1950s until mid-1970s, when it stabilized at levels slightly below 40 per cent. The lag of land prices behind the income growth may be attributed to the large-scale industrialization, which relieved chronic overpopulation in rural areas (Clark 1973). Accordingly, traditionally land-hungry regions, such as Krakow region (chapter 3), displayed consistently higher land prices. The evolution of the value of the agricultural land in Poland shows that communist countries underwent the similar process of fall in land (Figure 13).

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<sup>65</sup> Less than 5 per cent of agricultural land was in private ownership (Hudečková and Lošták 1992). Similar situation was in the Soviet Union. On the other hand, in Poland and Yugoslavia the dominant part of the agricultural land remained in the private ownership, with less than one-fifth of the agricultural land nationalized.

<sup>66</sup> As we are aware for socialist countries, only Vinski (1957, 1959) for Yugoslavia compares the market value and the 'economic' value (based on rent capitalization) of the agricultural land in 1953. As noted, this was possible due to the relatively higher proportions of privately owned land in Yugoslavia. Alternative estimates, however, did not differ substantially.

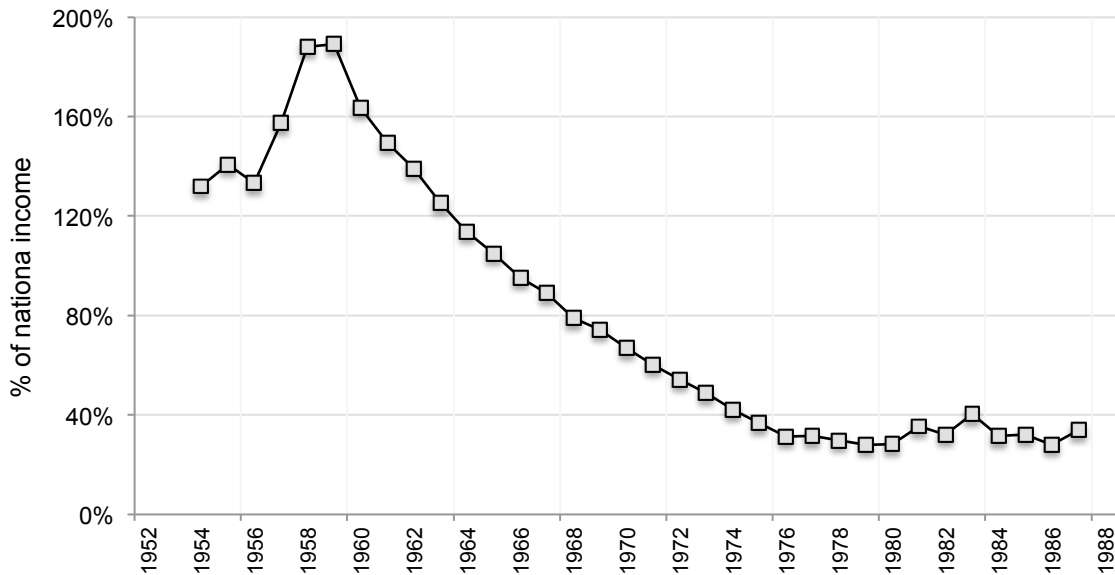


Figure 16: Market value of agricultural land in socialist Poland, 1954-1988

Source: own estimate: regional market land prices are applied to regional land area (*Rocznik Statystyczny*, various ed.)

Figure 13 shows a fall in the importance of the agricultural land with the return to market economy in the early 1990s. With the fall of communism and the subsequent liberalization of agriculture, market forces responded to the distortions in agriculture stipulated by the central planning (by the same token as they responded to the excess demand in the housing sector).<sup>67</sup> Here, one could speak of 'oversupply' of agricultural land, notably through the extension of marginal land during socialism as a part of policy of food self-sufficiency (it thus connoted a volume effect). But one should point to non-economic factors as the main 'corrective' factor, in the first place to the radical change in ruling ideology with the system change, which implied diminishing prospects of agriculture and resulted in shrinking land use, especially in its change to building use or springing up of wastelands.<sup>68</sup>

<sup>67</sup> In particular, the purpose of land value differs fundamentally in socialist and capitalist system.

<sup>68</sup> In general, there have been strong incentives for changing the status of agricultural land to the construction use there was a rise in the value of non-agricultural land, notably that underlying structures. The evidence on land use show a substantial expansion of (sub)urbanization, especially around big cities. In most of the cases, a desertion of agricultural land simply resulted in 'new wilderness' (Bičík and Jeleček 2009). In addition, privatization of state and collective farms through restitutions created numerous smallholdings, whose new owners were seldom engaged in agriculture.

## 7. Development of wealth-income ratio, 1970-2015: Selected topics

### 7.1. 'Capital Fundamentalism'

*"Accumulate! Accumulate! That is Moses and the Prophets." (Marx, Capital I, Ch. 22)*

The central role of capital accumulation for the development was nowhere more wholeheartedly accepted in blind faith as in former communist countries, to the point that it turned into obsession leading to large capital expansion. As a result, the role of the capital became disproportionately important in the economy. Figure 15 shows that capital-output ratio<sup>69</sup> in the Czech Republic experienced divergent evolution in comparison to other advanced countries since 1970.<sup>70</sup> However, it is well known that the growth in western European countries during their post-war 'Golden age' was equally extensive in character, whose main features were high investment rates and substantial government participation in the areas of planning and coordination. In this respect, a development in France, for example, in immediate post-war years did not differ much from centrally planned economies.<sup>71</sup> Eichengreen (2007, p. 110) thus states that in France "extensive system of subsidies, concessionary loans, and cross indexation led to an overemphasis on heavy industry to the neglect of housing, agriculture and consumer goods". One could be easily confused to which side of the iron curtain the description actually refers.

However, limits of extensive growth were reached by the 1970s, after which we observe a diverging pattern of the capital-output ratio between Czechoslovakia and western European countries. While declining efficiency of new investment led to the gradual abandonment of the extensive growth in Western Europe, in centrally planned economies it continued at the same pace and was only with the global energy price shocks and the strong crisis in socialist countries in 1980. ... reduction of import of modern technology, especially by trying to improve balance of payment (Brada 1989)

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<sup>69</sup> Or the book value national wealth, where corporate assets are valued by perpetual inventory method.

<sup>70</sup> However, there is higher similarity in levels to Asian 'extensive growers' such as Japan (Piketty and Zucman 2014). This should not come as a surprise, as both former Czechoslovakia and Japan are well-known examples of 'extensive growers', whose post-war development was characterized by consistently very high investment rates in the productive capacities. Indicated as well by highest depreciation rates in the Czech Republic and Japan among OECD countries.

<sup>71</sup> Eichengreen (2007, p. 110) thus says that "the successes of indicative planning in France reflected many of the same factors accounting for the relatively successful performance of the even more heavily planned economies of Central and Eastern Europe in these same years".

Figure 15 suggests that western countries, such as Germany or France, reached the steady state capital-output ratio. Japan was however characterized by high saving rate afterwards, but it has been argued that it also switched to intensive growth in the early 1970s, showing much higher productivity than in communist countries (Hsieh 2002). Needless to say, one cannot treat this short-term variations in the capital-output ratio  $\beta$  as a consequences of the exogenous growth rate (with  $\beta$  endogenously determined as in “The Second Law of Capitalism” in Piketty 2014), as extensive growth directly assumes endogenous  $g$  (as in the original Harrod-Domar model). Nonetheless, it is useful to think that 1970s marked the limit of this strategy, and additional capital accumulation did not translate into new growth (growth became exogenous, dependent on productivity growth).

Czechoslovakia was moreover the *most* capital intensive of all communist countries (or with high organic composition of capital in Marxist terms), with the bulk of the investment flowing into heavy industry, the policy itself exclusively influenced by supply side considerations. But this proved to be unbearable burden since large resources were needed merely to sustain the existing production levels.

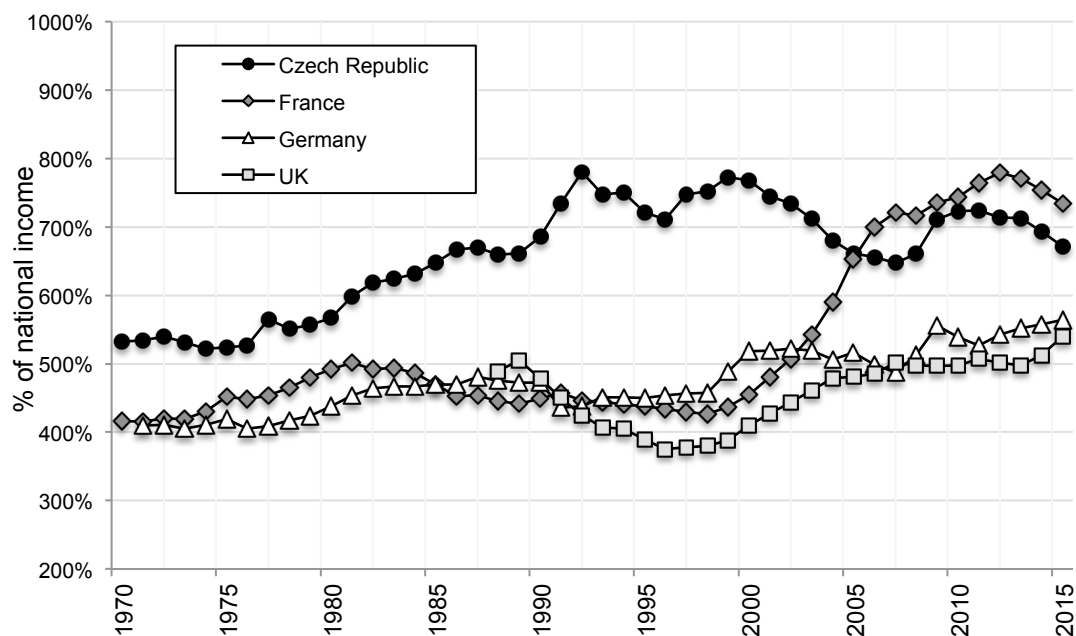


Figure 17: Book value national wealth in the Czech Republic, France, Germany and the UK

Source: WID

Thus, when considering historical evolution of capital, one needs to emphasize that its evolution in communist countries had fundamental impact on the welfare of the society. Its importance is visible in the role it played in the lives of several generations who sacrificed their present for the attainment of the future ideal communist society. As pointed by Kornai (1992, p. 303) “the population is compelled, without its consent being requested, to sacrifice some of its potential present consumption to investment designed to produce growth. It is quite another matter that the efficiency of investment is rather low, and in fact a faster rate of growth could be achieved even with a smaller sacrifice of consumption”. Also the massive change in the ownership structure that would, among other things, presumably facilitate the process of rapid capital accumulation, thus assigning the central role in the economic life to the government,<sup>72</sup> resulted in the loss of personal freedoms.

Kornai’s above description is well known to anyone even partially familiar with the history of socialist economies. From it, we highlight two things. First, consistently very high investment ratios pursued by central planners implied an indefinite deferment of the private consumption, which, as noted by Ofer (1987, pp. 1799-1800) suggested “distant horizons, low time preferences, and low discount rates of future benefits”. Second, it emphasizes an overall inefficiency of investment activity. Investments eventually became a goal *per se* - reflecting perverse incentives of the system - rather than a mean to ensure higher consumption in the future.

Figure 18 attempts to capture one welfare implications of this process by presenting the evolution of the labour share from 1970 until 2015. It shows that labour share before the transition was equivalent to roughly 60 per cent of national income, and that the welfare increased (taking labour share as its indicator) after the breakdown of communism. ‘Labour share for the socialist period is estimated as before-tax personal incomes (employment compensations, income from agricultural cooperatives, other income from work), while the rest is attributed to non-labour income. The latter predominantly refers to profits of socialized enterprises (without distinguishing net profits and profit taxes; Krejči 1981, Kornai 1992, p. 71). Thus, ‘factor shares’ up to 1991 should roughly reflect a balance between the state investment and the private consumption.

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<sup>72</sup> For example, in the mid-1980s, 97 per cent of the Czechoslovak output was produced by state sector (Hlavacek and Mejstrik, Tab. 1.3). This proportion very close as in Soviet Union and East Germany at the time, but substantially higher than in other socialist countries, such as Poland, Hungary or Yugoslavia

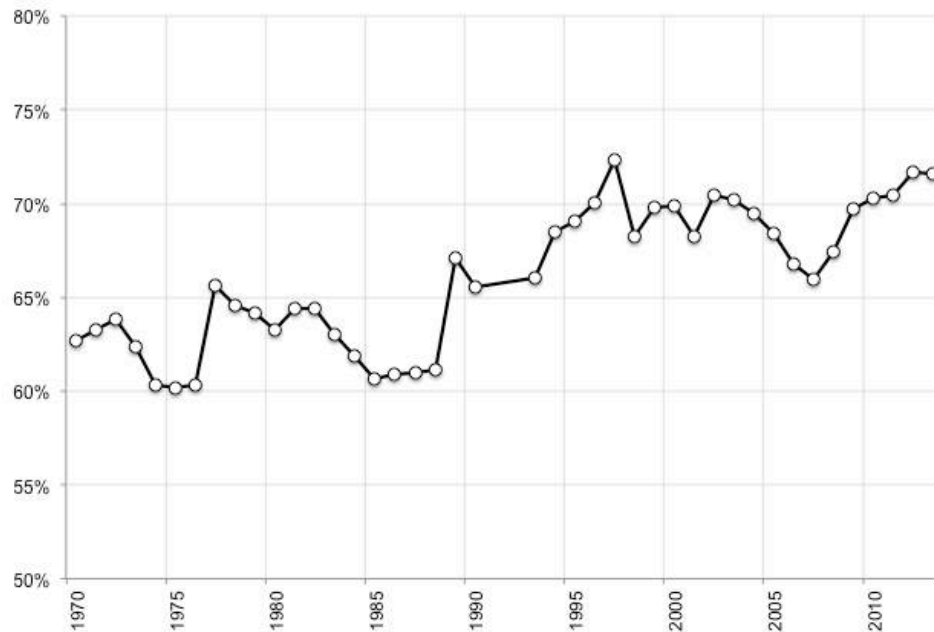


Figure 18: Labour share in (factor-cost) net domestic product

Source: computation from the Statistical Yearbook of Czechoslovakia; National Accounts of the Czech Republic

Here, one needs to draw attention to the relationship between capital accumulation and income distribution, which presents Ricardo's 'principal problem'. For example, there is a rich tradition linking investment with factor shares in the post-Keynesian literature (notably in the work of Kaldor, Sraffa, Robinson or Pasinetti), which presupposes that investments determine the profit share,<sup>73</sup> while the wage share is in turn obtained as residual.<sup>74</sup> This view is best articulated in the so-called 'Cambridge equation' ( $\pi = g/s_p$ ), which suggests the precedence in determination of the profit share, itself exogenous to the production process and its size dictated by the investment needed to sustain the balanced growth path (Pasinetti 1992). But in contrast to somewhat vague relationship between investment and profit share featuring the post-Keynesian literature, this link takes more basic and clear-cut form in the socialist economies, manifested in the discretionary character of the state in (factor) price setting and strongly centralized investment process.<sup>75</sup> Moreover, the inner working of the system nourished the investment drive, causing a general 'expansion huger' at all bureaucratic levels (Kornai 1992, pp. 161-2). This comes close to Keynesian 'animal spirits' which, according to Joan Robinson, present "historical, political and psychological characteristics of an economy". Along the same lines (posed, for

<sup>73</sup> This causality actually goes back to Kalecki

<sup>74</sup> Posing thus asymmetry between production factors, contrary to the neoclassical theory

<sup>75</sup> Abba Lerner: "the determination of the rate of investment is unavoidably political."

instance by the (neo-)Marxist distribution framework), the absolute bargaining position of the state implied that the planners could set wages as they found fit relative to labour productivity. In order to ensure high investment rates, wages were constantly held below the increases in productivity (Adam 1984).

The second aspect refers to the overall futility of large consumption sacrifices imposed on the population, since a large portion of investments did not contribute to (and by all accounts actually hindered) future prosperity. A multitude of uncompleted projects or irrationally high inventories are well-known features of the socialist accumulation. Teichova (1988) notes that almost a third of assumed investment in Czechoslovakia between 1955 and 1980 pertained to these two categories. Similarly, Borensztein and Montiel (1991) estimate that in Hungary more than a half of undertaken investment in this period could be termed as unproductive.

It is plausible to conclude that socialist economies were dynamically inefficient (as used in neoclassical growth models), with contributions of capital falling short of investment rates (Abel et al 1989).<sup>76</sup> The overinvestment in Czechoslovakia resulted in the accumulation of above-optimal level of the capital stock (exceeding the so-called 'Golden rule' level), and, consequently, excessive funds were required just to maintain these levels. The welfare would have undoubtedly risen if the society had consumed parts of it.<sup>77</sup>

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<sup>76</sup> This is equivalent to the condition that rate of return must exceed the growth rate ( $r > g$ ).

<sup>77</sup> By the same token, one can think of consumption deferments as temporarily counteracting the general tendency of the 'falling rate of profit', which according to Marx is the natural outcome of the accumulation process.



### Box 2: History of the doctrine

In the famous line above Marx singles out capital accumulation as the most distinctive feature in the workings of the capitalist system. If willing to survive, a capitalist is doomed to ever-going capital accumulation faced by ceaseless competition from other capitalists. Competition as well, but between socialist and capitalist countries, stood behind the massive capital expansion in the former socialist countries in Eastern Europe. In the Soviet Union after the Revolution, the communist leaders confronted with the backward state of the Soviet economy, wanted to catch-up with (and eventually surpass) the Western countries in the shortest possible time.<sup>1</sup>

The urge to industrialize (the 'haste doctrine'), whether nourished by the perceived external threat/dependence or in order to reach the ideal communist society,<sup>2</sup> was to be achieved primarily through the policy of high investment rates aimed at the rapid development of heavy industry.<sup>3</sup> Drawing inspiration from Marx's expanded two-sector reproduction scheme (e.g. see Robinson 1951; Harris 1972), it was argued, as famously articulated by Feldman, that favoring capital goods sector over consumer goods sector (Marx's Department I and Department II, respectively) in the allocation of investment would result in higher growth (Erllich 1967). And the obsession with growth as a goal per se, was often taken in the western conception to be inherent to the communist planning strategy. At least, development concerns were the official rationale expounded for the special role attributed to the heavy industry, which suited Party's top officials since it coincided with their true priorities. And these, according to new historical work (especially after opening Soviet archives in 1991, Kontorovich 2015) emphasize primarily the military aspect behind the Soviet industrialization. In that respect, especially important threat was Hitler's accession to power in Germany.

In Czechoslovakia, equally, the policy of high investment flows to heavy industry became the hallmark of the growth strategy during the first five-year plans. This 'iron' concept, as it had been popularly termed at the time, was rigidly copied from the Soviet model.<sup>4</sup> With respect to motivation, one should be reminded that Czechoslovakia occupied a special place in the military considerations of the Soviet bloc. As the most advanced socialist country, with the largest industrial base, it had to take on itself a particularly large burden in expanding the military potential of the bloc. This critical aspect of the Czechoslovakia's post-war development, points Teichova (1988), has largely been neglected by economic historians (Krejčí 1996, p. 94). Especially the emergence of the Cold War with its sharp bloc polarization, and the arms race after the creation of NATO and Comecom, meant that all future prospects were subdued to this supreme goal. Rebuilding and expanding heavy industry for armament production and industrialization of more backward countries of the Eastern bloc became the focal point of five-year plans.

Implementation of industrialization followed the well-known extensive growth pattern with the main emphasis placed on input expansion rather than in productivity growth. A huge mobilization of resources took place, evident in massive reallocation of workforce from agriculture to industry, women work participation, education levels (Šik 1967). Miracle post-war growth rates were taken to be a sign of superiority of the socialist path, especially in overcoming the problems that still resonated in collective memory, such as the problems of aggregate demand in the Great Depression.<sup>5</sup> Labor input was relatively early exhausted (Šik 1967), so continued concentration on capital accumulation led to further expansion of the capital stock (Ofer 1987, p. 1784). In short, what central planners were left with in their arsenal was strict adherence to capital fundamentalism.<sup>6</sup>

The turn to this strategy was facilitated by massive ownership change. The extent of nationalization was unique, and practically all productive capacities were transferred to the public ownership. Other policies were equally pursued in order to promote capital expansion, such as a separation of producer and consumer prices under the so-called two-level price system (especially during the first decades of the communist rule).

Prices of capital were set artificially lower than consumer prices, as a mean to discourage consumption (stimulate investment) and to ensure higher savings needed for rapid industrialization (Adam 1974, pp. 99-103).

Finally, there has been a huge literature dealing with the effect of the specific character of socialist capital accumulation on the economic growth. Was it a drag on the system or positive (initial) stimulus? In retrospect, we know that the growth model as practiced in socialist countries became the textbook example of the unsustainability of the input driven growth. Naturally, eventual termination of the extensive growth was well understood in socialist countries at the time, especially after the post-war 'miracle' growth rates started to lose its breath, and the necessity to supplement it with the intensive growth alternative figured out prominently in the call for reforms in the 1960s. Thus, Ota Šik, the top official behind the economic reforms leading to the Prague Spring, was pointing that Czechoslovakia had reached limits where investment-led strategy had actually become detrimental to growth (Šik 1967). The idea was in more coherent form expressed as declining marginal efficiency of investment in the face of labour, resource and organizational constraints (Adam 1974; similarly to Kalecki's 'ceiling and barriers' or Horvat's 'absorption capacity' (e.g. see Feiwel 1971; Voyno 2010)). In the neoclassical framework, that was in the meantime winning the day in the West, the socialist growth experience has often been seen as the outstanding example of decreasing marginal returns at work, as notably applied in the Solow growth model (e.g. Weitzman 1990, Krugman 1994).<sup>7</sup>

<sup>1</sup> As famously pointed by Stalin: "We are fifty or a hundred years behind the advanced countries. We must make good the distance in ten years. Either we do it or they crush us" (Ofer 1987, p. 1798).

<sup>2</sup> Note that socialist countries thought to have been only in the phase of transition to communism; e.g. see Marx in Critique of the Gotha Programm, or Lenin in The State and the Revolution

<sup>3</sup> As well as through the unfavourable treatment of agriculture in favour of industry, in the context of 'primitive socialist accumulation' or the so-called Probrazhenski dilemma (Erlach 1950; Millar 1978; Harrison 1985, Sah and Stiglitz 1987) and subsequent collectivization of agriculture under Stalin.

<sup>4</sup> Right from the outset there were many voices warning that the road taken was far from optimal. While the applicability of Feldman's or Preobrazhenski's prescriptions for industrializing Soviet Union and third world countries has been influential and at least seriously debated, this strategy was misplaced for the country at Czechoslovakia's level of development. Czechoslovakia was by far the most industrially developed country among countries in Eastern Europe that eventually turned to socialism after WWII (for example, the Czech Lands accounted for more than two-thirds of industrial potential of the Habsburg Empire). All signified huge structural change in country's economy. From country traditionally producing consumer goods (especially in the so called Sudetenland), it became the leading exporter of means of production in the Eastern Bloc

<sup>5</sup> Especially in the light of post-Keynesian preoccupations such as Harrod 'knife-edge' problem or Kaldor and Robinson's disequilibrium of saving and investment. See also Brus and Laski (1989)

<sup>6</sup> As defined by King and Levine (1994, p. 4), "capital fundamentalism embodies a belief that the rate of physical capital accumulation is the crucial determinant of economic growth".

<sup>7</sup> Just to point briefly that the huge literature was consequently born trying to explain Soviet growth slowdown, whether it was caused by decreasing returns to capital or technological retardation (falling TFP), critically depending on the form of production function assumed. For example, constant elasticity of substitution (CES) production function with less than unity elasticity of substitution between capital and labour ( $\sigma < 1$ ) (Weitzman 1970; Desai 1976; Easterly and Fischer 1995; Rusek 1989; Allen 2000) points that economy is experiencing problems in finding productive uses for additional capital accumulation, and the particular appeal of this story lies in the fact that it explains both the high growth rates after WW2 as well as the eventual decline of growth in the socialist countries. The turning point corresponds to economy reaching the full-employment, after which rising capital-labour ratio caused decreasing returns to capital to be especially acute, and consequently investment-led growth to stumble. On the other hand, most of the econometric studies have been using Cobb-Douglas production function ( $\sigma = 1$ ), and rather than to diminishing returns to capital, the growth slow-down has been attributed to rising technological retardation, or, in technical terms, to the falling total factor productivity (TFP) (e.g. Bergson (); or Whitsell (1985) for former socialist countries in Central Europe). But in general, the problem of the growth collapse in socialist economies is, fortunately, much more complex and richer topic than what the debate on the form of the production function form may imply (Ofer 1987; Allen 2001, 2003, Broadberry and Klein 2011).

## 7.2. Transition – privatization and transformation

The process of economic transition was central in shaping the evolution of wealth-income ratio. As we saw, it could be also regarded as more drastic manifestation of the development observed in western countries. First, there was a large transfer of ownership from public to private sector, something that started two decades earlier (obviously in comparatively quite limited scope) in the western countries. Second, there occurred a strong house price recovery. Finally, specific to former communist country, we argue that the market valuation of over-accumulated capital of dubious quality led to large real capital losses.

The fall of communism in Eastern Europe signified deep structural changes in all spheres of the social life. The economic strategy that was, more or less, consistently pursued over a half of the century was once and for all proclaimed erroneous, and the switch to market economy was enthusiastically endorsed. Most importantly, the central role of the state in the administration of the economy was to be abandoned in favor of the private initiative. And to make this possible, the predominant public ownership of assets had to be transferred into private hands. As we saw, this presumed a large transfer from public to private capital. Privatization implied a rebirth of the private wealth after a half of a century under the communist rule. The process primarily consisted of privatization of housing stock and state-owned enterprises. In the absence of the private capital, these also created preconditions for the emergence of *de novo* private sector, and in general of market oriented participation of the population

**Housing privatization.** The housing privatization in the former socialist countries assumed a foremost role in the wealth transformation during the transition, especially in shaping the private wealth pattern. As a result, the housing accounts today for the most important component of the private wealth in the Czech Republic (Figure 4). While the privatization of housing has not attracted as much attention in the literature as the privatization of enterprises, the historical uniqueness of this process has been well recognized. It has, without doubt, become a reference point in the historical research of capital, as it was according to the World Bank study probably the “largest wealth transfers in history” (World Bank 2000, p. i).

At the outset of transition Czechoslovakia had the largest state housing sector among the Eastern bloc countries, comprising more than a half of the housing stock. This stock was swiftly transferred under the control of municipalities, who were much too eager to get rid of it as soon

as possible, because the operating and maintenance costs greatly exceeded the fixed rental revenues. In addition, budget pressures increased as infrastructural network urgently needed improvements and rejuvenation (Hegedüs et al., p. 8). Restitution was one rapid solution pursued, unique for Czechoslovakia, where property was returned to those affected by the communist nationalization (according to some estimates it affected 70 per cent of property in the center of Prague; Sýkora and Šimonícková 1994). For the remaining state-owned flats, sitting tenants were offered deep discount on book values.

The launching the housing privatization program also raised concerns of the potentially adverse effect of a rapid give-away transfer of the state-owned housing stock on wealth inequality. It has been commonly assumed that housing assets are more evenly distributed than the corporate ownership, and in this respect, the communist emphasis on the universal housing should have produced equalizing effect on the overall distribution of income and wealth before the transition. We discussed how a huge system of low rents and state subsidies, secure tenure status, cheap credits, free land allocation etc., made housing in theory accessible and affordable to everyone. Equally, an all-inclusive transfer of housing would have had positive distributional effects, since it would have provided broad segments of population with the valuable (and often the sole) asset.

However, warnings about the adverse distributional effects of housing privatization were not without some rationale. The state-owned housing, eventually subject to the housing privatization, was predominantly located in urban centers, while private ownership prevailed in outskirts and in the countryside.<sup>78</sup> This location differential proved to be critical, because privatized urban stock experienced much larger appreciation during the transition and brought to new owners huge positive capital gains (Sýkora and Šimonícková 1994; Guriev and Rachinsky 2008, pp. 135-6). More favourable location depended in a large part on inherited inequalities from the socialist era. The urban stock was generally of higher quality and served by superior infrastructural network. Communist elites in particular had a privileged access to better housing, provided practically for free while enjoying *de facto* ownership (Szelenyi 1983). On the other hand, privately owned housing had presumed bearing personally the cost of construction (Kornai 1992, p. 320), which inevitably implied lower quality due to chronic shortages of material or skilled labour. It is true that housing in private ownership also benefited from a general upward adjustment of real estate

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<sup>78</sup> During communism only family houses were a part of the private property (predominantly located in the countryside; thus only slightly above 10 per cent of the housing stock in Prague and Bratislava were privately-owned; Kingsley et al. 1993, Tab. 1). This was the case in most of socialist countries (for example, in the USSR private constructions were not allowed in cities with population above 100,000; Alexeev et al. 1991, p. 3)

prices,<sup>79</sup> but as Yemtsov (2008, p. 317) noted: “housing transfer provided to [urban dwellers] dwarfs what the poor received as a result of marketization of their poorly constructed buildings on city outskirts”.

In all likelihood, the housing privatization adversely affected wealth inequality. Yemtsov (2008) examined housing privatization incidence in Poland, Russia and Serbia, and found that a rise in the housing wealth inequality is positively correlated with the volume of the privatized housing stock. This relationship could have been especially relevant in the case of the Czech Republic, which had the largest share of housing in the state ownership.<sup>80</sup>

**Privatization of enterprises.** Among the immediate challenges that transition economies had to comfort with was the question of how to privatize public capital. Privatization was primarily seen as necessary to restructure companies and improve their performance. The general consensus about its necessity was almost indisputably reached, and the real issue was rather the pace at which it was to be carried out (for example, often used distinction of ‘big bang’ versus gradual privatization; see Roland 2000). In the case of the Czech Republic, where practically the entire economy had been in the public hands, this implied an unprecedented change in the ownership structure between the public and private sector, parallel only to the reverse process of communist nationalization after the Second World War. The first post-communist governments strongly favored the ‘big bang’ approach – championed by the prime-minister Vaclav Klaus – which led to mass privatization through the so called ‘voucher’ privatization. Its main feature was to be its speed that would allow a comprehensive grasp and guarantee the irreversibility of the process. Another critical feature was that it principally took a form of mass (voucher) privatization with mostly free provision of assets to public, which enjoyed large public support because it was perceived as fair and inclusive. It was assumed best to leave everything to the market forces, since voucher privatization could bring about more natural development of capital markets and effectively identify the highest value users.

In effect, the voucher privatization was intended to proceed, using the market mechanism, from the universal ownership to more concentrated ownership structure (which would also mitigate

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<sup>79</sup> Even these magnanimous conditions of debt repayment were annulled with the widespread inflation experienced by all transition countries (Stanovnik 1994).

<sup>80</sup> For example, in Russia, Yemtsov (2008) notes that “70 per cent of all inequality in housing wealth observed in 2003 could be attributed to the effect of privatization.”

potential repercussions that diffused ownership might have on (poor) corporate governance (Mejstir 1998)). Thus, in comparison to housing privatization discussed above, enterprise privatization resulted in more inequitable distribution.<sup>81</sup> However, in enterprise privatization as well, despite its popular universal appeal, one finds numerous examples of an inequitable initial access to (more valuable) public capital, and not seldom benefiting the same elites as in the housing privatization. Consequently, various theories of elite perpetuation have been developed (mostly in the tradition of Bourdieu's (1986) capital conversion), where former communist elites and especially its technocratic part (managers of state-owned enterprises) initiated and used privatization as a tool to enfranchise their former implicit ownership (Benaček ).<sup>82</sup> This 'insider' transformation assumed labels such as 'capitalism without capitalists' (Eyal, Szelényi and Townsley 1998), 'nomenclature enfranchisement (Kowalik 2010).<sup>83</sup> It was exactly along these lines that Vaclav Havel defined popular concept of 'Mafia-capitalism'.

However, the experience of the Czech 'big-bang' privatization became the warning of practising rapid privatization without building proper institutional framework. Thus, gradualism with its careful approach, as practised in some other countries, proved to be a safer bet. In the course of the transition, deficiencies of the supposed 'Czech miracle' became more evident. The voucher privatization had sparked initial enthusiasm, which resulted in high valuation of privatized firms at the auctions. But very soon a painful awakening arrived in the form of failures of number of investment funds, bank failures (banks were overloaded with non-performing loans, no doubt in part due to the tradition of 'soft budget constraint' from the socialism; Kornai 1980), bankruptcies, 'asset stripping' and numerous privatization scandals (symbolized by Viktor Kožený, the so called 'pirate of Prague'), to name some of them. Moreover, much of the blame was attributed exactly to voucher privatization, which, according to criticism led to ineffective corporate governance (due to diffused ownership). Markets became suddenly far from excited at the prospects of effective restructuring of privatized companies. Prague stock exchange PX index records a dramatic fall after 1993, reaching its low point during the Russian financial crisis of 1998, which shattered all illusions about the 'Czech economic miracle' in the early 1990s.

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<sup>81</sup> The outcome itself, as it turned out, did not depend on the practiced privatization model, since all transition countries saw rapid concentration of corporate ownership (Grosfeld and Hashi 2003).

<sup>82</sup> 'convert' their possessions of social and cultural capital into the economic capital

<sup>83</sup> It is equally probable that the aspiration to create national bourgeoisie figured prominently in sanctioning this course, especially since economic and political independence were so closely linked in the collective memory of Eastern European countries. One parallel in the modern Czech history which could be drawn is the so called 'nostrification' after the dismemberment of the Austria-Hungary and the establishment of the First Czechoslovak

This was in large part a consequence of misguided communist investment policies. In the framework of the two-good wealth accumulation model we provide national wealth accumulation decomposition into volume and price component and find that huge capital losses largely stood behind the abrupt fall in national wealth-income ratio in the 1990s (Table ). One could even refer to this phenomenon as the burst of the 'communist bubble', where excessive capital stock accumulated during the communism became almost obsolete overnight. A delayed restructuring that was indispensable due to inherited weaknesses of businesses from the socialism. Many buildings and technologically outdated machines, in their impressive capacity to produce vast quantities of goods that no one wanted any more, obviously were not up to the challenges of the global competition. Equally, management skills were unaccustomed to demand and clearly unprepared for operating in the market economy. We should also add strong inventory shocks at the very beginning of transition, as levels were above rational due to hoarding during the socialism. Similarly, there are indirect evidences of this process such as falling experience premium on the one hand, and rapid rise of education premium on the other, which should be clearly related to ongoing restructuring (Švejnar 1996).

Thinking about elites necessarily involves stretching into the area of sociology and shows in general a need for the interdisciplinary approach, which has been at the core of thinking about inequality at least since the economics and sociology had been brilliantly combined in the pioneering work of Vilfredo Pareto. Sociological research has provided various theories to account for the emergence of the new economic elites in Central Eastern Europe after the fall of communism. It has been often pointed to the reproductive character behind the elite perpetuation in the transition from communism to capitalism, where the former communist managerial elite<sup>84</sup> has been at the forefront of capital transformation, and it was primarily through mass privatization in the Czech Republic that they tried to obtain legal ownership over the means of production (usually of the enterprises they had formerly managed) (Benaček 2006; Machonin, Tuček and Nekola 2006). In the tradition of Bourdieu's (1986) capital conversion, these authors have suggested that in the early stages of transition the communist elites tried to 'convert' their possessions of social and cultural capital into the economic capital (e.g., Eyal, Szélny and Townsley 1998). Even though one could claim that this was indeed necessary in order to achieve smooth and peaceful transition, due to former nomenklatura's 'insider' knowledge of the workings of the system and developed organisational skills,<sup>85</sup> it turned out to

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<sup>84</sup> A technocratic part of Djilas 'New Class'

<sup>85</sup> Note that exactly organizational ability of elites takes prominent place in Gaetano Mosca's elitist theory.

be too demanding challenge to adapt to the new realities of dynamic economy and international competition.

### 7.3. The rising importance of foreign ownership

Figure 12a showed that the Czech net international investment position has turned in two decades from small positive values in early 1990s to negative values around 50 per cent today, thus leading to the rising gap between domestic capital and national capital. As the experience with domestic based privatization as the backbone of 'Czech capitalism' was rather disappointing, there was a strong shift in the official policy towards attracting foreign investments as country tried to accelerate convergence, as well as a milder general public attitude towards foreign ownership. Especially the accession to the EU and other transnational organizations sparked the inflow of foreign investment, and very soon the Czech Republic became the top destination of foreign investment in Central Eastern Europe.

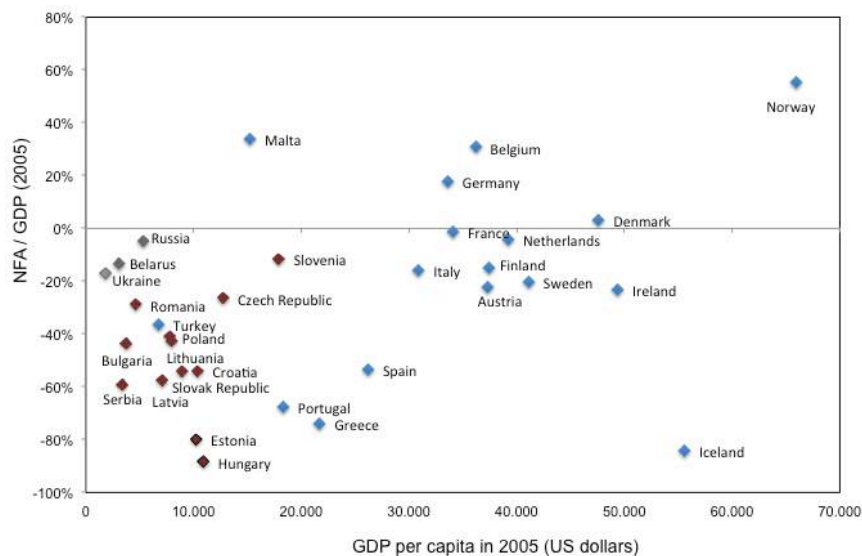


Figure 19: Net foreign assets and GDP per capita

Source: data from Lane and Milesi-Ferretti, External Wealth of Nations

In the simple framework of the standard macroeconomic model, foreign investment is treated as capital import flowing into the capital scarce country, driven by the differential in the rate of return. However, we saw that the Czech Republic could be hardly termed as capital-scarce country. Very high capital-output ratio actually indicates larger than usual capital intensity, and,



as we saw, the main problem was not in the lack of capital, but in its low productivity, of which one indicator are large negative revaluation effects. Thus, rather than treating these international flows as simple transfer of capital (for example, as in the case of industrialization), it is more useful to look at them as transfers of technology and know-how (notably, in the light of theories on foreign investment stemming from the pioneering work of Hymer (1976) and Kindleberger (1969), or now dominant 'OLI paradigm' (Dunning 1977)).

Figure 20 shows that the rising negative net investment position in the Czech Republic was almost entirely driven by FDI rather than portfolio or debt inflows.

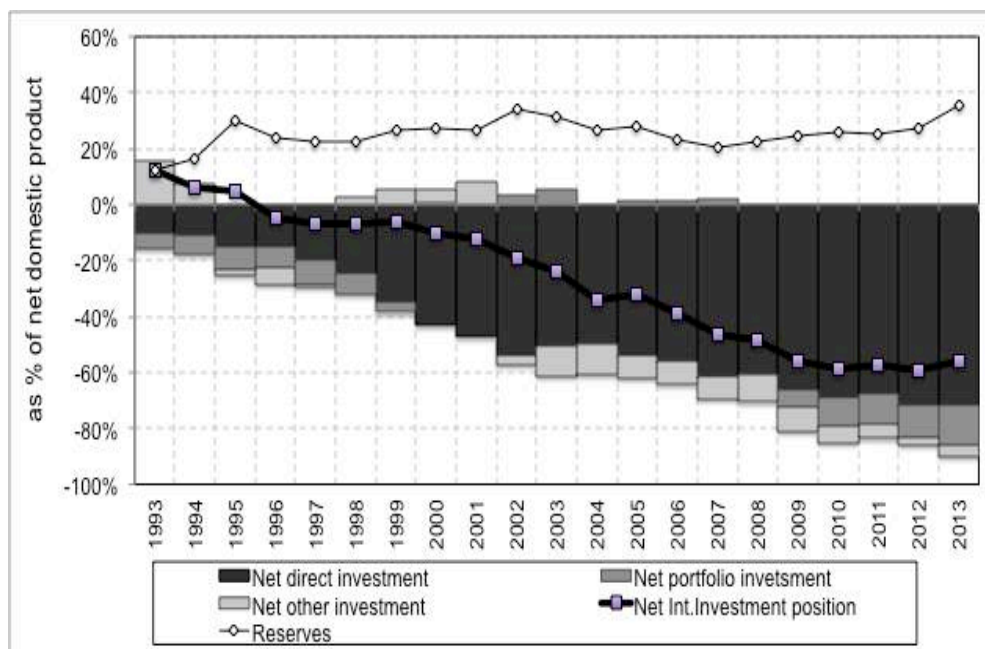


Figure 20: Net international investment position of the Czech Republic  
Source: The Czech National Bank

In general, foreign capital has been ascribed the key role in restructuring and modernizing the Czech economy. Large econometric literature has found that foreign privatization led to larger productivity gains (e.g. Djankov and Murell 2002; ). Foreign firms are generally more productive than domestic, and their role has become increasingly important. For example, in the middle of 2000s multinational corporations employed half of all employees in the country and generated 65 per cent of sales, while accounting for as much as 80 per cent of all exports (Švejnar and Uvalić 2009, p. 12). Especially the participation in global value chains could be seen as important in restructuring the Czech manufacturing.

However, this also raises issues (although sometimes bordering with paranoia) of raising market power of multinational enterprises and reducing competition, notably by hindering an entry of domestic entrepreneurs (e.g. through entry barriers, such as high cost investment, scale economies, R&D, etc.). In fact, a research on the nature of spill-overs from foreign to domestic industry has generally found evidence of negative spillover (especially horizontal) in the Czech Republic (Djankov and Hoekman 2000; Sabirianova, Švejnar and Terell 2005). To sum, MNEs' role in transition could result in the usual efficiency-equity trade-off.<sup>86</sup>

One should ask what lies behind high returns obtained by foreign capital as evidenced by large negative net foreign capital income outflows which have reached as much as 10 per cent of national income (Figures 11a and 11b)? On the one hand, a higher prominence of equity investment in contrast to debt could explain this partly as the 'equity premium', which has also implied certain stability, for example, against strong current account reversals (Lane and Milesi-Ferretti 2007). But there is also an indication that foreign capital entered capital-intensive industries as evidenced by very high capital share in foreign-controlled corporations, fluctuating between 40 to 50 per cent (Figure 21a), which is having greater impact on the aggregate level as today the largest part of corporate value added is generated in foreign-controlled companies (Figure 21b). Equally, there is a possibility of higher resource-intensity as suggested by surprisingly high value of natural resources (see section 3).

Foreign capital has been traditionally entering dominantly capital-intensive industries in the Czech Republic. The country has had historically relatively high level of industrial concentration in industry, ever since the industrialization during the Habsburg era (Rudolf 1976). Foreign capital was especially attracted by very high levels of industrial concentration in the First Republic (Teichova 1974)<sup>87</sup>, which has continued to be a somewhat distinguishable feature of the Czech economy. Teichova (1974) estimated that in 1937 foreign investment accounted for almost a third of total capital in industry, commerce, transport, banking and insurance in

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<sup>86</sup> Buckley (2006, p. 46) succinctly summarizes this trade-off as seen by Stephen Hymer: "the multinational corporation is both efficiency improving in the way that it integrates internal markets in goods, services, capital and information whilst at the same time such firms create distortions by the use of monopoly and monopsony power."

<sup>87</sup> Teichova (1974 p. 378) points out : "Among the countries of Central and Southeastern Europe Czechoslovakia attracted foreign capital investment not so much because she was less developed but because of the relatively high degree of concentration in her industries and banking, the comparatively low level of wages and the fairly stable political conditions of her democratic, republican system of government."

Czechoslovakia. Foreign capital had entered then strongest enterprises (less than 10 per cent of all enterprises), but these accounted for almost 50% of corporate capital. A trend towards concentration was especially strengthened during the communism, which was characterized by big monopolies created for the needs of central planning (“giantism” as termed by Erlich 1967; see also Mlčoch 1998, p. 35; Pryor 1973, p. 163). However, this trend continued after the fall of communism (Zemplerova 2004).

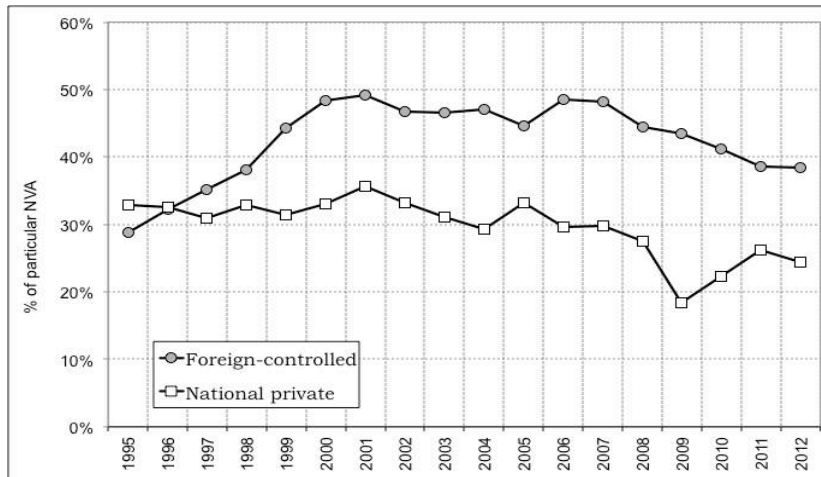


Figure 21a: capital share in non-financial corporations (by type of control)

Source: own calculation from CZSO

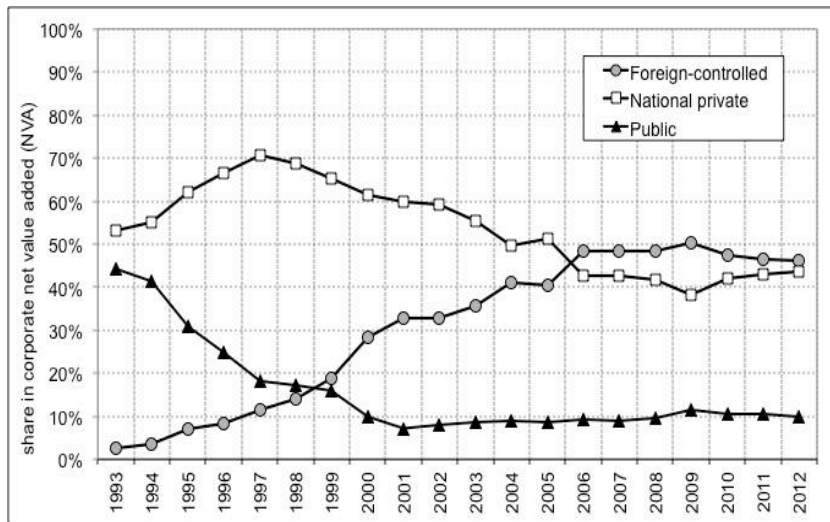


Figure 21b: share of particular non-financial corporations (by type of control) in the total non-financial corporate NVA

Source: own calculation from CZSO

## **8. Perspective**

The fall of communism in the Czech Republic and the international opening have led to a rapid recasting of institutional designs, with each new episode making its mark on the capital evolution. There has been a marked turn from the domestic based privatization to restructuring largely based on foreign capital. A rising integration transformed regulatory framework and paved the way to large technology and know-how transfers, which improved productivity and accelerated convergence. The integration assumed the wholly new dimension with the accession to the EU.

## Appendix:

### National wealth in the pre-WW1 Czech Lands

First official estimates of the Czechoslovak national wealth were made at the request of the League of Nations, in relation to the international project headed by Corrado Gini. Bibl (1927) commented that the Czechoslovak Statistical Office first declined to engage in this exercise, emphasizing various difficulties concerning the data availability and being sceptical whether the final results would be of “scientific worth”. It was only after Gini’s personal visit to the Statistical Office, and after some persuasion that reproducing Fellner’s estimates of the national wealth in prewar Cisleithania and Transleithania would be satisfactory, that the office engaged in the estimation. The results were published in three articles in *Statistický Vestník* (Bibl 1927).

**Land.** The total value of land and forests was estimated by capitalizing net yields. The total cadastral net income (rent) assessed by the land tax (for the purpose of the land tax) equalled 148.5 million crowns, which was following Fellner multiplied by 3.36, as it was argued that agricultural income had been substantially underestimated by the land tax (the coefficient itself was based on the documented market and forced auction sales of more than twenty thousand landed properties in 1886). Adjusted net income was capitalized at 4.5 per cent rate in order to arrive at the value for the total land equalling 11,047 million crowns. Again following Fellner, this estimate was checked by the so-called de Foville method,<sup>88</sup> which resulted in the value of 13,364 million crowns. Finally, the average of estimates obtained by the two methods was taken, corresponding to the total value of land and forests of 12,210 million crowns. Note that this estimate does not include land underlying buildings, which had not been the object of the land tax, but rather of the buildings tax (see below). The estimate for Slovakia and Subcarpathian Russia is 3,882 million crowns. The alternative estimate of Brdlik (1919) for Czechoslovakia is 15.6 billion crowns (Bibl 1927).

**Mines and metallurgy.** The annual gross income of mines and enterprises engaged in metallurgy, reported in *Österreichisches Statistisches Handbuch*, were reduced by 40% to obtain net income. These were consequently capitalized at the rate of 4 per cent, resulting in the total worth of 3,312 million crowns.

**Immovable property.** The value of buildings in 1912 was estimated on the basis of the Buildings tax. The tax distinguished the rented buildings tax (*daň činžovní; Hausklassensteuer*), to which buildings in large urban areas were subject, and the classified house tax (*daň třídní; Hauszinssteuer*), imposed only on dwellings in country and smaller urban areas<sup>89</sup> (where buildings for business purpose were exempt from the tax, while they were subject to the tax in urban areas, whether rented or not (Van Sickle 1931, pp. 13-5)). The net rent (gross rent reduced by 10 per cent for maintenance) from the statistics of the rented building tax was capitalized at 6.5 per cent rate, while that from the classified house tax (gross rent reduced by 15

<sup>88</sup> In brief, this method relies on the inheritance tax data to assess the total inherited wealth, which is then used to arrive at the total (private) wealth by applying a demographic (mortality) multiplier, accounting also for the tax evasion (Baffigi 2008).

<sup>89</sup> Assessed on the basis of the house cadastre according to the number of the rooms in the dwelling (Van Sickle 1931, p. 14).

per cent) was capitalized by 5 per cent rate. The Statistical Office also estimated tax-exempt property.<sup>90</sup> The resulting value of immovable property inclusive of the underlying land equalled 5,273 million crowns. However, there are indications that buildings are strongly underestimated by the tax (Bibl 1927, p. 445), and that tax-assessed values substantially diverge from the market values (e.g. see above for land). We make thus an upward adjustment of 20%. Since estimates of immovable property do not distinguish between residential and industrial buildings, we take 20 per cent of the total sum to correspond to the latter. Thus 80 per cent of immovable is included in housing category in Figure, while the rest is included in other domestic capital. This assumption is based on Stadnik (1968) (see below).

**Means of transport.** The total estimated worth of means of transport evaluated by the Czechoslovak Statistical Office equalled 4,227 million crowns. This category is comprised of roads (591m K), bridges (21m K), waterways and canals (60m K), railways (3,266m K), and posts, telegraph and telephone systems (287m K).

**Movable assets.** This category includes besides consumer durables also inventories, machinery and equipment livestock (Bibl 1927, p. 440), jewellery, vehicles and household appliance. We exclude consumer durables, such as cars and household appliance, which SNA do not include in the balance sheet. We take them to be worth one-fifth of the dwellings.

### Wealth in socialist Czechoslovakia

The accounting system used in former socialist countries, the Material Product System (MPS), differed essentially from the SNA in respect that it focused only on material output, excluding non-material economic activities ('non-productive' services such as housing, education, administration, etc.) (e.g. Holesovsky 1961). But with respect to the definition of capital, there was no important difference between SNA and MPS (United Nations 1979, p. 2). MPS distinguished 'national wealth and fixed assets' as one of the so-called 'balances' of the economy (Nesterov 1972, p. 288; Arvay 1994, p. 225). Non-financial produced assets in former communist countries were valued on the basis of large censuses of capital stock, conducted every 7-10 years, or when there was a substantial price revision. Due to the comprehensiveness of the census, it is plausible to argue that capital stock estimates in socialist countries were at least as reliable (if not more) than the contemporary estimates of western countries where non-financial assets were estimated using the perpetual inventory method (PIM) (Goldsmith 1985). Assets were valued at the current replacement cost, that is, if installed in the current year. Between official revaluations, assets were reported in book values, but as pointed, one should perceive them as being close to replacement costs in the absence of significant change in the price level (UN 1979), in which case the revaluation was initiated. In general, prices in socialist countries were (remarkably) stable,<sup>91</sup> since central planners set price stability as one of the top objectives. In former Czechoslovakia, after the first post-war capital census in 1946-8 and 1955, official revaluations were done in 1967 and 1977. While motivation for the 1955 census lay primarily in the need to estimate the value of the national capital stock (critical for planning

<sup>90</sup> The mean value of taxable buildings was used in order to estimate the value of those permanently exempted from the building tax.

<sup>91</sup> Former Yugoslavia is an exception as prices were liberalized there in much greater extent, and reported inflation was relatively high in the international context.

purposes), later revaluations were related to the general price reforms in the 1960s all over the Eastern Block (e.g. in the Soviet Union in 1960 and 1973, in Hungary in 1968 and 1976, etc.).

The following Table provides overview of national wealth compilation under the socialist accounting system<sup>92</sup>):

National Wealth Indicators			
	At the beginning of the year	At the end of the year	Increase during the year
<u>I. State property</u>			
a. Fixed assets			
Productive			
Non-productive (including housing)			
b. Stocks			
Material and supplies			
Work in progress			
Finished products			
Merchandise			
c. State reserves			
<u>II. Co-operative and collective farm property</u>			
a. Fixed assets			
Productive			
Non-productive (including housing)			
b. Stocks			
Material and supplies			
Work in progress			
Finished products and merchandise			
<u>III. Individual property of population</u>			
a. Fixed assets			
Productive			
Non-productive (including housing)			
b. Durable goods in households			
c. Stocks of agricultural products in personal plots			
TOTAL			
Plus land and forests			

Source: UN 1979, Tab. 5.1.; Nesterov, p. 293

The comprehensive estimates of national wealth in Czechoslovakia for 1975 and 1980 were published in Snopek (1984) and for 1985 in Berova et al. (1987). The following categories of national wealth are reported: net fixed assets<sup>93</sup>, unfinished construction, inventories, intangibles, agricultural land, non-agricultural soil, mineral and water wealth, timber reserves, livestock funds, consumer durables and net foreign position.

<sup>92</sup> State property was assumed as collective property of all people in the country (Nesterov, p. 293)

<sup>93</sup> whose price exceeded 5,000 Kč

### Fixed assets

A valuation of non-financial produced capital (dominantly, the fixed assets) was to the greatest part based on the sum of book values (historic costs) from enterprises' and government organizations' balance sheets.<sup>94</sup> The problem of aggregation was insurmountable before the 1955 census, as book values referred to acquisition prices of various years ranging over several decades. But after each official revaluation, book values of all assets acquired before the revision were reported in prices of the latest revaluation year (or the so-called 'estimate prices' in Soviet parlance). However, as noted above, the producer prices were on the whole kept fixed between official price revisions (e.g. see Figure A1), and only to a minor degree affected by changes in actual input prices (such as increases in wages or prices of construction material).<sup>95</sup> In Czechoslovakia, even if prices were to a certain degree liberalized during the price reform in the late 1960s,<sup>96</sup> the prices of most inputs remained fixed, under the strict control of central planners (Adam 1974).<sup>97</sup> Official revisions were triggered by unsustainable inflation in input prices, such as the oil shocks which were the direct cause of the general 1977 revision. Moreover, the growing pressure of increases in international prices resulted in new practice of 'continuous price updating' (1981-85) (Figure A1), as well as the new general revision of producer prices in 1984 (Adam 1989, p. 196).

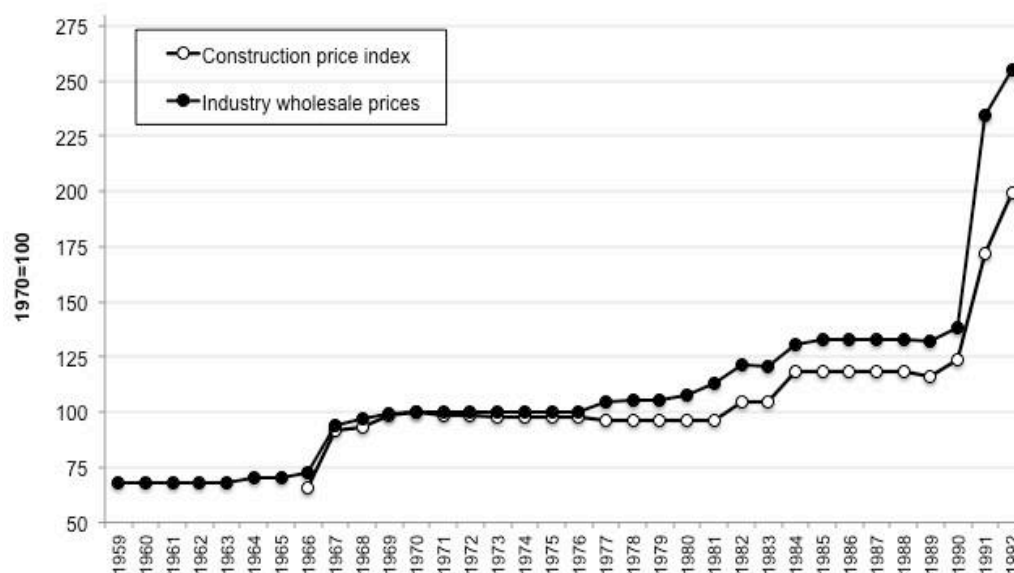


Figure A1: Construction price index and Industry Wholesale index

Source: Statistical yearbook (various editions)

<sup>94</sup> the concept of 'basic funds' was used

<sup>95</sup> For example, in the Soviet Union estimate prices introduced in the revaluation year were to remain fixed between the official price revisions.

<sup>96</sup> The reform introduced three sets of prices (Adam 1974, p. 190)

<sup>97</sup> This, however, directly clashed with the official Marxist pricing 'creed', according to which producer prices ought to be based on average production costs. As noted by Kornai (1992, p. 151), this "renders necessary a complex system of subsidies and levies to bridge the gap between prices invariable in time and costs varying in time".



Note that fixed assets series were reported in current and constant prices (in 1967, 1977 and 1984 prices). It has been already noted that official series in current prices correspond to book values of enterprises and government organizations and should not be confused with replacement values.<sup>98</sup> We have chosen instead to rely on series in constant prices and reflate them to arrive at replacement values by using appropriate price indexes. Series obtained this way are, in our opinion, preferable to book values because the official price indexes (such as the construction index or investment goods index) did capture certain changes in producer inputs between revaluations (see Kontorovich 1989), not accounted for in companies' book values.<sup>99</sup> Equally, a 'continuous price updating' introduced at the beginning of the 1980s led to the divergence between book and replacement values. For structures and buildings we have used the price index for construction works (*stavební práce*) and construction materials (*dodávky materialu a výrobku do stavebnictví*), while for machines and equipment the wholesale prices in industry (*velkoobchodní ceny v průmyslu*) and investment works (*investiční práce a dodávky z tuzemska*).

Fixed assets series in statistical yearbooks are reported gross of depreciation. Net values are provided in Snopek (1983) and Berova et al. (1987). According to these, accumulated depreciation accounted for as much as 41 to 43 per cent of the gross value in the 1975-85 period. On top of that, several authors warned that retirement rates of capital in former socialist countries were too low (in Czechoslovakia equaled roughly 2 per cent) (e.g. Alton et al. (1970, p. 64) point to Usievich and Shabunina). It was argued that the outdated and obsolete capital (in particular machinery and equipment) was not replaced on time,<sup>100</sup> remaining exceedingly long in operation, which also resulted in large costs of capital repairs (ibid.). As a result, the average age of capital was very high in the international perspective.<sup>101</sup>

The category of unfinished construction in socialist accounting has been divided between the fixed assets and inventories:<sup>102</sup> unfinished investment (*nedokončené investice*) to fixed assets, while unfinished works (machinery) and stocks (*nedokončené nevyfakturované práce a dodávky*) to inventories. This category roughly corresponds to investment in progress used by Mooresteen and Powell (1966, p. 94) in the Soviet Union.<sup>103</sup> The official estimates are 8-10 per cent of official net basic fund category (*základní prostředky*) (Snopek 1984, Berova et al. 1987)

Although we have chosen to rely on official socialist estimates of fixed assets (but exclusive of residential dwellings; see below), as our starting point we take the estimates of the Czech

<sup>98</sup> That is, book values were reported in prices of the last general revaluation, and were not valued at the prevailing prices of the given year.

<sup>99</sup> Even in countries that had legal requirements of annual revaluation of fixed assets, such as Yugoslavia, one observes notably slower rise in fixed asset prices than construction prices.

<sup>100</sup> As noted, there was no depreciation due to technical obsolescence.

<sup>101</sup> For example, according to Beliaev and Semenova 'period turnover' of productive fixed assets in former socialist countries was almost 30 years in comparison to 10 years in average in contemporaneous western countries (Alton et al. 1970, p. 64).

<sup>102</sup> In socialist accounting the category of 'unfinished construction' was not included in fixed assets (Goldsmith 1964, p. 87).

<sup>103</sup> Equally following Moorsteen and Powell (1966, p. 95), we add undepreciated value of unfinished projects to fixed assets.

Statistical Office according to SNA methodology.<sup>104</sup> The first available year for which we can compare estimates according to two methodologies is 1990. Figure A shows alternative series of net fixed assets as the proportion to the national income, and the mentioned discrepancy in 1990 is seen as the difference between the series 'based on official estimates' and the remaining two series. As can be seen the difference between net fixed assets (excluding residential) according has not been dramatic as might have been expected, The next one is often used the perpetual inventory method (PIM) (Goldsmith 1951). The most comprehensive application of PIM for the former socialist country has been for the Soviet Union by Moorsteen and Powell (1966). A close trend in PIM and series on based on fixed assets growth rates is due to the fact that the new investment series (Sixta et. al) are quite close to the official series during the socialism

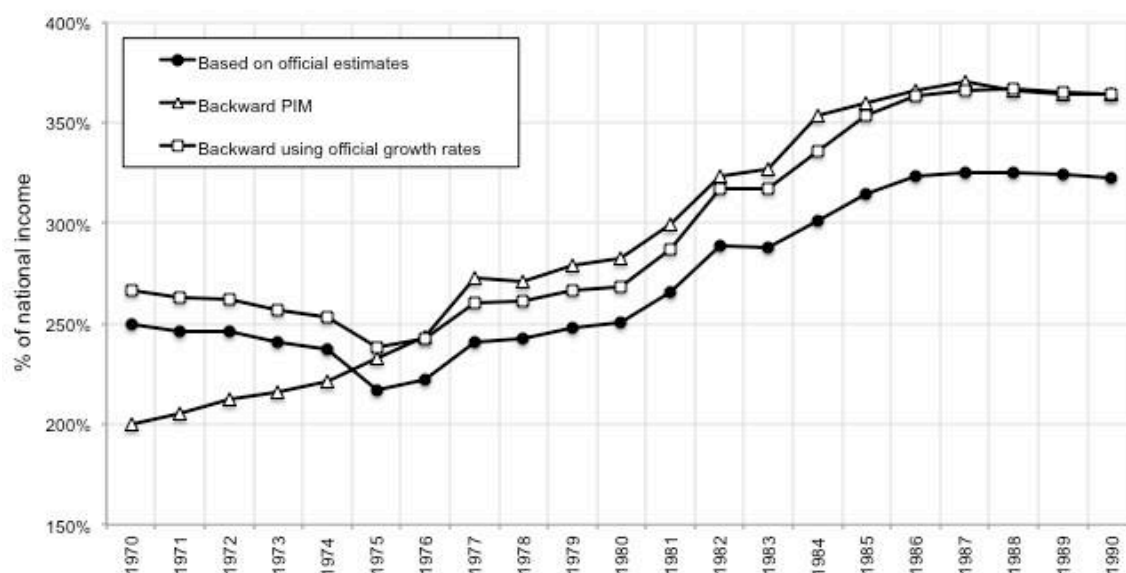


Figure A2: Alternative series of net fixed assets (excluding dwellings) in the Czech Republic, 1970-1990  
Note: own construction

### Inventories

The official estimates of inventories (*zásoby*) for the socialist period are given in Snopek (1984) and Berova et al. (1987). As noted above, we add to this also 'unfinished (not invoiced) works and stocks' (*nedokončene nevyfakturované práce a dodávky*), included in the accounting category of unfinished construction. Actually, these categories had been reported together as inventories in state-owned enterprises in Statistical Yearbooks on the annual basis (*prehled o zásobach v hospodarských organizacích*).<sup>105</sup> However, this is a direct indication that the coverage of inventory was not complete. Importantly, it did not cover government stocks, which could have been potentially substantial (e.g. Moorsteen and Powell (1966, p. 112) for the Soviet

<sup>104</sup> according to ESA1995 methodology. From the time when these series were constructed, there were new updates, with the introduction of the ESA2010 accounting standard. Yet, we

<sup>105</sup> The reported total value of inventories in the state-owned enterprises in the Czech Republic made 0.7 of the total for former Czechoslovakia.

Union)<sup>106</sup>. Although this limited coverage gives considerable ratio, roughly 100 per cent of national income in the 1980s, there is a notable gap in comparison to the value of inventories in 1990 as the first year for which the new estimates (according to SNA) are available, namely 100 per cent versus 142 per cent of the national income, respectively, in 1990. We attribute this discrepancy primarily to the non-coverage of government stock,<sup>107</sup> and arrive at the total stock of inventories by making an upward adjustment of the official estimates of inventory in state-owned enterprises by 20 per cent. The annual values of the later are taken from the Statistical yearbook (various editions).

### Housing

The housing component of national wealth is composed of dwelling structures and the underlying land. We have constructed our independent estimates of housing for the socialist period (1970-1991),<sup>108</sup> because the official data is inadequately explained and apparently of limited coverage. First, we estimated structures by applying the annual statistics of average prices of new flats (per  $m^2$ ) in the social sector (*Prumerne ceny dokončených bytu*) to the area of the dwelling stock from the censuses (family houses and multi-dwelling houses (*Domovní a bytový fond*)).

The census gives the total area of the dwelling stock according to the type of ownership (public or private) and the extent of the available installations. Since the available prices refer to new (completed) flats in the social sector, generally characterized by the higher quality standard and inclusive of conveniences, one further needs to differentiate the dwelling area according to the available installations in the dwelling. Thus, we use conversion factors to account for the varying degree of installations present.<sup>109</sup> For example, the conversion factor of 1 is applied to dwellings with the central heating, the sewage, the water supply system and the electricity. The conversion factor is reduced for installations not present, while for the dwelling area lacking in all of the mentioned installations the factor of 0.5 is applied. Finally, the factor of 0.25 is applied to dwellings constructed from the inferior building material (other than concrete or brick). The new replacement value of the dwelling stock (gross dwelling stock) at the current prices is estimated by multiplying the construction price per squared meter for the new flats (exclusive of the cost of the building site) by the dwelling area (classified by the available installations) and the relevant conversion factor. We use the census data on the dwelling area for 1971, 1981 and 1991, while for in-between years we use the official data on the area of the newly built dwellings and the data on the annual retirement. The data is available for the social and the private sector, while the proportion of the area with specific installations is linearly interpolated between the censuses. Next, the extent of the wear and tear is estimated using the data on the age profile of the dwelling stock from the censuses. We apply specific conversion factors ('depreciation profiles')

<sup>106</sup> On the other hand, inventories of households, such as of small crafts could be regarded as negligible.

<sup>107</sup> or due to revaluation as SNA recommends valuation at prices of the balance sheet date, while in socialism they were according to historic cost/acquisition prices...

<sup>108</sup> In this we follow methodology used by Kukić and Novokmet (in progress) for former Yugoslavia.

<sup>109</sup> We borrow these factors from the contemporary official estimates for Slovenia provided in Flajs (1984, Tab. 31)

to eight cohorts, classified by the year of its construction.<sup>110</sup> For example, the conversion factor of 0.95 is applied to dwellings constructed in the recent decade, while the factor of 0.3 is applied to the oldest cohort (older than eighty years) (depreciation to correspond based on Slovenia (1984, Tab. 32)) The resulting net (depreciated) dwellings stock equalled 70 per cent of the gross dwelling stock in the Czech Republic in 1980.

### Agricultural land

Socialist accounting devoted considerable attention to the problem of land valuation. Economists in former socialist countries recognized early on the importance of proper land valuation for the efficient resource utilization,<sup>111</sup> with a big debate of how this should be accomplished unfolding from the 1960s (see Cholaj 1968). In general, the majority of contributors agreed that land prices should be based on the land rent, in accordance with the view that land value corresponds to capitalized rent (*ibid.*).

The initial rejection of the land rent, characteristic for the 'classical' socialist phase<sup>112</sup>, focused solely on its distributive aspect (a view originating from the labor theory of value). However, in the following 'reform' phase, when the official doctrine was loosened and the concerns of economic rationality prevailed with the so-called 'optimal planning', the accent was placed on the allocative function of rent. The discussion grew particularly lively in the Soviet Union, where many eminent economists such as Kantorovich, Novozhilov or Nemchinov advocated the introduction of the differential land rent. In Czechoslovakia, inequalities arising from the so-called differential rent I (accounting for differences in the soil quality, favorable location, etc.), were tackled by the introduction of the differential land taxation in 1967.<sup>113</sup>

However, the value of the agricultural land was rarely estimated and/or published. Only Hungary provided official estimates of the agricultural land value (even more exceptionally, it had estimated also the value of national mineral resources; Hajpal 1976, p. 57). The Hungarian Statistical Office used the land rent capitalization method .... This was most often the sole option available, because the agricultural land had been in many socialist countries almost completely nationalized (for example, in Czechoslovakia or the former USSR) and there was no corresponding market (Goldsmith 1964, p. 87). Only in Poland and former Yugoslavia the land was predominantly in private ownership, and there is as a result some evidence on the market prices of land transactions. The Polish sources give a remarkable statistics of market land transactions (reported in Statistical Yearbooks), which we used to estimate the total market value of the agricultural land (see below).

For former Czechoslovakia both Snopek (1983) and Berova et al. (1987) estimate agricultural land by using the rent capitalization approach. They give only brief account of the underlying methodology stating that the land rent is taken as one-fourth of the gross agricultural output,

<sup>110</sup> The average age of the housing stock : 1991: 32,2 years in multi-dwelling buildings, 56,9 years for family houses ; in total 42,4 years (1980: 31,8 ; 48,3 ; 39,4) (1971: 39,9 ; 59 ; 50,1)

<sup>111</sup> Another worrying aspect had been an adverse effect on income inequality, as the absence of rent payments during the two decades following WWII strongly favored farms on more fertile land and on more favorable location.

<sup>112</sup> A distinction between different phases of socialism is taken from Kornai 1992.

<sup>113</sup> As pointed by Wilczynski (: "the tax rates varied from 0 to 930 korunas per hectare according to 145 natural conditions officially acknowledged as relevant agricultural production")

which is then capitalized at the 4 per cent rate. However, it is not clear how systematic and rigorous was this exercise, with respect to the land rent estimation or considerations regarding the appropriate capitalization rate. Their estimates for 1975, 1980 and 1985 give the level of 150% of national income. Conceptually, it is not clear what to make of these magnitudes. But as noted above, due to the lack of alternative, we take the land rent to be equal to one-fifth of the gross output in agriculture. Needless to say that this approach is quite arbitrary.

#### The valuation of equity

*1990-1991.* For the large (or voucher) privatization of enterprises, we take estimate of Oldrych Kyn who calculates market value per voucher at Kčs 30,000. When multiplied by 8,6 mln vouchers, this results in market value of Kčs 260 billion at 31 June 1992. Obviously, these As pointed by Frydman et al. (1993, p. 86): “any such attempt to estimate market value in the post-socialist economies obviously requires heroic assumptions”. Nonetheless, we take this amount and attribute it to the wealth of the private sector. Next, small privatization started in 1991, comprising sales of small businesses, restaurants and shops. The total number of units sold was 15,291 in 1991 and 6,441 in 1992. Amounts corresponding to small-scale privatization are taken from Mladek (p. 31, Table 3.2), who reports them as equal to 18.3 bln Kčs in 1991 and 11.1 bln Kčs in 1992. However, small privatization sales (rather than free transfers from government in the case of large voucher privatization) should have had a neutral effect on the net personal wealth as it reduced financial assets of the individuals engaged in purchases.

*SNA 2008.* Ondruš (2015, p. 8) describes procedures applied by the Czech Statistical Office for valuation of the «equity and shares» (AF.5) category:

- *Listed shares*: market values on the basis of stock-exchange prices; (the database MAGNUS)
- *Unquoted share*: book value of equity (for financial intermediaries, insurance companies and pension funds from the banking and financial statistics)
- *Other equity in limited liability companies and incorporated partnerships*: amount of the paid-up capital
- *Other equity of housing cooperatives*: market value of apartments minus loans

This suggests that the practice of CZSO has not been to estimate market value of unquoted shares and other equity on the basis of comparable quoted shares. Clearly, equity holdings in 'limited liability companies and incorporated capital' is the most problematic category (moreover, Ondruš (ibid.) notes that the new business loan stipulates the paid-up capital to 1 CZK, so the current methodological procedure is not sustainable).

‘Experimental valuation’ is a term used by the Czech Statistical Office in the recent attempts to attribute the ‘residual’ corporate value (net worth of corporations) to households, government and rest-of-the-world sector (Ondruš 2015, p.).<sup>114</sup> It can be inferred thus that CZSO takes PIM-

<sup>114</sup> Another option could be to use the aggregate Tobin’s q to upward correct the equity of each sector.

based corporate assets as more reliable. The Czech national accounts provide separate flow accounts and balance sheets for non-financial corporations classified according to majority control into national private, public and foreign-controlled.

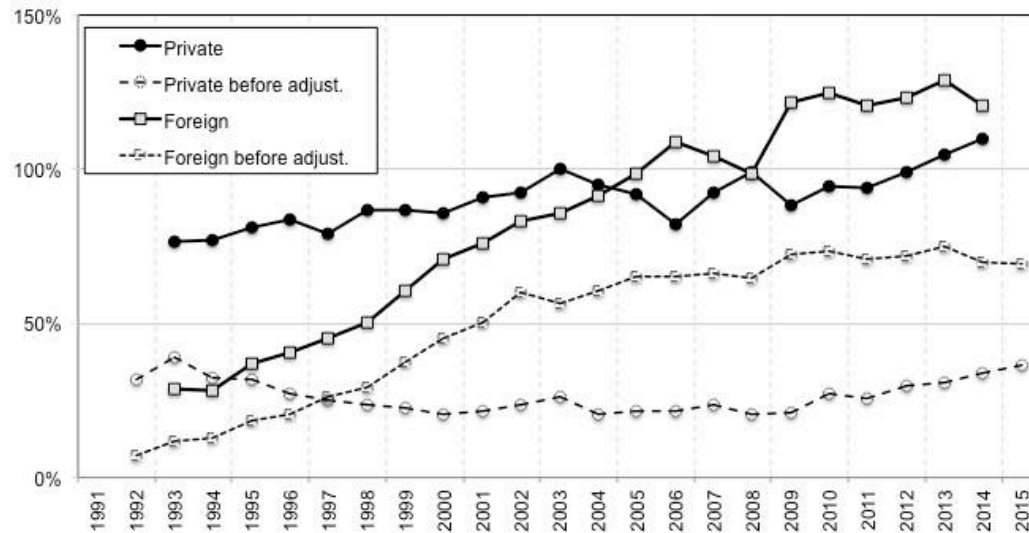


Figure A3: Adjusted equity by apportioning the 'residual' corporate equity

Source: see appendix

**References:**

- Abel, A. B., Mankiw, G. L., Summers, L. H., and Zeckhauser, R. J. (1989). "Assessing Dynamic Efficiency: Theory and Evidence". *Review of Economic Studies* 56, pp. 1-20.
- Acemoglu, D. and Robinson, J. A. (2015). "The Rise and Fall of General Laws of Capitalism". *Journal of Economic Perspectives* 29(1), pp. 3–28.
- Adam, J. (1974). *Wage, price and taxation policy in Czechoslovakia, 1948-1970*, Berlin: Duncker & Humblot
- Adam, J. (1984). *Employment and wage policies in Poland, Czechoslovakia and Hungary since 1950*, London: Macmillan
- Adam, J. (1989). *Economic reforms in the Soviet Union and Eastern Europe since the 1960s*, London: Macmillan
- Allen, R. C. (2001), "The Rise and Decline of the Soviet Economy", *The Canadian Journal of Economics / Revue canadienne d'Economique*, Vol. 34, No. 4, pp. 859-881
- Allen, C., and Šmídková, K. (1998). "A Model of the Demand of Czech Households for Financial Assets during Coupon Privatization", *Eastern European Economics*, 36(1), pp. 82-95
- Alton, T. (1962), *Czechoslovak national income and product, 1947-1948 and 1955-1956*, New York, Columbia University Press
- Arrow, K. J. (2000). "Economic Transition: Speed and Scope", *Journal of Institutional and Theoretical Economics (JITE) / Zeitschrift für die gesamte Staatswissenschaft*, 156(1), pp. 9-18
- Baffigi, A. (2008). "Estimates of private wealth in Italy after Unification: historiography and statistical method". In Banca d'Italia *Household wealth in Italy*
- Bičík, I. and Jeleček L. (2009). "Land use and landscape changes in Czechia During the period of transition 1990–2007." *Geografie – Sborník ČGS*, 114(4), pp. 263–281
- Brada, J. (1989). "Technological Progress and Factor Utilization in Eastern European Economic Growth." *Economica*, 56, pp. 433-448.
- Brandolini, A., Cannari, L., D'Alessio, G., and Faiella, I. (2004). "Household wealth distribution in Italy in the 1990s", Banca d'Italia, Temi di discussione, 530, October

Broadberry, S. and Klein, A. (2011), "When and why did eastern European economies begin to fail? Lessons from a Czechoslovak/UK productivity comparison, 1921–1991", *Explorations in Economic History*, 48, pp. 37–52

Buckley, R. M., Hendershott, P. H., and Villani, K. (1994). "Rapid housing privatization in reforming economies: pay the special dividend now". *TWURD working papers*

Buckley, P. J. (2006). "Stephen Hymer: Three phases, one approach?", *International Business Review* 15, pp. 140–147

Caves, R. (1996), *Multinational Enterprise and Economic Analysis*, Cambridge: Cambridge University Press.

Cholaj, H. (1968). "The Price of Nationalized Land under Socialism". *Eastern European Economics*, 6(3), pp. 3-33

Coase, R. H. (1937). "The nature of the firm". *Economica*, 4, pp. 386–405.

Desai, P. (1976), "The Production Function and Technical Change in Postwar Soviet Industry: A Reexamination", *The American Economic Review*, Vol. 66, No. 3, pp. 372-381

Djankov, S. and Hoekman, B. (2000). "Foreign Investment and Productivity Growth in Czech Enterprises" *The World Bank Economic Review*, 14(1), pp. 49-64

Djankov, S., and Murrell, P. (2002). "Enterprise Restructuring in Transition: A Quantitative Survey", *Journal of Economic Literature*, 40, pp. 739–792

Domar, E. D. (1966). "The Soviet Collective Farm as a Producer Cooperative". *The American Economic Review*, 56(4), Part 1, pp. 734-757

Drabek, Z., Janacek, K., and Tuma, Z. (1993). "Inflation in Czechoslovakia 1985-91", *The World Bank Policy Research Working Papers WPS113*

Dunning, J. H. (1977). "Trade, location of economic activity and the MNEs". In Ohlin, B., Hesselborn, P., and Wijkman, P. (Eds.), *The international allocation of economic activity*, pp. 395–418. London: Macmillan.

Dunning, J. H., and Rugman, A. M. (1985). "The influence of Hymer's dissertation on the theory of foreign direct investment". *American Economic Review*, 75(2), pp. 228–232.

Easterly, W. and Fisher, S. (1995), "The Soviet Economic Decline", *The World Bank Economic Review*, 9(3), pp. 341-371



Ellman, M. (1975), "Did the Agricultural Surplus Provide the Resources for the Increase in Investment in the USSR During the First Five Year Plan?", *The Economic Journal*, 85(340), pp. 844-863

Erlich, A. (1950), "Preobrazhenski and the Economics of Soviet Industrialization", *The Quarterly Journal of Economics*, 64(1), pp. 57-88

Erlich, A. (1967), "Development Strategy and Planning: The Soviet Experience",

Fischer, J., Sixta, J., and Vltavska, K. (2013). "The Development of Gross Domestic Product in the Czech Republic and Slovakia between 1970 and 1989". *Ekonomický časopis*, 61(6), pp. 549 – 562.

Flajs, A. (1986). *Družbeno bogatstvo SR Slovenije ob koncu 1980. leta*, Ljubljana: Zavod SR Slovenije za statistiko

Gini, C. (1914), *L'Ammontare e la composizione della ricchezza delle nazioni*, Torino: Fratelli Bocca

Girouard, N. et al. (2006), "Recent House Price Developments: The Role of Fundamentals", *OECD Economics Department Working Papers* 475, OECD Publishing.

Goldsmith, R. W., and Lipsey, R. E. (1963). *Studies in the National Balance Sheet of the United States, Vol. 1*, Princeton University Press

Goldsmith, R. W. (1964). "The national balance sheet of the Soviet Union" In *Essays on econometrics and planning presented to Prof. P. C. Mahalanobis on the occasion of his 70th birthday*. Oxford: Pergamon Press

Goldsmith, R. W. (1985). *Comparative national balance sheets: a study of twenty countries, 1688-1978*. Chicago: University of Chicago press

Gordon, M. (1962). *The investment, financing, and valuation of corporations*,

Harris, D. J. (1972), "On Marx's Scheme of Reproduction and Accumulation", *Journal of Political Economy*, Vol. 80, No. 3, Part 1, pp. 505-522

Hartwig, K-H. (1983). "Involuntary Liquid Assets in Eastern Europe: Some Critical Remarks", *Soviet Studies*, 35(1), pp. 103-105

Helfferrich, K (1917). *Deutschlands Volkswohlstand 1888-1913*, Berlin

Hobson, J. A. (1902). *Imperialism: A study*. (3<sup>rd</sup> Ed.) London: Unwin Hyman. 1988.

Holesovsky, V. (1961). "Karl Marx and Soviet National Income Theory", *The American Economic Review*, 51(3), pp. 325-344.

Hsieh, C. (2002), "What explains the industrial revolution in East Asia? Evidence from the factor markets", *American Economic Review*, 92, pp. 502-526.

Hymer, S. H. (1968). "The multinational corporation: An analysis of some motives for international business integration". *Revue Economique*, 19(6), pp. 949–973.

Hymer, S. H. (1970). "The efficiency (contradictions) of multinational corporations". *American Economic Review*, 60(2), pp. 441–448.

Hymer, S. H. (1972). "The internationalization of capital". *Journal of Economic Issues*, 6(1), pp. 91–111.

Hymer, S. H. (1976). *The international operations of national firms: A study of direct foreign investment*. Cambridge, MA: MIT Press.

Kindleberger, C. P. (1969). *American business abroad*. New Haven, CT: Yale University Press.

King, R. G. and Levine, R. (1994), "Capital Fundamentalism, Economic Development, and Economic Growth"

Kingsley and Struyk (1992). "Progress in Privatization: Transforming Eastern Europe's Social Housing", *The Office of Housing and Urban Programs Working Paper*

Kontorovich, V. (1989). "Inflation in the Soviet Investment and Capital Stock". *Soviet Studies*, 41(2), pp. 318-329

Knoll, K., Schularick, M., and Steger, T. (2014), "No Price Like Home: Global House Prices, 1870 - 2012," *working paper*

Kornai, J. (1980). *Economics of Shortage*. Amsterdam: North-Holland,

Kornai, J. (1992). *The Socialist System*. Oxford: Oxford University Press.

Krejčí, J. (1982). *National income and outlay in Czechoslovakia, Poland, and Yugoslavia*, New York: St. Martin's Press

Krugman, P. (1994). "The Myth of Asia's Miracle", *Foreign Affairs* 73(6), pp. 62-78

Kuznets, S. (1961), *Capital in the American Economy: Its Formation and Financing*, Princeton University Press

Lane, D., and Myant, M. (eds.) (2007). *Varieties of capitalism in post-communist countries*. Palgrave Macmillan

Lazarcik, G. (1963). "Factors Affecting Production and Productivity in Czechoslovak Agriculture, 1934-38 and 1946-60", *Journal of Farm Economics*, 45(1), pp. 205-218

Lane, P. R., and Milesi-Ferretti, G-M., (2007). "Capital flows to central and Eastern Europe," *Emerging Markets Review*, Elsevier, vol. 8(2), pp. 106-123

Lux, M. (Ed.) (2003), *Housing Policy: An End or a New Beginning*, Budapest: LGI – OSI

Lux, M. (2009), *Housing policy and housing finance in the Czech Republic during transition*, Amsterdam: IOS Press

Lux, M., and Sunega, P. (2010). "The private rental housing in the Czech Republic: growth and ... ?". *Sociologický časopis/Czech Sociological Review*, 46(3), pp. 349–373.

Lux, M. and Mikeszova, M. (2012), "Property Restitution and Private Rental Housing in Transition: The Case of the Czech Republic", *Housing Studies*, 27(1), pp. 77–96

Macours, K. and Swinnen, J. F. M. (2000). "Causes of Output Decline in Economic Transition: The Case of Central and Eastern European Agriculture". *Journal of Comparative Economics*, 28, pp. 172–206

Maddison, A. (2001). *The World Economy - A Millennial Perspective*, Paris: OECD

Matalík, I., Skolkova, M., and Syrovatka, J. (2005). "Real estate prices and CNB monetary policy", *BIS Research Papers* 21

Michalovic, P. (1992). "Housing in Czechoslovakia". In Hegedus, J., Tosics, I., and Turner, B. (eds.), *The Reform of Housing in Eastern Europe and the Soviet Union*, London: Routledge, pp. 37-49.

Mildschuh, W. (1909). *Mietzinse und Bodenwerte in Prag in den Jahren 1869-1902*. Wien: F. Deuticke

Mildschuh, W. (1931). *K naší otázce bytové*. Praze: Nákladem České národohospodářské společnosti

Mitchell, B. R. (2003), *International Historical Statistics*, Palgrave Macmillan (Fifth ed., 3 vol.)

Moorsteen, R., and Powell, R. (1966). *The Soviet capital stock, 1928-1962*, Homewood, Ill.: R. D. Irwin

Morton, H. W. (1980). "Who Gets What, When and How? Housing in the Soviet Union", *Soviet Studies*, 32 (2), pp. 235-259

Musil, J. (1992). "Recent changes in the housing system and policy in Czechoslovakia", In Hegedus, J., Tosics, I., and Turner, B. (eds.), *The Reform of Housing in Eastern Europe and the Soviet Union*, London: Routledge, pp. 50-7.

Myant, M. R. (2003). *The rise and fall of Czech capitalism: economic development in the Czech Republic since 1989*, Northampton (Mass.) : E. Elgar, cop.

Nesterov, L. (1972). "National wealth estimation in socialist countries", *The Review of Income and Wealth* 18(3): 287-301.

Nove, A. (1983). *The economics of feasible socialism*. London: Allen & Unwin

OECD (2001). *Measuring Capital - OECD Manual*, Paris

Ofer, G. (1987), "Soviet Economic Growth: 1928-1985", *Journal of Economic Literature*, Vol. 25, No. 4, pp. 1767-1833

Ondruš, V. (2011). "Compilation of Non-Financial Balances in the Czech Republic." *Statistika: Statistics and Economy Journal* 3

Ondruš, V. (2015), "Accounting for Wealth in the Czech Republic", *Statistika: Statistics and Economy Journal* 95(1), pp. 4-18

Pichler-Milanovich, N. (2001). "Urban Housing Markets in Central and Eastern Europe: Convergence, Divergence Or Policy 'Collapse'". *European Journal of Housing Policy* 1(2), pp. 145–187

Piketty, T. (2011). "On the Long-Run Evolution of Inheritance: France 1820-2050". *Quarterly Journal of Economics* 126(3), pp. 1071–1131.

Piketty, T. (2014). *Capital in the 21st century*, Belknap, Cambridge, MA.

Piketty, T., and Zucman, G. (2014). "Capital is Back: Wealth-Income Ratios in Rich Countries, 1700–2010". *Quarterly Journal of Economics* 129(3), pp. 1255–1310.

Poláková, O. (2006), *Bydlení a bytová politika*, Praha: Ekopress

Pryor, F. L. (1973). *Property and industrial organization in communist and capitalist nations*. Bloomington: Indiana university press.

Rognlie, M. (2015). "Deciphering the Fall and Rise in the Net Capital Share". *Brookings Papers on Economic Activity*. BPEA Conference Draft.

Rybáček, V. (2010). "Theory and practice of holding gains and losses: Is the importance of revaluation reflected in national accounts?" *Statistika: Statistics and Economy Journal*, 6

Rybáček, V. (2012). "Financial Wealth Distribution in Revised Financial Accounts". *Statistika: Statistics and Economy Journal*, 49(3)

Rusek, A. (1989), "Industrial Growth in Czechoslovakia 1971-1985: Total Factor Productivity and Capital-Labor Substitution", *Journal of Comparative Economics*, 13, pp. 301-313.

Sabirianova Peter, K., Svejnar, J., and Terrell, K. (2005). "Foreign Investment, Corporate Ownership, and Development: Are Firms in Emerging Markets Catching Up to the World Standard?", IZA Discussion Paper No. 1457

Sah, R. K. and Stiglitz, J. E. (1987), "Price Scissors and the Structure of The Economy", *The Quarterly Journal of Economics*, Vol. 102, No. 1, pp. 109-134

Sixta, J. (2014). "Development of the Measurement of Product". *Statistika*, 94(4)

Snopek, (1983). *Národní bohatství Československa*, SNTL: Nakl. technické literatury

Stadník, M. (1946). *Národní důchod a jeho rozdělení: se zvláštním zřetelem k Československu*. Praha: Knihovny Sborníku věd právních a státních.

Stádník, M. (1968). "An experiment in Czechoslovak national wealth estimates". In Stádník, M., *Theses for Harvard*, Ekonomický ústav ČSAV, Praha: Economic Institute of the Czechoslovak Academy of Sciences

Stamp, J. C. (1922), *Wealth and Taxable Capacity*, London: P.S. King and Son

Stanovnik, T. (1994). "The Sale of the Social Housing Stock in Slovenia: What Happened and Why", *Urban Studies*, 31(9), pp. 1559-1570.

Stiglitz, J. (1999). "Whither Reform? Ten Years of the Transition," presented at Annual Bank Conference on Devel. Econ., World Bank, Washington DC.

Svejnar, J., and Uvalic, M. (2009), "The Czech Transition. The Importance of Microeconomic Fundamentals", *UNU-Wider Research Paper* No. 2009/17

Sýkora, L. (1996): The Czech Republic. In: Balchin, P. (ed.): *Housing Policy in Europe*. London, Routledge, pp.272–288.

Sýkora, L., and Šimoníčková, I. (1994). "From totalitarian urban managerialism to a liberalized real estate market: Prague's transformations in the early 1990s." In Barlow, M., Dostál, P., and Hampl, M., (eds), *Development and Administration of Prague*. Amsterdam: Universiteit van Amsterdam, pp.47–72.

Sýkora, L., and Šimoníčková, I. (1996). "The Development of the Commercial Property Market and its Impact on Urban Development in the Context of Transition from a Command to a Market Economy: The Case of the Czech Republic and Prague" The real estate sector in transition economies. *Emergo: journal of transforming economies and societies*, 3(3)

Sýkora, L. (1996). "Transformace fyzického a sociálního prostředí Prahy". In M. Hampl, et al., *Geografická organizace společnosti a transformační procesy v České republice* Praha: Přírodovědecká fakulta Univerzity Karlovy, pp. 361-394.

Szelényi, I. (1983). *Urban inequalities under state socialism*. Oxford: Oxford university press

Teichova, A. (1974). *An economic background to Munich: international business and Czechoslovakia, 1918-1938*, London: Cambridge University Press

Teichova, A. (1988). *The Czechoslovak economy, 1918-1980*, London: Routledge

United Nations (1977), *Comparisons of the System of National Accounts and the System of Balances of the National Economy. Part One*. New York: United Nations.

United Nations (1979). *Guidelines on Statistics of Tangible Assets*. New York: United Nations.

United Nations (1981), *Comparisons of the System of National Accounts and the System of Balances of the National Economy. Part Two*. New York: United Nations.

Vltavská, K., and Sixta, J. (2015). "A historical view on the development of Czech economy from 1970", *Prague Economic Papers*, 24(1), pp. 105-122

Vonyó, (2010). 'Socialist Industrialisation or Post-War Reconstruction: Understanding Hungarian Economic Growth, 1949-1967', *Journal of European Economic History*, 39(2), pp. 253-300

Weitzman, M. L. (1970), "Soviet Postwar Economic Growth and Capital-Labor Substitution", *The American Economic Review*, 60(4), pp. 676-692

Weitzman, M. L. (1976). "On the Welfare Significance of National Product in a Dynamic Economy", *The Quarterly Journal of Economics*, 90(1), pp. 156-162

Weersink, A., Clark, S., Turvey, C. G., and Sarker R. (1999). "The Effect of Agricultural Policy on Farmland Values". *Land Economics*, 75(3), pp. 425-439

Whitesell, R. (1985), "The Influence of Central Planning on the Economic Slowdown in the Soviet Union and Eastern Europe: A Comparative Production Function Analysis", *Economica, New Series*, 52(206), pp. 235-244

Willis, J. W. (1950). "Short History of Rent Control Laws", *Cornell Law Review* 36(54), pp. 54-94

World Bank (2001). *Urban Housing and Land Market Reforms in Transition Countries: Neither Marx Nor Market*, World Bank: Washington DC.

Yemtsov, R. (2010), "Housing Privatization and Household Wealth in Transition," in James B. Davies (ed.), *Personal Wealth from a Global Perspective*, Oxford University Press, Oxford, pp. 312-333.

Zemplinerová, A. (1997), "The role of foreign investment enterprises in the privatisation and restructuring of the Czech Economy", *Research Reports* No. 238, WIIW

Zemplinerová, A. (1998), "Impact of foreign direct investment on the restructuring and growth in manufacturing", *Prague Economic Papers*, 7(4), pp. 328–45.

Zucman, G. (2013). "The Missing Wealth of Nations, Are Europe and the U.S. net Debtors or net Creditors?", *Quarterly Journal of Economics* 128(3), pp. 1321–1364.

# Chapter 6. From Soviets to Oligarchs: Inequality and Property in Russia 1905- 2016

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**Abstract.** This paper combines national accounts, survey, wealth and fiscal data (including recently released tax data on high-income taxpayers) in order to provide consistent series on the accumulation and distribution of income and wealth in Russia from the Soviet period until the present day. We find that official survey-based measures vastly under-estimate the rise of inequality since 1990. According to our benchmark estimates, top income shares are now similar to (or higher than) the levels observed in the United States. We also find that inequality has increased substantially more in Russia than in China and other ex-communist countries in Eastern Europe. We relate this finding to the specific transition strategy followed in Russia. According to our benchmark estimates, the wealth held offshore by rich Russians is about three times larger than official net foreign reserves, and is comparable in magnitude to total household financial assets held in Russia.

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\* This chapter is co-authored with Thomas Piketty and Gabriel Zucman



## 6.1. Introduction

Russia has undergone a dramatic economic and political transformation since the fall of the Soviet Union in 1990-1991. Gross domestic product fell abruptly in 1992-1995, while inflation skyrocketed. GDP started to recover in 1998-1999 and a decade of robust growth followed. The world financial crisis and the fall in oil prices interrupted this process in 2008-2009. Growth has been sluggish since then, and the level of economic activity fell again in 2014-2015, partly due to international sanctions following Russian military intervention in Ukraine. However, and despite the inherent difficulties in comparing GDP between Soviet and post-Soviet periods, there is little doubt that average incomes are significantly higher today than in 1989-1990. According to the estimates reported on Figure 1a, per adult national income has increased by about 40% between 1989 and 2016, from slightly more than 16 000€ at the end of the Soviet period to almost 24 000€ in recent years (both expressed in 2016 euros using purchasing power parity exchange rates). If we compare Russia's per adult national income to the Western European average—here defined as the simple arithmetic average of Germany, France and Britain—we find that the gap between Russia and Western Europe has narrowed a bit. Russian living standards were about 60-65% of the Western European average in 1989-1990, and reached about 70-75% by the mid-2010s.

This uneasy process of convergence with the West should also be analyzed from a longer run perspective (see Figure 1b). According to the best available estimates, Russia's per adult national income was stagnating at about 35-40% of Western European levels between 1870 and World War 1. Tsarist Russia was a poor and illiterate country. The ratio between Russia and Western Europe rose spectacularly to as much as 65% in the aftermath of World War 2. This reflects the modernization strategy followed by the Soviet state after the Bolshevik revolution—based on rapid industrialization and mass investment in basic education—as well as the mediocre growth performance of Western countries during the 1914-1945 period. Russia's relative position then reached a plateau and stagnated at about 55-65% of Western European levels between 1950 and 1990. One can even detect a relative decline starting in the late 1970s and during the 1980s, from more than 65% to less than 60% (despite the growth slowdown in the West during this period). The stagnation of Russian living standards relative to the West between the 1950s and the 1980s, together with rising shortages and

general frustration among the educated population, arguably contributed to the complex social and political processes that eventually led to the fall of the Soviet Union.<sup>1</sup>

Yet the consequences on the distribution of income and wealth of the dramatic transformations that occurred since 1989-1990 are not very well documented and understood. There is no doubt that income inequality has increased substantially since 1989-1990, at least in part because monetary inequality was unusually—and to some extent artificially—low under Communism. But little is known about the exact magnitude of the increase. Which income and wealth classes have benefited the most from the post-Soviet transition, and in what proportions? How do Russia's inequality levels compare to those observed in Western capitalist countries, in China, and in ex-communist Eastern European countries?

In this paper, we attempt to combine the various available data sources—national accounts, surveys, wealth rankings, and tax data, including recently released tax data on high-income taxpayers—in a systematic manner to provide consistent series on the accumulation and distribution of income and wealth in Russia from the Soviet period until the present day.

Our contributions are both methodological and substantial. First, from a methodological viewpoint, we provide what is to our knowledge the first attempt to exploit Russian national income tax tabulations to correct official survey-based inequality estimates.<sup>2</sup> We find that surveys vastly under-estimate the rise of inequality since 1990. According to our benchmark estimates, top income shares are now at least as high than in the United States, with a top 1% income share around 20-25%. We also find that inequality has increased substantially more in Russia than in China and ex-communist Eastern European countries, a finding we relate to the specific transition strategy followed in Russia.

Second, we combine various official and non-official series to provide the first complete balance sheets for private, public, and national wealth in post-Soviet Russia, including an estimate for offshore wealth. According to our benchmark estimates, offshore wealth is about

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<sup>1</sup> The best indicator of the mediocre Soviet economic and social performance in the post-World War 2 decades is probably the stagnation of life expectancy; see, e.g., Todd (1976). Life expectancy is better measured and to a large extent more informative than national income. Also note that using the West European average income as a reference point is clearly an over-simplification and does not do justice to the complexity of country-specific trajectories. For instance, Germany, France and Britain have quasi-identical average income in 2016, but Britain was lagging behind Germany and France in 1980 (only slightly above Russian level), and was on the contrary well ahead in 1870-1914. See Appendix B, Figures B1-B2.

<sup>2</sup> Previous studies used leaked income tax declarations for the city of Moscow for year 2004 (see Guriev and Rachinsky 2006, and section 2.2 below), but to our knowledge the national annual income tax tabulations were never used before.

three times larger than official net foreign reserves (about 75% of national income vs. around 25%), and is comparable in magnitude to total onshore household financial assets. That is, there is as much financial wealth held by rich Russians abroad—in the United Kingdom, Switzerland, Cyprus, and similar offshore centers—than held by the entire Russian population in Russia itself.

In brief, our new findings reveal an extreme level of inequality in Russia and a persistent concentration of rent-based resources—which are unlikely to be the best recipes for sustainable development and growth. While our results have implications for the growth and convergence prospects of Russia (and more broadly for the role of policies, institutions, and ideology in inequality dynamics), we stress that the present paper is essentially focused on measuring inequality and explaining how the various existing sources can be combined. Our modest objective is to make explicit what we know and do not know about inequality in Russia, and to put Russia's inequality trajectory in historical and comparative perspective. More data is required before we can make further progress in interpreting the findings.

This paper is part of a broader project, the World Wealth and Income Database (WID.world), that attempts to produce distributional statistics that are comparable across countries. To make the statistics as comparable as possible, we follow a common methodology that involves combining national accounts, surveys, and fiscal data in a consistent manner to produce “distributional national accounts”. This methodology was already applied in the United States (Saez and Zucman, 2016; Piketty, Saez and Zucman, 2016), France (Garbinti et al, 2016, 2017) and China (Piketty, Yang and Zucman, 2017). This is an ongoing project, and we have no doubt that the Russian series reported in the present paper will be improved in the future, as refined methods are designed and better data sources (hopefully) become available. All updates will be posted online at WID.world.

The rest of this paper is organized as follows. In section 2 we describe our main data sources, concepts, and methodology. Section 3 presents our results on the evolution of private wealth, public wealth, offshore wealth and national wealth-national income ratios in Russia and compare these findings to other countries. In section 4 we present our results on the evolution of income and wealth inequality in Russia, which we also compare to other countries. Section 5 provides concluding comments. This paper is supplemented by an ex-

tensive online Appendix that includes all our raw data sources and computer codes and presents additional results and robustness checks.<sup>3</sup>

## 6.2. Data Sources, Concepts and Methodology

This paper relies on five types of data sources: national income and wealth macro accounts, household income surveys, income tax data, household wealth surveys, and wealth rankings. We start by describing the macro data sources, and then proceed with distributional data. Our concepts and methods generally follow those described in the Distributional National Accounts guidelines used for the World Wealth and Income Database (Alvaredo et al., 2016). In this section, we focus on the main conceptual and empirical issues; complete methodological details are provided in the online Appendix.

### 6.2.1. National income and wealth series

#### 6.2.1.1. Basic concepts and conceptual framework

We follow the U.N. System of National Accounts (SNA 2008) conceptual framework and the definitions used by Piketty and Zucman (2014) and Alvaredo et al (2016). By combining official Russian official national accounts series together with a number of unofficial balance sheet estimates and sources, we provide consistent series for national income, national wealth, and their components over the 1990-2015 period.

National income  $Y_t$  is defined in the standard manner: GDP minus capital depreciation plus net foreign income. Private wealth  $W_t$  is defined as the total value of assets owned by households and non-profit institutions, minus their debt.<sup>4</sup>

Following SNA guidelines, assets include all the non-financial (real) assets – housing, land, buildings, machines, intellectual property etc. – and financial assets – including life insurance and pensions funds – over which ownership rights can be enforced and that provide economic benefits to their owners. Pay-as-you-go social security pension wealth is excluded, just like all other claims on future government expenditures and transfers (like education expenses

<sup>3</sup> The data appendix is available online at <http://piketty.pse.ens.fr/>, <http://gabriel-zucman.eu/russia>, and <http://WID.world>.

<sup>4</sup> At this stage Russian data sources do not allow to decompose private wealth into personal wealth (households) and non-profit wealth (non-profit institutions, usually a relatively small part of private wealth), so we only provide series for aggregate private wealth (personal plus non-profit).

for one's children and health benefits). Durable goods owned by households, such as cars and furniture, are excluded as well. Non-financial assets are the only "real" assets, in the sense that financial assets and liabilities exactly balance each other at the world level and do not contribute to global net wealth. As a general rule, all assets and liabilities are valued at their prevailing market prices. Corporations are included in private wealth through the market value of equities owned by households. Unquoted shares are typically valued on the basis of observed market prices for comparable, publicly traded companies.

We similarly define public (or government) wealth  $W_{gt}$  as the net wealth of public administrations and government agencies. In available balance sheets, public non-financial assets like administrative buildings, schools and hospitals are valued by cumulating past investment flows and upgrading them using observed real estate prices. We define market-value national wealth  $W_{nt}$  as the sum of private and public wealth:  $W_{nt} = W_t + W_{gt}$ . National wealth can also be decomposed into domestic capital and net foreign assets:  $W_{nt} = K_t + NFA_t$ . Domestic capital  $K_t$  can in turn be decomposed as the sum of agricultural land, housing, and other domestic capital (including the market value of corporations, and the value of other non-financial assets held by the private and public sectors, net of their liabilities).

An alternative measure of the wealth of corporations is the total value of corporate assets net of non-equity liabilities, what we call the corporations' book value. We define residual corporate wealth  $W_{ct}$  as the difference between the book-value of corporations and their market value (which is the value of their equities). By definition,  $W_{ct}$  is equal to 0 when Tobin's Q – the ratio between market and book values – is equal to 1. In practice, there are several reasons why Tobin's Q can be different from 1, so that residual corporate wealth is at times positive, at times negative. We define book-value national wealth  $W_{bt}$  as the sum of market-value national wealth and residual corporate wealth:  $W_{bt} = W_{nt} + W_{ct} = W_t + W_{gt} + W_{ct}$ . Although we tend to prefer our market-value concept of national wealth (or national capital), both definitions have merit.<sup>5</sup>

Balance sheets are constructed by national statistical institutes and central banks using many census-like sources, in particular reports from financial and non-financial corporations about their balance sheet and off-balance sheet positions, and housing surveys. The perpetual inventory method usually plays a secondary role. The interested reader is referred to

<sup>5</sup>  $W_{bt}$  corresponds to the concept of "national net worth" in the SNA (see Piketty and Zucman 2014, Data Appendix A.4.2). We use "national wealth" and "national capital" interchangeably (and similarly for "domestic wealth" and "domestic capital", and "private wealth" and "private capital"), and specify whether one uses "market-value" or "book-value" aggregates.

Piketty and Zucman (2014) for a precise discussion of the methods used by the leading rich countries.

#### 6.2.1.2. Special issues with Russia's national income and wealth accounts

In the case of Russia's balance sheets, all details about data constructions and raw sources are given in Appendix A. A number of additional remarks are in order. First, we put special attention at estimating offshore wealth. Generally speaking, the issue of offshore wealth and cross-border assets has become increasingly important at the global level in recent decades (see Zucman 2013, 2015). Russia is arguably the country in the world where this issue has become the most significant. As we will see in section 3 when we present our results, there are major discrepancies in Russia's basic economic and financial statistics, and in particular there is a large gap between very high trade surpluses during the 1990-2015 period and relatively limited accumulation of net foreign assets.

Capital flight and offshore wealth are natural candidates to explain this paradox, and in this paper we propose a method and an estimate for the likely magnitude of offshore wealth. By definition, such an estimate is bound to be approximate. But given the quantitative importance of this issue in the case of Russia, we feel that it is preferable to provide a plausible estimate (based upon a transparent method using the large cumulated "errors and omissions" residual in Russia's balance of payment) rather than to ignore the issue altogether. As we shall see, the question of offshore wealth plays a significant role for the overall analysis of national wealth accumulation in Russia and in comparison to other countries.

Next, we focus on post-1990 balance sheets in the context of this paper, and we do not attempt to use existing estimates and data series on Soviet and pre-Soviet balance sheets. There exists a long and voluminous tradition of balance sheets and capital accumulation accounts in the Soviet Union. However the system of relative prices used in these capital accounts has little resemblance to the post-Soviet period, so we choose to begin our balance sheet series in 1990. There also exists some balance sheet estimates for the pre-Soviet period, which to some extent are more comparable to the modern estimates and to the contemporary estimates for other countries. Existing estimates for 1913 typically show national wealth around 500-600% of national income, with a large share of agricultural land (see e.g. Goldsmith 1965). If they were to be compared to the post-1990 estimates reported in the present paper, the very long run pattern for Russia would be similar to that observed for Western countries (Piketty and Zucman, 2014): large and relatively stable national wealth-

national income ratios in the very long run, but with major changes in composition (agricultural land being replaced by housing and other domestic capital).

## 6.2.2. Series on income and wealth distribution in Russia

### 6.2.2.1. Income distribution series

We construct our income distribution series by combining national accounts, survey, wealth, and fiscal data. More precisely, we proceed in three steps: we start from household income survey data (**step 1**), which we correct using income tax data on high-income individuals and generalized Pareto interpolation techniques (Blanchet, Fournier and Piketty, 2017) (**step 2**). We then use national accounts and wealth inequality data in order to impute tax-exempt capital income (**step 3**). All corresponding computer codes and robustness checks are provided in the appendix.

This methodology in three steps mirrors that used for China by Piketty, Yang, Zucman (2017), with a number of important differences. In particular, the income tax data takes a different form in Russia and in China. In China, a relatively standard progressive income tax system (with graduated tax rates from 0% to 45%) has been in place (with minor changes) since 1980, but we only know the number and total income of taxpayers with annual taxable income above a certain threshold (usually 120 000 yuans), and the data is only available on an annual basis since 2006.

Russia, by contrast, has a flat 13% income tax since 2001. In 2008, the tax administration started to release annual tabulations that are in some ways richer than the Chinese data, in the sense that they provide information on the numbers of taxpayers for a larger number of brackets of “assessable income,” including very high brackets (taxpayers with annual incomes between 10 and 100 million rubles, 100 and 500 million, 500 million and 1 billion, 1 and 10 billion, and over 10 billion rubles).<sup>6</sup>

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<sup>6</sup> See Appendix B, Table B11 for the raw tabulated data. In 2016, 1€ = 74.5 rubles (market exchange rates) or 28.3 rubles (PPP). In most years between 2008 and 2015, we have typically about 400-500 taxpayers with assessable income above 1 billion rubles, and 30-50 with assessable income above 10 billion rubles (i.e. above 150 million dollars using market exchange rates). Needless to say, these are income levels that are never visible in household survey data. According to Forbes, there are during this period about 100 Russian billionaires with average wealth around 3-4 billion dollars, which may deliver annual income flows of the order of 100-200 million

Unfortunately there are two major limitations with these tabulated statistics. First, the concept of “assessable income” used in these tabulations resembles a “gross revenue” concept (rather than an “income” concept), in the sense that all personal revenues are taken into account, before any deductions (in particular before deductions such as professional expenses for entrepreneurial income, or asset acquisition price and other costs for capital gains, etc.).<sup>7</sup> Other tables released by Russian tax authorities do provide information about how total deductions compare to total revenues, but this information is not available at the bracket level, so we need to make assumptions in order to exploit the data. In our benchmark series, we assume the same deduction rate for all brackets.

The other major difficulty (which biases the data in the opposite direction) is the fact that not all taxpayers need to submit an income declaration in Russia’s personal tax system. In principle, taxpayers whose income is entirely reported by tax agents (i.e., who only earn wages reported by employers, and/or interest and dividends reported by financial institutions) do not need to submit a declaration. For them, the 13% flat income tax withheld at source is considered as final. The declaration is only compulsory for taxpayers who also receive other income (such as entrepreneurial income, capital gains, foreign income, gifts, etc.) on which the tax has not been withheld at source. Taxpayers who do not receive such incomes must also submit a declaration in case they want to claim personal deductions (such as deductions for charitable giving, education or health expenses, mortgage payments, etc., with the exception of deductions for dependent adults and children, which are already taken into account at source). In order to properly exploit the data, we need to make assumptions on what fraction of taxpayers file a declaration. In all variants, we assume that very top income taxpayers all file declarations.

Given these limitations of the raw income tax data, we present in the appendix a large number of variants based upon different alternative hypothesis about the profile of deduction

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dollars (assuming an average rate of return around 4-5%). Of course we have no way to know whether Russian billionaires pay income tax in Russia: according to Forbes most of them are Russian residents (see Figure 2 below and online appendix), but this does not tell us much about the legal arrangements governing their assets and income flows. At least the orders of magnitude are comparable.

<sup>7</sup> The reason why the tax administration uses “assessable income” (i.e., gross revenue) to tabulate income declarations instead of “taxable income” (i.e., gross revenue minus deductions) is unclear and might be due to tax audit strategy: in effect this is a way to keep track of all declarations with large revenues (before deductions are used to reduce taxable income to much lower levels). Also note that in some cases foreign residents are not allowed to claim deductions, so that in effect the flat tax rate applies to their gross revenue rather than their taxable income, which can make an enormous difference (in addition, the flat tax rate applicable to foreign residents is generally 30% rather than 13% for most income sources; this might contribute to explain why most Russian billionaires are Russian residents according to Forbes; see below). See Appendix B for details on Russian tax law and data.



rates and declaration rates. In section 4 below, we focus upon our benchmark series, which are relatively conservative and deliver intermediate inequality levels in the range of variants that we consider. We should stress that in all possible variants, the numbers of very high income taxpayers are much higher according to tax data than in self-reported survey data, so that our corrected inequality estimates (and in particular our corrected top 10% and top 1% income shares) are much larger than what raw survey data imply.<sup>8</sup> That being said, it is clear that the income tax tabulations that are currently available in Russia are imperfect.<sup>9</sup> The publication of improved tabulations would make it possible to construct more precise and detailed estimates of income inequality in Russia.

As far as we know, it is the first time that Russia's national income tax tabulations (which are available on Russian tax authorities' website) are used by researchers. Some researchers used a sample of individual-level income declarations from the city of Moscow that was leaked in 2004. The sample includes a lot more information than the tabulations we use in this paper, but unfortunately the data was not national and covered only few years. What is reassuring for our purposes is that the Moscow data led to quantitative results that are broadly similar to what we find here: the Gini coefficient jumped from about 0.3-0.4 in self-reported survey data to over 0.6 using the leaked tax data, and the top 10% income share moved from about 30% to over 50% of total income (see Guriev and Ruchinsky 2006, Table 4).

All details about the national income tax tabulations and the resulting estimates are provided in the online appendix. Regarding household survey data, we use the RLMS survey data (over the 1994-2015 period) and the HBS survey data for earlier years (HBS data is available over the 1989-2015 period; comparable Soviet surveys were conducted in 1980, 1985 and 1988 and we also use them). Both surveys (RLMS and HBS) have well-known advantages and limitations.<sup>10</sup> We assume that they provide an acceptable description of the distribution of income below the 90<sup>th</sup> percentile ( $p_0=0.9$ ). In order to exploit the income tax tabulations available over the 2008-2015 period, we apply generalized Pareto interpolation techniques

<sup>8</sup> See Appendix B, Figures B40-42.

<sup>9</sup> Ideally, Russian tax authorities should release tabulations by brackets of taxable income (and not only by brackets of "assessable income", i.e. gross revenue), reporting the amounts of total taxable income and of the various income subcomponents for each bracket (and not only the numbers of taxpayers), and covering the entire taxpayer population (including taxpayers whose income is reported by tax agents rather than through a declaration). The first improvement would already be substantial.

<sup>10</sup> With RLMS, we have access to individual micro-files and a detailed income questionnaire, but the survey suffers from sample attrition, ageing and declining-inequality bias at the end of the period (see Kozyrera et al 2015; see also Milanovic and Ersado 2010). With HBS, the sampling frame is more consistent over time, but income is measured indirectly (via consumption and change in financial saving), and only rudimentary and relatively opaque tabulations are available (see Yemstov 2008). See online appendix for more details how we combine the two surveys.

(Blanchet, Fournier and Piketty 2017) and piecewise-linear correction factors  $f(p)$  above  $p_0$  up to the percentiles provided by the tax data in order to correct the top part of the distribution (similarly to the method used by Piketty-Yang-Zucman 2017, and described in Alvaredo et al 2016). The resulting increase in top decile Pareto coefficients is used in order to correct survey-estimated Pareto shapes over the 1980-2007 period. In effect, this results into small upward corrections of raw survey inequality over the 1980-1990 period, and gradually increasing upward corrections after 1990 (see section 4 below, figures 10a-10c).<sup>11</sup>

Finally, we use tabulated data from Soviet earnings and income surveys that were already used for years 1928, 1934, 1956, 1959, and regularly until 1989 by other researchers (see in particular Bergson 1942, 1944, and the major work by Atkinson and Micklewright 1992, who provide an extensive collection of tabulated survey data for Russia and Eastern European countries under Communism; see also Flemming and Micklewright 2000 for a survey). In order to provide a comparison with pre-Soviet inequality, we also use the income distribution table that was estimated by Tsarist tax authorities for year 1905 in preparation for the possible introduction of an income tax (which was finally not introduced, so this cannot be compared to actual data).<sup>12</sup> As we explain in section 4 below, the precision of the resulting estimate should not be over-estimated, but the orders of magnitude appear to be plausible.<sup>13</sup>

### 6.2.2.3. Wealth distribution series

We also provide wealth distribution series for Russia over the 1995-2015 period (which we then use to allocate tax-exempt capital income). In order to construct these estimates, we use Forbes billionaire data and apply generalized Pareto interpolation techniques. Two remarks are in order here.

<sup>11</sup> This simply comes from the fact that raw survey data Pareto shapes are very low in pre-1990 surveys and quickly rise afterwards. The resulting 1990-2007 profile of rising inequality appears to be relatively robust, but it is evident that it would be preferable to have access to income tax tabulations prior to 2008. Unfortunately no such data seems to exist (except the 2004 leaked fiscal data from Moscow city, which yields consistent upgrade factors and tends to validate our approach).

<sup>12</sup> This 1905 estimate has been used by Gregory (1982) and Lindert and Nafziger (2012).

<sup>13</sup> Bergson (1984, p.1077) also provides earnings tabulations for 1914 with relatively high pre-war inter-decile ratios P90/P10 (5.55 in 1914, vs 3.66 in 1928 and 3.74 in 1934; see also Bergson 1942 p. 236). This is consistent with the relatively high inequality estimate for 1905. See Appendix B tables.

First, as we further explain in section 3 when we present the resulting estimates, there is substantial uncertainty about the exact level of wealth concentration in Russia. The number of Russian billionaires—as registered in international rankings such as the Forbes list—is extremely high by international standards. According to Forbes, total billionaire wealth was very small in Russia in the 1990s, increased enormously in the early 2000s, and stabilized around 25-40% of national income between 2005 and 2015 (with large variations due to the international crisis and the sharp fall of the Russian stock market after 2008). This is much larger than the corresponding numbers in Western countries: Total billionaire wealth represents between 5% and 15% of national income in the United States, Germany and France in 2005-2015 according to Forbes, despite the fact that average income and average wealth are much higher than in Russia. This clearly suggests that wealth concentration at the very top is significantly higher in Russia than in other countries (see Figure 2).

The problem, however, is that billionaire data is about very small groups of individuals (about 100 billionaires who are Russian citizens at the end of the period, most of whom are Russian residents according to Forbes). One needs to make fairly strong assumptions in order to move from there to estimates of the top 10% or even the top 1% and top 0.1% of the distribution. In the appendix we present a number of alternative series based upon explicit assumptions and generalized Pareto interpolation techniques. Unfortunately, there is significant uncertainty about these estimates. We know that Russia is a country with large wealth inequality, but we do not know the precise extent of wealth concentration (for instance, we cannot provide a precise comparison with the US). We very much hope that new data sources and methods will be developed in the future so as to improve these estimates. We return to this discussion when we present our benchmark series in section 4.<sup>14</sup>

Even though there is significant uncertainty about the exact magnitude of wealth concentration, this has relatively limited impact on our final income inequality estimates. As described above, we use the wealth inequality estimates to allocate tax-exempt capital income (typically undistributed corporate profits and imputed rent), assuming that the joint distribution of fiscal income and non-fiscal income (i.e. tax-exempt capital income) follows a Gumbel copula with

<sup>14</sup> Other researchers have used billionaire data and Pareto interpolation techniques in order to estimate top wealth shares in Russia and other countries. See in particular the estimates constructed by Davies et al (2011, 2010-2016) published in “Credit Suisse” Global Wealth Reports. Unfortunately, these works are not entirely explicit about what they mean by “Pareto interpolation” (they do not provide on-line computer codes, and we were not able to determine how exactly they compute their top wealth share estimates). As shown by Blanchet, Fournier and Piketty (2017), existing distributions of income and wealth are better characterized by “Pareto curves” (i.e. by a non-parametric curve of Pareto coefficients) than by a single Pareto coefficient. This also explains why it is unfortunately not sufficient to have billionaire data in order to infer top wealth shares with reasonable precision. All detailed estimates and computer codes are available on-line.

parameter  $\Theta=3$ .<sup>15</sup> We show that using the different alternative wealth inequality series has very little effect on final top income shares series, first and foremost because top fiscal income shares are already very large (suggesting that they already incorporate a substantial part of top economic capital incomes and business incomes), and next because non-fiscal income is not a very large income component and all wealth inequality series are characterized by large concentration.<sup>16</sup>

### 6.3. The Rise of Private Property in Russia

In this section we present our main results regarding the evolution of aggregate private and public wealth in Russia since the fall of the Soviet Union. The first major change that occurred between 1990 and 2015 is of course the transition from communism to capitalism, i.e., from public to private property.

#### 6.3.1. The general evolution of national, public and private wealth

According to our benchmark estimates (see Figure 4), net national wealth amounted to slightly more than 400% of national income in 1990, including about 300% for net public wealth (roughly three quarters) and little more than 100% for net private wealth (one quarter). In 2015, the proportions are basically reversed: net national wealth amounts to 450% of national income, including more than 350% for net private wealth and less than 100% for net public wealth. The dramatic fall in net public wealth happened in a couple of years only, between 1990 and 1995, following the so-called shock therapy and voucher privatization strategy.<sup>17</sup>

It is also worth noting that aggregate national wealth first fell relatively to national income between 1990 and 1999, from over 400% of national income to about 300%, i.e., aggregate national wealth fell even more than national income. It then rose very significantly between 1999 and 2008-2009, reaching about 550% of national income. This peak corresponds to a very large rise of Russian stock market prices and housing prices during this decade. Asset prices fell in the aftermath of the financial crisis, and aggregate national wealth is back to

<sup>15</sup> Full details are provided in the on-line appendix. Using national accounts series, we estimate that tax-exempt capital income gradually rises from 1% of fiscal income in 1990 to 10% in 2000 and then stabilizes at this level.

<sup>16</sup> See Appendix B, Figure B30-B31.

<sup>17</sup> One key argument behind the shock therapy doctrine was that rapid privatization would prevent any possible return to public property and communism. See, e.g., Boycko, Shleifer and Vishny (1995).

about 450% of national income in 2015, a level that is only slightly higher than in 1990. The major transformation during the 1990-2015 is the shift from public to private property, while the aggregate value of national wealth has remained roughly constant.

In order to better understand the processes at work, it is critical to look separately at the different asset categories. We start with the rise of private wealth (see Figure 4). One key finding is the critical role played by housing. Other domestic capital (mostly consisting of unincorporated businesses owned directly by households) and agricultural land (which was also largely privatized during the 1990s) increased over time, but these assets played a relatively limited role as compared to the rise of private housing, which increased from less than 50% of national income in 1990 to 250% of national income in 2008-2009 (at the peak of the housing bubble), down to about 200% of national income by 2015. In addition to real estate price movements, the gradual rise of private housing between 1990 and 2015 can be accounted for by the fact that housing privatization happened in a more continuous manner than the voucher privatization method used for companies. Tenants were typically given the right to purchase their housing unit at a relatively low price, but they did not need to exercise this right immediately. Due to various economic, political and psychological factors, many Russian households waited until the late 1990s and even the 2000s to exercise this right.<sup>18</sup>

What is particularly striking is the very low level of recorded financial assets owned by Russian households (as measured by the Bank of Russia official financial balance sheets). Household financial assets have always been less than 70-80% of national income throughout the 1990-2015 period, and they have often been less than 50% of national income (e.g. as little as 20-30% of national income in the late 1990s and early 2000s).<sup>19</sup>

In effect, it is as if the privatization of Russian companies did not lead to any significant long-run rise in the value of household financial assets, in spite of the fact that it is now possible to own financial shares in Russian firms, which seems especially paradoxical.

The initial decline in financial assets was predictable. Back in 1990, household financial assets (which at the time mostly consisted of saving accounts) amounted to about 70-80% of

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<sup>18</sup> Some were concerned about the possible maintenance costs associated to private ownership (while under public housing ownership maintenance work was taken care of by public authorities). Others were concerned about a possible political downturn (the presidential election of 1996 was won by Yeltsin with a 54% margin against communist party leader Zyuganov).

<sup>19</sup> Household debt (which is relatively small in Russia – less than 20% of national income) was deducted from housing values on the series reported on Figure 4, so net financial assets would be even smaller. See Appendix A for all details on sources and computations.

national income. Unsurprisingly, these Soviet-era savings were literally wiped out by the hyper-inflation of the early 1990s. The consumer price index was multiplied by nearly 5000 between 1990 and 1996, with annual inflation rates of the order of 150% in 1991, 1500% in 1992, 900% in 1993, 300% in 1994 and 150% in 1995. The new ruble – worth 1000 old rubles – was introduced in 1998, and inflation stabilized at about 20-30% per year on average between 1996 and 2006. Given the enormous inflation of the 1991-1995 period, Soviet-era savings were worth close to nothing by the late 1990s.

What is more surprising is why the new financial assets that were accumulated by Russian households during the 1990s – in particular through voucher privatization – did not compensate for this loss. Of course, when vouchers were first introduced in 1992-1993, it was very difficult for Russian households to know what to do with these new financial instruments and to put a price on them. More generally, one can argue that in the chaotic monetary and political context of the 1990s it is not too surprising that the market value of household financial assets remained relatively low until the mid to late 1990s. What is more difficult to understand is why such extremely low valuations persisted well after. In particular, in spite of the spectacular Russian stock market boom that occurred between 1998 and 2008, it is striking to see that total financial assets recorded as owned by Russian households amounted to little more than 70% of national income in 2008, i.e. less than the level observed in 1990.

In our view, the main explanation for this paradox is the fact that a small subset of Russian households own very substantial offshore wealth, i.e., unrecorded financial assets in offshore centers. According to our benchmark estimates, offshore wealth has gradually increased between 1990 and 2015, and represents about 75% of national income by 2015, i.e., roughly as much as the recorded financial assets of Russian households (see Figure 4). By definition, offshore assets are difficult to estimate, and we certainly do not pretend that our benchmark estimates are perfectly precise. But the orders of magnitude seem to be reasonable, and if anything may be somewhat under-estimated. We now turn to a more detailed presentation of the construction of these offshore wealth estimates.

### 6.3.2. Estimating capital flight and offshore wealth in Russia

In order to estimate the rise and magnitude of offshore wealth held by Russian households, it is natural to start by looking at the evolution of Russia's trade balance and balance of payments. Here the striking fact is the contrast between the very large trade surpluses and the relatively modest foreign assets (see Figure 5a).

Russia has run large trade surpluses every single year since the early 1990s. These trade surpluses – mostly driven by exports in oil and gas – have been around 5% of national income per year between 1993 and 1998, up to as much as 20% of national income in 1999-2000, and have stabilized around 10% of national income per year between 2001 and 2015. Over the 1993-2015 period, the average trade surplus neared 10% of national income per year (9.8%). In other words, every year during more than 20 years, the Russian economy has been exporting about 10% of its annual output in excess to what it has been importing. Given that the initial financial position of the country was close to zero in 1990 (very little foreign assets, very little foreign debt), this should have led to a massive accumulation of foreign assets by Russian residents (government, households and corporations). The paradox is that net foreign assets accumulated by Russia are surprisingly small: about 25% of national income by 2015 (see Figure 5a).

If one looks in more detail at Russia's balance sheet vis-à-vis the rest of the world, we find that both foreign assets (i.e., assets owned by Russian residents in the rest of the world) and foreign liabilities (i.e., assets owned by rest-of-the-world residents in Russia) have increased significantly since the fall of the Soviet Union. Both were extremely small in 1990 (about 10% of national income), reflecting low levels of financial integration with the rest of the world and strong capital controls. By 2015, foreign assets reached almost 110% of national income, and foreign liabilities were close to 85% of national income, hence the net foreign asset position was about 25% of national income.

How can we account for such a low level of net foreign wealth accumulation? The obvious explanation is capital flight: some Russian individuals (and/or some Russian corporations acting on behalf of individuals, and/or some Russian government officials acting on behalf of individuals) were somehow able to appropriate some of the trade surpluses in order to accumulate offshore wealth, i.e. foreign assets that are not properly recorded as such in Russia's official financial statistics. Given the weaknesses of Russia's legal and statistical system, and the widespread use of offshore entities to organize business and financial transactions in Russia over this period (see, e.g., the work by legal experts such as Nougayrede 2014, 2015, 2017), it is maybe not too surprising that such leakages might have occurred.

How large is the corresponding capital flight and associated offshore wealth? If we simply cumulate the trade surpluses over the 1990-2015 period, we obtain about 230% of national income. So one might conclude that cumulated capital flight is of the order of 200% of national income (given that official net foreign assets are less than 30% of national income). In

principle, one should also include the cumulated capital income flow on these foreign assets, which depending on the rate of return could lead to substantially larger estimates for missing foreign wealth (with a total around 300% of today's Russia national income, or more, depending on the return). The key question is: where has this missing wealth gone, and how can we reconcile the different pieces of evidence and explanation?

First, one should take into account the fact that the flow return earned on foreign assets might be lower than the flow return paid on foreign liabilities. This is indeed what the balance of payment of Russia indicates: we observe persistently negative net foreign income flow throughout the 1990-2015 period (about -3% of national income), in spite the generally positive net foreign asset position (see Figure 5a). In effect, a significant part of the annual trade surplus – between one quarter and one third – has been absorbed by this net capital income outflow. It is possible that this reported return differential also reflects some forms of capital flight, but we have no precise way to know.

Next, one should take into account the capital gains and losses realized on the portfolio of foreign assets and liabilities. Such valuation effects could potentially be enormous and account for the observed discrepancy between annual current account surpluses and the observed evolution of net foreign assets. That is, if all Russian investments abroad ended up in worthless assets (capital losses), while all foreign investments in Russia benefited from huge increases in value (capital gains), then one could in principle explain why Russia's net foreign assets are so small. Indeed this is partly what has happened: foreign investors bought Russian assets in the 1990s when stock market prices were extremely low and benefited from the booming stock market of the 2000s. This partly explains why foreign liabilities rose so much (see Figure 5b).

However, the return differential and valuation effects are not large enough to entirely explain the discrepancy between the cumulated trade surpluses and the change in the net foreign asset position. In order to estimate the magnitude of offshore wealth (missing foreign assets), we apply the following method. We take as given the observed differential in rates of return and capital gains and losses on foreign assets and liabilities, and we compute the sum of net errors and omissions and capital transfer outflows in the balance of payments. Net error and omissions reflect unrecorded saving: they correspond to the gap between the current (plus capital) account balance and recorded net foreign saving.<sup>20</sup> To these net error and omis-

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<sup>20</sup> For instance, in 2010 Russia has a current account surplus of \$67 billion, a capital account balance of \$0, and yet its recorded foreign saving flow is only \$58 billion instead of \$67 billion. That is, there are \$9 billion of net



sions, we also add capital transfer outflows, which according to balance of payments guidelines and definitions are supposed to capture changes in residency of wealthy Russian residents. The sum of net error and omissions and capital transfer outflows is our estimate of annual capital flight (the second component is usually relatively small, i.e. less than 10% of the total). We then cumulate yearly capital flight making various assumptions on the rate of return and we obtain the benchmark estimates and lower and upper variants reported on Figure 5c.<sup>21</sup>

According to our benchmark estimates, offshore wealth reaches about 75% of national income by 2015 (vs. about 100% in the upper-bound variant and 55% in the lower-bound variant). These estimates are by construction relatively conservative: we take as given the differential in returns and portfolio effects, which may also reflect some form of capital flight and accounting manipulation by foreign investors or by Russian nationals or ex-nationals. Our benchmark estimates suggest that Russians own approximately as much financial wealth offshore than onshore (about 70-80% of national income in both cases), i.e. they own about 50% of their true total financial wealth offshore. This is the same estimate obtained by Zucman (2014) using a different approach, which can be viewed as reassuring.<sup>22</sup>

We should stress again, however, that the frontiers between the different forms of missing wealth are highly uncertain and difficult to estimate with absolute precision, given the general lack of international financial transparency. What we know for sure is that the magnitude of cumulated Russian trade surpluses and total missing wealth over the 1990-2015 is extremely large (at least 200% of Russia's national income). It is more complicated to know who holds the missing wealth and the form it takes.

At a general level, one can distinguish between three different categories of beneficiaries: first, there are pure foreigners (individuals or corporations with no initial tie to Russia), who

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errors and omissions (either under-estimated Russian investment flows abroad, or over-estimated foreign investment flows in Russia).

<sup>21</sup> In our benchmark scenario, we assume that offshore wealth earns an annual rate of return which is equal to the growth rate  $g$  of the Russian economy + 2%. In our lower bound scenario, we assume that offshore wealth grows just like the Russian economy, i.e., at rate  $g$ . In our upper bound scenario, we assume that offshore wealth grows at rate  $g + 4\%$ . All details are provided in Appendix A.

<sup>22</sup> Namely, the estimate in Zucman (2014) relies on statistics on the bank deposits owned by Russian residents in offshore centers (Switzerland, Luxembourg, United Kingdom, etc.) which are published through the Bank for International Settlements (BIS). See Zucman (2013, 2014, 2015) for more details. Note however that the overall Russian asset levels reported by Zucman (2014) are lower than those reported here, partly because the former only capture financial assets (and excludes real foreign assets), and partly because our new estimate is broader in scope, as it includes wealth that belongs to non-residents (emigrants, captured by capital transfer outflows) on top of offshore assets belonging to residents. See the discussion below.

accumulated wealth by doing business in Russia since the 1990s via differential rates of return and valuation effects (there foreigners might now hold the corresponding wealth in Russia or elsewhere, or might have consumed it; in some cases, this mechanism might have also benefited Russia nationals or ex-nationals). Next, there are Russian nationals (or ex-Russian nationals) who are now foreign residents, and who were able to divert assets via offshore transactions. Last, there are Russian nationals who still have their primary residence in Russia, and who were able to divert assets via offshore transactions.

Our estimates of offshore wealth can be viewed as the sum of the last two components. We do not attempt to provide a formal breakdown between them, i.e., between Russian residents and non-residents. According to balance-of-payments statistics, capital transfers represent less than 10% of total net errors and omissions and capital transfers, so one might be tempted to conclude that Russian residents are the primary holders. This would also be consistent with the global Forbes billionaire data, according to which the vast majority of Russian billionaires have their primary residence in Russia (see section 2 and Figure 2).<sup>23</sup>

Even more uncertain is the nature of the destination assets: some of the offshore wealth might be invested back in Russian corporations, and some might be invested abroad (e.g., a mansion in London, a castle in France, or a company in Germany, the U.S. or elsewhere).<sup>24</sup> By inspecting the list of Russian billionaires released by Forbes (which together own more than 400 billion dollars in assets, i.e., the equivalent of about half of our estimated 800 billion dollars in Russian offshore wealth), and the information about the corresponding wealth portfolios published in Forbes and other magazines, one may be tempted to conclude that most of the offshore wealth is held in Russian companies (in particular in the energy and financial sectors). On this basis, our preferred interpretation of available data is that a large fraction of Russia's official foreign liabilities (over 80% of national income in 2015 – see Figure 5b) is actually held by Russian residents via offshore accounts. Given that the Forbes list does not provide any information regarding the fraction of reported billionaire wealth held offshore (we suspect this is a very large fraction, but we do not know), it is difficult to go further.

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<sup>23</sup> Note that the notion of primary residence used by Forbes is not entirely clear, and may not coincide with the notion used by Russian tax administration or other legal definitions.

<sup>24</sup> Note that according to SNA Guidelines real assets owned in other countries are treated as financial assets owned in a foreign corporation (which then owns the domestic real assets).

### 6.3.3. Market-value vs book-value national wealth

We now come to the evolution of the composition of aggregate national wealth (both public and private) in Russia over the 1990-2015 period. So far we focused on market-value national wealth. That is, corporate assets were valued at prevailing stock market prices.

This explains a large part of the fluctuations in the ratio between market-value national wealth and national income reported on Figure 6a: the value of other domestic capital (which includes the value of corporate capital and other non-housing non-agricultural-land domestic capital) is very small in the late 1990s-early 2000s because of the low stock market valuation of Russian companies. In contrast, market-value national wealth reaches much higher levels in 2008-2009 due to high corporate and housing valuations (see Figure 6a).

Another, complementary viewpoint on national wealth consists of looking at book-value national wealth. That is, the value of corporations is defined as the difference between the value of their non-financial and financial assets and the value of their financial non-equity liabilities (see section 2 above). If we apply this definition, we find that the levels of other domestic capital and total national wealth are much less volatile (see Figure 6b). In effect, this is taking away stock market fluctuations.

It is also worth noting that book-value national wealth is systematically larger than market-value national wealth in Russia. In other words, Tobin's Q ratio, i.e. the ratio between market (equity) value and book value is always less than one, including at the peak of the stock market boom in 2008.

It is worth pointing out that there are very different ways to interpret the fact that Tobin's Q is systematically below one. There are many countries with well-functioning legal systems where Q ratios are systematically below one, such as Germany, Nordic countries or Japan (see Piketty and Zucman, 2014). The standard explanation is the stakeholder model: various actors other than shareholders, including worker representatives and sometime regional government, share corporate decision-making power, which may reduce the market value of equity shares, but not necessarily the social value of companies. Of course, one can also think of less optimistic interpretation of low Q ratios, which may better fit the Russian case, such as ill-defined property rights and low protection of shareholder stakes in companies (not the benefit of other well-defined and potentially efficiency-enhancing stakeholders, but simply because the legal system is not working well).

An additional reason for less than one Tobin's Q in Russia could be due to the low market valuation of the capital inherited from the Soviet era. The story of the overextended and uncompetitive Soviet industry is quite well known. But inherited capital still accounts for the important part of the Russian capital stock and many industries have been artificially kept alive as a part of the government social policy. To some extent, this explanation is complementary to the above mentioned, since government can reduce shareholders' control in most profitable sectors, such as natural resources, as a part of the wider rent-sharing system (Gaddy and Ickes 2002; Gustafson 2012).

Finally, it could also be that this low level of market valuation reflects the importance of offshore assets and legal outsourcing in the management and control of Russian corporations. That is, one additional reason why the market value of equity shares traded on the Russian stock market is relatively low might be that Russian corporations are embedded into a complex nexus of contracts and offshore legal entities, of which the system of official shares ruled by the Russian legal system and traded on Moscow stock market is only the visible part. Some of the case-based evidence reported by legal scholars such as Nougayrede (2014, 2015, 2017) seems consistent with this interpretation. More research is needed to analyze these issues.

#### 6.3.4. Comparison with Western and other ex-communist countries

We now compare our findings regarding the evolution of aggregate wealth in Russia to the evolution observed in other countries. Consider first the evolution of private wealth-national income ratios. It is by now well-known that there has been a general rise of private wealth relative to national income in all developed countries since the 1970s-1980s (Piketty and Zucman 2014; Piketty 2014). This evolution can be attributed to a mixture of factors, including a combination of growth slowdown and relatively high saving rates (leading to high wealth-income ratios, partly in relation to ageing), as well as a general rise of the relative price of housing and financial assets relative to the consumer price index, reflecting a complex set of institutional and possibly technological changes (including financial deregulation, the end of rent control, rising agglomeration effects, and relatively slow technical progress in construction and transportation as compared to other sectors).

The case of Russia – together with that of China and other ex-communist countries – can be viewed as an extreme case of this general evolution, reflecting another critical explanatory factor, namely the privatization of public assets. In Russia as in China, private wealth was very limited back in 1980: slightly more than 100% of national income in both countries ac-

According to our estimates. By 2015, private wealth has reached 500% of national income in China, i.e. approximatively the same level as in the U.S., and rapidly approaching the levels observed in countries like France or Britain (550-600%). In Russia, private wealth has also increased enormously relative to national income, but the ratio is “only” of the order of 350-400% in 2015, i.e. at a markedly lower level than in China and in Western countries (see Figure 7a). We should stress that the gap would be even larger if we did not include our estimates of offshore wealth in Russia’s private wealth.<sup>25</sup>

Moreover, the rise of Russian private wealth has been almost exclusively at the expense of public wealth, in the sense that national wealth – the sum of private and public wealth – almost did not increase relative to national income (from 400% in 1990 to 450% by 2015). In contrast, China’s national wealth has reached 700% of national income by 2015 (see Figure 7b).

The widely divergent patterns of national wealth accumulation observed in Russia and China can be accounted for by a number of factors. First, saving rates have been markedly higher in China – typically as large as 30-35%, vs 15-20% at most in Russia (net of depreciation). If a country saves more, it is bound to accumulate more wealth.

Next, Chinese savings were used for the most part to finance domestic investment and hence domestic capital accumulation in China. In contrast, a very large fraction – typically about half – Russia’s national saving were in effect used to finance foreign investment (via very large trade surpluses and current account surpluses) rather than domestic investment. This is not necessarily bad in itself, except that as we have seen earlier these large flows of foreign savings did not result into much wealth accumulation, due to general mismanagement of the surpluses (bad portfolio investment, capital flight and offshore leakages). Again, the gap between Russia and China would be even larger if we did not include offshore wealth in Russian national wealth (as we do throughout this paper and on figure 7b, which is obviously debatable, given that offshore wealth is largely out of reach of Russia’s national government). In contrast, if we were to include the full value of cumulated trade surpluses in Russia’s national wealth, then Russia’s national wealth-income ratio would be at the same level as China by 2015 (around 700% of national income). This illustrates the macroeconomic significance of this issue.

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<sup>25</sup> For other countries, offshore wealth is estimated to be much smaller than in Russia (typically less than 10% of national income; see Zucman 2014) and is not included in the estimates reported here. Note however that offshore wealth held by Chinese has been increasing fast in recent years and might become more significant over time. We plan to further investigate this issue in the future work.

Finally, another reason why China's national wealth income ratios are higher than in Russia is because relative asset prices have increased more. In particular, Tobin's Q ratios are much closer to one in China (see Piketty, Yang and Zucman 2017 for detailed volume-price decompositions of China's wealth accumulation). The interpretation of this finding might reflect different factors (including more organized stake-holders in Russia, and/or less well protected property rights, and/or more legal outsourcing; see the discussion in previous subsection).

It is also interesting to compare the evolution of the overall share of public property in Russia and other countries (see Figure 7c). In developed countries, the share of net public wealth in net national wealth was significantly positive in the post-WW2 decades up until about 1980, around 15-25% of national wealth, reflecting low public debt and significant public assets (including corporate assets in manufacturing and finance in several Western countries). Net public wealth declined significantly since the 1980s, due both to the rise of public debt and the privatization of public assets. By 2015 net public wealth has turned negative in Britain, Japan and the U.S. (and is barely positive in Germany and France). In effect this means that private wealth holders own the equivalent of total public assets (via financial intermediation and the ownership of public debt), and also a fraction of future tax payments (in countries with negative net public wealth).

Ex-communist countries like Russia, China and the Czech Republic (also represented on Figure 7c) have followed the same general pattern as developed countries in recent decades – namely a declining share of public property – but starting from a much higher level of public wealth. In these three ex-communist countries, the share of net public wealth was as large as 70-80% in 1980, and falls between 20% (Russia) and 30-35% (China and the Czech Republic) in 2015,<sup>26</sup> i.e. a level that is higher but not incomparable to that observed in “capitalist” countries during the “mixed economy” period (1950-1980). In other words, these countries have ceased to be communist, in the sense that public ownership has ceased to be the dominant form of property, but they still have much more significant public wealth than other capi-

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<sup>26</sup> However, we should note here that a relatively higher share of the public wealth in the national wealth observed in the Czech Republic, equivalent to 30-35%, is not entirely representative for former communist countries in Eastern Europe. The Czech Republic displays unusually high ratio of public non-financial produced assets (or broadly the public infrastructure) to national income. In the ongoing work we document lower public infrastructure to national income ratio in most other ex-communist countries, such as Hungary or Slovenia, so public wealth generally accounts today for smaller share in the national wealth in Eastern Europe. See Appendix A for more details.

talist countries.<sup>27</sup> This is due both to low public debt and significant public assets (including in Russia in the energy sector). There are also strong differences between these countries. In particular, the privatization process was much more gradual in China than in Russia: it started earlier, and is still going on (although Chinese authorities might also choose to stabilize the public-private divide at the current level). The gradual privatization pattern observed in the Czech Republic is intermediate between the two, and is in some ways closer to China (see Figure 7c). From that viewpoint, the “big bang”, “shock therapy” approach followed for privatizing Russia appears to be markedly different from that followed in other ex-communist countries (something that we will later relate to the different inequality trajectories). It would be very interesting to compare these patterns to other Eastern European countries, but unfortunately comprehensive balance sheets are yet to be collected for most of these countries.

Finally, it is interesting to compare ex-communist countries with respect to the importance of foreign assets (see Figure 7d). It is particularly striking to contrast the case of Russia and China, which both have positive net foreign assets (i.e. these two countries own more assets in the rest of the world than what foreigners own in Russia and China), and Eastern European countries, which all have hugely negative net foreign assets (i.e. these are largely foreign-owned countries). These differences are partly due to differences in economic and natural endowments. In particular, it makes sense for countries with large (but not permanent) natural resources such as Russia to accumulate trade surpluses and foreign reserves for the future. This is what one observes in most oil-rich countries in the Middle East and elsewhere.

But differences in political institutions and ideologies seem to play an even bigger role than purely economic factors. As we have already and repeatedly stressed, Russia has been unable to accumulate large foreign assets, in spite of the equivalent of over 200% of national income in cumulated trade surpluses over the 1990-2015 period. In contrast, an oil-rich country like Norway, with comparable trade surpluses (around 10% of its national income per year over this period) accumulated a very large sovereign fund (see Figure 7f).

It is also striking to see that China has accumulated net foreign assets that are similar in magnitude to those of Russia (see Figure 7d), in the absence of any significant natural resource endowment, and with much smaller trade surpluses (less than 3% of national income on average over the 1990-2015 period). This reflects more efficient management of trade

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<sup>27</sup> Throughout this paper we refer to China as an « ex-communist country », in the obvious sense that public ownership has ceased to be the dominant form of ownership, and notwithstanding the fact that China's Communist Party is still ruling the country.

surpluses and foreign reserves (which are viewed as critical for the country's economic and financial sovereignty by the CPC), and also a political choice of limiting foreign investors' rights in China.

Finally, the large negative foreign asset positions of Eastern European countries should obviously be put in relation to the fact that these countries have adopted a development strategy based upon economic and political integration within the European Union. Eastern European countries are largely foreign-owned, but the owners tend to come from EU countries (in particular from Germany). So in some sense it is not entirely different from the situation of peripheral regions that are being owned by more prosperous central regions in a large federal country.

It is also worth noting that these patterns of foreign ownership also have consequences for the study of domestic inequality. In particular, as demonstrated in chapter 1, the fact the holders of top capital incomes tend to be foreigners rather than domestic residents contributes to lower top income shares in countries like the Czech Republic or Poland or Hungary (as compared to countries like Russia or Germany). I.e. foreign owned countries tend to have less domestic inequality (other things equal). We will return to this when we compare inequality trends across countries.

Finally, note that a significant subset of Eastern European countries (in particular Poland, Hungary and Bulgaria) already had large negative net foreign asset positions back in 1990 (see Figure 7e). Here the pattern has been mostly one of change in the identity of the foreign owner (from Russia to Germany, to a large extent).

#### **6.4. The Rise of Income and Wealth Inequality in Russia**

We now present our results regarding the evolution of income and wealth inequality in Russia. We begin with income inequality and the very long-run trends, before moving to a closer analysis of the recent decades, comparison with other countries, and finally wealth inequality.



### 6.4.1. Income Inequality: the Long-Run Picture

Our general results on the long-run evolution of inequality in Russia over the 1905-2015 period are summarized on Figures 8a-8b. The basic picture is pretty obvious: income inequality was high under Tsarist Russia, then dropped to very low levels during the Soviet period, and finally rose back to very high levels after the fall of the Soviet Union. According to our benchmark estimates, the top 10% income share was about 45-50% in 1905, dropped to around 20-25% during the Soviet period, and rose again to 45-50% in the 1990s before stabilizing at this very high level since then (see Figure 8a). The top 1% income share was somewhat below 20% in 1905, dropped to as little as 4-5% during the Soviet period, and rose spectacularly to 20-25% in the recent decades (see Figure 8b).

Several remarks are in order. First, these broad orders of magnitude can be considered as reliable, but small variations should not be taken too literally, given the strong limitations of our data sources. In particular, our benchmark estimates suggest that inequality levels in Tsarist and post-Soviet Russia are roughly comparable. Very top income shares seem if anything somewhat larger in post-Soviet Russia. One can interpret this finding as showing that modern economic and financial technologies (including international oil markets and offshore wealth) are able to generate more extreme monetary inequality than traditional societies like Imperial Russia. One could also argue that extreme inequality is maybe less dramatic (and more acceptable) when average living standards are much higher.

However we should also make clear that the differences between the two periods may not be fully significant, first because the lack of detailed income tax data – and the general lack of financial transparency – make our estimates for the recent period relatively imprecise (we will later return on this); and next and most importantly, because the estimate for 1905 is at least as imprecise. It relies not on actual income tax data, which was never implemented in Tsarist Russia, but on income tax projections that were made by Imperial tax administration at the time the regime was considering the possibility to implement such a tax. Similar estimates were made in a similar context in other countries in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries (e.g. in France), and the comparison between these projections and the actual income tax data generated by the application of the new fiscal system revealed that the tax administration was significantly underestimating top income levels (see Piketty, 2001). Of course we will never know what would have happened if an income tax had been implemented in Tsarist Russia, but these is a possibility that the same result would have prevailed. It seems safer to

conclude that inequality levels in Tsarist and post-Soviet Russia are both very high – and roughly comparable, possibly with a somewhat higher level in the later period.<sup>28</sup>

Finally, it is worth stressing that the measures of monetary inequality depicted on Figures 8a-8b obviously neglect non-monetary dimensions of inequality, which may biases comparisons of inequality over time and across societies. For instance, inequalities in personal status and basic rights (including mobility rights) were pervasive in Tsarist Russia, and persisted long after the official abolition of serfdom in 1861.<sup>29</sup> Summarizing such inequalities with a single monetary indicator is clearly an over-simplification of a complex set of power relations and social domination, and should be kept in mind when making historical and international comparisons.

The same general remark applies to the Soviet period. Monetary inequality was reduced to very low levels under Soviet communism (and also in other communist experiences, as we shall later see). For instance, a top 1% income share around 4-5% means that top 1% income holders earn only 4-5 times the average income of the time, as compared to 20 times when the top 1% share is equal to 20%. This reluctance to rely on extended monetary hierarchies is a feature that is confirmed by all Soviet household surveys and administrative documents on salary scales. In addition, the Soviet regime abolished private ownership (except in some cases for small capital holdings) and therefore suppressed top capital incomes (which in other societies always represent a large fraction of top incomes). It also compressed very significantly the hierarchy of salaries and labor incomes.

However this obviously does not mean that the Soviet elite did not have access to superior goods, services and opportunities.<sup>30</sup> This could take different forms – access to special shops, vacation facilities, etc. – which in effect could allow the Soviet top 1% to enjoy living standards that in some cases might have been substantially higher than 4-5 times average

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<sup>28</sup> Lindert and Nafziger (2012) argue that the 1905 official inequality estimate might be somewhat overestimated. However on the basis of similar estimates done by tax administrations in other countries (such as France, see above), we tend to reach the opposite conclusion. In any case, the data seems too fragile to draw a definitive conclusion about the comparison between levels of monetary inequalities prevailing in 1905 and 2005-2015.

<sup>29</sup> For instance, according to the 1861 reform, the serfs were made responsible for compensation to landlords for loss of labor, with “redemption payments” to be made annually for 49 years (this resembles the compensation that Haiti had to pay to its former French slave-owners in order to obtain independence). These payments were later renegotiated, with extensive regional and local variations, but the general point is that the abolition of serfdom was a very gradual process, which in some cases reinforced the rights of landlords (rather the rights of ex-serves). In particular, there is ample evidence that landlords retained for several decades extensive coercion power to restrict the mobility rights of peasants (who were subject to a specific legal status and court system based upon unwritten “customary law” and largely controlled by local elites). See Denison (2014).

<sup>30</sup> See Matthews (1978) for the most comprehensive attempt at delineating the Soviet elites.

incomes (though probably quite a bit lower than under Tsarist or in post-Soviet Russia). Unfortunately we have no way to quantify this.

Finally, it is worth pointing out that although monetary inequality has been very low throughout the Soviet period, there are interesting medium term variations. Namely, we observe a very strong compression of the distribution of income during the first stage of the Revolution (resulting into a large inequality decline between 1905 and 1925), followed by a relative enlargement of income hierarchies between 1925 and 1956 during the Stalinist period, a gradual decline between 1956 and 1980, and a rise during the 1980s and at the beginning of the economic reforms. This periodization has already been noted by other scholars exploiting Soviet sources on the distribution of income and wages (see e.g. Atkinson and Micklewright 1992).

#### 6.4.2. Who Benefited from Post-Soviet Transition?

We now look into more details at the recent period. First, it is striking to see that the rise in income inequality occurred very fast after the fall of the Soviet Union. According to our benchmark estimates, the top 10% income share rose from less than 25% in 1990-1991 to more than 45% in 1996 (see Figure 8a).

It is also worth pointing out that this enormous rise came together with a massive collapse of the bottom 50% share, which dropped from about 30% of total income in 1990-1991 to less than 10% in 1996, before gradually returning to 15% by 1998 and about 18% by 2015 (see Figure 8c). There is no doubt that hyper-inflation played a key instrumental role in the collapse of bottom incomes. Between 1990 and 1996, prices were multiplied by a factor of nearly 5000 (see section 3 and Appendix A). Inflation was particularly high in 1992-1993 after official price liberalization occurred on January 1<sup>st</sup> 1992. A large part of bottom 50% income classes were made up of pensioners and low-wage workers whose nominal incomes were not fully indexed to price inflation, resulting into massive redistribution and impoverishment for dozens of millions of Russians households (particularly among the retired population). Low-end pensions and wages then benefited from a gradual recovery process between 1996 and 2015, but they never fully returned to their 1990-1991 relative income share.

Together with this process of rapid collapse and partial recovery for bottom income groups, we observe a more gradual and continuous process of rising top 1% income shares, from

less than 6% in 1989 to about 16% in 1996 and over 26% in 2008. The top 1% share then dropped in the aftermath of the 2008-2009 financial crisis and stabilized around 20-22% since 2010 (see Figure 8a).

If we consider the period 1989-2016 as a whole, average per adult national income has increased by 41% according to our benchmark estimates, i.e. at about 1.3% per year. However the different income groups have enjoyed widely different growth experiences. The bottom 50% earners benefited from very small or negative growth, the middle 40% from positive but relatively modest growth, and the top 10% from very large growth rates (see Tables 1-2 and Figure 9a). From that viewpoint, the 1989-2016 looks very different from the 1905-1956 period, when most of the growth went to the bottom 90%, and also from the 1956-1989 period, when the distribution was approximately constant and growth was relatively balanced over all groups (see Table 3 and Figure 9b).<sup>31</sup>

The fact that the growth incidence curve over the 1989-1996 period displays a strong upward-sloping profile is fully consistent with recent findings presented in the 2016 EBRD report on inequality dynamics in transition economies.<sup>32</sup> There are two differences, however. First, the growth incidence curve reported on Figure 9a is even more strongly tilted toward top incomes than the one presented in the EBRD report. This is because we use corrected inequality series combining survey data with income tax data and wealth data, while the EBRD growth incidence curve relies solely on self-reported survey data. Next, the EBRD report uses a different income concept that we do and comes with a higher cumulated growth of average income over the 1989-2016 (i.e. about +70% instead of +41%). We think it is preferable to use per adult national income (as we do), and we recognize that it is very difficult to compare real incomes for the Soviet and post-Soviet periods in a satisfactory manner. E.g. if we were to evaluate the welfare costs of shortages and queuing in 1989-1990, then it is possible that our aggregate growth figures might jump from +41% to +70% or more.<sup>33</sup> More generally, we should make clear that there is little doubt in our view that the welfare of the vast majority of the population has improved since the end of Communism. The interesting question is whether they could have improved even more and in a more balanced and egalitarian manner with different policies and a different inequality trajectory.

<sup>31</sup> See Appendix B, Figures B13 to B17 for detailed growth incidence curves by sub-period.

<sup>32</sup> See EBRD (2016, Chart 1.3, p.12).

<sup>33</sup> See Appendix A for a detailed discussion of alternative Russian growth series. One reason why the EBRD report comes with higher cumulated real growth estimates over the 1989-2016 is because they look at household income, whose share in GDP and national income was unusually small in 1989-1990. However to the extent that other components of national income also ultimately benefit to households it seems more justified to look at national income rather than household income.

We should also point out that the income-tax-data correction plays a much bigger role than the wealth-data correction in our corrected inequality estimates (see Figures 10a-10b). This reflects the fact that the income tax tabulations include a significant number of declarations very high business and capital income flows. This is also reinsuring, in the sense that the data available for the wealth correction (namely Forbes billionaire data) is relatively limited and uncertain. In the Appendix, we provide detailed robustness checks and a number of alternative variant series for the income-tax-data corrections. In all variants, corrected inequality levels are substantially higher than raw survey levels, and stand relatively close in magnitude to our benchmark series (by international and historical standards).<sup>34</sup>

Finally, it is interesting to note that our corrected Gini coefficient reaches its peak value in 1996, due to the very low bottom 50% share measured for this year (see Figure 10c). This contrast with top 10% and top 1% income share series, which reach their peak levels in 2007-2008 (see Figures 10a-10b). This illustrates the need to go beyond synthetic inequality estimates and to look separately at the different segments of the distribution.

### 6.4.3. International comparisons

We now come to international comparisons. We first compare the long-run evolution of income inequality in Russia and Western countries (here we take the US and France as examples, France being relatively representative of the West European pattern). In a way, Russia appears like an extreme version of the long-run U-shaped pattern observed in the West during the 20<sup>th</sup> century (see Figures 11a-11b).

At the beginning of the 20<sup>th</sup> century, income inequality stood at very high levels pretty much everywhere, in Russia as well as in the US and France. Given the data limitations that we already discussed, it is difficult to make precise comparisons between the inequality levels in the different countries around 1900-1910 (except that they were all very high). Available data suggests that top income shares stood at comparable levels in Russia and the US, and possibly at somewhat higher levels in France, but the observed gaps are not very large. Also if we take into account the non-monetary dimensions of inequality, including the limited rights of the rural poor in Russia, one can arguably conclude that inequality was higher in Russia.

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<sup>34</sup> See in particular Appendix B, Figures B40-B42.

During the 1917-1989 period, inequality stood at low levels everywhere, but the compression of inequality was particularly extreme in Russia. Previous research has stressed the role of political factors to account for the reduction of inequality in Western countries in the aftermath of the 1914-1945 political and military shocks: severe compression of top capital incomes following war destructions and the Great Depression; new policy regime with the rise of steeply progressive taxation of income and inherited wealth, the welfare state, and in some cases rent control and partial nationalization, with important variations across countries (see Atkinson and Piketty 2007, 2010; Piketty 2014). Russia illustrates an extreme form of political shock: the Soviet regime attempted to put an end to private property altogether, and to reduce monetary inequality to an extremely low level – indeed a level that had probably never been experimented before in human history.

Finally, in order to explain rising inequality in the West since the 1970s-1980s, with important variations across countries, previous research has again stressed the role of political factors and ideological reversals, including the conservative revolutions of the 1980s in the US and the UK, the rise of anti-progressive-tax movements, financial deregulation, and so on (Piketty, 2014). Here again Russia illustrates an extreme form of policy reversal: the system of public property was dismantled in a couple of years in 1991-1995, ultra-rapid voucher privatization and so-called “shock therapy” were implemented, and at the end of the process a flat tax system was put in place (with a 13% flat rate on top incomes which Reagan, Thatcher and Trump combined could not have dreamed of). Regardless of how one evaluates the desirability of these policies, this is clearly a policy reversal of enormous proportions.

Two further remarks are in order. First, the ideological shifts observed in the different parts of the world across the 20<sup>th</sup> century clearly share some common origins, and have influenced one another. At a general level, the very high – and to some extent rising, or at least non-declining – inequality levels observed in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries contributed to the rise of anti-free-market reactions pretty much everywhere. World War 1, the Great Depression and World War 2 strengthened the perception that laissez-faire capitalism was leading the world to chaos and needed to be regulated by stronger state policies. The Bolshevik Revolution also contributed to induce Western elites to accept policy changes which they largely refused until World War 1. In turn, the failure and final fall of the Soviet Regime in the late 1980s contributed to the pro-market ideological shifts.

Next, it is particularly interesting to compare the inequality trajectories followed by Russia and ex-communist countries. All Eastern European countries for which we have historical data – in particular Poland, the Czech Republic and Hungary – are characterized by high

inequality levels in the early 20<sup>th</sup> century and during the interwar period, low inequality during the communist period (1945-1990), and high and rising inequality since 1990 (see Figure 11c). Note that although all communist countries are characterized by unusually low levels of monetary inequality, there are interesting variations: inequality appears to be particularly low in the Czech Republic and Hungary, with top 1% income shares below 3%, as opposed to 4-5% in Russia (and close to 6% at the end of the Stalinist period).

The fact that Soviet inequality was generally higher than under East European communist regimes has been noted by other researchers using historical survey and earnings data for communist countries during this period. In particular, this finding also applies to other dispersion indicators such as the P90/P10 ratio. We refer in particular to the work of Atkinson and Micklewright (1992), who stress that Russian inequality during the 1960s-1970s-1980s is in some ways intermediate between the East European level (Hungary, Poland, Czechoslovakia) and the British level, and who also find that gender inequality is substantially smaller in all communist countries (as compared to Britain and to other Western countries) during the 1960s-1970s, with a somewhat shrinking gap during the 1980s (unfortunately our data sources do not allow us to look at gender gaps in the long run in Russia).<sup>35</sup>

Regarding the recent period, it is striking to see that inequality has risen to much higher levels in Russia (with top 1% income shares as high as 20-25%) than in Eastern European countries (where top 1% shares fall in the 10-14% range the end of the period) (see Figure 11c). While our income tax data for Russia has many limitations (the income tax tabulations available for Eastern European countries are much more extensive and were recently exploited; see previous chapters), the gap with other ex-communist countries seems large enough to be significant. This is also consistent with the Forbes billionaire data showing an unusually large number of Russian billionaires since the 1990s-2000s, as compared to other ex-communist countries, and also as compared to other parts of the world.

While our data sources are too limited to provide a complete analysis of the inequality gap between Russia and other ex-communist countries, it seems natural to refer to the different post-communism transition strategies that were conducted in the different countries, and in particular to the very fast “shock therapy” and voucher privatization strategy that was conducted in Russia. A plausible interpretation of available data is that voucher privatization took

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<sup>35</sup> See in particular Atkinson and Micklewright table 4.1 (p.81), table 4.2 (p.88), figure 4.7 (p.96) and table 5.1 (p.112). For some years, earnings inequality levels in the USSR (as measured by P90/P10 ratios or Gini coefficients) are actually very close to British levels.

place so fast, and within such a chaotic monetary and political context, that small groups of individuals were able to buy back large quantities of vouchers at relatively low prices, and also in some cases to obtain highly profitable deals with public authorities (e.g. via the famous loans-for-shares agreements). Together with capital flight and the rise of offshore wealth, this process arguably led to much higher level of wealth and income concentration in Russia than in other ex-communist countries. As was mentioned above, the fact that a substantial part of the capital stock is owned by foreign wealth holders in Eastern European countries also contributes to lower inequality.

The data series that we have for China are unfortunately much shorter (they begin in 1978), but they also show that rising inequality is much stronger in Russia, while China seems to be closer in magnitude to the Eastern European pattern (see Figure 11d). According to our estimates, inequality was somewhat higher in China than in Russia in 1980 (due in particular to substantial urban-rural gap), and has now become substantially larger in Russia. This can be related to the fact that the privatization process was much more gradual in China, where public authorities still control the majority of corporations (see Piketty, Yang and Zucman 2017). This finding is again consistent with the Forbes billionaire data, showing a much higher level of billionaire wealth in Russia than in China (see section 2 above, Figure 2).

We certainly do not mean to suggest, however, that the only reason for higher top income shares in Russia is entirely due to different privatization strategies and resulting differences in today's property structure. While top capital and business incomes certainly play an important role (they probably constitute a large fraction of top-bracket taxpayers in Russia's income tax tabulations), it is very likely that higher inequality of labor income in Russia also plays an important role. Generally speaking, previous work on inequality dynamics in transition economies has shown the key role played by labor market forces and wage inequality (see e.g. Flemming and Micklewright, 2000; Yemstov, 2008; Milanovic and Ersado, 2010; EBRD, 2016). Unfortunately the data that we use in the present paper does not allow us to properly disentangle these different factors. Access to more detailed income tax data (with breakdowns by income categories) would be necessary in order to evaluate the respective role of capital income, self-employment income and wage income in the rise of inequality in Russia as compared to other countries.

Finally, we present our findings for wealth inequality. According to our benchmark series, wealth concentration has increased substantially in Russia over the 1995-2015 period, and now stood at a substantially higher level than in countries like China or France, and a level that is comparable or even higher than the United States (see Figures 12a-12c).



We should stress, however, that these wealth inequality estimates are even more fragile than our income inequality series. The data sources available to study wealth in Russia are unfortunately much more limited than to study income (where we could rely on combination of household income survey data and income tax data). There exists no reliable household wealth survey, and there exists no wealth tax data and no inheritance tax data (indeed such taxes do not even exist in Russia). In contrast to France and the US (where we have detailed income tax micro files with capital income flows that can be capitalized, and where we also have access to inheritance tax data and household wealth surveys), and in contrast also to China (where at least we have household wealth surveys), all what we have to study wealth inequality in Russia is the Forbes billionaire data. This is a bit better than nothing at all, and this certainly captures something real, but this is not much.

We do our best to combine Forbes billionaire data with normalized wealth distribution data for other countries and generalized Pareto interpolation techniques in order to produce transparent estimates, but we stress that different variants (based upon alternative assumptions regarding how to use the Forbes data) lead to significant margins of error. We can reasonably certain that wealth inequality is very high in Russia by international standards, but it is not possible to be certain for instance as to whether top wealth shares in Russia are higher or not than in the US. They are certainly higher at the level of the top 100 individuals, but we would need more information about individuals who own (say) between ten and one hundred millions dollars (rather than on billionaires only) in order to be able to conclusive regarding the top 1% or top 0,1% wealth share (let alone the top 10% share).<sup>36</sup>

## 6.5. Concluding comments and perspectives

In this paper, we have attempted to combine the various existing data sources in a systematic manner in order to provide consistent series on the accumulation and distribution of income and wealth in Russia from the Soviet period until the present day. In particular, we have combined national accounts, survey, wealth and fiscal data, including recently released tax data on high-income taxpayers (which to our knowledge was never used before). We have found that official inequality estimates vastly underestimate the concentration of income in Russia. We have also provided the first complete balance sheet series for private wealth,

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<sup>36</sup> See Appendix B, Figures B51-B57 for alternative series on wealth inequality in Russia. What is reinsuring is that this has a negligible impact of our corrected inequality series, because most of the correction comes from the income tax data rather than from the wealth data. See Figures B30-31.

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public wealth and national wealth in post-Soviet Russia, including an estimate of offshore wealth.

We should stress again that the lack of data access and financial transparency makes it very difficult to properly analyze inequality dynamics in Russia. In particular, currently available income tax tabulations suffer from major shortcomings and ought to be extended and improved.<sup>37</sup> We have done our best to combine the various existing data sources in the most plausible manner, but the quality of raw available data remains highly insufficient.

Our findings on long run distributional trends in Russia also confirm the importance of policies, institutions and ideology for understanding inequality dynamics. The dramatic failure of Soviet communism and egalitarian ideology – in the form it was applied in Russia – seems to have led to relatively high tolerance for large inequality and concentration of private property (partly coming from outright plundering of the country's natural resources and foreign reserves). In effect, extreme inequality seems acceptable in Russia, as long as billionaires and oligarchs appear to be loyal to the Russian state and perceived national interests. Whether this fragile equilibrium will persist in the coming years and decades remains to be seen.

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<sup>37</sup> See section 2.2 above and Appendix B.

## References

- Alvaredo, F., Atkinson, A. B., Chancel, L., Piketty, T., Saez, E., and Zucman, G. (2016). "Distributional National Accounts (DINA) Guidelines: Concepts and Methods used in WID.world", *WID.world Working Paper* 2016/02
- Atkinson, A.B., and Micklewright, J. (1992). *Economic transformation in Eastern Europe and the distribution of income*. Cambridge University Press
- Blanchet, T., Fournier, J., and Piketty, T. (2017). "Generalized Pareto Curves: Theory and Applications ", *WID.world Working Paper* 2017/03
- Bergson, A. (1942). "Distribution of the Earnings Bill Among Industrial Workers in the Soviet Union", *Journal of Political Economy*, 50(2), pp.227-249
- Bergson, A. (1944). *The Structure of Soviet Wages – A Study in Socialist Economics*, Harvard University Press
- Bergson, A. (1984). "Income Inequality Under Soviet Socialism", *Journal of Economic Literature*, 22, pp.1052-1099
- Boycko, M., Shleifer, A., and Vishny, R. (1995). *Privatizing Russia*, MIT Press
- Davies, J., Sandstrom, S., Shorrocks, A., and Wolff, E. (2011). "The Level and Distribution of Global Household Wealth", *The Economic Journal*
- Davies, J. Lluberas, R. Shorrocks, A. (2010-2016). *Global Wealth Report and Databook*, Credit Suisse Research Institute, annual publication
- Dennison, T. (2014). "The Institutional Framework of Serfdom in Russia: the View from 1861", in S. Cavaciocchi ed., *Serfdom and Slavery in the European Economy, 11<sup>th</sup> -18<sup>th</sup> centuries*, pp.83-96, Firenze University Press
- European Bank for Reconstruction and Development (EBRD), *Transition for All: Equal Opportunities in an Unequal World*, Transition Report 2016-2017 (October 2016)

Flemming, J., and Micklewright, J. (2000). "Income Distribution, Economic Systems and Transition", In A.B. Atkinson and F. Bourguignon (eds.), *Handbook of Income Distribution*, North-Holland, pp. 843-918.

Gaddy, C., and Ickes, B. (2002). *Russia's virtual economy*, Washington: Brookings Institution Press

Garbinti, B. Goupille, and J. Piketty, T. (2017). "Income Inequality in France, 1900-2014: Evidence from Distributional National Accounts (DINA)", WID.world Working Paper 2017/04

Garbinti, B. Goupille, and J. Piketty, T. (2017). "Accounting for Wealth Inequality Dynamics: Methods, Estimates and Simulations for France (1800-2014)", WID.world Working Paper 2017/05

Goldsmith, R. (1965). "The National Balance Sheet of the USSR", in C. Rao ed., *Essays in Econometrics and Planning*, Pergamon Press, pp. 83-102.

Gregory, P. (1982). *Russian National Income, 1885-1913*, CUP

Guriev, S., and Rachinsky, A. (2005). "The Role of Oligarchs in Russian Capitalism", *Journal of Economic Perspectives*, 19(1), pp.131-150

Guriev, S., and Rachinsky, A. (2006). "The Evolution of Personal Wealth in the Former Soviet Union and Central and Eastern Europe", UNU/WIDER 2006/120

Gustafson, T. (2012). *Wheel of Fortune: The Battle for Oil and Power in Russia*, Harvard University Press

Kozyreva, P., Kosolapov, M., Popkin, B.M. (2015). "Data Resource Profile: The Russia Longitudinal Monitoring Survey—Higher School of Economics (RLMS-HSE) Phase II: Monitoring the Economic and Health Situation in Russia, 1994–2013", *International Journal of Epidemiology*, pp. 1-7

Lindert, P., and Nafziger, S. (2012). "Russian Inequality on the Eve of the Revolution", *NBER Working Paper*

Maddison, A. (1998). "Measuring the Performance of a Command Economy: An Assessment of the CIA Estimates for the USSR", *Review of Income and Wealth*,

Matthews, M. (1978). *Privilege in the Soviet Union*. London: Allen & Unwin

Mavridis, D., and Mosberger, P. (2017). "Income inequality and incentives: The quasi-natural experiment of Hungary, 1914-2008", mimeo

Milanovic, B., and Ersado, L. (2010). "Reform and inequality during the transition: An analysis using panel household survey data, 1990-2005", UNU-WIDER, 2010/62

Nougayrede, D. (2014). "Outsourcing Law in Post-Soviet Russia", *Journal of Eurasian Law*, pp. 383-448

Nougayrede, D. (2015). "Yukos, Investment Round-Tripping and the Evolving Public-Private Paradigm", *American Review of International Arbitration*, 26(3), pp. 337-364

Nougayrede, D. (2017), "The Use of Offshore Companies in Emerging Market Economies: a Case Study", *Columbia Journal of European Law*, 23(2), pp. 401-440

Piketty, T. (2001). *Les hauts revenus en France au 20<sup>e</sup> siècle*, Grasset

Piketty, T. (2014)., *Capital in the 21<sup>st</sup> century*, Harvard University Press

Piketty, T. Saez, E., and Zucman G. (2016), "Distributional National Accounts: Methods and Estimates for the U.S.", WID.world Working Paper

T. Piketty, L. Yang, G. Zucman, "Capital Accumulation, Private Property and Rising Inequality in China, 1978-2015", WID.world Working Paper 2017/06

Piketty, T., and Zucman G. (2014). "Capital is Back: Wealth-Income Ratios in Rich Countries 1700-2010." *The Quarterly Journal of Economics*, 129(3), pp. 1255–1310.

Saez, E. and Zucman G. (2016). "Wealth Inequality in the United States: Evidence from Capitalized Income Tax Data". *The Quarterly Journal of Economics*, 131(2), pp. 519–578.

---

Todd, E. (1976), *La chute finale. Essai sur la decomposition de la sphère soviétique*, R. Laffont, (*The Final Fall. An essay on the decomposition of the Soviet sphere*, Karz Publishers, 1979)

Treisman, D. (2016). "Russia's Billionaires", *American Economic Review*, pp. 236-241

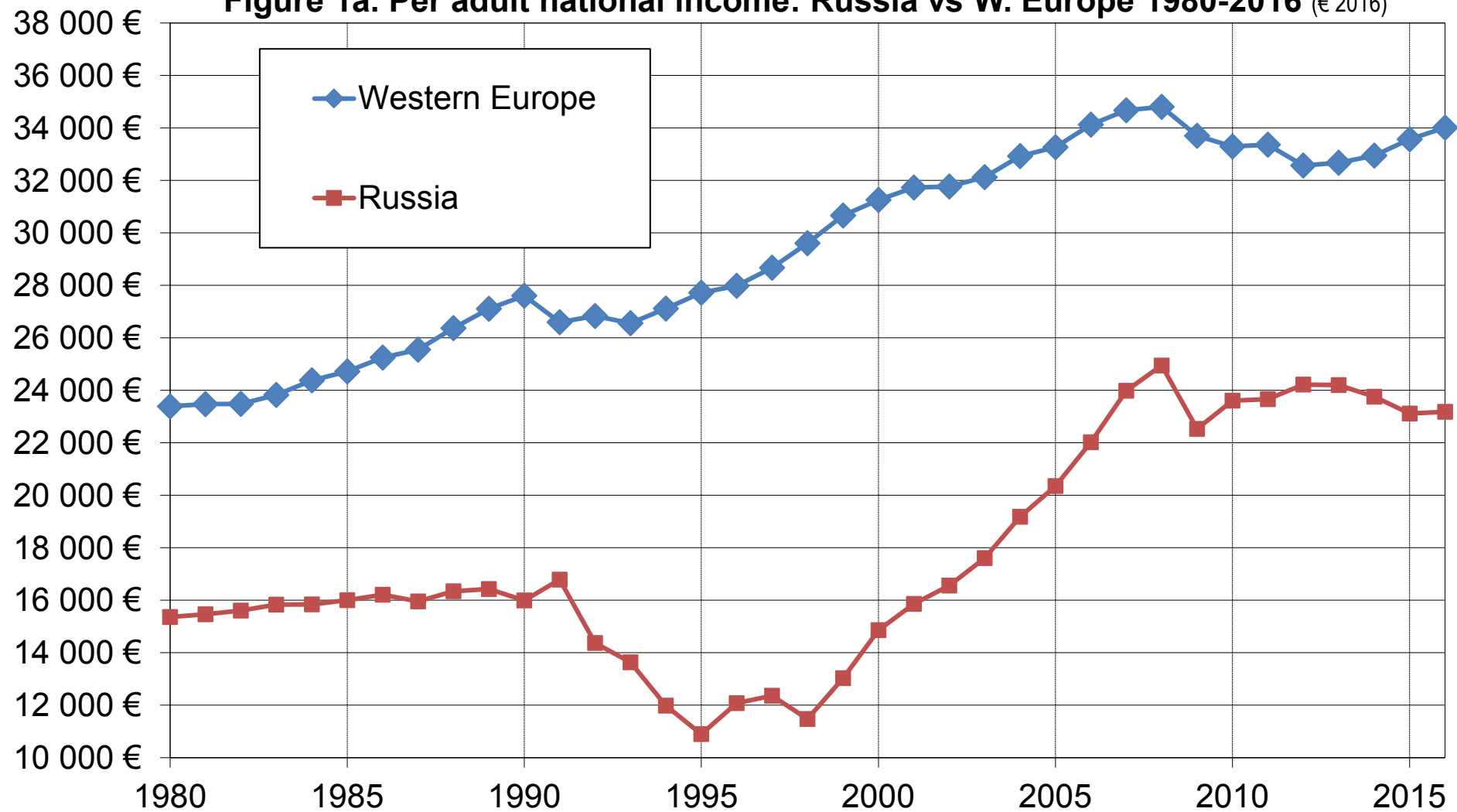
Yemtsov, R. (2008). "Through the Looking-Glass: What is behind official data on inequality in Russia over 1992-2003?", *World Bank, Working Paper*

Zucman, G. (2013). "The Missing Wealth of Nations, Are Europe and the U.S. net Debtors or net Creditors?", *Quarterly Journal of Economics*, 128(3), pp. 1321-1364

Zucman, G. (2014). "Taxing Across Borders: Tracking Personal Wealth and Corporate Profits", *Journal of Economic Perspectives*, 28(4), pp. 121-148

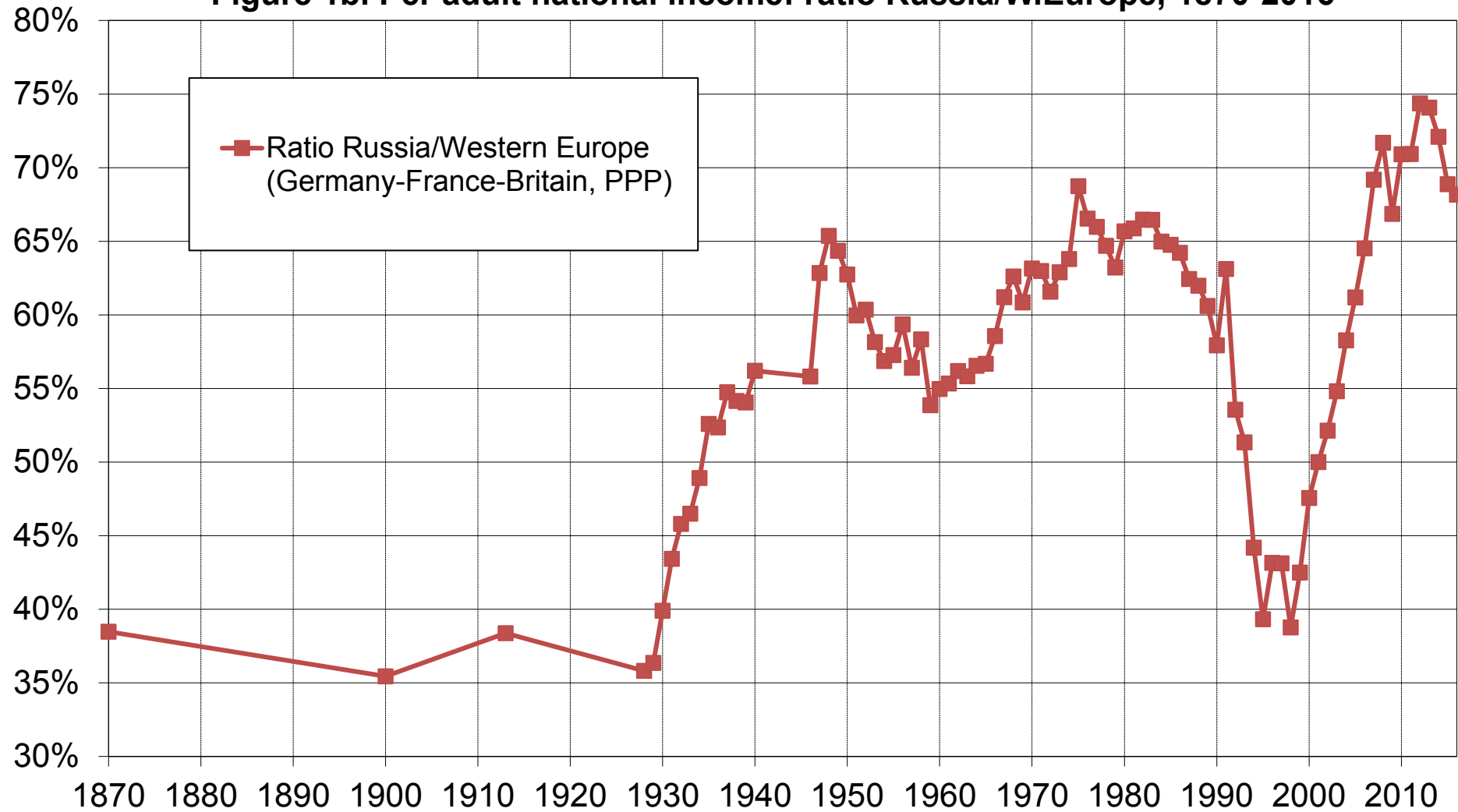
Zucman, G. (2015). *The Hidden Wealth of Nations*, University of Chicago Press

**Figure 1a. Per adult national income: Russia vs W. Europe 1980-2016 (€ 2016)**



Per adult national income in € 2016 PPP. Western Europe = arithmetic average Germany-France-Britain.  
Authors' computations using official national accounts and revised GDP deflator. See Appendix A.

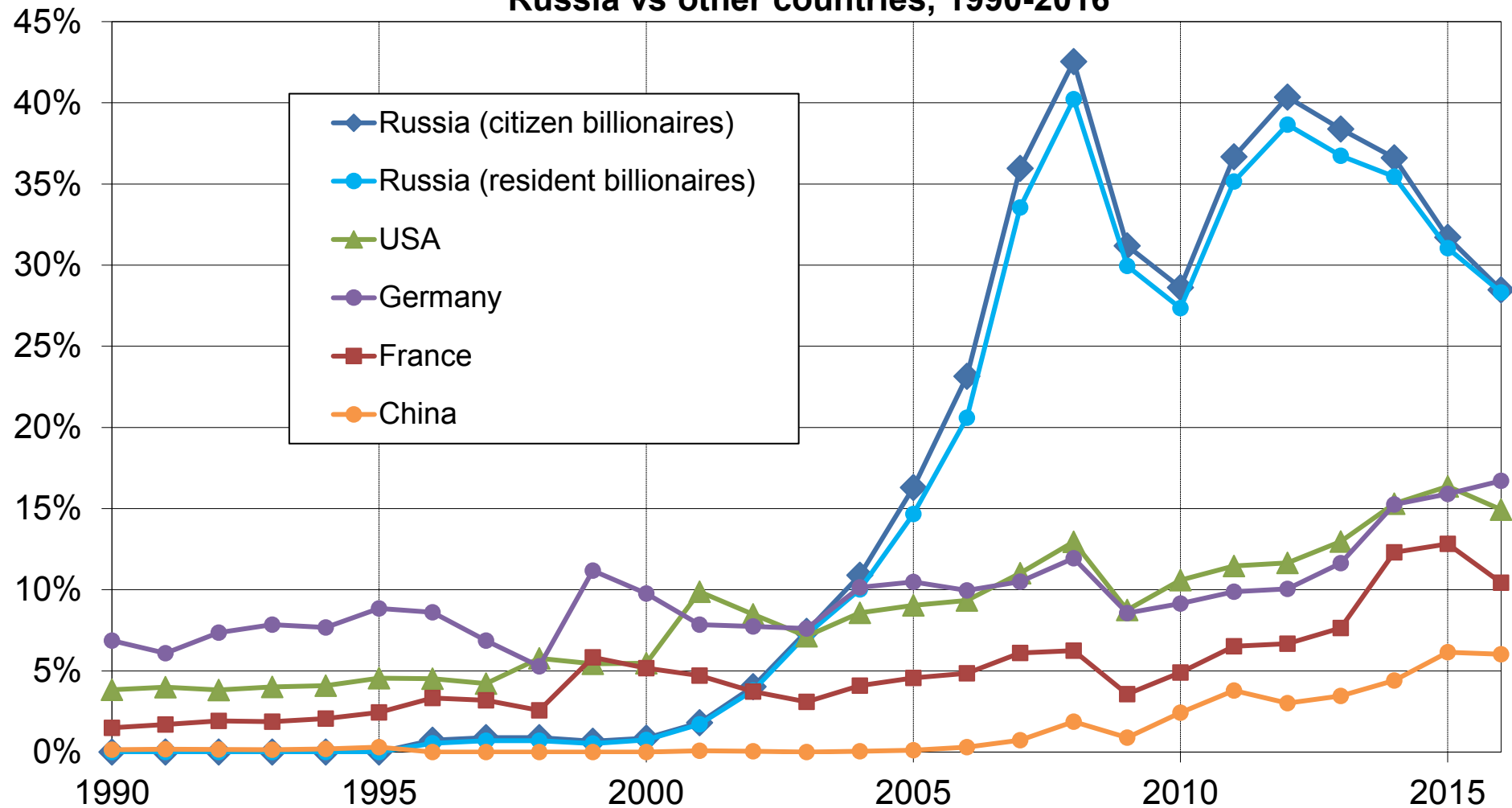
**Figure 1b. Per adult national income: ratio Russia/W.Europe, 1870-2016**



Per adult national income in € 2016 PPP. Western Europe = arithmetic average Germany-France-Britain.

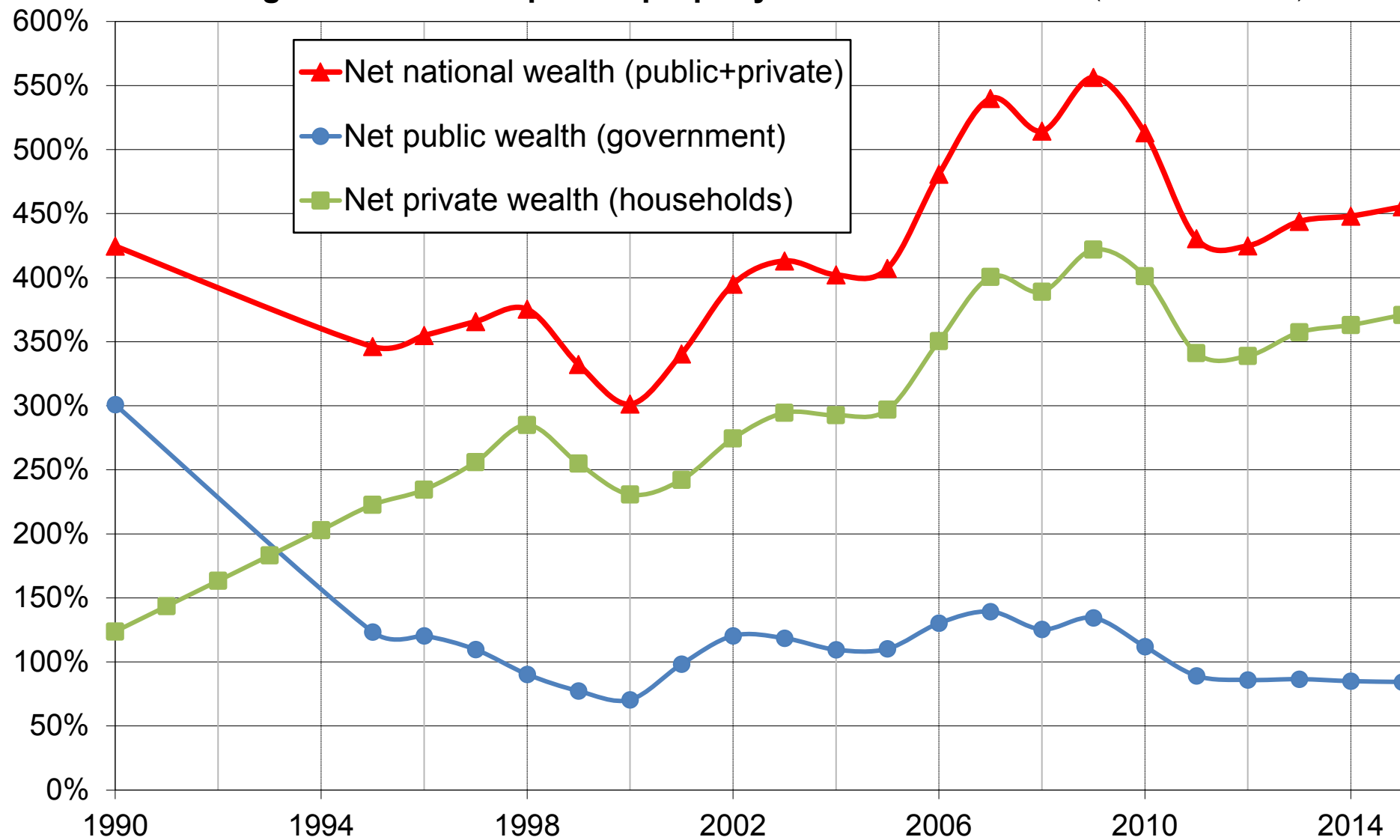


**Figure 2. Total Forbes billionaire wealth (% national income):  
Russia vs other countries, 1990-2016**

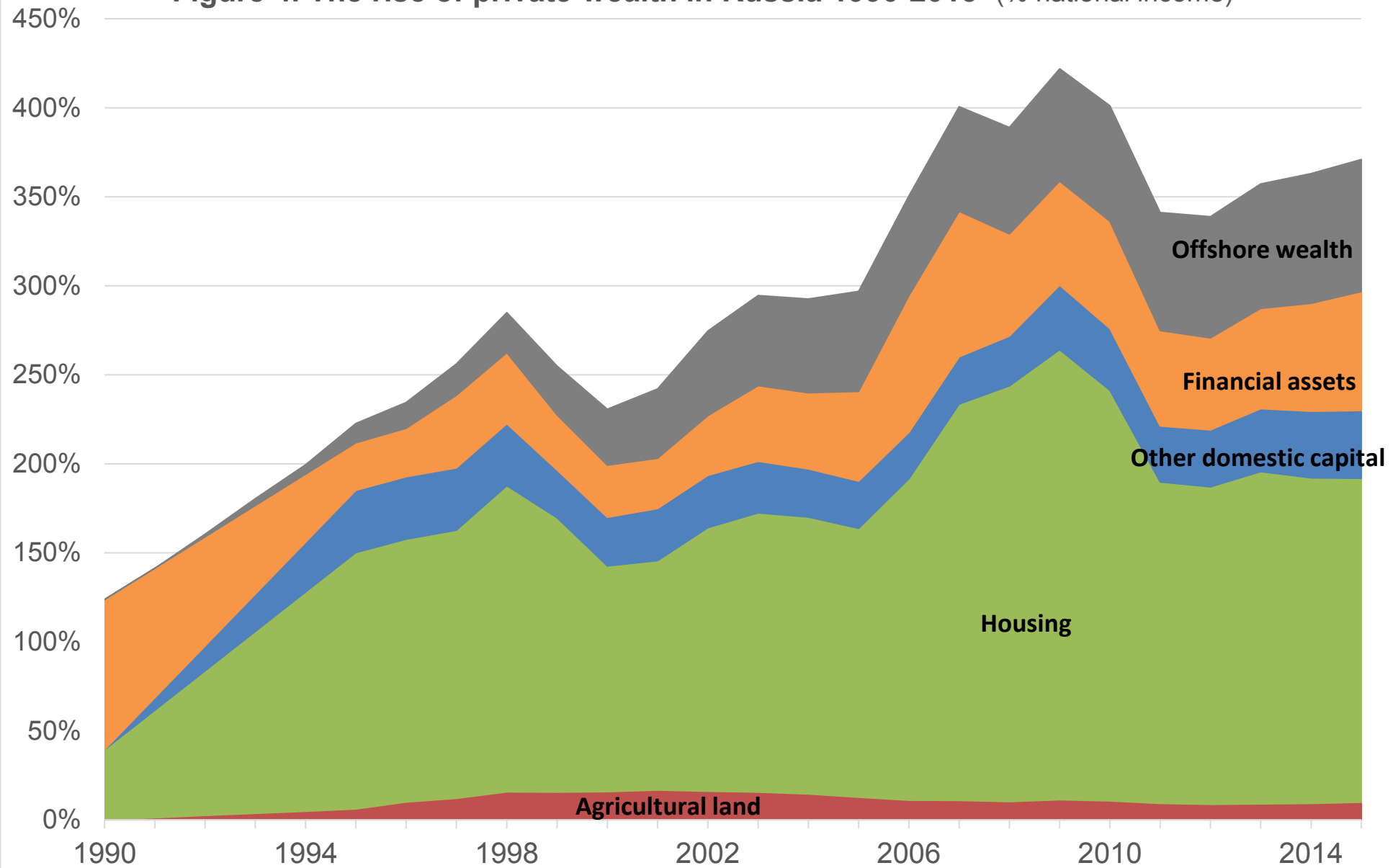


Total billionaire wealth (as recorded by Forbes global list of dollar billionaires) divided by national income (measured at market exchange rates). For other countries, we only report citizen billionaires (numbers for resident billionaires are virtually identical).

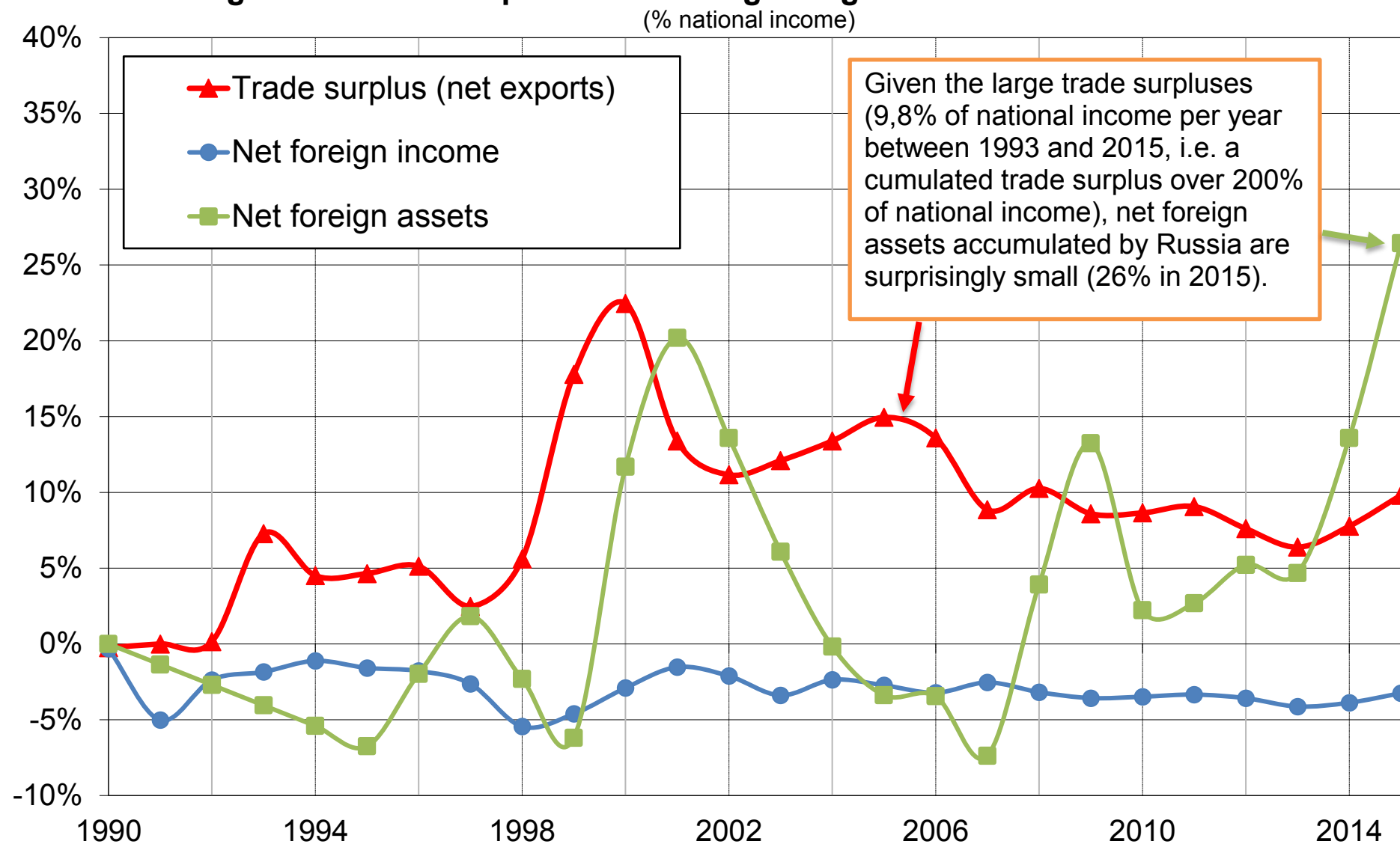
**Figure 3: Public vs private property in Russia 1990-2015** (% national income)



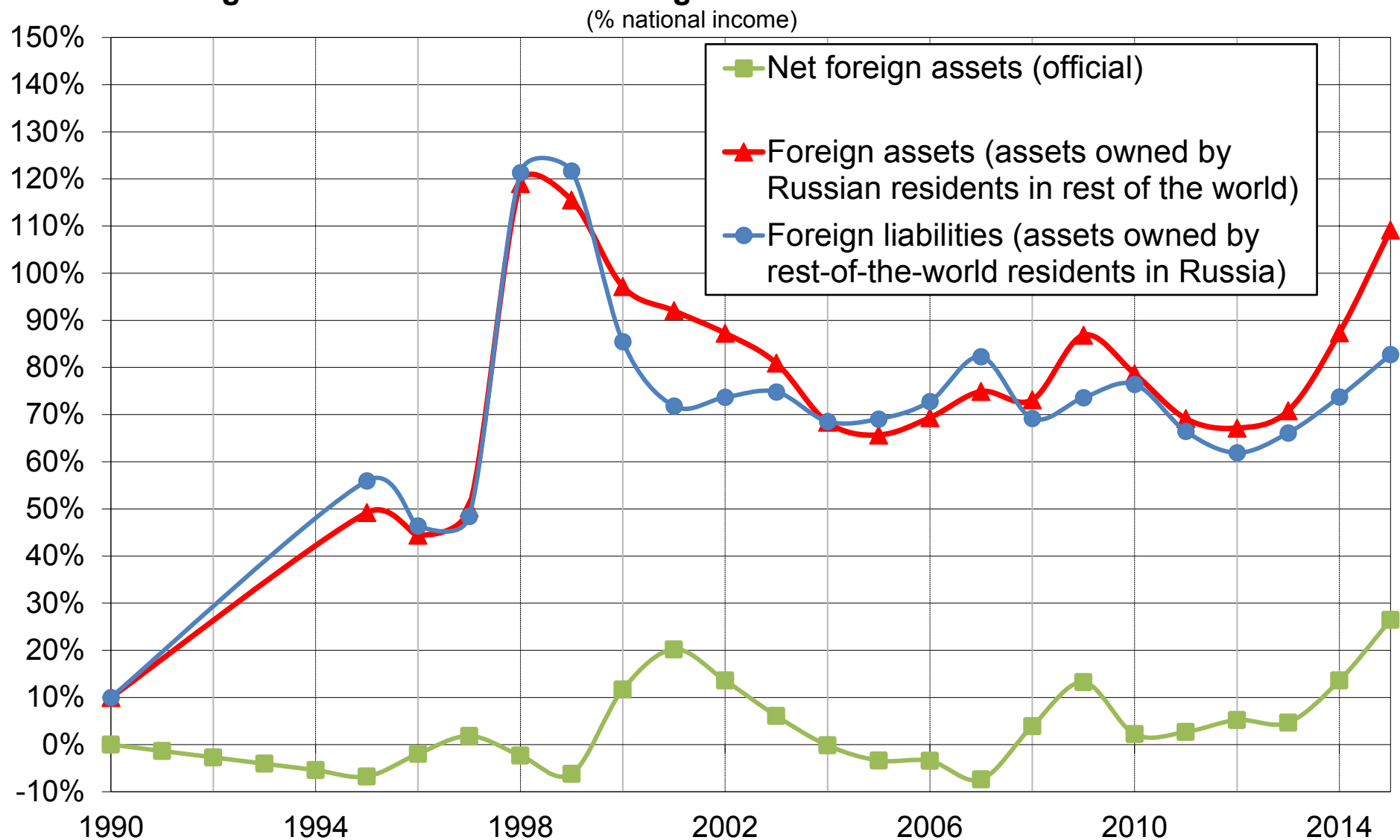
**Figure 4. The rise of private wealth in Russia 1990-2015** (% national income)



**Figure 5a. Trade surplus and missing foreign assets in Russia 1990-2015**

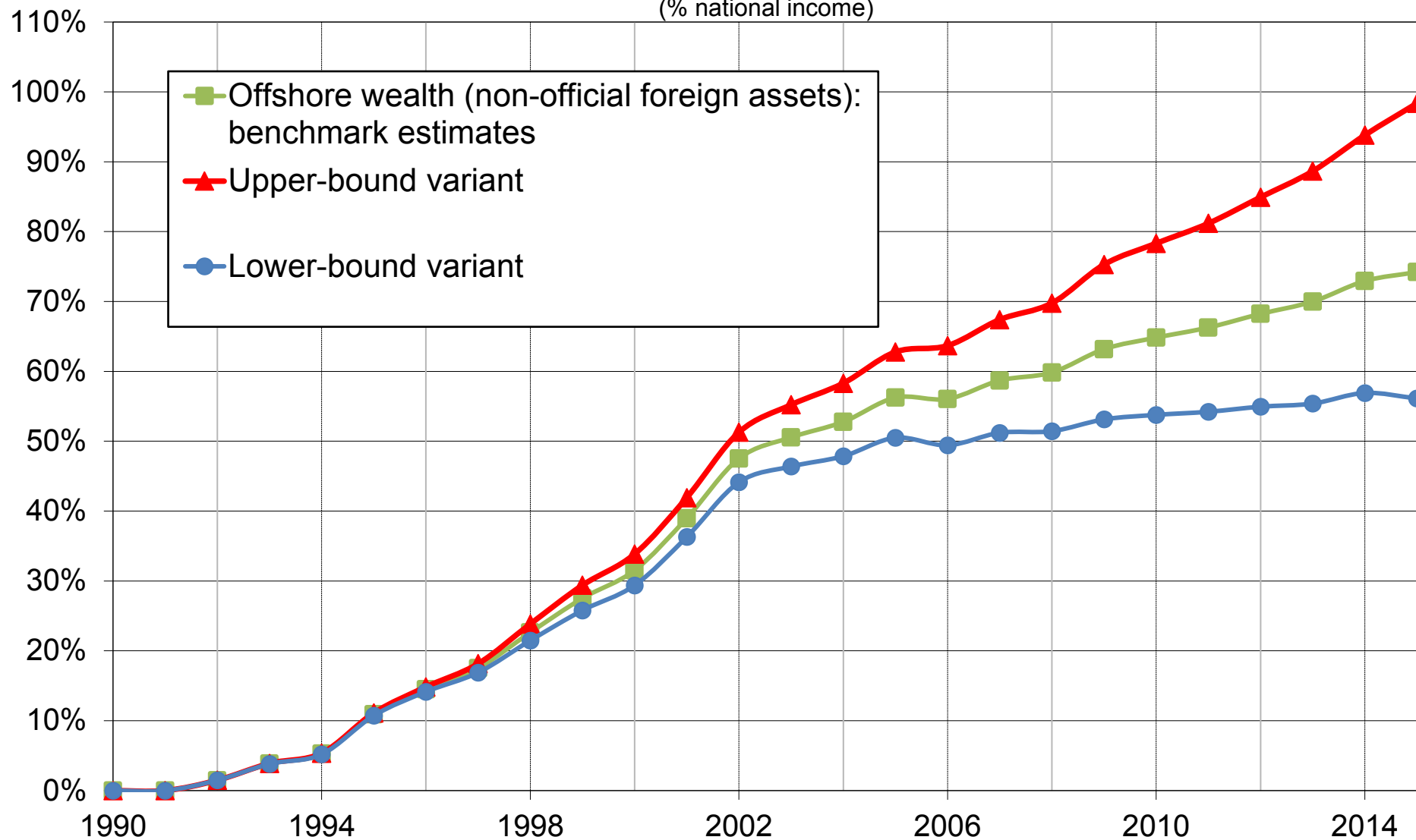


**Figure 5b. Russia's official foreign assets and liabilities 1990-2015**



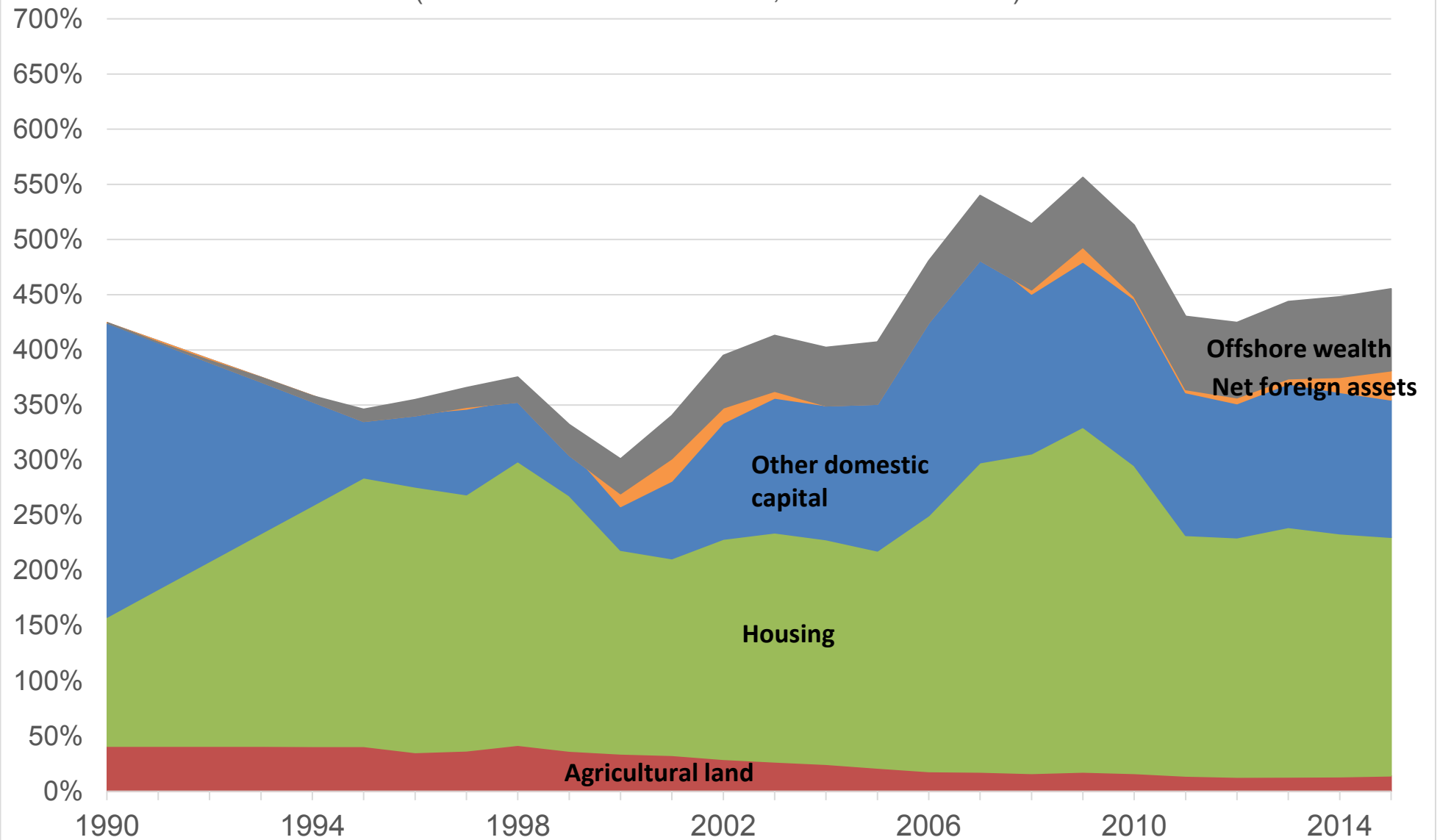
**Figure 5c. Estimating Russia's missing foreign assets 1990-2015**

(% national income)



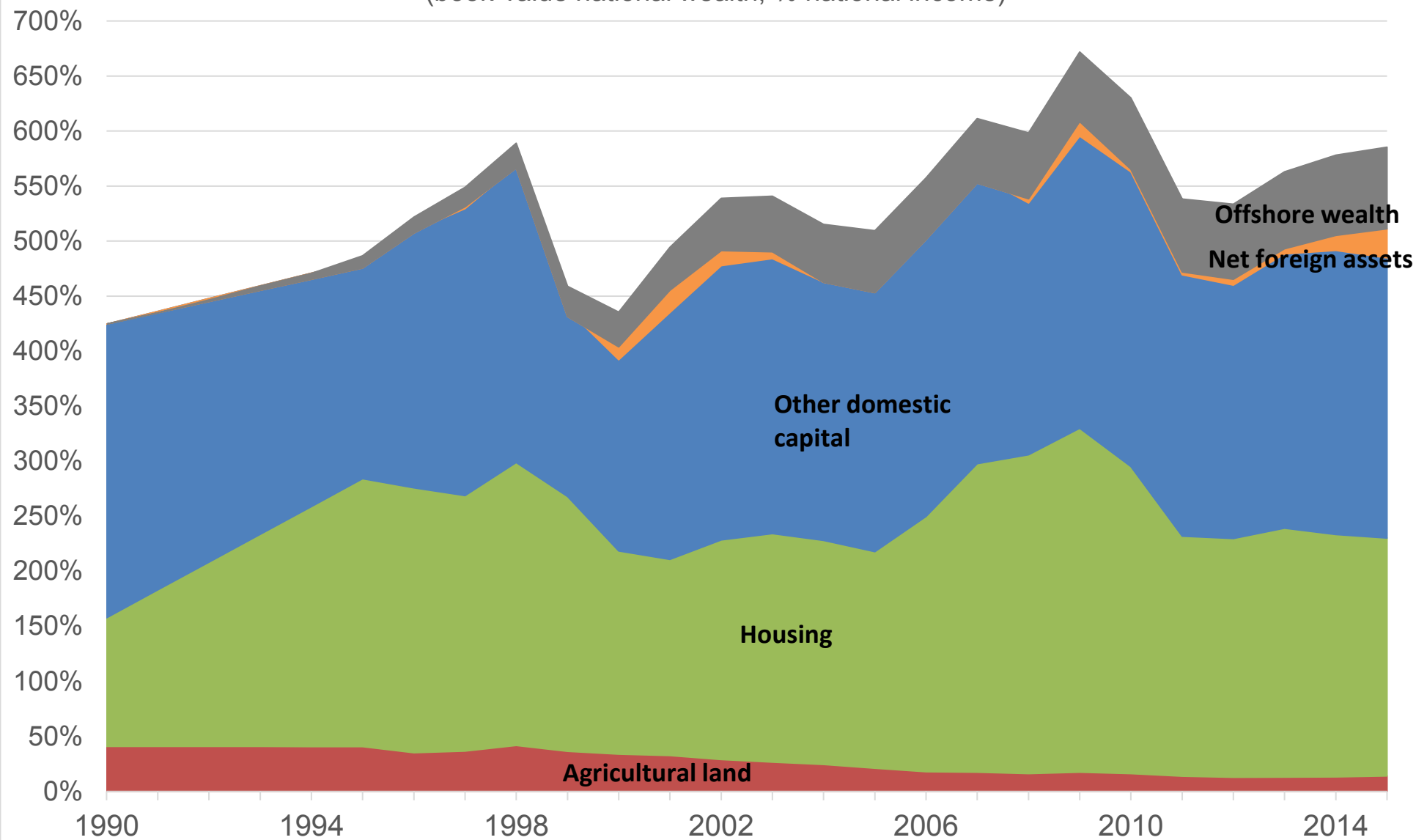
**Figure 6a. The structure of national wealth in Russia 1990-2015**

(market-value national wealth, % national income)



**Figure 6b. The structure of national wealth in Russia 1990-2015**

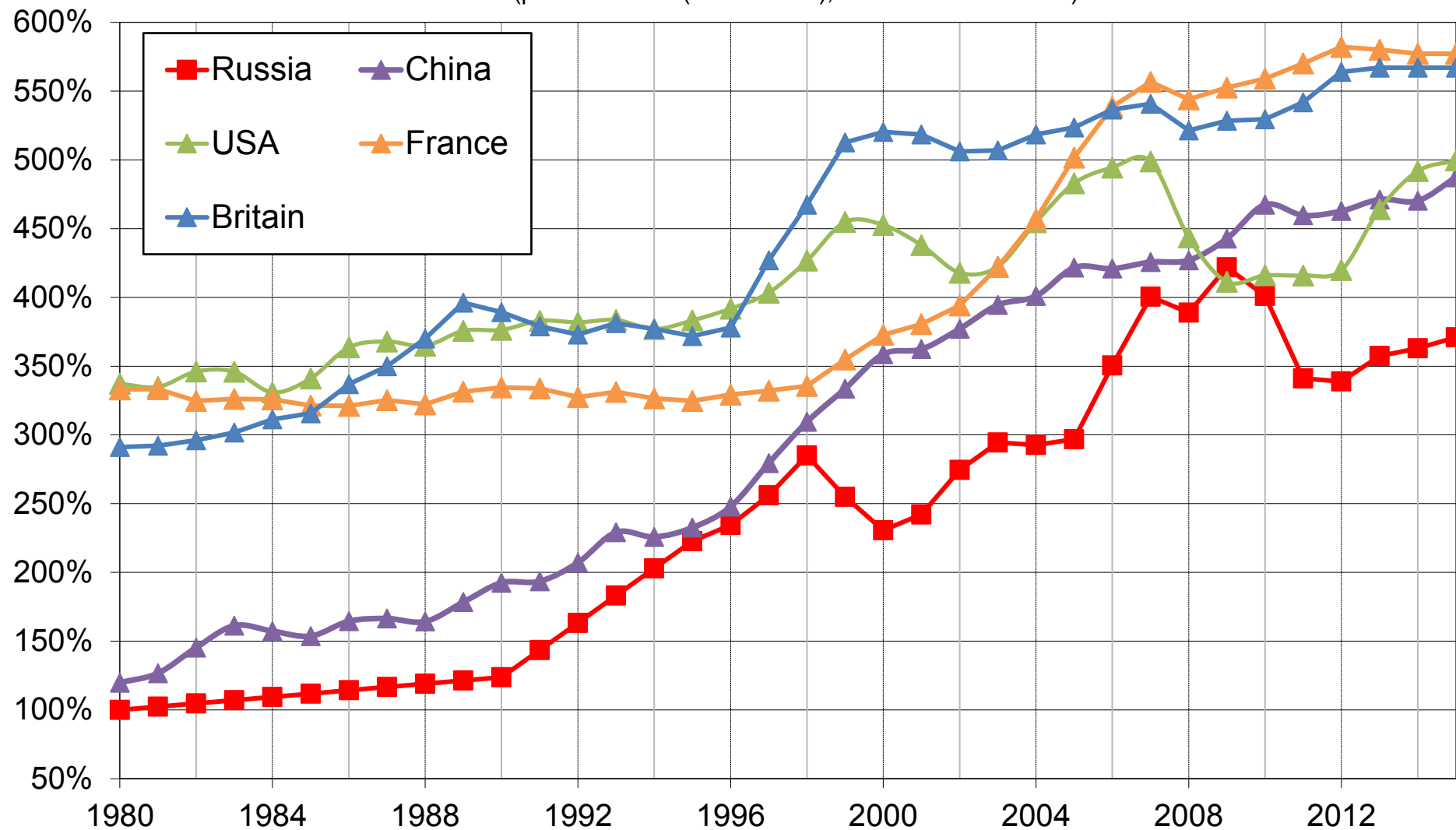
(book-value national wealth, % national income)





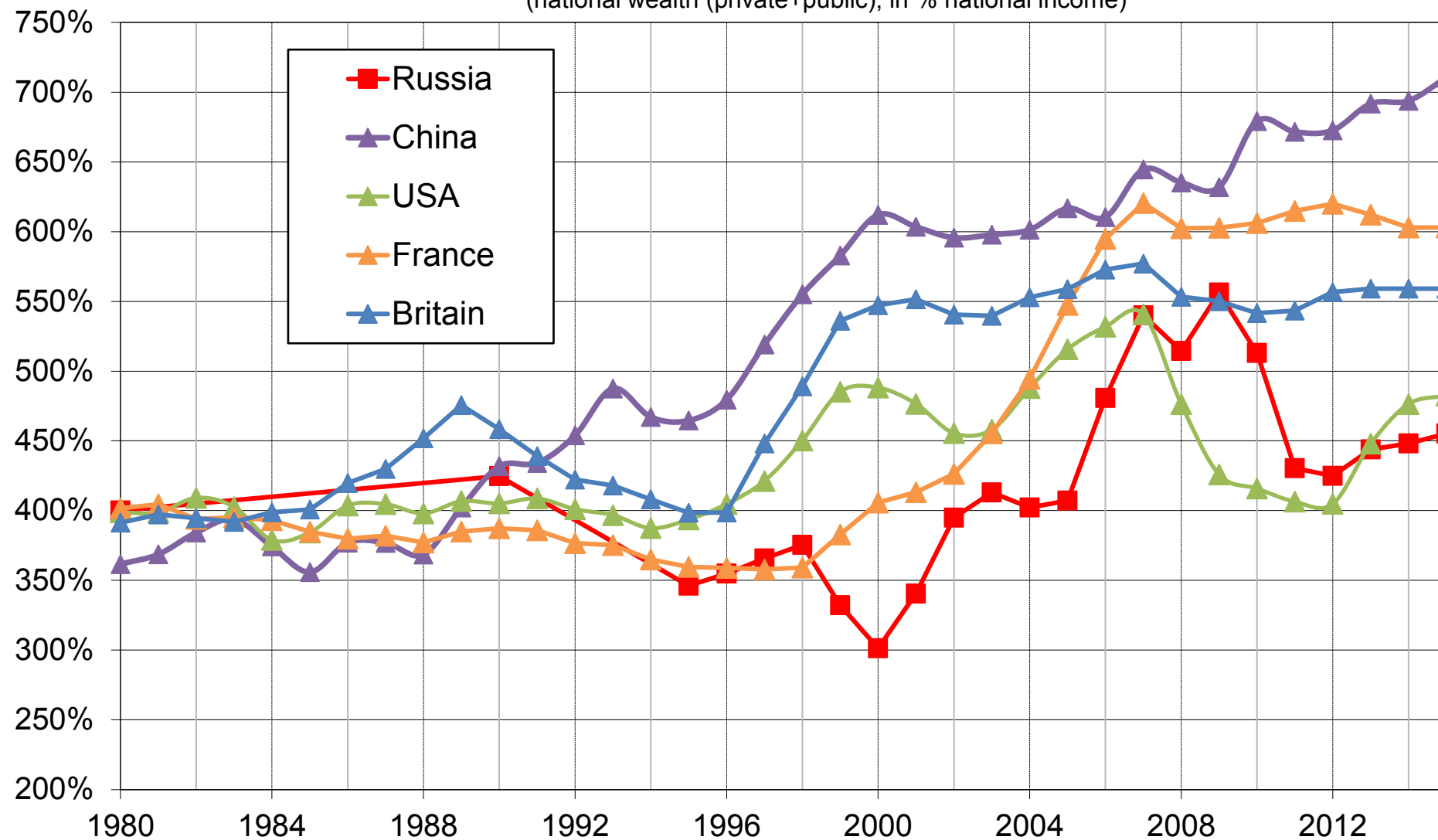
**Figure 7a: The rise of private wealth: Russia vs China & rich countries**

(private wealth (households), in % national income)

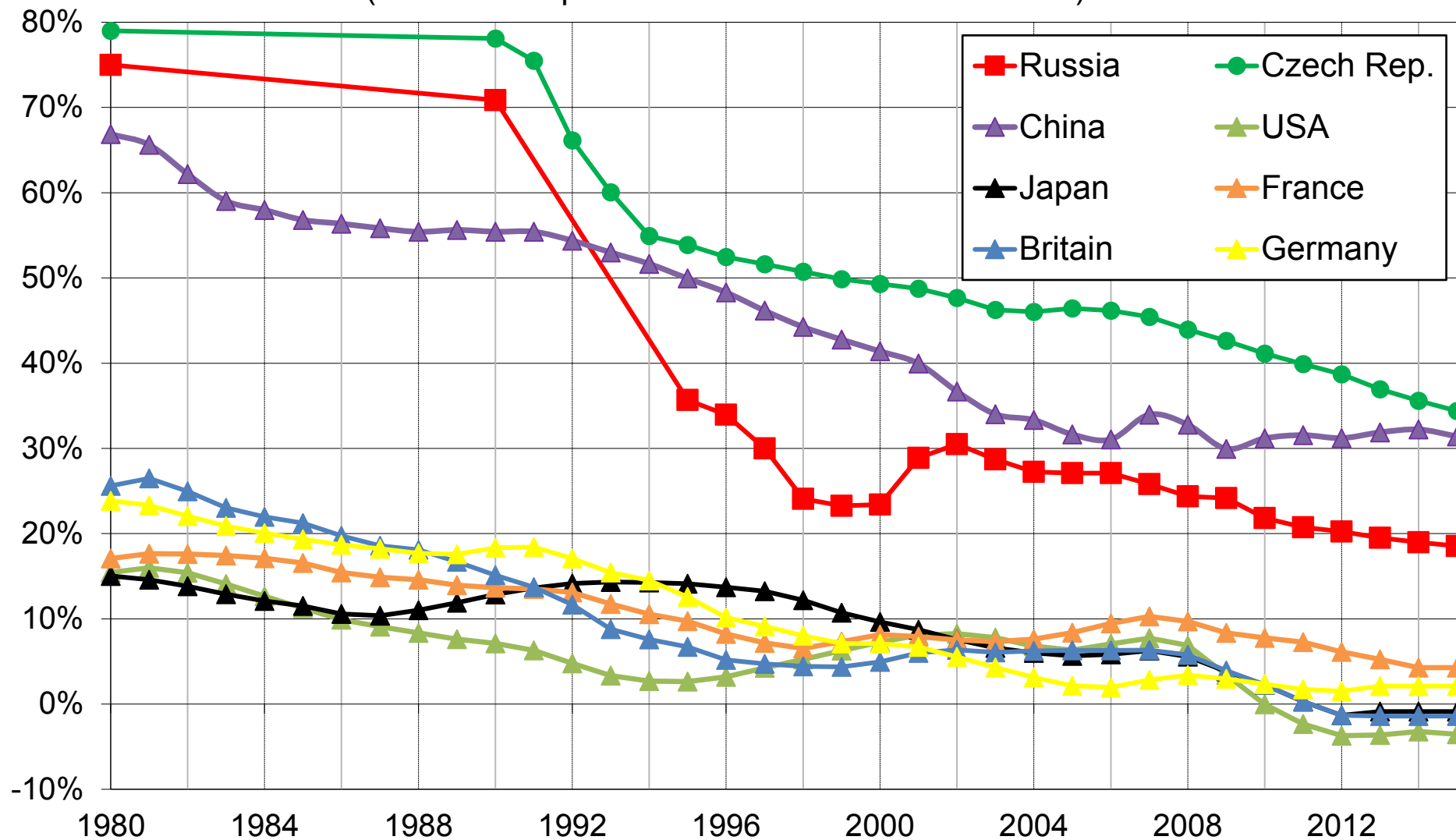


**Figure 7b: National wealth accumulation: Russia vs China & rich countries**

(national wealth (private+public), in % national income)

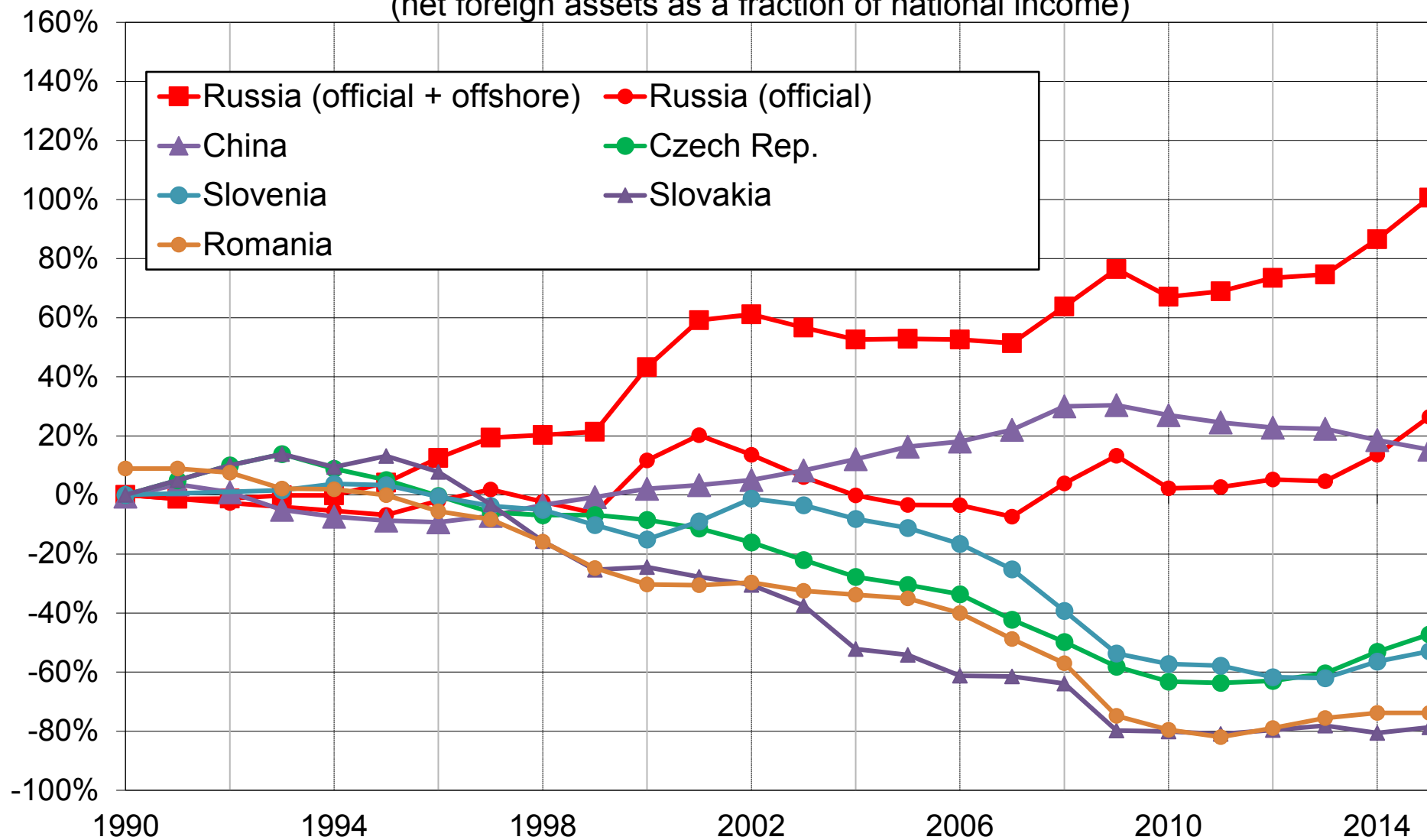


**Figure 7c. The decline of public property: Russia vs other countries**  
(share of net public wealth in net national wealth)



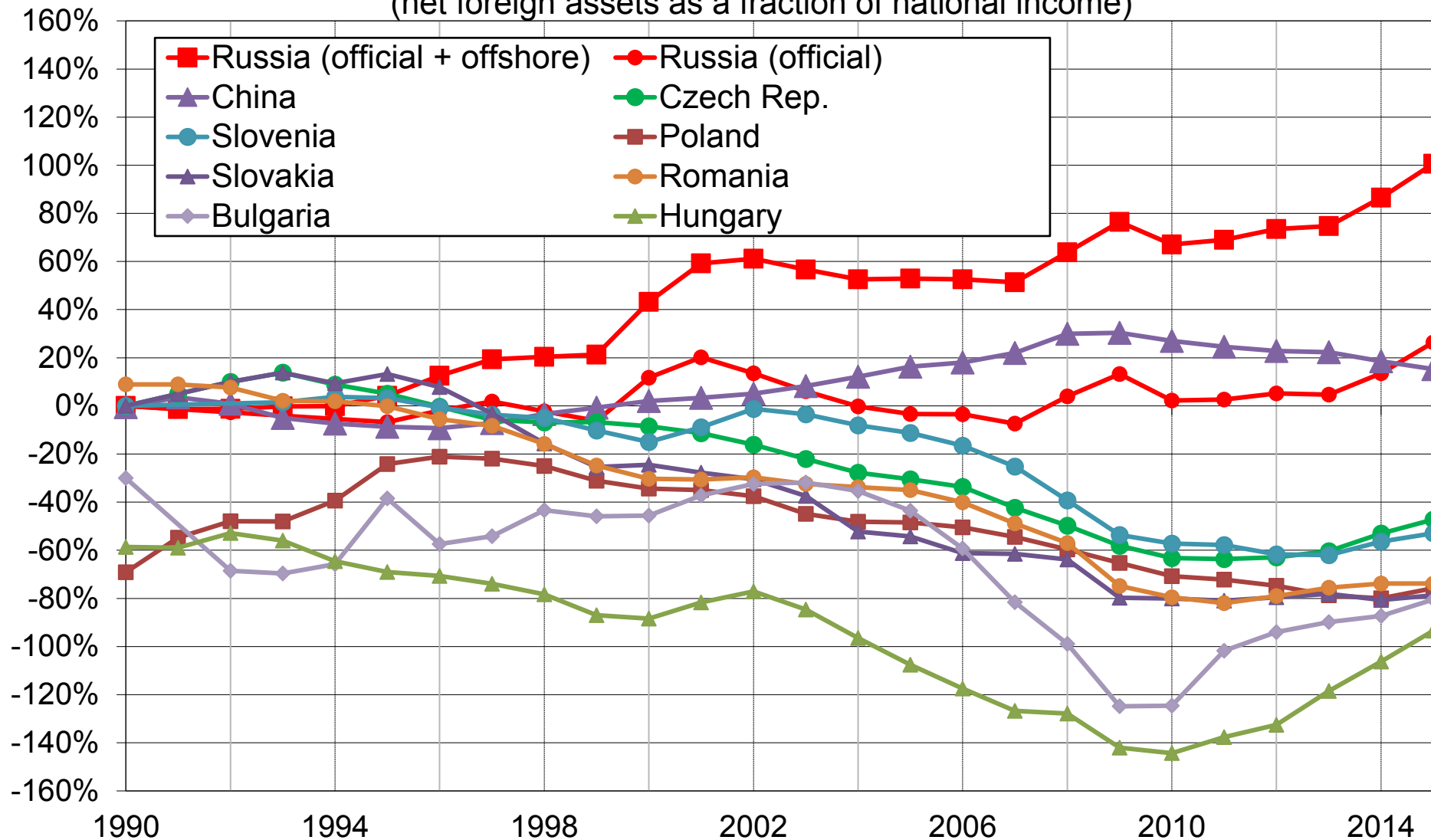
**Figure 7d. Net foreign assets: Russia vs other ex-communist countries (1)**

(net foreign assets as a fraction of national income)

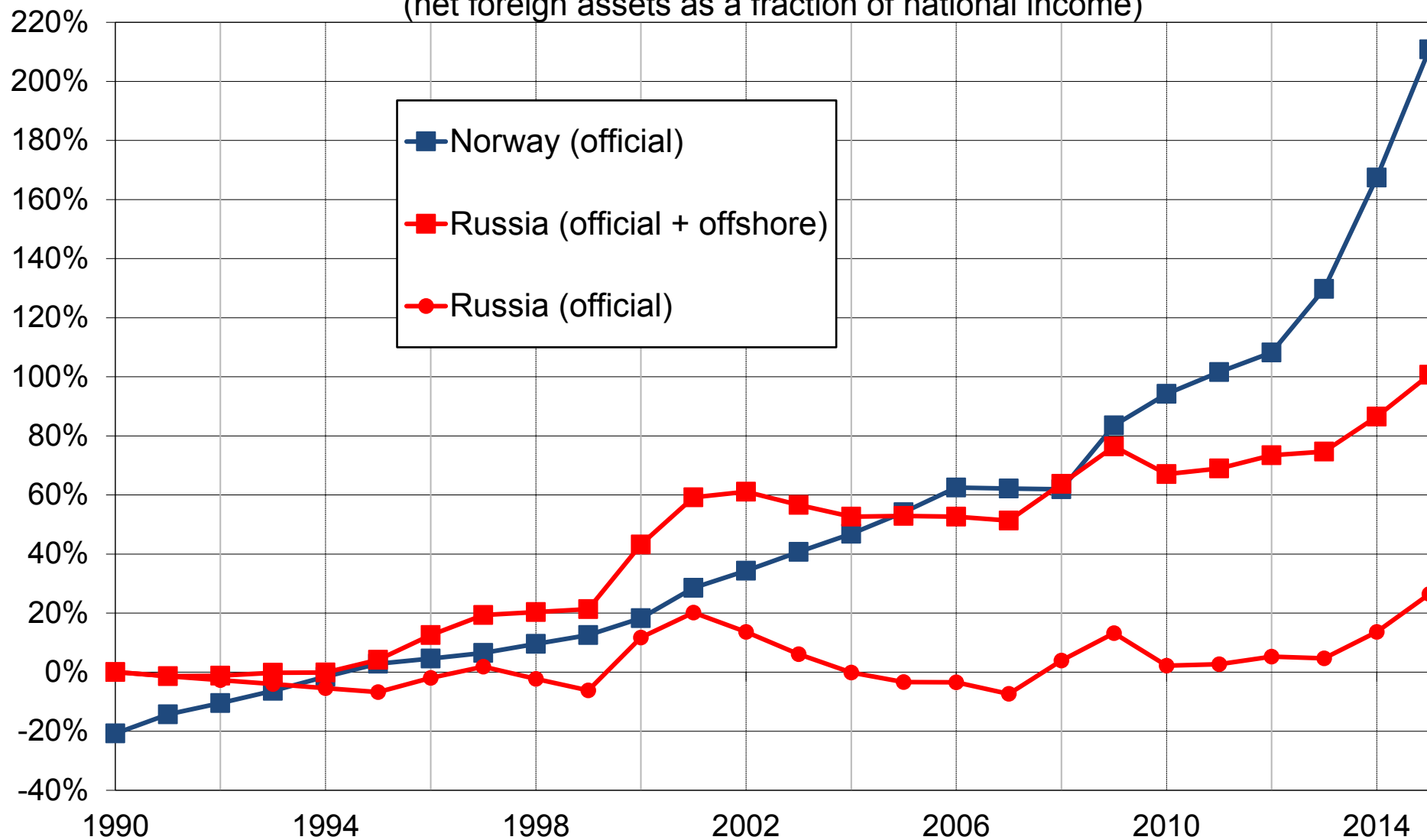


**Figure 7e. Net foreign assets: Russia vs other ex-communist countries (2)**

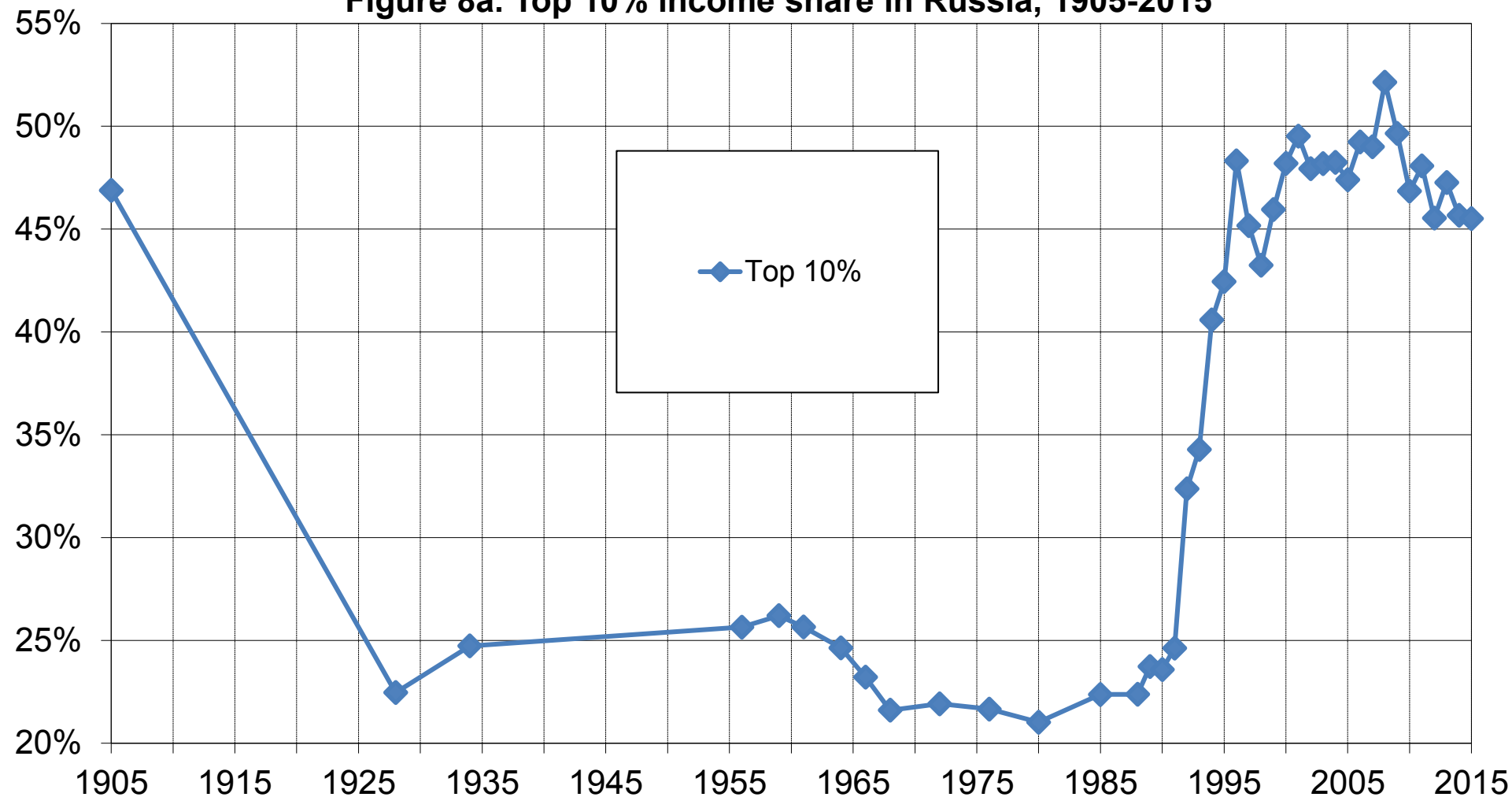
(net foreign assets as a fraction of national income)



**Figure 7f. Net foreign assets: Russia vs other oil-rich countries**  
(net foreign assets as a fraction of national income)

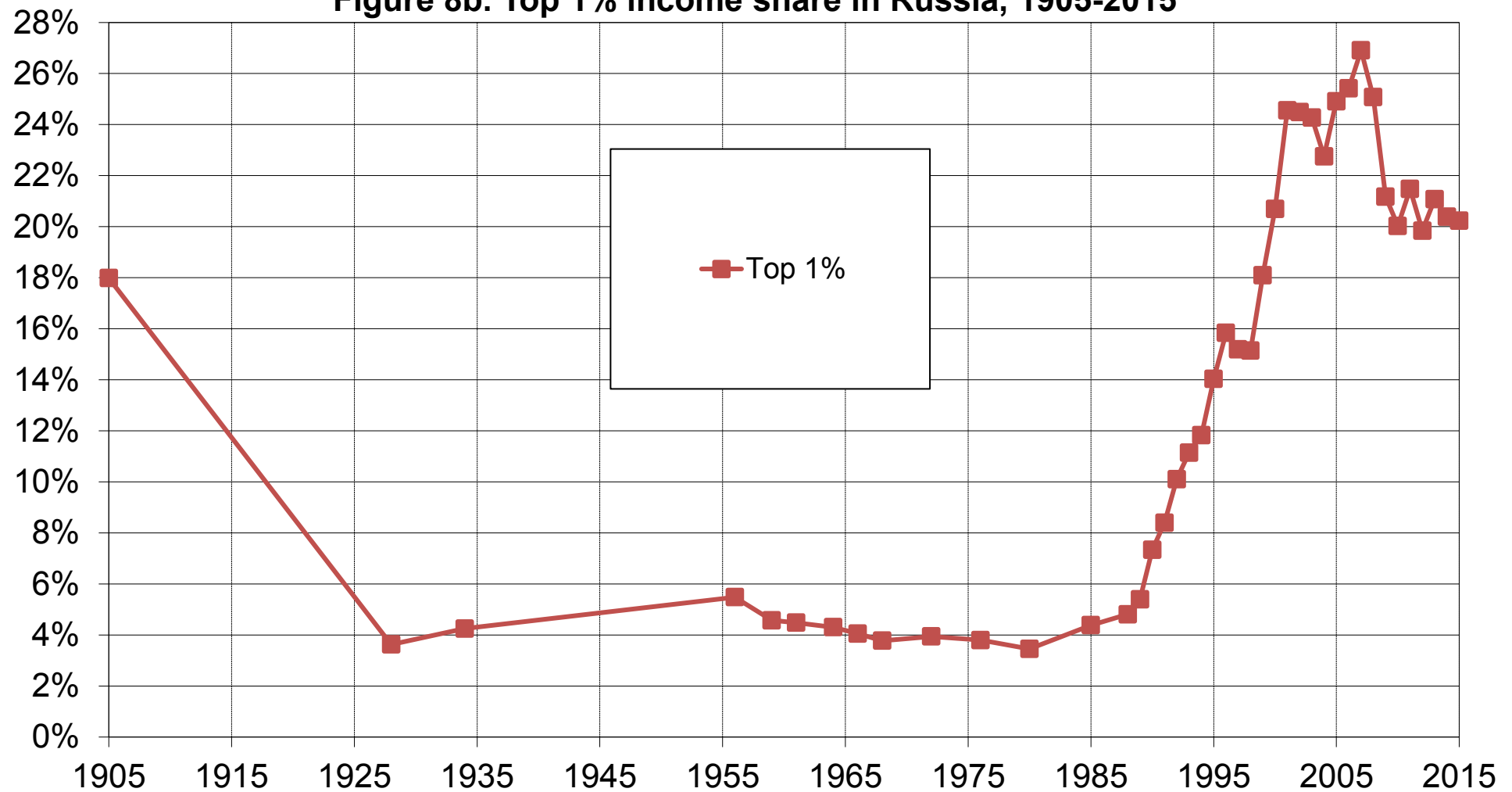


**Figure 8a. Top 10% income share in Russia, 1905-2015**



Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among adults.  
Corrected estimates combine survey, fiscal, wealth and national accounts data. Raw estimates rely only on self-reported survey data.  
Equal-split-adults series (income of married couples divided by two).

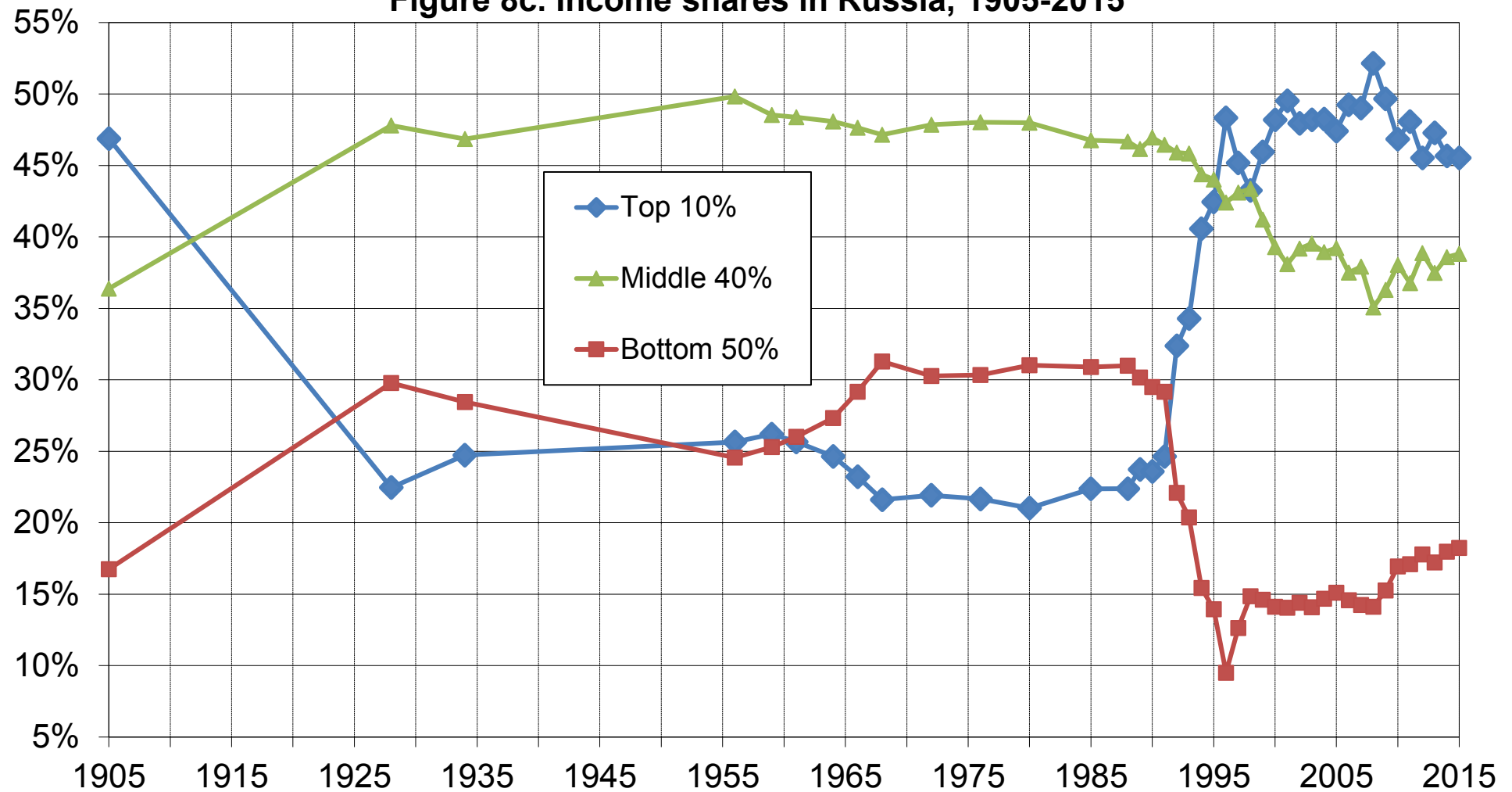
**Figure 8b. Top 1% income share in Russia, 1905-2015**



Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among adults.  
Corrected estimates combine survey, fiscal, wealth and national accounts data. Raw estimates rely only on self-reported survey data.  
Equal-split-adults series (income of married couples divided by two).

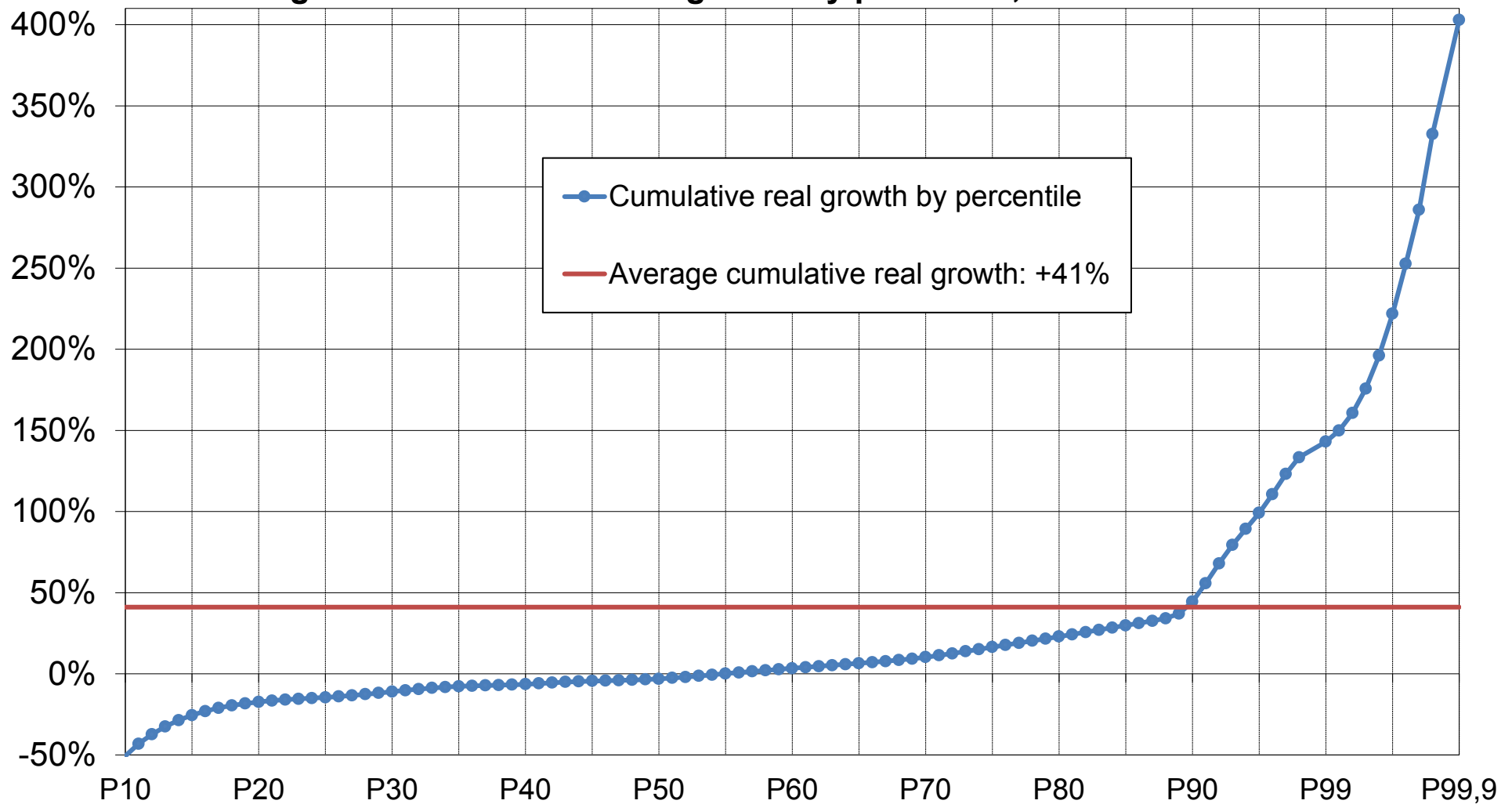


**Figure 8c. Income shares in Russia, 1905-2015**



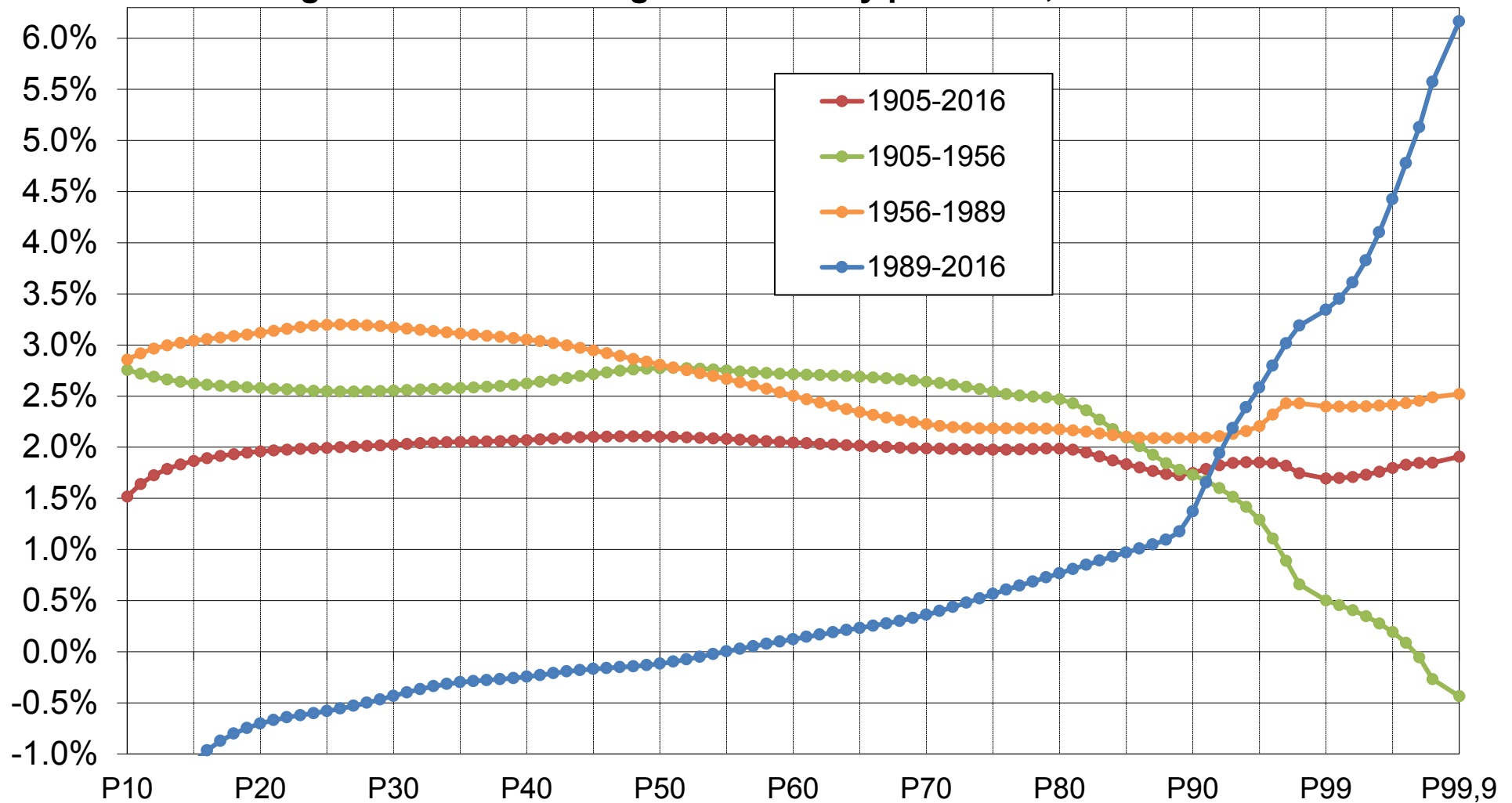
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among adults.  
Corrected estimates combine survey, fiscal, wealth and national accounts data. Raw estimates rely only on self-reported survey data.  
Equal-split-adults series (income of married couples divided by two).

**Figure 9a. Cumulative real growth by percentile, Russia 1989-2016**



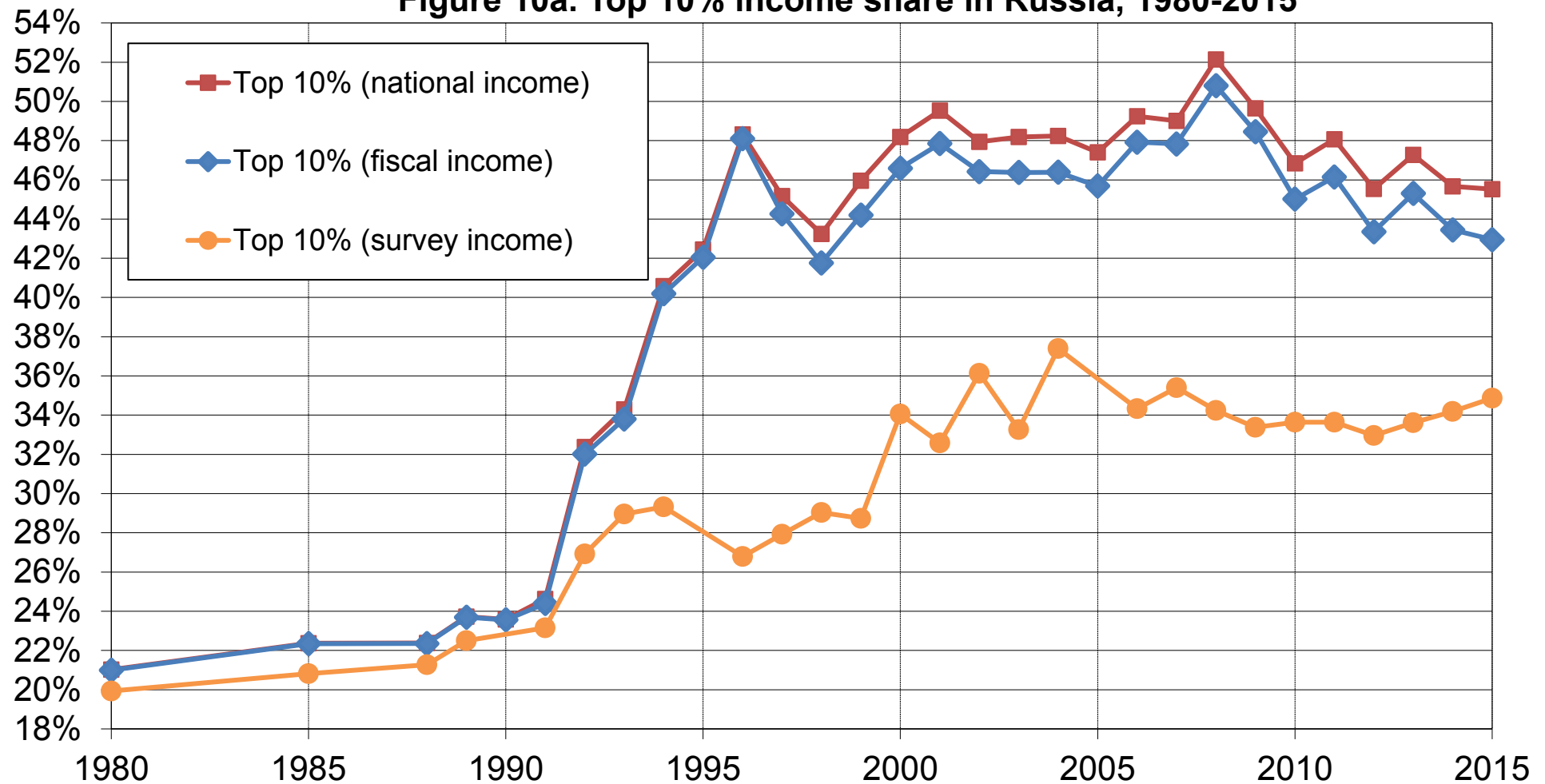
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

**Figure 9b. Annual real growth rates by percentile, Russia 1905-2016**



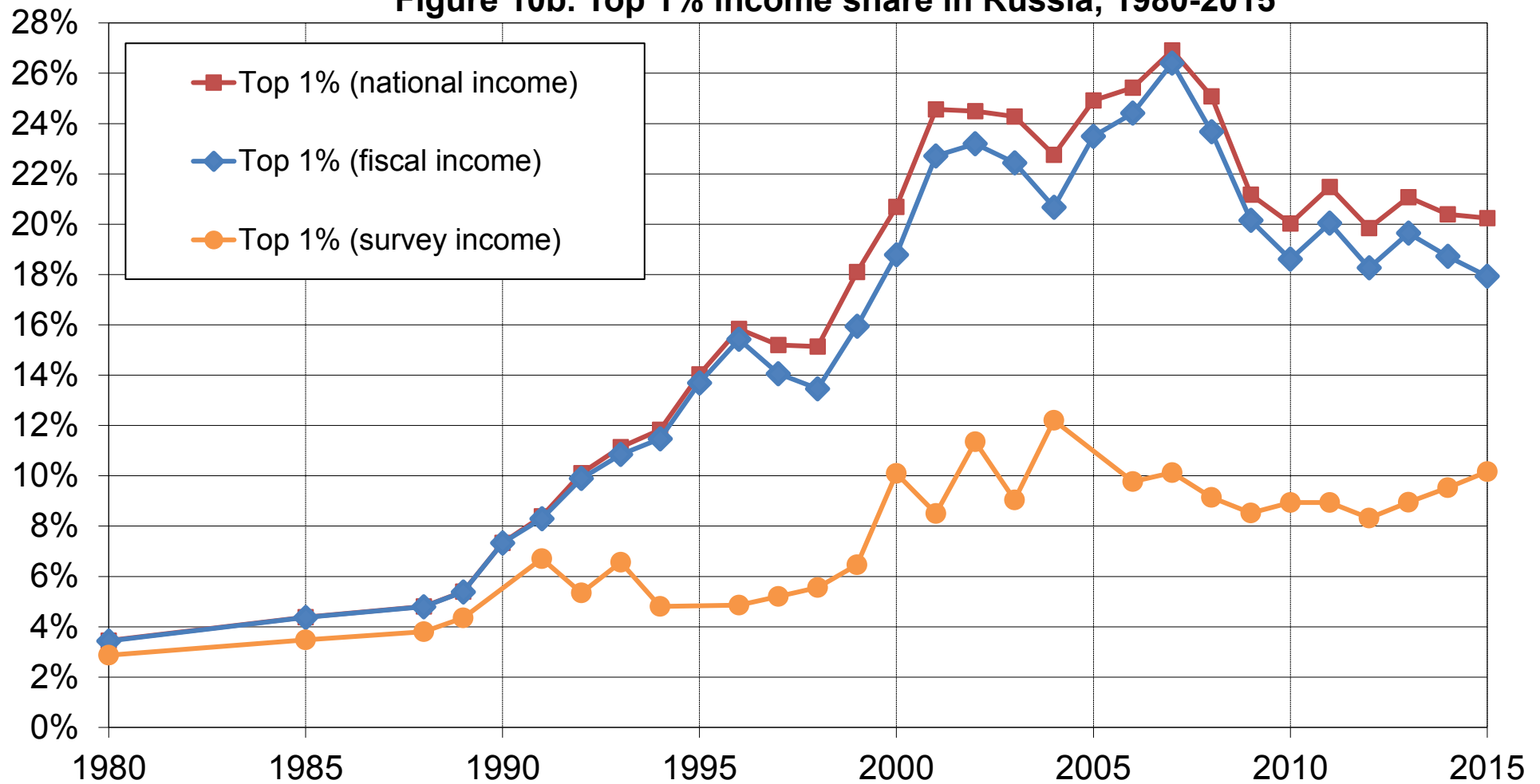
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

**Figure 10a. Top 10% income share in Russia, 1980-2015**



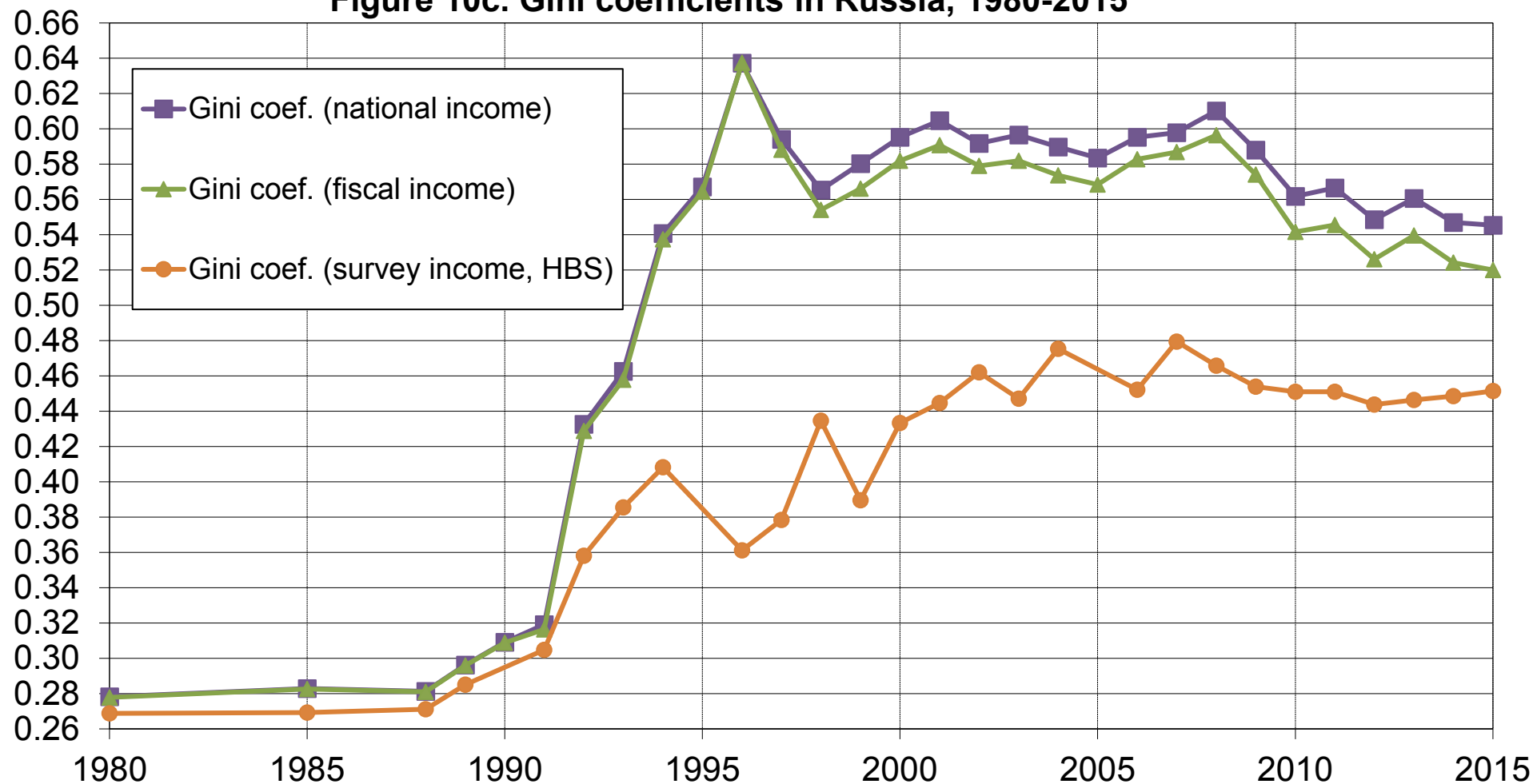
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

**Figure 10b. Top 1% income share in Russia, 1980-2015**



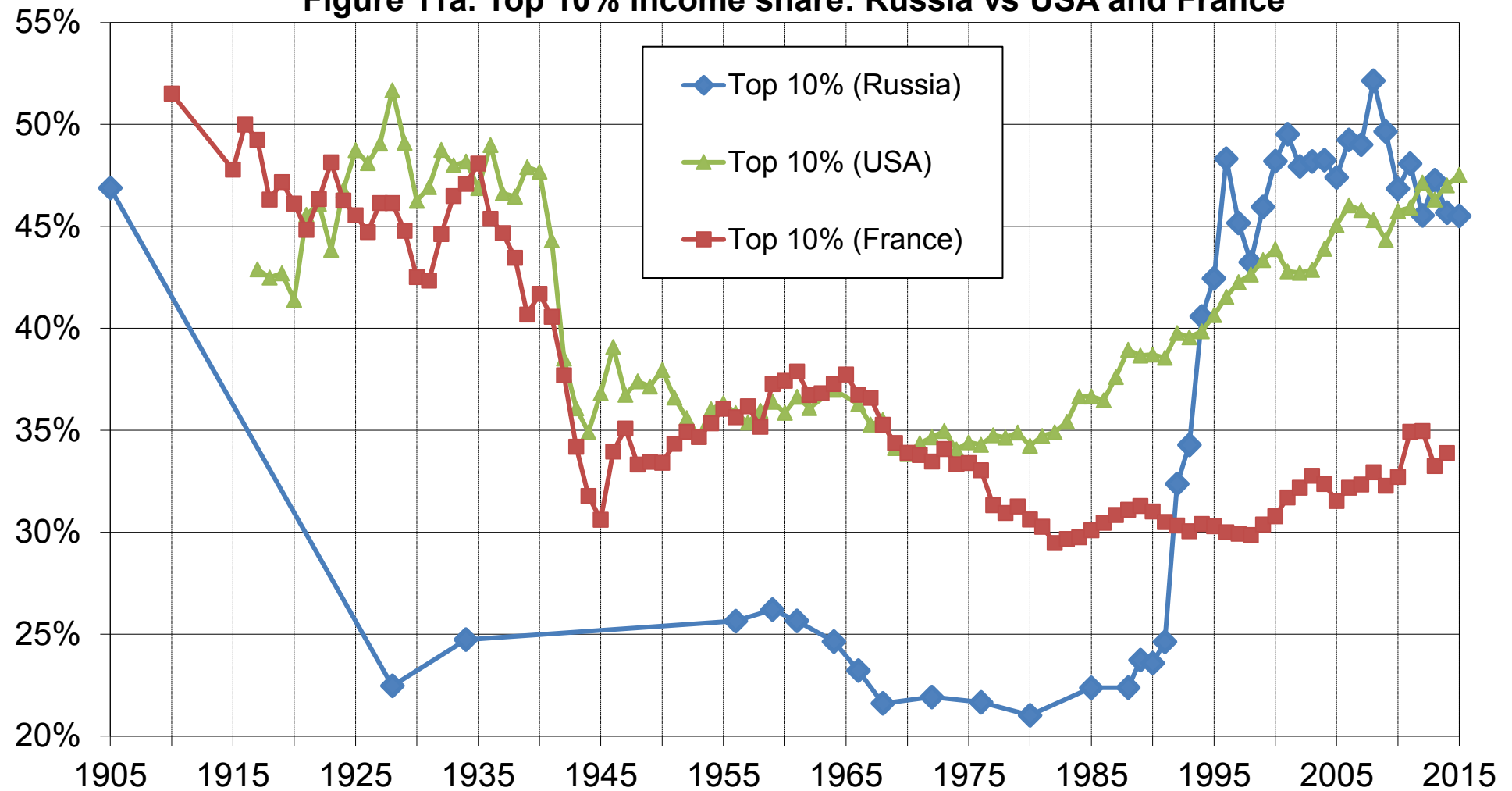
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

**Figure 10c. Gini coefficients in Russia, 1980-2015**



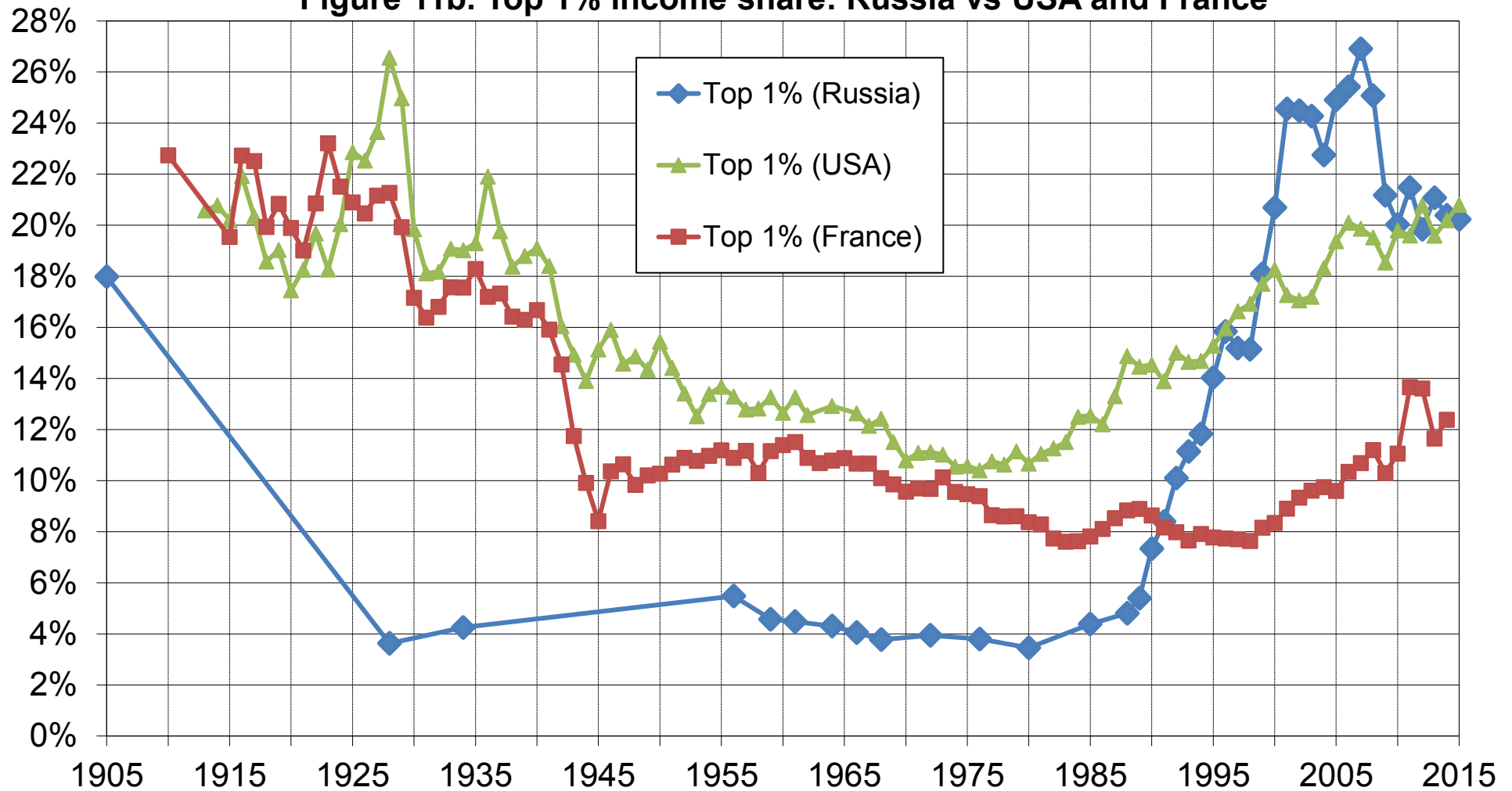
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

**Figure 11a. Top 10% income share: Russia vs USA and France**



Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Sources for USA and France: WID.world.

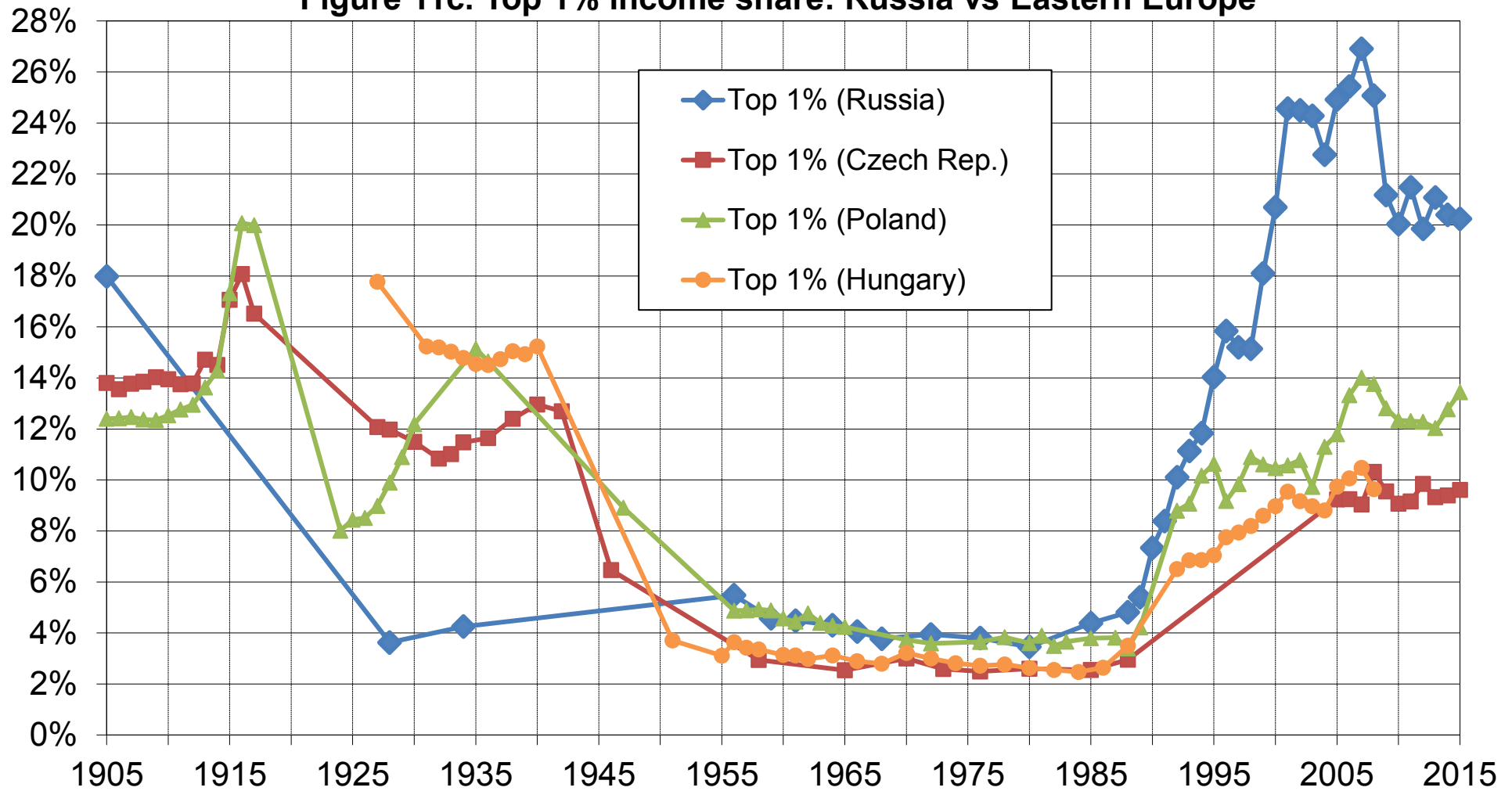
**Figure 11b. Top 1% income share: Russia vs USA and France**



Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Sources for USA and France: WID.world.

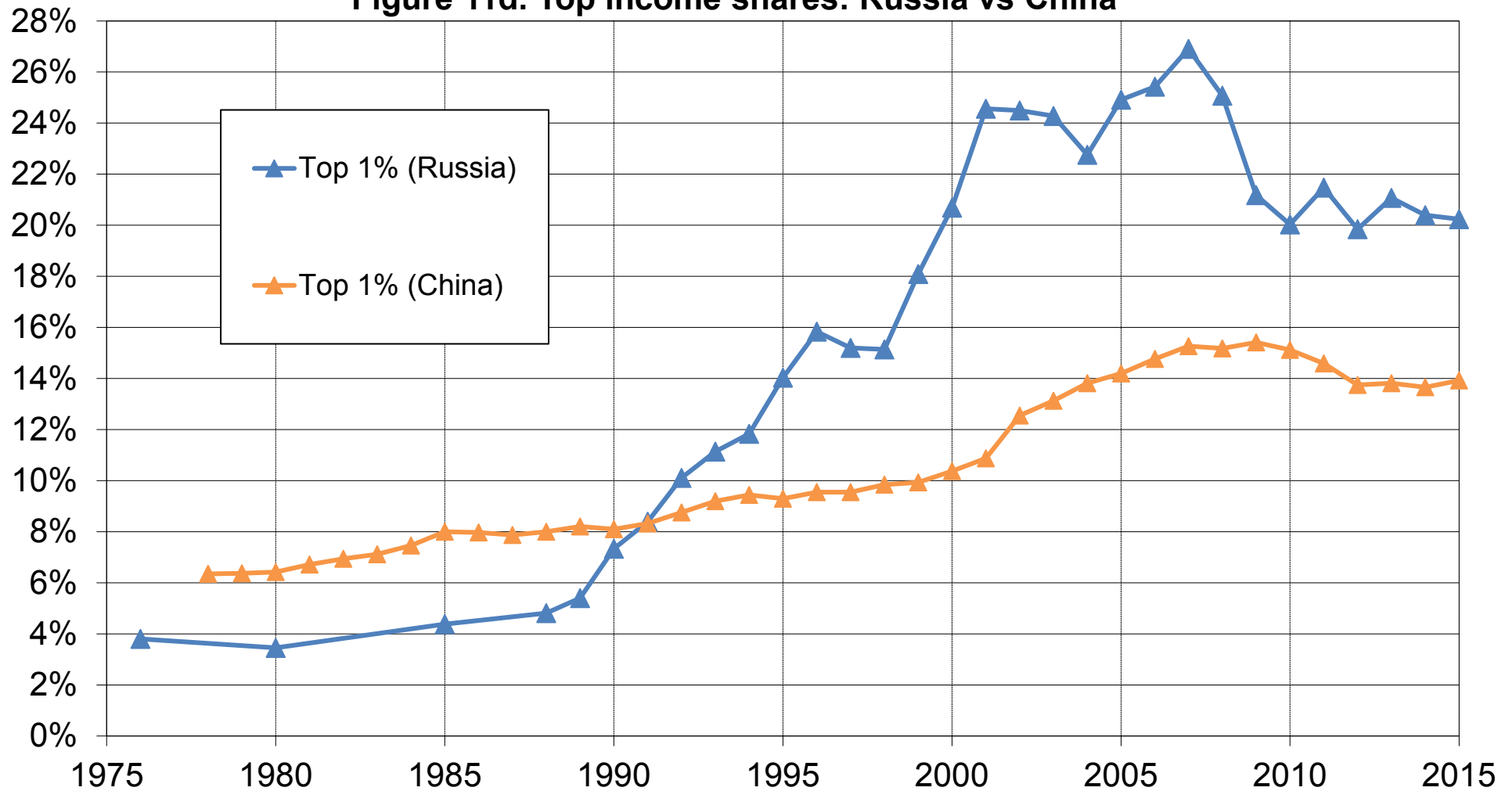


**Figure 11c. Top 1% income share: Russia vs Eastern Europe**



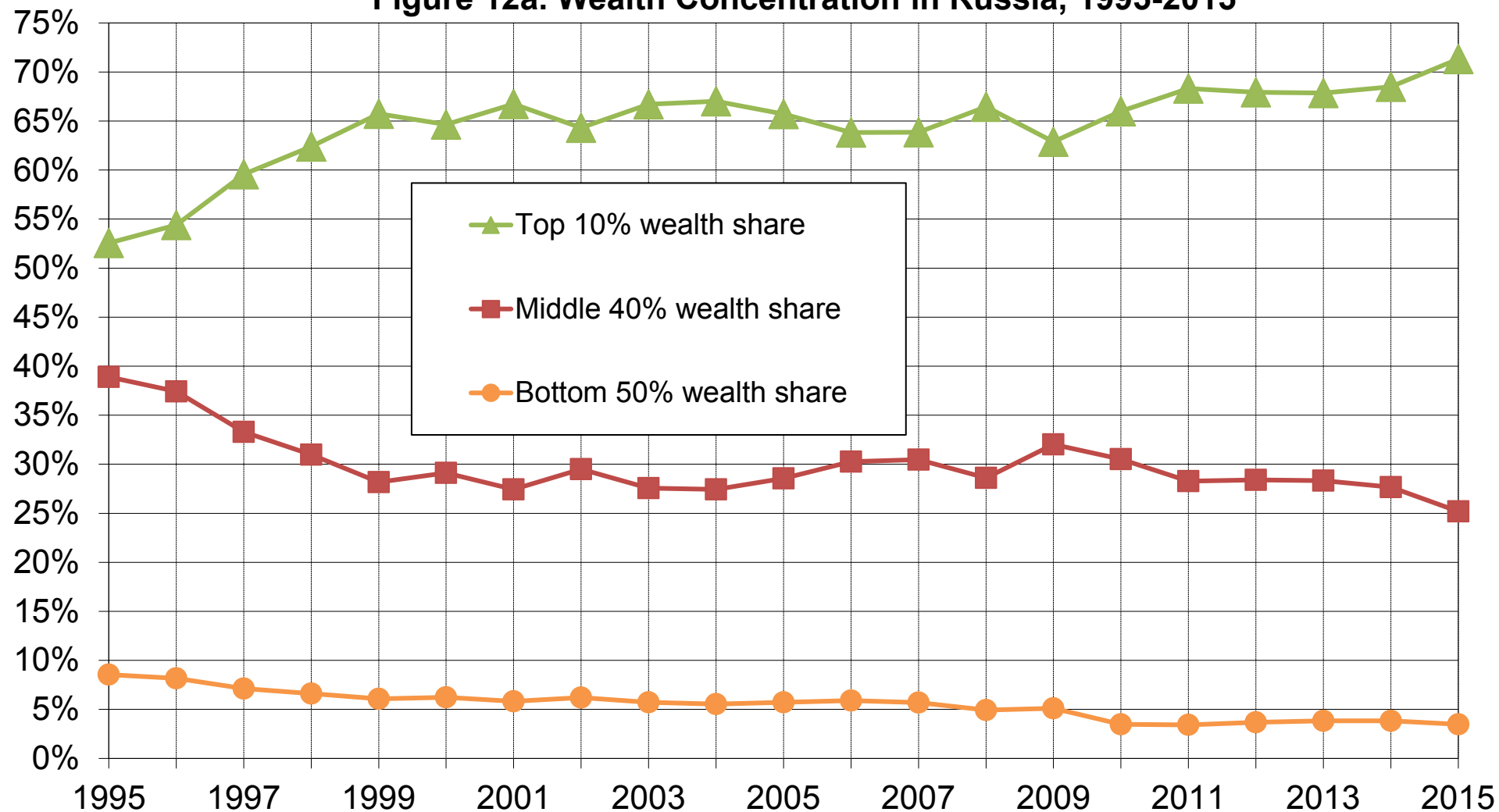
Distribution of pretax national income (Russia) or fiscal income (other countries). Source for Eastern Europe: Novokmet (2017); Hungary: Mavridis and Mosberger (2017).

**Figure 11d. Top income shares: Russia vs China**



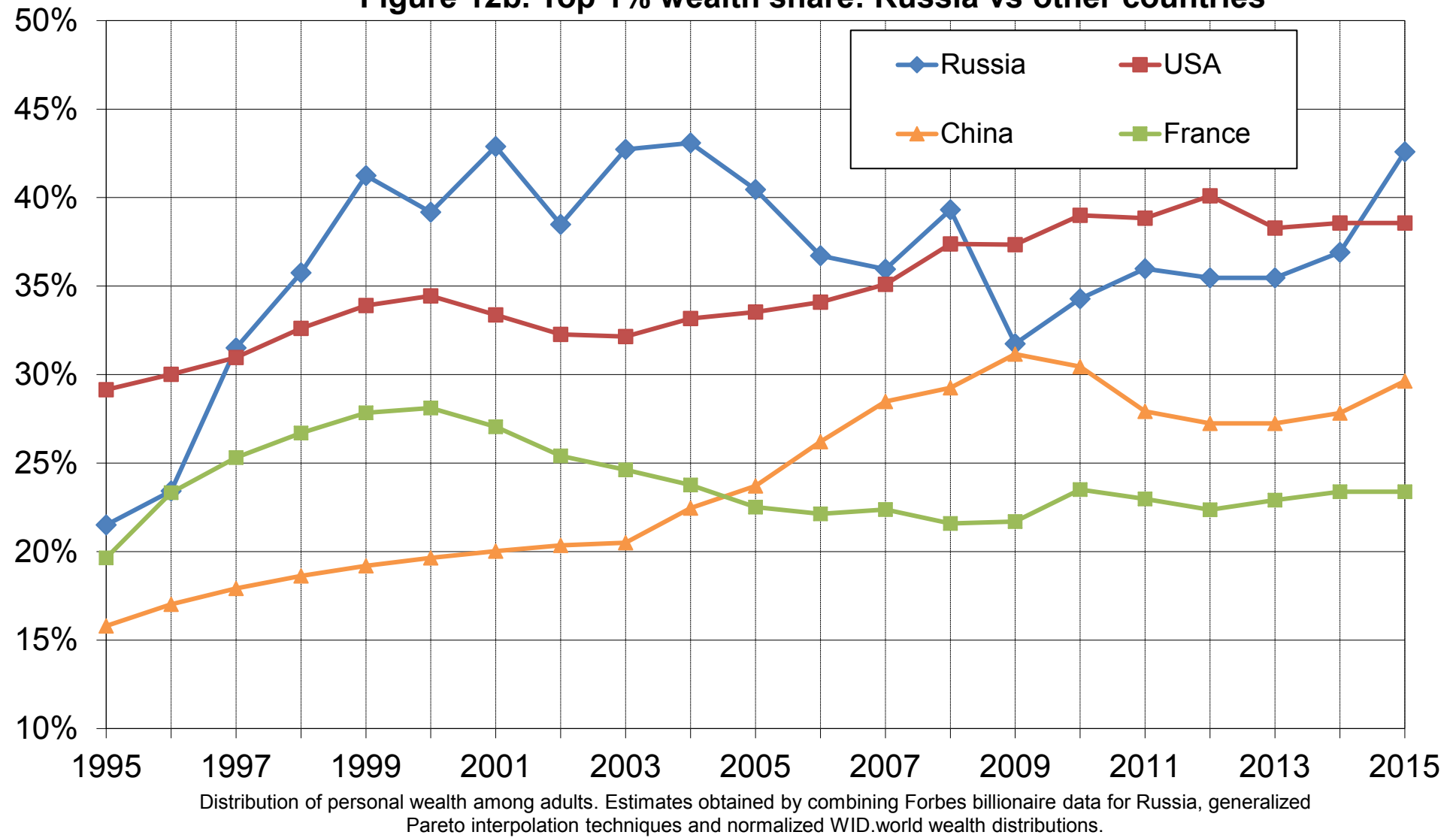
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Sources for China: WID.world.

**Figure 12a. Wealth Concentration in Russia, 1995-2015**

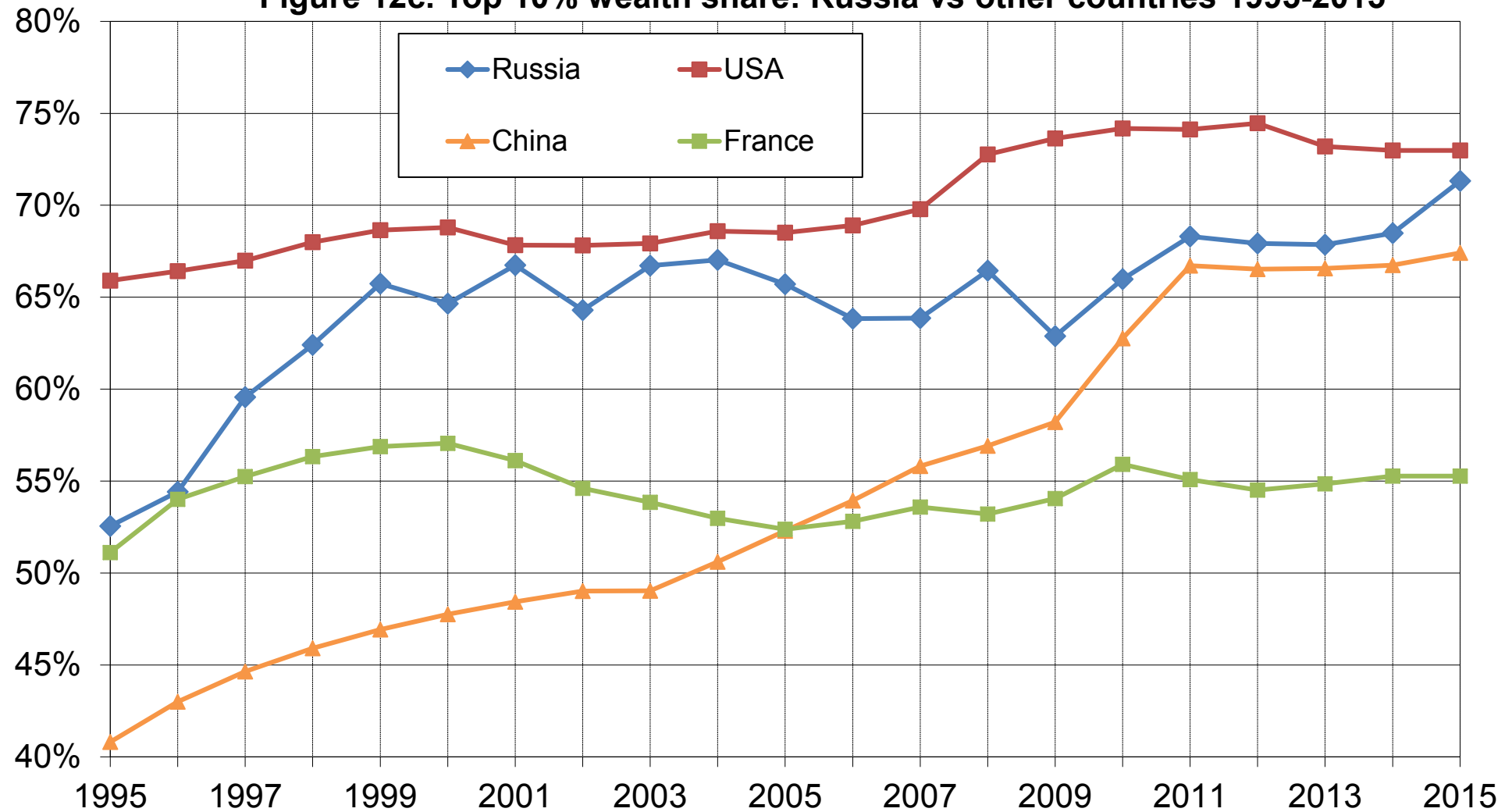


Distribution of personal wealth among adults. Estimates obtained by combining Forbes billionaire data for Russia, generalized Pareto interpolation techniques and normalized WID.world wealth distributions.

**Figure 12b. Top 1% wealth share: Russia vs other countries**



**Figure 12c. Top 10% wealth share: Russia vs other countries 1995-2015**



Distribution of personal wealth among adults. Estimates obtained by combining Forbes billionaire data for Russia, generalized Pareto interpolation techniques and normalized WID.world wealth distributions.

**Table 1: Income thresholds and income shares in Russia, 2016**

<b>Income group</b>	<b>Number of adults</b>	<b>Income threshold</b>	<b>Average income</b>	<b>Income share</b>
Full Population	114 930 000	0 €	23 181 €	100.0%
Bottom 50%	57 465 000	0 €	7 877 €	17.0%
Middle 40%	45 972 000	13 959 €	21 728 €	37.5%
Top 10%	11 493 000	36 311 €	105 516 €	45.5%
<i>incl. Top 1%</i>	<i>1 149 300</i>	<i>133 107 €</i>	<i>469 105 €</i>	<i>20.2%</i>
<i>incl. Top 0.1%</i>	<i>114 930</i>	<i>638 423 €</i>	<i>2 494 185 €</i>	<i>10.8%</i>
<i>incl. Top 0.01%</i>	<i>11 493</i>	<i>3 715 478 €</i>	<i>12 131 771 €</i>	<i>5.2%</i>
<i>incl. Top 0.001%</i>	<i>1 149</i>	<i>18 769 565 €</i>	<i>58 575 685 €</i>	<i>2.5%</i>

**Notes:** This table reports statistics on the distribution of income in Russia in 2016 (expressed in PPP € 2016). The unit is the adult individual (20-year-old and over; income of married couples is splitted into two). In 2016, 1 euro = 74,5 rubles (market exchange rate) or 28,3 rubles (purchasing power parity). Income corresponds to pre-tax national income. Fractiles are defined relative to the total number of adult individuals in the population. Corrected estimates (combining survey, fiscal, wealth and national accounts data). Source: Appendix B.

**Table 2: Income growth and inequality in Russia 1989-2016**

<b>Income group</b> (distribution of per adult pre-tax national income)	Average annual real growth rate 1989-2016	Total cumulated real growth 1989-2016	Share in total macro growth 1989-2016
Full Population	<b>1.3%</b>	<b>41%</b>	<b>100%</b>
Bottom 50%	<b>-0.8%</b>	<b>-20%</b>	<b>-15%</b>
Middle 40%	<b>0.5%</b>	<b>15%</b>	<b>16%</b>
Top 10%	<b>3.8%</b>	<b>171%</b>	<b>99%</b>
<i>incl. Top 1%</i>	6.4%	429%	56%
<i>incl. Top 0.1%</i>	9.5%	1054%	34%
<i>incl. Top 0.01%</i>	12.2%	2134%	17%
<i>incl. Top 0.001%</i>	14.9%	4122%	8%

Distribution of pre-tax national income among equal-split adults. The unit is the adult individual (20-year-old and over; income of married couples is splitted into two). Fractiles are defined relative to the total number of adult individuals in the population. Corrected estimates (combining survey, fiscal, wealth and national accounts data).

**Table 3: Income growth and inequality in Russia 1905-2016**

<b>Income group</b> (distribution of per adult pre-tax national income)	Average annual real growth rates			
	1905-2016	1905-1956	1956-1989	1989-2016
Full Population	<b>1.9%</b>	<b>1.9%</b>	<b>2.5%</b>	<b>1.3%</b>
Bottom 50%	<b>1.9%</b>	<b>2.6%</b>	<b>3.2%</b>	<b>-0.8%</b>
Middle 40%	<b>2.0%</b>	<b>2.5%</b>	<b>2.3%</b>	<b>0.5%</b>
Top 10%	<b>1.9%</b>	<b>0.8%</b>	<b>2.3%</b>	<b>3.8%</b>
<i>incl. Top 1%</i>	2.0%	-0.3%	2.5%	6.4%
<i>incl. Top 0.1%</i>	2.3%	-1.2%	2.7%	9.5%
<i>incl. Top 0.01%</i>	2.5%	-2.1%	3.0%	12.2%
<i>incl. Top 0.001%</i>	2.7%	-3.0%	3.3%	14.9%

Distribution of pre-tax national income among equal-split adults. The unit is the adult individual (20-year-old and over; income of married couples is splitted into two). Fractiles are defined relative to the total number of adult individuals in the population. Corrected estimates (combining survey, fiscal, wealth and national accounts data).



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**Appendix to  
From Soviets to Oligarchs:  
Inequality and Property in Russia 1905-2016**

Appendix A. National income and wealth accounts series

Appendix B. Income and wealth distribution series

The zip file NPZ2017.zip includes the following files (in addition to the pdf files of the main paper and present appendix):

NPZ2017MainFiguresTables.xlsx : figures and tables presented in the main paper

NPZ2017NationalAccountsData.zip : all national accounts files

NPZ2017DistributionSeries.zip : all distribution series files

## Appendix A. National income and wealth accounts series

Our detailed national income and national wealth series are presented in the file **NPZ2017AppendixA.xlsx**. This file includes a large number of tables presenting different breakdowns and decomposition of national income and national wealth by income and asset categories, following SNA 2008 concepts and the distributional national accounts guidelines of Alvaredo et al (2016). A general discussion about data sources, methodological and conceptual issues regarding national accounts is provided in the paper. The file includes more detailed explanations on how our series were constructed.

We also provide access to a directory including the raw material from official and non-official series that were used to construct these series (**NPZ2017NationalAccountsData**).

The zip file **NPZ2017NationalAccountsData.zip** contains both the .xlsx file with the detailed series and the raw material directory and is included in the zip file **NPZ2017.zip**.

All details about our computations and the way we used the various pieces of raw statistical data are given in the data files. Here we simply outline the main steps, references and assumptions behind the data construction.

### Appendix A.1. National balance sheets

#### Appendix A.1.1. Housing

The methodology that we use to estimate the market value of housing (residential structures and the underlying land) in Russia consists in combining the official statistics of the housing stock area with the house market prices (the comparison method). We proceed in two steps. In the first step, we multiply the housing area by the relevant house prices. In the second step, we apply correction factors to account for potential composition biases in the house prices.<sup>38</sup> Finally, for the early 1990s, we have assumed that the house prices evolved in relation to the general price inflation. The estimation is performed at the level of eight federal districts,<sup>39</sup> distinguishing in each between public and private dwelling stock, and further between urban and rural dwelling stock.

The corresponding annual data on the dwelling area (in square meters) in federal districts are found in the official publications of the Statistical Office of Russia (Rosstat) (e.g. *Zhilishchnoye khozyaystvo*, Statistical Yearbook of Russia, etc.; for 1990 from World Bank 1995, Tab. 3.8). Rosstat has also been publishing average selling prices of new and existing

<sup>38</sup> Namely, that the dwellings which have been sold might not be representative of the total housing stock, for example if the market transactions are more prevalent on particular locations (e.g. city centers) or for dwellings of the certain quality standard.

<sup>39</sup> The Russian Federation is administratively divided into eight federal district: Central Federal District, North-western Federal District, Southern Federal District, North Causcas Federal District, Volga Federal District, Ural Federal District, Siberian Federal District, Far Eastern Federal District

dwellings (per square meter) on the quarterly and annual basis. Realized market prices have been collected in administrative centers and larger cities.

In step 1 we multiply prices of the existing dwellings by the housing stock area – in each federal district for private and public housing, distinguishing further between urban and rural housing. However, several adjustments were required. In order to account for the potential composition bias, we have applied 0.85 of reported housing prices to the private urban dwelling area and 0.65 to the public urban dwelling area.<sup>40</sup> Next, the rural house prices are taken as 0.4 of reported housing prices in particular districts. Obviously, a move from the realized market transactions of dwellings to the total housing value has been the most difficult step in our estimation procedure, potentially accompanied with many uncertainties (Palacin and Shelbourn 2005).

Fortunately, we can compare our results to several alternative estimates. Most importantly, Rosstat (2014a, Table 12) has published the market value of the private housing in Russia in the 2002-2012 period – as a part of the methodological paper for the calculation of imputed owner-occupier rents. Rosstat uses a conceptually equivalent methodology,<sup>41</sup> but it is nonetheless remarkable that the two estimates are so close to each other, suggesting that we have managed in large part to minimize composition bias by controlling for the regional price variation and the urban-rural price differential. The current revision of the series, where we match regional house prices of dwellings of different quality<sup>42</sup> to the corresponding census figures, will hopefully further improve the accuracy of our estimates. But, above all, we hope that in the near future Rosstat will start publishing official housing series as a part of national balance sheets, including both private and public housing. Another available estimate is Yemtsov (2010) for the private housing in Russia in 2003. Yemtsov estimates housing value by capitalizing market rent. The figure he obtains - 175% of the national income in 2003 - is again very close to our estimate (185% of the national income). Overall, our housing series display plausible orders of magnitude that are in line with the available alternative estimates. All series are presented in **NPZ2017AppendixA.xlsx**.

Finally, nationally representative house prices are available since 1996. This is clearly related to the fact that only by the mid-1990s the privatization of the housing stock provided a sufficiently large reservoir of housing units on the market. Private ownership was quite limited in urban areas during the Soviet era. Still in 1990, almost 80 per cent of the urban housing stock was in the state ownership (see Statistical Yearbook of Russia). Accordingly, sporadic evidence of house prices in larger cities in the early 1990s (e.g., Kosareva et al. 2000, p. 166;<sup>43</sup> Daniell and Stryuk 1997) are not representative of the country as a whole. These indi-

<sup>40</sup> We have thus assumed that the urban public housing has been located on less favorable locations, or has been of inferior quality than the urban private housing stock.

<sup>41</sup> Rosstat (2014a, p. 21) explains the methodology as follows: “The calculation of the market value of residential buildings was carried out by multiplying the corresponding area of residential buildings, distributed according to two criteria - according to the material of the walls and the year of construction - by the respective prices, separately for apartment houses and individual houses. The calculation was carried out separately for urban and rural settlements.” (authors’ translation from Russian)

<sup>42</sup> Distinguishing between low-quality dwellings, medium-quality dwellings, high-quality dwellings, and luxury dwellings.

<sup>43</sup> Based on the data of the Russian realtors guild.

cate very high prices, which should be related to the very low supply and to a large extent comprised real estate transactions for the commercial use (World Bank 1995, p. 28).

Our strategy has been instead to assume that between 1990 and 1995 house prices evolved in relation the general price inflation. In a paucity of (often contradictory) price information, we believe that the most robust evidence of the house price evolution in the first transition years in Russia, and Eastern Europe in general, has been that house prices outpaced to a certain degree the general price inflation (Stryuk 1996; Kosareva et al. 2000, Tab. 3.12; Palacin and Shelburn 2005). In the immediate post-socialist hyperinflationary environment, the housing preserved its real value (World Bank 1995, p. 30; Kosareva et al. 2000). Indeed, indirect evidence suggests that the proportionally higher rise of house prices relative to consumer prices stimulated housing purchases and investments, which served as a hedge against the rampant inflation that virtually wiped out all financial saving. This could have additionally motivated many Russians with tenancy rights to privatize flats (*ibid.*).

We have assumed that house prices outpaced consumer prices by 2%, and applied it backwards to 1990. The resulting housing value increases from 110% of the national income in 1990 to 240% of the national income in 1996. The estimate for 1990 can be compared with the official Soviet housing estimate based on replacement costs.<sup>44</sup> Official estimates are of magnitude between 80-90% of the national income in the 1980s, thus not far removed from our benchmark (moreover, there is an indication of the bias in the direction of underestimation, as the Soviet methodology for housing remains to a large extent elusive regarding the housing coverage and details of pricing (Moorsteen and Powell 1966; Powell 1979)).<sup>45</sup> But, obviously, there is no compelling reason that two measures should tally in practice, especially in the socialist economy.<sup>46</sup> However, all indicators substantiate the finding of a strong increase in housing value in the early 1990s. This was a universal phenomenon,<sup>47</sup> as Kosareva et al. (2000, p. 166) note, “no matter whether it was a standard residential property or a higher-quality property with an improved plan, custom design, and better location”. The emergence of real estate market implied that market forces acted on widespread distortions in prices and urban patterns (Bertaud and Renaud 1997; World Bank 2001)<sup>48</sup>. The location especially came to play the main role with the marketization of residential land. Broadly speaking, the development of housing in Russia and Eastern Europe could be seen as a part of the global trend documented for developed countries (Knoll et al. 2014; Piketty and Zucman 2014).

<sup>44</sup> Dwellings (excluding underlying land) were a part of the so-called non-productive assets in the Soviet wealth accounting (e.g. Nesterov 1972). We assume, following Goldsmith (1965, 1985), that the land underlying dwellings is equivalent to 30% of the value of dwelling structures.

<sup>45</sup> The capitalization of rent is not meaningful since the ‘social’ rent was heavily subsidized (it made less than 5% of household income; it remained fixed since 1929) (Morton 1980). See Alexeev (1991) for the attempt to estimate market house rents in the Soviet Union.

<sup>46</sup> Theoretically, in market equilibrium replacement costs should equal market house value (DiPasquale and Wheaton 1992; Jaffee and Kaganova 1996)

<sup>47</sup> The replacement values of housing saw equally sharp rise with the virtual explosion of construction material prices, much higher in magnitude than had been the rise of consumer prices (World Bank 1995, p. xix).

<sup>48</sup> A peculiarity exhibited by socialist cities is lower densities in city center than on the urban periphery (Bertaud and Renaud 1997).

### Appendix A.1.2. Agricultural land

The agricultural land market is still very underdeveloped in Russia. More than twenty years after the abandonment of the Soviet state-run agriculture and the turn to the private market-based agriculture, the huge potential of the Russian agriculture has been largely unexploited. As a result, the data on agricultural land market transactions is scarce, making, in turn, the market value estimation of the agricultural land a particularly challenging task.

In the absence of official estimates of the land value in Russia, we pursue the comparison method as applied above for the housing, which consists in multiplying the land area by the relevant current market prices. However, in contrast to the housing exercise, where we had at our disposal unusually detailed and reliable house prices, the market prices of the agricultural land are practically non-existent.

Due to the specific character of the agricultural land privatization in Russia, and the subsequent developments (see below), land leasing has been the predominant form of market transactions involving land, while the land sales account for a very small share of the market activity in Russia. Namely, privatization of agricultural land in Russia proceeded by transferring in the early 1990s the state-owned agricultural land into the joint ownership of farmers on former collective and state farms (*kolkhozes* and *sovkhozes*)<sup>49</sup> (the so-called Nizhny Novgorod model; Wegren 1998). Farmers were granted land shares, representing paper claims on a piece of land in the joint shared ownership (without actually allotting specific physical plots, but with the right to eventually convert a share into the physical plot in the individual ownership) (Lerman and Shagaida 2007, p. 21). Most farmers-shareowners have chosen to leave the land in the joint shared ownership and to lease out their shares, largely to corporate farms (former collective and state farms that have been incorporated in the meantime). The large agricultural enterprises farm today most of the agricultural land in Russia (Lerman and Sedik 2013, Tab 22.5).<sup>50</sup>

As a result of the privatization, the ownership of the agricultural land has markedly changed since the Soviet era, when the land was entirely in the state ownership. Today almost two-thirds of the agricultural land is in the private ownership and one-third in the state ownership. Close to 90 percent of the privately owned agricultural land (more than 50 of the total agricultural land) is owned through land shares, and the remaining modest share in the form of demarcated land plots (Lerman and Shagaida 2007, p. 16). A conversion of land shares into the physical plots in the individual ownership is rather cumbersome and expensive procedure, hampered by numerous administration constraints.

Accordingly, one needs to take into account both land leasing and land sales transactions to assess the value of the agricultural land. The official statistics is quite detailed concerning leasing and sale of the state-owned land. Both transaction volumes and prices are annually

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<sup>49</sup> The restitution to previous owners, as practised in many other ex-communist countries in Eastern Europe, was not considered due to the longer time passed since the forced collectivizations and land expropriations in Russia.

<sup>50</sup> According to the 2006 agricultural census, the large enterprises in Russia cultivate on average 11,846 ha. For comparison, the average size of the very large farms in the US is around 863 ha (Lerman and Sedik 2013, Tab. 22.8)

published.<sup>51</sup> On the other hand, the information is very limited for market transactions between individuals.<sup>52</sup> We conduct two variants to estimate the value of the agricultural land. First, we use the selling prices of the state land at auctions, in particular for the land sold to peasant farms and agricultural enterprises.<sup>53</sup> The value of agricultural land is obtained by applying prices to the land area. Prices are available at the federal district level.<sup>54</sup> The second variant applies the official cadastral land value (per ha) to land area. Rosstat stipulates the latter approach<sup>55</sup> in the official methodology for the estimation of the market value of the agricultural land (*Metodologicheskiye rekomendatsii po otsenke zemli*).<sup>56</sup> Both variants give similar land values, but we follow the latter as it compatible with the official methodology (and hopefully, soon to be available official land estimates). Furthermore, we believe that the cadastral valuation – however imperfect proxy for the actual market values – is at the moment the preferable appraisal of the agricultural land value at the macroeconomic level in Russia, in the first place due to its exhaustive regional treatment of the huge and highly heterogeneous Russian agricultural land area. For the 1990s we have assumed that the land value moved in line with the price index of agricultural products.

The resulting series display very low value of agricultural land in Russia – less the 20% of national income today. These values are consistent with the sporadic evidence on land prices, suggesting an extremely low value of the agricultural land in Russia. The most relevant evidence on land lease prices (which is the predominant form of market land transactions) between individuals is the BASIS survey (Lerman and Shagaida 2007), carried out in three regions representative of the advanced, intermediate and backward agricultural production (respectively, Rostov, Nizhny Novgorod and Ivanovo). According to the survey, a price of the lease per hectare per year ranged between 350-450 rubles in 2003. For example, by applying the same payback period (an inverse of the capitalization rate) of 33 years (as used for the cadastral valuation) in order to move from land lease to market price, we arrive at the market price very close to the one we use.<sup>57</sup>

The principal reason for the low value of agricultural land in Russia is very low or non-existent demand. The transformation of the Russian agriculture proceeded with series of

<sup>51</sup> In the annual publications of Rosreestr (Federal Agency for State Registration, Cadastre and Cartography): *State (National) Report "On situation with and utilization of land in the Russian Federation"*

<sup>52</sup> The number of transactions is published in the official statistics, but, as Lerman and Shagaida (2007, p. 16) point out, this makes a negligible part of the actual activity, since individuals predominantly do not register land transactions. Moreover, buying and selling of land was prohibited until the passing of the Agricultural Land Market Act in 2003. Prices of land transactions between individual are not available. A complete lack of any public information on market land prices has often been indicated as one of the chief obstacles for the development of the functioning land market.

<sup>53</sup> Namely, the Rosreestr statistics do not distinguish separately sales of agricultural land in the total land. Since important part of the land transactions involves the sale for construction use (for individual housing or dacha construction).

<sup>54</sup> Clearly, selling prices of the state agricultural land can be removed from market prices, and due to various (political, social or cultural) reasons poorly reflect an actual supply and demand relationship. In principle, the state land should be sold at the prevailing market price, but this is not possible in practice due to a lack of the established market prices.

<sup>55</sup> Yet, we are not aware of the actual land estimates produced by Rosstat.

<sup>56</sup> Thus, Rosstat notes in *Metodologicheskiye rekomendatsii* that cadastral value should be based on the market values. Rosreestr generally assessed land values by discounting lease payments. It applies 33 years as the payback period (Rosreestr 2015).

<sup>57</sup> Obviously, assuming the appropriate capitalization rate is a very delicate issue.

shocks. Artificially large Soviet agriculture suddenly shrank with the removal of subsidies and the rise of input costs after price liberalization (Liefert and Swinnen 2002). It was accompanied by the exodus of the population from the agricultural sector, leaving much land idle, frequently turned to the construction use or into wastelands. Besides, the rural population in Russia is much poorer on average (it was among the lowest income strata during the Soviet Union; McAuley 1979). It is poorly informed, faced by numerous administration barriers, lacking necessary financial means, with no access to bank credit, etc. All this discourages serious engagement in the agricultural activity.

Finally, imperfect property rights are the factor substantially limiting demand for the agricultural land. Privatization has created large strata of holders of land shares that in effect do not have full control over the land. Without doubt, the agricultural land – as no other component of the national wealth – encapsulates a peculiar history of the property relations in Russia. From communal land tenure in the tsarist Russia to the Soviet forced collectivization, Russia pursued different development path than Western Europe. Moreover, to many observers, loose property rights in agriculture in the post-Emancipation period revealed the fundamental gulf between Russia and the West<sup>58</sup> (see Dennison 2011 for the comprehensive overview). The so-called ‘peasant myth’, as famously outlined by the Russian agricultural economist Chayanov (1966), has endured to this very day, frequently casting doubt upon the adaptability of the Russian village to the market-based agriculture with profit-maximizing agents and clearly defined property rights.<sup>59</sup> On the other hand, Gerschenkron (1962) provides the classic statement of the so-called institutional argument, according to which the Russian fundamental ‘otherness’ is rather a result of the specific historical institutional development in Russia, which adversely affected labour mobility (e.g. peasant immobility during tsarist period; urban immobility (*propiska*) during the Soviet era, etc.) and in turn the property rights development (Dennison 2011). More generally, it has been perceived as the main cause of the Russia’s economic ‘backwardness’. Accordingly, the lesson for today is that the improvement in the agricultural institutional and legal framework is a requisite for the successful development of the Russian agriculture.

#### Appendix A.1.3. Other domestic capital

We define other domestic capital as all non-financial assets excluding the housing and the agricultural land. It comprises the non-financial assets of the corporate sector, the public infrastructure, the capital of small proprietors, etc. As a starting point in our estimation approach, we use the official Rosstat’s estimates of the fixed capital stock available for the 2011-2015 period, produced in compliance with the SNA 2008 standard. In particular, Rosstat has published fixed assets classified by categories of dwellings, other (non-residential) buildings, constructions, machinery and equipment, means of transport and other fixed assets. Both gross and net of depreciation values are provided. In order to obtain estimates for years prior to 2011, we have used the perpetual inventory method (PIM). Specifi-

<sup>58</sup> For example, contrasting the collectivistic spirit of the Russian (peasant) to the western individualism. This view was propagated by the literary giants, such as Herzen or Tolstoy (Dennison 2011).

<sup>59</sup> Gregory (1994, p. 54) thus notes that the Soviet leadership justified its reluctance to return to the private agriculture in the late 1980s by alluding to the presumed failure of the private agriculture in the post-emancipation period of the tsarist Russia or during the New Economic Policy (NEP) period (1921-8). Gregory (1994) shows both of these assertions to be wrong.

cally, we start with the net stock of fixed assets in 2011 and apply backwards the gross fixed capital formation series in constant 2011 prices adjusted for the consumption of fixed capital.

Gross fixed capital formation series are available from the national accounts for the following four types of fixed assets: i) dwellings; ii) non-residential buildings and structures; iii) machinery and equipment, and means of transport; iv) other fixed assets. We initiate PIM by taking 2011 stocks for asset types from ii until iv.<sup>60</sup> Consumption of fixed capital for each type of fixed asset is estimated by multiplying the inverse of the expected service life by the gross fixed capital stock (assuming thus straight-line depreciation profile). For non-residential buildings and structures, we assume the average expected service life of 55 years, for machinery and equipment 13 years (Erumban and Voskoboynikov 2014). These assumptions are found to be consistent with the official data available for 2011-2015. Finally, thus obtained net fixed capital series in constant prices is converted into current prices using the appropriate price indices specified by Rosstat: 'the producer price index in construction' for non-residential buildings and constructions; 'the acquisition price index for machinery and equipment of investment purpose' for the machinery and equipment. The land underlying non-residential buildings is taken as 20 per cent of the net value of structures. The value of inventories is taken from the enterprise annual survey (*Finansi Rossii*).

Unfortunately, Rosstat does not provide a sectoral ownership composition of the fixed capital. Instead, the sectorization of the other domestic capital between corporate, household and government sectors has been approximated as follows. First, the other domestic capital in the government ownership is taken as reported in the *IMF Government Finance Statistics*.<sup>61</sup> The remaining part is divided between the corporate and the household sector in the way that the other domestic capital of the household sector (largely capital of small businesses) is taken as rising from the mid-1990s until today from 0.1 to 0.15 of the total net other buildings and structures and from 0.1 to 0.2 of the machinery and equipment. The residual value is attributed to the corporate sector. Note that the non-financial capital of corporations is included in the so-called book-value national wealth, while in our benchmark market-value national wealth series corporations are valued instead through their equity. See the next section for more details.

The value of the other domestic capital in 1990, which is our benchmark year for the Soviet period, comes from the 'balance of fixed assets' statistics (one of the four main 'balances' under the Material Product System (MPS); Arvay 1994; Nesterov 1972, 1997). The method was based on annual surveys of enterprises' and government organizations' balance sheets, using as starting points periodic general censuses of the total capital stock undertaken in the socialist countries (in 1960 and 1973 in the Soviet Union) (Goldsmith 1965, 1985; Moorsteen and Powell 1966; Powell 1979; Kaplan 1963).<sup>62</sup> The figure for other domestic capital in 1990 based on this source should be seen as reliable due to the comprehensive coverage of the capital, made possible by the centralized reporting system of the Soviet command economy. And plausibly it should be preferred to the backward application of PIM outlined above, due

<sup>60</sup> We also estimate dwelling stock in this way in the attempt to distinguish between structures and the underlying land for the housing component (see section A.1.1)

<sup>61</sup> The data has been prepared by the Russian Treasury and it is also available at its website.

<sup>62</sup> The method is conceptually akin to PIM, using the year of the general inventory as the benchmark year.



to the very large uncertainty regarding both price and investment series<sup>63</sup> during the chaotic period in the early 1990s (hyperinflation, mass privatization, large-scale capital retirements, etc.). The series for fixed assets are reported in Statistical Yearbooks (*Narhoz*), in 1973 prices (Soviet estimate prices), which we convert to current prices using the appropriate price indices for construction works and for the machinery and equipment.<sup>64</sup> The constructed series for fixed assets for the 1960-1990 period are included in **NPZ2017AppendixA.xlsx**.

#### Appendix A.1.4. Financial assets and liabilities

The Bank of Russia has published complete Financial Accounts and Financial Balance Sheets of all institutional sectors for 2011-2015. These are fully in compliance with SNA 2008. In order to reconstruct sectoral financial balance sheets for the period 1990-2010, we rely on various official sources, in the first place on the official monetary statistics of the Bank of Russia. First, we look at the financial assets (exclusive of equity and investment fund assets) and liabilities of the household and the government sector.

##### Appendix A.1.4.1. Household financial assets and liabilities

Currency and deposits has been traditionally the most important financial asset of the Russian households. In the Soviet Union, it was basically the sole saving alternative available to the population (in addition to limited residential investment). Russian households started the transition with the substantial value of deposits and currency holdings, equivalent to almost 80 per cent of the national income, largely as a result of the (forced) saving amid limited consumption opportunities in the shortage economy of the Soviet Union (the so-called “ruble overhang”). But the rampant inflation of the early 1990s wiped them out overnight. In the course of the following two decades, households have accumulated deposits and currencies equaling to around 40 per cent of the national income. Other types of financial assets, such as holdings of debt securities, have played a very limited role in the portfolio of Russian households.<sup>65</sup>

The data on household deposits before 2011 (inclusive of the Soviet period) is available in the official publications (e.g. Statistical Yearbook of Russia; *Sotsial'noye polozheniye i uroven' zhizni naseleniya Rossii*, etc.). Currency held by households is set to 75 per cent of the cash in circulation (monetary aggregate M0).

On the other hand, the Russian households entered the transition with the negligible debt burden. Goldsmith (1965, p. 89) thus pointed out as “the outstanding feature of...financial relations [in the Soviet Union] the virtual absence of the debt of the household sector”. With the high inflation of the early 1990s, this modest debt was eliminated along with the private

<sup>63</sup> It is also not feasible due to a lack of investment series by the fixed asset type for the early 1990s.

<sup>64</sup> For machinery and equipment we use the alternative western price index constructed by Becker (1974), CIA (1979) and Trembl (1991), due to the well known hidden inflation in the wholesale machinery prices. The widespread practice in socialist economies was to simulate the “new product” by making minor adjustments to the existing ones rather than to raise administrative prices.

<sup>65</sup> Goldsmith (1965, p. 89), for instance, notes that population's holding of government bonds in the Soviet Union could be hardly claimed as private ownership since they are “are frozen, without interest and without definite repayment date”.

financial assets. Since then, the household debt has risen quite moderately. In particular, the low housing affordability has prevented any substantial rise in mortgages (the housing was generally acquired through free privatization). The housing loans account thus for less than a third of the total loans of Russian households. The data on household debt are found in the official monetary statistics.

#### Appendix A.1.4.2. Government financial assets and liabilities

Financial balance sheets of the government sector are reconstructed using various official sources. First, the general government deposits in the central bank and credit institutions are documented in the financial survey of the Bank of Russia. For 1990, we take government deposits in Gosbank (*Narhoz* 1990). This category has comprised to a large extent assets of the Stabilization fund until 2008, and after its split the National Welfare Fund and the Reserve Fund. Other government assets are taken from the *IMF Government Finance Statistics*.

Detailed data is available for the domestic and external government debt. Domestic debt in the form of credit lines or debt securities (Government Short-Term Bonds (GKO) and Federal Loan Bonds (OFZ)) is found in monetary statistics. In 1990, domestic government debt referred to the debt to Gosbank (*Narhoz* 1990) (moreover, the credit to the government made the largest asset item of the Gosbank's balance sheet). External debt before 1992 is taken from Fischer (1992).

#### Appendix A.1.4.3. Equity assets

The data on the capitalization of the equity market in Russia is used as the benchmark to estimate the total equity assets of Russian institutional sectors before 2011. The market capitalization of the Russian equity market in recent years makes on average 70 per cent of equity assets held by household, government and foreign institutional sectors as reported in the Financial Accounts. By extension, the remainder pertains to unquoted shares and equity of limited liability companies and partnerships, which the Bank of Russia values by the book value of equity liabilities. Our approach has been to assume that households, the general government and the rest of the world directly own the total value of listed corporations represented by the stock market capitalization (we disregard thus cross-ownership between corporations). The information on the capitalization of the Russian equity market is available from *Naufor Factbook* or the *World Bank Development Indicators*. We add to this the value for non-listed entities approximated as 30 per cent of the national income throughout years.

This figure is divided between the household, the government and the rest of the world sector as follows. The equity of the rest of the world in Russian corporations is taken from the international investment position. It is consistent with the amounts reported in the Financial Accounts for the recent years. For private and government equity holdings we keep the proportions documented in the Financial Accounts for the recent years.

## Appendix A.2. National Income

### Appendix A.2.1. National Income Series for Russia, 1991-2016

For the post-1990 period, we use the official Rosstat's national accounts series. The official income accounts data are fully in line with the SNA 2008 standard from 2011 onwards. For years before 2011, we make two major adjustments: first, we add imputed rents of owner-occupied housing; and second, we provide the modified series for the consumption of fixed capital based on the market value of fixed capital.

The imputed rents of homeowners are not accounted for in the official statistics before 2011. For the 2002-2010 period, we take the available Rosstat's estimates (2014a, T. 12) without any modification. For the 1995-2002 period, we estimate imputed rents of owner-occupiers based on our series of market value of private housing (see section A.1.1.), by applying the following simple formula used by Rosstat (2014a):

$$U_t = [(1 + s_t) * r_t^* + d_t] W_t$$

where:

$U_t$  – gross operating surplus of owner-occupied housing service

$W_t$  – mid-year market value of private housing

$d_t$  – coefficient of fixed capital consumption

$r_t^*$  – annual real rate of return<sup>66</sup>

$(1 + s_t)$  – inflation rate

The resulting series are between 4-7 per cent of GDP. We have assumed that actual house rents make 10 per cent of the total amount, while the remainder relates to imputed rents of owner-occupiers. We add only imputed rents and assume that actual rents are included in the official data. The relatively small proportion of actual rents is due to the high rate of homeownership in Russia and, as a result, quite limited rental market. Note that very high homeownership rates are characteristic for former communist countries in Eastern Europe.<sup>67</sup> In order to limit the volatility during the hyperinflationary period of the early 1990s, we take imputed rents of owner-occupied housing to be equal to 3% of GDP. The inclusion of imputed rents leads to an increase in items of income accounts of the household sector (e.g. GVA, operating surplus, primary and disposable income), but household savings are not affected since owner-occupied housing service is fully consumed by the households (final consumption is equal to the output for own final use).<sup>68</sup>

The series for the consumption of fixed capital are adjusted using our depreciation series estimated by the perpetual inventory method (PIM). See section A.1.3. for details. For 1991-1995, we set the consumption of fixed capital as 15% of GDP.

Accounts for institutional sectors are available since 1995.

<sup>66</sup> The real rate of return on residential dwellings,  $r_t^*$ , is kept fixed at 2.5%, as used by Rosstat (2014a).

<sup>67</sup> For example, the Czech Republic has somewhat larger rental market and, therefore, higher proportion of actual rents.

<sup>68</sup> Actually, savings are usually negative due to the intermediate consumption in the form of dwelling maintenance or house insurance. However, we disregard this item.

### A.2.2. Historical National Income Series

For the 1960-1990 period, we use Ponomarenko's (2002) retrospective national accounts series. The methodology he uses consists in adjusting the official Goskomstat's series based on MPS to the relevant SNA definitions. To bridge the gap in the coverage between the two accounting standards, it includes the value added of non-material services (the production of the so-called non-productive sphere) not accounted for in the MPS, such as finance, education, health, transport etc. Further adjustments are made for widely known shortcomings of the official Soviet statistics, in the first place the military spending, for which he uses alternative western estimates (e.g. CIA estimates).

Obviously, the coverage is not the main stumbling block to the comparability between the two systems. GDP is essentially a measure of market economy, and there is no workable solution to arrive at meaningful market values in the socialist accounting (see below). Ponomarenko provides instead series based on official Soviet established prices. He also makes various calculations in basic prices to account for "social" distortions.<sup>69</sup> As for the consumption of fixed capital, Ponomarenko uses the official depreciation series.<sup>70</sup> These were aggregated from the regular reports of enterprises and government organizations. The latter were required to calculate depreciation allowances according to the officially prescribed parameters that were applied to book values of the capital (a mix of prices from the last general revaluation and of subsequent acquisition prices), which were, however, quite close to current replacement values due to general price stability in socialist countries.<sup>71</sup> The series are of magnitude around 15% of GDP.

For the earlier Soviet period, we use series based on adjusted factor cost (AFC) valuation<sup>72</sup> (Bergson 1961; Morsteen and Powell; CIA 1990). Although having said that no method can account for the fundamental difference between the systems (which AFC aspires), there is no major structural break in the series as AFC estimates are generally quite close to the official series (Marer 1985, p. 15) (since they were based on the latter). Finally, for the pre-revolutionary Russia we use estimates of Gregory (1982) covering 1885-1913 period, as well as the NEP period.

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<sup>69</sup> E.g., large subsidies on housing or on basic necessities; high turnover taxes on manufactured consumer goods or alcohol.

<sup>70</sup> Capital repairs need to be excluded from the official depreciation series and included in intermediate costs.

<sup>71</sup> Moreover, a larger increase in prices was often followed by the general capital census.

<sup>72</sup> AFC was developed by Bergson

## **Appendix B. Income and wealth distribution series**

Our detailed income and wealth distribution series are given in the zipped directory **NPZ2017DistributionSeries.zip**. This directory includes our final benchmark distribution series NPZ2017FinalDistributionSeries.zip, as well as alternative series and the complete computer codes and all detailed computations and raw material (household survey tabulations, income tax data, billionaire data) that we used to construct these series. For more details on the organization of these files, see ReadMeNPZ2017DistributionSeries.doc. The main robustness checks and variant series are presented in **NPZ2017AppendixB.xlsx** and are summarized on Figures B1-B57, which we briefly describe below.

### **Appendix B.1. Income distribution series**

The general methodology that we use in order to construct our income distribution series is summarized in the main paper (section 2.2.1). It basically consists of three steps: in step 1 we use raw household income survey tabulations and generalized Pareto interpolation techniques (Blanchet, Fournier and Piketty, 2017) in order to estimate raw series on the distribution of raw survey income and raw fiscal income by g-percentile (before any correction); in step 2 we use high-income-taxpayers income tax data in order to correct upwards these estimates and obtain corrected estimates of the distribution of fiscal income by g-percentile; in step 3 we use national accounts and wealth data in order to include tax-exempt capital income data (such as undistributed profits, imputed rent and other “non-fiscal income”) and to obtain corrected estimates of the distribution of pre-tax national income by g-percentile. All details are provided in the data files and computer codes. Here we discuss a number of additional issues about variant series and robustness checks.

This methodology in three steps mirrors that used in the case of China by Piketty-Yang-Zucman (2017), with a number of important differences. As explained in the main paper (section 2.2), the main difference is that we need to make assumptions about the profiles of “deduction rates” (i.e. the average bracket-level ratio of deductions to gross revenue) on the one hand, and “declaration rates” (i.e. the average bracket-level fraction of taxpayers submitting a declaration). The raw tabulations by income bracket released by Russia’s tax authorities for income years 2008-2015 are reported on Table B11 (see also Table B10 for aggregate statistics on Russia personal income tax). As one can see, there are typically about 5 million declarations each year (about 5% of adult population), including 0.5 million declarations over 1 million rubles in assessable income (gross revenue).

In our benchmark estimates, we assume a flat profile of deduction rate (same deduction rate for all brackets), and a rising profile of declaration rate (up to 100% for very high income taxpayers). This profile was chosen so as to deliver plausible levels of log-linearly-estimated Pareto coefficients (i.e. coefficients defined by  $a_i = \log[(1-p_i)/(1-p_{i+1})]/\log[(thr_i+1)/thr_i]$ ). In effect, the raw data includes too many large declarations in the raw data as compared to the number of lower declarations, so that one needs to assume a fairly steep profile for the declaration rate in order to obtain plausible coefficients (i.e.  $a_i$  not too close to 1, and  $b_i = a_i/(a_i - 1)$  not too large: plausible inverted Pareto coefficient  $b_i$  are usually not higher than 3-4 at the very most, including in highly unequal countries).

We also provide variant series based upon alternative assumptions for the profile of declaration rates and deduction rates. The different profiles are reported in file NPZ2017AppendixB.xlsx, Table B13. All detailed results are presented in the subdirectory Gpinter and can be reproduced by using the WID.world/gpinter interface based upon generalized Pareto interpolation techniques (Blanchet, Fournier and Piketty, 2017). The Stata format do-file generating the fiscal correction is do\_gpinter\_RussiaRLMS. It is based upon piecewise-linear correction factors  $f(p)$  above  $p_0=0.9$  up to the percentiles  $p_1$ ,  $p_2$  and  $p_3$  corresponding to the assessable income thresholds 10 million, 100 million and 500 million rubles.

Generally speaking, our estimates show the impact of the wealth correction is much more limited than the fiscal correction (see Figures B20-B24). As a consequence, using alternative wealth inequality series (see below) to impute tax-exempt capital income has limited consequences on final income series (see Figures B30-B31). What is more relevant is the choice of the variant for using income tax declarations (see Figures B40-B42) (variants 2.2-2.5 correspond to different profiles for the declaration rate, and variants 3.1-3.4 to different profiles for the deduction rate; the benchmark series correspond to variant 2.1).

Note however that the upward correction on raw survey inequality estimates is very large in all cases. The reason can be easily seen from the raw income tax tabulations, which indicate very high top income levels. Incomes reported on declarations represent about 28-32% of total assessable income and 8-12% of total taxable income (see Table B10). Given that most of the income comes from large declarations (from the tabulations one can infer that at least three quarters come the declarations over 1 million rubles), and that many middle-large declarations are missing (otherwise log-linear Pareto coefficients are simply too close to 1), it is not too surprising that tax data leads to a very substantial upgrade of top 1% income shares.

For years 2008-2015 we use our benchmark corrections, and we report on Figure B42 the corresponding inverted Pareto coefficients  $b(p)$  estimated at quantile  $p=0.9$  for the different variants. In effect  $b(0.9)$  declines from 3.4-3.5 to 2.8 over the period 2008-2015 with variant 2.1 and takes intermediate values between variants 2.2-2.3 3.1-3.2 (less inequality) and 2.4-2.5 3.3-3.4 (more inequality). We report on Figure B43 our benchmark inverted Pareto coefficients that we use for the 1980-2007 period. All variants, computer codes and robustness checks are presented in the subdirector Gpinter in zipped directory NPZ2017DistributionSeries.zip.

## Appendix B.2. Wealth distribution series

As explained in the main paper (section 2.2), the data sources at our disposal in order to estimate wealth inequality in Russia are very limited. Unlike in other countries, where we can use a combination of sources and methods, all we have in Russia at this stage is billionaire data. Therefore we proceed as follows.

First, we compute average standardized distributions of wealth for the US, France and China from WID.world series (that is, we divide all thresholds and bracket averages for all 127 generalized percentiles by average wealth, and we compute the arithmetic average for the three countries). We note that variations across countries and over time in these standardized wealth distributions mostly happen above  $p_0=0.99$ . I.e. below  $p_0=0.99$  the ratios of the differ-

ent percentile thresholds to average wealth are relatively stable over time and across countries, at least as a first approximation (most of the variation seems to take place within the top 1%). Therefore we choose to use the same normalized distribution for Russia below  $p_0=0.99$  as the average US-France-China normalized distribution.

The difficult question is to know how to link the distribution from  $p_0=0.99$  to billionaire level, and also to make an assumption about the average number  $n$  of adults per billionaire family (sometime Forbes includes very large family groups in the same billionaire family, sometime it is just one individual or one married couple). We first re-estimate 127 generalized percentile within the top 1% of the normalized distribution in order to reach billionaire level. In our benchmark series we assume  $n=5$  and a linear correction factor  $f(p)$  from  $p_0=0.99$  up to billionaire level (because this seems to work relatively well for the US, France and China).

We also variant series based upon alternative assumptions:  $n=2,4,6,8$  instead of  $n=5$ , and also a piecewise linear  $f(p)$  with a fraction  $f=0,0.2,0.4,0.6,0.8,1$  of the total correction between  $p_0=0.99$  and  $p_1=0.999$  (and a fraction  $1-f$  between  $p_1=0.999$  and billionaire level). The results are presented on Figures B53-B56.

Finally, we also present variant series based upon the wealth rankings from Finanz magazin rather than Forbes. Finanz provide rankings for broader groups of millionaire than just billionaires (they typically cover 300-500 wealth Russians rather than 100 in Forbes at the end of the period), but they do not cover all years, and most importantly they seem to miss important segments of wealth holders in the bottom part of their list (the inverted Pareto coefficient seems unplausibly high, around 8-10, vs a more plausible 3-4 in Forbes rankings). The results are presented on Figure B57.

All variants, computer codes and robustness checks are presented in the subdirector GpinterWealth in zipped directory NPZ2017DistributionSeries.zip.

**Appendix References:**

Alexeev, M. (1991). "Expenditures on privately rented housing and imputed rents in the USSR", *Berkley-Duke Occasional Papers* 31

Alexeev, M., Baker, L., and Westfall, M. (1991). *Overview of the Soviet Housing Sector*, Washington DC: Padco Inc.

Alexeev, M. and Weber, S., eds. (2013). *The Oxford Handbook of the Russian Economy*, Oxford: Oxford University Press

Arvay, J. (1994). "The Material Product System (MPS): A retrospective" in *The Accounts of Nations*, ed. Kenessey, Z., New York, IOS, pp. 218–236.

Becker, A. (1974). "The Price Level of Soviet Machinery in the 1960s", *Soviet Studies*, 26(3), pp. 363-379

Bertaud, A., and Renaud, B. (1997). "Socialist Cities without Land Markets", *Journal of Urban Economics* 41(1), pp. 137-51.

Bessonov, V. and Voskoboynikov, I. (2008). "Fixed Capital and Investment Trends in the Russian Economy in Transition," *Problems of Economic Transition* 51(4), pp. 6-48

Blanchet, T., Fournier, J. and Piketty, T. (2017), "Generalized Pareto Curves: Theory and Applications ", *WID.world Working Paper* 2017/03

Central Intelligence Agency (1990). "Measures of Soviet gross national product in 1982 prices", *A study prepared for the use of the Joint Economic Committee of the United States*, Washington DC: US Government Printing Office

Chayanov, A. (1966). *The Theory of Peasant Economy*, ed. D. Thorner, B. Kerblay and R. E. F. Smith. Homewood, IL: R. A. Irwin

Clark, C. (1973). *The value of agricultural land*, Oxford; New York: Pergamon Press

Daniell, J. and Struyk, R. (1997). "The Evolving Housing Market in Moscow: Indicators of Housing Reform", *Urban Studies* 34(2), pp. 235-254



Dennison, T. (2011). *The Institutional Framework of the Russian Serfdom*, Cambridge University Press

DiPasquale, D. and Wheaton, W. (1992). "The Markets for Real Estate Assets and Space: A Conceptual Framework", *Real Estate Economics* 20(2), pp. 181–198

Fischer, S. (1992). "Stabilization and economic reform in Russia", *Brookings Paper on Economic Activity* 1, pp. 77-126

Garvy, G. (1977). *Money, financial flows and credit in the Soviet Union*. Cambridge Mass.: Ballinger Publishing company

Gerschenkron, A. (1962). *Economic backwardness in historical perspective: a book of essays*. Cambridge: Belknap Press of Harvard University Press

Goldsmith, R. W. (1965). "The National Balance Sheet of the USSR", In *Essays in Econometrics and Planning*, ed., C. Rao, Pergamon Press, pp. 83-102.

Goldsmith, R. W. (1985). *Comparative national balance sheets: a study of twenty countries, 1688-1978*. Chicago: University of Chicago press

Gregory, P. (1994). *Before command: an economic history of Russia from emancipation to the first five-year plan*, Princeton N.J.: Princeton University Press

International Monetary Fund (various). *Government Finance Statistics Yearbook*, Washington DC

Jaffee, D. and Kaganova, O. (1996). "Real estate markets in urban Russia", *Journal of Transforming Economies and Societies*, 3(3)

Kaplan, N. (1963), "Capital Stock", In *Economic Trends in the Soviet Union*, eds. A. Bergson and S. Kuznets, Cambridge Mass.

Kosareva, N., Stryuk, R., and Tkachenko, A. (2000). "Russia: Dramatic Shift to Demand-Side Assistance", In *Homeownership and housing finance policy in the former Soviet bloc: Costly populism*, ed. R. Stryuk, The Urban Institute

Lerman, Z., Csaki, C., and Feder, G. (2004). *Agriculture in Transition: Land Policies and Evolving Farm Structures in Post-Soviet Countries*. Lanham, MD: Lexington Books

Lerman, Z. and Natalya Shagaida, N. (2007). "Land policies and agricultural land markets in Russia", *Land Use Policy* 24, pp. 14–23

Lerman, Z. and Sedik, D. (2013). "Russian Agriculture and Transition", In *The Oxford Handbook of the Russian Economy*, ed. M. Alexeev and S. Weber, Oxford: Oxford University Press

Maddison, A (2001). *The World Economy: A Millennial Perspective*, OECD.

Macauley, A. (1979). *Economic welfare in the Soviet Union: poverty, living standards, and inequality*, Herts: University of Wisconsin press G. Allen and Unwin

Marer, P. (1985). *Dollar GNPs of the USSR and Eastern Europe*, Washington DC and Baltimore: Johns Hopkins University Press

Moorsteen, R., and Powell, R. (1966). *The Soviet capital stock, 1928-1962*, Homewood, Ill.: R. D. Irwin

Morton, H. W. (1980). "Who Gets What, When and How? Housing in the Soviet Union", *Soviet Studies* 32 (2), pp. 235-259.

Nesterov, L. (1972). "National wealth estimation in socialist countries", *The Review of Income and Wealth* 18(3), pp. 287-301.

Nesterov, L. (1997). "National Wealth Estimation in the USSR and the Russian Federation", *Europe-Asia Studies*, 49(8), pp. 1471-1484

Nove, A. (1989). *An Economic History of the USSR*. (5<sup>th</sup> ed.), London: Penguin Classic.

Palacin, J., and Shelburne, R. (2005). "The Private Housing Markets in Eastern Europe and in the CIS", *United Nations Economic Commission For Europe Economic Analysis Division Discussion Paper* 6, UNECE: Geneva.

Piketty, T, Yang, L., and Zucman, G. (2017). “Capital Accumulation, Private Property and Rising Inequality in China, 1978-2015”, *WID.world Working Paper* 2017/06

Piketty, T., and Zucman, G. (2014). “Capital is Back: Wealth-Income Ratios in Rich Countries 1700-2010”. *The Quarterly Journal of Economics* 129(3): 1255–1310.

Ponomarenko, A. N. (2002), *Retrospektivnye natsional'nye scheta Rossii: 1961-1990*, Moscow: Finansy i statistika.

Powell, R. (1979). “The Soviet Capital Stock from Census to Census, 1960-73”, *Soviet Studies* 31(1), pp. 56-75

Rosstat (2014a). *Metodologicheskiye podkhody k otsenke zhilishchnykh uslug, proizvodimyykh i potrebyayemykh vladel'tsami zhil'ya, v sisteme natsional'nykh schetov*, Moscow

Rosstat (2014b). *Metodologicheskiye rekomendatsii po otsenke zemli dlya otrazheniya v balanse aktivov i passivov i schetakh nakopleniya sistemy natsional'nykh schetov*, Moscow

Rosstat (2017). *Balans aktivov i passivov i scheta nakopleniya v chasti osnovnogo kapitala. Metodologicheskiy kommentariy*, Moscow

Struyk, R. (1996). “The long road to market”, In *Economic Restructuring of the Former Soviet Bloc: The Case of Housing*, ed. R. Struyk , Washington D.C.: Urban Institute

Treml, V. (1991). “Price index for Soviet machinery”, RAND note N-3297-USDP

Vainshtein, A. L. (1960). *Narodnoe bogatstvo i narodnokhoziaistvennoe nakoplenie predrevoliutsionnoi Rossii*. Moscow: Gosstatizdat.

Wegren, S. (1998). *Agriculture and the state in Soviet and post-Soviet Russia*, Pittsburgh: University of Pittsburgh Press

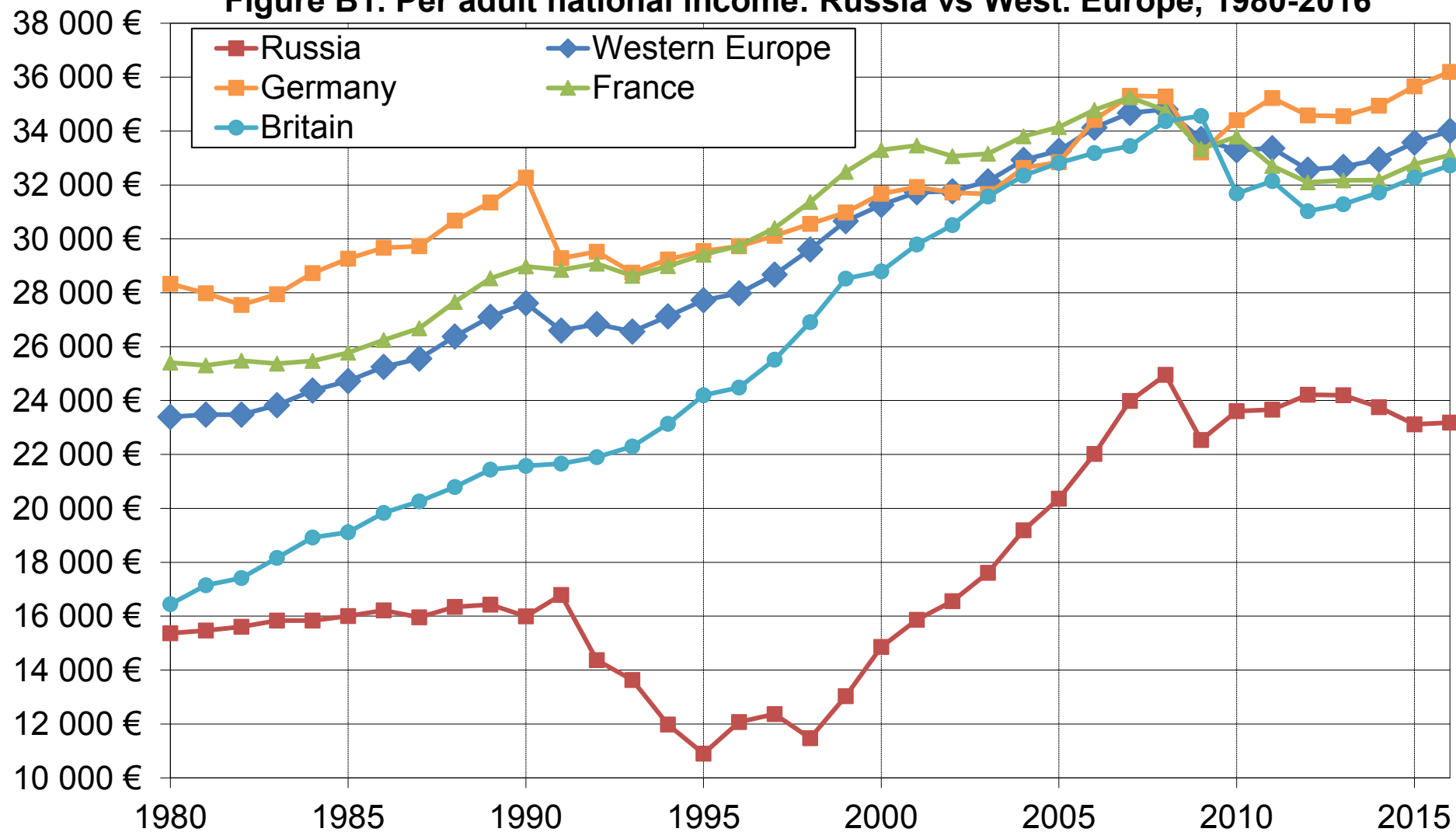
World Bank and Goskomstat (1995). *Russian Federation: Report on the National Accounts*, World Bank: Washington DC.

World Bank (1995). *Russia Housing Reform and Privatization: Strategy and Transition Issues, Volume 1: Main Report*. World Bank: Washington DC.

World Bank (2001). *Urban Housing and Land Market Reforms in Transition Countries: Neither Marx Nor Market*, World Bank: Washington DC.

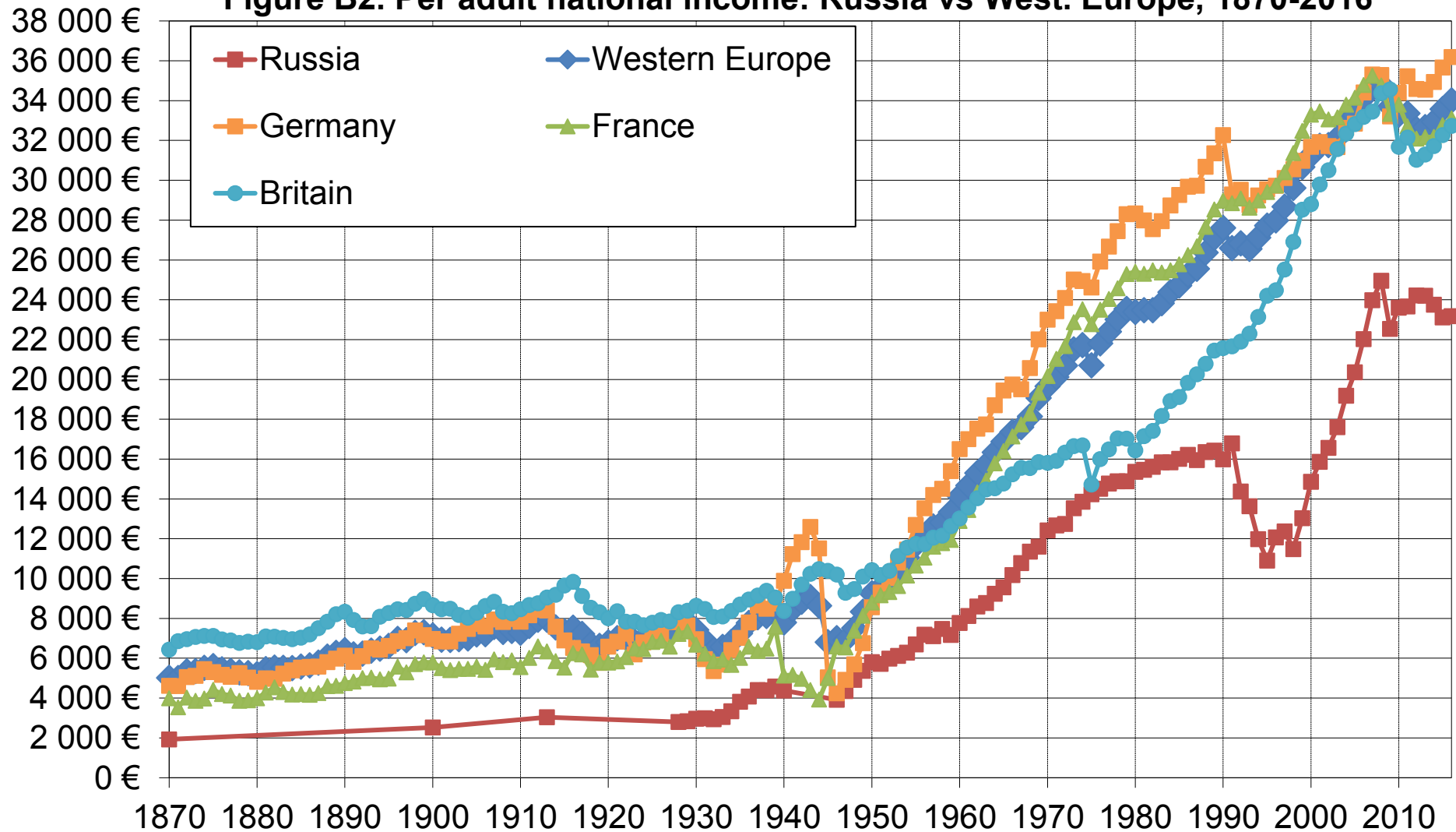
Yemtsov, R. (2008), "Housing Privatization and Household Wealth in Transition," In *Personal Wealth from a Global Perspective*, ed. J.B. Davies, Oxford University Press, Oxford, pp. 312-333.

**Figure B1. Per adult national income: Russia vs West. Europe, 1980-2016**



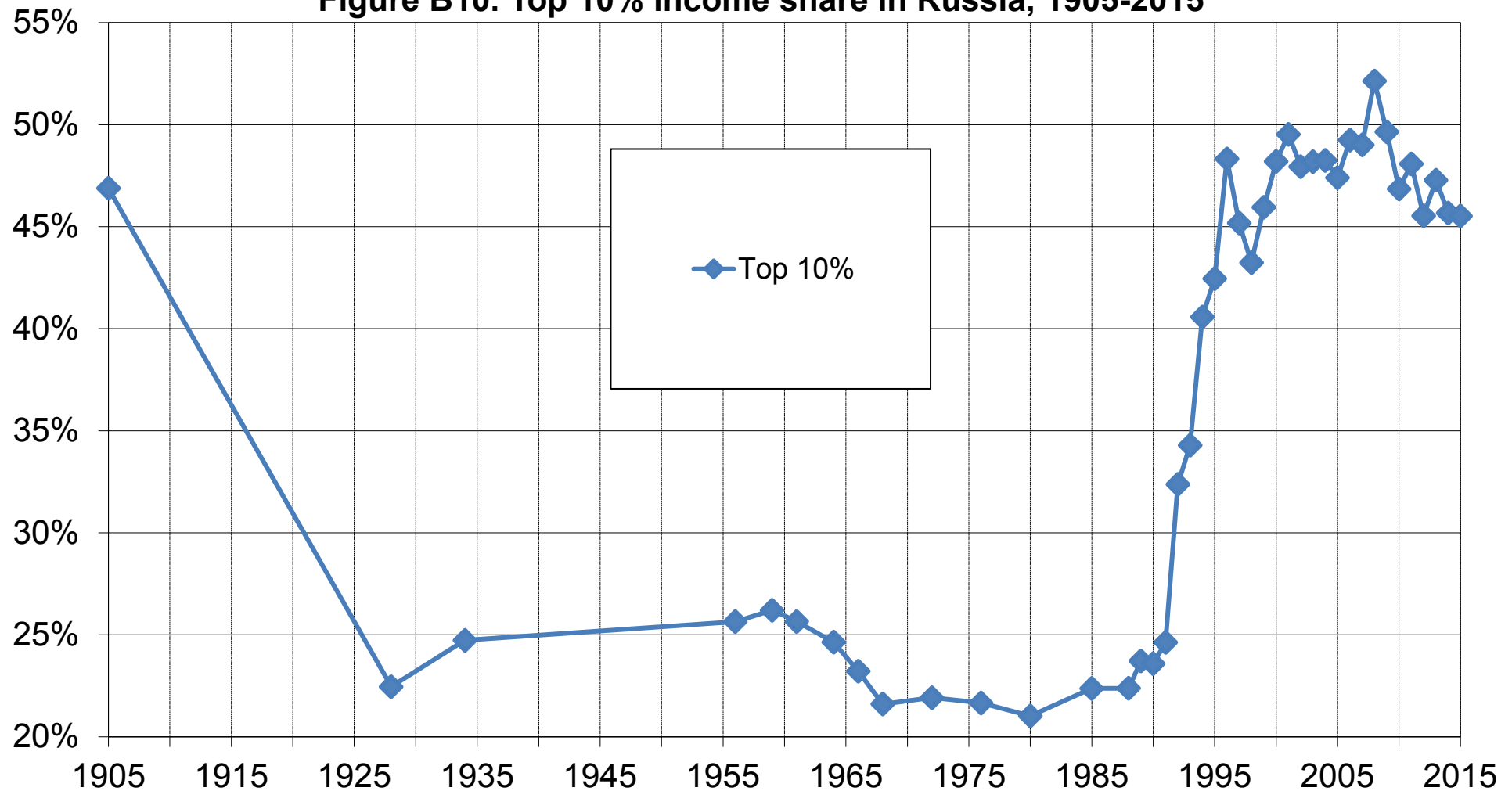
Per adult national income in euros 2016 PPP. Western Europe = arithmetic average Germany-France-Britain.

**Figure B2. Per adult national income: Russia vs West. Europe, 1870-2016**



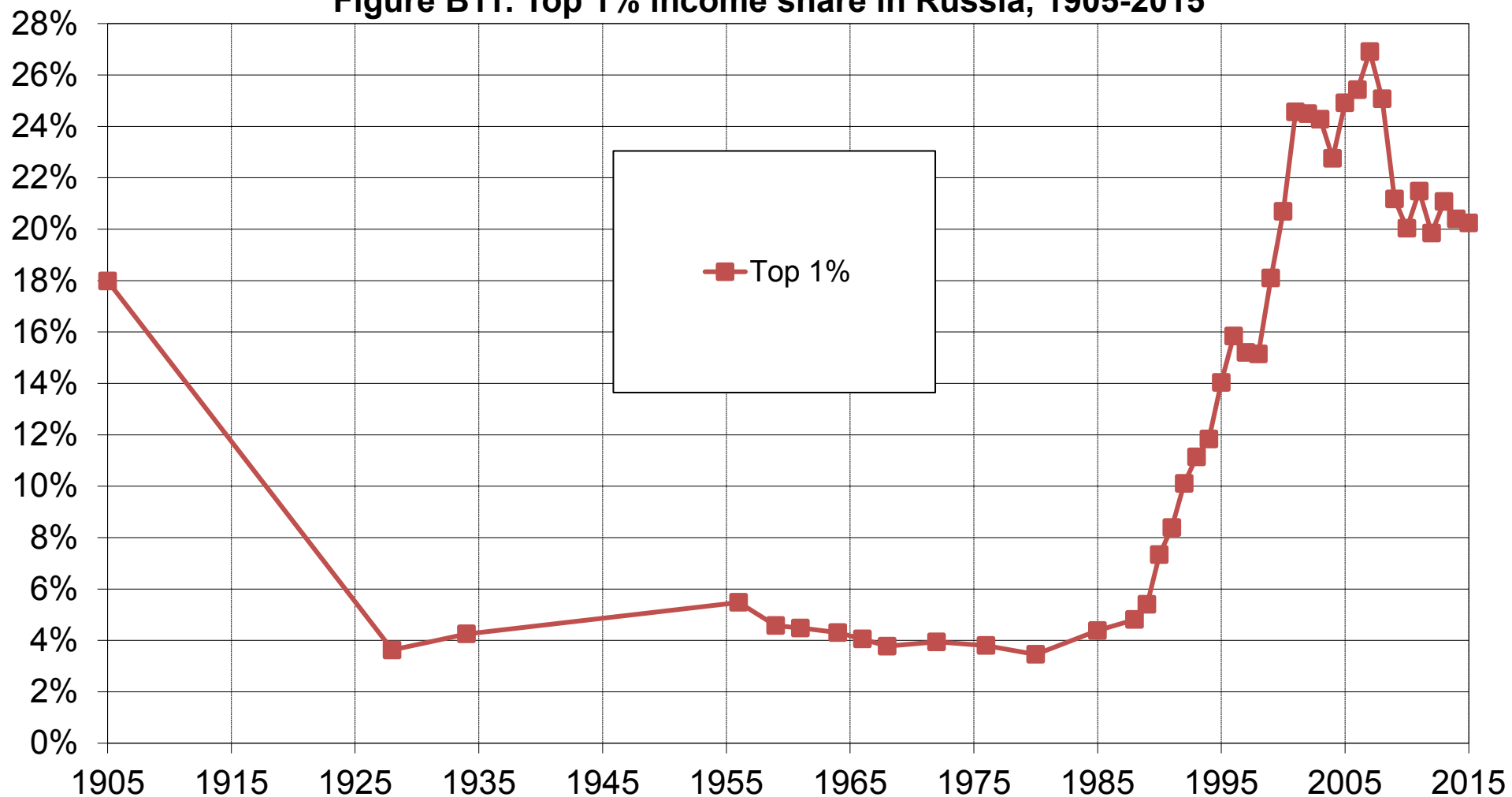
Per adult national income in euros 2016 PPP. Western Europe = arithmetic average Germany-France-Britain..

**Figure B10. Top 10% income share in Russia, 1905-2015**



Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among adults.  
Corrected estimates combine survey, fiscal, wealth and national accounts data. Raw estimates rely only on self-reported survey data.  
Equal-split-adults series (income of married couples divided by two).

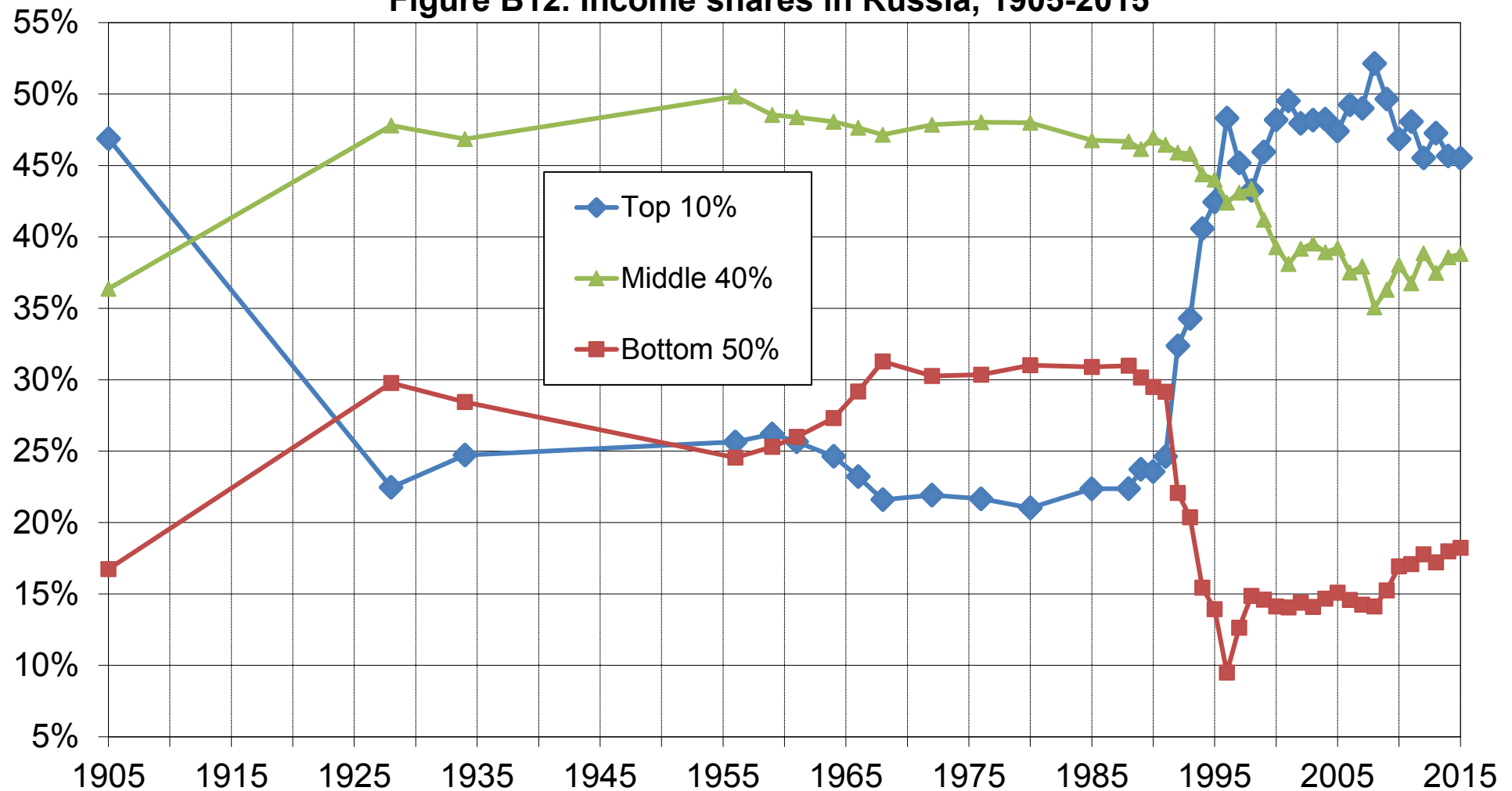
**Figure B11. Top 1% income share in Russia, 1905-2015**



Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among adults.  
Corrected estimates combine survey, fiscal, wealth and national accounts data. Raw estimates rely only on self-reported survey data.  
Equal-split-adults series (income of married couples divided by two).

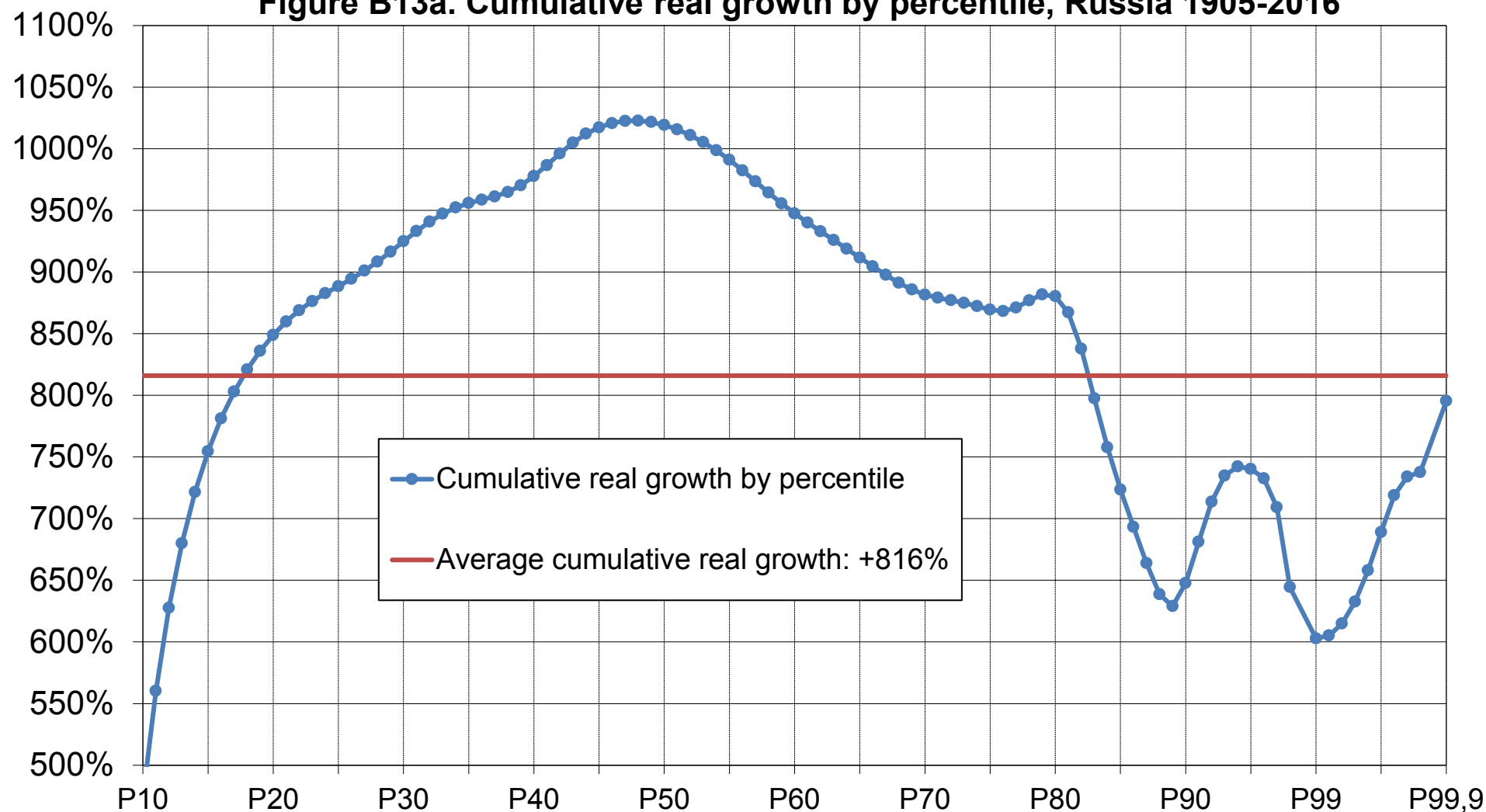


**Figure B12. Income shares in Russia, 1905-2015**



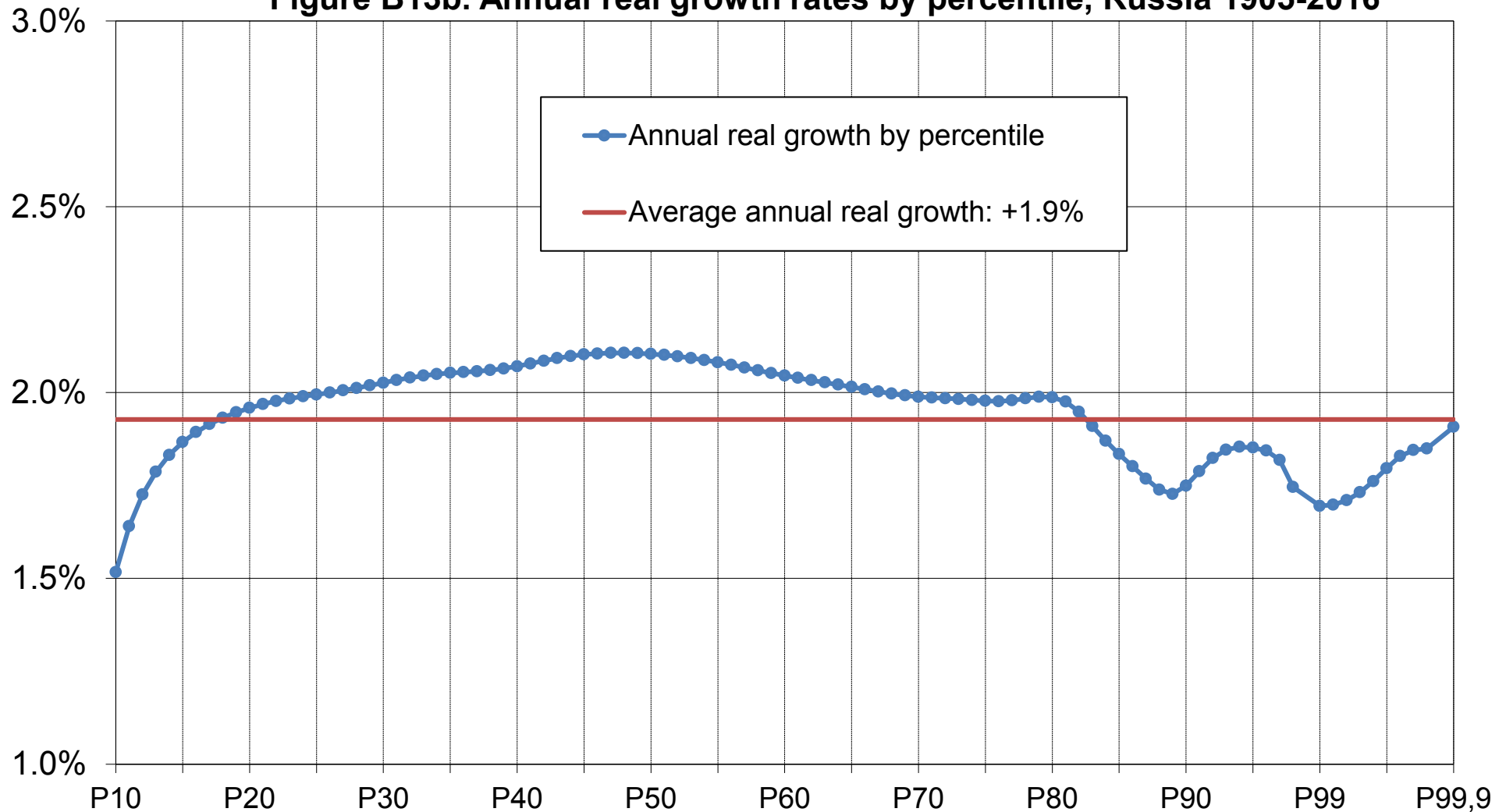
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among adults.  
Corrected estimates combine survey, fiscal, wealth and national accounts data. Raw estimates rely only on self-reported survey data.  
Equal-split-adults series (income of married couples divided by two).

**Figure B13a. Cumulative real growth by percentile, Russia 1905-2016**



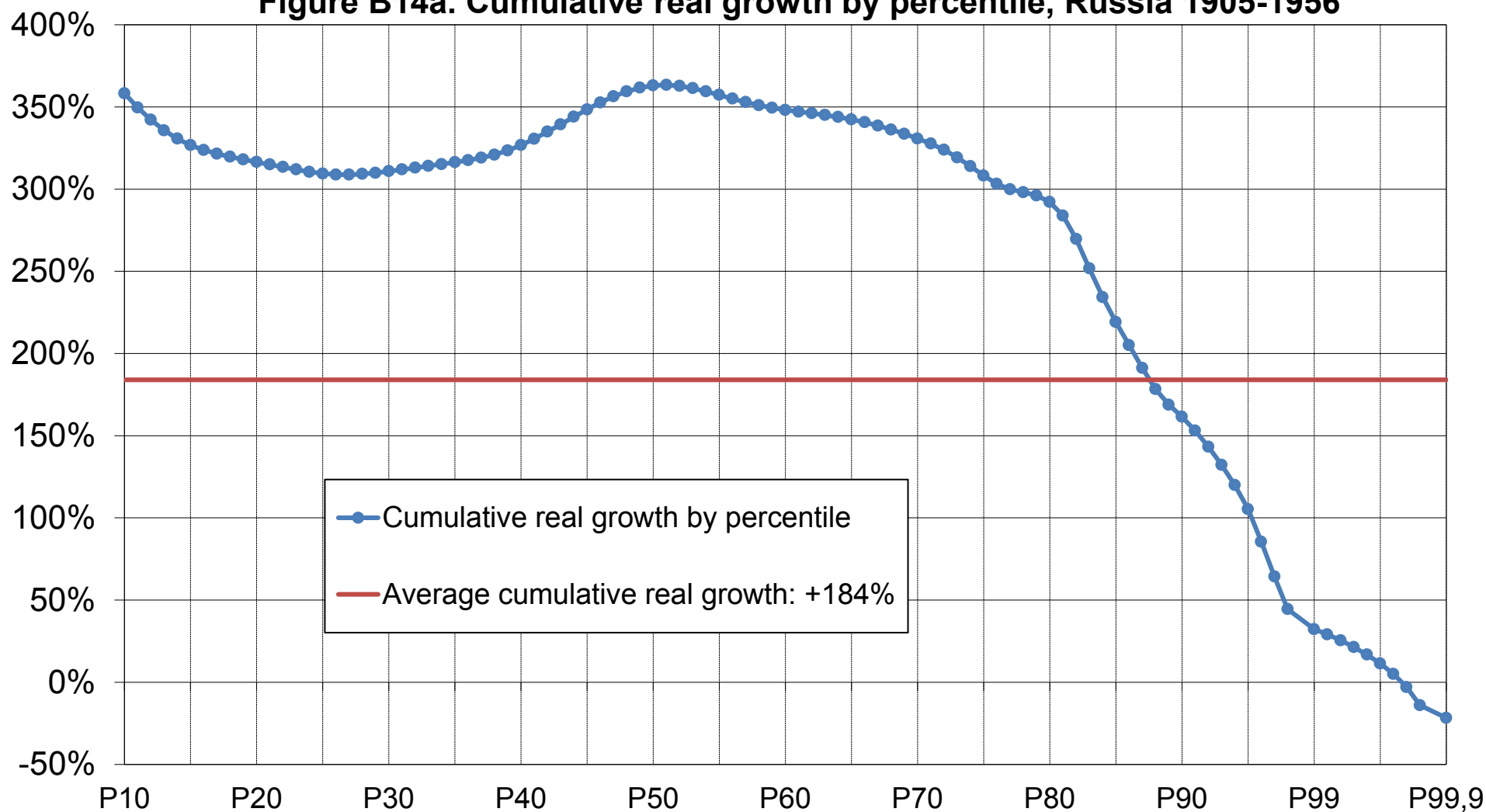
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

**Figure B13b. Annual real growth rates by percentile, Russia 1905-2016**



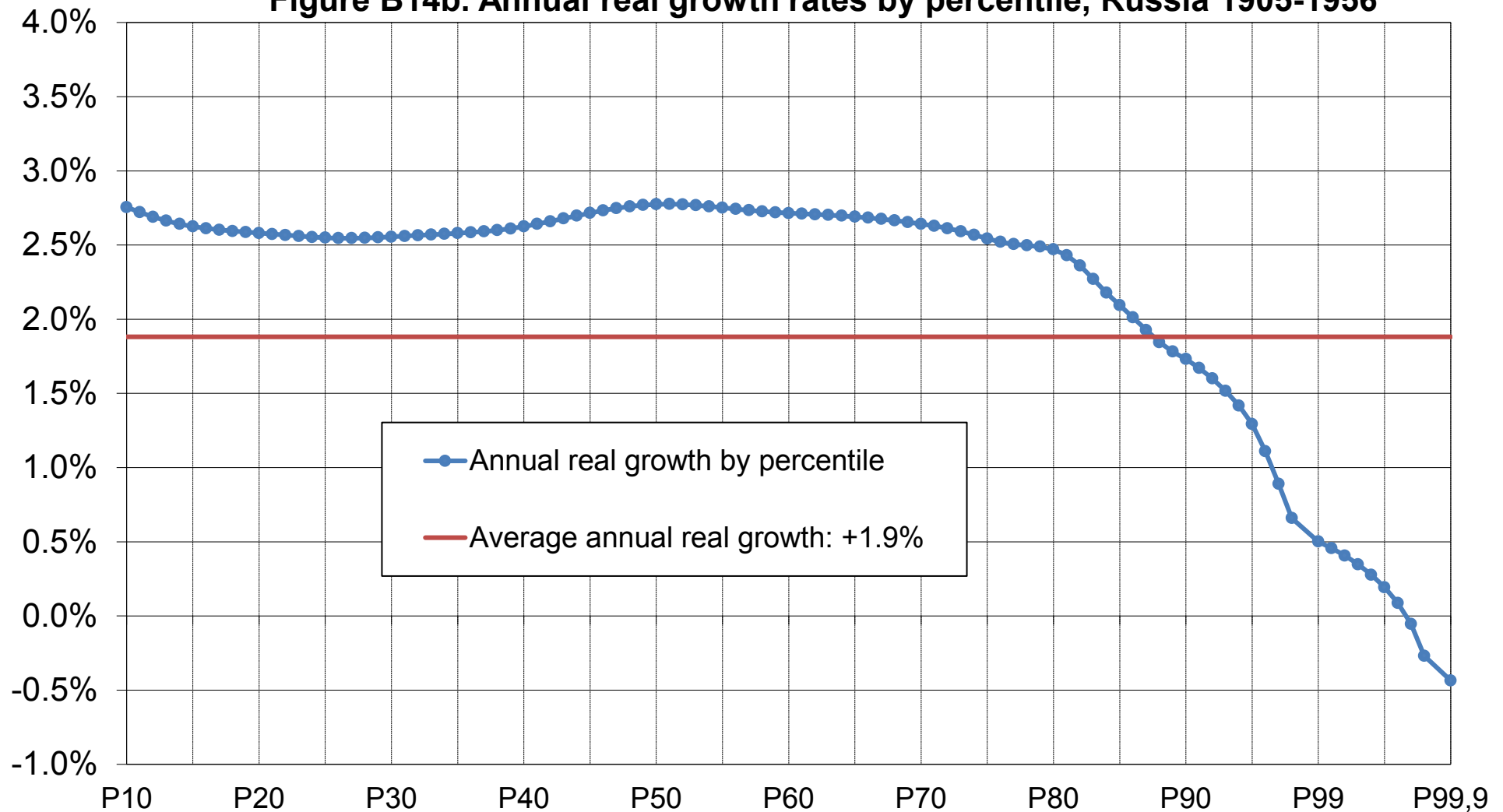
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

**Figure B14a. Cumulative real growth by percentile, Russia 1905-1956**



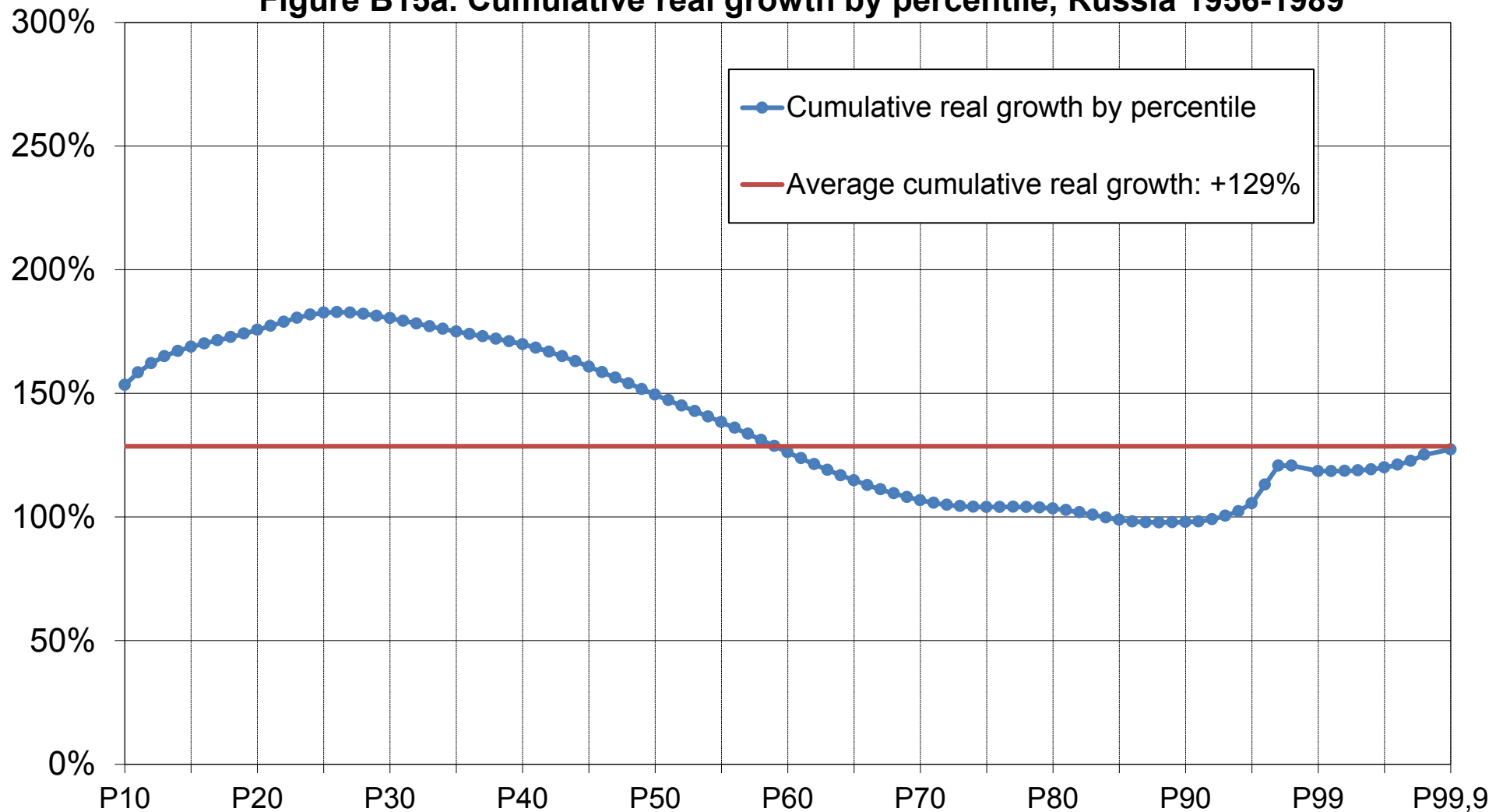
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

**Figure B14b. Annual real growth rates by percentile, Russia 1905-1956**



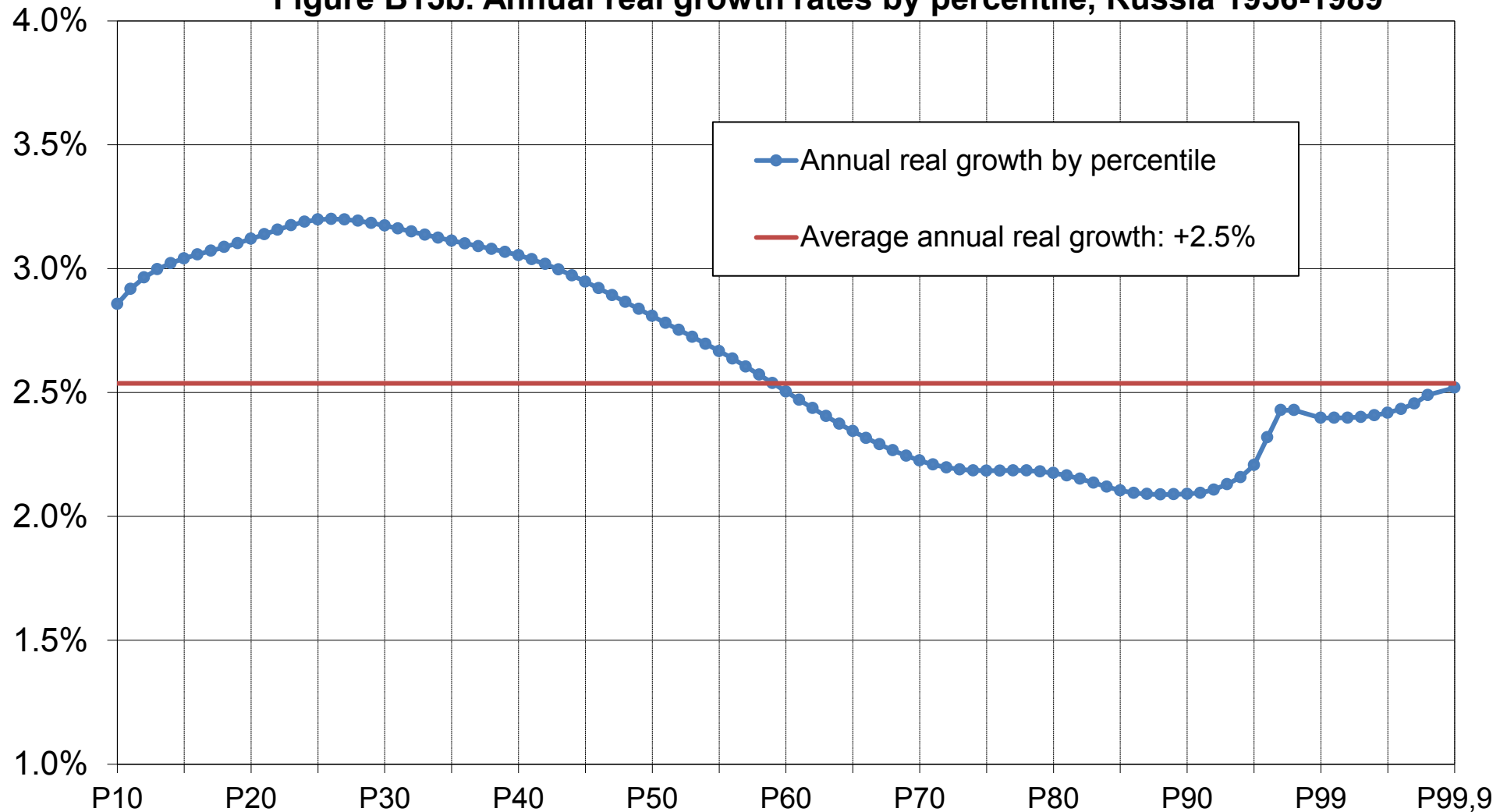
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

**Figure B15a. Cumulative real growth by percentile, Russia 1956-1989**



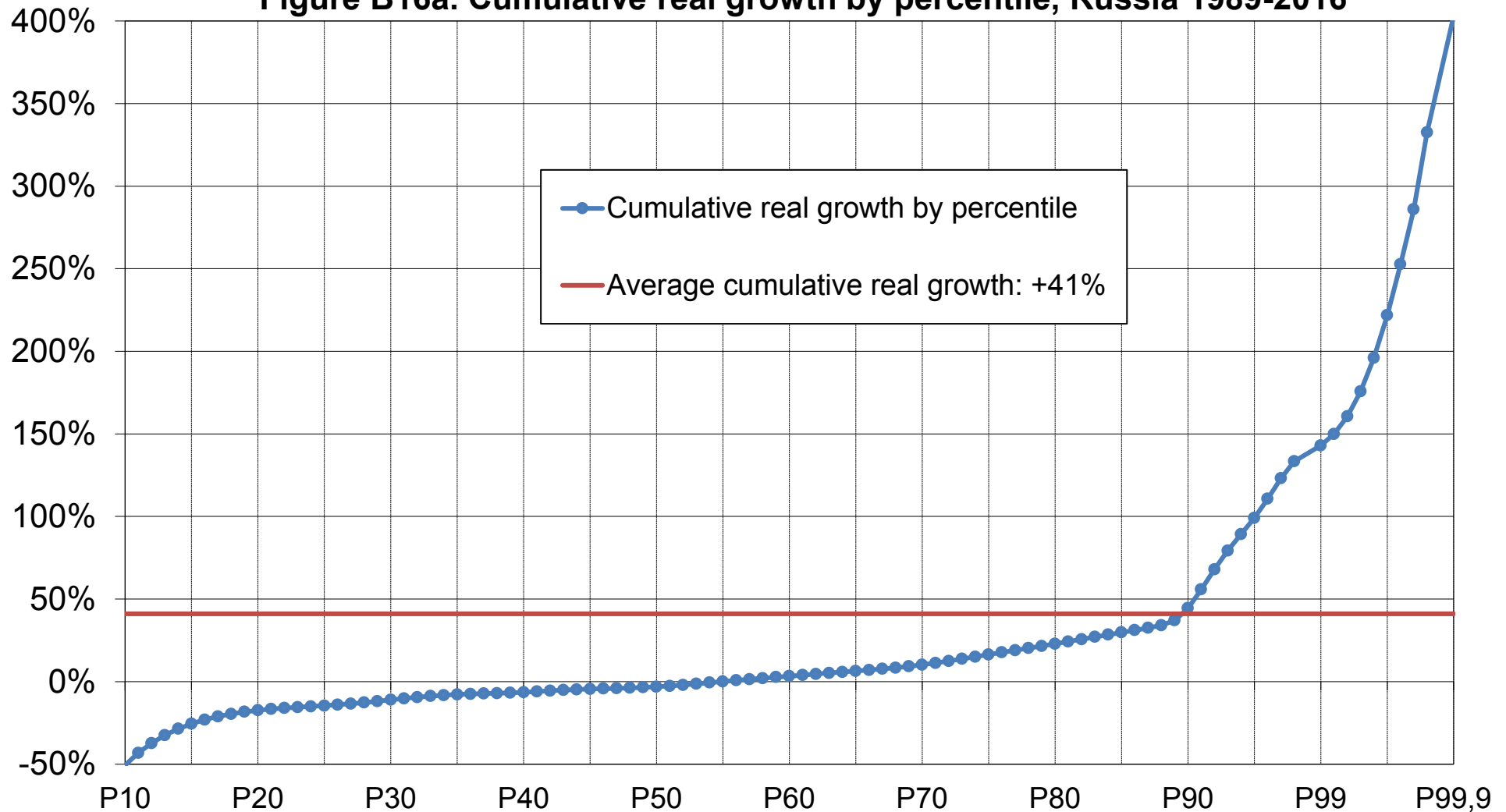
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

**Figure B15b. Annual real growth rates by percentile, Russia 1956-1989**



Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

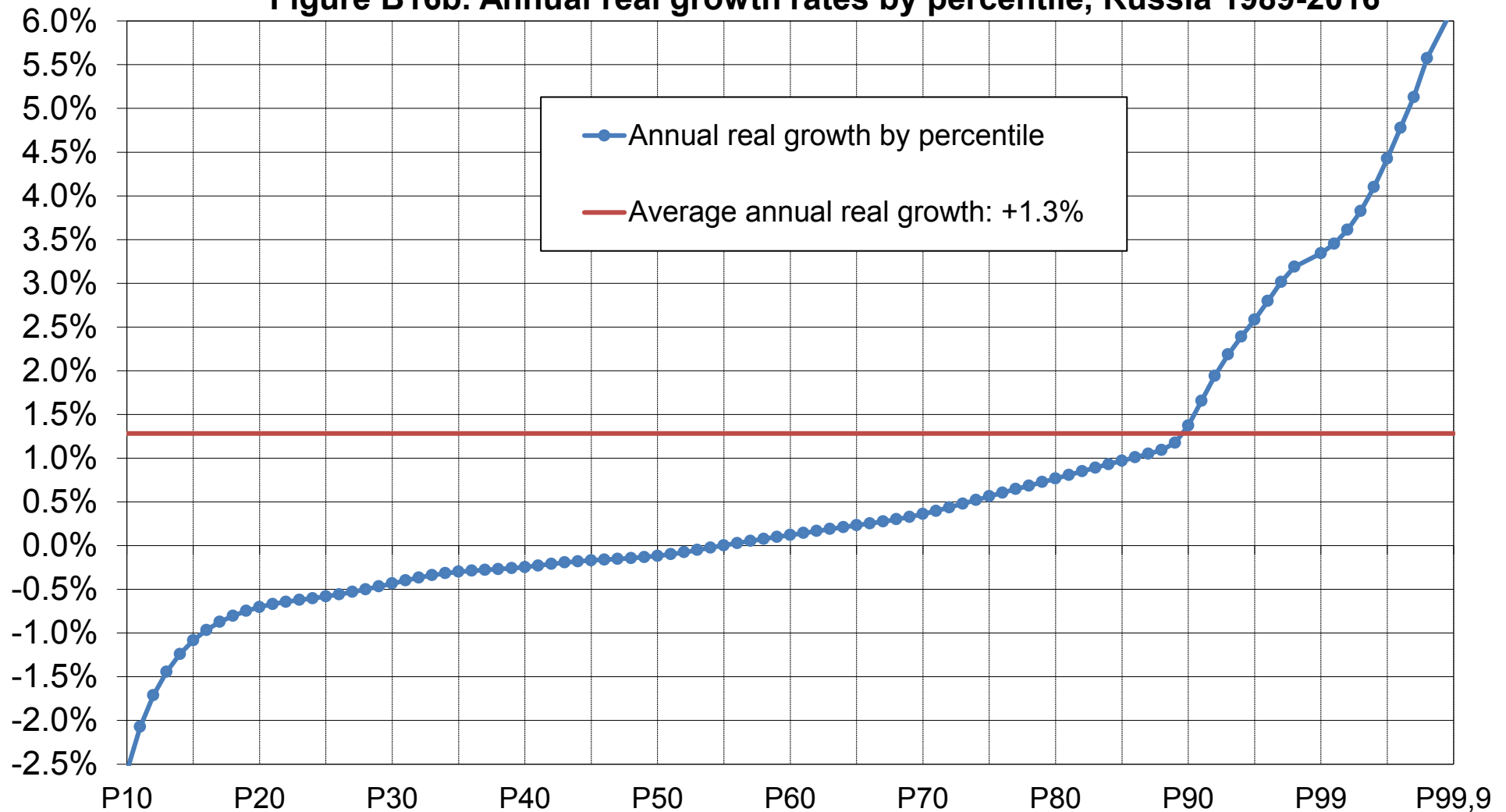
**Figure B16a. Cumulative real growth by percentile, Russia 1989-2016**



Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

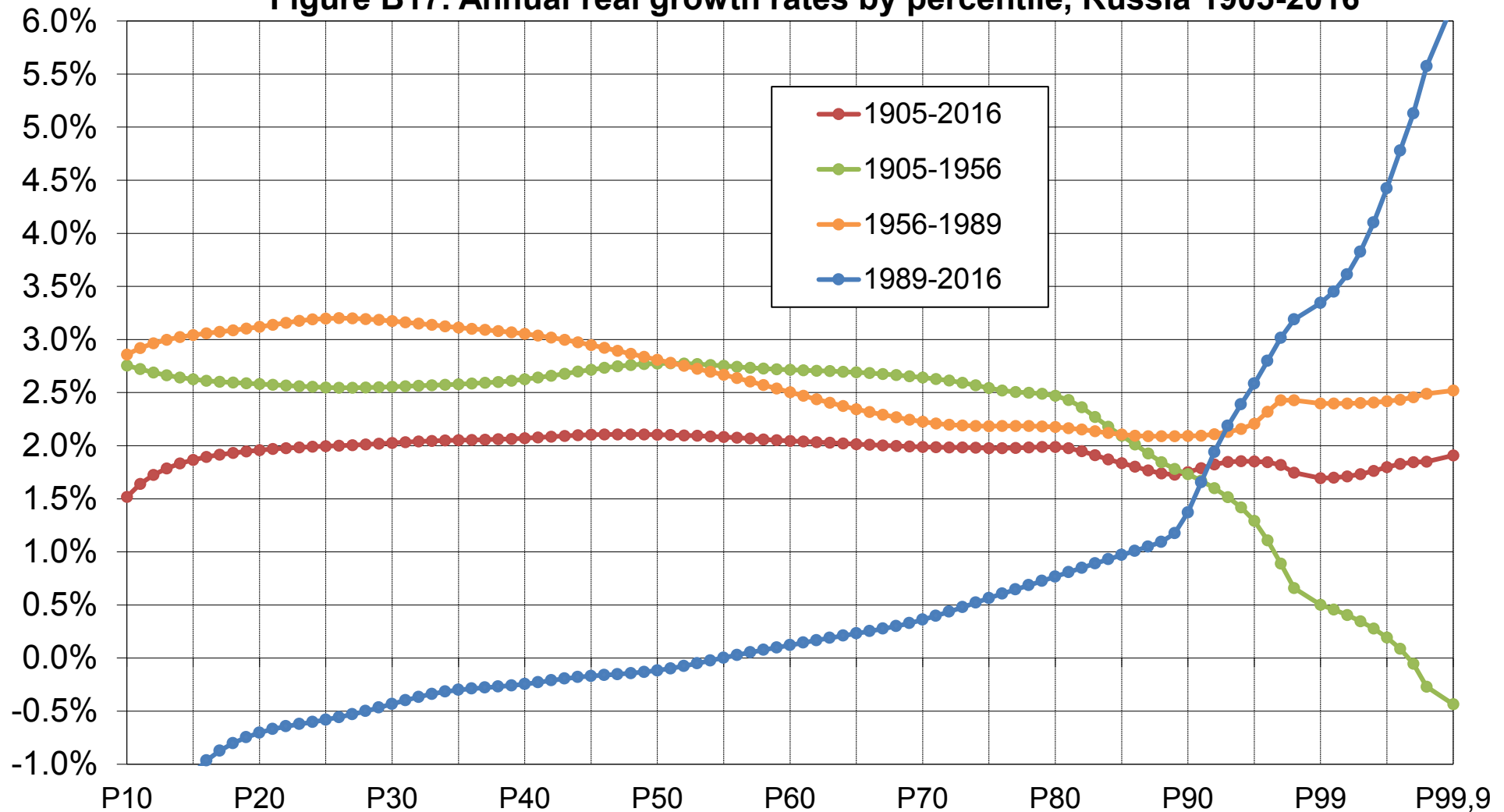


**Figure B16b. Annual real growth rates by percentile, Russia 1989-2016**



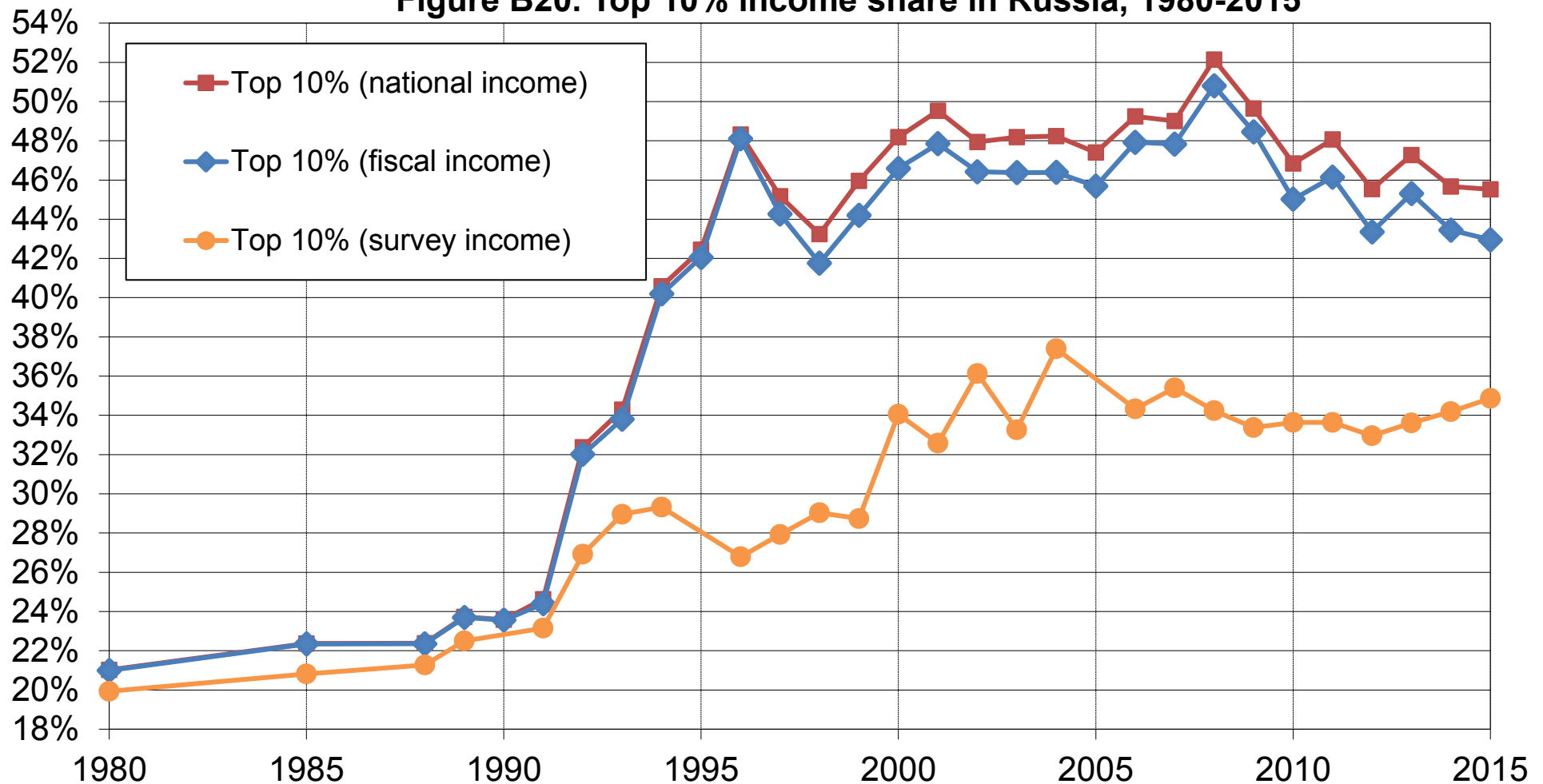
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

**Figure B17. Annual real growth rates by percentile, Russia 1905-2016**



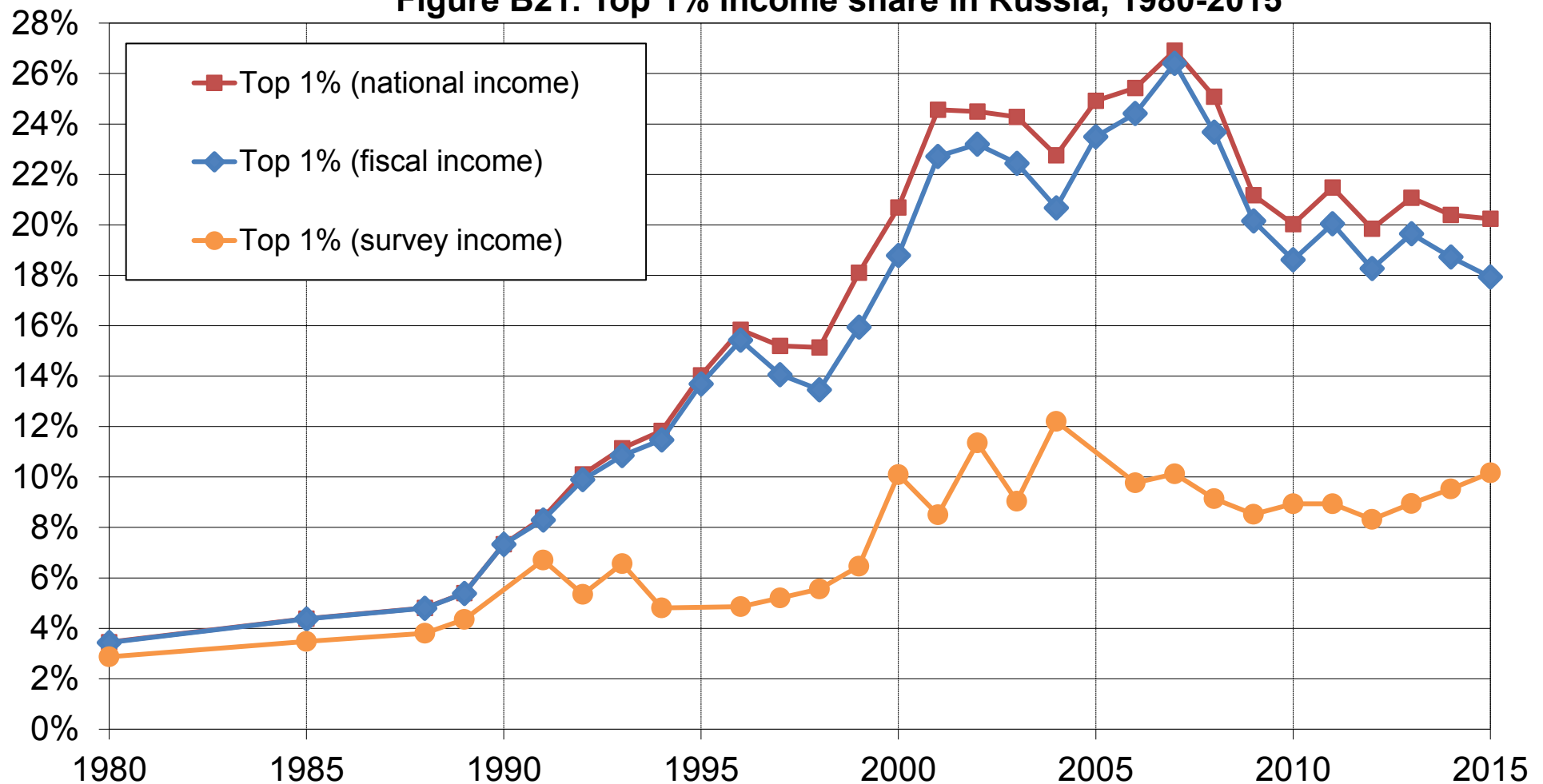
Distribution of pretax national income (before taxes and transfers, except pensions and unempl. insurance) among equal-split adults (income of married couples divided by two). Corrected estimates combine survey, fiscal, wealth and national accounts data.

**Figure B20. Top 10% income share in Russia, 1980-2015**



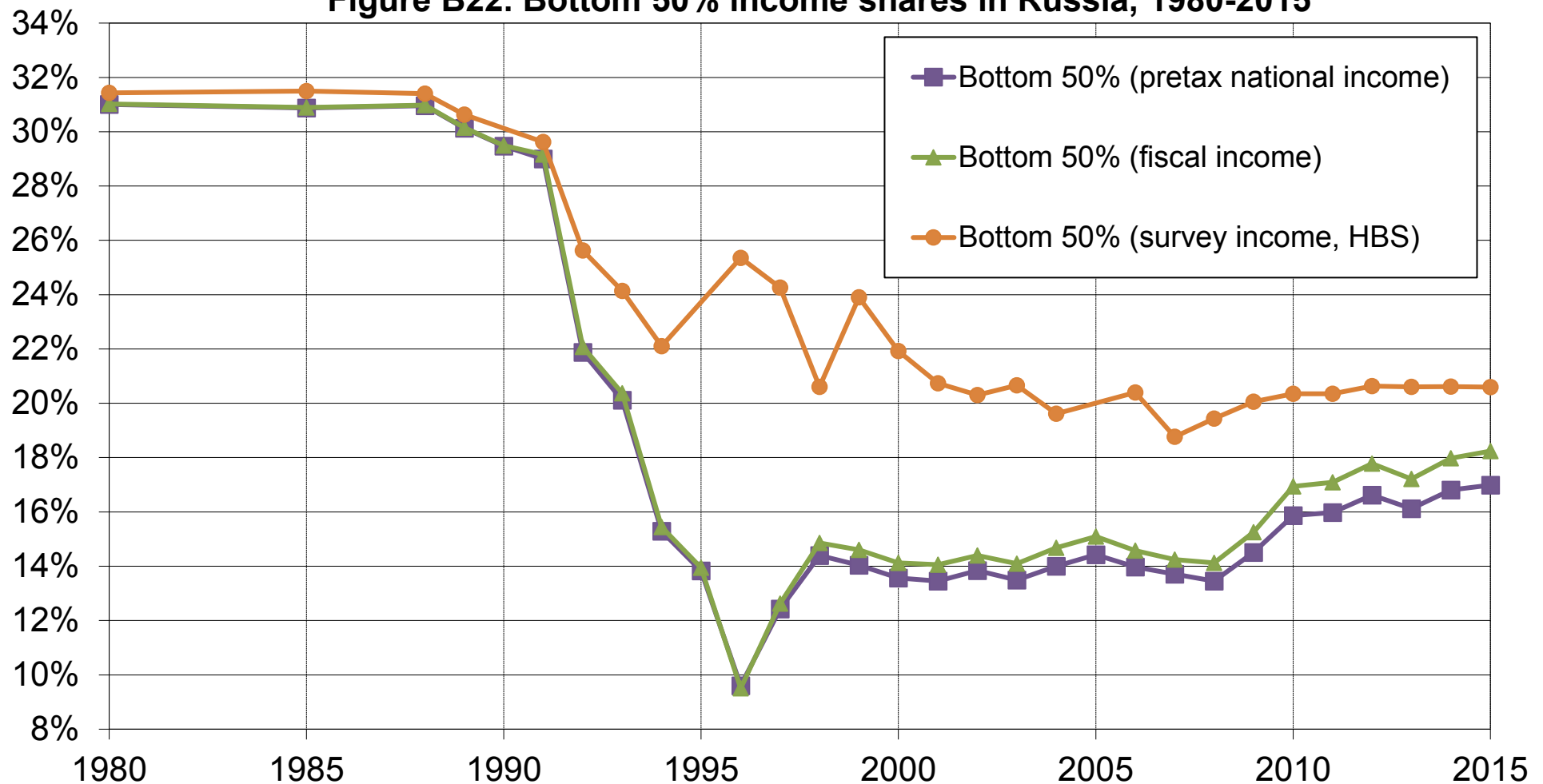
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

**Figure B21. Top 1% income share in Russia, 1980-2015**



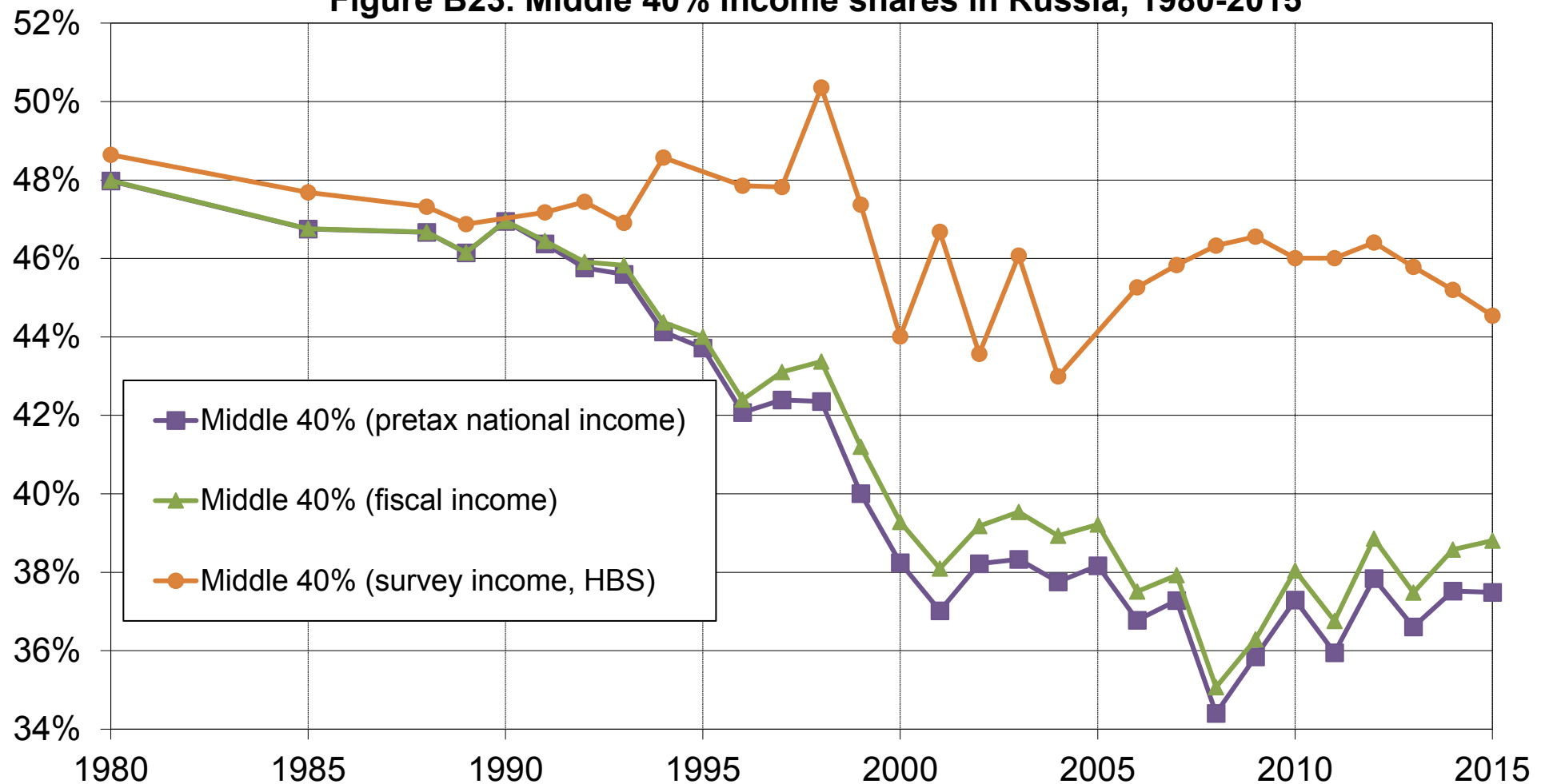
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

**Figure B22. Bottom 50% income shares in Russia, 1980-2015**



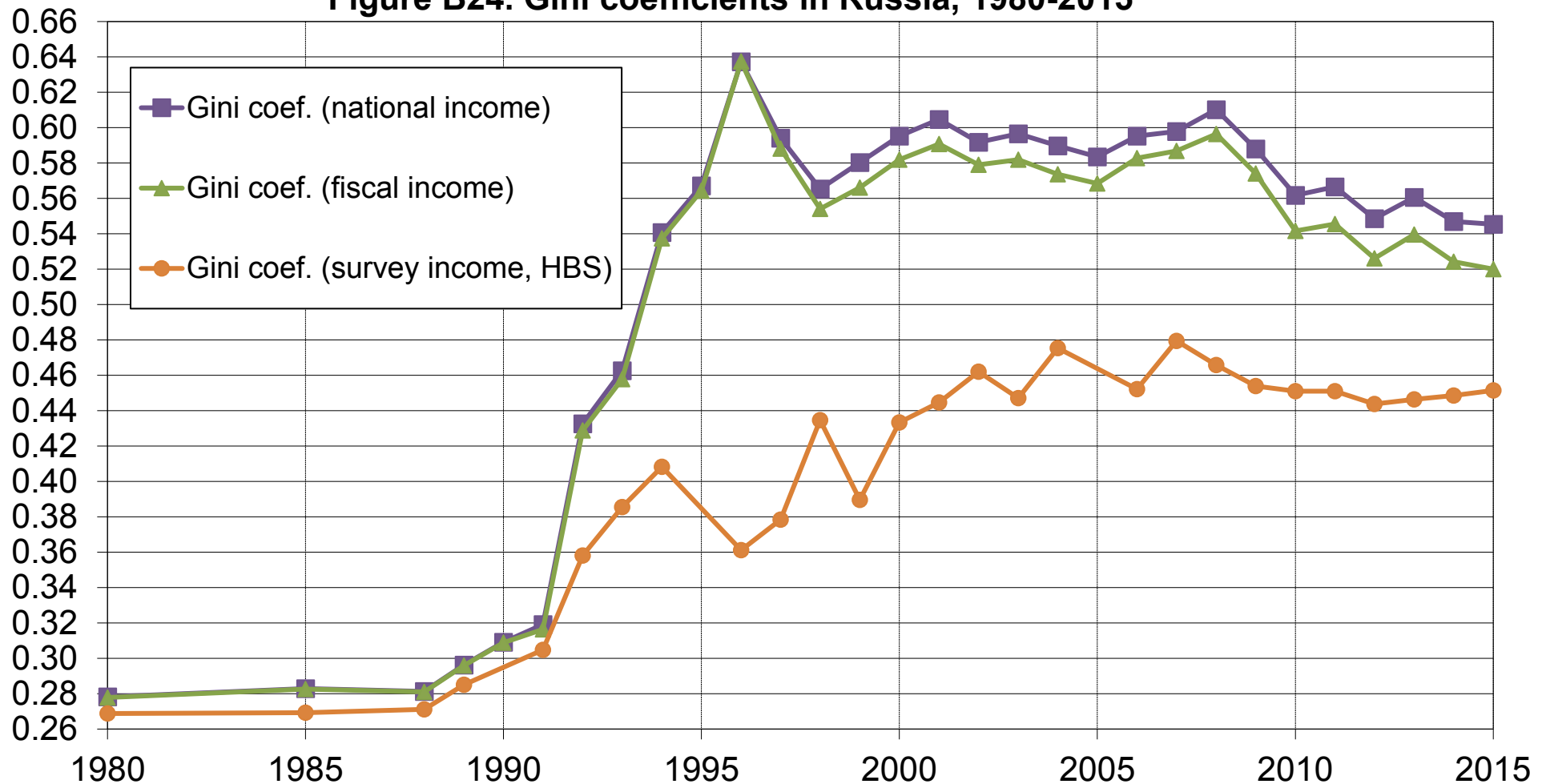
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

**Figure B23. Middle 40% income shares in Russia, 1980-2015**



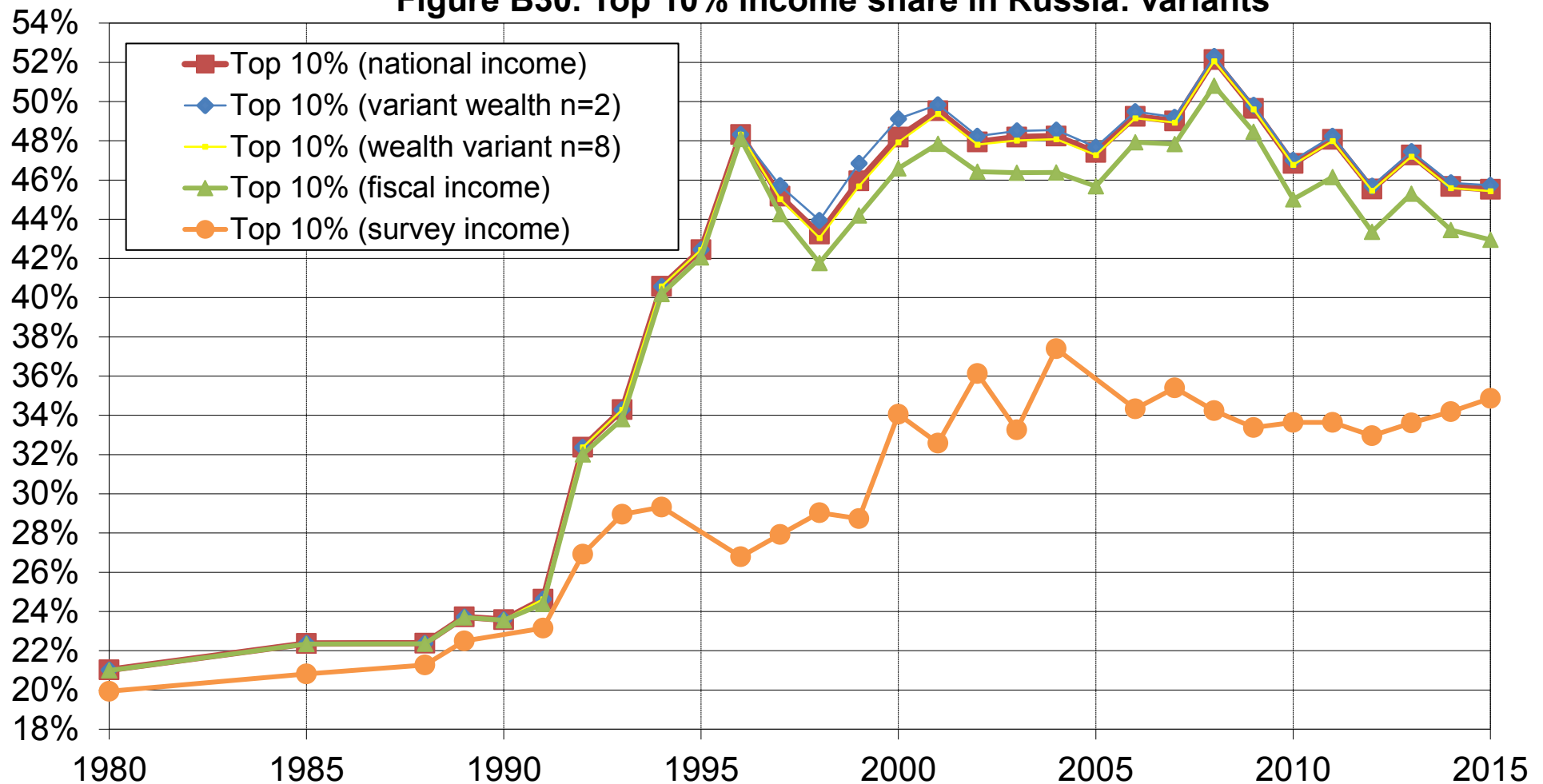
Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

**Figure B24. Gini coefficients in Russia, 1980-2015**



Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

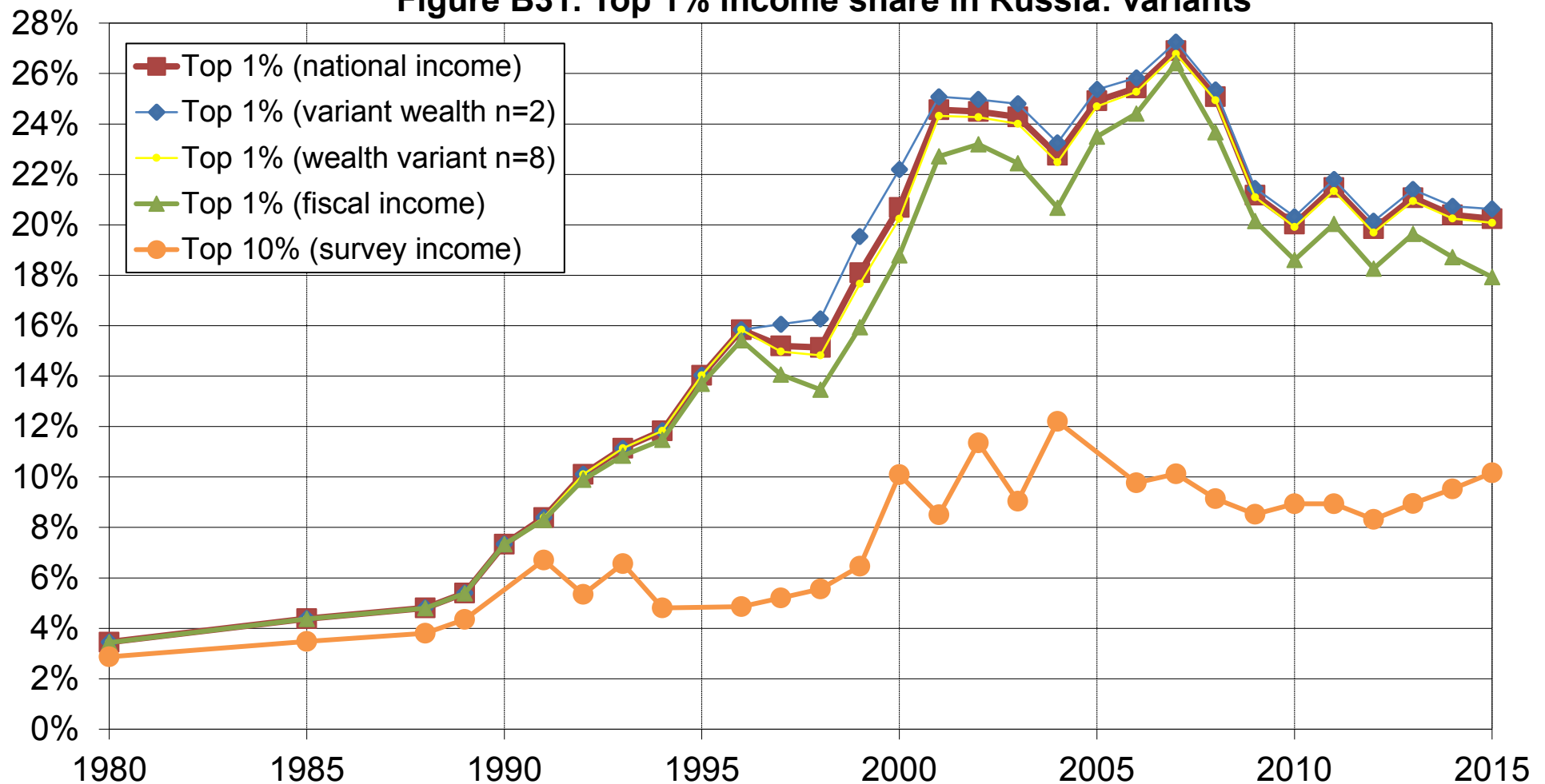
**Figure B30. Top 10% income share in Russia: variants**



Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

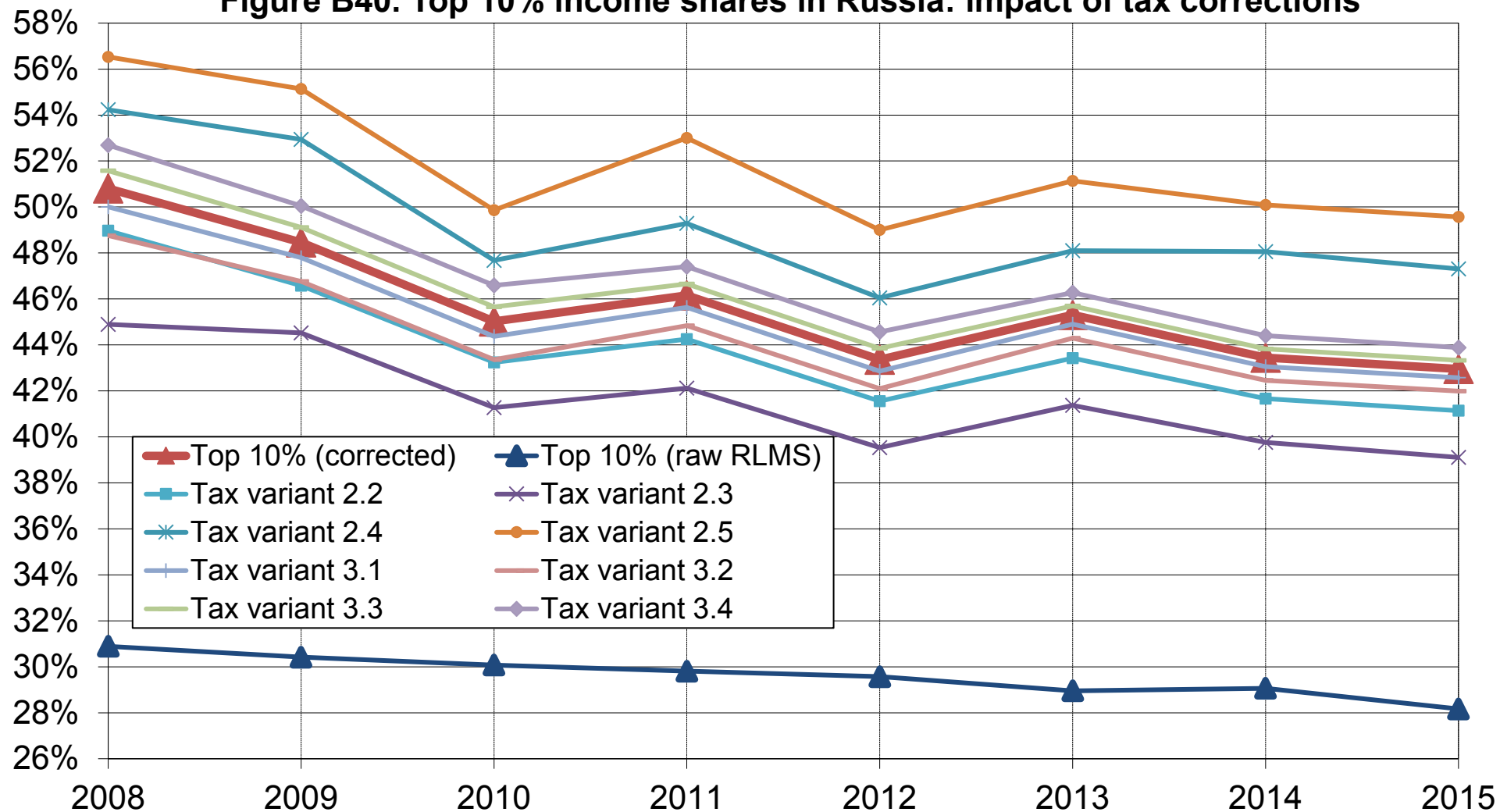


**Figure B31. Top 1% income share in Russia: variants**



Distribution of income (before taxes and transfers, except pensions and unempl. insurance) among equals-split adults (income of married couples divided by two). Pretax national income estimates combine survey, fiscal, wealth and national accounts data. Fiscal income estimates combine survey and income tax data (but do not use wealth data to allocate tax-exempt capital income). Survey income series solely use self-reported survey data (HBS).

**Figure B40. Top 10% income shares in Russia: impact of tax corrections**

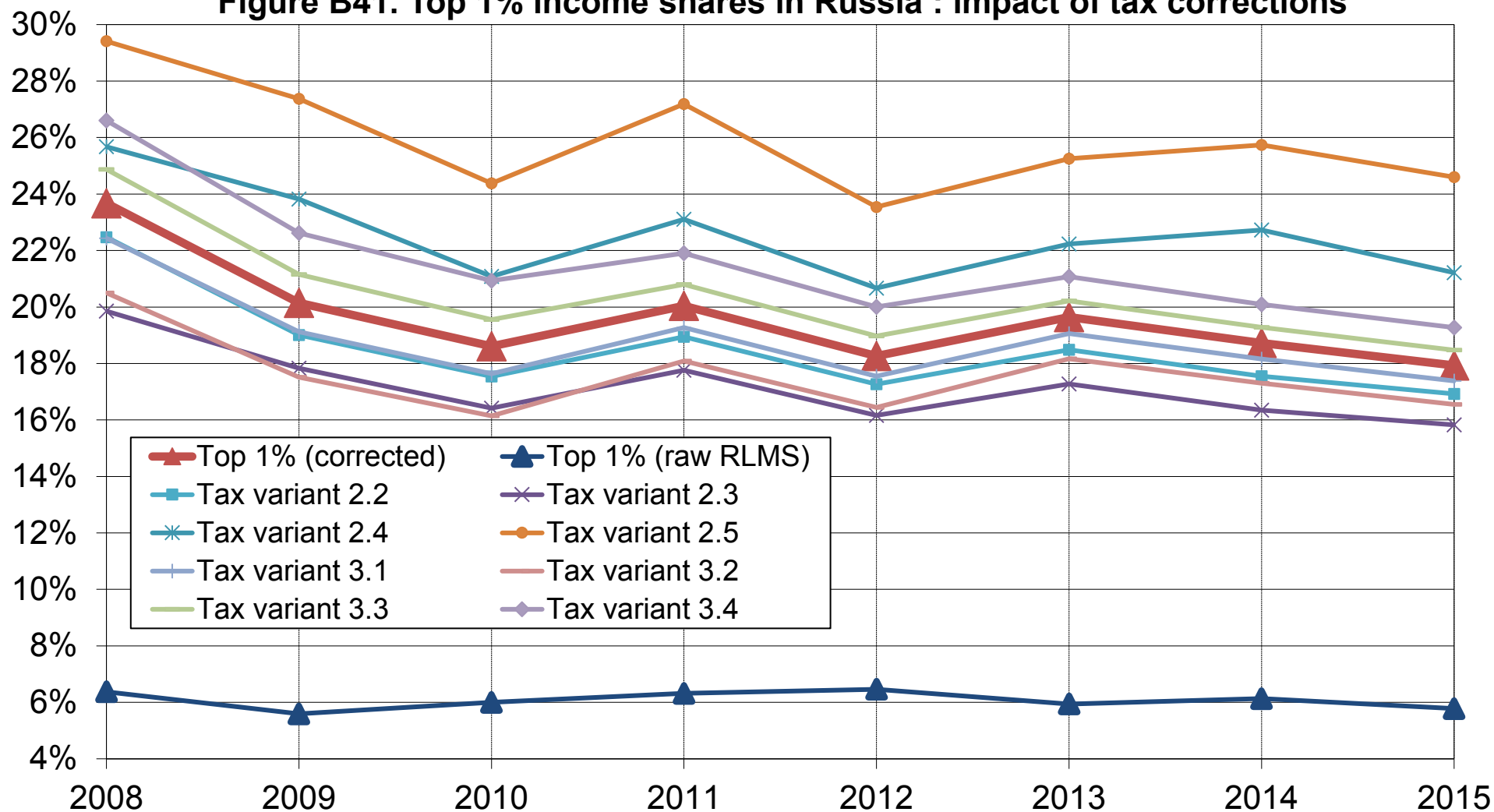


Distribution of fiscal income (before taxes and transfers, except pensions and unempl. insurance) among adults.

Fiscal income estimates combine RLMS survey data and income tax data. Raw estimates rely only on self-reported RLMS survey data.

Equal-split-adults series (income of married couples divided by two).

**Figure B41. Top 1% income shares in Russia : impact of tax corrections**

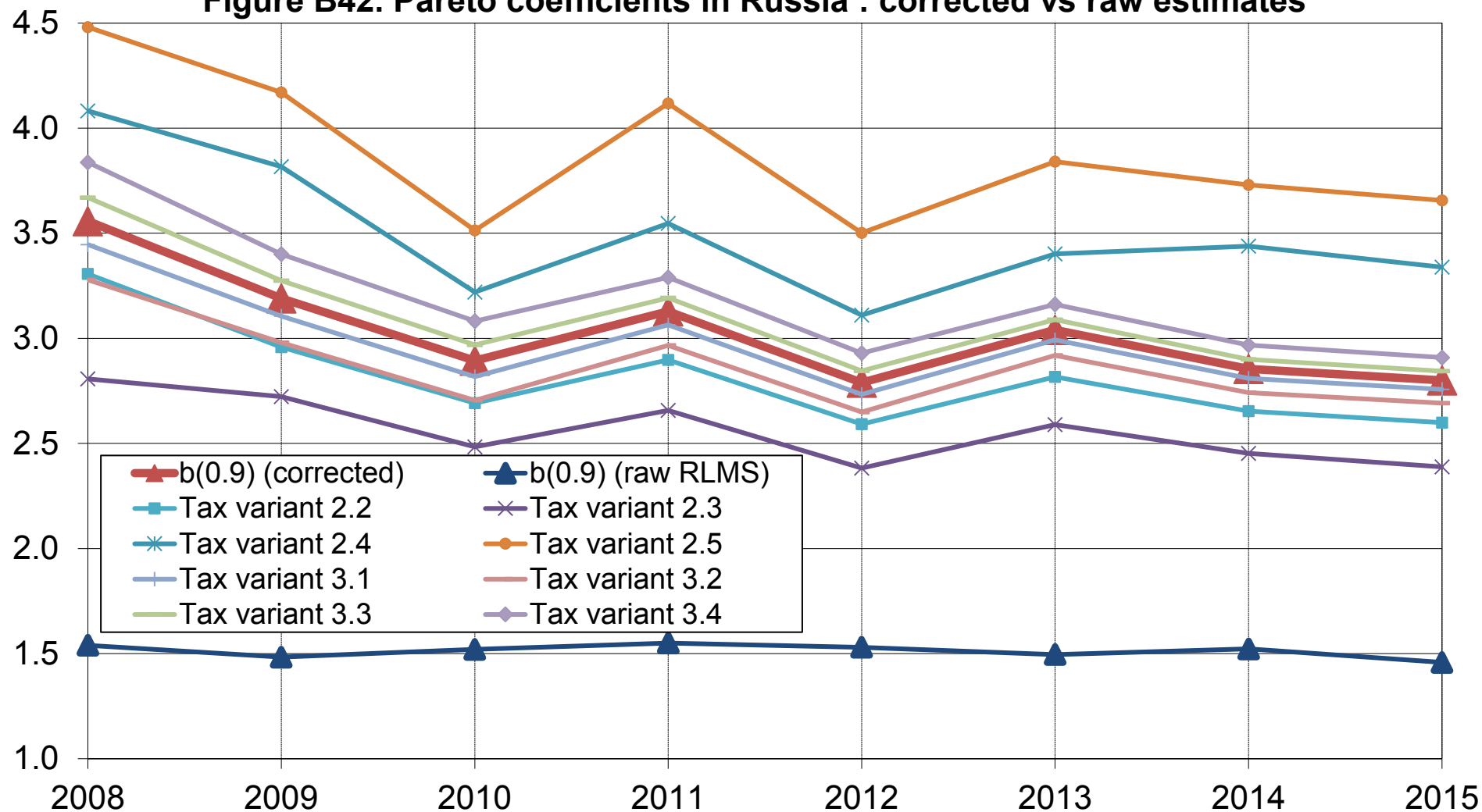


Distribution of fiscal income (before taxes and transfers, except pensions and unempl. insurance) among adults.

Fiscal income estimates combine RLMS survey data and income tax data. Raw estimates rely only on self-reported RLMS survey data.

Equal-split-adults series (income of married couples divided by two).

**Figure B42. Pareto coefficients in Russia : corrected vs raw estimates**

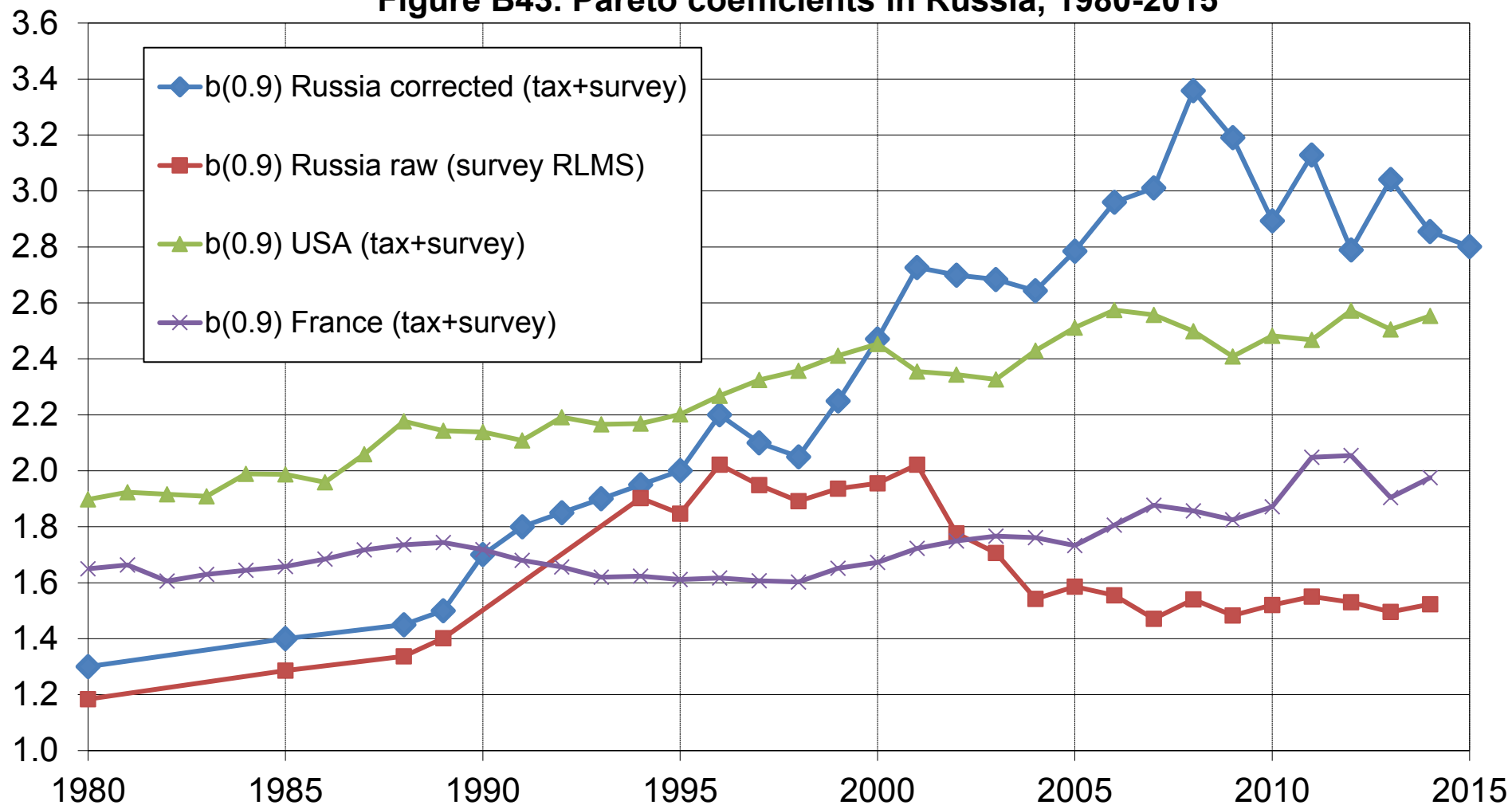


Distribution of fiscal income (before taxes and transfers, except pensions and unempl. insurance) among adults.

Fiscal income estimates combine RLMS survey data and income tax data. Raw estimates rely only on self-reported RLMS survey data.

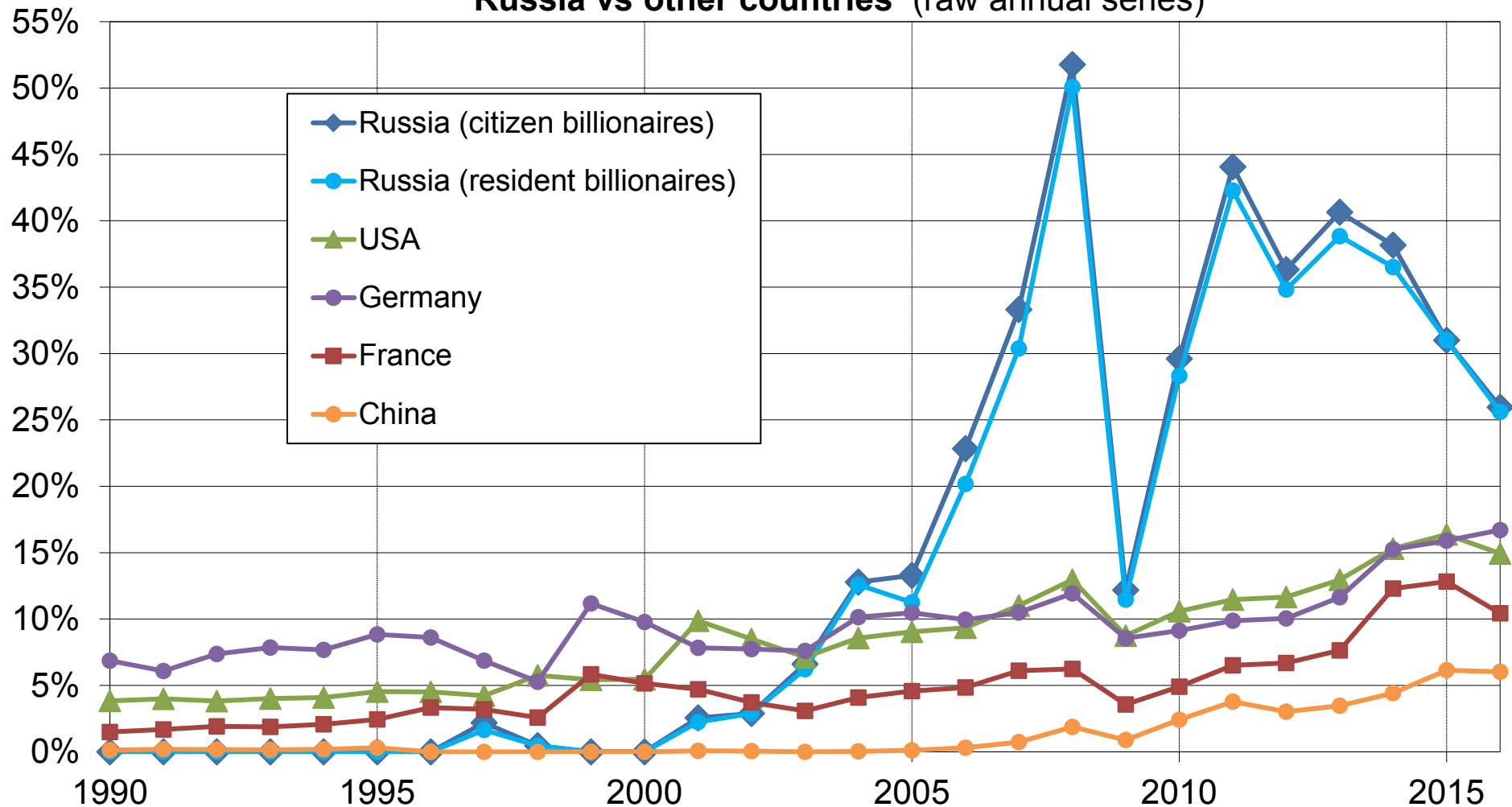
Equal-split-adults series (income of married couples divided by two).

**Figure B43. Pareto coefficients in Russia, 1980-2015**



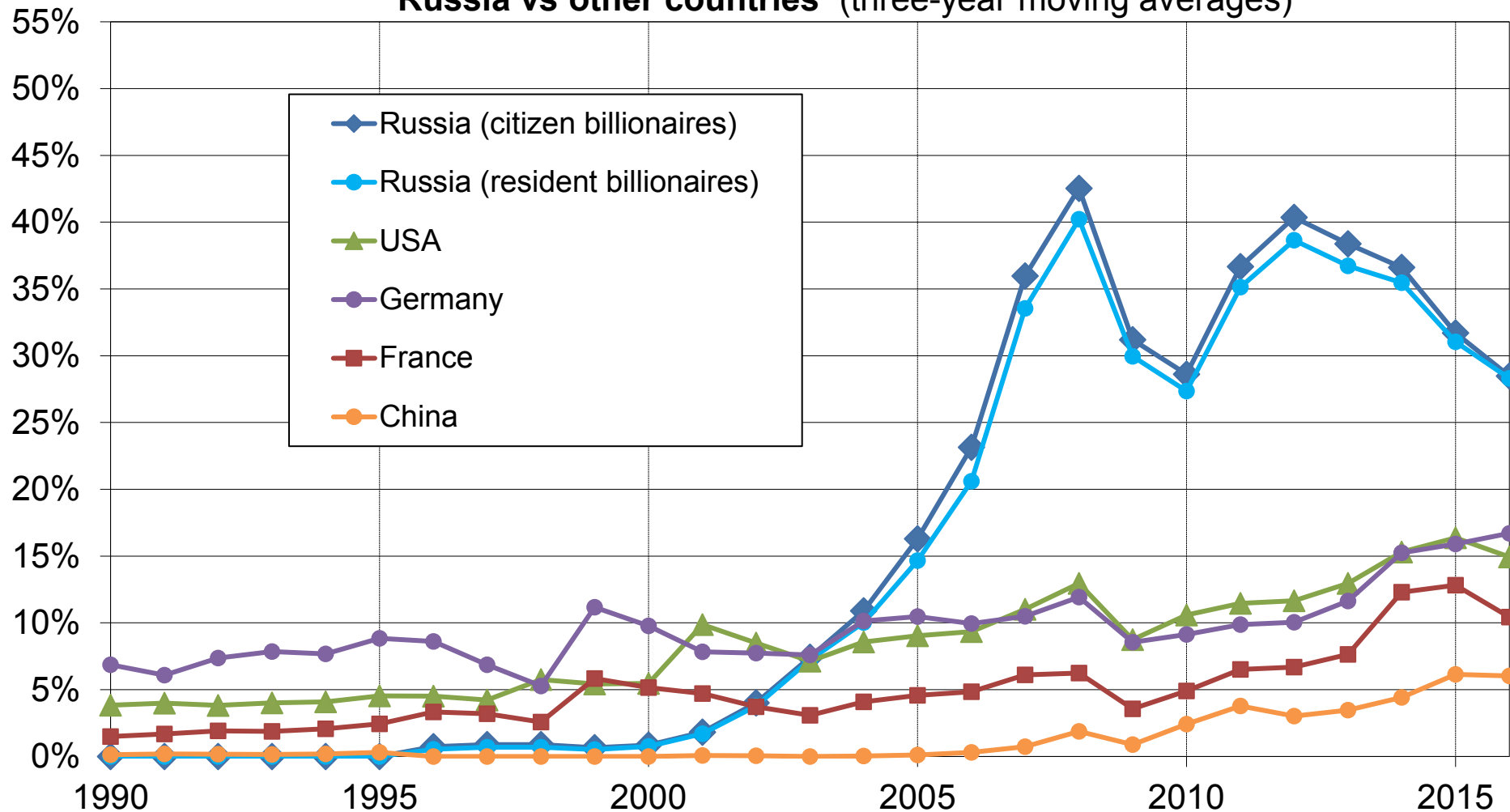
Distribution of fiscal income (before taxes and transfers, except pensions and unempl. insurance) among adults.  
 Fiscal income estimates combine survey, fiscal, wealth and national accounts data. Raw estimates rely only on self-reported survey data.  
 Equal-split-adults series (income of married couples divided by two).

**Figure B50a. Total Forbes billionaire wealth (% national income):  
Russia vs other countries (raw annual series)**



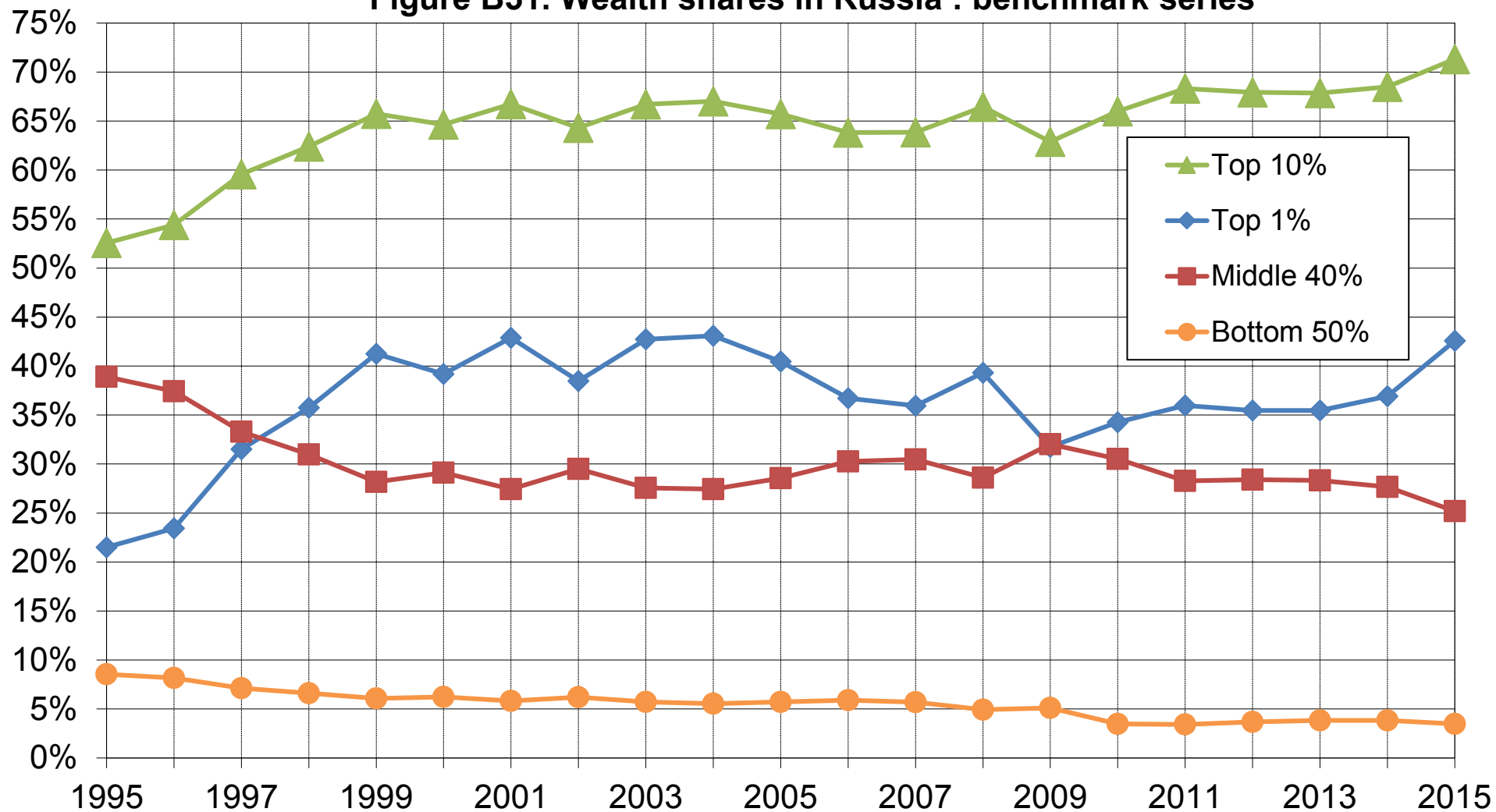
Total billionaire wealth (as recorded by Forbes global list of dollar billionaires) divided by national income (measured at market exchange rates). For other countries only citizen billionaires are reported here (numbers for resident billionaires are virtually identical).

**Figure B50b. Total Forbes billionaire wealth (% national income):  
Russia vs other countries (three-year moving averages)**



Total billionaire wealth (as recorded by Forbes global list of dollar billionaires) divided by national income (measured at market exchange rates). For other countries, we only report citizen billionaires (numbers for resident billionaires are virtually identical).

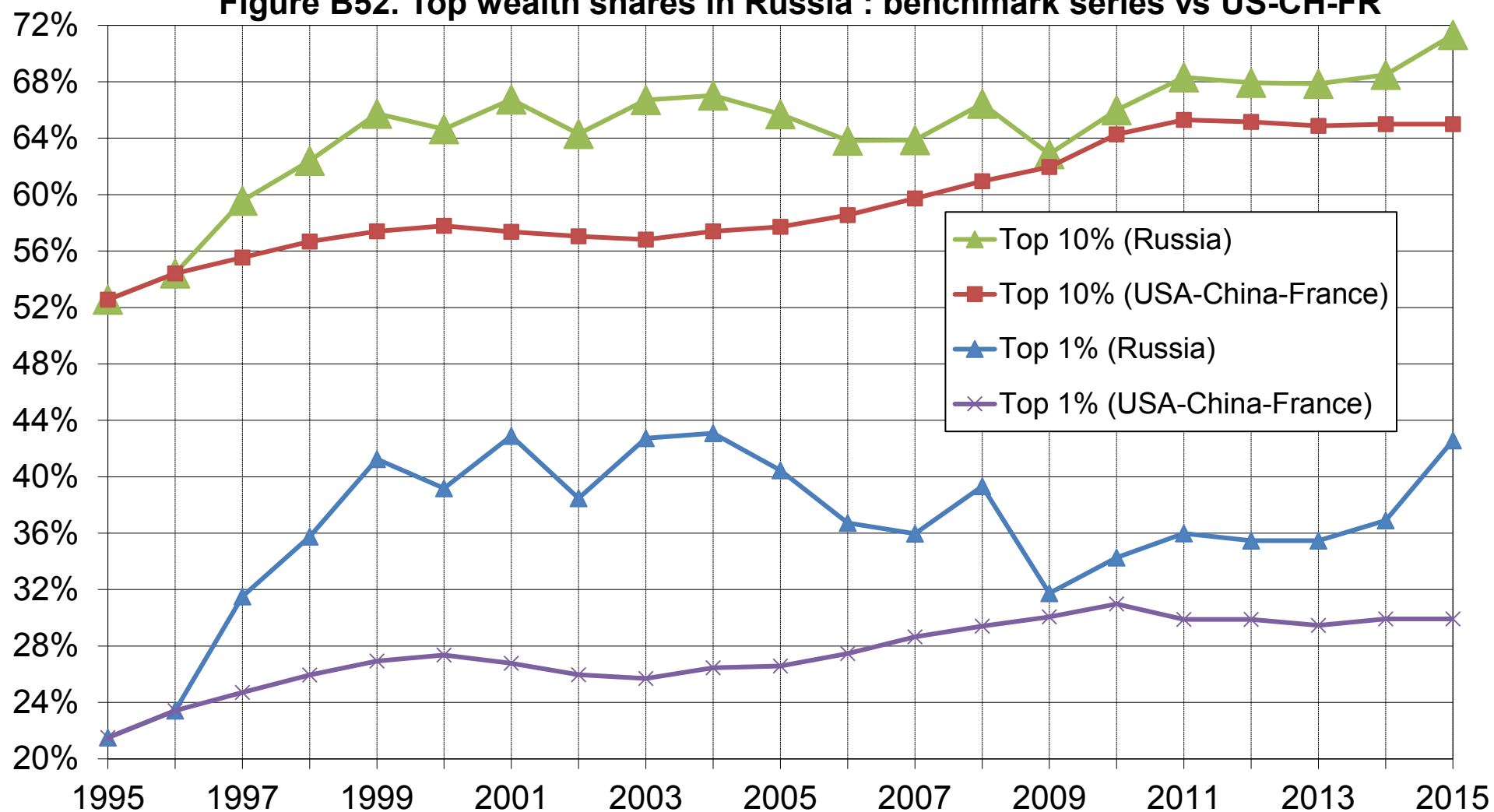
**Figure B51. Wealth shares in Russia : benchmark series**



Distribution of personal wealth among adults. Estimates obtained by combining Forbes billionaire data for Russia, generalized Pareto interpolation techniques and average normalized wealth fistribution for USA-China-France. Benchmark series.

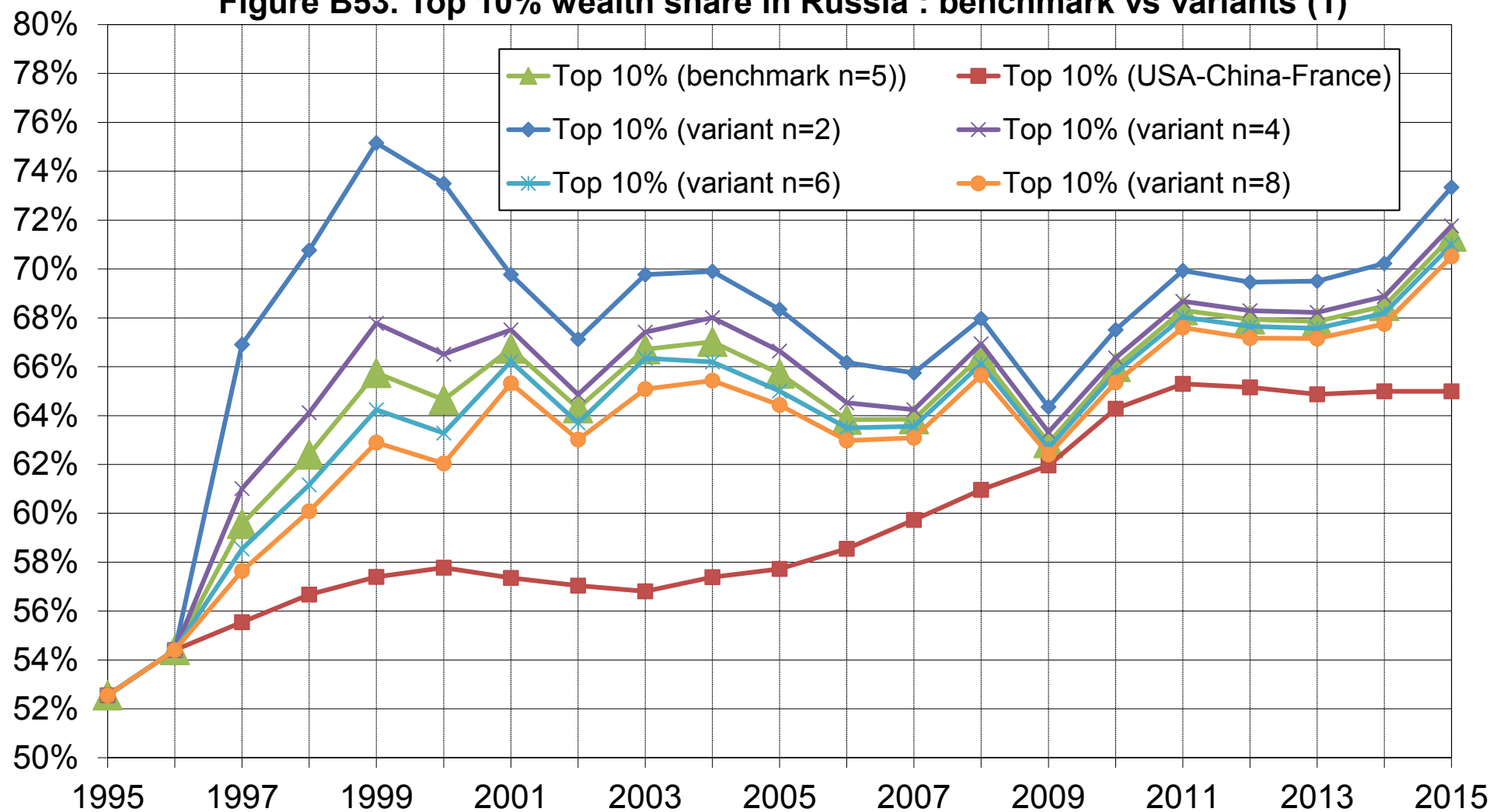


**Figure B52. Top wealth shares in Russia : benchmark series vs US-CH-FR**



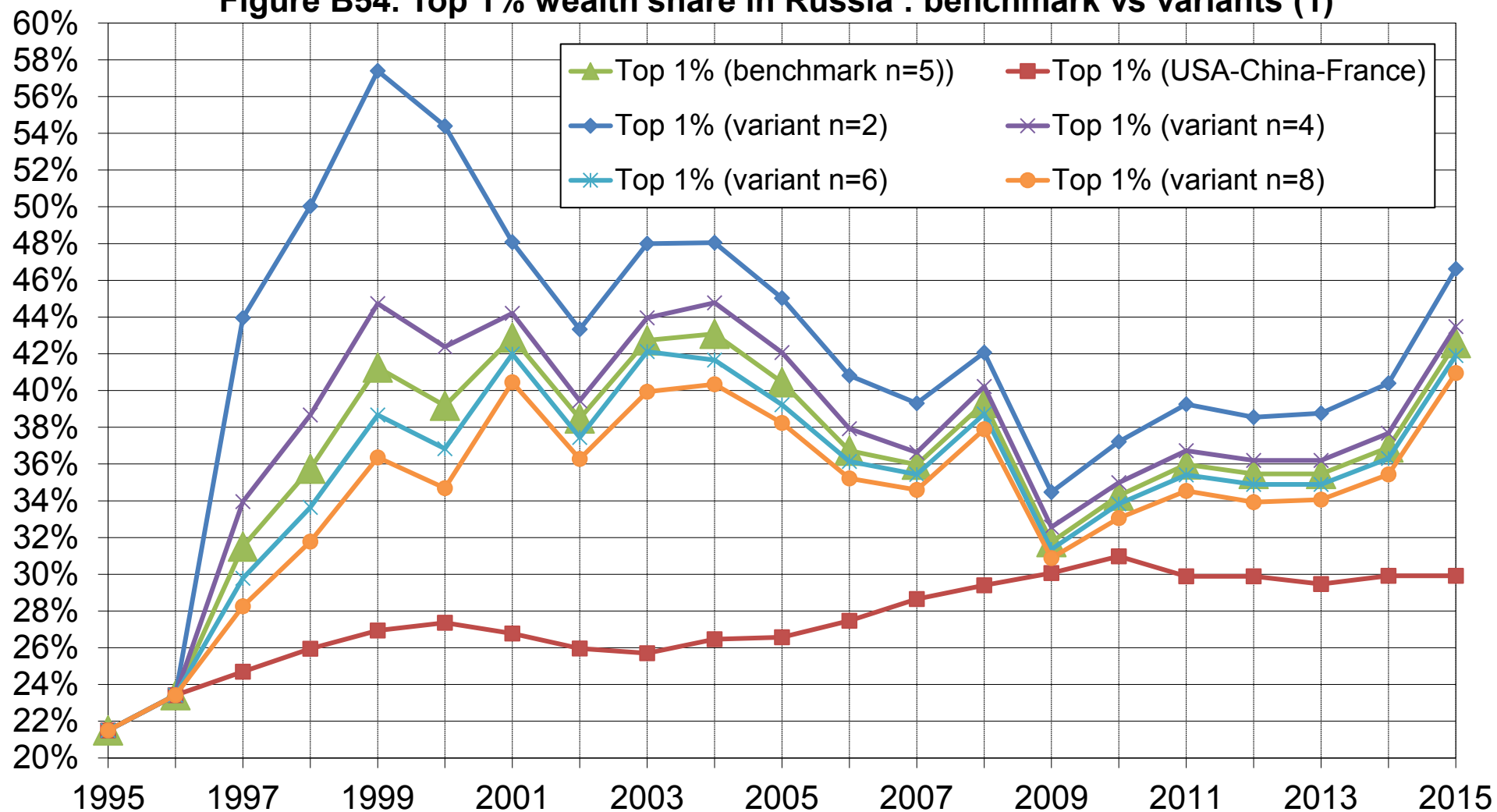
Distribution of personal wealth among adults. Estimates obtained by combining Forbes billionaire data for Russia, generalized Pareto interpolation techniques and average normalized wealth fistribution for USA-China-France. Benchmark series.

**Figure B53. Top 10% wealth share in Russia : benchmark vs variants (1)**



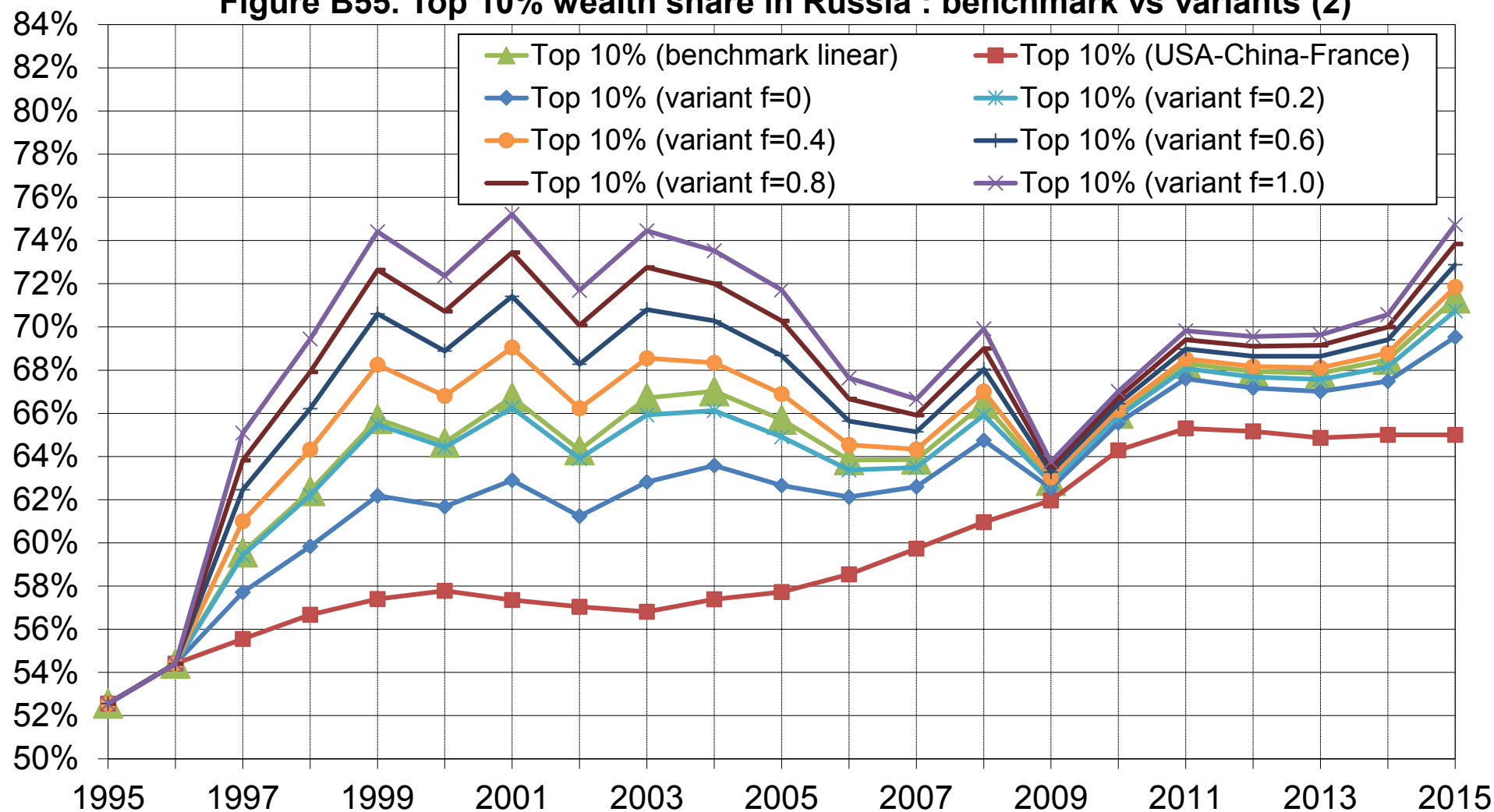
Variants based upon vaying numbers of adults per billionaire family: n=2,4,5,6,8. Corrections factors corr(p) linear between  $p=0.99$  and billionaire wealth. Estimates 1997-2000 are highly volatile due to small number of billionaires.

**Figure B54. Top 1% wealth share in Russia : benchmark vs variants (1)**



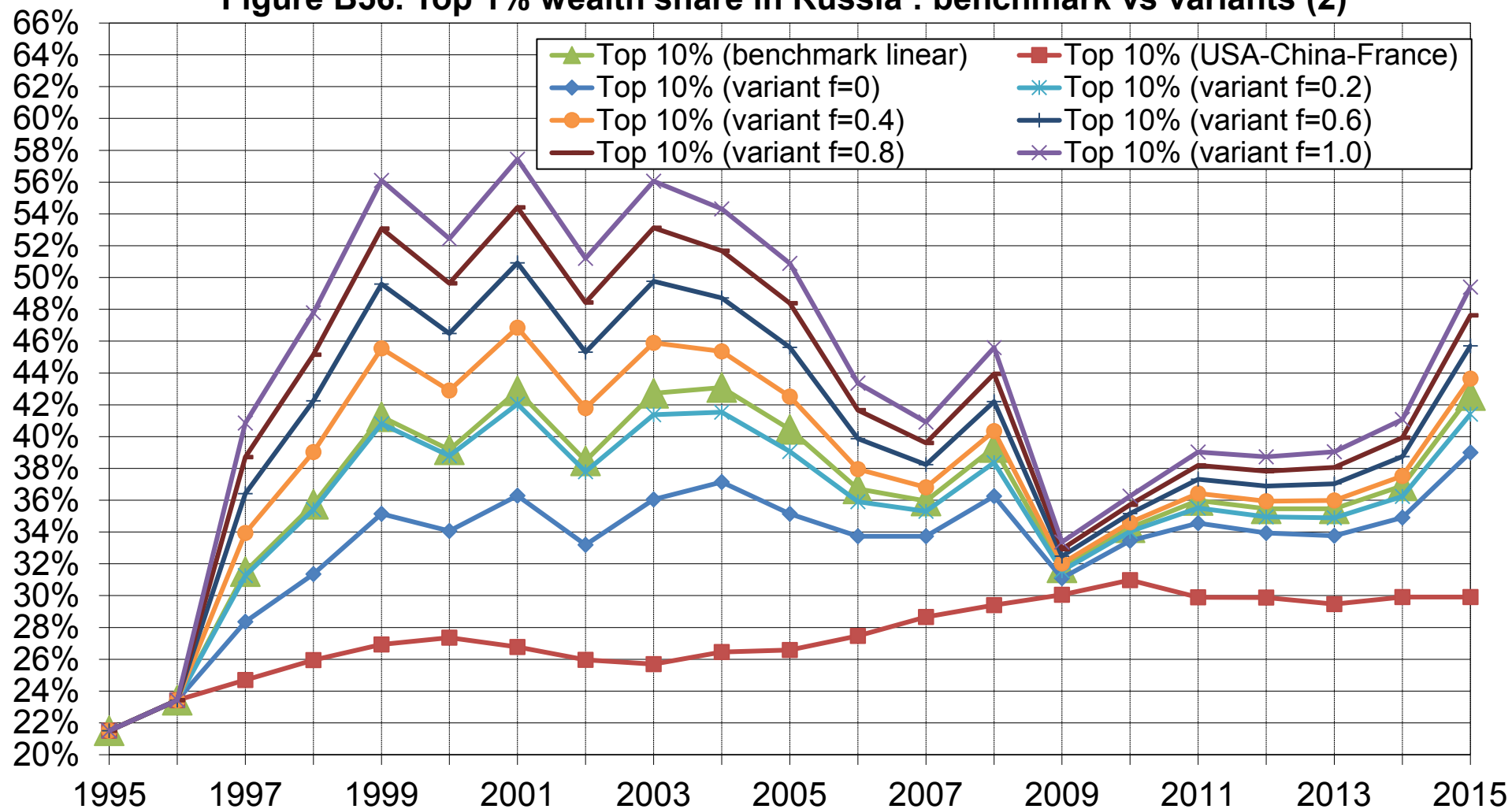
Variants based upon vaying numbers of adults per billionaire family: n=2,4,5,6,8. Corrections factors corr(p) linear between p=0.99 and billionaire wealth. Estimates 1997-2000 are highly volatile due to small number of billionaires.

**Figure B55. Top 10% wealth share in Russia : benchmark vs variants (2)**



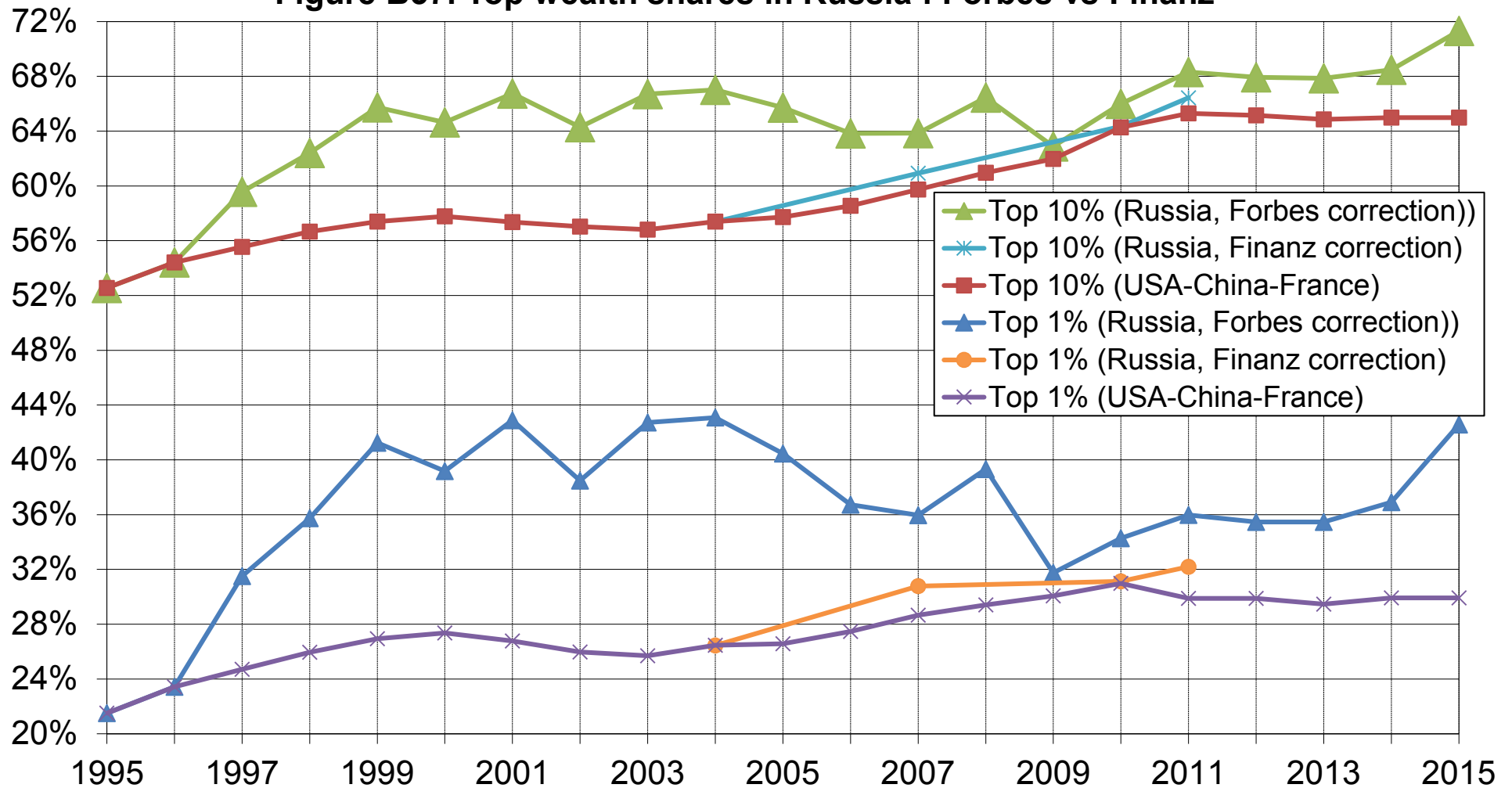
Variants based upon varying slopes of correction factors  $\text{corr}(p)$ : linear between  $p=0.99$  and billionaire level (benchmark) or piecewise linear with fraction  $f$  of total correction between  $p=0.99$  and  $p=0.999$ . Number of adults per billionaire family  $n=5$ .

**Figure B56. Top 1% wealth share in Russia : benchmark vs variants (2)**



Variants based upon varying slopes of correction factors  $\text{corr}(p)$ : linear between  $p=0.99$  and billionaire level (benchmark) or piecewise linear with fraction  $f$  of total correction between  $p=0.99$  and  $p=0.999$ . Number of adults per billionaire family  $n=5$ .

**Figure B57. Top wealth shares in Russia : Forbes vs Finanz**



Estimates obtained by combining Forbes and Finanz billionaire data for Russia, generalized Pareto interpolation techniques and average normalized wealth fistribution for USA-China-France. Benchmark series: number of adults  $n=5$ , linear  $\text{corr}(p)$ .

Table B10. Aggregate Russian Income Tax Data (2008-2015)										
Description			Income year_t							
TAX REVENUES OF PERSONAL INCOME TAX	Code	Source	2008	2009	2010	2011	2012	2013	2014	2015
total taxes PIT (bln.rub.; before 1998 trillion rub.)	Stat.	Yearbook (Finansi)	1 666	1 666	1 791	1 996	2 262	2 499	2 703	2 808
total taxes PIT (thd.Rub.)	1130	1NM	1 665 602 273	1 665 049 638	1 789 631 580	1 994 869 291	2 260 335 639		2 688 688 359	2 806 507 629
taxes payable according to PIT-3 (thd.Rub.)										
taxes payable withheld by tax agents (thd.Rub.)			1 561 937 054	1 588 938 035	1 866 915 662	1 972 900 269	2 219 353 256	2 483 351 939	2 687 589 515	2 825 269 743
Tax revenue/national income			4.4%	4.7%	4.2%	3.8%	3.8%	4.1%	4.1%	4.2%
SUMMARY: PIT WITHELD BY TAX AGENTS	Code	Source	2008	2009	2010	2011	2012	2013	2014	2015
Total assessable income (gross revenue) (thd. rubles)			20 565 462 966	23 818 734 313	28 331 426 563	25 312 710 657	24 490 497 797	25 492 643 254	25 768 813 677	26 945 921 773
% of national income			54%	67%	67%	48%	42%	41%	39%	41%
Total taxable income (thd. rubles)			12 130 510 016	12 347 333 254	14 294 726 260	15 270 361 088	17 196 238 196	19 252 672 745	20 941 823 317	21 650 661 438
% of national income			32%	35%	34%	29%	29%	31%	32%	33%
Total tax liability (thd. rubles)			1 561 937 054	1 588 938 035	1 866 915 662	1 972 900 269	2 219 353 256	2 483 351 939	2 687 589 515	2 825 269 743
Implicit tax rate			12.9%	12.9%	13.1%	12.9%	12.9%	12.9%	12.8%	13.0%
Implicit deductions rate			41.0%	48.2%	49.5%	39.7%	29.8%	24.5%	18.7%	19.7%
TYPES OF INCOME										
Wages and Salaries (thd. rubles)								18 079 262 480	19 306 816 543	20 049 022 053
% of nat. acc. category								66%	64%	62%
% of nat. acc. category (adjusted for hidden earnings)								102%	97%	94%
Dividends (thd. rubles)								771 444 731	1 189 644 353	1 008 573 996
Sales of securities (thd. rubles)								3 487 937 294	5 094 344 167	6 023 652 360
Deductions (claimed through tax agents)										
Standard tax deductions (thd. rubles)			138 151 495	347 847 834	338 076 469					
Property-related tax deductions (thd. rubles)			140 167 813	151 052 711	100 549 299					
Tax deductions on specific incomes (thd. rubles)			8 285 451 685	11 104 483 576	13 712 486 601	9 636 680 831	6 860 946 700	5 814 912 873	4 422 279 008	
of which on sale of securities, repo agreem., etc			98%	98%	99%	99%	99%	98%	97%	0
Memo: MACRO SERIES	Source:									
National income (bln.rub.; before 1998 trillion rub.)	NPZ2017	Appendix A	38 072	35 316	42 465	52 966	58 851	61 668	66 413	66 413
Wages and salaries (bln.rub.; before 1998 trillion rub.)	NPZ2017	Appendix A	16 493	17 326	19 759	21 532	24 330	27 273	30 333	32 185
Official estimate on hidden employees' comp. and mixed income (bln.rub.; before 1998 trillion rub.)					6 632	7 868	8 959	9 612	10 376	10 858
Net mixed income (bln.rub.; before 1998 trillion rub.)										
THE NUMBER OF TAX RETURNS AND TAXPAYERS	Code	Source	2008	2009	2010	2011	2012	2013	2014	2015
The total number of registered 3-NFDL returns (units)	1010	1DDK/P1	7 545 363	6 569 187		7 870 191	8 346 045	8 771 417	9 678 197	10 011 015
of which [code 1010] the total number of registered 3-NFDL returns for income in year t (units)	1020	1DDK/P1	6 226 069	5 212 419		6 640 755	7 003 585	7 228 444	7 738 375	7 840 611
The number of taxpayers who submitted 3-NFDL return (persons)	1025	1DDK/P1	5 775 641	4 812 407		6 094 523	6 409 038	6 606 377	7 043 243	7 122 330
The total number of registered 3-NFDL returns, entered in the information resources of tax organs for the total number of registered 3-NFDL returns,	2001	1DDK/P2	6 203 705	5 204 476		6 622 307	6 977 803	7 203 944	7 703 924	7 811 824
entered in the information resources of tax organs for income in year before the year t (units)	2002	1DDK/P2	1 292 808	1 338 421		1 223 356	1 335 300	1 535 244	1 932 524	2 159 430
[from codes 2001 and 2002], the total number of cameraly verified declarations (units)	2010	1DDK/P2	7 072 639	6 168 824		7 455 356	7 852 391	8 250 357	9 067 339	9 371 141
[from code 2010], the number of cameraly verified declarations for the year t (units)	2015	1DDK/P2	5 904 190	4 959 513		6 348 814	6 654 852	6 876 722	7 331 438	7 447 466
			95.2%	95.3%		95.9%	95.4%	95.5%	95.2%	95.3%
INCOME, TAXABLE INCOME, TAX LIABILITY : 3-ND	Code	Source	2008	2009	2010	2011	2012	2013	2014	2015
[from code 2010] the total sum of assessable income (gross revenue) in verified declarations (thd. rubles)	2020	1DDK/P2	6 477 372 704	7 695 267 482		5 263 335 215	5 313 636 052	5 725 848 683	7 349 656 391	7 429 352 056
The total sum of taxable income according to declarations of income obtained in for the year 2008 (thousand rubles)	2170	1DDK/P2	1 458 243 037	1 043 000 620		1 307 742 782	1 342 786 147	1 545 156 434	1 974 808 912	1 936 515 010
The total sum of tax payable upon declarations of income obtained in 2008 (thousand rubles)	2180	1DDK/P2	189 604 174	129 016 743		165 546 382	166 833 404	193 102 161	238 982 773	254 412 840
Tax liability / taxable income			13.0%	12.4%		12.7%	12.4%	12.5%	12.1%	13.1%
Implicit tax deductions / assessable income			77.5%	86.4%	88.9%	75.2%	74.7%	73.0%	73.1%	73.9%
Assessable income in declarations/total assessable income			31.5%	32.3%		20.8%	21.7%	22.5%	28.5%	27.6%
Taxable income in declarations/total taxable income			12.0%	8.4%		8.6%	7.8%	8.0%	9.4%	8.9%
Assessable income per declaration			1 121 498	1 599 048		863 617	829 085	866 715	1 043 505	1 043 107

Taxable income per declaration			252 482	216 732	214 577	209 514	233 889	280 383	271 893	
Tax withheld,...										
Information on certain types of income in 3-NDFL form :										
The number of taxpayers : income from the <u>sale of immovable property</u> ; income in year t	1200	1DDK/P1A						537 949	472 766	
Total income (thd.rubles)	1201	1DDK/P1A						639 627 020	571 172 766	
Total taxable income (thd.rubles)	1202	1DDK/P1A						121 726 000	104 375 189	
Total tax liability (thd.rubles)	1203	1DDK/P1A						15 824 380	13 546 619	
									13%	
The number of taxpayers : income from the <u>sale of other property</u> ; income in year t	1300	1DDK/P1A						881 229	806 314	
Total income (thd.rubles)	1301	1DDK/P1A						237 299 815	757 203 983	
Total taxable income (thd.rubles)	1302	1DDK/P1A						25 780 523	33 850 928	
Total tax liability (thd.rubles)	1303	1DDK/P1A						3 351 468	4 330 319	
									13%	
The number of taxpayers : income from the <u>operation with securities</u> ; income in year t	1400	1DDK/P1A						22 350	22 393	
Total income (thd.rubles)	1401	1DDK/P1A						817 240 934	977 124 295	
Total taxable income (thd.rubles)	1402	1DDK/P1A						82 038 646	92 656 090	
Total tax liability (thd.rubles)	1403	1DDK/P1A						10 665 024	12 078 580	
									13%	
The number of taxpayers : income from <u>leasing property/rent</u> ; income in year t	1500	1DDK/P1A						232 724	259 744	
Total income (thd.rubles)	1501	1DDK/P1A						24 662 442	28 405 124	
Total taxable income (thd.rubles)	1502	1DDK/P1A						22 873 138	25 269 828	
Total tax liability (thd.rubles)	1503	1DDK/P1A						2 973 508	3 361 744	
									13%	
The number of taxpayers : income <u>received as gift</u> ; income in year t	1600	1DDK/P1A						20 984	21 672	
Total income (thd.rubles)	1601	1DDK/P1A						4 602 655	7 003 643	
Total taxable income (thd.rubles)	1602	1DDK/P1A						3 775 815	5 769 622	
Total tax liability (thd.rubles)	1603	1DDK/P1A						490 856	751 605	
									13%	
The number of taxpayers : income from <u>labour (civil) contract, withheld by tax agents</u> ; income in year t									5 012 742	
Total income (thd.rubles)									2 419 035 315	
Total taxable income (thd.rubles)									2 375 203 193	
Total tax liability (thd.rubles)									310 958 102	
									13%	
The number of taxpayers : income from <u>labour (civil) contract, not withheld by tax agents</u> ; income in year t								108 718	378 844	
Total income (thd.rubles)								24 731 026	44 024 805	
Total taxable income (thd.rubles)									47 601 838	
Total tax liability (thd.rubles)								11 001 845	6 830 562	
									14.3%	
The number of taxpayers : income from <u>equity share, in form of dividends</u> ; income in year t									27 764	
Total income (thd.rubles)									171 190 191	
Total taxable income (thd.rubles)									156 913 471	
Total tax liability (thd.rubles)									20 541 847	
									13%	
reported income for certain income sources									4 975 160 122	
reported taxable income for certain income sources									2 841 640 159	
TAX DEDUCTIONS : 3-NDFL tax form	Code	Source	2008	2009	2010	2011	2012	2013	2014	2015
SOCIAL TAX DEDUCTIONS on income in year t (thd. rubles)	see formula	1DDK/P2	42 305 056	45 230 943	0	46 803 124	50 704 650	56 226 662	66 100 443	
INVESTMENT TAX DEDUCTIONS										2 530 946
PROPERTY-RELATED TAX DEDUCTIONS on income in year t (thd. rubles)	see formula	1DDK/P2	3 509 792 081	5 450 093 736		2 540 690 549	2 499 897 470	2 695 092 667	3 744 167 007	3 821 639 616
PROFESSIONAL TAX DEDUCTIONS on income in year t (thd. rubles)	see formula	1DDK/P2	1 240 636 417	1 138 508 248		1 309 032 888	1 342 285 687	1 358 338 089	1 447 197 525	1 477 817 627



<b>TOTAL TAX DEDUCTIONS (thd. rubles)</b>			4 792 733 554	6 633 832 927	0	3 896 526 561	3 892 887 807	4 109 657 418	5 257 464 975	5 299 457 243
% OF IMPLICIT TAX DEDUCTIONS			95.5%	99.7%	#DIV/0!	98.5%	98.0%	98.3%	97.8%	96.5%
<b>TAXATION OF ENTREPRENEURS AND OTHER SEL</b>	Code	Source	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
The number of taxpayers that submitted declaration for income obtained in year t	3010	1DDK/P3	401 463	400 561		397 348	377 865	345 125	376 708	397 867
(from 3010] The total sum of <u>assessable income</u> (gross revenue) in relevant declarations (thd. rub.)	3020	1DDK/P3	1 595 758 362	1 436 410 658		1 600 110 994	1 614 571 486	1 625 163 650	1 783 347 930	1 853 274 205
(from 3020] The total sum of <u>assessable income</u> (gross revenue) from entrepreneurial activity and	3030	1DDK/P3	1 409 074 132	1 258 908 409		1 433 347 254	1 487 816 687	1 515 344 282	1 637 480 343	1 717 597 120
the number of relevant declarations with zero total income from the entrepreneurial activity and private practice (units)	3040	1DDK/P3	274 000	281 153		276 938	273 840	247 502	279 140	300 993
The total sum of professional tax deductions claimed by taxpayers <u>on incomes from entrepreneurial activity</u> and private practice according to relevant provisions of income from entrepreneurial activity	3050	1DDK/P3	1 329 315 362	1 196 867 121		1 358 662 953	1 411 508 477	1 425 228 326	1 537 287 402	1 603 922 154
check P2, code 2150			94%	95%	#DIV/0!	95%	95%	94%	94%	93%
(from 3050] The total sum of taxable income indicated by taxpayers in relevant declarations (thd. rubles)	3070	1DDK/P3	167 045 239	98 816 996		111 472 079	120 977 461	125 471 668	143 213 715	154 933 571
			79 758 770	62 041 288	0	74 684 301	76 308 210	90 115 956	100 192 941	113 674 966
(from 3010] The total sum of tax payable in relevant declarations (thd. rubles)	3080	1DDK/P3	14 416 248	12 549 445		14 203 879	15 336 778	15 881 253	18 176 831	20 196 626
implicit tax rate			8.6%	12.7%		12.7%	12.7%	12.7%	12.7%	13.0%
<b>PIT WITHHELD BY TAX AGENTS - 13% FLAT TAX RA</b>	Code	Source	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
The number of <i>info/settlement (svedeniy)</i> for income of individuals in year t, received by the tax authorities	1010	5NDFL	96 852 408	92 653 921	92 681 285	93 195 698	92 621 706	92 223 185	91 141 047	92 791 396
Total assessable income (gross revenue) (thd. rubles)	1020	5NDFL	20 113 910 718	23 387 152 247	27 234 322 577	24 682 266 056	23 740 363 786	24 647 557 902	24 501 973 518	26 814 583 922
Total taxable income (thd. rubles)	1030	5NDFL	11 719 598 939	11 962 009 990	13 470 648 463	14 683 464 611	16 482 485 648	18 448 335 932	19 749 106 411	21 535 286 290
Total tax liability (thd. rubles)	1040	5NDFL	1 512 849 551	1 544 141 569	1 708 702 659	1 908 281 573	2 142 501 661	2 398 244 576	2 567 468 160	2 799 863 352
			12.9%	12.9%	12.7%	13.0%	13.0%	13.0%	13.0%	13.0%
Total tax withheld (thd. rubles)	1050	5NDFL	1 504 130 111	1 540 158 229	1 703 429 843	1 904 548 640	2 139 208 063	2 392 679 884	2 584 808 819	2 789 993 287
<b>PIT WITHHELD BY TAX AGENTS - 30% FLAT TAX RA</b>	Code	Source	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
The number of <i>info/settlement (svedeniy)</i> for income of individuals in year t, received by the tax authorities	2010	5NDFL	744 974	545 746	506 241	582 115	658 867	643 880	621 264	328 165
Total income (thd. rubles)	2020	5NDFL	57 500 124	58 882 715	636 985 373	56 174 482	53 145 732	54 892 585	55 321 021	49 303 972
Total taxable income (thd. rubles)	2030	5NDFL	43 381 047	36 957 950	392 805 386	41 484 127	46 989 408	48 361 880	48 651 451	37 585 957
Total tax liability (thd. rubles)	2040	5NDFL	12 740 412	10 913 554	115 101 287	12 362 701	13 997 113	14 410 109	14 513 108	11 088 532
			29.4%	29.5%	29.3%	29.8%	29.8%	29.8%	29.8%	29.5%
Total tax withheld (thd. rubles)	2050	5NDFL	12 332 173	10 697 311	11 306 458	12 098 027	13 771 942	14 136 320	14 374 617	10 811 351
<b>PIT WITHHELD BY TAX AGENTS - 9% FLAT TAX RAT</b>	Code	Source	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
The number of <i>info/settlement (svedeniy)</i> for income of individuals in year t, received by the tax authorities	3010	5NDFL	3 383 952	2 941 179	3 046 585	3 602 913	3 093 022	3 007 734	2 917 472	20 109
Total income (thd. rubles)	3020	5NDFL	377 973 305	357 727 109	437 006 364	554 497 109	676 177 184	769 205 095	1 186 252 110	4 103 549
Total taxable income (thd. rubles)	3030	5NDFL	351 847 298	333 775 652	408 392 665	526 334 874	646 534 692	735 421 202	1 119 702 367	4 031 363
Total tax liability (thd. rubles)	3040	5NDFL	31 713 851	29 955 241	36 750 855	47 356 164	58 178 336	66 172 572	100 734 026	490 708
			9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	12.2%
Total tax withheld (thd. rubles)	3050	5NDFL	31 649 509	30 007 516	36 642 571	47 183 451	58 054 851	65 901 234	100 619 677	697 193
<b>PIT WITHHELD BY TAX AGENTS - 35% FLAT TAX RA</b>	Code	Source	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
The number of <i>info/settlement (svedeniy)</i> for income of individuals in year t, received by the tax authorities	4010	5NDFL	3 875 212	2 080 589	2 407 986	1 134 930	880 281	722 166	925 459	2 375 922
Total income (thd. rubles)	4020	5NDFL	12 236 143	9 541 671	15 457 436	11 327 585	9 532 113	8 482 523	7 396 791	18 543 174
Total taxable income (thd. rubles)	4030	5NDFL	11 909 507	9 288 326	15 331 168	10 912 024	9 113 006	8 091 820	7 018 977	18 130 222
Total tax liability (thd. rubles)	4040	5NDFL	4 104 287	3 182 001	5 286 277	3 767 364	3 135 978	2 804 930	2 436 199	6 250 225
			34.5%	34.3%	34.5%	34.5%	34.4%	34.7%	34.7%	34.5%
Total tax withheld (thd. rubles)	4050	5NDFL	3 746 348	2 827 398	4 554 666	3 230 691	2 481 062	2 040 566	2 134 648	5 967 989
<b>PIT WITHHELD BY TAX AGENTS - 15% FLAT TAX RA</b>	Code	Source	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
The number of <i>info/settlement (svedeniy)</i> for income of individuals in year t, received by the tax authorities	5010	5NDFL		8 586	10 735	11 861	11 074	11 429	9 860	10 410
Total income (thd. rubles)	5020	5NDFL		1 812 530	2 871 164	2 827 380	4 587 642	4 454 105	6 284 656	16 647 029
Total taxable income (thd. rubles)	5030	5NDFL		1 797 807	2 854 176	2 816 213	4 583 042	4 448 085	6 271 369	14 676 288
Total tax liability (thd. rubles)	5040	5NDFL		262 892	422 036	414 280	655 012	663 840	935 971	2 170 075
				15%	14.8%	14.7%	14.3%	14.9%	14.9%	14.8%
Total tax withheld (thd. rubles)	5050	5NDFL		258 126	415 196	408 567	645 740	657 106	931 940	2 045 734
<b>PIT WITHHELD BY TAX AGENTS - other tax rates</b>	Code	Source	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>

[illegible]

Table B11. Raw Russian Income tax tabulations, 2008-2015 (tables PIT3 P1 and PIT3 P3)									
Annual gross revenue (assessable income) threshold in current rubles (thr)	All taxpayers submitting a declaration 3-NDFL (table PIT3 P1) (all income sources included)				Taxpayers with entrepreneurial income submitting a declaration 3-NDFL (table PIT3 P3) (entrepreneurial income only)				
	Number of declarations in bracket [thr <sub>i</sub> , thr <sub>i+1</sub> [	Fraction of adult population with income y ≤ thr <sub>i</sub>	Log-linear Pareto coefficient a $a_i = \log[(1-p_i)/(1-p_{i+1})] / \log[thr_{i+1}/thr_i]$	Inverted Pareto coefficient b = a/(a-1)	Number of taxpayers in bracket [thr <sub>i</sub> , thr <sub>i+1</sub> [	Fraction of adult population with income y ≤ thr <sub>i</sub>	Log-linear Pareto coefficient a $a_i = \log[(1-p_i)/(1-p_{i+1})] / \log[thr_{i+1}/thr_i]$	Inverted Pareto coefficient b = a/(a-1)	Fraction of declarations with entrep. income
<b>2008</b>	n	p	a	b	n	p	a	b	
1	5 307 756	0.948172175	0.181910178		65 829	0.998948079	0.05968182		1%
1 000 000	428 726	0.995801425	1.07730753	13.93535061	34 570	0.99953880	0.484948436		8%
10 000 000	33 302	0.999648606	0.825156369	-4.7193962	14 067	0.999849012	0.785229184		42%
100 000 000	4 829	0.999947442	1.081136679	13.32488203	2 428	0.999975242	1.317543959	4.149170286	50%
500 000 000	535	0.999990775	1.060180713	17.6166194	236	0.99999703	1.80083180	2.248701665	44%
1 000 000 000	455	0.999995576	1.113063323	9.844601203	95	0.999999148			19%
10 000 000 000	38	0.999999659							
Total declarations	5 775 641	5.18%	Average gross revenue		117 225		Average gross revenue		2%
Total ≥1 000 000	467 885	0.42%	2 004 268		51 396		20 683 596		11%
Total adult pop.	111 439 000								
<b>2009</b>	n	p	a	b	n	p	a	b	
1	4 511 724	0.957129114	0.200708913		55 657	0.999098237	0.05777043		1%
1 000 000	267 999	0.997321393	0.963773673		30 965	0.999594053	0.494197674		12%
10 000 000	27 276	0.999708838	0.781298519		12 116	0.999869902	0.768621448		44%
100 000 000	4 437	0.999951823	1.067023547	15.92012957	2 144	0.999977836	1.229368826	5.359790381	48%
500 000 000	557	0.99999135	1.229840528	5.350842774	254	0.999996936	1.934411658	2.070192127	46%
1 000 000 000	385	0.999996312	1.154602343	7.468207271	90	0.999999198			22%
10 000 000 000	29	0.999999742							
Total declarations	4 812 407	4.29%	Average gross revenue		101 226				2%
Total ≥1 000 000	300 683	0.27%	1 950 456		45 569				15%
Total adult pop.	112 253 500								
<b>2010</b>	n	p	a	b	n	p	a	b	
1	5 108 572	0.951381133	0.19901620		53 993	0.999113061	0.056570686		1%
1 000 000	318 741	0.996890378	1.06110674	17.36480694	30 965	0.999594053	0.494197674		10%
10 000 000	25 087	0.999729853	0.762635315		12 116	0.999869902	0.768621448		48%
100 000 000	4 216	0.99995334	1.015372039	66.0531800	2 144	0.999977836	1.229368826	5.359790381	51%
500 000 000	579	0.999990896	1.206016592	5.853977965	254	0.999996936	1.934411658	2.070192127	44%
1 000 000 000	416	0.999996054	1.215039962	5.650298439	90	0.999999198			20%
10 000 000 000	27	0.999999759							
Total declarations	5 457 638	4.86%	Average gross revenue		99 562		Average gross revenue		2%
Total ≥1 000 000	349 066	0.31%	1 822 070		45 569		22 020 289		13%
Total adult pop.	112 253 500								
<b>2011</b>	n	p	a	b	n	p	a	b	
1	5 665 202	0.946084299	0.19202626		54 994	0.999121907	0.05908383		1%
1 000 000	397 333	0.996201976	1.12779504	8.825029527	29 584	0.999611816	0.49338864		7%
10 000 000	26 637	0.999717016	0.77655214		11 358	0.999875362	0.72539790		43%
100 000 000	4 264	0.999952662	0.99032205		2 247	0.999976544	1.19298904	6.18164140	53%
500 000 000	642	0.999990384	1.28847470	4.466508511	264	0.999996561	1.66171970	2.511213888	41%
1 000 000 000	430	0.999996063	1.47226875	3.11743842	122	0.999998913			27%
10 000 000 000	15	0.999999867							
Total declarations	6 094 523	5.39%	Average gross revenue		98 569		Average gross revenue		2%
Total ≥1 000 000	429 321	0.38%	1 765 301		43 575		23 922 319		10%
Total adult pop.	113 038 000								
<b>2012</b>	n	p	a	b	n	p	a	b	
1	5 892 092	0.943431779	0.18222461		48 169	0.99917707	0.05334383		1%
1 000 000	485 468	0.995437269	1.215438048	5.641705625	29 964	0.99960618	0.491868903		6%
10 000 000	26 516	0.999722165	0.802350371		11 417	0.999873109	0.702306157		43%
100 000 000	4 016	0.999956204	1.029751805	34.61140621	2 372	0.999974816	1.134976332	8.40870628	59%
500 000 000	553	0.99999165	1.267310871	4.740962707	304	0.999995947	1.591317996	2.691137437	55%
1 000 000 000	383	0.999996531	1.59439255	2.682389861	151	0.999998655			38%
10 000 000 000	10	0.999999912							
Total declarations	6 409 038	5.66%	Average gross revenue		92 377		Average gross revenue		1%
Total ≥1 000 000	516 946	0.46%	1 700 810		44 208		28 003 957		9%
Total adult pop.	113 297 500								
<b>2013</b>	n	p	a	b	n	p	a	b	
1	6 031 915	0.941718295	0.17678367		43 236	0.999228081	0.04932704		1%
1 000 000	542 840	0.994932075	1.259271972	4.856953739	29 618	0.99960951	0.48035147		5%
10 000 000	26 711	0.99972103	0.8088194		11 818	0.999870801	0.714363568		44%
100 000 000	3 986	0.999956675	1.037280852	27.82342154	2 347	0.99997506	1.101741944	10.82878805	59%
500 000 000	552	0.99999184	1.310277735	4.222918975	310	0.999995765	1.497499659	3.010051627	56%
1 000 000 000	360	0.999996709	1.457765479	3.184524707	170	0.9999985			46%
10 000 000 000	13	0.999999885							
Total declarations	6 606 377	5.83%	Average gross revenue		87 499		Average gross revenue		1%
Total ≥1 000 000	574 462	0.51%	1 693 891		44 263		30 927 291		8%
Total adult pop.	113 352 500								

2014	n	p	a	b	n	p	a	b	
1	6 354 278	0.938318076	0.16826259		43 648	0.999231135	0.04976225		1%
1 000 000	654 754	0.993966318	1.304031391	4.289134049	29 142	0.999613387	0.468684303		4%
10 000 000	28 950	0.999700394	0.813097467		12 003	0.999868601	0.69894106		41%
100 000 000	4 221	0.999953926	1.007246317	139.0011408	2 470	0.999973718	1.076114096	14.13817089	59%
500 000 000	613	0.999990892	1.284275553	4.517713669	329	0.99999535	1.394356568	3.535776201	54%
1 000 000 000	404	0.999996261	1.268700039	4.721622089	202	0.999998231			47%
10 000 000 000	23	0.999999799							
Total declarations	7 043 243	6.17%	Average gross revenue		87 794		Average gross revenue		1%
Total ≥1 000 000	688 965	0.60%	1 781 649		44 146		33 499 100		6%
Total adult pop.	114 186 500								
2015	n	p	a	b	n	p	a	b	
1	6 446 648	0.938033288	0.17047996		42 687	0.999240538	0.04859928		1%
1 000 000	640 300	0.994121335	1.280959971	4.559225875	28 669	0.99961193	0.447021739		4%
10 000 000	29 988	0.999692164	0.816871436		12 894	0.99986136	0.719335648		43%
100 000 000	4 383	0.99995307	1.040330461	25.79515449	2 508	0.999973542	1.082005245	13.19434189	57%
500 000 000	587	0.999991204	1.253646827	4.942489683	328	0.999995363	1.378511623	3.641926796	56%
1 000 000 000	398	0.999996311	1.212392509	5.708263988	205	0.999998216			48%
10 000 000 000	26	0.999999774							
Total declarations	7 122 330	6.20%	Average gross revenue		87 291		Average gross revenue		1%
Total ≥1 000 000	675 682	0.59%	1 768 869		44 604		34 529 253		7%
Total adult pop.	114 938 000								

Notes. (1) Published income tax tabulations for Russia solely include frequency data (i.e. numbers of taxpayers per gross revenue bracket) and no mean-income data (i.e. mean or total gross revenue per bracket). Here we report a crude estimate of "average gross revenue" obtained by assuming mean-bracket averages (see formula), which clearly over-estimates the true average (because of declining density); indeed we find averages around 2 million rubles, as opposed to about 1 million rubles in aggregate income tax statistics (see Table B10).

(2) The table PIT3-P1 includes all taxpayers submitting an income declaration 3-NDFL. In principle, taxpayers whose income is entirely reported by tax agents (i.e. wages reported by employers, interest and dividends reported by banks or firms) do not need to submit such a declaration (i.e. the 13% income tax withheld at source is considered as final). I.e. the declaration 3-NDFL is compulsory solely for taxpayers who also receive other income flows (such as entrepreneurial income, capital gains, foreign income, gifts, etc.) on which the tax has not been withheld at source. However taxpayers who do not receive such income flows must also submit a declaration 3-NDFL in case they want to claim personal deductions (such as deductions for charitable giving, education or health expenses, mortgage payments, etc., with the exception of deductions for dependent adults and children, which are already taken into account at source).

(3) Table PIT3-P3 includes only the taxpayers with entrepreneurial income submitting an income declaration 3-NDFL. The complete table also includes a bracket-level breakdown of entrepreneurs into "individual entrepreneurs", "heads of peasant farms", "notaries and other with private practice", lawyers".

(4) There are several important limitations about this data: (i) The fraction of adult population submitting a declaration is about 5%-6% throughout the period. It is clear that it must rise from less than 5% below one million rubles to close to 100% in very top brackets (high-income taxpayers have stronger incentives to claim large personal deductions and are more likely to have non-wage income), but we do not know exactly at what speed it goes from 5% to 100%. (ii) The raw tables (both PIT3-P1 and PIT3-P3) use are based upon "gross revenue", i.e. total revenue before any deduction (such as professional expenses for holders of entrepreneurial income, or asset acquisition price and other costs for holders of capital gains, etc.) rather than "taxable income" (i.e. gross revenue minus all deductions; by construction income tax liability equals 13% of taxable income). Available data show that total deductions represent about 75% of gross revenue throughout the period, but we do not know how this average ratio varies across brackets. (iii) These two limitations explain why Pareto coefficients  $a$  (estimated via log-linear interpolation, because of the lack of mean-income data) are so close to 1, so that inverted Pareto coefficients  $b=a/(a-1)$  are so unplausibly high (i.e. 5-10 or more instead of 2-4). See next table for different possible assumptions about correction factors.

**Table B12. Corrected Russian Income tax tabulations, 2008-2015**

Annual taxable income threshold in current rubles [thry=thr*(1-r)]	Corrected table based upon all taxpayers submitting a declaration 3-NDFL (table PIT3 P1) (all income sources included)				Exemple of correction factors	
	Corrected number of taxpayers ny=n/y in bracket [thry <sub>i</sub> ,thry <sub>i+1</sub> [	Fraction of adult population with income y≤thry <sub>i</sub>	Log-linear Pareto coefficient a $a=\log[(1-py_i)/(1-py_{i+1})]/\log[thry_{i+1}/thry_i]$	Inverted Pareto coefficient b=a/(a-1)	<b>Declaration rate:</b> fraction of taxpayers in gross revenue bracket [thr <sub>i</sub> ,thr <sub>i+1</sub> [ submitting a declaration	<b>Deduction rate:</b> average ratio deductions/(gross revenue) in gross revenue bracket [thr <sub>i</sub> ,thr <sub>i+1</sub> [
<b>2008</b>	ny	py	a	b	f	r
0	103 146 446	0.00000000	0.188058153		5%	77%
225 129	7 795 018	0.925586611	1.221864276	5.507260098	6%	77%
2 251 288	475 743	0.995535356	1.358515533	3.789279423	7%	77%
22 512 878	19 316	0.999804444	1.351213377	3.847271961	25%	77%
112 564 392	1 529	0.999977776	1.385385267	3.594805991	35%	77%
225 128 783	910	0.999991493	1.397024741	3.518734722	50%	77%
2 251 287 835	38	0.999999659			100%	77%
Total taxpayers	111 439 000	100.00%				
Total adult pop.	111 439 000					
<b>2009</b>	n	p	a	b	f	r
0	106 970 995	0.00000000	0.221226667		4%	80%
200 000	4 872 709	0.952941292	1.110272628	10.06843353	6%	80%
2 000 000	389 657	0.996349374	1.308541682	4.241053183	7%	80%
20 000 000	17 748	0.999820599	1.324162414	4.084873379	25%	80%
100 000 000	1 591	0.999978705	1.581001889	2.7211648	35%	80%
200 000 000	770	0.999992882	1.440148781	3.271959034	50%	80%
2 000 000 000	29	0.999999742			100%	80%
Total declarations	112 253 500	100.00%				
Total adult pop.	112 253 500					
<b>2010</b>	n	p	a	b	f	r
0	106 080 446	0	0.20994997		5%	80%
200 000	5 795 291	0.945007916	1.213280651	5.688657857	6%	80%
2 000 000	358 386	0.996634733	1.289926476	4.449150331	7%	80%
20 000 000	16 864	0.99982738	1.269083186	4.7163229	25%	80%
100 000 000	1 654	0.999977611	1.548844652	2.822009191	35%	80%
200 000 000	832	0.999992348	1.5026294	2.989537422	50%	80%
2 000 000 000	27	0.999999759			100%	80%
Total taxpayers	112 253 500	100.00%				
Total adult pop.	112 253 500					
<b>2011</b>	n	p	a	b	f	r
0	105 413 470	0	0.19516856		5%	75%
248 463	7 224 236	0.932548964	1.27983416	4.573545072	6%	75%
2 484 628	380 529	0.996458767	1.30647583	4.262900058	7%	75%
24 846 276	17 056	0.999825145	1.23474296	5.259978725	25%	75%
124 231 379	1 834	0.999976032	1.63055762	2.585897885	35%	75%
248 462 758	860	0.999992259	1.76591679	2.305624851	50%	75%
2 484 627 577	15	0.999999867			100%	75%
Total taxpayers	113 038 000	100.00%				
Total adult pop.	113 038 000					
<b>2012</b>	n	p	a	b	f	r
0	104 073 589	0.00000000	0.18155087		6%	75%
252 706	8 826 691	0.91858681	1.365883993	3.733106724	6%	75%
2 527 057	378 800	0.996494009	1.333741481	3.996331161	7%	75%
25 270 571	16 064	0.999837419	1.27775775	4.600259584	25%	75%
126 352 853	1 580	0.999979205	1.602210982	2.6605476	35%	75%
252 705 705	766	0.999993151	1.889861721	2.123770105	50%	75%
2 527 057 054	10	0.999999912			100%	75%
Total taxpayers	113 297 500	100.00%				
Total adult pop.	113 297 500					
<b>2013</b>	n	p	a	b	f	r
0	103 082 842	0.00000000	0.17381252		6%	73%
269 856	9 869 818	0.909400692	1.409669899	3.440989691	6%	73%
2 698 563	381 586	0.996472598	1.340524639	3.936645066	7%	73%
26 985 632	15 944	0.999838961	1.284350691	4.516784142	25%	73%

134 928 158	1 577	0.99997962	1.656096966	2.524164951	35%	73%
269 856 316	720	0.999993533	1.751160622	2.331273193	50%	73%
2 698 563 164	13	0.999999885			100%	73%
Total taxpayers	113 352 500	100.00%				
Total adult pop.	113 352 500					
<b>2014</b>	<b>n</b>	<b>p</b>	<b>a</b>	<b>b</b>	<b>f</b>	<b>r</b>
0	101 848 844	0.00000000	0.16106368		6%	73%
268 694	11 904 618	0.89195171	1.454706793	3.199219397	6%	73%
2 686 940	413 571	0.996207626	1.347239584	3.879855998	7%	73%
26 869 405	16 884	0.999829521	1.255072402	4.920455489	25%	73%
134 347 023	1 751	0.999977384	1.635808063	2.572801695	35%	73%
268 694 046	808	0.999992722	1.557873188	2.792522068	50%	73%
2 686 940 459	23	0.999999799			100%	73%
Total taxpayers	114 186 500	100.00%				
Total adult pop.	114 186 500					
<b>2015</b>	<b>n</b>	<b>p</b>	<b>a</b>	<b>b</b>	<b>f</b>	<b>r</b>
0	102 847 751	0.00000000	0.16300473		6%	74%
260 657	11 641 818	0.894810686	1.430739491	3.321588852	6%	74%
2 606 573	428 400	0.996098495	1.349990038	3.857224183	7%	74%
26 065 732	17 532	0.999825722	1.293209495	4.410530758	25%	74%
130 328 661	1 677	0.999978257	1.604223073	2.655017898	35%	74%
260 657 322	796	0.999992848	1.49989847	3.000406204	50%	74%
2 606 573 219	26	0.999999774			100%	74%
Total taxpayers	114 938 000	100.00%				
Total adult pop.	114 938 000					

Notes. These corrected income tax tabulations take into account the fact that only a fraction of taxpayers need to submit a declaration, and that raw tabulations use "gross revenue" rather than taxable income. In effect, tax-data correction factors need to make two assumptions, about the declaration-rate profile and the deduction-rate profile: (1) The profile (number of declarations)/(number of taxpayers) follow a rising profile such that the implicit inverted Pareto coefficients have "reasonable value" (2-4 rather than 5-10). Alternative correction factors are presented in the following table.(2) The simplest assumption for deductions is to assume a flat profile: i.e. the deductions/(gross revenue) ratio can be assumed to be constant across brackets and equal to the average ratio observed in aggregate income tax statistics (see Table B10); alternatively one could assume an upward-sloping profiles (see variants).