



HAL
open science

Essais sur l'intermédiation financière dans les pays émergents de l'Europe : de la transition économique jusqu'à la crise

Jasna Atanasijević

► **To cite this version:**

Jasna Atanasijević. Essais sur l'intermédiation financière dans les pays émergents de l'Europe : de la transition économique jusqu'à la crise. Economics and Finance. Université Panthéon-Sorbonne - Paris I, 2013. English. NNT : 2013PA010004 . tel-03745609

HAL Id: tel-03745609

<https://theses.hal.science/tel-03745609v1>

Submitted on 4 Aug 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

UNIVERSITE PARIS 1 – PANTHEON – SORBONNE

U.F.R. DE SCIENCES ECONOMIQUES

Année 2013

ESSAYS ON FINANCIAL INTERMEDIATION IN EMERGING
EUROPE FROM TRANSITION TO CRISIS

Thèse de Doctorat en Sciences Economiques

(Arrêté du 30 mars 1992)

présentée et soutenue publiquement le 13 décembre 2013 par

Jasna ATANASIJEVIĆ

Directrice de recherche :

Madame Mathilde MAUREL, Directrice de recherche au CNRS, Université Paris 1

Composition du Jury :

Mme Slađana BARJAKTAROVIC-RAKOČEVIĆ (rapporteur), Professeur à
l'Université de Belgrade

M. Fabrizio CORICELLI, Professeur à l'Université Paris 1

Mme Mathilde MAUREL, Directrice de recherche au CNRS, Université Paris 1

M. Boris NAJMAN, Maître de conférence à l'Université Paris Est Créteil

Mme Milica UVALIĆ (rapporteur), Professeur à l'Université de Pérouse

L'Université de Paris I n'entend donner aucune approbation ou improbation aux opinions émises dans cette thèse. Ces opinions doivent être considérées comme propres à leurs auteurs.

Remerciements

Mes remerciements s'adressent en premier lieu à ma directrice de thèse, Mathilde Maurel, pour la confiance qu'elle m'a accordée pour rédiger cette thèse ainsi que pour ses conseils et son soutien.

Cette thèse doit également beaucoup à Boris Najman qui a suivi l'ensemble de mes travaux. Il a beaucoup contribué à ce travail, de par l'article que nous avons écrit ensemble, par nos fructueuses discussions, ses encouragements et ses conseils, sa relecture attentionnée de la thèse, ainsi que par sa gentillesse et son humour.

De même, je tiens à remercier très sincèrement Milica Uvalic et Sladjana Barjaktarovic-Rakocevic, qui ont accepté d'être rapporteurs de cette thèse, ainsi que Fabrizio Coricelli, Mathilde Maurel et Boris Najman, qui ont accepté d'être membres du jury de soutenance.

Je voudrais faire part de ma grande reconnaissance aux relecteurs patients de certains chapitres, Marko Danon, Ivona Radosavljevic, Ramona Jimborean, Andrew Roberts, Aleksa Nenadovic, Jovan Brakus, Milica Matijevic, Peter Sanfey. Je remercie aussi à ma mère Vesna Dimitrijevic et à son collègue Zlatan Kratovic, qui m'ont beaucoup aidé au cours de la construction de la base de données des banques serbes que j'ai obtenue par la gentillesse de la Banque nationale de Serbie. J'adresse aussi ma gratitude aux rapporteurs anonymes pour leurs commentaires sur les parties publiées de la thèse.

Je désire ensuite grandement remercier Kori Udovicki qui a su reconnaître mes intérêts scientifiques et qui m'a donnée la possibilité de participer au projet de création d'un centre de recherche dans le cadre duquel j'ai pu poursuivre une étude qui fait partie de ma thèse. Je remercie également de tout cœur Vladimir Cupic, l'ex-directeur de la Hypo-Alpe-Adria banque à Belgrade, où j'occupe actuellement le poste d'économiste en chef. Il m'a donné des éclaircissements pertinents de la vie pratique d'une banque opérant dans un environnement de transition, ce qui se trouve être dans le centre de mon intérêt scientifique, ainsi que de cette thèse. Je lui remercie aussi de ses points de vue originaux et pratiques sur mon sujet. J'adresse une chaleureuse reconnaissance au directeur actuel de la banque, Zoran Vojnovic, pour son soutien et surtout sa compréhension de mes priorités académiques pendant la finalisation de la

thèse en 2013. Je remercie également mes deux collaborateurs les plus proches dans mon poste actuel, Olivera Radisa et Marko Danon, pour leur appui et assistance pendant mes recherches et pour leur soutien amical dans la période de finalisation de la thèse. Également, les discussions quotidiennes avec les autres collègues ont toujours été très enrichissantes. Ici je pense surtout à Mirko Spanovic, Martin Kammermeier, Oliver Klessinger, Rade Vojnovic, Milos Velimirovic, Srdjan Vidovic, Vesna Djordjevic, Jelica Vujacic, Vesna Tomasevic, Maja Bozovic, Jana Grujic, Dusan Mihailovic, Darko Blazic, Danica Jovic, Ivana Petrovic, Rade Bajic, ainsi qu'à mes collègues de l'époque de CEVES Dusko Vasiljevic, Vuk Djokovic, Sonja Avlijas, Goran Radosavljevic. La collaboration avec eux ainsi que les échanges quotidiens d'idées m'ont toujours beaucoup aidé à raffiner mes pensées et ma compréhension des pratiques de la banque.

Le soutien et la bonne humeur de l'équipe du ROSES ont été déterminants pendant les années de préparation de cette thèse que je passais à Paris en 2005 et 2006. Je pense en particulier à Monica, Ramona, Julie, Clara, Natalia, Do, Waldemar, Fehmi, Olivier, Pramuan. Mme Elda André mérite tout mon gratitude pour sa gentillesse et pour sa disponibilité sans faille depuis mon premier jour de thèse jusqu'à la soutenance.

Le soutien financier dont j'avais bénéficié en tant que boursier du Gouvernement français pendant les années 2005 et 2006 était un élément très important pour la réalisation de cette thèse. Je remercie à Eric Tonon, le conseiller à l'Ambassade de France de l'époque pour mon inscription en thèse et pour son engagement et Lila Prstojevic et Vesna Adamovic qui ont eu toujours beaucoup de patience pour organiser mes séjours en France.

Tanja, Alma, Ana, Jasmina, Maja, Jovana, Davor, Dragana, Marijana, Milja, Srdjan, Aleksa, Maja, Vuk, Jelena, Vanja, Milica, Stefano, Djurdjica, Tanja, Sandra, Natasa, Sanja, Irena, Vlada, Vesna, Jela, Maja, Verica, Bule, Irany, Zizi, Aimee, Rosa, mes cousins Marko, Kata, Velibor, Marina, Lidiya, amis à l'infinie patience, toujours présents pour les hauts comme pour les bas, dont l'amitié et le soutien ne m'ont jamais fait défaut au cours de ces années alors même que j'avais parfois tendance à m'éloigner. Quelques uns parmi eux avaient toujours confiance en moi, même dans les moments où la confiance m'a manquée. Mes amis parisiens méritent également une chaleureuse gratification. Les moments passés avec eux lors de mon séjour à Paris étaient un contrepois précieux à mes efforts scientifiques. Ici je tiens remercier Marija, Miona, Monica, Ramona, Waldemar, Dragan, Gauthier. Je garderai toujours dans mon cœur l'amitié avec Henri-Louis Védie et sa famille – Marie-Odile, Loïk et Bertrand,

surtout leurs accueils chaleureux dans la maison à Briquebeque resteront dans mon souvenir. Le soutien ne m'a pas manqué de Marie-Françoise de Saint Remy, l'amitié que je garde depuis mon année à Toulouse, lorsque je faisais mon Master. Ma gratitude va également à Carole Decamps dont la compréhension pour mes aspirations académiques m'était très importante. Ses mots pendant mes visites à l'HEC afin de me servir des ressources de leur bibliothèque, « ici c'est votre maison », resteront toujours dans ma mémoire.

Il y a des personnes qui méritent une reconnaissance particulière pour m'avoir poussé à avancer et terminer la thèse dans les moments difficiles ou je perdais la motivation. Ici, mise à part ma mère, je pense notamment à Ivona Radosavljevic, Bogdan Solaja, Jasna Vidic, Daca Stefanovic, Lenka Brkic et leurs sages conseils sur la vie scientifique. Mes remerciements vont également à Andrea Prsic pour son aide lors de la rédaction de certaines parties de cette thèse lorsque j'avais ma main cassée en hiver 2012/2013 ainsi qu'à Tavia Tomlinson et à Igor Bagayev pour leur assistance linguistique.

Ce travail doit avant tout aux encouragements tout au long de ces années de ma famille. Mes pensées vont en particulier vers ma mère Vesna Dimitrijevic, mon père Veljko Dimitrijevic, ma sœur Milica Dimitrijevic et son fiancé Mirko Minic. Je suis reconnaissante de plein cœur à mes deux grand-mères Miladinka Trninic et Vasilija Dimitrijevic, les deux décédées en 2009, pour leur soutien dans la préparation de ma thèse, pour leur accueil et leur soin quand j'avais besoin de calme et de tranquillité pour rédiger la thèse, cachée du rythme quotidien. Je suis également reconnaissante à mon grand père Dragoljub Dimitrijevic, lui aussi défunt, pour la flamme de l'amour pour la science qu'il avait illuminé lorsque j'étais petite et qui ne m'a jamais quitté depuis.

A mon fils Mihailo

Abbreviations and Acronyms

BEEPS	Business Environment and Enterprise Performance Survey
BIS	Bank for International Settlements
CAD	Current account deficit
CD	Certificate of deposits
CDS	Credit default swaps
CEE	Central and Eastern Europe
CEEB	Central and Eastern Europe and Baltic
CEO	Chief Executive Officer
CESEE	Central, Eastern and South-eastern Europe
CEVES	Centar za visoke ekonomske studije (in English: Center for High Economic Studies)
CIS	Commonwealth of Independent States
EBRD	European Bank for Reconstruction and Development
ECB	European Central Bank
EU	European Union
FDI	Foreign Direct Investment
FED	Federal Reserve System
GDP	Gross domestic product
GLS	Generalized least squares
GMM	Generalized method of moments
IMF	International Monetary Fund

IT	Inflation targeting
LHS	Left hand side
NATO	North Atlantic Treaty Organization
NBS	National bank of Serbia
NMS	New member states
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary least squares
RHS	Right hand side
ROA	Return on assets
SEE	South-eastern Europe
SME	Small and medium size enterprises
SOCB	State owned commercial banks
SOE	Socially owned enterprises
TFP	Total factor productivity
US	United States
USSR	Union of Soviet Socialist Republics
VAR	Vector auto-regression
WBES	World Business Environment Survey

Contents

Remerciements	iii
Abbreviations and Acronyms	vii
Contents	ix
List of tables	xii
List of figures	xv
Summary in French (Résumé en français): Essais sur l'intermédiation financière dans les pays émergents de l'Europe: de la transition économique jusqu'à la crise	xvi
General introduction.....	1
Chapter 1. Financial integration, income convergence and European integration of the Emerging Europe from the post-crisis perspective	25
1.1. Introduction	25
1.2. The transmission of the global crisis and the role of financial and European integration.....	27
1.3. Financial integration, EU integration and income convergence.....	31
1.4. Transforming financial sectors: Banking sector reforms, an overview	42
1.5. Concluding remarks.....	58
Appendix to Chapter 1.	61
Chapter 2. Pre-Crisis Lending Market Dynamics: Credit Boom, Competition, Information and Segmentation	62
2.1. Introduction	62
2.2. Overview of the Literature on Credit Boom, Competition, Segmentation and Information.....	66
2.3. Monetary and Banking Sector in Serbia.....	73
2.3.1. Macro-economic and Monetary Framework.....	73

2.3.2.	The evolution of the banking sector in Serbia and framework for the empirical analysis	75
2.3.3.	Lending terms and competitive environment in 2005: Result of detailed field survey	80
2.4.	Theoretical Framework	94
2.5.	Estimation Methodology and Estimation Specification	103
2.5.1.	Model Specification	105
2.5.2.	Dataset	106
2.5.3.	Definition of Variables	108
2.6.	Estimation Results	111
2.6.1.	Net interest margin: market power	111
2.6.2.	Asset quality: measured by “hard” Information	114
2.7.	Conclusion	116
	Appendix to Chapter 1.	121
Chapter 3.	Monetary Policy Transmission in Emerging Europe: the Role of Bank Credit and Other Challenges	137
3.1.	Introduction	137
3.2.	Monetary policy transmission – theory and empirical evidence: overview of main channels	142
3.3.	Monetary policy in European transition countries	148
3.3.1.	Monetary policy practice	149
3.3.2.	What we know on monetary policy transmission in Emerging Europe	153
3.3.3.	Inflation targeting framework	168
3.4.	Theory on credit channel and bank lending channel – credit view vs. money view: background for the empirical research	174
3.5.	Empirical estimation of the bank lending channel in Serbia	181
3.5.1.	Estimated model	181
3.5.2.	Data base description	185

3.5.3. Methodology and Results	186
3.6. Challenges to effective monetary transmission: the analysis of the case of Serbia.	192
3.7. Concluding remarks.....	199
Appendix to Chapter 3.	202
Chapter 4. Financial Integration and Macroeconomic Sustainability: a Sector Approach to Access to Finance and the Pre-Crisis Growth Model	204
4.1. Introduction	204
4.2. Review of the relevant literature	208
4.2.1. Finance, financial liberalization and growth	209
4.2.2. Empirical literature on firm level financing obstacle.....	212
4.2.3. Credit rationing, financial constraint, information asymmetry – theoretical background	221
4.3. Description of the database.....	225
4.4. Estimation methodology, variables definition and results.....	226
4.4.1. Construction of the dependent variables	227
4.4.2. Definition of independent variables	228
4.4.3. Results from the empirical estimation.....	231
4.5. Discussion of results, conclusion, and policy implications	242
Appendix to Chapter 4.	247
General Conclusion	253
References	268

List of tables

TABLE 1-1. Financial and trade integration of European transition economies before the crisis	33
TABLE 1-2. Domestic credit to non-government sector and cross border lending in European transition economies before the crisis	34
TABLE 1-3. Domestic credit to private sector and stock market capitalisation.....	47
Table 1-4. Foreign currency indexation and loan to deposit ratio in 2012	55
TABLE 1-5. Financial sector evolution indicators, European transition countries	57
TABLE 1-6. Emerging Europe: Standard and Poors' rating overview: 1995-2013	61
TABLE 2-1. Prevailing Effective Interest Rate on New Lending (Aug-Oct 2005).....	84
TABLE 2-2. Average Deviation of Interest Rates from Prevailing Within Banks.....	85
TABLE 2-3. Summary of answers: Question – “Which of the following factors caused changes of interest rates on your bank's credits in the first half of 2005?”	86
TABLE 2-4. Competitive pressure and its effects on lending terms	87
TABLE 2-5. Key barriers to further credit expansion in the first half of 2005	87
TABLE 2-6. Share of different items in bank liabilities	89
TABLE 2-7. Currency structure of bank liabilities.....	89
TABLE 2-8. Ranking of the relative cost of the each category of liabilities (from 1 'the lowest' to 11 'the highest').....	90
TABLE 2-9. Banks' evaluation of the inter-bank liquidity market (based on total 19 answers)	91
TABLE 2-10. Number of banks that one bank is ready to place to, overview of the answers	91
TABLE 2-11. The frequency of transaction on the inter-bank liquidity market.....	92
TABLE 2-12. Preferences in bank liquidity management	92
TABLE 2-13. Interest rates on the last inter-bank loan, (in % p.a.)	94
TABLE 2-14. Distribution of observation across bank types	108
Table 2-15. Estimation results for interest margin.....	113
TABLE 2-16. Estimation results for bank asset quality.....	116
TABLE 2-17. Macroeconomic and banking sector indicators for Serbia.....	131
TABLE 2-18. Asset and liabilities structure of banks by ownership type, evidence from the database	132

TABLE 2-19. Field survey coverage	133
TABLE 2-20. Variables definition and descriptive statistics.....	134
TABLE 2-21. Correlation matrix of variables	135
TABLE 2-22. Criteria for Classification of Bank Claims in Accordance with Degree of Collectability, 2005	136
TABLE 3-1. Monetary Policy Frameworks, Exchange Rate Regimes, and Inflation Rates in Transition Economies, 1993-2008	151
TABLE 3-2. Overview of the Exchange Rate Pass-Through to Prices in Transition Countries	155
TABLE 3-3. Definition of variables and indicative parameters from IMF (2008).....	173
TABLE 3-4. Baseline model.....	189
TABLE 3-5. Model with bank characteristics and interaction term with monetary policy: size, liquidity, and capitalization	191
TABLE 3-6. Model with foreign ownership as bank characteristic and interaction terms with both local and foreign monetary policy.....	192
TABLE 3-7. Financing available to enterprises (as a percentage of total financing)	199
TABLE 3-8. Variables definition and descriptive statistics.....	202
TABLE 4-1. Major business obstacle, summary for 18 European transition countries (list in Appendix).....	206
TABLE 4-2. Access to finance obstacle vs. industry, overview of database.....	229
TABLE 4-3. Probit model : Dependent variable: Access_to_finance_1, marginal effects ...	235
TABLE 4-4. Probit model: Dependent variable: Access_to_finance_2, marginal effects	236
TABLE 4-5. Distribution of observation of ‘Access to finance’ as business obstacle across firms split by their use of loan financing.....	237
TABLE 4-6. Probit model on sub-sample of firms that do not use a loan or a credit line: marginal effects	238
TABLE 4-7. Distribution of answers on reasons why firm did not apply for a loan or a credit line – by business sector (manufacturing and other industries)	240
TABLE 4-8. Probit model for determinants of loan demand: marginal effects.....	241
TABLE 4-9. Distribution of observations on reasons for not applying for a loan across the status of existing external debt	242
TABLE 4-10. Survey coverage by country and year	247
TABLE 4-11. Definitions of dependent variables	248
TABLE 4-12. Definition of independent variables	249

TABLE 4-13. Variables descriptive statistics	250
TABLE 4-14. Correlation matrix of variables	251
TABLE 4-15. Probit model estimation results for country dummies, marginal effects	252

List of figures

FIGURE 0-1. EBRD Transition indicator score	13
FIGURE 0-2. Nominal per capita GDP in Euro.....	13
FIGURE 1-1. Convergence of income in Europe: 1994-2008.....	26
FIGURE 1-2. Economic growth in transition countries: real GDP annual growth 2000-2012	29
FIGURE 1-3. Exchange rate development in New Europe: 2008-2012	30
FIGURE 1-4. Bank nonperforming loans to total gross loans, index (2007=100)	30
FIGURE 1-5. Current account deficit and income growth in Emerging Europe.....	37
FIGURE 1-6. Current account deficit and income growth, World-wide sample.....	37
FIGURE 1-7. Price of debt and income convergence in selected European countries from transition region.....	39
FIGURE 1-8. Price of debt and income convergence in selected European countries from EU-15	40
FIGURE 1-9. Domestic credit expansion, 2000-2010	51
FIGURE 1-10. Cross border exposures of BIS reporting banks to Emerging Europe.....	54
FIGURE 2-1. Credit to non-monetary non-government sector: annual growth of stock.....	79
FIGURE 2-2. Stylized features on the structure and flows in the banking sector in Serbia ..	120
FIGURE 3-1. The monetary transmission mechanism	143
FIGURE 3-3. Inflation and exchange rate: January 2007 to June 2013.....	195
FIGURE 3-4. Inflation, interest rate and exchange rate changes	195
FIGURE 3-5. Carry trade attractiveness	196
FIGURE 3-6. Monetary policy ‘loop’ in small open economy.....	197
FIGURE 3-7. Domestic and cross-border loans and monetary policy instruments	198
FIGURE 3-8. Real exchange rate, inflation targeting countries	200
FIGURE 3-9. Inflation rate, year-on-year, in %	201
FIGURE 3-10. Schematic representation of monetary policy in inflation targeting regime .	203
FIGURE 4-1. Supply and demand for loans	223
FIGURE 4-2. Expected return for bank with imperfect information	223

Summary in French (Résumé en français):

Essais sur l'intermédiation financière dans les pays émergents de l'Europe: de la transition économique jusqu'à la crise

L'intention principale de cette thèse est d'analyser les implications macroéconomiques des défaillances microéconomiques des marchés financiers résultant de la transformation économique des pays d'Europe Centrale et Orientale. Ces implications se sont notamment manifestées durant la récente crise mondiale. Dans ce résumé je présente d'abord l'environnement de la crise puis les principaux traits décrivant les deux décennies de la transition économique précédant la crise dans la région de l'Europe Emergente. J'accorde une attention particulière à 'la dimension financière' pendant les deux phases observées – la crise et la transition. Ensuite seront présentés, le sujet, l'objectif principal, ainsi que la méthodologie utilisée dans la thèse. Puis, suit la description du cadre de préparation de cette thèse et la présentation de sa structure d'ensemble, incluant les résumés des trois chapitres empiriques et de leurs conclusions spécifiques.

L'Europe Emergente : de la transition à la crise

Mon objectif de recherche porte sur les phénomènes qui caractérisent la région de l'Europe centrale et orientale, libellée récemment comme l'Europe émergente ou nouvelle Europe, et précédemment - depuis la chute du mur de Berlin - comme les économies en transition¹. Les liens commerciaux et financiers entre les pays d'Europe ont contribué à la propagation de la

¹ Bien que la transition est considéré par certains comme terminée, j'utilise dans le reste de la thèse alternativement les termes « économies en transition », « Europe émergente » et, dans certains cas, « nouvelle Europe » pour faire référence à cette région. Aucun de ces termes est sémantiquement suffisamment précis pour décrire le profil économique et politique commun des pays ex-communistes d'Europe centrale, orientale et du Sud -Est qui ont aujourd'hui plus ou moins réussi à appliquer les principes d'économie de marché et de démocratie. Les expressions « pays en transition » ou « Europe émergente » sont cependant assez communes pour être utilisées dans des descriptions générales des processus pertinents pour l'ensemble de la région. Bien que le sujet de la thèse porte particulièrement sur la région de l'Europe en transition, quelques-uns de mes résultats empiriques sont également valides pour tout pays en développement connaissant la libéralisation et l'intégration financière dans les flux mondiaux de capitaux. En ce sens, la région européenne est seulement un cadre analytique de phénomènes plus globaux.

crise de la Zone euro vers la région de l'Europe de l'Est. Cette dernière a été intégrée dans l'espace économique et politique européen au cours des deux décennies précédant la crise. Par ailleurs, la crise a apporté une preuve directe de l'intégration de ces économies à l'économie mondiale et notamment aux économies de l'Europe occidentale.

Pour comprendre le contexte économique particulier des pays d'Europe centrale et orientale durant la crise, il est utile ici de faire référence à leur histoire politique et économique récente. Au début des années 1990 tous ces pays ont embarqué dans une transition économique ayant, parmi les objectifs politiques, le passage d'une économie de planification centrale à une économie de marché. Ce processus est particulièrement intéressant car il a eu lieu dans un contexte de globalisation de l'économie mondiale qui a été facilitée par une vague de déréglementation financière et de libéralisation des flux de capitaux et de commerce. La transition a symboliquement commencée avec la chute du mur de Berlin en 1989. Elle est définie comme un processus de réformes économiques et institutionnelles visant à faire passer les économies centralement planifiées, et un socialisme d'État en tant que système politique des pays d'Europe orientale (PECO) centrale et orientale et dans la Communauté des États indépendants (CEI se référant à la plupart des ex pays - URSS), à l'économie de marché et la démocratie comme tradition politique. Les réformes étaient particulièrement profondes et radicales au début du processus et plus souples par la suite, avec les progrès de la transition. Bien que l'agenda des réformes, ainsi que leur vitesse et leur intensité aient variés d'un pays à l'autre, elles ont toutes été conçues de manière à contenir un certain nombre d'éléments principaux communs. Les réformes qui ont marquées la première phase de transition économique visaient la stabilisation macroéconomique, la libéralisation des flux de commerce et de capitaux et la privatisation des entreprises d'Etat. Ce programme de réforme est connu sous le nom de « consensus de Washington² » puisque les prescriptions qui y figurent ont été recommandées par les institutions financières internationales basées à Washington. Dans la seconde phase de la transition l'importance du renforcement des institutions du marché a été mise au premier plan. En même temps les pays en transition d'Europe centrale et orientale se sont lancés sur la voie de l'intégration à l'Union européenne, en tant que partie intégrante de leur processus de transition. Beaucoup d'entre eux sont devenus membres de l'Union comme la République Tchèque, l'Estonie, la Hongrie, la Lettonie, la Lituanie, la Pologne, la Slovaquie et la Slovénie en 2004, la Roumanie et la Bulgarie en 2007 et la Croatie en 2013. Tous ces pays ont généralement convergé vers l'Europe occidentale développée en termes de

² Première fois présenté en 1989 par John Williamson

revenu et de développement institutionnel et économique en général. Beaucoup de ces pays ont encore besoin de mettre en place certaines réformes structurelles afin d'atteindre un niveau de fonctionnement des marchés satisfaisant, une croissance durable incluant la stabilité macro-économique et un niveau suffisant de convergence par rapport aux économies des pays avancés de l'Union européenne qui représentent leur référence historique, géographique, économique et politique. Cependant, le niveau de vie et le respect des principes démocratiques se sont considérablement avancés à travers la région et le niveau d'intégration économique et politique est devenu significatif.

La réforme du secteur financier a été considérée comme l'un des piliers essentiels de la transition, de la convergence et de l'intégration économique de ces pays. Néanmoins, le secteur financier a aussi joué un rôle central dans la transmission de la crise globale. Du fait de son rôle de moteur de croissance suggéré dans la littérature théorique et empirique, la mise en place d'un secteur financier solide et efficace était considérée comme une condition sine qua non pour une transition effective. La réforme du secteur financier, en particulier celle du secteur bancaire, peut être observée pendant les deux phases de la transition économique. En bref, la réforme a commencé avec la privatisation des banques étatiques, la libéralisation des conditions d'entrée des banques étrangères couplée avec l'ouverture du compte de capital. Elle a été accompagnée par la constitution d'un environnement institutionnel adéquat avec la mise en place de règles prudentielles, de standards de comptabilité et d'un cadre de politique monétaire comparable à celui appliqué dans les économies de marché des pays développés. En parallèle, le climat général de la protection des droits de propriété et de l'application de l'Etat de droit étaient renforcés.

Bien que beaucoup de ces économies ont connu une convergence, en termes de revenu moyen, de performance économique générale et de cadre politique, vers l'Europe de l'Ouest et sont devenus membres de l'Union européenne, à la veille de la crise les secteurs bancaires dans tous ces pays étaient marqués par l'héritage spécifique et commun de leur processus de transition. Ainsi, les principales spécificités de leurs secteurs bancaires étaient : (1) l'expérience d'une croissance rapide du crédit suite à la libéralisation des flux de capitaux, qui a conduit à un approfondissement très rapide du marché financier, (2) la domination des banques étrangères, et la forte dépendance des financements extérieurs reflétée par un taux élevé du ratio des crédits sur les dépôts au niveau local, (3) le degré important de l'euroisation financière – une dénomination des crédits et des dépôts en monnaie étrangère conduisant à un risque de change élevé à la fois au niveau macroéconomique et microéconomique.

Directement relié au modèle de réforme décrit plus haut, ces pays ont suivi un modèle de croissance économique spécifique jusqu'à la survenue de la crise mondiale. Leur modèle de croissance d'avant-crise était basé en grande partie sur leur intégration financière grâce à l'importation de l'épargne étrangère sous forme de dette extérieure (BERD, 2009). Ce modèle a donné lieu à une autre série de spécificités macroéconomiques: (1) une libéralisation des marchés financiers pour l'entrée de capitaux étrangers, (2) une croissance fortement liée à la dette extérieure et aux investissements directs étrangers, (3) un déficit persistant du compte courant, (4) un niveau élevé de dette extérieure. Toutes ces caractéristiques représentent une conséquence directe de l'intégration générale de l'Europe émergente dans l'Union européenne, y compris l'intégration politique qui a certainement accentué l'intensité de l'intégration économique. Bien qu'il soit difficile de comparer ces deux sphères d'intégration - politique et économique (financière), il semble que jusqu'à la crise la seconde ait atteint un niveau beaucoup plus avancé que la première.

Lorsque la crise a touché cette région au cours du dernier trimestre de 2008, ses effets se sont rapidement propagés. Au delà du ralentissement du commerce et des investissements directs étrangers, l'un des principaux canaux de transmission a été le secteur financier – qui en même temps est devenu très intégré dans les flux de capitaux internationaux. En particulier, l'influx de capitaux des banques étrangères ayant des filiales locales, ainsi que les crédits directs à des sociétés locales des banques transfrontalières, se sont d'un coup arrêtés. Ainsi, un élément important de la croissance de la demande et de l'investissement d'avant-crise s'est évaporé. Néanmoins, le risque de renversement des flux de capitaux avait été rapidement évité grâce à la coopération internationale. À savoir « l'initiative de Vienne », qui a été signée entre les gouvernements, les banques européennes présentes dans la région de l'Europe en transition et les institutions financières internationales. L'élément principal de cette initiative signé en 2009, et accompagné par des arrangements entre les différents pays et le FMI, était que les grands groupes bancaires présents dans cette région acceptent mutuellement de ne pas réduire le niveau total de leur placements dans chaque pays. Ainsi, la panique générale et le ralentissement qui pouvait résulter d'un désendettement sans coordination avaient été prévenus. D'un autre côté la reprise économique dans ces pays est devenue encore plus incertaine. Puisque les principales banques présentes dans la région de l'Europe Centrale et Orientale proviennent de la Zone euro, les problèmes des secteurs bancaires de la zone ont provoqué une vague de désendettement financier. Ce désendettement s'est propagé aux pays émergents d'Europe en même temps que l'alternative d'un redressement via les exportations

vers le noyau européen s'est affaiblie en raison de la faiblesse de la demande de l'Europe des quinze.

Malgré des politiques contra-cycliques destinées à atténuer ses conséquences négatives, la crise a révélé des déséquilibres fondamentaux qui ont été constitués dans la période précédente et qui représentent aujourd'hui un défi pour une relance économique plus durable. Ces problèmes sont soulignés par le niveau élevé de prêts non productifs et de créances douteuses dans le secteur bancaire, ainsi que par le désendettement général des banques locales et des banques étrangères directement exposées aux firmes locales. Le désendettement a commencé depuis 2010 et 2011 et la reprise du crédit semble incertaine. La viabilité à long terme du modèle de croissance d'avant-crise est remis en question et de nouvelles sources de croissance ont été recherchées via l'augmentation des exportations et de la compétitivité, mais sans résultat significatif pour l'instant.

Le champ, le sujet, le but et l'approche méthodologique de la thèse

Les principales raisons de l'importance macroéconomique d'un système bancaire efficace sont largement reconnues. Elles reposent sur le rôle clé que le système bancaire tient dans une économie: l'intermédiation, la transformation des échéances, la facilitation des transactions de paiement, l'allocation du crédit et le maintien d'une discipline financière entre les emprunteurs. En premier lieu, un secteur bancaire efficace assure une intermédiation efficace et l'allocation de ressources, encourage la gouvernance d'entreprises et la croissance. Deuxièmement, le crédit bancaire joue un rôle important dans la transmission de la politique monétaire. Troisièmement, la stabilité de système bancaire est un pilier pour la stabilité générale d'une économie alors que les crises bancaires entraînent des coûts fiscaux conséquents. Par conséquent, la vulnérabilité des banques suscite la préoccupation des politiques publiques en raison des externalités négatives liées aux faillites bancaires. Enfin, les banques jouent un rôle crucial dans la gestion des risques de l'endettement financier résultant des entrées de capitaux dans une économie (IMF Outlook 2000). En outre, dans une économie intégrée dans les flux de capitaux globaux, la stabilité financière et des prix d'un pays, ainsi que la disponibilité du crédit pour l'économie locale, sont beaucoup plus étroitement liés aux conditions des marchés financiers mondiaux.

L'importance de la structure de financement et de la performance des marchés du crédit dans la compréhension de la macro-économie est mise en avant la première fois au sein de l'Approche de la Structure Financière (Gertler, 1988). Selon ce courant de théorie la

contrainte de crédit et l'asymétrie d'information (imperfection du marché) produisent au moins deux effets macro-économiques. Ces deux effets sont: (1) une variabilité excessive de la production globale et de la consommation individuelle en réponse aux chocs exogènes et (2) l'apparition de cycles déterministes endogènes dans des modèles où cela serait impossible avec des marchés parfaits.

L'intérêt principal exploré et présenté dans cette thèse sous le titre "Essais sur l'intermédiation financière dans la région de l'Europe émergente : de la transition à la crise ", est l'implication macroéconomique de la transformation du secteur financier qui a eu lieu au sein du processus de transition économique et de l'intégration de la région dans le marché financier international. Néanmoins, la thèse se focalise sur les fondements microéconomiques de certaines vulnérabilités macro-économiques qui ont été constitués avant la crise mais qui ont contribué à la propagation des effets négatifs sur l'économie en temps de crise. Pour explorer ce sujet, en dehors des descriptions générales fondées sur des faits macroéconomiques, j'effectue une analyse empirique principalement sur des données micro-économiques. Les problèmes en question sont principalement liés à l'existence d'imperfections de marché tels que l'asymétrie d'information sur le marché local du crédit suite à la libéralisation, mais aussi à certaines défaillances du marché financier global qui se reflètent ensuite sur les conditions d'endettement local. Les vulnérabilités liées au fonctionnement du système financier sont en même temps spécifiques parce qu'elles ne se sont pas manifestées dans les économies développées. Elles n'étaient pas non plus attendues à survenir à priori à la suite des réformes mises en place. Elles sont plutôt le résultat du processus de transition sui generis et peuvent être attribuées à la fois à la transition elle-même et au contexte global.

Dans cette thèse je traite, comme champ de recherche, l'ensemble relativement homogène des économies d'Europe centrale et orientale y compris les économies d'Europe du Sud-Est. Ces pays partagent un passé politique commun ainsi que des objectifs futurs similaires en termes d'intégration politique dans l'Union européenne. Ils partagent également les défis économiques communs, malgré des différences évidentes. Aucun de ces pays n'est particulièrement riche en ressources afin de fonder son développement sur ses exportations, comme le font certaines des économies en transition d'Asie de la Communauté des États indépendants (CEI). En plus, toutes les économies en transition considérées dans cette thèse sont des pays relativement petits. Même en tenant compte de quelques exceptions avec de grands marchés comme la Pologne ou la Roumanie, toutes ces économies ont la nécessité de s'intégrer dans les flux régionaux et internationaux d'échanges. Cette nécessité va de pair avec

des défis spécifiques de la libéralisation du commerce et, dans le cas de l'intégration financière - de l'ouverture du compte de capital pour la stabilité macroéconomique - la gestion de l'inflation, le taux de change, la dette extérieure, le financement étranger du déficit budgétaire, le déficit du compte courant, le chômage. Enfin, ces économies ont un héritage semblable en termes de structure économique, de protection sociale et de culture d'entreprise résultant du système économique passé.

Faisant l'objet d'une transformation rapide et d'une mise en place d'institutions de marché rudimentaires, les économies émergentes d'Europe centrale et orientale, permettent au chercheur d'identifier d'une manière beaucoup plus claire et explicite certains comportements de marché, et des frictions de marché ainsi que de suivre les effets de la politiques économique. Ces derniers sont plus faciles à isoler étant donné que le système des institutions de marché est nouveau et représente un environnement moins complexe pour les processus économiques. Dans la détermination de l'objet de cette thèse, mon intention était de profiter de cette opportunité. D'autre part, faire de la recherche sur les économies en transformation rapide apporte de nombreuses difficultés. En effet, les ruptures structurelles sont fréquentes et résultent de changements dans les institutions et les règlements ainsi que d'événements isolés à forte influence, etc. L'existence de ces perturbations, à mon avis, affaiblit les conclusions de nombreuses études macro-économiques entre pays. En outre, cela implique la nécessité d'analyser même les questions macroéconomiques en prenant en compte l'évolution spécifique de chaque pays ainsi que par le recours à des données microéconomiques. Le changement permanent et la transformation structurelle profonde est remet aussi en question l'efficacité des nouvelles politiques qui sont fondées sur l'expérience précédente (données historiques) ou sur l'expérience d'un autre groupe de pays (dans la plupart des cas, sur les économies de marché développées). Cet argument est connu comme la critique de Lucas. À cet égard, mieux on connaît des comportements individuels et leurs modifications éventuelles résultant de l'environnement économique en évolution, telles que la crise mondiale ou la longue période de transition, mieux sera cerné le cadre pour la définition d'une politique économique appropriée. Une autre limite dans la recherche sur les économies en transition vient de la disponibilité et de la qualité des données. Certaines données sont tout simplement indisponibles et de nombreuses données disponibles sont d'une qualité douteuse résultant du système statistique qui a également été adapté, avec plus ou moins de succès, d'un système économique (planification centrale) à un autre (économie de marché). D'un autre côté, les données micro-économiques, comme par exemple les données financières des entreprises

individuelles, même lorsqu'elles sont disponibles, elles doivent être utilisées avec une attention particulière, car les standards de comptabilité ont fait l'objet de réformes et des changements juridiques particuliers peuvent influencer sur la fiabilité de certains rapports financiers.

Tous les pays en transition n'ont pas eu la même trajectoire ni ont atteint les mêmes niveaux de réussite dans la transition, le développement économique ou la résistance aux effets négatifs de la crise. Cependant, comme décrit précédemment, ils faisaient tous partie d'un processus économique unique et ont partagé le même objectif politique principal en termes de convergence et d'intégration dans l'Union européenne. Le choix de sujets de recherche spécifiques et la proximité physique et mentale aux questions locales m'ont poussé à me focaliser sur la Serbie dans une partie de cette thèse. La Serbie est entrée dans la transition un peu plus tard que les autres économies d'Europe centrale et orientale, à sa sortie d'une décennie de turbulences politiques difficiles dans l'ex-Yougoslavie au cours des années 1990, et s'est engagé dans des réformes politiques et économiques seulement depuis les années 2000. En dépit de cet héritage, la Serbie a connu toutes les réformes économiques typiques d'une économie en transition en Europe, avec apparemment moins de succès, en témoigne son niveau de PIB par habitant encore loin de moyenne des pays d'Europe centrale et orientale. Il serait difficile de revendiquer que les conclusions sur la Serbie sont parfaitement représentatives de tout autre pays en transition. Toutefois, puisque le pays se trouve dans des conditions similaires sur le plan économique et financier, on peut s'attendre à des répercussions semblables dans toute la région.

Bien que l'idée d'analyser un seul pays, comme je le fais dans les chapitres 2 et 3, comporte ses faiblesses, comme l'absence de contrefactuels et la taille limitée des bases de données sur une courte période, elle a aussi des avantages évidents. Étudier les phénomènes liés au secteur financier sur le cas d'un seul pays émergent donne un meilleur aperçu des comportements individuels – ils sont plus clairs, plus évidents, plus rudimentaires. Il est donc plus facile de cerner leurs principaux déterminants que dans les cas de marchés développés avec l'interférence de divers éléments perturbateurs et d'institutions beaucoup plus sophistiquées et complexes. La focalisation sur un seul marché permet au chercheur de mieux cerner les chocs structurels, de définir des variables qui sont plus à même de décrire correctement les spécificités locales et de prendre en compte toutes les informations disponibles, ce qui n'est pas toujours possible de faire à l'échelle d'un panel de plusieurs pays.

Comme l'aspect financier a été l'un des principaux piliers du processus de réforme générale dans la transition, ainsi que l'un des principaux canaux de l'intégration des économies en transition dans l'Europe et les flux financiers internationaux, la compréhension de ses fondements microéconomiques permet ; (1) de mieux comprendre l'origine des vulnérabilités provenant de la période d'avant-crise et qui ont renforcé la propagation de la crise dans la région, (2) d'aider les instigateurs des politiques publiques à définir des politiques et des institutions plus adaptées aux spécificités des économies locales et (3) de donner quelques pistes pour de nouvelles politiques économiques, qui devraient faciliter une relance économique plus durable en aidant les pays à sortir de la crise.

Dans cette thèse, j'ai mis un accent particulier sur les questions microéconomiques immanentes à la transformation du secteur financier qui sont systématiquement pertinents et ont un vaste impact macro-économique. Autrement dit, étant donné que les politiques ciblent des effets macro-économiques alors qu'ils affectent des comportements micro-économiques, il est nécessaire de comprendre le mécanisme intrinsèque du comportement de micro-agents à l'égard de la politique économique afin d'en assurer l'efficacité.

La méthodologie appliquée dans la recherche empirique présentée dans la thèse comprend une enquête de terrain des banques sur la base d'entretiens en face à face à l'aide d'un questionnaire conçu en avance ; une analyse économétrique d'une base de données en panel d'indicateurs financiers de banques individuelles, ainsi que certaines séries de données structurelles et macroéconomiques. L'approche empirique comprend la méthode des moindres carrés généralisées et la méthode des moments généralisées. La question de l'accès au financement est menée en utilisant une estimation probit en s'appuyant sur des données fournies par la BERD et la Banque mondiale, de l'enquête Business Environment and Enterprise Performance Survey (BEEPS).

Le cadre de la préparation de la thèse

Cette thèse est le résultat de huit ans de recherche dans le domaine de l'économie appliquée. En parallèle avec l'encadrement académique au sein de l'Université Paris 1 - Sorbonne, où je faisais d'abord partie du laboratoire ROSES, devenu plus tard, CES (EUREQA) en 2005, cette thèse est également enrichie par mon engagement professionnel. En premier lieu, Mme Mathilde Maurel et M. Boris Najman sont particulièrement responsables pour l'encadrement théorique et l'application d'une approche méthodologique appropriée dans les recherches menées au cours de la préparation de ma thèse. D'un autre côté, le contenu de la thèse est

largement déterminé par mon expérience professionnelle dans mon pays d'origine – la Serbie, tout au long de la période de préparation de la thèse. Cette expérience m'a beaucoup aidé dans le choix de questions pertinentes pour l'étude du secteur financier en transition qui a été le sujet général auquel je me suis intéressée. Elle m'a également permis de bénéficier d'un accès à des sources de données et des institutions comme la banque centrale en tant que régulateur et producteur des principales données pertinentes dans l'étude du secteur financier. La proximité du secteur bancaire serbe et des principales institutions économiques m'a donc aussi aidé à examiner avec plus d'attention l'évolution de la méthodologie des données – elle aussi faisant objet de changements au long de la période observée. Je crois cette proximité m'avoir permis d'éviter dans certains cas les biais dans mes résultats empiriques qui auraient pu provenir de changements méthodologiques dans la constitution de la base ou d'une mauvaise qualité des données.

La recherche présentée dans les chapitres 2 et 3 a été motivé par les idées que j'ai eues quand j'étais chercheur dans un « think tank » serbe – le Centre for Advanced Economic Studies (CEVES). Le CEVES visait à apporter l'excellence dans la réflexion et la pratique économique en Serbie et a entrepris un énorme travail de collecte et d'analyse de toutes les séries macro-économiques pertinentes, un si vaste projet n'ayant pas été mis en place jusque-là. Dans cet objectif général, il a créé un institut conjoint avec la Faculté d'économie de l'Université de Belgrade et a commencé à publier une publication précieuse appelée Bulletin trimestriel sur les tendances et les politiques économiques en Serbie (Quarterly Monitor) qui est toujours une publication phare de la Faculté des sciences économiques et une référence dans son domaine en Serbie. En plus de suivre régulièrement les évolutions du secteur bancaire et monétaire, j'étais en charge de plusieurs projets de recherche spécifiques visant à apporter des connaissances approfondies sur quelques questions importantes, mais pas assez comprises, sur l'évolution du secteur financier. Le premier projet de recherche a eu pour objectif de révéler le niveau des taux d'intérêt et les autres conditions sur le marché du crédit bancaire. Dans l'accomplissement de cette tâche j'ai bénéficié du soutien généreux de Mme Kori Udovicki qui était le fondateur et le directeur du think tank CEVES. J'ai mené une enquête sous la forme d'entretiens avec les représentants des banques serbes. Les entretiens ont été basés sur le questionnaire détaillé préparé précédemment (Annexe au chapitre 1, A.1). Les résultats de cette enquête, qui sont présentés dans sa grande majorité dans le chapitre 2, m'ont inspirés pour approfondir ma recherche afin d'expliquer la dispersion des taux d'intérêt du crédit bancaire enregistré en Serbie. Cette recherche plus poussée, entièrement présentée

dans le reste du chapitre 2, est basée sur l'estimation empirique sur la base de données des rapports financiers couvrant toutes les banques opérant en Serbie pendant la période de libéralisation et de croissance rapide du secteur financier, de 2000 à 2005. Cette étude a été réalisée en coopération avec M. Boris Najman et été publiée dans le *Journal of comparative economic studies* (Palgrave MacMillan) en Juin 2008. Nous avons identifié la présence d'une segmentation du marché du crédit typique d'un secteur bancaire libéralisé dans un pays émergent où la concurrence entre les deux types de banques - l'une avec un avantage en termes de coûts, mais avec un désavantage en termes d'information (les banques étrangères) et l'autre avec un avantage et un désavantage inversés (les banques locales) -- se produit. Notre dernier constat met en évidence le niveau élevé de l'asymétrie d'information sur le marché du crédit, ce qui était raisonnable puisque le secteur bancaire était « nouveau » en ce qui concerne les agents du marché financier, mais aussi en ce qui concerne le cadre institutionnel modelé par d'importantes réformes pendant la transition. En même temps, il y avait certains segments de marché où les banques exerçaient un pouvoir de marché, comme vers les petits et moyens entreprises et les ménages. Aussi, une partie de la demande de crédit était presque inélastique au prix (le taux d'intérêt). Le résultat fut non seulement un niveau général des taux d'intérêt élevé, mais également une dispersion élevée entre le taux d'intérêt enregistrés sur les crédits aux différents types de client dans une même banque, ainsi que pour le même type de prêt et le même type de client entre les banques. Ce dernier point, en complément de mon observation résultant de deux ans de suivi et de rédaction d'une analyse régulière des développements du secteur monétaire et bancaire dans la publication *Quarterly monitor*, m'a dévoilé une autre question qui méritait d'être exploré en détail. Ainsi, j'ai formulé le sujet du chapitre 3. Plus précisément, la segmentation détectée typique sur le marché du crédit dans les économies en transition, dominé par des banques étrangères et accompagné de l'introduction d'un nouveau cadre de politique monétaire sous la forme de ciblage de l'inflation implicite, tout ceci se déroulant en parallèle avec les entrées abondantes de crédits transfrontaliers directs, m'ont poussé à étudier la transmission de la politique monétaire par le secteur bancaire, en particulier à examiner l'existence du canal du crédit bancaire. Cette étude est élaborée dans le chapitre 3. La recherche empirique sur données individuelles des bilans trimestriels bancaires pour toutes les banques opérant dans le secteur financier serbe dans la période 2006-2012, combinée avec les statistiques macro-économiques pertinentes pour la question, ont conduit à la conclusion que le canal du crédit bancaire, tout en étant la principale composante de la création monétaire, n'était pas efficace dans la transmission des signaux de la politique monétaire. Il est particulièrement important de le prendre en compte dans le cadre

de l'introduction d'un ciblage d'inflation où le taux d'intérêt de référence, en tant que principal instrument de la politique monétaire, exerce l'impact le plus fort sur les prix par l'intermédiaire du taux de change, alors que le canal du taux d'intérêt est plus faible. La survenue de la crise économique mondiale déclenchée par l'éclatement de la bulle spéculative sur le marché hypothécaire américain (subprime) qui commençait à se répandre en touchant aussi les marchés émergents et les économies en transition, a coïncidé avec ma tâche d'économiste en chef et directeur du département de recherche économique avec une banque en Serbie – Hypo Alpe Adria Bank, membre d'un groupe autrichien, le Hypo Group Alpe Adria. J'ai rejoint la banque en Octobre 2009 où j'ai pris la responsabilité de diverses analyses d'adaptation, aussi avec un risque croissant dans les portefeuilles des prêts bancaires et de montée de l'aversion des banques opérant en Serbie, en particulier des banques étrangères. La crise a commencé à se montrer sous la forme de nombreuses vulnérabilités macroéconomiques et financières. La monnaie locale a commencé à se déprécier, le niveau de NPL a doublé, et le resserrement du crédit était en voie. Non seulement cette crise a bousculé toutes mes convictions antérieures en matière de libéralisation des marchés financiers et du bien-fondé provenant de la doctrine néo-classique derrière la transformation économique, mais elle m'a aussi fait changer de perspective dans la thèse. Notamment, au lieu de projeter la transition comme un processus qui a commencé dans les années 1990, j'ai mis au premier plan la crise, en tenant compte des vulnérabilités dans le secteur financier qui se sont produites comme résultats sui generis de la transition et qui, en fait, ont contribué à la propagation des effets de la crise. Le point de vue de ma position au sein d'une banque étrangère présente sur place, en même temps que mes recherches antérieures sur le secteur bancaire en Serbie, m'ont aidé en premier lieu à expérimenter et à comprendre le rôle systémique d'une grande banque et de saisir l'amplitude de l'impact macroéconomique des développements du secteur financier.

Structure de la thèse et le résumé de principaux sujets traités et des conclusions

La thèse se compose de quatre chapitres. Le Chapitre 1 est introductif et est destiné à présenter l'ensemble du contexte, y compris les réformes du secteur financier, l'intégration financière et ses implications macroéconomiques dans les économies en transition d'Europe depuis le début de la transition dans les années 1990 jusqu'à aujourd'hui. On y présente le lien entre l'intégration financière et la convergence économique ainsi que l'hypothèse sur le rôle stimulant de la perspective d'intégration politique de ces pays pour l'intégration financière de leurs économies avec les pays développés de l'Europe. Ce chapitre couvre également la

description de la transmission de la crise, avec une attention particulière portée aux risques et canaux résultant de la période d'intégration précédente. Il souligne certaines vulnérabilités résultant de l'intégration financière, telles qu'une forte présence de crédit direct transfrontalier et une large portion de crédit indexé en devises. Les trois chapitres qui suivent sont chacun concentré sur l'un des enjeux majeurs dans la compréhension du fonctionnement du secteur financier dans une économie de transition. Le chapitre 2 porte sur l'étude des imperfections du marché de crédit qui se produisent suite à la libéralisation financière. Du fait du rôle important du crédit bancaire dans l'économie et puisque pendant la période de transition un nouveau cadre de politique monétaire a été introduit sous forme de ciblage d'inflation implicite et puis explicite, le chapitre 3 est dédié à l'étude du rôle du crédit bancaire dans la transmission de la politique monétaire. Finalement, à la lumière de la récente crise et de sa propagation sur les économies en transition, qui s'est manifestée sous la forme d'un resserrement du crédit et qui a dévoilé leurs vulnérabilités macroéconomiques, on essaie d'identifier les causes de ces vulnérabilités directement liées à la conception spécifique du marché du crédit dans ces pays. Ainsi, dans le Chapitre 4, on analyse l'accès au financement et sa variation entre les secteurs d'activité, en essayant d'expliquer les fondements microéconomiques et les modes de distribution du crédit (et de la croissance) dans les différents segments de l'économie. Alors que le chapitre 2 et le chapitre 3 sont fondés sur des recherches empiriques du secteur bancaire serbe et de l'économie serbe, comme un cas représentatif de pays européen en transition, le chapitre 4 est basé sur un panel d'économies en transition et des données d'une enquête d'entreprises, la Business Environment and Enterprise Performance Survey (BEEPS), réalisée conjointement par la Banque mondiale et la Banque européenne de reconstruction et développement dans 29 pays en transition portant sur un échantillon fiable d'entreprises de chaque pays.

Chapitre 1 : L'Europe Emergeant – le principaux défis macroéconomiques

L'internationalisation des marchés financiers, qui a pris de l'ampleur depuis les années 1990, a été une partie inséparable du processus plus général de mondialisation, rendu possible par la vague de déréglementation et de libéralisation des flux économiques internationaux. La mondialisation financière en Europe s'est façonnée d'une manière différente qu'ailleurs. Cette distinction se reflète largement dans la direction que prenaient les flux financiers. Le capital « descendait » du noyau riche vers la périphérie pauvre. Il s'agissait de profiter de rendements marginaux sur les investissements plus élevés dans de nouveaux marchés inexploités, en cohérence avec la proposition néo-classique stipulant que le capital va là où le rendement

marginal de l'investissement est plus important. Cela allait quand même à l'encontre du modèle enregistré au niveau global, où le capital « montait » (ce phénomène est connu comme le « Lucas puzzle »), probablement en quête de sécurité et de protection. En phase avec ce dernier phénomène, l'une des hypothèses crédibles expliquant le sens des flux au sein de l'Europe s'est fondé sur le fait que ces nouvelles économies émergentes étaient sur la voie de la convergence politique, y compris d'harmonisation institutionnelle et d'intégration dans l'Union européenne. Ce dernier point aurait ainsi été anticipé et s'est manifesté via la disponibilité des fonds (reflétant la perception d'un risque desserré) qui ont été placés en abondance dans la région de l'Europe en transition. D'autre côté, la réforme du secteur financier en conformité avec les principes du marché a été l'un des piliers essentiels de la transition globale des pays d'Europe centrale et orientale. La réforme a abouti à la libéralisation des marchés financiers et à l'entrée des banques étrangères qui ont canalisés la majeure partie des entrées de capitaux dans cette région. Cette intégration financière a par ailleurs apporté beaucoup de résultats positifs, comme la convergence du revenu moyen et l'amélioration du niveau moyen de vie.

Avec la crise de nombreux déséquilibres fondamentaux, constitués au cours de l'intégration financière de la période précédente, ont propagée les effets de la crise et ont représenté un obstacle supplémentaire pour la reprise économique de la région. Celle-ci est en grande partie dépendante financièrement des pays développés de l'Europe de l'Ouest. Le financement est devenu beaucoup plus coûteux et moins disponible avec plus d'aversion au risque depuis la crise. Depuis lors les banques étrangères présentes localement, et qui dominent les secteurs financiers locaux, se désendettent. Les banques connaissent des moments difficiles, avec un niveau élevé de prêts non performants et une capitalisation insuffisante, et du fait il n'existe aucune perspective de fin de la crise du crédit (« credit crunch »). Les politiques locales ont un espace de manœuvre limité. Le déficit budgétaire, qui a atteint des niveaux trop élevés, fait grimper la dette publique. La politique monétaire est apparemment sans succès dans la relance des investissements et de la consommation, malgré une inflation relativement faible. Il est devenu évident que le modèle de croissance des pays de l'Europe émergente poursuivi jusqu'avant la crise n'était pas viable. En effet il était fondé sur le levier financier du secteur privé qui a entraîné des importations et a créé de grands déséquilibres dans le commerce extérieur et dans la compétitivité externe des économies locales.

Contrairement aux prestations incontestables de la mondialisation dans d'autres domaines tels que le libre-échange, la conscience sur les risques de la mondialisation financière sur la

stabilité macroéconomique et financière existait avant même la dernière crise. Les raisons ont été associées à des différences fondamentales entre le secteur financier et l'économie « réelle ». Même si des marchés de capitaux libres peuvent allouer efficacement le capital, les grandes institutions financières interconnectées peuvent aussi prendre des risques qui imposent de lourdes pertes sous forme d'externalités négatives sur le reste de l'économie, alors que les grandes entreprises manufacturières ne le peuvent pas. La Crise asiatique de 1997 a apporté un changement majeur dans la perspective des flux de capitaux à court terme. Les risques dans les flux de capitaux de court terme sont reconnus être plus importants que les avantages éventuels, et donc les pays devraient s'engager dans une libéralisation plus restrictive qu'avant cette crise, avec une attention particulière portée aux flux de capitaux de court terme (Stiglitz, 2000). Toutefois, les imperfections des marchés financiers en combinaison avec la déréglementation et la libéralisation, y compris les lacunes de système d'incitations dans le comportement des institutions du marché financier se sont apparemment reproduit dans la région de l'Europe émergente et la crise actuelle les a seulement rendus apparents. Bien qu'il n'y ait toujours pas de crise bancaire systémique, mais plutôt plusieurs cas de faillites d'institutions financières, cette liste de risques s'est matérialisée dans une faible et vulnérable économie réelle. L'idée de la recherche empirique présentée dans cette thèse était d'examiner certains de ces risques au niveau microéconomique.

Cette thèse est composée également de trois études sur des dimensions distinctes de l'intermédiation financière dans les économies en transition d'Europe. Le point commun à ces études est qu'elles traitent des défaillances au niveau micro-économique de l'intermédiation financière qui se manifestaient ensuite comme les déséquilibres et les faiblesses des politiques macroéconomiques. Ces vulnérabilités sont devenues particulièrement évidentes avec la crise mondiale. Leur compréhension apparaît ainsi pertinente au regard des perspectives économiques de la région.

Chapitre 2. Le marché du crédit et la compétition suite à la libéralisation

La première étude empirique présentée dans le Chapitre 2 examine les résultats de la concurrence sur un marché du crédit bancaire libéralisé en essor - la phase qui a caractérisé l'intermédiation financière dans les économies en transition. Dans l'exemple de la Serbie, j'arrive aux conclusions suivantes. Tout d'abord, grâce à une enquête sur place que j'ai conçu et réalisé afin de couvrir les conditions du marché du crédit en prenant soin de tous les détails méthodologiques et de la qualité des données, j'ai couvert un échantillon représentatif de 19

banques. L'enquête a enregistré que le niveau des taux d'intérêt des prêts est en général élevé avec une dispersion extrême dans tous les segments de marché et entre les banques. La même enquête a enregistré la présence croissante de la concurrence et de son impact sur les taux d'intérêt du crédit, tandis que les pressions concurrentielles ont été différemment ressenties parmi les différentes banques. De même, il était évident que les différentes banques sont financées par une composition différente de ressources et de prix. L'estimation empirique des déterminants des marges de taux d'intérêt des banques à l'aide de méthode des moindres carrés généralisées sur un panel de données annuelles couvrant le secteur bancaire dans son ensemble en Serbie de 2000 à 2005, a apporté le résultat suivant. Les banques étrangères chargent des marges d'intérêt relativement moins élevées par rapport aux banques locales, une fois que l'on tient compte de la différence dans les coûts administratifs, les coûts de financement et la capitalisation. Cette constatation est en contradiction avec les résultats de recherches à l'échelle mondiale fournie par Claessens et al. (2001) suivant laquelle les banques étrangères ont des marges plus faibles que les banques locales dans les pays développés, mais que c'est l'inverse dans les pays en développement. Sur le cas de la Serbie, le résultat obtenu peut s'expliquer par les coûts administratifs moins élevés dans les banques étrangères et par leur focus sur le segment de marché plus compétitif. La présence générale des banques étrangères, cependant, n'a pas eu d'incidence sur les marges d'intérêt des banques ce qui est en cohérence avec les résultats de l'estimation similaire sur l'Amérique latine fournies par Soledad Martinez et Mody (2004). Un autre résultat montre que les grandes banques ont été en mesure de facturer des marges d'intérêt plus élevées et de cette façon ont probablement exercé un certain pouvoir monopolistique sur les clients. En outre, l'estimation des déterminants de la qualité des actifs bancaires, mesurée par le taux de provisions pour le risque de crédit sur les actifs, révèle que le niveau de risque des banques locales augmente avec la présence accrue des banques étrangères sur le marché. Les résultats précédents indiquent que la concurrence sur le marché du crédit libéralisé entre les nouveaux entrants (banques étrangères) et les banques locales déjà présentes peuvent engendrer des phénomènes de «flight to captivity³» : des emprunteurs moins transparents vont vers les banques locales alors que les emprunteurs plus transparents vont auprès des banques étrangères où ils peuvent trouver un prix d'endettement plus attractif. Les banques étrangères ont un avantage de coût car elles ont accès au refinancement étranger tandis que les banques locales se financent par des dépôts locaux et par des emprunts à court terme auprès de banques étrangères sur le

³ Dell'Araccia and Marquez (2004)

marché interbancaire. Les banques locales, contrairement aux banques étrangères, bénéficient d'un avantage informationnel car ils connaissent mieux le marché dans la période suivant la libéralisation. Ce modèle de compétition sur le marché du crédit peut résulter dans la concentration des risques sur un segment de marché. Ce segment est caractérisé par une concurrence plus faible. Les taux d'intérêt sur ce segment sont d'autant plus élevés que les clients, plus opaques et donc perçus comme plus risqués, ont moins de pouvoir de négociation par rapport aux banques étant donné qu'ils étaient déjà rationnés par les banques étrangères. En même temps, il est possible que certains des emprunteurs potentiels qui sont plus petits et moins transparent, mais avec des affaires saines, restent en dehors du marché car ils sont confrontés à des taux d'intérêt destinés au segment de marché plus risqué avec certaines marges monopolistiques (« mark-up » sur le prix).

Chapitre 3. Le canal du crédit bancaire dans la transmission de la politique monétaire

La deuxième étude se concentre sur la recherche du rôle du crédit bancaire dans la transmission de la politique monétaire dans le cadre du ciblage d'inflation qui a été introduit dans un ensemble de réformes de transition. Le crédit bancaire a représenté le principal moteur de l'expansion monétaire et dans le même temps, la principale source des pressions inflationnistes liée à la demande. J'ai analysé dans cette étude l'existence du canal de crédit bancaire sur le cas de la Serbie en utilisant la fameuse méthodologie établie par Kashyap et Stein (2000) avec une estimation par la méthode des moments généraux sur la base de données trimestrielles en panel de banques individuelles pour la période Juin 2006-Septembre 2012. Le résultat de l'estimation a montré que la quantité des crédits bancaires ne répond pas aux changements d'instrument de la politique monétaire et que ce dernier phénomène peut avoir pour origine à la fois une demande de crédit inélastique ou une offre de crédit inélastique. Ce résultat suggère que les deux canaux de transmission de la politique monétaire, le taux d'intérêt (en passant par la réaction de la demande de prêt suite aux variations du taux d'intérêt) et le canal du crédit bancaire (en passant par l'ajustement de l'offre de crédit suite aux changements du taux d'intérêt référent) ont été inefficaces en Serbie dans la période observée. Bien que certaines des études basées sur la même approche méthodologique dans un ou plusieurs pays en transition dans différentes périodes de temps, ont mis en évidence des preuves à l'appui du canal du crédit bancaire (comme Matousek et Sarantis, 2009), l'impression principale de la présentation de ce courant de littérature est plutôt son incapacité à apporter des réponses claires sur l'existence d'un canal du crédit bancaire. Même du point de

vue de la transmission de la politique monétaire en générale, y compris tous les canaux disponibles, la littérature empirique sur les pays en transition souffre du même manque de preuves cohérentes et complètes (Ehrmann et al. (2007) fournissent une revue de littérature). L'évidence de l'existence du canal du crédit bancaire n'est pas non plus claire dans les pays de l'UE-15. Ehrmann et al. (2002) trouvent des résultats en faveur du canal du crédit bancaire pour la France, l'Italie et l'Allemagne et Farihna (2001) en trouve pour le Portugal, mais Hernando (2001) ne trouve aucun effet pour l'Espagne.. J'ai également essayé d'inclure dans l'interprétation de mes résultats toute mon expérience d'analyste des dix années où j'avais étroitement suivi le secteur bancaire et les évolutions monétaires en Serbie et dans la région. Ainsi, le résultat empirique montrant l'absence d'impact de l'instrument de la politique monétaire du crédit bancaire est en quelque sorte attendu puisque l'ensemble de l'économie est très « euroisé » i.e. 70% de tous les crédits sont libellés en euros. Ce dernier point implique que le taux d'intérêt en monnaie locale est la référence pour seulement une partie mineure de l'intermédiation financière. En plus, la principale source de refinancement des banques nouvellement entrées (les banques étrangères) était l'augmentation du capital et les prêts de la banque mère de l'étranger. Dans ce contexte, le taux d'intérêt de référence sur la monnaie locale a naturellement une moindre importance. Il apparaît donc que la vraie stabilisation de l'inflation a pu survenir seulement avec la stabilisation du taux de change. Le canal du taux de change a apparemment joué le rôle plus important dans la transmission de la politique monétaire en Serbie. Mis à part son impact direct sur les prix des produits d'importation, l'héritage de la faible monnaie nationale et l'hyperinflation des années 1990 s'est reflété dans l'utilisation de devises pour une grande partie des transactions. Dans ce contexte, malgré l'objectif explicite d'utiliser le taux d'intérêt comme principal instrument, dans la pratique le ciblage d'inflation impliquait l'utilisation du taux de référence local pour gérer indirectement le taux de change et finalement le niveau de prix. Cela a créé un cercle vicieux de la politique monétaire visant à maintenir les prix stables dans un environnement de flux financiers ouverts (la plupart à court terme) - une situation connue sous le nom de « la trinité impossible » - avoir en même temps un compte de capital ouvert pour les entrées (et les sorties) de capitaux étrangers, une politique monétaire souveraine et un taux de change stable. Ce « trilemme » a été résolu en permettant la flexibilité du taux de change dans le cadre du ciblage de l'inflation. Cependant, le taux de change étant le facteur dominant de l'inflation, ce trilemme est difficile à résoudre. Le différentiel important de taux d'intérêt entre l'Euribor et le taux sur la monnaie locale attire des investissements (spéculatifs) en monnaie locale. Ce dernier inciterait l'appréciation de la monnaie locale et donc la stabilisation des prix (l'effet

déflationniste). Tout risque de dépréciation exogène de la monnaie locale diminuerait les rendements en monnaie locale des investisseurs spéculatifs et représenterait un risque de sorties de monnaie locale et de dépréciation soudaine. Par conséquent, cela représenterait un risque pour l'accélération de l'inflation et obligerait la politique monétaire locale à augmenter son caractère restrictif, en l'occurrence à augmenter le taux de référence nominal. La volatilité du taux de change induit la volatilité du taux d'intérêt et la modification de son objectif principal des flux réels (impact directe à plus long terme sur la production, l'investissement et l'épargne) aux flux financiers (impact indirect à court terme sur le taux de change). Certains de ces défis sont mis en évidence dans la littérature d'avant-crise (Stone et al. 2009) comme d'après-crise (Svensson 2009, Ostry et al., 2012). La conclusion plus générale de l'analyse poursuivie dans le Chapitre 3 est que, dans le contexte d'un marché réduit et dans l'environnement d'un marché financier ouvert aux flux de capitaux étrangers, la politique monétaire locale devient un otage du capital spéculatif à court terme. Ainsi la politique monétaire basée sur des instruments du marché (i.e. le taux d'intérêt) est moins efficace dans une petite économie ouverte puisque ces instruments ne conduisent pas aux effets désirés sur les flux réels. Même les instruments prudents qui visent à stopper la croissance excessive du crédit et (contrairement aux mouvements de taux de référence) se répercutent sur les taux d'intérêt des prêts en augmentant le coût réglementaire sous forme de provisions pour risques, ne se traduisent pas nécessairement avec une réduction de la croissance du crédit. Notamment, face aux restrictions prudentielles certains crédits ont été remplacés par des crédits directs transfrontaliers. Dans le même temps, le crédit intermédié localement est devenu plus cher et a continué de croître dans certains segments de marché où la demande était peu élastique au prix (ménages et entreprises moins transparentes locales). Ces derniers problèmes étaient probablement moins importants dans les économies en transition qui ont mis en place des institutions plus solides et une stabilité politique (ceux au-dessus du « grand partage »⁴) que dans le cas de la Serbie examinée dans cette étude. La recherche sur le cas serbe nous a permis, cependant, de mettre en lumière les manifestations néfastes de la mise en œuvre de politiques fondées sur l'économie de marché sur la base d'une capacité institutionnelle faible et dans un contexte de stabilité politique insuffisante – cet environnement étant commun pour de nombreux pays émergents.

⁴ Berglof et Bolton, 2001

Chapitre 4. L'accès au financement

La troisième étude empirique dans cette thèse traite les déterminants de la contrainte financière dans 18 pays en transition d'Europe via des données d'enquête sur les entreprises effectuées par la BERD en quatre volets de 2002 à 2008. Tous les pays étudiés ont en commun d'avoir fondé leur modèle de croissance sur l'intégration financière pendant la période avant-crise, (BERD, 2009). Examiner en profondeur l'obstacle du financement au niveau des entreprises peut apporter des réponses pertinentes sur les conséquences de développement financier sur la croissance du secteur réel. Le principal résultat de l'estimation empirique, effectuée à l'aide de la méthodologie du probit, a été que la probabilité de contrainte financière est plus forte pour les entreprises manufacturières que d'autres industries. En plus, l'estimation révèle également que les entreprises manufacturières ont plus besoin d'endettement extérieur et que ceux qui n'ont pas de prêts bancaires sont plus enclins à déclarer que des taux d'intérêt élevés et d'autres conditions de crédit sont les raisons de leur non recours au financement externe. Cette constatation m'a incité à formuler l'hypothèse plus générale sur le rôle du secteur financier dans les effets macroéconomiques du modèle de développement appliqué dans les économies en transition dans la période précédant la crise. À savoir, deux décennies d'une inégalité d'accès au financement des entreprises manufacturières (de production de biens échangeables) ont donné lieu à des déséquilibres structurels dans le secteur réel qui se reflète dans le déficit commercial i.e. le secteur des biens échangeables sous-développé et celui des biens non-échangeables (construction, immobilier, commerce) surdéveloppé. Le mécanisme sous-jacent à cette conclusion peut être aussi bien le fameux problème du marché de voiture d'occasion (« lemons problem », Akerlof, 1970). Cette interprétation est analogue au marché des voitures d'occasion où un propriétaire de voiture de qualité supérieure à la moyenne n'est pas disposé à participer au marché où le prix est fixé en fonction de la qualité moyenne (en raison du manque d'information du côté de la demande sur la qualité spécifique de chaque voiture). Dans un marché du crédit dont les taux d'intérêts offerts par les banques correspondent à la perception du risque moyen (incluant le risque pays calculé comme la marge de taux d'intérêt avec l'aide de l'agence de rating), à certains add-on pour la rémunération des coûts résultant de réglementations prudentielles et parfois aussi à une marge monopolistique, les projets sains avec de « bons risques » restent systématiquement hors de la demande de prêts et hors du marché du crédit. Systématiquement sous-financés, ces projets s'abstiennent d'un financement externe et deviennent sous-représentés avec le temps, tandis que le déficit du commerce extérieur du pays augmente. La

dernière explication suppose que la finance produit la croissance réel (Schumpeter, 1911, Levine, 2004). Un autre effet peut amplifier ce déséquilibre structurel. Selon les conclusions de l'étude de la politique monétaire, l'appréciation réelle de la monnaie locale résultant du contexte spécifique de la politique monétaire pendant la période de forte intégration financière, peut entraîner un phénomène de « maladie hollandaise ». Ses effets peuvent encore aggraver le sous-développement relatif du secteur échangeable (industrie manufacturière). Notamment, il est plus rentable d'importer que de produire localement tandis que l'exportation est moins compétitive avec une monnaie locale forte résultant d'importantes entrées de capitaux étrangers vers les marchés émergents libéralisés dans le cadre de la transition économique (Egert, 2013).

La principale conclusion générale découlant de ces recherches empiriques est que les imperfections immanentes au marché financier reflètent également l'impact qu'ont laissé les réformes spécifiques pendant la transition de ces pays sur leurs vulnérabilités économiques et financières .. La façon dont le système financier et monétaire se transforme a des conséquences sur la stabilité financière, l'efficacité de la politique monétaire et sur le déséquilibre de la balance extérieur. Toutes ces conséquences ont été amplifiées avec la dernière crise car les marchés financiers des pays émergents d'Europe ont été beaucoup plus intégrés précédemment, ce qui a agité en faveur de la propagation de la crise dans la région.

Quelques recommandations générales

Il y a aussi quelques autres observations plus générales découlant des analyses présentées dans cette thèse qui donnent des perspectives pour de futures recherches. Elles concernent l'évaluation du choix d'une simple réplique des institutions de marchés mures et développés dans l'environnement d'un nouveau marché en cours d'établissement. Des marchés « jeunes » sont caractérisés par une forte asymétrie de l'information et un faible niveau de crédibilité auprès des agents économiques, y compris souvent un faible niveau de crédibilité des gouvernements. Une simple copie des institutions de marchés développés (les lois, la conception institutionnelle, les procédures), sans souci particulier porté aux normes locales héritées du passé, peut conduire à une faible implémentation des institutions et à des déséquilibres structurels. Imposer des instruments de marché pour les politiques peut n'avoir aucun effet si le marché n'est toujours pas opérationnel. Dans le cas de la politique monétaire, le cas examiné dans cette thèse en est une illustration intéressante. Introduire le taux d'intérêt comme principal instrument de la politique monétaire et hésiter à appliquer les mesures plutôt

administratives (il avait une connotation péjorative avant la crise alors que de nos jours ce genre de mesures est considéré par la politique macro-économique prudentielle), peut conduire à de nombreuses distorsions comme le montre l'inefficacité de la politique monétaire.

La recherche conduite sur des questions spécifiques du secteur financier mène à l'observation générale que le manque de connaissance ex-ante peut être dû à certaines des conséquences négatives des réformes et des politiques de la transition. On aurait cependant pu s'attendre à manquer de connaissances locales sur l'économie de marché lorsqu'elle est introduite pour la première fois. Néanmoins, même les connaissances et l'expérience des marchés développés qui ont été conseillées aux pays en transition ne sont pas toujours judicieuses étant donné que les nouveaux processus générés au cours de la transition n'avaient pas de précédent et ont créés leurs propres modes de fonctionnement et leurs propres effets (*sui generis*). La compréhension spécifique par les agents économiques locaux – les entreprises et les citoyens – des institutions de l'économie de marché peut se traduire par des réactions qui ne sont pas conformes aux hypothèses des modèles. Par exemple, le manque de compréhension des citoyens pour les institutions des marchés financiers (crédit, taux d'intérêt, etc.), ont pu avoir entraîné une faible élasticité de la demande au prix du crédit, mais aussi à des emprunts imprudents qui conduisent un taux de défaut élevé (les crédits non-performants) comme on a pu le voir dans les résultats empiriques présentés dans cette thèse.

Une autre observation générale qui se dégage de la recherche effectuée et est présentée dans cette thèse concerne le lien inséparable – peu importe la direction de la causalité – entre les flux financiers d'un côté et les flux réels et l'environnement politique (et institutionnel) de l'autre. L'internationalisation de la finance et le développement financier qui excède le développement du secteur réel peut entraîner des bulles et des chocs sur l'économie. D'autre part, l'intégration financière entre les pays de noyau d'Europe et ceux d'Europe émergente a apparemment atteint un niveau bien au-delà de leur harmonisation institutionnelle et leur intégration politique d'avant-crise. Nous avons vu que l'optimisme et la perception du risque irréaliste reflétée dans les marges de risque moins élevé de la dette des pays d'Europe émergente venant du noyau du européen avant la crise, ainsi qu'une augmentation forte et soudaine de la perception du risque depuis, a reflété l'augmentation de l'aversion au risque suite à la crise. On peut s'attendre à ce que dans l'avenir le niveau d'intégration financière atteint soit un levier important pour de futur progrès en matière de convergence dans la qualité des institutions et du niveau d'intégration politique.

Nous pouvons également remarquer que les risques politiques représentent un ennemi au développement du secteur réel et, au-delà d'un certain niveau, ils empêchent les résultats positifs et amplifient les résultats négatifs du développement du marché financier sur l'économie réelle. Ce cas de figure s'était probablement manifesté dans le cas de la Serbie. Les marchés financiers réagissent à un risque politique et macroéconomique plus élevé, y compris aux faibles institutions et au manque de transparence de l'information sur les agents économiques, en investissant à court terme et en exigeant un rendement plus élevé par une marge couvrant le risque pays. Cela, par conséquent, aggrave la vulnérabilité de l'économie locale. Les flux financiers à court terme peuvent être nuisibles au développement, car ils augmentent la volatilité et l'exposition à la contagion et aux changements d'humeur du marché financier international. La marge du taux d'intérêt rémunérant le risque pays mène à un coût de financement plus élevé dans un pays émergent indépendamment du risque spécifique qui peut être en réalité en-dessous du risque pays.

Les enseignements clés: recommandations pour les responsables des politiques économiques et pour les acteurs des marchés financiers

Ce que l'on peut faire à l'avenir pour éviter les répercussions négatives de l'intermédiation financière sur les vulnérabilités du secteur réel dans les marchés émergents reste un grand défi pour les politiques futures. Il semble que, depuis la crise, dans le vieux débat sur les rôles respectifs des marchés et de l'Etat, la balance a penché, au moins un peu, vers l'Etat. Les points de vue sur la nécessité d'une régulation et sur les limites de la réglementation sont en cours de révision dans le sens où ils sont tous les deux plus importants que ce que l'on pensait auparavant. De quelle manière ces politiques devraient être conçues? La solution pourrait reposer sur le retour aux principes de base derrière l'existence d'institutions financières. Elle s'appuie sur la résolution des problèmes principal-agent – de l'asymétrie d'information – par la collecte d'informations, le contrôle des risques et la prise de bonnes garanties. Cette solution comprend également le cadre des mesures incitatives qui façonnent le comportement des institutions financières pour favoriser le développement à long terme au détriment du profit à court terme (malgré la perte à long terme).

D'où pourraient provenir les principales recommandations aux responsables et décideurs des politiques économiques? Du point de vue d'un contexte national – le principal message de cette étude serait qu'il est illusoire de lutter contre la globalisation, mais connaître ses principes peut aider à en tirer profit et en éviter les pièges. Ainsi devraient être privilégiés le

renforcement des institutions et l'approche gradualiste de la libéralisation une fois qu'un système de gouvernance solide et d'incitations est établi. En ce qui concerne la libéralisation financière, la distinction devra être effectuée entre la dette à court terme et les flux de portefeuille d'un côté, et les investissements à long terme de l'autre, en faveur des derniers. À l'avenir, les politiques concernant l'intermédiation financière doivent prendre soin d'un développement national équilibré, qu'apparemment les marchés financiers à travers leur propre mode de fonctionnement ne produisent pas automatiquement. Ces politiques devraient inclure la surveillance du niveau de taux d'intérêt et empêcher des taux trop élevés conduisant à un risque trop élevé pris par les banques. Les obstacles à l'accès au financement doivent être détectés et résolus. Les connaissances générales sur le financement des entreprises doivent être renforcées. La mitigation de l'asymétrie d'information devrait être un des principes directeurs derrière les politiques nationales. Le mécanisme propre à la finance internationale où, en raison de l'asymétrie d'information tous les risques d'un pays sont captés par une marge déterminée sur la base des notations des agences internationales en plus d'autres éléments du coût d'endettement résultant d'un niveau de taux d'intérêt élevé, peut être atténué par la politique du gouvernement visant à partager le risque ou réduire l'asymétrie d'information. Ces politiques devraient viser à faciliter l'accès au financement pour les secteurs de production où les investissements initiaux sont plus élevés et les rendements sont plus faibles mais plus stable sur le long terme.

Au niveau mondial - i.e. du point de vue des investisseurs étrangers aux marchés émergents et de leurs organismes de réglementation - fixer les bonnes incitations à l'intérieur des marchés et des institutions financières devrait être un objectif porté au premier plan. Dans ce contexte, le retour aux principes de base derrière l'existence de l'intermédiation financière devrait aider également. La crédibilité mutuelle dans le processus de placement est construite pour longtemps. A court terme, on peut obtenir des rendements exceptionnels, mais à moyen et long terme – la valeur du secteur financier ne peut pas s'accroître sans croissance du secteur réel. Et le secteur réel a ses limites. Bien que les pays émergents représentent un champ propice pour des rendements marginaux sur investissement plus élevés, ces rendements sont limités par des facteurs naturels. Pour en revenir au « marché des voitures d'occasion » (lemons market) (Akerlof, 1970), un investisseur étranger (banque) pourrait vouloir offrir du financement pour un bon projet avec un taux d'intérêt qui comprend (1) le risque pays où le projet s'effectue, i.e. un pays émergent, (2) les coûts imposés par la réglementation locale et (3) la marge de la banque. Mais cet investisseur peut se trouver confronté au problème que les

projets ayant des perspectives à long terme avec un investissement initial élevé, ayant un rendement raisonnable et à un faible risque de défaut, sont tout simplement en dehors du marché du crédit où le niveau général de taux d'intérêt vont au-delà de la capacité de remboursement des bons projets. Dans le même temps, les projets qui restent du côté de la demande ne sont probablement pas ceux qui vont rembourser les prêts.

Après plusieurs années de travail en Serbie en tant qu'observateur et même un participant à la transformation dynamique du secteur financier, d'abord comme chercheur dans un institut de recherche et think tank influent qui visait à plaider en faveur de meilleures réformes, dernièrement en tant qu'analyste dans l'une des plus grandes banques étrangères où j'ai observé le marché financier de l'épicentre, j'ai essayé d'apporter par cette thèse le plus de mes impressions possible qui ont en même temps inspirées et animées mes conclusions. La principale recommandation qui épure la liste des résultats spécifiques détaillé ici est que, bien que le choix politique est fait en faveur de principes du marché, comme celles qui fournissent une allocation plus productive des ressources, afin de s'acquitter de cette proposition théorique pour obtenir le résultat désiré, la construction d'une architecture financière est une condition cruciale.

Cette architecture financière devrait être adaptée au marché spécifique – à son héritage en termes (1) de normes déjà bien ancrées et qui influencent les affaires et les décisions de financement, (2) des objectifs de développement à long terme de l'économie réelle, (3) des connaissances locales sur la finance. Le secteur bancaire est un secteur avec une perspective de long terme. Il devrait accompagner le développement du secteur réel en le promouvant afin d'assurer sa propre prospérité. Tous les pays sont sujets à des crises bancaires, peu importe le degré d'avancement. Les marchés émergents ont tendance à avoir en plus d'autres types de crises comme des crises de la dette publique ou des crises de change (Reinhart et Rogoff, 2009). En ayant cela à l'esprit, la Serbie, ainsi que d'autres économies en transition d'Europe, peuvent prétendre que leur secteur bancaire est assez résistant à la crise globale. Contrairement aux États-Unis ou au Royaume-Uni, ils ne ferment pas tant de banques. En Serbie, par exemple, deux banques publiques ont fait faillite depuis la crise. Deux autres sont sous la stricte supervision et face à une sous-capitalisation grave.

Il y a cependant des événements représentant une menace pour le reste du système bancaire qui est toujours bien capitalisée malgré le taux de crédit problématiques NPL de 20%. La principale menace est le risque de manque de reprise du secteur réel. Une partie de ces risques

sont produits par le secteur financier lui-même, précisément à cause de son architecture et des règles inhérentes. Ces règles ont peut-être été établies pour servir la meilleure cause, mais les résultats peuvent en être assez éloignés. Les risques peuvent avoir tendance à se concentrer dans certaines petites banques locales malgré les avantages prévus de la concurrence dûs à l'entrée de banques étrangères. Même si les banques étrangères sont plus efficaces (comme en témoignent les œuvres de Bonin et al. (2004), Weill (2003), Fries et Taci (2004)), et en mesure d'offrir un prix de financement inférieur, le fait que les agents économiques ne sont pas familiarisés avec l'endettement et son prix représenté par le taux d'intérêt, avec les risques de change, etc. peut permettre aux banques d'appliquer des prix monopolistiques.

En plus, lorsqu'au lieu de recueillir des informations et évaluer les risques de chaque emprunteur, le prix d'entrée général du financement des banques étrangères dans les marchés émergents est calculé sur la base de l'information fournie par les agences internationales de notation, traduit en « rating » de pays puis des marges de risque pays correspondant, il peut entraîner de graves distorsions dans la structure de l'économie locale. Cela peut également indiquer que le point de vue des banques n'est pas assez à long terme puisqu'elles choisissent de se reposer plutôt sur des informations externes que de faire eux-mêmes ce qui est leur principale fonction économique et raison d'être. Charger à tous les emprunteurs locaux le risque souverain, qui est actuellement évalué comme « junk bond », se traduit à traiter tous les agents (même les excellents clients en termes de crédibilité) a priori comme des clients à haut risque et toutes les entreprises, même les plus stables avec les projets rentables comme des « junk businesses ». Une partie de cette perspective de court terme peut être attribuée à l'instabilité politique. Mais dans une large mesure, elle est le résultat des incitations propres à la construction du système financier. En même temps, l'instabilité politique est, comme nous l'avons montré, inséparable de la convergence des revenus et de l'intégration financière, peu importe quel est le sens de la causalité.

Une certaine réconciliation des perspectives (le long terme favorisé par rapport au court terme) et des objectifs entre les banques, les régulateurs et le public est nécessaire et ce n'est que dans ce contexte que les affaires devraient être laissées aux forces du marché. Il est inutile que l'autorité monétaire et réglementaire, qui devrait être en mesure d'avoir une perspective d'ensemble de l'économie et de prévenir les vulnérabilités du système, mette tous ses efforts dans l'application d'un cadre de politique (visant par exemple l'inflation) qui n'a pas d'impact sur la variable cible. En termes de politique prudentielle où les instruments étaient plutôt établis sur mesure dans le cas de la Serbie, et reposaient d'avantage sur des restrictions

administratives que sur les mécanismes de marché, les résultats sont bien meilleurs car le système financier est relativement stable malgré plusieurs chocs depuis la crise.

A l'avenir, la pratique bancaire, à la fois dans les pays développés et dans les pays en développement, aura besoin de plus de créativité, plus de flexibilité et plus d'approche holistique. On aura besoin de plus de combinaison de la science avec la pratique. Les institutions financières mondialisées auront besoin de plus de compréhension et d'adaptation aux besoins locaux et les spécificités économiques pour éviter que, en quête de rendements plus élevés, ils nuisent à l'économie locale dans laquelle ils placent en même temps et nuisent ainsi à leur propre vitalité à long terme.

J'espère que mon étude a, au moins un peu, contribué dans cette perspective. Comme bien métaphoriquement exprimée par Sedlacek (2011, p. 321), "Il y a une chanson qui dit que les règles et les lois sont créées par des avocats et des poètes. Les poètes (dans le sens large du terme) donnent le sens et l'esprit des règles ; les avocats leur donnent la forme et la lettre. De même, nous pouvons dire qu'un grand économiste peut être un remarquable mathématicien ou un excellent philosophe. Il me semble que nous avons donné aux avocats et aux mathématiciens un rôle trop important au détriment des poètes et des philosophes. Nous avons échangé trop de sagesse contre de l'exactitude, trop d'humanité contre de la mathématisation. Cela me rappelle une tour d'ivoire extrêmement minutieuse, mais avec des fondations construites sur du sable. Il va sans dire que cette parabole parle de la façon dont un sage architecte accorde plus d'attention aux fondations plutôt qu'aux décorations baroques sur le dessus des tours de son immeuble. Quand la pluie arrive, la cathédrale ne tombe pas comme une maison en sucre."

General introduction

The main idea in this thesis is to analyze the macroeconomic implication of the micro-level failures of financial markets resulting from economic transformation of countries in Central and Eastern Europe. These macro-level vulnerabilities were particularly felt with the global crisis. In this introductory chapter, we first present the environment of the global crisis followed by the main features of two decades of economic transition that preceded the crisis in the region of Emerging Europe. We have placed special focus on the ‘finance dimension’ in both phases – crisis and transition. Further on, we present the field, main goal and methodology applied in the thesis. It is followed by a description of the framework of the preparation of the thesis and it ends with an overview of the structure of the thesis, including the content of its chapters.

Emerging Europe: from transition to global crisis

The global crisis, now in its seventh consecutive year, started to unfold in 2007 with the subprime mortgage bubble burst in United States and the collapse of one of the largest banks – Lehman Brothers. The losses spread over the financial system. State intervention prevented faster contagion and collapse of larger scale. Output shrunk and the fall in demand reflected in a downturn in economic activity leading to global recession from 2008 not only in the United States but across the world. Though the United States economy is showing some signs of recovery in 2013, after several waves of intensive policy intervention since the crisis (quantitative easing and fiscal expansion), this recovery still seems fragile. Several Eurozone economies went into severe debt crisis in 2010. The crisis resulted from the combination of high debt burden (private and/or public) and declining output resulting from lower demand and global contraction on financial markets.

Pre-crisis accumulation of debt was a result of a period of high (and relatively cheap) global liquidity and intensive financial integration of peripheral economies into European Union that was accompanied with large foreign debt inflows. Fears of a sovereign debt crisis spurred among investors operating in the highly interconnected financial market as a result of the high accumulated private and government debt levels and the investors’ awareness of self-reinforcing economic activity downturn. A wave of downgrading of sovereigns’ ratings of European states followed the economic downturn. Rising risk aversion reflected in increased

prices of sovereign bonds and therefore of new debt issuance. This, in combination with weakening real economic output due to a slowdown in demand, led to an unsustainable burden of accumulated debt for individual borrowers as well as for governments of some European countries (in the first place in the so called peripheral ones). European banks owned a significant amount of sovereign debt, such that concerns regarding the solvency of banking systems or sovereigns were negatively reinforcing.

In several countries, banking sector exposure to the subprime asset backed securities devalued since the property bubble burst was transferred to sovereign debt as a result of banking system bailouts and government responses to slowing economies post-bubble. The structure of the Eurozone as a monetary union without fiscal union contributed to the accumulation of macroeconomic vulnerabilities in the run up to the crisis. Financial flows directed from the rich core to the poorer periphery and access to cheap funding produced deterioration in external competitiveness in the periphery as unit labor costs increased and demand fuelled from foreign debt with single (overvalued) currency (i.e. fixed nominal exchange rate) spurred imports and kept necessary structural adjustment of local economy in a second plan. A series of monetary and financial support measures has been implemented since 2010 in order to prevent serious damages to economic activity. However, the Eurozone did not recover from the crisis as, after a temporary upturn in 2011, many countries from the union were back into recession in 2012 and some of them have remained in recession in 2013.

Given this context, where the sustainable economic recovery in developed “western” economies as well as in highly interdependent “peripheral” economies (including so called Emerging Europe) seems still hard and uncertain despite a long list of applied growth supporting policies, it is obvious that the global crisis was not a temporary shock or a usual recession, but a much deeper, long-lasting phase in economic history. It is even considered the most severe crisis since the Great Depression. In that sense, one may expect it to leave a deep trace in economic thought. Moreover, we might see in future its permanent impact on the behavior of economic agents. In the same line of expectations, the pre-crisis economic policy paradigm may be subject to a revision in line with newly established norms. The role of the market that was almost dogmatized within a ruling neoliberal concept before the crisis is now a subject of debate and revision since it is once again demonstrated that some important hypotheses of efficient market were not fulfilled.

The crisis and lasting recession has also raised some questions and brought shifts in view and practice in many areas of economic policies related to the financial markets and international capital flows. Thus, unlike the relative coherence attained in support of financial globalization, liberalization of capital flows, the inflation goal of the monetary policy and micro-prudential policy, the crisis has reinforced a more pragmatic, specific country made (and not general), systemic, gradual, step-by-step approach. The intensifying globalization that preceded the crisis did not stop but some slowdown or “deglobalization” in the short run seems likely to occur. Already, since the crisis, trade globalization halted while financial globalization reversed. A simple measure of trade intensity, world exports as a percentage of world GDP, rose steadily from 1986 to 2008 but has been flat since. Global capital flows, which in 2007 topped 11 trillion dollar, amounted to barely a third of that figure in 2012 (The Economist, 2013).

The importance of a domestically owned component of the banking system is now widely understood as foreign banks, beside importing stability from their home countries in regular times, also foster the transmission of the crisis and import instability in difficult times. The credibility of the open capital-account position was further reduced by unexpected instability in the advanced country’s financial systems and by the need to take defensive action against rapid capital outflows and to offset the effects of large inflows (particularly inflation, asset bubbles, and rapid appreciation of the currency). Unlike the one target one instrument approach in terms of monetary policy regime where inflation targeting was largely considered as an ideal model to converge to, the instability associated with perfect currency float and open capital account became a threat as crisis induced a sudden stop and further reversal of capital flows.

The two targets (inflation and exchange rate) and two instruments (interest rate and sterilized intervention) became at least equally recommended for small open economies instead of a strict adherence to the inflation targeting framework (Ostry, et al., 2012) as focusing exclusively on inflation may lead to accumulation of imbalances in real sector. An example of such imbalances may reflect in real effective exchange rate appreciation of capital receiving countries. This last may have contributed to ‘Dutch disease’, like effects translated to under-developing of production sectors, undermining of exports and current account deficit. On the other side, expansionary monetary policy combining with large current account surpluses in emerging countries (particularly Asian and oil-exporting ones) is somewhere even blamed for the crisis bubble. Monetary policy and micro level prudential policy has lost its importance in

front of more articulated macro-prudential policies, focusing on financial stability of the system.

As argued by Stiglitz (2012): “The perspective that low and stable inflation leads to a stable real economy and fast economic growth was never supported by either economic theory or evidence, and yet it became a main tenet of central-bank doctrine. This idea has been destroyed by the crisis—and it ought to have been. Economists focused on the nth-order social losses that arise from disequilibrium relative prices that arise in the presence of inflation, on the deadweight loss of consumer surplus that results when price misalignments occur. Focusing on inflation diverted attention away from something that was much more important, the far larger, first-order consequences of financial instability. Indeed, the price misalignments were not even of second-order importance. They were more like tenth order of significance relative to the losses resulting from the failure of the financial market. With the output gap, those losses have reached trillions of dollars. Compared to that, the losses in the consumer surplus that come from the small microeconomic misallocations are miniscule. The crisis has shown that financial stability is far more important than price stability.”

Moreover, the financial crisis has additionally pointed to the relevance of the studying of credit markets. “In the aftermath of what has been called the “new classical” revolution⁵, there was a consensus that macroeconomics should be put on sound microfoundations. The big mistake was that some economists put it on the wrong microfoundations. They turned to the microfoundations of competitive equilibrium analysis – an approach that, at the time that it became the foundation for the new microeconomics, was being undermined by several strands of research, including work in game theory and on the economics of imperfect and asymmetric information. The standard competitive model was particularly suspect for an analysis of macroeconomics because it assumed full employment and its assumptions where the singular set of assumptions under which markets, by themselves, work well” (Stiglitz, 2012).

All these shifts brought to the surface with the crisis are relatively new and still have to be translated into more general paradigms and specific policy solutions. Despite risks arising from previous intensive wave of globalization, and the fact that policies aiming to help

⁵ Lucas’s 1972 paper is often cited as the seminal work in new classical economics. See R. Lucas Jr. “Expectations and the Neutrality of Money”, *Journal of Economic Theory* 4, no.2 (1972): 103-124. See B. Greenwald and J.E. Stiglitz, “Keynesian, New Keynesian, and New Classical Economics”, *Oxford Economic Papers* 39, no. 1 (1987): 119-133, for more extended analysis of the importance of providing the right microfoundatons.

economies to get out of recession are more national than global, these policies have to be subject to international coordination in order to be effective in the environment of interlinked financial markets. The recent example is the quantitative easing policy led by the FED and Japanese monetary expansion. My intention with this thesis is to bring clearer understanding on specific market mechanisms and failures in support, in order to assist in the better design of relevant policies in emerging economies. In my view, they have to be adapted to specifics of microeconomic market foundations in order to produce desirable macroeconomic long-term sustainable impacts.

The focus of the research in the thesis is on phenomena characterizing the region of Central and Eastern Europe, lately often denominated as emerging European economies or New Europe and prior to that and since the fall of Berlin wall as transition economies⁶. The trade and financial linkages in Europe contributed to the propagation of the Eurozone crisis to this region that have been to certain extent integrated into economic and political European space over two decades preceding the crises. Moreover, the crisis brought direct evidence of interlinks between these economies with the global economy, and Western European economies in the first instance.

To understand the specific economic setting in Central and Eastern European countries in the run up to the crisis, it is important to make a reference here to their recent political and economic history. All these countries had embarked on a so called economic transition in the early 1990s having among their political aims the plan to shift their economy from a central planning to market based one. This process is particularly interesting as it took place in the environment of globalization of the world economy, including financial deregulation and liberalization of capital and trade flows. Transition as an economic process, including a whole set of economic and institutional reforms aimed at transforming the centrally planned economies with state socialism as a political system of countries in Central and Eastern Europe (CEE) and in Commonwealth of Independent States (CIS referring to most ex-USSR

⁶ Though transition is considered to be over by some, in the remainder of the thesis I alternatively use the terms transition economies, emerging Europe and in some cases New Europe for referring to that region. No one of these terms is semantically precise enough to depict the common economic and political profile of ex-communist countries of Central, Eastern and South-Eastern Europe that are now more or less successfully applying market principles in their economies and democratic political system. The terms 'transition countries' or 'Emerging Europe' are however common enough to be used in general descriptions of processes that are relevant for the whole region. Though the subject of the thesis is particularly coined to the transition region of Europe, some of the findings of the empirical research being undertaken on these economies examples can also be relevant for any developing country that experiences financial liberalization and integration into global capital flows. In that sense, the European region is only a paradigm for the much wider global phenomena.

countries) to market economies with democracy as political tradition, started symbolically from the fall of the Berlin Wall in 1989.

The initial years of the transition process were radical and sharp but softened as it progressed. Though reforms varied in their timing, speed and depth from one country to another, they were all designed in a manner to contain some common main elements. The reforms that marked the initial phase of economic transition consisted of macroeconomic stabilization, liberalization of trade and capital flows, and privatization of state enterprises. This reform agenda is known as the Washington Consensus⁷ as the list of prescriptions was recommended by Washington based international financial institutions. In the later phase of transition reforms, the awareness of the importance of the building of market institutions had become a driving principle. Meanwhile, emerging countries from Central and Eastern Europe have all embarked on the path of integration to the European Union as part of the course of their transition process. Many of them have already become members of the Union, such as the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia in 2004, Romania and Bulgaria in 2007, and Croatia in 2013.

All these economies have generally converged in their income level, overall economic and institutional development to developed Europe. Many of these countries still need to tackle some remaining structural reforms in order to achieve a satisfactory level of functioning of markets, sustainable growth including macroeconomic stability, as well as the level of convergence to the core economies of the European Union as their historical, geographical, economic and political benchmark. However, the living standard and respect of democratic principles did considerably improve across the region and the level of economic and political integration became significant.

The financial sector reform has been considered as one of the crucial pillars of economic transition to market economy, its income convergence and integration, as well as one of the key channels of the crisis transmission once it occurred. The establishment of a strong and efficient financial sector was considered a necessary pre-condition for an effective transition in theoretical and empirical literature as the development of the financial sector has been recognized as a crucial driver of economic growth in these economies⁸. The financial sector reform, and banking sector reform in particular, can be observed through both phases of

⁷ First time presented in 1989 by John Williamson

⁸ Transition Report EBRD, 2009

overall economic transition. In brief, it began with the privatization of state owned banks, liberalizations of entry to foreign banks coupled with the opening of the capital account. It was accompanied by the building of an institutional environment through the establishment of prudential rules, accounting and reporting standards and the introduction of monetary policy frameworks, akin to that applied in developed market economies, in parallel with more general improvement of protection of ownership rights and the rule of law.

Though many of these economies have significantly converged in its income, overall economic performance, and political setting with that of Western European countries and have become members of European Union, the banking sectors in all these countries entered the crisis with the legacy from their specific transition process. Namely, the main specificities of their banking sectors were: (1) the experience of rapid credit growth following the capital flows liberalization resulting in very fast deepening of the financial market; (2) foreign bank dominance and the resulting high dependence of foreign funding and high local loan to deposit ratios; (3) the significant financial euroization, i.e., foreign currency denomination of loans and deposits and the resulting high foreign currency risk exposure both on the macroeconomic and on microeconomic level.

Directly connected to the previous, these countries have led a specific model of economic growth until the global crisis. Their pre-crisis growth model, to a large extent, consisted of growth based on financial integration through the import of foreign savings in the form of foreign debt (EBRD, 2009). The last has resulted in another set of macroeconomic specifics being: (1) liberalized financial markets for foreign inflows, (2) growth highly dependent on foreign debt and foreign direct investments, (3) persistent current account deficit, (4) high level of foreign debt. All these characteristics represent a direct result of the overall integration of the Emerging Europe into the European Union, including political integration that has certainly given additional momentum to the speed of economic integration. Though it is hard to compare these two streams of integration – political and economic/financial – it seems that the second one reached a more advanced level than the first one when the crisis began.

When the crisis hit this region in the last quarter of 2008, its effects spilled over rapidly. Besides a downturn in trade and in direct investments from abroad, one of the key transmission channel of the crises was the one that passed through the financial sector, which in the meantime had become highly integrated in the international capital flows. Namely, the

financial inflows through foreign banks with local subsidiaries as well as direct cross-border lending by foreign banks to companies that constituted the important element of pre-crisis growth in demand and investment, have been stopped with the financial problems in their home countries' headquarters.

Nevertheless, soon after the crisis driven sudden stop in capital inflows into the transition economies, the risk of reversals, i.e., outflows, had been prevented. Proximity and political integration did encourage this move. Specifically, the so called Vienna initiative was signed among governments, banks exposed to the transition region of Europe (mainly banks from neighboring Western European countries) and international financial institutions. The main element of the Initiative signed in 2009 and accompanied by the Arrangements concluded between the individual countries and the IMF was that large banking groups present in the transition region would not reduce their total exposure to each individual country. Thus, the overall panic and downturn that could result from uncoordinated deleveraging of banks had been prevented in the first moment. On the other hand, the economic recovery became even more uncertain as domestic problems in the core of Europe's banking sectors caused a subsequent wave of financial deleveraging in Emerging Europe region and weak demand from fragile Western European countries is weighting on export led recovery as a alternative.

Despite these measures to prevent sharper fall in output and financial distress of a larger scale, the crisis revealed some fundamental imbalances that were built before and are still representing a challenge for more sustainable economic revival. These are reflected in a high level of non-performing loans in the banking sector, and deleveraging of both locally present banks as well as foreign banks directly exposed to local companies. The deleveraging emerged in 2010 and 2011 and its reversal seems uncertain. The long-term sustainability of the pre-crisis growth model came under question and new sources of growth are being searched for in increased exports and competitiveness, though still with no significant results.

Field, subject of the thesis, goal and methodological approach

The main reasons for the macroeconomic significance of the efficient and well functioning banking sector are widely recognized. They rely on the key role it plays in the economy: intermediation, maturity transformation, facilitating payment flows, credit allocation, and maintaining financial discipline among borrowers. Firstly, an efficient banking sector provides an efficient intermediation and resource allocation, promotes corporate government and fosters growth. Secondly, banks' credit plays an important role in monetary policy

transmission. Thirdly, banking sector stability is crucial for overall economic stability and a banking crisis produces significant fiscal costs. Therefore, the vulnerability of banks leads to public policy concerns because of the negative externalities related to bank failures. Finally, banks play a crucial role in risk management of debt creating capital inflows in one economy (IMF Outlook 2000). Moreover, in an economy integrated into the global capital and financial flows, one country's financial stability as well as local financing terms and credit availability are tightly related to the conditions of the global financial markets.

The importance of the structure of financing and performance of credit markets for understanding the macro-economy is first time put in advance within the so called Financial Structure Approach (Gertler, 1988, an early overview). According to this stream of the theory, credit constraint and asymmetric information (market imperfection) produce at least two effects for the macro-economy. These are: (1) excess variability of aggregate output and individual consumption in response to exogenous disturbances, and (2) emergence of endogenous deterministic cycles in models where it would be impossible with perfect markets.

The main interest explored and presented in this thesis under the title "The essays on financial intermediation in New Europe from transition to crisis" is the macroeconomic implication of the financial sector transformation that took place within the process of the economic transitions and integration of the region. Nevertheless, in the focus of the research carried out and presented in the thesis are microeconomic foundations of certain macroeconomic vulnerabilities that were built on before the crisis but that propagated negative effects to the economy in crisis times. To explore the main subject, apart from general descriptions based on macroeconomic facts, we perform empirical analysis mainly on micro-level data in order to understand these specific issues. These issues are mostly related to the existence of market imperfections such as information asymmetry within the liberalized local credit market but also to some failures of the global financial market that are further reflected in local lending. The vulnerabilities related to the functioning of the financial system are at the same time specific because they were not characterizing financial sectors in developed economies. They were also not ex ante expected to arise as a result of implemented reforms. They are rather results of a sui generis transition process and may be attributed both to transition itself and to global context.

In this thesis we focus, as a field for my research, on the relatively homogenous set of economies of Central and Eastern Europe including South Eastern Europe. These countries share similar political past as well as similar future goals in terms of political integration into the European Union. They also share some common future development and economic challenges. Despite evident differences, no one of these countries is particularly rich in resources in order to be able to base their development on their export, as some of Asian transition economies from the Commonwealth of Independent States (CIS) region. Also, all ex-transition economies considered in this thesis are relatively small countries. Even considering a few exceptions with large markets like Poland and Romania, all these economies have to integrate by necessity into regional and international flows of trade. This necessity goes together with specific challenges of trade liberalization and, in the case of financial integration – of capital account opening, for macroeconomic stability – managing of inflation, foreign exchange rate, foreign debt, foreign financing of fiscal deficit, current account deficit, and unemployment. Finally, these economies have similar heritage in terms of economic structure, social protection and business culture resulting from the past economic system.

Being a subject of rapid transformation and application of rudimental market institutions, the emerging economies of central and Eastern Europe enable the researcher to identify in a much more explicit and clear way certain market behaviors and market frictions as well as to trace the effects of economic policies. The last are easier to isolate as the system of market institutions is new and represents a less complex environment for economic processes. In the determination of the subject of this thesis, my intention was to benefit from that opportunity. On the other hand, conducting research on the fast changing economies brings many difficulties as structural shocks that arise often result from changes in institutions, regulations, one off events of a large scale, etc. The existence of these caveats, in my opinion, weakens the conclusions drawn from many cross country macroeconomic studies. Moreover, it implies the necessity to analyze even macroeconomic issues using or paying attention to individual country developments and to microeconomic data. The constant change and deep structural transformation is also challenging from the perspective of the efficiency of new policies that are based on previous experience (historical data) or on the experience from other sets of countries (in most cases, on developed market economies). It is known as Lucas' critique.

In that respect, the deeper the knowledge of individual behaviors and their potential modifications resulting from the changing economic environment such as a global crisis, or

preceding a long period of transition, the better will be the context for defining the appropriate economic policy. Another caveat in doing research on transition economies comes from the data availability and data quality. Some data are simply not available and many available data is of a dubious quality resulting from the statistical system that is also being adapted more or less successfully from one economic system (central planning) to another (market economy). On the other hand, micro level data, as for example financial data of individual firms, even when they are available, have to be taken with caution as accounting standards are subject to reform and specific tax and legal issues may impact the reliability of certain financial records.

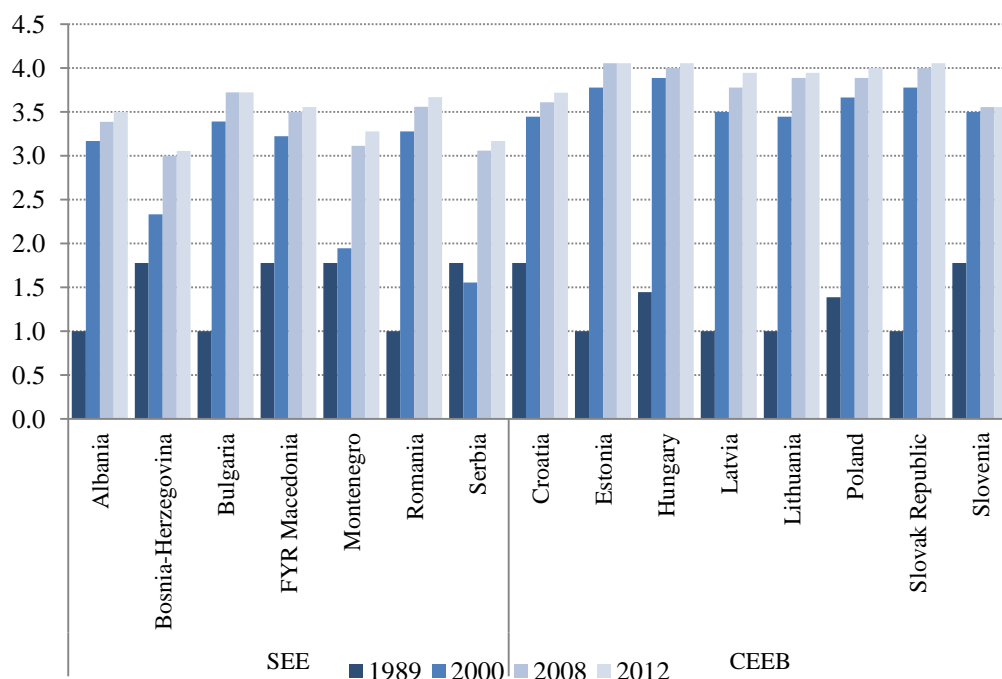
The transition countries did not all have the same paths and the same level of success in transition, in economic development as well as in mitigation of the consequences of the crisis and recovery. However, as previously described they were part of a unique economic process of systemic transformation to market economy and shared the same key political goal in terms of introducing of democracy and civic society but also convergence and integration into the European Union. In terms of success in overall market reforms some authors point to the “divide” (Berglof and Bolton, 2001) between frontrunners that are nowadays basically EU members and belong to the region of CEEB and less successful reformers as Balkan countries from SEE region. This divide may be traced by the level of per capita income and average transition indicator score, FIGURE 1, FIGURE 2. The same wedge reflected in the robustness to the effects of global crisis and perspective of recovery where SEE countries are more hardly hit by the crisis and are more fragile in terms of perspective for the recovery.

The choice of specific research issues and mental and physical proximity to specific developments steered part of research in the thesis to focus on Serbia (presented under Chapter 2 and Chapter 3). Serbia has somewhat specific transition reforms chronology relative to other countries from Emerging Europe and from CEEB in particular. Some of market reforms were implemented in the period from 1988 to 1990 though with short life as already in mid-1991 the former Yugoslavia ceased to exist. The last government of Socialist Federal Republic of Yugoslavia led by prime minister Ante Markovic introduced a set of economic reforms including introduction of private sector, currency convertibility, foreign investment, import and price liberalization and legislative framework for privatization of socially owned enterprises. The most of positive effects of these reforms were shadowed by the following decade of difficult political turbulences in ex-Yugoslavia during the 1990s including war, isolation, hyperinflation and related reversals in economic reforms. With the political change resulting from the elections in 2000 resulting in new pro-democratic

government, Serbia has embarked on decisive political and economic reforms, like other transition economies did in early 1990s, only since 2001. Serbia thus entered the transition a decade later than other transition economies in Europe. Despite legacy from 1990s, Serbia experienced all typical economic features of a transition economy in Europe throughout the 2000s. Serbian transition outcome was apparently relatively less successful by the fact that the level of per capita GDP is still far below CEEB average as well as the overall indicator of transition reforms (FIGURE 1, FIGURE 2). Uvalic (2013) points to three group of factors in explaining Serbia's lagging behind in the reform process: the adverse political conditions in 1990s; the neglect of fundamental microeconomic reforms after 2001, where the experience of other transition countries was not sufficiently taken into account; and until fairly recently, the generally hostile external environment.⁹ Knowing the previous, it might be questionable to claim that findings on Serbia are perfectly representative for any other transition country but only of its own. However, the main topic of interest in this thesis is financial intermediation together with the liberalization of capital flows as a general environment. The reforms in both banking sector and capital account convertibility have attained the most advanced level of harmonization to a liberal-market capitalism model relative to other areas of reforms (Uvalic, 2010, p.268). Therefore, the findings on finance related issues in an emerging country resulting from the case study of Serbia may be considered as of a broader relevance.

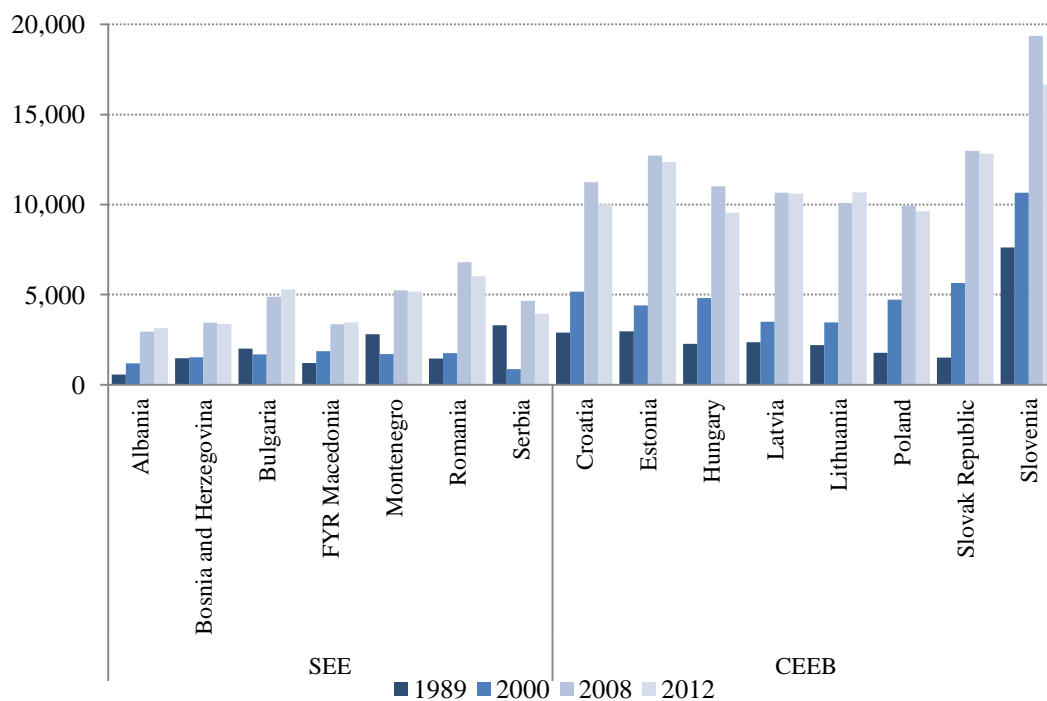
⁹ See Uvalić (2010) for a comprehensive overview of Serbia's transition performance, and Uvalić (2013) for a summary of political and economic evolution on Serbia's path toward market economy.

FIGURE 0-1. EBRD Transition indicator score



Source: EBRD. Note: Country scores are calculated as a simple average of scores of six dimensions: large scale privatization, small scale privatization, governance and enterprise restructuring, price liberalization, trade and forex system competition policy. Scores range from 1 (worst) to 4.3 (corresponding to 4+, best).

FIGURE 0-2. Nominal per capita GDP in Euro



Source: World bank data, United Nations Statistics Division

Though the approach of analyzing a single country, as it is used in chapters 2 and 3, has its shortcomings from the perspective of having no comparative case or counterfactuals and that of relatively small datasets if the time span is short, it also has some obvious advantages. Studying financial sector related phenomena on the case of one transition/emerging country gives better insights into the behaviors of economic agents – they are clearer, more visible, more rudimental and thus easier to capture its main determinants than in the developed markets with various interfering developments and much more sophisticated and complex institutional structures. The deep insight into one market enables the researcher to better capture the structural shocks, to define variables more properly having in mind the local specifics, and to take into account all available information that are not always possible to use on the cross country scale.

Since financial transformation was one of few main pillar of overall transition reform process, as well as one of the key channels of integration of the transition economies into Europe and global financial flows, understanding its microeconomic foundations enables one to (1) better understand the seeds of the vulnerabilities that fostered the crisis transmission to the region, (2) help policymakers to set better adapted policies and institutions, and (3) to give some insights for new economic policies that should aim to bring economies out from crisis and put them on to a more sustainable growth path.

In this thesis, we put a particular focus on the microeconomic issues immanent to the transforming financial sector that are systemically relevant and have wider macroeconomic impact. In other words, from an economic policy perspective, as policies are targeting macro-variables while they affect the micro-economic behaviors of agents, it is needed to understand the mechanism of the micro-agents' behavior in respect to economic policy in order to assure policy effectiveness.

The issues that are treated in this thesis concern the functioning of the liberalized credit market, the role of credit in the newly established monetary policy framework, the segmentation of the credit market according to risk and transparency of borrowers, and determinants of financing obstacle including differences in access to finance between firms from productive and non-productive industries.

The methodology applied in the empirical research presented in the thesis includes field survey of individual banks by face-to-face interviews on the basis of a prepared questionnaire, econometric analysis of a panel database consisting of individual banks financial indicators,

as well as some structural and macroeconomic data series. The empirical approach includes generalized least square and general method of moment estimation. The research of financing obstacle is held using probit estimation on a database provided by EBRD and the World Bank from Business Environment and Enterprise Performance Survey (BEEPS).

Doing research closely connected to the field and to the everyday ‘vibration’ of the markets in one economy, as it was the case during part of the time of the preparation of thesis, helps one’s intuition to understand the developments and to make reasonable hypothesis. It also helps to take the appropriate data and to construct good indicators for the empirical part of the research. It enables access to specific information that can explain some unusual results from off-site data analysis. It holds especially from the perspective of the micro data analysis that is largely used in this thesis. Unlike cross-country macroeconomic data where many market specificities are sacrificed in order to attain the comparable variables across countries, the single country micro data is rich in details and there is no need to sacrifice any single information. In that sense, the fieldwork survey we have performed while preparing Chapter 2 is crucial for my deeper understanding of the issues explored in the further two chapters and the collected soft facts through the interviews with bank managers are of great value in interpretation of the further hard facts-based findings from the empirical estimation. In both the analysis of lending market segmentation and credit channel of monetary policy, we resorted to micro data from individual bank levels. Additionally, we have put a lot of effort into data collection and preparation of the coherent database taking into consideration all methodological caveats and changes (such as change in chart of accounts in bank accounting) in order to avoid possible misleading conclusions and distortions in reasoning. The micro-level data approach is also used in Chapter 4, but in this case my analysis is performed using a pooled panel of enterprise level data from all European transition economies. The micro-level data significance in applied economic literature grew in importance since the period of the 1997 Asian crisis, whose roots were explored at the micro level, after it was concluded that it was impossible to capture the causes of the crisis on aggregate level data. The authors like Pomerlano (1998) analyzed for the first time the enterprise finances in the overview of that crisis.

The thesis is particularly rich in methodological notes and clarifications relative to specific data and series. The caveats with local data sometimes have origin in peculiarities arising from the old statistical methodology that was serving planned economies and is also a subject of the transition to market based institutions as the whole economy that is described and

measures by the statistical system. This transition of the statistical system consists of the introduction and transformation of methodologies for collecting the relevant data that would support the market-based economy measuring. Other caveats come from some local economic specifics, such as large euroization of the economy. The thesis is full of methodological insights about data with the aim of turning attention to some crucial points related to main macro and micro statistics describing the banking sector and the monetary system of transition economies.

The findings on data quality are a result of the seven years of research on the banking system in Serbia, which included a deep and thorough understanding of statistical systems, methodologies applied and regulatory frameworks that define all data used to describe the banking sector. Pointing to some relevant data problems related to the quantification of the banking sector developments aims also to further stress reserve when dealing with these particular statistics in applied research. It also aims to put some general reserve on any statistics originating from transition and emerging countries that are a subject of rapid change in methodologies and in statistical systems. Therefore, special attention is paid to methodological details regarding used data for empirical research. This is particularly important for conclusions based on micro level data.

The fact that we did empirical research on a single country level, and also a field work on site in two out of four chapters, enables me to pay attention to the following caveats that a researcher may encounter when faced with micro level data: (1) bank balance sheets' reliability and the meaning of indicators on bank financial position and performances that arise from bank balance sheets¹⁰, presented within Chapter 2, section 2.5; (2) information on bank interest rates and spreads as important measure of financial intermediation efficiency and of the level of competition, presented also within chapter 2, section 2.3.3 ; (3) the caveat relative to measure of credit growth stemming from the large share of indexed loans 3.5, used in Chapter 3.

Framework for the preparation of the thesis

This thesis comes as a result of eight years of work in the field of applied economic research. In parallel with the academic curriculum within the University Paris 1 – Sorbonne, where I've been a part of, first ROSES and later CES (EUREQA) research team since 2005, the thesis is also enriched through my professional engagement. To begin, Mme Mathilde Maurel and M.

¹⁰ Schoors (2000 and 2001) gives one of rare detailed methodological insights in banking sector data for Russia.

Boris Najman are particularly responsible for the achieved academic scrutiny, theoretical background and application of the appropriate methodological approach. Further, the content of the thesis is largely determined by my professional experiences in my home country, Serbia, along the period of the preparation of the thesis. The latter has assisted greatly in the choice of relevant issues for the investigation and understanding of the financial sector in transition that was the general subject of my interest. It also enabled me to benefit from the proximity to data sources and institutions such as the central bank as a regulator and producer of main datasets relevant for studying the financial sector. The proximity to the Serbian banking sector and main economic institutions has thus also helped me to examine, with more attention, the evolution of data methodology that was as well subject to changes along the observed period. In some cases, I believe this proximity prevented the distortion of the empirical results that could mislead my conclusions due to the methodological changes or poor data quality.

The research presented in Chapter 2 and Chapter 3 was motivated by the insights I got while I was a part time and full time researcher in a think tank Center for Advanced Economic Studies in Serbia (CEVES). CEVES's aim is to bring excellence in economic thinking and decision making to Serbia and has undertaken the huge task of collecting and analyzing all relevant macroeconomic series; such a vast project having not been in place until then. Within that general goal, it established a joint institute with the Economics Faculty of the University of Belgrade and started publishing a valuable publication called *Quarterly monitor of economic trends and policies in Serbia* that is still a flagship publication of the Faculty of Economics and a reference in its field in Serbia. Besides regular following of the monetary and banking sector developments, I was in charge of several specific research projects aiming to bring in-depth insights into a few not enough understood but important issues related to the developments in financial sector. The first research project was aiming to screen the interest rates level and other terms in bank lending market.

In performing this task I enjoyed the generous support of Kori Udovicki who was a director and a founder of the CEVES think tank. I conducted a detailed survey consisting of interviews with relevant managers of Serbian banks. The interviews were based on a previously prepared detailed questionnaire (Appendix to Chapter 1, A.1). The results of this survey, which are presented in its large part within Chapter 2, inspired me to perform further research in order to explain the registered dispersion of the interest rates on banking loans in Serbia. Further research, which is entirely presented in the remainder of the Chapter 2, is based on the

empirical estimation using the detailed financial statements database of all banks operating in Serbia, covering the period from 2000 to 2005 marked by the liberalization and fast growth of the financial sector.

This study was co-authored by Boris Najman and published in *Comparative economic studies* (Palgrave MacMillan) in June 2008 (Dimitrijevic, Najman 2008). We have identified the presence of the segmentation of the lending market typical for a liberalized emerging banking sector where competition between two types of banks – one with cost advantage but information disadvantage (foreign banks) and the other with the opposite set of advantage and disadvantage (local banks) – occurs. The last finding pointed to a high level of information asymmetry in the lending market, which was reasonable as the banking sector was ‘young’ in terms of market players but also in terms of institutional setting as transition brought significant reforms in the financial market. At the same time, there were certain market segments where banks were exercising market power versus middle and small enterprises and citizens. Also, there was a part of demand that was almost inelastic to the price of lending. The result was that the general level of interest rate was high, but the high was also the dispersion between the same loans rate for different types of client within a bank, as well as for the same type of loan and type of clients across banks. The last, together with my observation resulting from almost two years of monitoring and writing regular analysis of monetary and banking sector flows and policies for the publication *Quarterly monitor*, unveiled to me another issue that merited to be explored in details. Thus I’ve defined the subject to Chapter 3.

Namely, the detected segmentation typical for lending markets in transition economies that get dominated by foreign banks and introduction of the new monetary framework in the form of implicit inflation targeting, all taking place in parallel with abundant inflows of direct cross-border lending, have inspired me to investigate the transmission of monetary policy through the banking sector, specifically the existence of the bank lending channel of transmission. It is elaborated in the Chapter 3. The empirical research on the detailed quarterly individual bank financial data for all banks operating in the Serbian financial sector for the period from 2006 to 2012 combined with the relevant macroeconomic statistics led to the conclusion that bank lending channels, though the main component in money creation, was not efficient in the transmission of the monetary policy impulses. This is particularly important to consider in policy setting given the inflation targeting framework and reference

interest rate are main monetary policy instruments while also interest the rate channel is weak and the exchange rate has the strongest impact on prices.

The occurrence of the global economic crisis triggered by the burst of the speculative bubble in the US mortgage market (subprime) that start to spread and affected also the emerging markets and transition economies, has coincided with my task of a chief economist and director of economic research department with the 4th largest bank in Serbia – Hypo Alpe-Adria-bank, a member of the Austrian Hypo Group, Alpe-Adria. I joined the bank in October 2009 where I took the responsibility for various analyses coping also with rising risk in bank lending portfolios and rising risk aversion of banks operating in Serbia, particularly foreign-owned ones. The crisis started to show in the form of many macroeconomic and financial sector vulnerabilities. The currency started to depreciate, the level of NPL doubled, and credit crunch was on the way. Not only has the crisis shaken all my previous beliefs in terms of liberalization of financial markets and the absolute well from a neo-classical like economic transformation, but it also made me change my perspective in the thesis. Namely, instead of projecting transition as a process that started in the 1990s, I put in first place the crisis and observed the irregularities that occurred as sui generis transition outcomes in the financial sector and that, in fact, propagated the crisis effects. My perspective from present established foreign banks, together with previous research I've done on the banking sector in Serbia, helped me in the first place to experience and understand the systemic role of a large bank and to capture the dimension of the macroeconomic impact of the financial sector developments.

The experience within a bank enriched my previous understanding of bank behavior as a risk focused rigorous lender, which was almost an academic prejudice. Namely, I understood that the profit focus and resulting struggle for fulfilling the ambitious plan reflected in short-term incentives were dominant in describing the market behavior of banks in the pre-crisis period. However, with the crisis, the support from headquarters by relatively low cost refinancing lines became less available. The last became even more accentuated with the Eurozone debt crisis and the need for capital adequacy improvement in Western European bank headquarters since 2010 and 2011. Thus, the abundance of finance where financial inflows were observed almost as a threat to macroeconomic stability turned the landscape in the opposite direction – i.e., to the scarcity of funds that lately took even a form of deleveraging. What did that mean for the locally present banks' business models? And what of local economic growth?

The last two issues were of particular interest for me from my position as a bank chief economist where I had the opportunity to participate also in the arising and still ongoing local debate on the ways to change the pre-crisis growth model based on the financial integration and foreign savings model (in large extent channeled toward imports and consumption, which turned obviously unsustainable with the crisis) to a more export and investment driven model. The debt and leveraging that represented a development chance before the crisis, with the economic downturn started to represent a main challenge for future growth since the crisis. The level of the non-performing loans lent in the pre-crisis boom period started to surge when the crisis began and the local banks put enormous effort in the collection of problematic placements. The risk standard became stricter as we moved from the “financially abundant times” to “financially scarce times” where the country risk spreads became high and foreign financing far more expensive than before the crisis. The pro-cyclical nature of such developments became the enemy of the recovery which should be naturally in both the interest of banks and foreign investors in the region and local governments and population.

Also, given the situation in the lending market and the high level of financial integration, as explained in the Chapter 3, the maneuver scope of monetary policy for support of the economy is limited. On top of that, in the new institutional setting, its single goal is price stability and not real activity. Since the crisis, prices have been under constant threat from currency depreciation transmission and the monetary policy had no space for further expansion. In that state of mind, I got inspired by one finding from the EBRD’s enterprise performance survey (BEEPS) undertaken in several turns – in 2002, 2005 and 2008. That survey brought the summarized evidence that in the period of financial abundance across the transition region in Europe, the access to finance represented a second largest obstacle for business in these economies. Thus, I decided to further investigate the issue of financing obstacle determinants. In my opinion, that issue is deeply rooted within the microeconomic functioning of the financial and business sector. And at the same time, it may play a crucial role and have a long-term impact on the overall economic structure, and affect the macroeconomic stability and sustainability of the development model through imbalances such as trade deficit and composition of the output¹¹. Thus, I’ve formulated the subject of Chapter 4 of this thesis to look at the role of access to finance in transmission of the crisis.

¹¹ In the context of the rethinking of what we know about growth and growth promoting policies, Dani Rodrik (2012) points out that in order for developing countries to achieve a long term sustained economic growth, it is crucial to achieve a right mix of economic activities. In that respect, the same author states that “while the

My experience from inside the bank also gave me much deeper and direct insight into the credit market, bank client relationships and business sector financial needs and demand side for credit. These insights enabled me to interpret my findings on the access to finance determinants, and in particular on the asymmetric financing obstacle with productive and non-productive businesses – obtained as an empirical result on the basis of a cross country pooled panel with detailed Business Environment and Enterprise Performance Survey (BEEPS) covering all transition economies through three turns of the survey. I used a probit estimation in that research. The research presented in Chapter 4 was partly published in a co-authored paper with Vladimir Cupić, the former CEO of the bank who particularly enriched and complemented my researcher's view with the practitioner's experience as an executive. We gave central place in that research to a simple but very attractive explanation of the causes of large macroeconomic imbalances related closely with banking sector development specific to transition economies. The paper was published in the *Ekonomika preduzeca* review, a special issue dedicated to the Annual meeting of economists organized by the Serbian association of economists in March 2010, where the paper had been presented.

My experience as analyst in a bank taught me also of a recent rising exposure of a local economy (Serbia) to international financial markets in difference to before the crisis where the main channel was through bank lending. As the government began to issue more debt in order to finance the high budget gap that had opened since the crisis, foreign investors and their investment banks were often visiting me as a local chief economist to get more insights into local economic perspectives. I witnessed how their perspective on their financing of fiscal deficit (including their yields on financed T-bills) was limited to a focus only on maximum one year ahead. They are not much interested in economic fundamentals. Instead, they are interested in short-term foreign exchange rate development as some of them invest in local currency debt. I understood also the superficiality of these investors as single information (usually concerning international liquidity rather than fundamentals) suddenly triggers panic and investor withdrawal from local currency through call of swaps' stop loss clauses. That is why I wanted to present an overview of both the financial development and financial integration process in transition countries of Europe that evidently contributed to the economic convergence of the region (Coricelli, et al., 2008; Brezigar-Masten, et al., 2008) but also opened the field for much vulnerability. I introduce it as a descriptive overview in

composition of output may be of second-order importance in a rich country, it is of first-order importance for economic performance and economic growth in a developing country”.

Chapter 1 in order to set the relevant context as a playfield of the phenomena that I explore in the remainder of the thesis.

Structure of the thesis and brief overview of main topics

The thesis consists of four chapters. Introductory Chapter 1 is intended to present the whole context including financial sector reforms, financial integration and their macroeconomic implications in European transition economies that started in the 1990s lasting until today. It presents the link between financial integration and income convergence as well as the hypothesis on the stimulating role of the political integration perspective of these countries for the financial integration of their economies with developed core Europe. It also covers the transmission of the crisis with special attention to the risks and channels resulting from the previous period of integration. It points to some key vulnerabilities such as large cross border loan stock and high share of loans indexed in foreign currency to unhedged borrowers that should be part of the future coordinated supervision and in the mind of the policymakers. The three chapters that follow are each one concentrated on one of the issues of major importance to understanding the functioning of the financial sector in one transition economy.

Chapter 2 covers the study of the market imperfections occurring in the lending market during the chronologically earliest phase of financial liberalization. These imperfections result in market segmentation and are inherent phenomena of rapid credit growth in a new liberalized market. Once we identify the pattern of lending market segmentation in Chapter 2, we base the research question, around which we constitute Chapter 3, on that finding. Chapter 2 argues that the risk in domestic banks increase with the increasing entry of foreign banks due to the existence of market imperfections (asymmetric information and competition between informed and uninformed lenders). Further on, in Chapter 3, we check whether this market structure may play a role in monetary policy transmission. As new monetary policy framework was introduced in the form of implicit and lately explicit inflation targeting, having in mind the failures in the credit market and the important role that credit have in the economy, my aim is to investigate the role of bank credit in monetary policy transmission. Chapter 3 is thus on monetary policy transmission with special emphasis on the role of banks in this mechanism. Both empirical analysis in Chapter 2 and Chapter 3 are based on micro level data on individual banks for the entire Serbian banking sector.

While Chapter 2 uses annual data in the period from 2000 to 2005, in Chapter 3 the quarterly data panel is obtained for the period from 2006 to 2012. And finally, in light of the recent

crisis and its propagation on transition economies in a form of credit crunch and revealing of the macroeconomic vulnerabilities, we try to identify the causes of these vulnerabilities that are directly linked to the specific setting in the lending markets in these countries. Thus, we analyze the access to finance and its variation across business sectors, trying to explain the microeconomic foundations and patterns of distribution of credit (and hypothetical growth) across segments of the economy.

These findings inspired me to propose one possible relationship between segmentation of access to finance, analyzed in the Chapter 4, with the segmentation of the lending market, examined in the Chapter 1. We also propose the mechanism that relates these microeconomic market failures in the financial sector to the wider macroeconomic imbalances resulting in structural vulnerabilities as current account gap and underdeveloped export. While Chapter 2 and Chapter 3 are based on the empirical research of the Serbian banking sector and the Serbian economy as a representative case of European transition economies, Chapter 4 is based on a set of transition economies and data from the Business Environment and Enterprise Performance Survey (BEEPS) realized jointly by the World Bank and European Bank for Reconstruction and Development in 29 transition countries covering a reliable sample of enterprises from each country.

The central idea of the thesis is to investigate which market imperfections in the financial market in transition economies were crucial for the propagation of the global crisis. The conclusions are that credit market is segmented and that in one segment risk is particularly concentrated. It is the case with domestic banks. Another finding related to the credit market is that the general level of interest rates is too high. The causes are both from external and local factors. The first are linked to the international financial market assigning high country spread as entry cost for all financial inflows into non-investment grade country, as Serbia and many other emerging countries are. The internal factors are related to high regulatory costs of dealing with credit expansion imposed to banks in the form of reserve requirements but also the monopolistic behavior of banks as it will be registered in Chapter 2.

In terms of monetary policy, analyzed in Chapter 3, the general finding is that it is of limited efficiency and that it has no impact on bank credit while the last was apparently critically determining the real activity. The fact that credit determines the real sector development and above all its uneven growth resulting from access to finance is a conclusion of Chapter 4. The recommendations for future policies following from these findings would be to essentially

focus on dealing with these imperfections. As underlined by Stiglitz (2012, p.37): “Sins of both commission and omission—most notably, excessive deregulation, a failure to effectively enforce the regulations that existed, and the failure to adopt new regulations reflecting changes in financial markets—made the economies of the United States and, to some extent, Europe vulnerable to collapse. These failures led to the crisis and have continued in its wake.”

In that line of arguments, the regulatory environment in new market economies should encompass institutions to deal with information asymmetries and market failures that finally result in macroeconomic imbalances and propagation of an external shock such as the global crisis. Moreover, they may reproduce what we observe here in any developing countries other than European transition economies in the phase of economic liberalization and financial integration. Having that in mind their investigation merits special attention.

Chapter 1. Financial integration, income convergence and European integration of the Emerging Europe from the post-crisis perspective

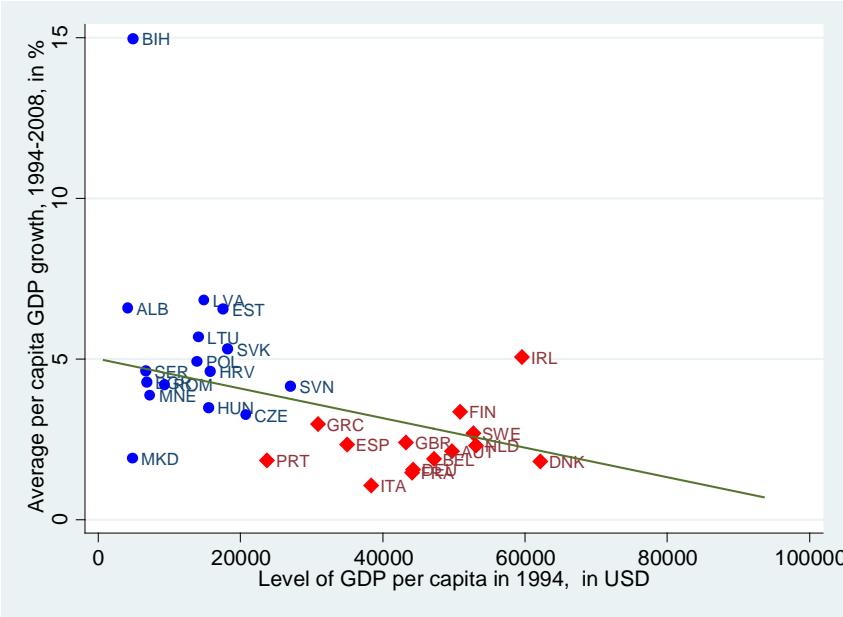
1.1. Introduction

The global crisis hit the region of Emerging Europe after twenty years of market reforms. The crisis transmission was tightly related to the institutional and economic developments in the preceding period. The past two decades in European transition economies have been marked by an unprecedented level of integration. Formerly, centrally planned economies, most of them politically belonging to the Soviet bloc, have embarked onto the path of political and economic transformation converging into the community of Western European market economies with democratic political traditions. The two processes – economic integration and political convergence did happen in parallel. The two may even be observed as strongly interrelated and mutually reinforcing processes. While the political integration can be tracked by institutional alignment and progress over official stages towards final accession to the European Union, the economic integration reflected in the remarkable convergence of average income and living conditions of poorer European countries' citizens to the level much closer or even equal to their Western European neighbors. Poorer countries have thus registered much stronger growth records over the 1990s and 2000s, FIGURE 1-1.

It is highly probable that integration itself had facilitated income convergence to a large extent. The perspective of future integration into the European Union had apparently represented a significant leverage for the economic integration of Central and Eastern European countries, and in particular for their financial integration. On the other hand, financial integration spurred financial development, both having the incontestable role for economic growth. The overall growth pattern in European transition economies has been

qualified in the literature as “financial integration driven growth model”¹². The role of financial integration and rapid financial development was also crucial as one of the main channels for transmission of the recent global financial crisis to the region of New Europe but also in the Eurozone proper crisis on the relation core-periphery.

FIGURE 1-1. Convergence of income in Europe: 1994-2008



Source: World Bank databank

Hence, besides this incontestable benefit for the overall level of activity and living standard, the pursued integration has also been responsible for generating the macroeconomic threats such as: credit booms, large private debt stocks composed mainly of lending in foreign currency, large current account deficits and stock of foreign debt both contributing to the large external financial needs in these countries. In that way, it has opened the channels for the transmission of the global crisis to these economies. Foreign bank presence had been seen already in the literature as a significant factor for the propagation of the crisis from bank home countries to host countries (Cull and Soledad Martinez Peria, 2010).

The idea of this chapter is to overview the ‘finance dimension’ with the last two decades of economic integration of the countries of Emerging Europe including the last crisis period. Special attention is paid to financial development and main macroeconomic relations within the process of financial integration. This overwhelming outline should serve to set the

¹² EBRD, 2009.

background in which the topics analyzed in the following three chapters were developing. The three specific topics that follow in chapters 2 to 4 have in common the fact that all treat specific challenges for macroeconomic and financial stability in transition economies that is directly linked to their financial integration and financial sector reforms within the broader economic transition process. Another purpose of this chapter is also to introduce and to define key terms that are going to be extensively used in the remainder of the thesis to describe the (macroeconomic) context related to (microeconomic) analyses. These are: economic transition, financial reforms, financial integration, financial liberalization, financial development, and financial deepening. All these distinct but interconnected phenomena belong to the more general field of the macroeconomic dimension of finance.

In the first subsection, we describe the transmission of the global crisis to European transition economies and the role that financial integration has played in prior generation of macro-vulnerabilities as well as in stabilization and mitigation of potentially more severe consequences to macroeconomic stability at first and growth perspective at second. In the second subsection, we shed more light on the financial integration itself and its relation to EU integration and income convergence in transition countries, citing main findings from that stream of literature. In the final subsection we simply describe the transformation of the financial sector including liberalization, reforms, foreign bank entry and privatization of state owned banks, rapid credit growth and intensified banking competition and credit market deepening – all typical evolution of the financial sector during transition. Here again, we accompany the description with the main findings of the related literature.

1.2. The transmission of the global crisis and the role of financial and European integration

The global crisis started as a subprime mortgage crisis in the United States. It became visible after 2006 when home prices started to fall. They fell 40% in real terms over five years from 2006 to 2011 (Standard & Poor's / Case-Shiller US home price index). By 2007 this decline had brought prices of home mortgage securities down far enough to create a crisis in these securities. It was called subprime crisis because the price falls were especially striking among mortgages issued to subprime borrowers, that is, home buyers who are judged more likely to default because of factors including their past payment and employment histories. Financial innovations related to these subprime loans themselves were blamed for the crisis. But the

crisis did not remain confined to subprime mortgages. That was only the initial shock in the much broader crisis. The consequence was a drop in real estate prices and the collapse of financial institutions, not only in the United States but also in Europe and elsewhere. By the spring of 2009 the crisis was so severe that it was described as the biggest financial calamity since the Great Depression of the 1930s—bigger than the Asian financial crisis of the 1990s and bigger than the oil-prices induced crises of the 1974-75 and 1981-82. Major concern with the financial globalization relative in particular to short-term financial inflows has been whether it increases vulnerability and volatility due to the exposure to external shocks (Stiglitz, 2000). The last global crisis has been a live test for it.

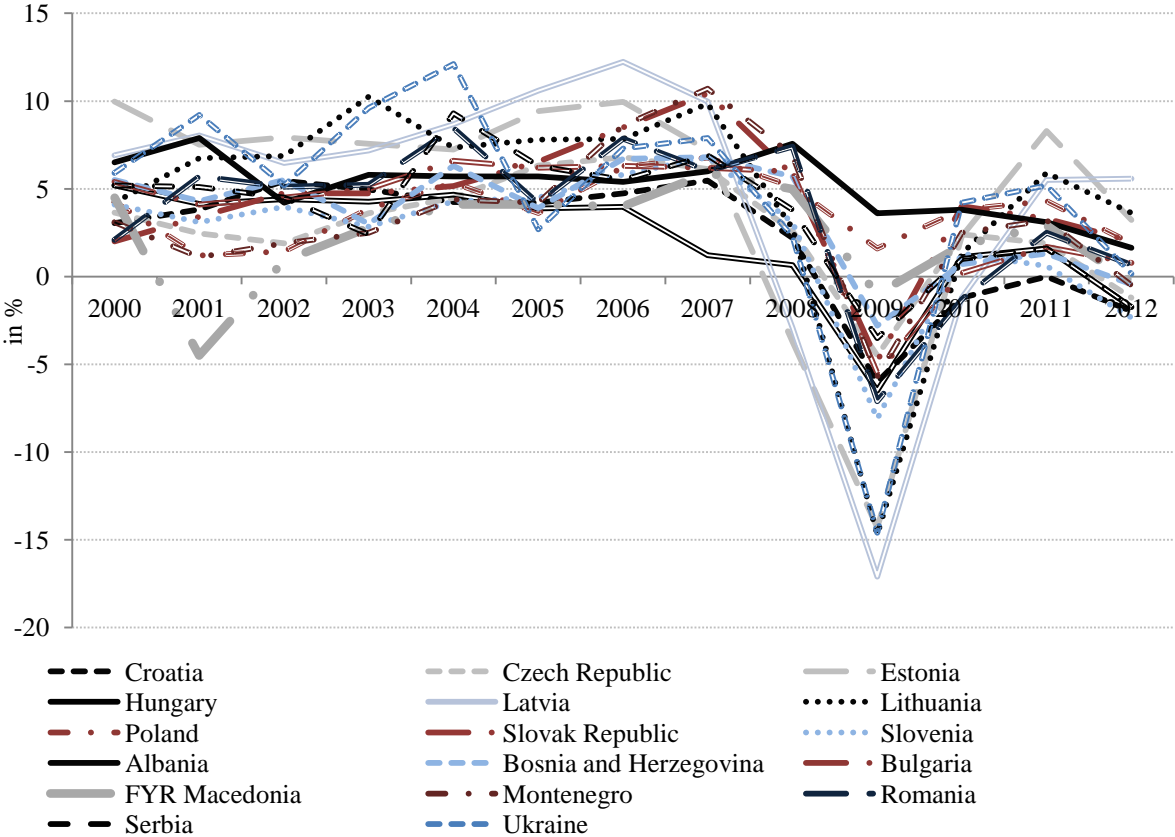
The financial turmoil rapidly spread from the United States to Europe and other parts of the world through the financial interlink resulting from the strong globalization wave preceding the shock. The financial markets contracted and burst as asset prices (bubble) started to unfold. As global liquidity soared financial markets contracted and credit became less available and more expensive. Banks from core-EU countries that were mainly represented across New Europe became more concerned as their own capital requirements were faced with increase risk in their asset and the depleting value of their collateral. Swiftly, the inflows of capital and debt to New Europe stopped and the previous credit expansion was threatened by sudden reversal. The propagation of the crisis basically went through two main channels – financing and trade. In the last quarter of 2008 and first quarter of 2009, as a consequence of the sudden standstill in financial inflows followed in parallel by demand for domestic export goods, the European transition region was faced with the significant drop in output (FIGURE 1-2).

The reversals in the financial flows and related much sever output contraction have been, however, prevented by a coordinated international action within the co called “Vienna initiative”. The headquarters of large Western European banks largely exposed to the transition region, together with international financial institutions (IMF, EBRD) and representatives of governments, agreed that these banks would not decrease their exposure to the economies of Central and Eastern Europe over the two year period while these countries would conclude the IMF support arrangements where needed¹³. The immediate credit crunch had been avoided. Hand in hand with the strong output decline, most of the transition

¹³ De Haas et al (2012) present evidence of the effects of the Vienna initiative. They show that both domestic and foreign banks sharply curtailed credit during the crisis, but that foreign banks that participated in the Vienna Initiative were relatively stable lenders. They neither find evidence of negative spillovers from countries where banks signed commitment letters to countries where they did not.

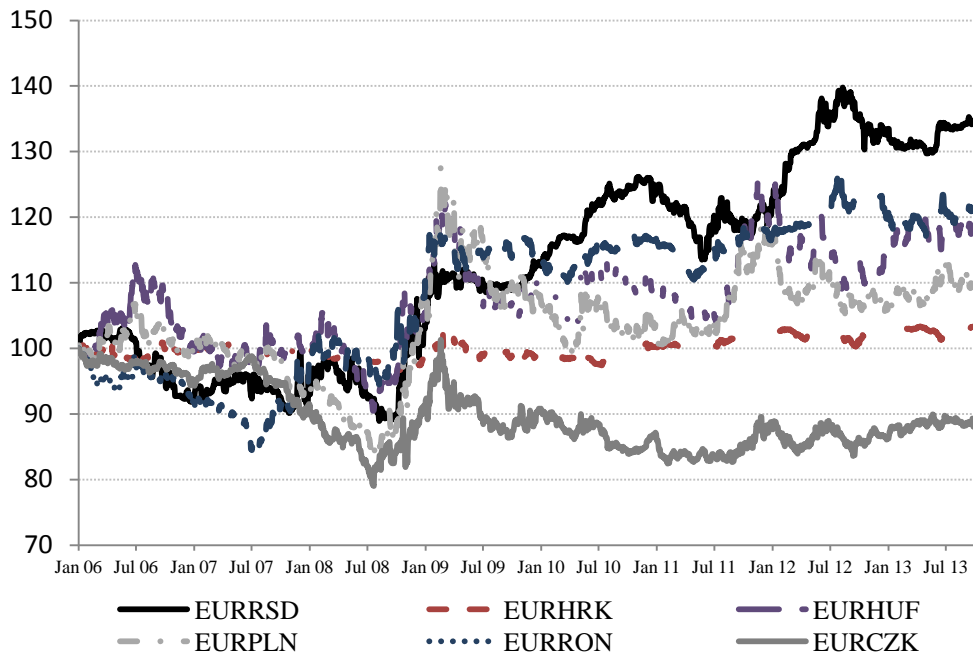
countries also registered depreciation pressures on their currencies as a consequence of the above described halt in financial inflows (FIGURE 1-3). At the same time, along the period Q4 2008 – Q2 2009, the share of non-performing loans in the banking sectors of these economies rose between 1,5 times, as in Poland, and 5,5 times, as in Latvia (FIGURE 1-4).

FIGURE 1-2. Economic growth in transition countries: real GDP annual growth 2000-2012



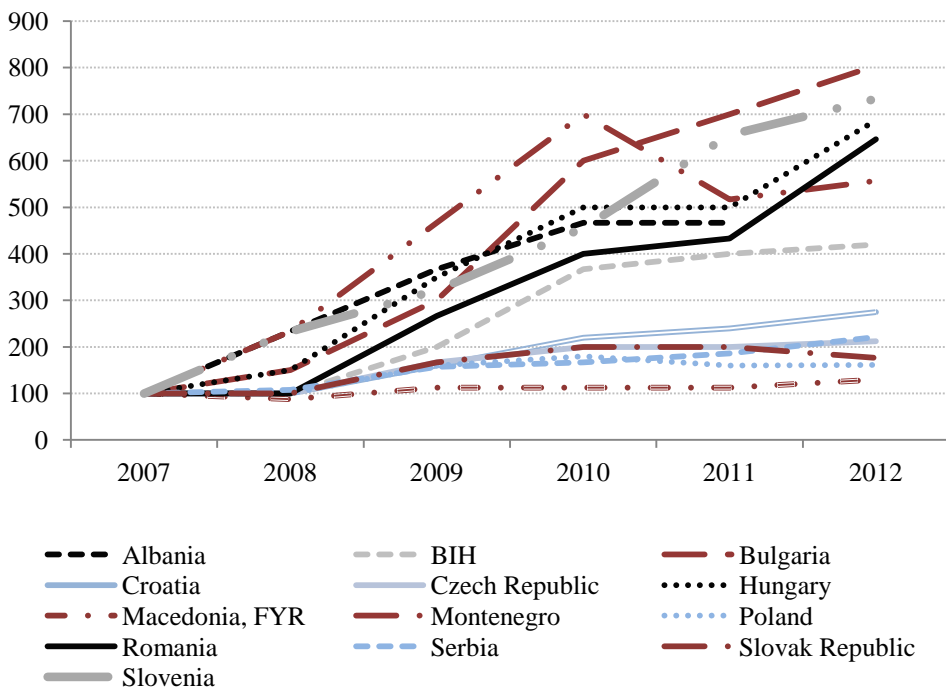
Source: EBRD

FIGURE 1-3. Exchange rate development in New Europe: 2008-2012



Source: Bloomberg

FIGURE 1-4. Bank nonperforming loans to total gross loans, index (2007=100)



Source: World Bank

The severe impact of the crisis has probably coincided or only turned attention to the accumulated macroeconomic imbalances in these economies. As a result, a shadow has been cast over their model of economic development and its sustainability. Many new questions on

the future drivers of development and economic growth in these countries have been raised. Also, the role of financial integration and accompanying foreign banks' dominance in financial markets in these countries were put into question. Berglöf, et al. (2009) in analyzing the propagation of the crisis to the European transition region conclude that, on one hand, the most of the cross-country variation in output decline can be explained by a small group of macro vulnerabilities, above all, by the pre-crisis credit boom and by external debt accumulation (both driven by financial integration based on foreign banks' entry).

On the other hand, foreign banks were seen as a stabilizing factor during the crisis, in some way mitigating the problem that they had caused. The last was documented by significantly lower capital outflows in countries with relatively larger foreign bank presence. The last finding has been verified equally in de Haas and Llyveld (2010) and Winkler (2009). Moreover, financial integration in transition economies has also been seen as problematic for two reasons. First, foreign financing and/or the presence of foreign banks seemed to play a role in the accumulation of a large share of foreign currency indexed lending in transition economies (EBRD, 2009; Abiad, et al., 2009). Second, high concentration of loans in some industries (e.g. in construction industry), has been registered. Both developments were making these economies and their financial sectors more vulnerable to foreign currency and systemic risk.

1.3. Financial integration, EU integration and income convergence

Overall process of improvement in quantity, quality, and efficiency of financial intermediary services has been usually defined as financial development. Financial development is considered as a credible source of economic growth. A famous review and discussion on theory and evidence by R. Levine (2004), though underlying that "we are far from definitive answers to the question: "Does finance cause growth, and if it does, how?"", highlights the following. "Without ignoring the weaknesses of existing work and the absence of complete unanimity of results, three tentative observations emerge. Taken as a whole, the bulk of existing research suggests that (1) countries with better functioning banks and markets grow faster, but the degree to which a country is bank-based or market-based does not matter much, (2) simultaneity bias does not seem to drive these conclusions, and (3) better functioning financial systems ease the external financing constraints that impede firm and industrial

expansion, suggesting that this is one mechanism through which financial development matters for growth.”

In particular, having in mind the main functions provided by the financial system “financial development involves improvements in the (i) production of ex ante information about possible investments, (ii) monitoring of investments and implementation of corporate governance, (iii) trading, diversification, and management of risk, (iv) mobilization and pooling of savings, and (v) exchange of goods and services. Each of these financial functions may influence savings and investment decisions and hence economic growth. Since many market frictions exist and since laws, regulations, and policies differ markedly across economies and over time, improvements along any single dimension may have different implications for resource allocation and welfare depending on the other frictions at play in the economy,” (Levine, 2004).

In the case of countries of Central, Eastern and South-Eastern Europe, or so called Emerging Europe (or New Europe), financial integration and development was one of several streams of overall economic integration during their transition and political integration to the EU. The economic integration in New Europe took place on several main horizons – trade, finance, labour, and knowledge. Financial integration, together with trade integration, had a prominent place. The first – trade channels – correspond to the expansion in trade volumes exchanged between these countries and EU-15 countries and thus attaining the significant level of trade openness (TABLE 1-1). The second – financial integration – took probably the most impressive pace. Namely, having reduced barriers to capital account transactions, transition countries participated fully in the increased volume of international financial flows. The most important component of capital inflows in the early transition period was foreign direct investment, which in 2004 for the region as a whole accounted for almost half of total external liabilities (Lane and Milesi-Ferretti, 2007).

TABLE 1-1. Financial and trade integration of European transition economies before the crisis

	Average CAD, 2000-2008, in % of GDP	Foreign banks share in total banking sector asset, end-2008, in %	External debt/GDP, end-2008, in %	Trade openness, (Exports+Imports)/GDP, end-2008, in %
Albania	-8.9	93.6	20.4	48.3
Armenia	-7.3	50.5	na	41.0
Belarus	-3.8	20.6	24.6	119.8
Bosnia and Herzegovina	-15.8	95.0	42.5	94.6
Bulgaria	-11.8	83.9	103.5	111.6
Croatia	-5.9	90.8	82.4	64.6
Czech Republic	-4.2	84.7	41.6	131.8
Estonia	-10.9	98.2	114.1	80.2
FYR Macedonia	-6.1	93.1	49.1	109.7
Hungary	-7.6	84.0	114.4	135.7
Latvia	-12.3	65.7	124.0	74.2
Lithuania	-8.3	92.1	68.9	112.5
Moldova	-8.2	31.6	67.9	106.4
Montenegro	-15.7	84.6	52.7	85.7
Poland	-3.5	76.5	46.2	72.0
Romania	-8.4	87.7	49.0	56.4
Serbia	-8.6	75.3	60.4	66.3
Slovak Republic	-5.3	99.2	53.3	147.6
Slovenia	-2.3	31.1	105.7	115.5
Ukraine	2.5	51.1	56.4	84.8

Source: EBRD

Furthermore, there was a significant process of financial integration through cross-border bank acquisitions (partly registered as FDIs) and lending led by large Western European banking groups. The countries of transition Europe represented a green field for financial market development. This development was particularly dynamic in the period from 2005 to 2007, which coincided with the period of high global output growth, soaring commodity prices, and abundant liquidity. The presence of foreign banks in the region grew significantly both through local subsidiaries of EU-15 based commercial banks and through direct cross-border lending of EU banks to enterprises based in European transition countries. In some of transition countries the share of foreign banks approached 100%. The credit to private sector was growing at double digit rates both as direct credit by local banks and cross border credit by foreign banks, usually mother companies of locally present foreign banks. This financial deepening process brought local credit to GDP ratios as measure of financial development, close to comparable levels of credit to GDP (measured as total local and cross-border credit) as in developed EU members (TABLE 1-2).

TABLE 1-2. Domestic credit to non-government sector and cross border lending in European transition economies before the crisis

Country	Domestic loans, end-2008 (% of GDP)	Cross-border loans, end-2008 (% of GDP)	Total loans, end- 2008 (% of GDP), (1)+(2)
	(1)	(2)	(3)
Albania	35.3	24.5	59.8
Bosnia and Herzegovina	53.5	27.3	80.8
Bulgaria	74.5	62.1	136.6
Croatia	68.1	70.7	138.8
Czech Republic	51.0	17.5	68.5
Estonia	91.9	118.4	210.3
FRY Macedonia	43.9	16.9	60.8
Hungary	67.6	65.5	133.1
Latvia	89.6	90.2	179.8
Lithuania	62.7	66.2	128.9
Montenegro	87.2	63.0	150.2
Poland	55.0	24.2	79.2
Romania	38.5	39.6	78.1
Serbia	39.7	30.9	70.6
Slovakia	44.7	89.0	133.7
Slovenia	85.6	71.9	157.5
Ukraine	79.8	22.8	102.6
Germany	108.6	27.9	136.5

Source: EBRD; BIS

It is however important to note that financial integration within Europe including that of developing (Emerging) Central and Eastern European countries, took place during the worldwide trend of financial globalization. Financial globalization started in the 1980s due to a large wave of deregulation of capital markets, and removal of barriers for cross-border capital flows and securitization. And unlike global trade integration, where there is a consensus on clear positive outcomes for developing countries' welfare and growth (resulting from specialization, price reduction, diversification, etc.), views on financial globalization are rather mixed. Financial globalization is seen as growth supporting thanks to capital accumulation and enhanced access to financing (Fischer, 1998; Summers, 2000).

Nevertheless, it is associated with higher income volatility and exposure to crisis due to the sudden stops (Rodrik, 1998; Bhagwati, 1998; Stiglitz, 2002). A wide range of literature on the direct net benefits from financial globalization for developing countries on the world wide scale is, however, inconclusive. An excellent literature survey by Kose, et al. (2006) sums up that there is little robust evidence for the direct casual relation between financial integration

and growth, but when accounting for thresholds like level of financial market development, institutional quality, governance, macroeconomic policies and trade integration, there is a positive effect of financial integration on growth for the countries above thresholds. Moreover, the benefits from financial integration seem to be rather indirect in that financial integration plays a catalytic role in generating an array of collateral benefits that may help boost long-run growth. These benefits are, similar to financial market development, better institutional environment, better governance, and macroeconomic discipline.

Empirical evidence for transition countries acts in support of the positive role of financial development and financial integration for growth and income convergence. For financial development, the empirical analysis in Coricelli, et al. (2008), using industry-level data for EU and transition countries, revealed that it indeed significantly contributed to growth and catching-up in transition economies. The same is confirmed by applying both the cross country¹⁴ and cross sector approaches. By applying the methodology proposed by Rajan and Zingales (1998) consisting of verifying if the sectors with greater external financial needs grow faster with more intensive financial integration of the economy, Friedrich, et al. (2010) have obtained positive results in contributing to the impact of financial integration to economic growth in a set of transition and emerging economies.

When the international capital flows between developed and developing countries are considered, there is a general pattern observed on a world scale during the past two decades marked by financial globalization. This pattern is translated in three ‘puzzles’ in international macroeconomics. The first is that capital usually goes ‘uphill’, that is from poor to rich countries, unlike the proposition of the neoclassical growth theory assuming that capital goes where it is scarce and where its marginal product is thus higher, leading to the income equalization. This is known as Lucas’ puzzle in international economics (Lucas, 1990). Second, global level economic evidence shows that there is a correlation between national level of savings and investment. This particularly means that countries are growing based on their own savings and that there is a preference for investing at home even when there is a lower marginal return on investment than elsewhere. This finding has been puzzling from the point of view of the permanent income hypothesis, since high-growth countries should borrow abroad against future income to finance a higher level of investment and consumption. This phenomenon is called Feldstein-Horioka puzzle (1980).

¹⁴ EBRD (2009) and Abiad and al. (2009)

Finally, Gourinchas and Jeanne (2007) have observed, using a large sample of non-OECD countries, the negative correlation between productivity growth and net capital inflows over the period 1980-2000. The last is known as the “allocation puzzle”, again contradicting the traditional view of the neoclassical growth model where capital is normally directed toward more productive investment. The typical example for these three puzzles is that of China and the United States capital flows. Unlike the previously described global pattern, the European patterns of financial integration and capital flows between ‘old’ and ‘new’ Europe over the last two decades were more in line with the theoretical propositions. Within Europe, capital has been flowing ‘downhill’ – from ‘rich’ to ‘poor’ countries. Poorer countries (including transition economies of Central and Eastern Europe) were net receivers of capital rich Western European countries during last two decades preceding the crisis.

Another European distinctiveness during decades before the crisis was the phenomenon of income convergence¹⁵. While on the world scale, a rather ‘a big divergence time’¹⁶ growth pattern within Europe offers again a counterexample. Catching-up by new entering countries has been considerable (FIGURE 1-1). Poorer countries were growing at much higher rates than richer ones. Intuitively, financial integration and income convergence in Europe are tightly related. Apparently the financial flows from rich to poor countries have played a crucial role in the income convergence of the latter ones. Transition countries differed sharply from other emerging countries in their financial integration and income catch-up, as documented in Lane and Milesi-Ferretti (2007). Significant capital inflows to transition countries resulted in persistent current account deficits associated with a sizable increase in private investment, well above domestic private savings.

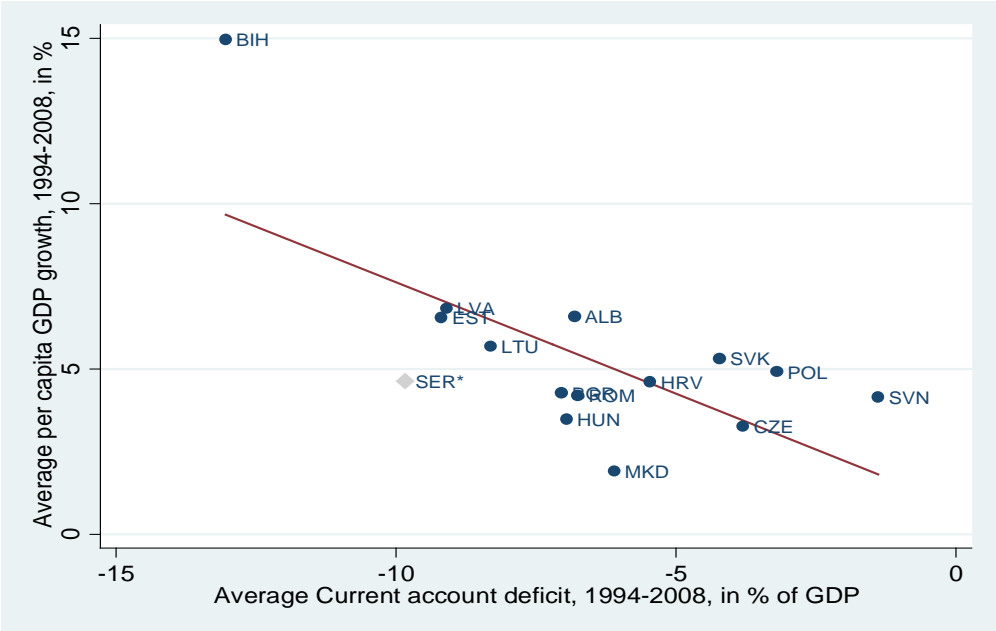
In a large cross country study by Abiad, et al., 2009, this link was particularly highlighted. By estimating the determinants of current account deficits (as difference between national savings and investments) across Europe on a large cross country database, the authors explained the increased dispersion of the current account deficit in Europe by financial integration while the direction of that relationship depended on the country’s income. While poorer countries that were more financially integrated ran larger deficits, richer countries that were more

¹⁵ The term β -convergence was invented by Barro and Sala-i-Martin (1992) and refers to the negative correlation between initial levels of real GDP per capita and its average annual growth rate, either after conditioning for certain control variables (conditional β -convergence) or without conditioning (unconditional β -convergence). Together with the concept of β -convergence, Barro and Sala-i-Martin (1992) introduced the concept of σ -convergence. It refers to the decrease of the dispersion of real GDP per capita across economic units through time. It should be noted that β -convergence is a necessary but not sufficient condition for σ -convergence.

¹⁶ Pritchett, 1997

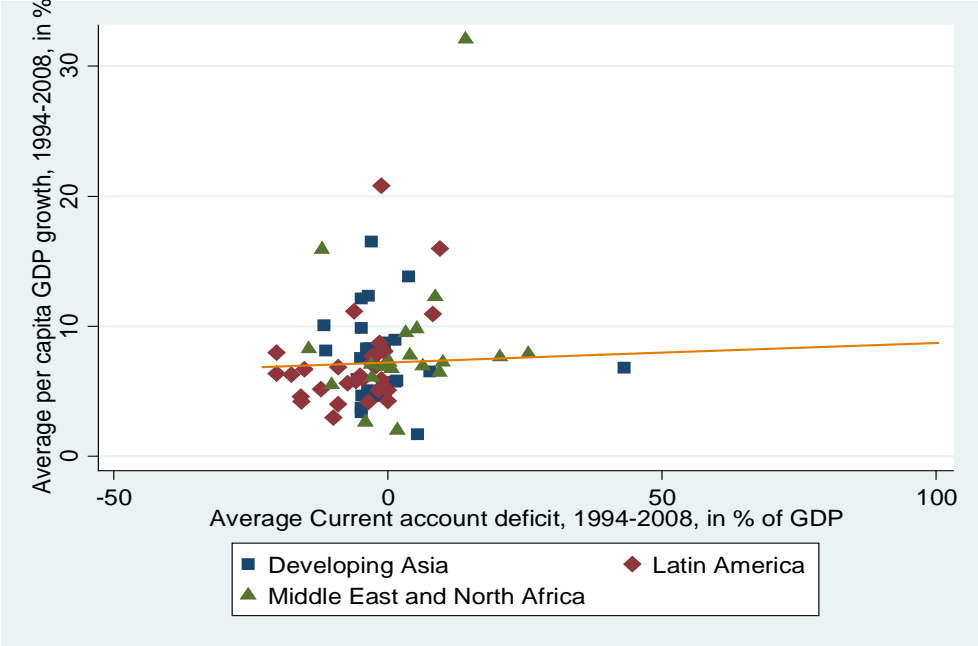
financially integrated ran larger surpluses. Illustrating the previous hypothesis, the negative correlation between size of current account deficit and GDP growth is registered in Europe (FIGURE 1-5), while the same does not hold on the global scale (FIGURE 1-6).

FIGURE 1-5. Current account deficit and income growth in Emerging Europe



Source: World Bank databank

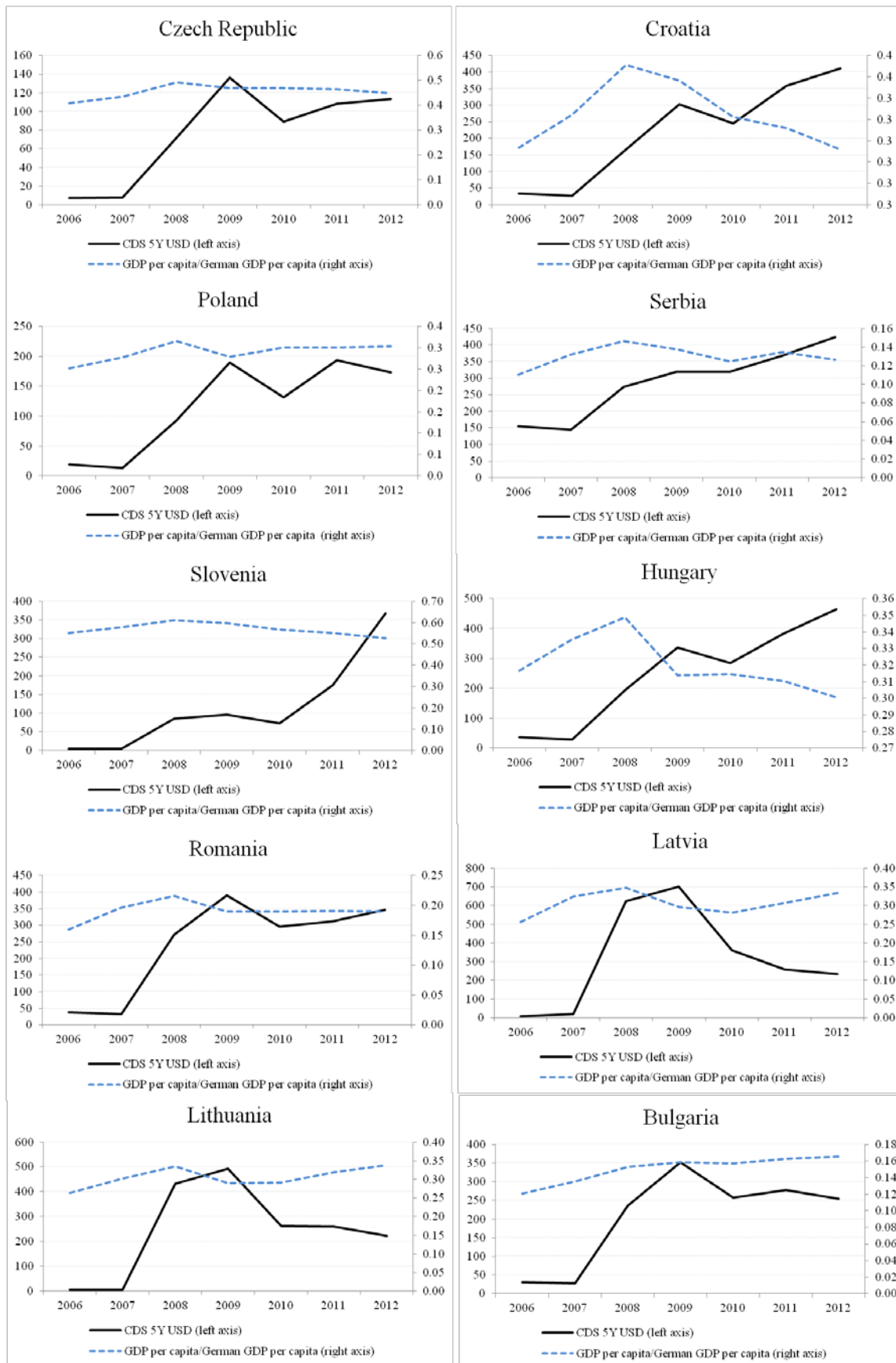
FIGURE 1-6. Current account deficit and income growth, World-wide sample



Source: World Bank databank

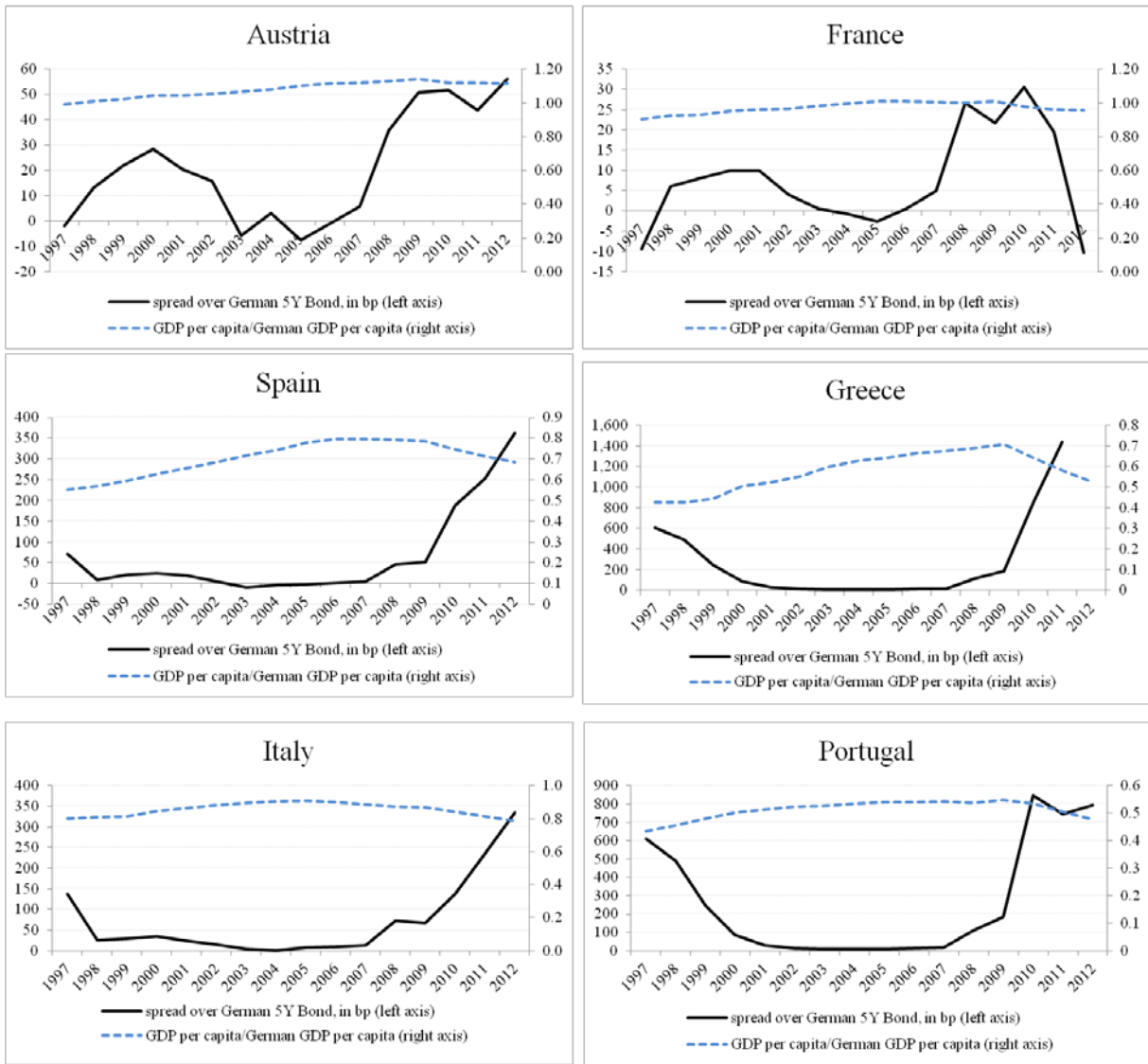
Looking at the evolution of the relative cost of borrowing measured by spread over risk-free asset and income convergence measured as relative GDP per capita of one country compared to Germany along a previous decade or two may give an insightful illustration of financial market sentiment in contrast to the real sector convergence. The price of borrowing for poorer (but converging) European economies had reduced particularly fast. Far faster than their per capita income converged, FIGURE 1-7 and FIGURE 1-8. This observation points to at least two trends. One is the abundance of financial funds willing to take a risk of investing in poorer European economies, thus reflected in high supply and risk appetite translated in lowering spread (price). The other trend is that a part of a much faster decrease in spread than improvement in fundamentals (measured by relative GDP per capita to German GDP per capita) may be attributed to (pre)pricing of credibility of future political unification. For investors, the last would mean better protection of capital invested in new markets resulting from institutional alignments and political harmonization to richer parts of Europe. The reversal in terms of spread and risk rating over the last few years, since the Lehman crisis, is other evidence in support of this assumption (FIGURE 1-8, TABLE 1-6).

FIGURE 1-7. Price of debt and income convergence in selected European countries from transition region



Source: Eurostat, Bloomberg

FIGURE 1-8. Price of debt and income convergence in selected European countries from EU-15



Source: Eurostat, Bloomberg

The presented hypothesis on the relationship between the direction of financial flows and institutional factors may be directly linked to European integration of the transition region. Namely, all post-communist economies located on the European continent had an implicit or explicit goal of membership of the European Union¹⁷. The underlying cohesion within the European Union at political, economic and monetary level has been evolving over the same two decades in parallel with the processes of economic and financial integration, in particular, within its territory.

¹⁷ Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia joined European Union in 2004. Bulgaria and Romania joined in 2007, Croatia in 2013, while Montenegro, FYR of Macedonia and Serbia are in candidate status from 2010, 2005 and 2013 respectively, and Albania and Bosnia and Herzegovina are recognized as potential candidates.

Some recent studies highlighted empirical findings in support of the previous intuitive hypothesis that the perspectives of institutional and political alignments within the process of European integration of transition countries play a role in encouraging the financial integration with the direction of capital flows and the price of capital in contradiction with the global level experience. Using the methodology by Rajan and Zingales (1998), based on industry-level data for the time span from 1998 to 2005 for 25 middle-income countries, of which twelve are from emerging Europe, Friedrich, et al. (2010) showed that the European transition region benefited much more strongly from financial integration in terms of economic growth than other developing countries since late 1990s. The effect of financial integration on growth is not only statistically significant, but also economically important. Hence, the experience of emerging Europe seems to conform to neoclassical growth theory, which predicts that openness to foreign capital should allow countries to grow faster towards their steady state income levels.

The difference between the effect of financial integration in emerging Europe and elsewhere in the observed period cannot be explained by threshold effects in financial development, institutional quality, and trade integration since there was no evidence of such effect on the sample. Also the Emerging Europe interaction term remained significant in these regressions. However, there is substantial evidence that the finding can be explained by the region's high level of political integration with the European Union. Within the group of transition countries, the effect of financial integration was found to be strongest for countries that are most highly politically integrated with the European Union. They account for the four dimensions of political integration – institutions, policy coordination, attitudes and political stability. This finding suggests that financial and political integration are complementary processes and that political integration may reinforce the benefits of financial integration.

A possible explanation of these findings is that the process of political integration with Europe created expectations of a stable political and economic environment in the European transition countries and of the eventual catch-up of their institutions with those of Western European countries. This in turn made it profitable for foreign investors to engage in projects that would otherwise have been considered too risky, with beneficial effects on economic growth.

1.4. Transforming financial sectors: Banking sector reforms, an overview

In order to have a complete background on specific financial intermediation-related developments in the region of Emerging Europe that are going to be studied in further chapters of the thesis, this overview ends with a look back into the overall process of the transformation of banks that took place during transition. At the beginning of the 1990s, the economic transition had started in the ex-communist countries of Central and Eastern Europe in parallel with their “political transition”. The main ideology behind economic reforms has been based on the neo-liberalist proposition consisting of liberalization, privatization, macroeconomic stabilization (so called Washington consensus) and the establishment of market institutions and policies. The specific reforms have been undertaken with the support and supervision from the International Monetary Fund, World Bank, and the European Bank for Reconstruction and Development as main representatives of the developed market economies. Financial sector reforms took prime place on the list of specific reforms, with the main purpose of establishing an efficient financial intermediation, so important for economic growth and welfare.

Financial reforms in transition economies, like any financial reforms, have been concentrated along the following particular axis: credit controls and reserve requirements, interest rate controls, entry barriers, state ownership, policies on securities markets, banking regulations, and restrictions on capital account (as classified by Abiad, et al., 2008). The arguments in support of this particular list of reforms were covered by emerging literature at the time (during the 1990s).

The argumentation for specific reforms was usually built on interpreting the empirical findings from transition countries within the ruling theoretical concepts of market economy as a new adopted paradigm. Authors like Bonin and Wachtel (2003) argued that from an economic point of view, a properly executed bank restructuring operation is ‘cheaper’ than the continuation of providing loans from state-owned banks to loss-making enterprises. The arising benefits, according to them, include more efficient allocation of resources and the strengthening of structural conditions for effective monetary control. Improvement of bank management was another key element in designing a market based banking sector. This implies improved regulations and effective supervision. It is highlighted in the literature that

without the requisite development of lending expertise, supervisory and regulatory skills and monitoring mechanisms, growth in financial depth and intermediation may hamper rather than support economic growth (Rousseau and Wachtel, 2005).

Banking regulation and supervision are typically aimed at the protection of depositors from the potentially opportunistic behavior of the owners and managers of banks. They promote trust of potential depositors in the financial system. The important element of the financial sector reform is the improvement in the financial sector environment including clear and universally applied accounting standards and auditing practices, and a legal framework for debtor–creditor relationships. Countries with better accounting information, creditor rights, and more rigorous enforcement tend to have more highly developed financial intermediaries (La Porta, et al., 1998). These environmental characteristics provide more reliable information for decision making by intermediaries and bolster confidence in financial contracting (Holden and Prokopenko, 2001; Wachtel, 2001).

The leading opinion in the literature is that the quickest way to bring about the necessary management changes is to provide for bank independence from the government through foreign direct investments (FDI) in the banking sector. It is argued that privatization of state-owned banks, together with the opening of banking institutions to foreign investors, improves the performance of banking sectors in transition countries. Foreign banks bring with them stability and rapid improvements because of their know-how in marketing, risk management and information technology (OECD, 1993; Kraft, 2004). In reforming the financial sector in transition economies, one important debate was whether governments should try to reform existing state-owned banks (the rehabilitation approach) or whether a new private banking system should be allowed to emerge (a new entry approach). Or should there be a mix of the two approaches, in which the state bank activities are restricted while a parallel private banking system develops?

Claessens (1996) provided a cross-country comparison of banks' institutional development in 25 transitional economies. This study argued that progress can be faster under the new entry approach, especially relative to initial conditions. Progress under the rehabilitation approach appears to be inhibited by poor incentives. In most countries, even those with a good banking infrastructure and a large segment of good banks, a two track process has evolved, with differences between weak and strong banks. The author of this study concluded that weak banks have moved little beyond central planning. Regression estimates provided evidence that

slow progress of weak banks is associated with concentration, government preferential treatment, and limited new banks entry. The strong argument for the implementation of a market-based banking sector instead of direct government intervention in the capital allocation in transition countries is provided by Santomero (1996), Corbet and Mayer (1992) and Udell and Wachtel (1995). These authors stressed that nowhere was the need for change greater than in the financial sector and in the behavior of banking institutions since these firms had to convert from de facto government agencies to credit evaluators, borrower monitors, and loan collectors. Financial system reform, according to these authors, had to be embarked upon in a manner that enhances the banks' ability to perform their new role. Admitting that banks would still not perform perfectly as they function in an imperfect information environment, these authors argued that efforts should be made to bring banks to their normative goal. Admitting that even market-based regulation that should be put in place involves trade-offs between stability and market discipline, Santomero (1996) stressed that it would be a mistake to remove the latter, as the appearance of stability offered by centralization was only an illusion.

Most countries banking systems in transition economies have evolved from a single institution, the monobank, which was in charge of both monetary policy and deposit/credit activities. The role of the monobank was not to screen and monitor credit projects in order to provide that collected funds are placed in the most prospective way. It was to channel funds that were already allocated by the plan. The overall level of credit in centrally planned economies was high, aiming to support production in line with politically desirable directives determined by the plan. Since the planned economy repressed or hid inflation with price ceilings and guaranteed jobs for all, at least nominally, the standard counter cyclical tasks of central banking were not especially relevant to the monobank. The early reforms aiming the transition to market-based financial systems involved the separation of central bank and commercial bank from the monobank followed by breaking up the commercial banking activities into multiple smaller units.

Most countries also allowed for entry of new banks. In parallel, other important macroeconomic reforms were undertaken – price liberalization, privatization, trade and capital liberalization, and macroeconomic stabilization. Though a two-tier banking system existed in some East European economies even prior to the official launch of economic transition, the macroeconomic role of the financial sector was not much different from that of the monobank. The first countries to introduce a two-tier banking system were the former

Yugoslavia in 1960s, followed by Hungary, the Soviet Union and Poland in the mid 1980s. However, these were in a way “progressive” banking system solutions organized under the state ownership framework or in so called self-management framework with social-ownership in the case of former Yugoslavia. Quasi existing financial intermediation in these countries was driven by credit control. State management of banks produced the system in which state (socially) owned firms were financed on non-selective creditworthiness criteria. The result was large hidden losses made through unselective loans to companies (soft budget constraint) covered by resorting to primary emission (money printing).

The reforms that were reshaping the structure of financial intermediaries were coupled with changes in the conduct and effects of monetary policy. The described separation of central and commercial banking enabled for some rudiments of monetary policy, like credit ceilings and refinancing windows. However, central banks had weak incentives to conduct price-stabilizing monetary policy and relatively little power to regulate commercial banks. Its independence from political influence by the government was contestable, while factual independence was often not assured by formal rules.

The new commercial banks formed from the break-up of the monobank faced difficult prospects. For a time, they were little more than accounting constructions and were run by segments of the old bureaucratic network and staff. Their inherited balance sheets consisted of household deposits, loans from central bank on the liabilities side, and portfolio of enterprise credits of unknown quality (market value) on the assets side. Bank managers had limited market-based banking experience, a generally low quality of assets and little guidance from still an undeveloped system of bank regulation. In addition, most of the newly created banks remained in state ownership as well as their business clients.

Lending policies of these early banks were loose and not much based on economic principles. Instead, non-performing loans were automatically rolled over, usually with additional loan support by the central bank (i.e. by monetary emission). This lax lending policy to state-owned industry in absence of an efficient monetary policy framework became an important source of inflationary pressure during early phase of transition. In the same period, the macroeconomic situation materialized in an inherited “monetary overhang” in most East European economies. Household savings in deposit accounts that had accumulated as a result of the pervasive shortages of consumption goods and distortionary price controls under central planning turned after price liberalization into an open inflation. Thus, just at the time

when money and credit were to become more central to the economy, the new banks found themselves in a macroeconomic environment where rapid disintermediation was occurring. As a reaction, central banks made an attempt to control monetary growth by sharply reducing real credit in the early 1990s. That resulted in a severe credit crunch (Calvo and Coricelli, 1995). In all transition countries, the initial response to the monetary tightening by enterprises was inertia reflected in the accumulation of unpaid bills to suppliers and in some cases to workers.

Authors like Berglof and Bolton in their seminal work (2001) argue that it was in this period that a Great Divide opened up. According to them the separation of more successful and less successful transition countries¹⁸ occurred. Some countries, mostly in Central Europe and in the Baltic region, gradually managed to resist the pressures to bail out banks and enterprises. After the initial pain of the credit crunch and several banking crises, the eventual outcome in these countries was a stable monetary and fiscal policy. The same authors evaluate those ‘frontrunner’ countries as successful in gradually re-orienting their productive sector and integrating it with world trade, thus restarting the growth process early on.

On the other side of the ‘Divide’, in most of the former Soviet Union as well as countries in Southeast Europe, authorities did not, or could not, resist the pressures for financial relief. Central banks, after only a few months of attempted stabilization, provided additional loans to commercial banks and monetized the rapidly increasing stocks of credit. This pattern of repeated bailouts for both banks and businesses led to a lack of enterprise restructuring, weaker banks, and the need for more inflationary credit bail-outs. As a result these countries have experienced a much more protracted slump than might otherwise have been the case (Berglof and Bolton, 2001)¹⁹. However, though the financial sector played a significant role in the separation between frontrunner and back runner countries, the same authors see the causes elsewhere. They point to the problem in institutional strength, governance practices, and government capacities to deal with reforms, maintain fiscal and monetary discipline and to establish a credible regulatory and institutional framework, rather than the problem from the financial sector itself.

¹⁸ “This ‘Great Divide’ is visible in almost every measure of economic performance: GDP growth, investment, government finances, growth in inequality, general institutional infrastructure, and increasingly in measures of financial development,” Berglof and Bolton, 2001, p.1.

¹⁹ Though this reference study by Berglof and Bolton (2001) considered the differences in financial development policies as a possible explanation for divergent growth paths of countries above and beyond the ‘Great Divide’, it concludes, however, that the fiscal and monetary discipline and the regulatory environment under which financial institutions and markets had to operate mattered the most at the critical point when the Great Divide opened up. They facilitated both financial and economic development.

The financial liberalization has represented one of the main components of macroeconomic reforms among early transition policies. Though a variety of particular policy solutions for financial sector transformation was employed across transition countries, we could resume it in the following general policies strategy encompassing all these particular solutions. The policies employed in order to construct a market-based financial sector from the inherited one, consisted mainly of improving the legal and regulatory environment, providing the security of creditor rights, and efficient contract enforcement mechanism as well as ensuring the accuracy and availability of information on the operations of financial institutions. The regulatory and institutional environment was changing in the direction of providing sound supervision and regulation of financial institutions.

Special attention was given to the independence of the central bank. The experience from transition countries shows that all these financial systems evolved in bank-based ones with only limited development of the capital markets (TABLE 1-3). Other financial institutions such as pension funds and investment funds started to emerge only after about a decade from the beginning of transition and even still remain relatively underrepresented in the total assets of financial intermediaries. The financial liberalization policy included liberalization of the entry of foreign banks' subsidiaries. Resolution of bad loans that burdened state-owned banks was assured through privatization after cleaning their balance sheets or recapitalization. Some foreign banks decided to enter local markets by founding a greenfield bank, while others did it through the purchase of local banks, usually privatizing it in the same time. Foreign bank entry was encouraged as capital was scarce locally. The system of complementary institutions was introduced including the improvement of collateral laws and establishing collateral registries in order to improve information about small borrowers and to protect creditor rights.

TABLE 1-3. Domestic credit to private sector and stock market capitalisation

	Domestic credit by banking sector (in per cent of GDP)				Stock market capitalisation (in per cent of GDP)			
	2000	2005	2008	2012	2000	2005	2008	2012
Albania	3.0	10.3	35.2	38.3	n.a.	n.a.	n.a.	n.a.
Bosnia and Herzegovina	5.6	22.6	67.4	62.3	n.a.	n.a.	n.a.	n.a.
Bulgaria	11.6	44.5	71.7	71.9	4.8	17.6	17.1	13.1
Croatia	36.0	55.6	64.7	68.0	14.5	28.8	38.5	38.2
Czech Republic	49.9	37.6	50.6	56.9	19.3	29.5	21.7	19.0
Estonia	23.9	60.0	96.4	79.3	32.4	25.1	8.2	10.7
FYR Macedonia	10.5	18.6	42.4	47.5	0.2	10.8	8.4	5.8
Hungary	32.0	51.7	69.8	56.4	25.8	29.5	12.0	16.8
Latvia	16.9	60.7	90.5	67.7	7.4	15.8	4.8	3.9

Lithuania	10.0	34.0	62.7	51.3	13.9	31.5	7.7	9.4
Poland	26.6	27.8	49.6	53.8	17.9	30.9	17.0	36.3
Romania	7.2	11.3	45.0	45.0	3.4	20.8	9.7	9.4
Serbia	7.6	30.7	40.2	53.9	n.a.	23.1	25.5	19.9
Slovak Republic	51.3	36.2	45.0	n.a.	3.5	7.2	5.2	5.0
Slovenia	35.8	53.8	85.3	87.4	13.6	22.1	21.6	14.3
Ukraine	11.2	31.2	76.3	62.0	6.0	29.0	13.5	11.7

Source: EBRD Transition reports, World Bank Databank, Financial Sector Development Indicators

Following the initial establishment of banks in the early 1990s and bank failures and systemic banking crises in the mid 1990s, the third stage of transformation took place. This involved lengthy restructuring through privatization and the entry of foreign banks. By the end of the century, most banks were privately owned, and foreign banks dominated the sector in many transition countries (TABLE 1-5). Foreign ownership of banking assets has moved from 0% at the launching of transition to close to 100% in some countries. This is the case with all European transition economies except Slovenia (only about 30% of foreign ownership of banking sector asset while state keeps about 50%²⁰).

This phase in financial sector reforms is equally well covered by the empirical studies conducted on the sample of transition economics. Fries and Taci (2002) analyzed banking reforms in transition economies on the panel of 515 banks in 16 transition countries for the years 1994-1999. Their key finding is that progress in banking and enterprise reforms is the sine qua non of the sound development of banks. The evidence indicates the importance of banking reforms: banking regulation and supervision and in particular capital adequacy requirements, privatization of state owned banks, opening the market for the entry of foreign banks, fostering the development of institutions that improve access for all potential entrants into the banking market to information about the creditworthiness of potential borrowers, and the same regulatory treatment for both domestic and foreign banks. This study also indicates the need to strengthen the supply response of banks, considering the measures in that regard as an essential complement to the Washington-consensus reforms. This includes more effective regulation of the entry and exit of banks, the commercial provision of information about the creditworthiness of potential borrowers, and removal of obstacles to the expansion of foreign banks.

The same line of recommendations are provided in the larger scope seminal study by Barth, et al. (2005) exploring a unique database on bank regulation in over 150 countries. The last

²⁰ OECD, 2011

study also argues that restrictions on the entry of new banks, government ownership of banks, and restrictions on bank activities harm banking sector performance. The authors find that domestic political factors shape both regulations and their effectiveness.

Based on the fact that only a well performing financial sector can provide an efficient intermediation of savings to investment, there is a whole stream in empirical research advancing the argument in favor of foreign bank entry based on analysis of profitability and cost efficiency of banks within the new young banking sector in transition economies. This literature corpus brought a rich argumentation for (a) bank privatization (resulting from the comparison of performance between private and state-owned banks), and for (b) entry of foreign banks (resulting from comparison of performance between foreign banks and domestic, i.e. local banks). Competition, fostered by the entry of foreign banks, which also import fresh capital, is considered desirable for the promoting efficiency of the banking industry and providing benefit for the overall economy.

Fries and Taci (2004) examined the cost efficiency of 289 banks in 15 transition countries from Central and Eastern Europe, using stochastic cost frontier approach in measuring bank cost efficiency. They showed that banking systems dominated by foreign-owned banks record lower costs and that the link between a country's progress in banking reform (EBRD indicator) and cost efficiency of banks is not linear; early stages of reform are associated with cost reductions, while cost tends to rise at more advanced stages. Private banks are found to be more efficient than state-owned ones, but there are differences among private banks. The privatized banks with majority foreign ownership are the most efficient and those with domestic ownership are the least.

Similarly, Fries, et al. (2006) investigated how market entry and privatization affect bank margins and marginal cost in transition countries by estimating bank revenue and cost function. They found that in the first sub-period (1995-89), privatized banks earned higher margins than other banks, while foreign start-ups had relatively lower marginal costs. They explain the higher margins as an ability to attract demand or as rise in cost. In the second sub-period (1999-2001), state banks earned higher margins than all private banks except newly established foreign banks. In the third sub-period (2002-2004), foreign banks had the lowest margins while domestic banks had the widest. Bonin, et al. (2005) investigated the impact of privatization of banks in six transition economies – Bulgaria, Czech Republic, Croatia, Hungary, Poland and Romania. They made comparisons across the ownership types with the

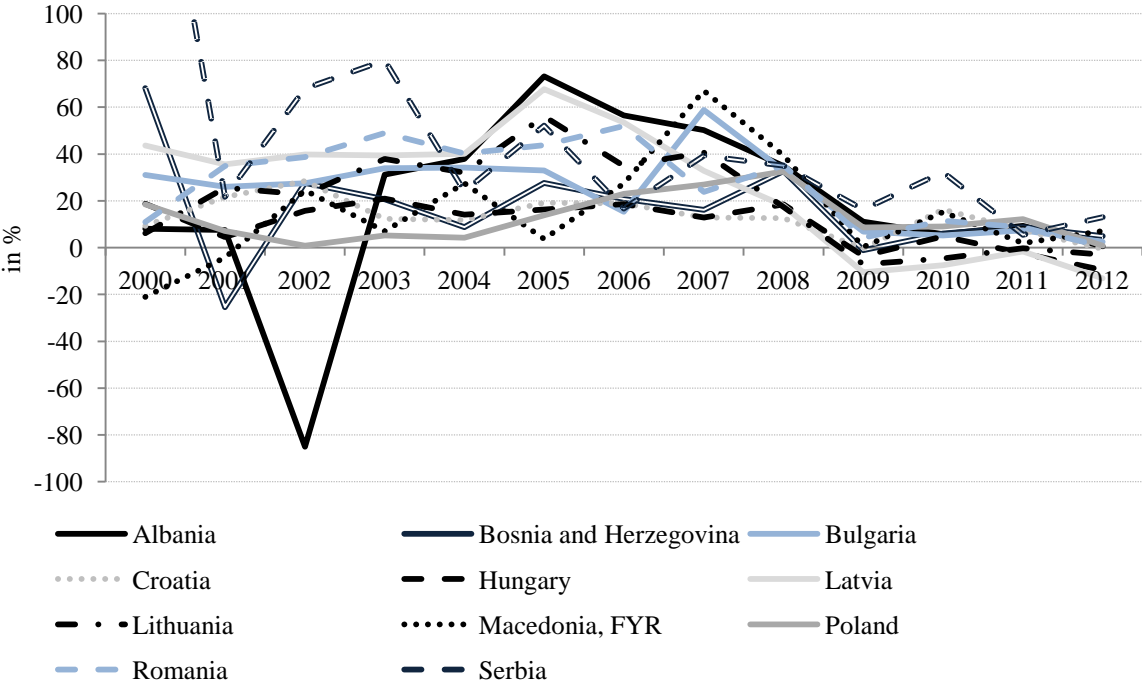
efficiency measures constructed using the stochastic frontier approach on financial statements of the largest banks. They found that foreign-owned banks were the most efficient and government-owned banks were the least efficient. These authors concluded that it is important to attract the strategic foreign owner in the privatization process of banks and that both method and timing of privatization matter for efficiency. More precisely, voucher privatization does not lead to increased efficiency while early-privatized banks are more efficient than later-privatized banks. Similarly, Weil (2003) finds that foreign owned banks are on average more cost efficient than domestic ones by using the stochastic frontier approach in measuring cost efficiency on bank level data in Poland and Czech Republic. The author also argues that the difference in cost efficiency does not result from differences in scale of operations or the structure of activities.

The operation efficiency of banks is also important from the perspective of interest margins and ultimately for cost of financing. In that respect it is usually part of the studies of market concentration, segmentation, and risk. Another set of studies shifts its focus from costs and cost efficiency determinates to factors behind interest rates and interest margins level, the last being indicator for efficiency, profitability, and competition. Claeys and Van der Vennet (2003) examined the determinants of bank interest margins in CEE and compared them to Western European using a panel data set of 2,279 banks from 36 countries over the period from 1994 to 2001. They found evidence that the most important determinants of bank interest margins in CEE banks were the same as in Western European banks: concentration, operational efficiency, capital adequacy, and risk behavior. Moreover, they argue that the institutional reform first shifts risk behavior and increases margins, and later on the effects of competition push margins down.

Drakos (2003) undertook the analysis of interest margins in order to assess the success of banking sector reform after the first ten years of transition. He used the bank interest margin to evaluate the extent of improvement in the banking sector efficiency on a panel of banks in a set of transition countries. The author tested the effect of the transition process, bank ownership and the entry of foreign banks on margins. The obtained results showed that margins significantly decreased over the observed period implying that the overall transition process was effective. Additionally, the entry of foreign banks contributed to the reduction of margins.

Another distinction of transforming financial sectors in transition following their liberalization and foreign bank entry was reflected in rapid financial deepening and strong credit growth by double digit rates, FIGURE 1-9. The credit expansion, often qualified as credit boom, was partly a consequence of the relaxation of financial constraint and the consequent catching-up (Coricelli, et al., 2006). It was also to the large extent a result from the supply-side driven growth (Eller, et al., 2010). The domestic credit was only partially financed from locally collected deposits. It was rather funded from capital intake and refinancing lines that locally established subsidiaries of foreign banks were receiving from their mother companies.

FIGURE 1-9. Domestic credit expansion, 2000-2010



Source: EBRD

Moreover, in parallel with this channel of credit expansion via subsidiaries of foreign banks, local borrowers were also receiving direct loans from foreign banks’ headquarters abroad. These were so called cross-border loans which emerged almost in parallel with local lending and were probably directly linked to foreign bank penetration and the liberalization of financial flows. This kind of direct lending by foreign banks’ headquarters to enterprises in transition countries attained a considerable share in total private sector debt in European transition economies. The locally present foreign bank in some cases provides the counter

guarantee for these loans and that transaction was registered as their contingent liabilities. The loans were registered in the loan portfolio of the mother bank abroad. These flows were out of local supervision unless registered in off-balance contingent liabilities. The rationale behind this phenomenon was possibly in the circumventing of local regulatory requirements, which would render a credit more expensive to local enterprises and less competitive. The enterprises that borrowed by cross-border loans were usually large companies. This phenomenon is, however, very poorly treated and described in the literature on transition banking. This was probably due to the difficulty in capturing these flows as they were not covered by any supranational statistical source until 2007 when the Bank for International Settlements started to provide this kind of data for BIS reporting banks.

One of the early and rare references to the existence of significant cross border lending in transition economies and related risk was in Sguard (1996). He captures the significant amounts of inflow of direct foreign borrowing by local enterprises from the balance of payment statistics for Hungary, Czech Republic and Slovenia in the first years of transition. These inflows are of comparative scale as traditional locally intermediated credit by local banking sector. When examining possible explanations behind these flows, the author rejects the macroeconomic ones and proposes the following micro-economic factors, while the available information disables the clear picture and discrimination between them. One is that a large part of direct cross border loans is made of enterprise to enterprise loans, linked to various forms of trade finance and subcontracting agreements. Another possibility is that foreign banks consider that they face less risks (and potential bankruptcy costs) when lending to Eastern European enterprises as opposed to commercial banks, which would be exposed to higher insolvency and systemic risks. The third possible explanation, according to Sguard (1996) is that Eastern European enterprises which can directly borrow abroad should either have exceptional credentials of their own, or have an active foreign shareholder who may provide some form of guarantee.

The author underlines, however, that in both cases, performing local banks should be able to collect this information and monitor loans at much lower costs than, say, a Frankfurt based competitor. Otherwise, the implicit idea streaming from these findings is that a credit market may be developing between domestic enterprises and foreign agents, more or less as a substitute to the domestic one. In some cases these flows can contribute to the underestimation of the credit market development in these countries. Puhr, et al. (2009) used a loan-level dataset of Austrian banks to study the characteristics as well as the major driving

forces of direct cross-border lending in CESEE and the CIS. By means of a series of univariate analyses, these authors from the Austrian central bank provide support for the relevance of geographic proximity – small and medium sized banks mainly lend to neighboring countries. Banks' direct lending also seems to follow nonfinancial FDI by Austrian companies to CESEE and the CIS. They also analyze the interdependencies between direct (i.e. by Austrian headquarters) and indirect (i.e. by local subsidiaries) cross-border lending and find evidence in support of the hypothesis of complementary flows. That is, that these two streams of financial flows are not substitutes but rather two parallel independently driven flows.

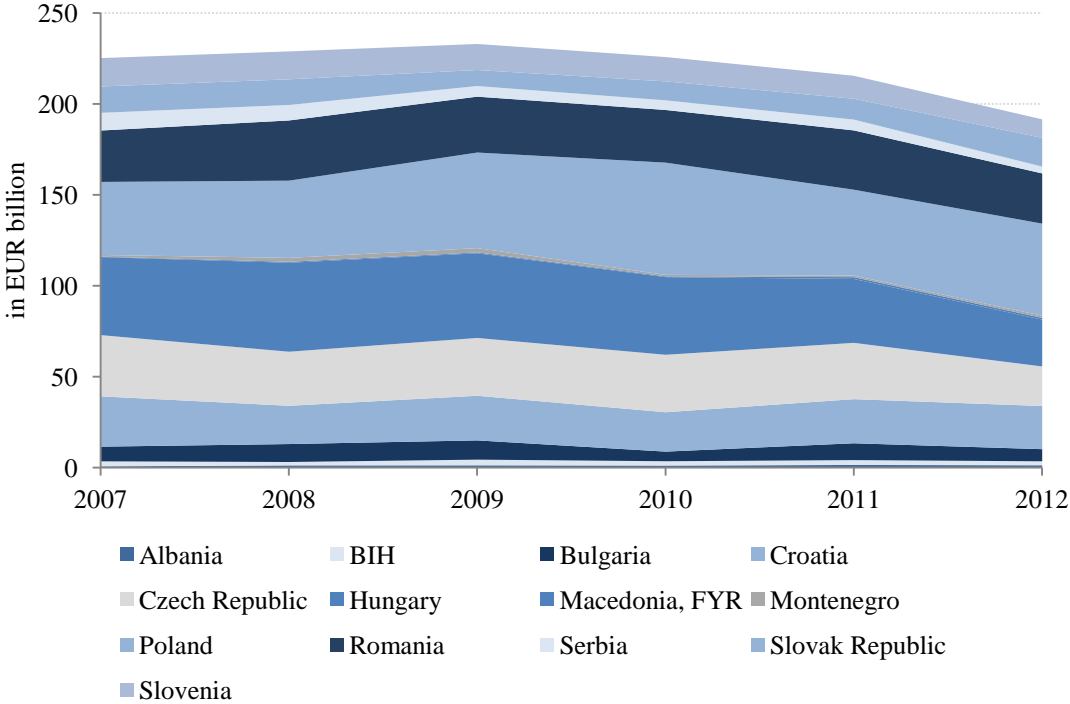
In addition, host country macroeconomic factors such as GDP growth, private sector credit growth, financial intermediation growth and wage growth are also identified as determinants of growth in direct cross-border lending to companies. Another study, however, argues that the inflow of direct foreign credit in transition countries was more intensive before foreign banks opened subsidiaries, while after the entry and expansion of foreign banks local market share the volume of such credit was reduced (de Haas and Lelyveld, 2004). From the standpoint of financial stability, probably the only available study before the recent rise in interest for cross-borders²¹ explores the experience of Latin America, and records an interesting finding: that in the periods of crises on local financial markets, cross-border credit decreased more rapidly than foreign bank lending through local subsidiaries (Peek and Rosengren, 2000).

In one post-crisis study on the determinants of cross-border bank flows to emerging markets, Hermann and Mihaljek (2010) examined the nature of spillover effects in bank lending flows from advanced to the emerging markets. They identified specific channels through which such effects occur. Based on a gravity model they examined a panel data set on cross-border bank flows from 17 advanced to 28 emerging market economies in Asia, Latin America and Central and Eastern Europe from 1993 to 2008. This empirical analysis suggests that global as well as country specific factors are significant determinants of cross-border bank flows. Greater global risk aversion and expected financial market volatility seem to have been the most important factors behind the decrease in cross-border bank flows during the crisis of 2007–08. The withdrawal of cross-border loans from the CEE region was less pronounced

²¹ One of obstacle and reasons probably for the fact that cross-border loans were out of the scope of abundant empirical literature on financial development in transition countries and on financial stability is the lack of comprehensive data. Bank for International Settlements started only since 2007 to systematically cover data on cross border exposure of BIS reporting banks. Prior to that there was no evidence of these flows.

than from Asia and Latin America. The authors explain it by the higher degree of financial and monetary integration in Europe as well as the relatively sound banking systems of CEE. These results are robust to various specification, sub-samples and econometric methodologies.

FIGURE 1-10. Cross border exposures of BIS reporting banks to Emerging Europe



Source: BIS Quarterly Review

Note: the aggregated level of cross border loans by BIS reporting banks exposure to these countries correspond to 20% of GDP of the countries represented on the graph.

Probably the consequence of financial development supported by foreign financial inflows in Emerging Europe, the large part of new lending to private sector is denominated (or indexed) to foreign currency. This share was in 2012 in all countries from the Emerging Europe region at above 50%, except in Poland, Table 1-4. The Euro and Swiss franc were the most frequently used currencies. This was a way for banks to hedge their foreign currency liabilities including cross-border refinancing lines as well as local saving deposits that were also largely denominated in foreign currency. However, private sector borrowers – enterprises and individuals – were usually not hedged, holding debt liabilities in foreign currency on one side and income, or its major part, in local currency on the other side.

This inherent systemic risk did not attract much attention during the expansionary period before the crisis since the same foreign inflows that were responsible for abundant foreign currency indexed lending also contributed to the strength of domestic currency in parallel.

However, it did contribute to the amplitude of increase in non-performing loans after the crisis when the sharp local currency depreciation translated into an increase in the credit risk of existing borrowers as debt to income burden increased in the case of borrowers with debt indexed to foreign currency (Atanasijevic and Bozovic, 2013)²².

Table 1-4. Foreign currency indexation and loan to deposit ratio in 2012

	FX indexed loans in total loans stock, in %	Loans / Deposite ratio (non government sector), in %
Albania	64.5	58
Bosnia and Herzegovina	66.8	140
Bulgaria	63.8	113
Croatia	72.2	118
FYR Macedonia	57.4	96
Hungary	55.4	122
Montenegro*	0.0	108
Poland	32.6	115
Romania	63.6	127
Serbia	72.2	137
Slovak Republic*	0.8	97
Slovenia*	4.6	152

Source: EBRD, 2012

Note: Countries marked with asterisk use Euro as official currency. Share of loans indexed to foreign currency relates to other currencies than Euro while in all other countries the major part of indexed loans is linked to Euro as foreign currency.

Another dimension of bank business that was fundamentally reshaped during two decades of reforms is the risk within the banks' portfolio despite rapid credit expansion being traditionally associated with the deterioration of credit quality. The high non-performing loans level resulting from the phase of initial liberalization and banking crisis has been reduced and cleaned up through the following phase of financial development including institutional strengthening, for bank entry and credit expansion. The inherited bad loans were written off and new lending was subject to enhanced risk procedures. The majority of new loans were still too young to fail and the period of economic transition until the global crisis was simply

²² In a recent study that I conducted and presented in a co-authored paper with M. Bozovic (2013), we examined the factors that induce a non-performing status of loans using well-diversified portfolio on corporate loans from the bank where I work as chief economist representing about 6% of market share. By running a probit model, we identified that the exchange rate is a statistically significant determinant of loan default, beside other determinants such as GDP growth, collateral coverage, company location, relationship status with the bank, and maturity of the loan. Moreover, though exchange rate depreciation reduces the repayment ability of corporate borrowers, we show that this affects both foreign- and local-currency denominated loans alike. We attributed this finding to the fact that in any highly euroized economy, exchange rate depreciation inevitably leads to the increase in input costs and overall liabilities of a company.

characterized by strong economic growth implying strong and improving fundamentals. The last may figure as an explanation behind the finding from the study by Kraft and Jankov (2005).

They analyzed the Croatian banking system that was experiencing phases of credit boom during the transition period. The early credit boom had led to a banking crisis while this was not the case with the later ones. They did not find any strong connection between rapid loan growth and credit quality. Their modeling results suggest that it is simplistic to point to rapid growth alone as the cause of banking problems. Coricelli, et al. (2006) investigated the main determinants of retail lending growth throughout the region. They tried to identify episodes of credit boom and analyzed the possible correlation between such booms, consumption booms, and a country external account position. Estimating an aggregate consumption function, under the assumption of liquidity-constrained households, these authors found that rapid growth in household credit markets largely reflected an equilibrium phenomenon in which household credit increased rapidly from extremely low initial levels in the context of the relaxation of liquidity constraints. Namely, the rate of growth of credit responded to changing market conditions on the supply side and to good prospects for income growth.

Unlike these developments in expansionary period of credit market, an original post-crisis study by Coricelli, et al (2010) examines the microeconomic aspects of lending booms, in particular firms' financing decisions, the potential relationship between excess leverage and institutional characteristics, and most importantly, the link between corporate leverage and total factor productivity growth. They used firm-level panel data from the group of CEE emerging economies and tested the non-linear relationship between leverage and total factor productivity (TFP) growth – that moderate leverage can stimulate TFP growth by providing finance for new technologies, innovation or new capacity while beyond certain threshold further increases in leverage become a drag on productivity. Using a threshold model (à la Hansen, 2000) to endogenously determine the existence and significance of threshold effects of leverage on TFP growth, they identified an upper threshold limit (about 40 per cent of total assets) beyond which further increases in leverage could adversely affect TFP growth in the sample. Adverse effects of high leverage are robust and hold not only in the full sample, but also in various subsamples including large firms, firms with more intangible assets as well as more profitable firms. The results of the same study also suggest that the leverage threshold varies across countries characterized by different levels of financial development, thus highlighting a possible effect of financial institutions on leverage imbalances. The last finding

suggests that the prevalence of excessive leverage may reflect microeconomic inefficiencies in credit allocation among firms in CEE countries, especially those with weaker financial markets and institutions.

TABLE 1-5. Financial sector evolution indicators, European transition countries

	Number of banks (foreign-owned)				Asset share of state-owned banks (in per cent)				Non - performing loans (in per cent of total loans)			
	1994	2000	2007	2009	1994	2000	2007	2009	1994	2000	2007	2009
Croatia	50 (na)	43 (21)	33 (16)	32 (15)	55.5	5.7	4.7	4.1	12.2	19.8	4.8	7.8
Albania	6 (3)	13 (12)	17 (15)	16 (14)	97.8	64.8	0.0	0.0	na	42.6	3.4	10.5
BIH	na	56 (14)	32 (21)	30 (21)	na	55.4	1.9	0.8	na	13.9	3	6.0
Bulgaria	40 (1)	35 (25)	29 (21)	30 (22)	na	19.8	2.1	2.9	6.8	10.9	2.5	6.7
FYR Macedonia	6 (3)	22 (7)	18 (11)	18 (14)	na	1.1	1.4	1.4	na	46.5	10.9	12.6
Hungary	43 (17)	42 (33)	40 (27)	38 (23)	62.8	7.7	3.7	3.9	17.6	3.1	2.8	6.7
Montenegro	na	na	11 (8)	11 (9)	na	na	0.0	0.0	na	na	3.2	13.5
Poland	82 (11)	73 (46)	64 (54)	67 (57)	72.3	23.9	19.5	22.1	28.7	16.8	5.4	8.0
Romania	20 (3)	33 (21)	31 (26)	31 (25)	80.4	50.0	5.7	7.9	18.5	3.8	3	8.5
Serbia	na	81 (3)	35 (21)	34 (20)	na	90.9	15.7	18.5	na	27.8	5.1	15.7
Slovak Republic	19 (4)	23 (13)	26 (15)	27 (13)	66.9	49.1	1.0	0.9	30.3	26.2	2.6	5.2
Slovenia	44 (6)	28 (6)	27 (11)	25 (11)	39.8	42.5	14.4	16.7	22	9.3	3.9	6.0
Czech Republic	47 (13)	40 (26)	37 (29)	na	19.2	27.8	2.4	na	34	39.7	na	na

Source : EBRD

1.5. Concluding remarks

Up to this point we have portrayed the ‘big picture’ of main economic processes relevant for two decades of European integration including capital flows, financial integration, income convergence and political integration. Further on, we have shown that financial integration in terms of capital price had a much faster pace than economic convergence before the crisis. To be precise, the price of foreign capital (measured by CDS spread on five years sovereign bonds) that bountifully entered into these economies has been reduced much faster than improvement in fundamentals (measured by development of the relative GDP per capita versus German GDP per capita). This was the case for all countries in Emerging Europe including those old members of the EU that are now referred to as EU-periphery – such as Portugal, Italy, Greece, Spain. A possible explanation, for which there is even some empirical evidence in the literature, is that financial markets had priced the credibility of future tight political integration, convergence in income and reduction of borders between these countries and the ‘core EU’ and thus lowered the price of debt. Parallel to that, financial markets were extremely liquid during the years preceding the global crunch.

With the global financial crisis that first occurred in the United States in 2007, the globalization of finance has shown its other face. The financial distress was rapidly transmitted to Europe. By the end of 2008, all transition countries were suffering from the sudden halt in capital inflows. Moreover, the prices of financing increased as a reflection of the change not only in international market liquidity but also in risk appetite. The consequent fall in output was sharp coupled with currency depreciation and the credit crunch. The latter caused a significant rise in non-performing loans. The coordination among banks, governments and international financial institutions prevented more severe outflows and sharper initial output contraction in transition countries in Europe. As the initial crisis shock has evolved to a much broader debt sustainability crisis (both private and public debt) across the EU, the economic challenges to rebound the economy are still present after five years since the start. It has been made clear that the pre-crisis financial and broader economic integration attained a much more advanced level than did the political integration. Therefore, we may presume that the existing debt interlinks represent a levy for the advancement of political integration between European countries.

Since the Lehman crisis and even more with the sovereign crisis within the EU economies, the risk of reversal of capital flows is increased due to stricter regulation of financial markets, more risk aversion, and less liquidity. Even more, some authors recognize that a radical change in the global development agenda is in place with these last two severe crisis episodes (Birdsall and Fukuyama, 2011). These changes will most likely include (1) “the end of ‘foreign financing fetish’ meaning that there will be no more cheap and abundant foreign funding of development in the future”, and (2) “more place for interest in industrial policies (never criticized from theory point of view but always by the fact that economic decision-making in developing countries could not be shielded from political pressure)”.

Another post crisis challenge results from the fact that the deepened fiscal deficit from post crisis stimuli to the economy and lower tax income, significant current account deficits and high external financing needs are causing the worries about the sustainability of debt levels and price for future borrowing in these countries. Since these are mostly small open economies, with high levels of ‘euroization’, the scope of monetary policy is limited. The same stands for an exchange rate policy in floating regimes due to “the unholy trinity” challenge of open capital account, stable prices and stable exchange rate. The control of surging fiscal deficit is considered as a necessary precondition for improvements in external competitiveness. Balancing of the economy structure in terms of the rationalization of public sector and the increase in tradable industries are usual guidelines.

Besides that, the shadow has been cast on the sustainability of the pre-crisis growth model in emerging European economies. This model was based on financial integration led growth in debt and consumption where imports were growing faster than exports and foreign financial needs were continuously increasing. It created some systemic vulnerability that accelerated the negative effects on the economy during the crisis. The last context of a prolonged crisis and difficulty in reviving the economic activity in advanced economies, which would be able to trigger growth in less advanced countries, points to the importance of paying attention and in-depth researches of the challenges resulting from financial integration that are relevant for financial stability and macroeconomic stability as well as sustainable growth and development. The new growth in emerging European countries is even more desirable from the perspective of the repayment of existing debt stock. Though financing remains an uncontested levy for investments and growth, the inherent patterns of the financial market may be improved in order to ensure the positive dimension of financial integration to demonstrate and to avoid its negative sides.

Looking deeper into the pre-crisis financial development and related effects on growth pattern may help in finding solutions for future growth revival. The aim of the following part of this thesis is to go a layer below macroeconomic reflections of financial integration. In three distinct studies, our aim is to analyze the macroeconomic role of finance in transition economies on micro-level data in order to contribute to policies and institutions that would strengthen the effectiveness of the financial sector in these countries in the rebalancing of these economies.

Appendix to Chapter 1.

TABLE 1-6. Emerging Europe: Standard and Poors' rating overview: 1995-2013

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Albania											B+	B+	B+	B+	B+	B+	B+	B+	B+
Bulgaria				B	B	B+	BB-	BB	BB+	BB+	BB+	BBB+	BBB+	BBB	BBB	BBB	BBB	BBB	BBB
Croatia			BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB	BBB	BBB	BBB	BBB	BBB	BBB-	BBB-	BB+	BB+
Czech Republic	A	A	A	A-	A-	A-	A-	A-	A-	A-	A-	A-	A	A	A	A	AA-	AA-	AA-
Estonia			BBB+	BBB+	BBB+	BBB+	A-	A-	A-	A	A	A	A	A	A-	A	AA-	AA-	AA-
Germany	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA	AAA
Hungary	BB+	BBB-	BBB-	BBB	BBB	A-	A-	A-	A-	A-	A-	BBB+	BBB+	BBB	BBB	BBB	BB+	BB	BB
Latvia			BBB	BBB	BBB	BBB	BBB	BBB+	BBB+	A-	A-	A-	BBB+	BBB-	BB	BB+	BB+	BBB	BBB+
Lithuania			BBB-	BBB-	BBB-	BBB-	BBB-	BBB	BBB+	BBB+	A	A	A	BBB+	BBB	BBB	BBB	BBB	BBB
Macedonia, FYR											BB+	BB+	BBB-	BBB-	BB	BB	BB	BB	BB-
Montenegro										BB	BB	BB	BB+	BB+	BB+	BB	BB	BB-	BB-
Poland	BB	BBB-	BBB-	BBB-	BBB	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+	A-	A-	A-	A-	A-	A-
Romania			BB-	B-	B-	B-	B	B+	BB	BB+	BBB-	BBB-	BBB-	BB+	BB+	BB+	BB+	BB+	BB+
Serbia										B+	BB-	BB-	BB-	BB-	BB-	BB-	BB	BB-	BB-
Slovakia	BB+	BBB-	BBB-	BB+	BB+	BB+	BBB-	BBB	BBB	A-	A	A	A	A+	A+	A+	A+	A	A
Slovenia		A	A	A	A	A	A	A	A+	AA-	AA-	AA	AA	AA	AA	AA	AA-	A	A-

Source: Bloomberg

Chapter 2. Pre-Crisis Lending Market

Dynamics: Credit Boom, Competition, Information and Segmentation*

2.1. Introduction

Within the context presented thoroughly in Chapter 1. this chapter aims to analyze in detail the environment of intensive foreign bank entry as the main channel for large financial inflows into the transition economies that happened in the early 2000s. The observation of this environment and the related phenomena of lending market segmentation resulting from increasing competition of banks should be of a particular interest for the following main reasons. First, the transition in Eastern Europe was an environment of explicit change in institutions leading to liberalization that made market segmentation more visible than in the more complex environment of mature markets. Second, analyzing a single country offers more detailed insights and detailed data including methodology from the local authorities. It allows greater attention to be placed on each relevant market characteristic. Although established on the single country study, the findings presented herein may reproduce in any emerging country in the similar environment regarding financial market reforms.

After the initial liberalization of capital flows, the consensus for the right way of reforming the non-performing banking sector in transition countries, inherited from the central planning times, was to open them for foreign bank entry (in details described in Chapter 1. section 1.4). The intensive entry was a driver of rapid credit growth and integration into international capital flows as foreign owned banks brought capital and refinancing lines from their home countries' headquarters. In combination with the very shallow local credit market they encountered in host countries and deposit activity revival, it resulted in an unprecedented

* The study that is presented in this chapter is the result of collaboration with Boris Najman and is published in *Comparative Economic Studies*, Palgrave MacMillan's journal, 2008, Vol (50), p.217-252, under the title 'Inside the Credit Boom: Competition, Segmentation and Information – Evidence from the Serbian Credit Market'. The survey presented in section 2.3.3 is a result of collaboration with Ms. Kori Udovicki and is conducted under the project of Foundation for Development of Economic Science hosted and co-founded by the Faculty of Economics, University of Belgrade.

credit expansion where annual growth of credit registered double digit rates over several years in a row (FIGURE 1-9). Despite the incontestable support to the overall output growth (and final consumption in particular), the resulting credit boom represented a concern to these countries' monetary authorities in their aim to maintain financial stability, trade balance, and control inflation²³. Moreover, overall financial stability has been threatened since the rapid credit growth is usually an environment for the loosening of lending standards.

In addition to bringing the domestically lacking fresh capital, foreign banks were expected to import better management practices and know-how. Foreign banks established themselves in host countries as de novo entrants, through privatization of state-owned banks (after prior cleaning of their balance sheets from bad loans, which were taken over by the government or simply written off), or by acquisition of small local private banks (Bonin, et al., 2004). In all transition economies except Slovenia, after 10 years of transition, foreign ownership became the dominant type of bank ownership. While newly established foreign banks financed a large part of their operations through credit lines from their West European mother banks, local banks mostly collected their funding locally – domestic deposits and in some cases even by borrowing from the foreign-owned banks. Disposing with such a bountiful source of financing combined with a largely underdeveloped and shallow lending market provided a field for increasing competition between new arriving banks and existing domestic banks (state-owned and private) for their respective market shares.

All previously described developments arrived in pair with the institutional reforms enabling financial market operations within a framework immanent to developed market economies. The economic agents were not always wholly familiarized with the new implementing institutions of the financial system. Informational asymmetry was large in many areas between users and suppliers of financial services. The informational asymmetry was even more supported by the transforming real sector where many old state-owned companies were privatized and some others went bankrupt as they lost their pre-transition markets or were faced with foreign competition or harder budget constraint. Many new private companies were founded. In that respect, financial intermediation became even more dynamic from both supply and demand side.

²³ See the proceeds from the conference on “Finance and consumption workshop”, European University Institute, June 2006

The first insights signaling the market segmentation and its link to risk came to me through the field survey that was conducted in 2005. The survey's aim was to describe the fast growing liberalized credit market – the interest rate level and its main determinants, as well as the prevailing trends in the supply and demand of loans. It covered 19 banks representing 66% of total banking asset at the time. The results from the survey which are relevant for the topic of the thesis will be presented in a separate section of this chapter.

The timing of the field survey was particularly convenient in terms of capturing the very specific moment of one banking sector's evolution. It was the time marked by intensive entry of foreign banks creating strong competition for market shares, the last supported by the abundance of funding. The same period (2005) was characterized by the strong momentum in the international financial market – at that time extremely liquid and with low spreads and interest rates; and thanks to the rebound in the real sector, the demand for loans was also favorable.

The field survey brought several original findings regarding the interest rate level and competition on the credit market. Some particularly interesting findings that motivated us to further investigate the results of competition and information asymmetry that could reflect in lending market segmentation are the following. The first relates to the large dispersion of the loan interest rate (1) across banks for the same product in terms of maturity and purpose to the same type of customer, and (2) within the same bank for the same product among different type of customers. Another finding pointed to the difference in terms of financing structure across different type of banks in respect of their ownership. Also, large differences in terms of the pricing of deposits across banks were registered. These last two findings also indicated a certain degree of market segmentation. It did suggest that the existing competitive advantage was in favor of foreign banks in terms of funding price and availability of funding.

Pursuing on the findings from the field survey, we have further explored the original dataset for the banking sector in Serbia for the period from the phase of intensive reforms of the financial sector from 2000 until 2005. The main idea is to better understand the segmentation of the lending market resulting from a specific setting in terms of competition and information. This setting is characteristic for banking sector liberalization in the early phase of transition. We are particularly interested in explaining the consequences of liberalization and the resulting banking competition on the structure of the credit market. In the analysis, we pay attention to the information aspect of the competition. We also try to indentify the main

determinants of the net interest margins across the banking sector as they should reflect in the same time operation efficiency, risk of lending, and the level of the competition, i.e. the existence of markup in bank pricing.

Thus, in this chapter, using a panel of banks' financial data, we analyze the period from 2000 to 2005, including the liberalization of capital flows in 2001. The share of total banking assets in possession of foreign banks increased from 0% in 2000 – the starting year of reforms and transition – to 67% at the end of 2005 (Table 2), while the average annual credit growth in the same period reached around 50% in nominal terms. The analysis and conclusions are therefore based on two types of data: one from the field survey of banks conducted in September 2005 and another from an original dataset with financial statements of the Serbian banking sector from 2000 to 2005. In exploring the segmentation of the lending market, we were inspired by the theories of the model proposed by Dell'Ariccia and Marquez (2004). They explained that market segmentation in the banking sectors of a liberalized market (like in transition and emerging countries) was as a result of competition between an informed lender with a cost disadvantage (local bank) and an uninformed lender with a cost advantage (foreign bank). They qualified the resulting segmentation of the market as a “flight to captivity” – the phenomenon where the less transparent, and thus more captive, borrowers concentrate on domestic banks while more transparent ones attracted by lower interest rates go to foreign banks. In other words, the quality of information held by domestic banks on the marginal and average borrower may decrease during the period of rapid credit growth. The empirical estimation, first of banking margin, then of asset quality, illustrates the plausible existence of the same phenomenon in the observed banking sector. The panel data estimation leads to the main result showing that foreign banks having significantly lower funding costs are charging lower margins on their lending relative to the margins of domestic banks. Another important finding implying the lending market segmentation is driven by the increasing competition is that risk (loan portfolio quality) within domestic banks increases with the increasing overall market presence of the foreign banks.

In what follows, we first present a review of related literature (Section 2.2), followed by the background of the Serbian banking sector, which is relevant for this analysis – the main characteristics of the banking system together with a brief description of main macroeconomic features (Section 2.3). In section 2.4, we proceed with the presentation of dataset, methodology of the empirical estimation, and present the variables. Section 2.5 contains the

main estimation results and their implications supported by previous findings from the on-site banking survey. Section 2.6 provides conclusions on the content of the chapter.

2.2. Overview of the Literature on Credit Boom, Competition, Segmentation and Information

There are three main strands of literature on banking in transition economies that closely relate to the topic of this Chapter and could help to set the subject and its background. The first explores the credit boom and the underlying vulnerability of the banking sector. The second treats issues of privatization, restructuring of the banking sector, and foreign bank entry. These two literature streams are useful in this study in order to understand the context, including relevant circumstances in which the explored phenomena of lending market segmentation may occur. The last strand of literature, which is referred to most, and directly following from the previous one, deals with competition among banks, including the effect on the local lending market reflected in bank margins, cost efficiency and the consequent segmentation, and risk distribution across the market.

Many researches explore the phenomenon of rapid private sector credit growth in transition countries. Rapid credit growth can trigger banking sector distress through two channels: macroeconomic imbalances and deterioration of loan quality, since risk assessment may suffer due to the vast amount of new loans extended (Duenwald, et al., 2005). Kraft and Jankov (2005) analyzed the Croatian banking system, which has, similarly to the Serbian system, experienced phases of credit boom during the transition period. The early credit boom has led to a banking crisis while this was not the case with the later ones. They do not find a strong connection between rapid loan growth and credit quality. Their modeling results suggest that it is simplistic to point to rapid growth alone as the cause of banking problems. By the research undertaken in and presented in this Chapter of the thesis, we believe that a better understanding of lending terms and the effects of competition in the fast growing credit market could be a key element for explaining the link between rapid credit growth and financial stability, as well as the efficacy of financial intermediation.

Coricelli, et al. (2006b) suggest that there is no serious concern about the risk inherent to a credit boom in the household market. This is due to the relaxation of the liquidity constraint that existed in the pre-transition period. In order to answer the question about the impact of

credit growth on banking sector stability, the role of information in shaping the structure of the lending market is introduced within the hypothesis explored in this thesis. Thus, indirectly, we arrive at the conclusion of a certain segmentation of the lending market induced by competition between banks with different levels of information about borrowers. We do not find evidence for a major concern, at least not on the overall market. Certain segments could, however, attain an excessive credit risk level (measured by the available data based on official methodology). The latter is a result of competition leading to a shift of domestic banks to more captive but less transparent borrowers as it will be presented in the empirical section of this Chapter.

A wide range of the existing literature on banking in transition concerns privatization and foreign bank entry. It is evident that the traditional motivation for international bank expansion such as ‘following the client’ was not the main driver in the case of entering the banking sectors of transition countries. The existing literature widely explores the causes and effects of foreign bank entry in both developing and transition countries (for a comprehensive survey, see Clarke, et al., 2001). However, these sources are ambiguous concerning empirically evidencing foreign versus domestic bank performance and the differences in the determinants of performance.

Claessens, Demirguc-Kunt and Huizinga (2001) analyze the effects of foreign presence on domestic banking markets on the world scale. Their empirical study is based on 7900 bank observations for 80 countries in the period from 1988 to 1995. Their main findings suggest that foreign banks have lower margins and profitability than domestic banks in developed countries, while the opposite holds in developing countries. Their empirical evidence also suggests that an increased presence of foreign banks is associated with a reduction of profitability and margins for domestic banks probably as a result of fiercer competition. This study, however, does not include transition countries in its panel.

In the same manner, there are a number of studies on transition countries treating the issue of performance differences (above all cost and profit efficiency) among different bank ownership categories. Private banks are thus seen as more cost efficient than state-owned banks while in the same manner, foreign banks appear more efficient than domestic banks. The representative studies are these of Fries and Taci (2004), Bonin, Hasan and Wachtel (2005), and Weill (2003). The empirical research of Bonin, et al. (2004), that investigates the effect of bank privatization via foreign bank acquisition in the six transition countries from the CEE

region, using BankScope database, find that foreign-owned banks are the most efficient while government-owned banks are the least efficient.

Similarly, Fries and Taci (2004) examine the cost efficiency of 289 banks in 15 transition East European countries, using stochastic cost frontier approach in measuring cost efficiency. The findings of this study show that banking systems dominated by foreign-owned banks record lower costs and that the association between a country's progress in banking reform (EBRD indicator) and cost efficiency is non-linear – early stages of reform are associated with cost reductions, while costs tend to rise at more advanced stages. Private banks are found to be more efficient than state-owned ones, but there are differences among private banks. Privatized banks with majority foreign ownership are the most efficient and those with domestic ownership are the least.

Weill (2003) finds in the same manner that foreign-owned banks are in average more cost efficient than domestic ones, using the stochastic frontier approach in measuring cost efficiency on bank level data in Poland and Czech Republic. This author also concludes from the same study that this difference in cost efficiency does not result from differences in scale of operations or the structure of activities. They do not explore the causes of such a gap, and the simple ownership effect could conceal many phenomena. The first intuitive answer that comes into mind for explaining the 'ownership' gap would be the quality of management.

Rossi, Schwaiger, Winkler (2005) challenge this view testing the hypothesis of bad management. They use the methodology proposed by Berger and DeYoung, (1997) and Williams (2004) by linking managerial behavior to bank efficiency levels. Tests for management behavior are analyzed as an inter-temporal relation across asset quality of the bank, capitalization and bank efficiency, using the Granger causality approach. Using this approach for a sample of U.S commercial banks, Berger and DeYoung (1997) checked four different kinds of management behavior: (a) bad management hypothesis, which implies that bad managers do not adequately control for operating expenses and poorly manage loan portfolio, this may cause that the low efficiency brings greater amount of problem loans; (b) skimping hypothesis, which implies that quality of a bank's loan portfolio is a consequence of the costs connected with the monitoring of lending activities. This will bring a positive correlation between cost efficiency and problem loans; (c) bad luck hypothesis, which means that unexpected and external factor increase the problem loans, which in turn reduces cost efficiency as monitoring costs are increased as a consequence; and (d) moral hazard

hypothesis suggests that managers of weakly capitalized banks are less risk adverse and engage in risk taking behavior. Therefore, low bank capitalization can cause an increase in problem loans. Rossi, Schwaiger, Winkler (2005) find no evidence for bad management hypothesis explaining the relationship between efficiency and loan quality. They did find evidence for the bad luck hypothesis, which means that the exogeneity of bad loans is triggering inefficiency. This leaves the question of the causes of the performance gap open for other research.

In the study presented in this chapter, we aim primarily to explain the competition in the lending market by testing the determinants of bank margins and asset quality. In the framework of an imperfect market, we use market segmentation to explain the fact that there are significant differences in margins and asset quality across banks due to foreign bank presence. We examine the environment of banking industry liberalization where the competition is particularly intensive resulting from the entry of foreign banks. Competition among banks affects the net interest margins of the banks, which, observed on the level of the banking sector, indicate the cost of financial intermediation and thus the efficiency of financial intermediation through the banking system. Regulators have traditionally tried to restrict competition in the banking sector with the aim of avoiding excessive risk taking. Since the 1970s banking systems were becoming more liberalized while was becoming more frequent. Although most crises were preceded by financial liberalization, it has been recognized that the regulatory failures such as lax enforcement of capital requirements and poor supervision, were standing in the origin of the crises rather than liberalization itself²⁴. Also, there is almost a consensus that financial liberalization pushes financial development and therefore output growth²⁵. The last stands either in the absence of a banking crisis, or even in the presence of a banking crisis if the economy was financially repressed to start with.

Liberalization and deregulation as components of the larger trend of globalization that began in the 1980s, resulted in increased competition in banking. The restructuring of the banking sector was happening along these two processes. It has resulted in a higher concentration on the local markets, imposing concerns on the local supervision and competition policy. It was thus challenging to choose right regulation responses while keeping in mind evidences that on one hand increased competition also increased the efficiency of the financial intermediation while on the other hand it can provoke the increased risk of banking failures. The general

²⁴ Vives, 2001.

²⁵ King and Levine, 1993a, b

trend in supervisory response to this issue was in introducing competition in banking, while controlling bank risk taking by capital requirements, appropriate regulations and reinforced market discipline with better information disclosure on the other side.

Like in any other industry competition in banking contributes to allocative, productive, and dynamic efficiency. A competitive banking system is important for the efficiency of the production of financial services, the quality of financial products and the degree of innovation in the sector. It can also matter for the access of firms and households to financial services and external financing, in turn affecting overall economic growth. Although not all relationships are clear as usually, the competition is necessarily imperfect. The sources of frictions in the retail banking industry are entry barriers (such as reputation and the branch network) and switching costs. In the corporate banking industry these barriers are established relationships and asymmetric information. All previously cited barriers result in space for banks to exercise their market power²⁶.

As evidenced by Goodhart and Schoenmaker (1993), the banking industry has some caveats in terms of positive contribution of competition. Namely, large amount of debt increases the risk of failure while dispersion of small investors limits their ability to monitor the activities of banks. This creates a potentially severe moral hazard problem and banking failures are associated with large social cost, typically of a systemic nature. The fact that governments are prepared to pay large amounts to bail out banks as opposed to simply liquidating them may be interpreted as evidence that the external cost of failure is perceived to be high.

The desirability of competition is again affected by the specificities of the banking industry both on the capital and liabilities side and on the asset side (credit). First, the competition alone is not responsible for a fragile character of banking since a monopoly bank can be subject to a run as well. Second, market power may, in some degree, be beneficial for banking stability. It moderates risk taking incentives as a bank with market power in static models of deposit competition is less aggressive in setting rates. Third, in a dynamic setting market power enhances the charter value of a bank (through higher profits) and makes the bank more conservative as argued by Keeley (1990). In the same direction, the decline of charter values due to deregulation and liberalization has been blamed by Hellmann, et al. (2000) for the increase in failures in the banking sector from the 1980s. All these three specificities have one

²⁶ Vives, 1991.

common idea behind them – that the market power increases the bank’s opportunity cost of going bankrupt.

Another particularity, this time on the asset (credit) side, is that a bank with market power has more incentive to alleviate the asymmetric information problem by investing in monitoring the projects of firms and establishing value enhancing relationship banking²⁷. The last increases availability of credit to firms. Finally, the opposite suggestion is that market power tends to increase the interest rates and together with credit rationing increases the probability of banking failures. Yet, the reputation concern of the banking institution could moderate this problem²⁸. In response to above presented features, the common guidelines for a country’s optimal banking competition level is resumed in Vives (2001, p.545): “Different countries may have different optimal levels of competition intensity. Countries with a strong regulatory structure where risk based insurance and informational disclosure can be implemented to a high degree and with relatively low social costs of failure will benefit from vigorous rivalry. To the contrary, emergent and developing countries’ economies with a weak institutional structure and high social costs of failure should moderate the intensity of competition.”

The competition level across countries is largely empirically examined through the foreign bank entry. Claessens and Laeven (2003) used bank-level data and applied the Panzar and Rosse (1987) methodology to investigate the factors that drive the level of competition in the banking industry. First they estimated the indicator of competitiveness as the extent to which changes in input prices are reflected in revenues earned by specific banks in the banking systems of 50 countries. The competitiveness indicator is further related to indicators of the countries’ banking system structures and regulatory regimes. Their findings led them to conclude that systems with greater foreign bank entry and fewer entry and activity restrictions were more competitive. However, they did not find that the competitiveness indicator negatively related to banking sector concentration. The interpretation suggests that effective competition is determined by contestability, especially through allowing (foreign) bank entry and a ban on activity restrictions for banks.

In analyzing the effect of foreign bank ownership on the level of competition, some researchers focus on the degree of foreign bank ownership (Clarke, et al., 2001). Others, however, argue that openness to foreign banks is crucial because it makes the domestic market

²⁷ Besanko and Thakor, 1992; Petersen and Rajan, 1996.

²⁸ Boot and Greenbaum, 1993.

contestable (Demirguc-Kunt, Levine, and Min, 1998; Claessens, Demirguc-Kunt, and Huizinga, 2001). From this perspective, the crucial issue is access, not the actual fraction of the domestic banking industry owned by foreign banks (Clarke, Cull, D'amato, and Molinari, 2000; Clarke, Cull, Martinez-Peria, and Sanchez, 2003). Levine (2003) examined the impact of policies toward foreign bank entry on commercial bank net interest margins. They investigate if countries that impede the entry of foreign banks induce a bigger gap between the interest expense paid to depositors and the interest income received from borrowers after controlling for bank-specific characteristics, macroeconomic conditions, and structure of the economy's banking industry. Thus, the paper provides information on the efficiency effects of regulatory restrictions on foreign bank entry.

This study distinguishes between impediments to foreign bank entry and the fraction of the domestic banking industry owned by foreign banks. To examine the independent impact of restrictions on foreign bank entry from actual foreign bank participation, they simultaneously control for the fraction of domestic banking assets associated with foreign owned banks. Thus, the paper provides information on the efficiency effects of regulatory restrictions on foreign bank entry independent of (i) impediments to domestic bank entry and (ii) the actual degree of foreign bank ownership. The results indicate that impediments to foreign bank entry boost bank net interest margins. Moreover, this study concludes that foreign banks are special in terms of significance for bank margins.

When controlling for impediments to domestic bank entry, restrictions on foreign bank entry continue to explain bank net interest margins. However, it is not foreign bank ownership per se captured by share of foreign owned banks but the impediments to foreign bank entry, that matter for level of bank interest margins. Namely, the fraction of foreign entry applications, an indicator of contestability of the market, denied explaining bank interest margins even when controlling for the degree of foreign bank ownership. Mamatzakis, et al. (2005) used Panzar Rosse's methodology to measure the level of competition in the banking sector in South Eastern European countries in the period 1998-2002. Their evidence shows that the dominant market form in these banking sectors is monopolistic competition²⁹, although competition intensifies over time.

Another relevant study is the one by Beck, et al. (2005) examining the relationship between bank concentration and banking system fragility and the mechanisms underlying this

²⁹ For detailed definition of monopolistic competition, see Dixit and Stiglitz, 1977.

relationship. The authors find no support for the view that concentration increases the fragility of banks. Rather, banking system concentration is associated with a lower probability that the country will suffer a systemic banking crisis. In terms of policies, the authors of the last study find that (i) regulations and institutions that facilitate competition in banking are associated with less, *not more*, banking system fragility and (ii) including these policy indicators does not change the results on concentration. The last suggests that concentration is a proxy for something else besides the competitive environment. Moreover, they present suggestive evidence that concentrated banking systems tend to have larger, better-diversified banks, which may help account for the positive link between concentration and stability.

2.3. Monetary and Banking Sector in Serbia

After presenting the review of the relevant empirical literature in the previous section, the aim of this section is to depict the background for further empirical analysis of the banking sector. The relevant macroeconomic framework in Serbia in the period from 2000 when most of the transition strategy has been set and officially launched is exposed in sub-section 2.3.1. Further on, in sub-section 2.3.2, we present the evolution of the banking sector including reforms and resulting developments characterized by the entry of foreign banks, intensive competition and the establishment of key market institutions. Finally, in sub-section 2.3.3, we present the original evidence from a survey of the lending market that we designed and undertook with the aim of understanding its specific developments. The outcomes of this survey in fact motivated our further empirical research that will be described in sections 2.5 and 2.6 after having presented the theoretical framework used to formulate the empirical hypothesis in section 2.4.

2.3.1. Macro-economic and Monetary Framework

Serbian transitional reforms firmly started from the political shift to a democratic government in 2001. After a few years of an uncertain and fragile macroeconomic environment, driven by strong domestic demand (mainly private consumption), economic expansion was becoming robust, gathering momentum particularly as of 2004, when GDP growth (in real terms) reached 8,2%. The economy grew by 6% on average from 2006 to 2008. Such a significant GDP growth was initially a reflection of a low level base (Serbian industrial production in 2000 represented only about a half of that in 1989), rather than solid fundamentals. High foreign capital inflows began in 2004 and were particularly high until 2008. They represented

the main driver of growing domestic demand and output. They were in the form of foreign direct investments (directed to privatization of state-owned companies including banks and insurance companies), foreign bank capital intakes, foreign debt by banks and local companies.

Consistently high inflows of capital allowed the accumulation of foreign reserves. The increasing recapitalization of the banking system and the high inflow of funds from abroad, combined with the revival of local deposits, led to above average rates of total credit growth, exceeding 50% year-on-year on average along the period (Table 1). This translated to high rates of money supply growth. In three years, inflation was reduced to a one-digit level on exchange rate crawling peg policy. It, however, remained unstable and already by 2004, it had climbed to two digits on strong credit driven demand expansion, but remaining on the stabilizing long-term path. After the inflationary spike in 2005 (year and retail price inflation 17.7%), the central bank loosened its managed floating exchange rate regime.

In June 2006, the monetary authority adopted a new policy framework that focused on achieving price stability through numeric inflation objectives with the reference rate as the main instrument –the so called implicit inflation targeting. The interest rates were obviously high but there is no relevant statistic that illustrates correctly their evolution over time as well as the overall level. The currency substitution (“euroization”) of the Serbian economy remained extremely high throughout the period. About 70% of deposits are denominated in foreign currency, while the same percentage of loans is indexed in foreign currency (usually in euro). The brisk growth, first successes of macro stabilization, and fiscal reforms had improved the country’s budget performance, leading to growing budget surpluses in 2004 and 2005. However, some fiscal loosening has emerged, since reflecting in strong wage hikes in the public sector. The consolidated fiscal deficit remained, however, contained thanks to bountiful fiscal receipts (VAT tax, excise and custom duties all supported by strong demand, consumption and imports).

Privatization proceeds were more than sufficient for financing the budget deficit and for the repayment of maturities of the inherited public debt. Public debt was therefore reduced from 70% of GDP in 2001 to 25% of GDP in 2008. Growing demand, spurred in particular by strong credit growth reflecting in high growth of imports and in widening current account deficit, rose from almost 0% of GDP in 2000³⁰ (resulting from closed economy that stayed

³⁰ -0.6% of GDP before grants and -0.3% of GDP after grants, IMF (2002) p.41

from 1991 to 2001 under the international economic embargo) to almost 20% of GDP in 2008. The export rate did not recover to keep pace with imports since the structure of real sector reflected broken trade and production chains with the common Yugoslav market following the split of Slovenia, Croatia, Macedonia, and Bosnia and Herzegovina during the 1990s and broken international trade links after a decade of economic isolation and several large industry plants destroyed in the NATO bombing in 1999. The revival of Serbian exports came as a result of several privatizations in metal and other manufacturing industries while agricultural output represented traditional export components in Serbian exports.

2.3.2. The evolution of the banking sector in Serbia and framework for the empirical analysis

The Serbian banking system reposed on the Yugoslav banking system, which differed from the other centrally planned financial systems of socialist countries of the Soviet type³¹. While in “pure” communist economies economic resources were highly centralized and allocated to the final users by the central planning authorities, in Yugoslavia, instead of state property, a social property was introduced in 1950s with the workers’ self management. Workers at the firm level were authorized to make necessary management decisions on the use of resources entrusted to them by society³² within general planning provided on the state level. The concept of the centralized “social property without an owner” in fact finally promoted inefficiency and led to huge losses which were “socialized”. Successful companies subsidized those companies which failed to deliver and operated under a “soft budget constraint” (Kornai, 1986).

The differences in perception of a socialist path were also reflected in the financial system. Yugoslavia had a two-tier banking system from the mid-1960s, an interbank market from the late 1960s, a foreign exchange market from early 1970s, and a capital market from the late 1980s. However, after a decade of social and economic decay, Serbia entered 2001 with a banking system that was not only unreformed in line with market principals, but burdened by bad and shameful memories of frozen citizens’ foreign currency savings in 1992, historic record hyperinflation (1992-93), and default pyramid schemes. These phenomena all manifested the abuse of the banking system for political purposes and reflected in the banks’ balance sheets in roughly the following way. On the liabilities side, as EUR 4.2 billion of old

³¹ Vuckovic 1963

³² “‘Social property’ gave enterprises only the right to use socially owned assets and to appropriate the proceeds (*usus* and *usus fructus*), but not full property rights.”, Uvalic (2010, p. 15)

'frozen' foreign currency citizens' savings and respective interests due, about EUR 6.5 billion of liabilities for loans from the Paris and London club of creditors that banks channeled to the economy acting as a primary debtor toward foreign creditors. On the assets side – the bad loans in the same amount were placed mainly in several large state controlled companies, which were able to benefit from such loans for social and political purposes. But besides these, the private businesses that were legally enabled since 1990 hardly survived during the 90s; in terms of financing, they relied mainly on self-financing from their own accumulation, while citizens relied largely on foreign currency remittances that were estimated at about EUR 2-3 billion per year.

Although nominally disposing of asset that accounted for 200% of GDP (EUR 12.4 billion) in 2000, the banking system was almost nonexistent, its 'toxic' part representing about 70% of total banking assets at the end of the 1990s. At the same time, the banking system was highly state-controlled and artificially concentrated (5 large state controlled banks represented 63% of banking assets on 31st December 2000) and contained too many banks (87 at the end of year 2000) compared to other economies of similar size. Many of the small banks that emerged during the 90s served to satisfy their owners' financing needs and those of their closely related parties – state-owned or socially-owned companies. Prudential supervision of banks was very lax throughout the pre-reform period, resulting in a highly under-capitalized, inefficient and unprofitable banking system at the eve of the reforms (see Table 2 for year 2000). The new government (established in January 2001) committed itself to reforming the economy and radical reforms aimed at promoting a sound and efficient market-based financial system were undertaken in the banking sector. Despite its specific history, the Serbian banking sector followed a similar reform path as other transition countries in Europe.

Evolution of the legal framework and banking reform

Banking reform in Serbia encompassed the regulatory measures typical for transition economies. The Bank Insolvency Law (2001) and the Law on Banks and Other Financial Organizations (mid-2002) as well as the Law on Payment Operations (late 2002), and their subsequent amendments, laid the foundation for the market-oriented banking in Serbia³³. However, the speed of economic change rendered adjustments necessary early on. At the end of 2002, minimum capital requirements for credit institutions were raised, which supported consolidation tendencies. The new accounting law enacted in early 2003 required all banks to

³³ Barisitz, 2003.

adopt IAS (International Accounting Standards) as an accounting framework from 2003. This has set off a gradual and not yet fully completed change from traditional formalistic and compliance-oriented bookkeeping and supervision behavior to substantive risk-based approaches.

To increase transparency and simplify lending, the Association of Serbian Banks established a Credit Bureau at the beginning of 2004, which collects data on credit outstanding and default information about bank clients, including households and enterprises. In mid-2005, a new Law on Deposit Insurance providing for compulsory insurance of accounts of natural persons up to a limit of EUR 3,000 was passed. While it is still evolving, transition toward risk-based practices has been supported by the enactment of a new Law on Banks, which entered into force in December 2005. This piece of legislation aligned key regulatory matters with Basel Core Principles for Effective Banking Supervision and EU directives. It prescribed improved systems for the risk monitoring governance of banks, introduced consolidated supervision, tightened related party exposure limits as well as provisioning requirements, and strengthened the licensing procedures of banks by applying fit and proper criteria to founders and acquirers of shares. While the legal framework was judged to meet international standards by mid-2006,³⁴ full enforcement of the new rules and elimination of regulatory forbearance remain challenges yet to be surmounted. The banking sector's institutional framework still offers room for further development.

The EBRD's Banking Sector Reform Index (which measures the quality of bank regulation and supervision, banking competition and the level of financial deepening, etc.) awarded Serbia a score of 2.7 (on a scale from 1 to 4+), a comparatively moderate standing on a par with that of all other countries in the Western Balkans but much lower than that of more advanced CESEE economies (e.g. Slovenia: 3.3, Poland: 3.7, Hungary: 4.0).

Following the "lost decade" of the 1990s, the new Serbian authorities carried out incisive bank restructuring measures in 2001 and 2002 which stabilized the sector. The Bank Rehabilitation Agency, established in 2001 as a government body charged with handling the 'ill' state owned banks, in January 2002, decided to liquidate the largest four banks (Jugobanka, Beogradska Banka, Beobanka and Investbanka). It was estimated that it had been too late to save these old state-owned banks, being burdened with non-performing loans, huge losses (negative net assets), and on the liabilities side frozen citizens' foreign currency

³⁴ See Hayward and Westphal, 2006, p. 34.

savings. The inherited liabilities to citizens were converted into state debt and bonds have been issued maturing over a 15-year horizon. The remaining state-owned banks were either merged to larger and healthier ones or remained under surveillance of the Agency until their privatization or definite liquidation.

Once this occurred, foreign strategic investors did not wait for long to get involved and to tap into the large banking potential in the last Southeastern European country whose sector was not yet dominated by FDI. Serbia then went through a radical transformation of ownership structures in but five years and in this sense “caught up” with its regional peers, who themselves had taken 10 to 15 years to arrive at a similar level. Obviously persuaded by neighboring countries’ experiences, the central bank and the government decided to give priority to the bank privatization method of direct sales to foreign strategic investors.

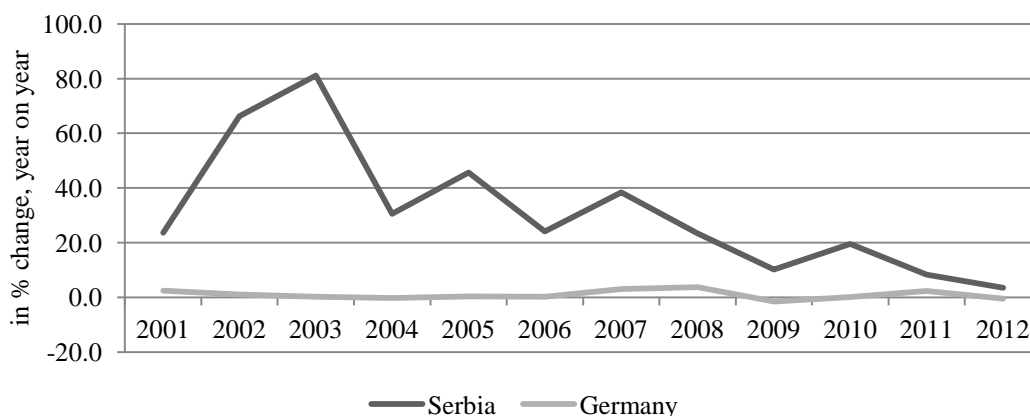
The banking market, being opened to foreign bank entry in 2001³⁵, experienced a wave of growing competition and consolidation. The first de novo foreign banks were licensed (Raiffeisen bank, HVB) in 2001. Further foreign bank entries were subject to the unofficial rule adopted by the central bank in the meantime, aiming to stimulate the resolution of remaining undercapitalized local banks. Thus, new entrant foreign banks had to purchase a local bank in order to obtain a license to operate in the Serbian banking market. The Serbian banking sector thus dramatically changed between 2000 and 2005. The state-owned banks’ share in total banking sector assets dropped from 94% in 2000 to only 25% at the end of 2005, while foreign banks (representing 0% in 2000) attained 67% of total assets. The size of the banking sector measured as total assets to GDP increased from 35% in 2002 to almost 50% in 2005, indicating still a low level of financial intermediation.

The concentration of the banking system did not decrease significantly with the entry of new banks. The index of concentration C5 (the share of 5 biggest banks in total banking assets) slightly exceeded 50% by the end of 2005. The overall bank performance improved due to improved supervision and competition, as well as the improving business environment. ROA thus evolved from -33% in 2001 to -0.5% in 2005, remaining however slightly negative on the aggregated level. EU banks overwhelmingly dominate among foreign-owned institutions, and thus prevail in the sector as a whole. Banks from Austria, Greece, Italy and France have

³⁵ In almost all transition economies, except Slovenia, after 10 years of transition it became a dominant type of bank ownership.

especially taken the lead, but banks from Serbia’s regional peers (e.g. Hungary, Slovenia) as well.

FIGURE 2-1. Credit to non-monetary non-government sector: annual growth of stock



Source: National Bank of Serbia, ECB

Note: data for Serbia is adjusted for effect of foreign exchange rate fluctuation on total stock of indexed loans.

The factors common to the sharp credit expansion in Serbia and in other transition countries³⁶ are successful post-crisis macroeconomic stabilization and robust growth, restoration of confidence in the banking sector, and sizable foreign exchange inflows. Loans are financed by the re-entry of cash into the banking system and the revival of deposits. However, the liberalization of the banking market led to increasing foreign bank participation. Their entry was often encouraged by local banking authorities, which faced the difficult task of rehabilitating, recapitalizing and stabilizing the inherited banking sectors. The newly established foreign banks rely on extensible funding from their West European mother banks (contrary to local banks)³⁷. This credit boom provides a field for increased competition in the lending market in transition countries growing from a very shallow basis.

Since 2001, the new central bank representatives have committed themselves to a tough and independent prudential supervision of banks, constantly reinforcing banking regulations in line with internationally recommended principles of banking supervision and practices from developed economies.

³⁶ See for example Duenwald, et al. 2005 for an analysis of credit booms in Bulgaria, Romania and Ukraine.

³⁷ As stated in Duenwald, et al. 2005, pp.13 for the cases of Bulgaria, Romania and Ukraine: “Many of the banks’ foreign owners are domiciled in less profitable mature markets, so parents have encouraged their subsidiaries and branches to pursue aggressive loan portfolio expansion to gain market share and improve consolidation results, thereby contributing to the acceleration of credit.”

As proven by various studies of transition banking sectors, ownership was a crucial factor for differentiation among banks, or at least the one factor that can be attributed to differences in principal performance and asset structure ratios. This trend was present in Serbia as well. Ownership (measured as foreign-owned, state-owned and domestic private banks) plays a more significant role in the differentiation of the liabilities structure (structure of resources of financing) than it does on the assets side of balance sheets, i.e. the structure of placements and asset holdings (TABLE 2-18). On the liabilities side, locally owned private banks enjoy financing mainly from capital (high equity to debt ratios), as well as from enterprises deposits. They also have a lower share of collected foreign currency savings from households compared to the two other ownership categories. Foreign bank funding is significantly dominated by loans and deposits they receive from abroad (parent companies), which is not at all the case with the other two ownership categories. They also have an important share of the newly collected citizen's foreign currency savings, which experienced a revival and is now a constantly increasing trend since the reforms were launched in 2001.

The heterogeneity in the liabilities structure is likely to have an impact on bank strategies, since it affects the availability of long-term funding, liquidity, or costs. Banks still do not refinance them by issuing bonds or bills since the financial markets are not developed enough. The inter-bank liquidity market is active but there is still very little information about its functioning. On the asset side, domestic private banks extend relatively fewer loans to citizens compared to their total assets than other bank types. All banks hold a high share of cash and cash equivalents in their assets. Lending represents the core banking activity³⁸ so that interest and fees are the principal components of bank income. Almost all observed banks operate as universal banks in the whole territory. There are a few banks that focus on a certain region, but they still operate as universal banks. There was one specialized bank (JUBMES) for supporting the export of priority goods, but we exclude it from our sample in further empirical estimations.

2.3.3. Lending terms and competitive environment in 2005: Result of detailed field survey

In order to document the interest rate level in Serbian banks – for lending and deposit – and to describe their main determinants, both being inadequately evidenced by the national statistics (provided in this case by the central bank), we designed and conducted an on-site survey. The

³⁸ The banks operate on the securities market as well, but these activities are of limited scope since the equity market remains underdeveloped during the whole period.

banking survey was arranged in the period August-October 2005 with the institutional support of the Foundation for the Advancement of Economics (FREN), operating within the Faculty of Economics of the University of Belgrade. The survey covered 19 out of 41 active banks at that time, representing 66% of total banking assets as of 30 September 2005 (the survey coverage is presented in Appendix in the TABLE 2-19).

The chief executive officers of banks were initially asked to participate in the survey and, with their consent, the questionnaire was completed by bank officers of financial controlling, risk management, treasury and accounting departments. The questionnaire consisted of 67 questions divided into five sections. In Section 1, the questions involved the detailed structure of loans by type of customers, maturity and purpose. Section 2 was aimed at identifying all patterns in calculating the interest, including application of indexation, of outstanding loan volume as well as the type of interest rate (fixed or variable). This was the way to define the standard 'models' used by the Serbian banks in calculating their interest rates in order to be able to interpret and compare the collected data. In Section 3, the level of interest rates in specific areas of bank lending is covered. Particular attention was paid to eliminating any possible sources of data non-homogeneity. This was the reason the categories of the most common loans to households and enterprises were precisely defined – in terms of customer type, customer risk profile, loan purpose and maturity.

Separate questions were asked about loans to SMEs, and those provided to large enterprises. The data collected in the form of effective interest rates involved three categories: the prevailing interest rate (applied in most loan agreements for a given type of loan); interest rate charged to prime customers; and interest rate charged to the riskiest customers. In addition to data relating to the level of interest rates, the banks were asked about the standard models they apply to calculate the specific interest, including the form of loan indexation clause. This allowed us to treat the interest rates to indexed and non-indexed loans separately. Section 4 was devoted to the funding sources used in bank lending. The questions related to interest rates paid on liabilities including on collected deposits. This section covered as well operations of the inter-bank money market, i.e. the way that banks manage their liquidity. Finally, Section 5 of the questionnaire involved the current trends in lending rates on loans to households and to enterprises, and the main factors affecting the rates in 2005, being the period of the survey. The composition of the questionnaire that served as a basis for the survey is presented in the Appendix to this chapter.

The on-site banking survey registered several interesting features that provide some indications and deeper insight in the lending market structure hardly observable through official balance sheet data and aggregate macroeconomic statistics. Several results from the survey relevant for the subject of this chapter are illustrative of the general subject discussed in this chapter of the thesis. These are (1) the level of lending interest rates including variations across banks and categories of loans and customers, (2) the characteristics of competition on the lending market and barriers for additional credit expansion, (3) the liabilities – its pricing and structure reflecting funding and funding cost, and (4) functioning of interbank money markets.

Lending interest rates

Apart from the relatively high general level of lending interest rates, the most puzzling finding was the large dispersion of prevailing interest rates. The diversity is observed both across banks in the cases of same loan type, maturity and purpose, and within the same bank (on the same loan type) for different customers depending on their risk assessment. The prevailing rate applicable to 12-month loans for working capital, depending on the bank, varies from 7% to 22%. The same range with SME lending is even wider as these types of loans are provided by one bank at the rate of 9%, while with another the same rate reached 35.87%.

With retail lending, even more extensive variations in the prevailing interest rate may be noted when it comes to current account overdrafts (from 24% to 103% for unauthorized overdrafts, and from 14.3% to 48.2% for authorized overdrafts). The dispersion of interest rates is greater with short-term than with long-term loans. To a certain extent, the differences might be the result of the positioning of banks in various market segments. These developments are normal in highly integrated markets where the segments are differentiated by the average level of risk. Apart from different approaches of banks to risks, the extremely varying rates with the same type of loans may not only point to the highly non-homogeneous customers in each category, but also to the largely non-integrated market.

The market appears in that way probably due to the limited flow of information, and it is likely that banks (a) perceive the same risks differently or (b) they exercise their monopolistic power to a different extent. As far as the retail lending rates are concerned, these variations also become wider (the extremes are registered with unauthorized and authorized current account overdrafts) as the terms become shorter. This endorses the conclusion that the

customers are less informed of this form of short-term lending and apparently are less sensitive to rates, and it is not necessary for banks to homogenize their terms among them.

These findings imply the existence of certain segmentation in the credit market. It is likely that some banks are more or exclusively active in a certain risk category of clients. Competitive forces therefore may not affect a bank's interest rates in the same manner in the segment of large borrowers with a wide and good reputation as in the segment of locally operating smaller enterprises with opaque official financial information (practices of enterprises' parallel accounting) and with even a deep and long-lasting relationship with the bank.

The variance of interest rates charged to prime and to the riskiest customers from the prevailing rate is presented in TABLE 2-2. An individual bank provides 12-month SME loans for working capital to prime customers at the rate which is, on the average, 25.4% below the prevailing interest rate for this type of loan. The same loan is made available to the riskiest customers at a rate which, on the average, exceeds the prevailing interest rate by 29.9%. With the riskiest large corporate customers, the interest rate is on average 4.9 and 6.6 percentage points above the prevailing rate charged in short-term and long-term lending, respectively. In the case of SMEs, the average difference is 4.6 percentage points with short-term and 2.2 percentage points with long-term lending. This means that – although large enterprises are given better terms – if the risk objectively exists in the long run, banks will account for risk in their interest rates. Here, the highly dispersed rate within a single bank rather indicates the non-homogeneous enterprises demand for loans. If the demand structure is such, it leaves enough room for banks to include a monopolistic margin in their rates for segments where the customers are less price-sensitive.

Besides these specific insights on interest rate level and its dispersion, we might notice that in general, the registered interest rate level is high even with the least risky client and product. The last suggests the existence of an objectively high risk from the perspective of banks. This risk may be attributed to factors such as the lack of information about customers and the lack of adequate collateral.

TABLE 2-1. Prevailing Effective Interest Rate on New Lending (Aug-Oct 2005)

type of client / loan	foreign currency clause	no. of answers	prevailing rate in banks		
			minimum	weighted average	maximum
<u>Loans to large enterprises</u>					
Revolving loans and overdrafts on business account	yes	7	7.00	8.59	22.61
12-month loans for current assets	yes	8	7.00	9.21	22.00
12-month loans for current assets	no	3	21.05	23.37	25.00
12-month dinar loans guaranteed by 100% foreign currency deposit	yes	6	2.40	7.44	7.91
5-year investment loans	yes	7	6.00	9.10	10.40
<u>Loans to SME's</u>					
Revolving loans and overdrafts on business account	yes	8	9.00	16.27	26.53
Revolving loans and overdrafts on business account	no	4	21.05	23.41	30.00
12-month loans for current assets	yes	12	9.00	14.53	35.87
12-month dinar loans guaranteed by 100% foreign currency deposit	no	4	22.61	31.77	34.33
5-year investment loans	yes	11	7.50	9.43	12.30
<u>Loans to households</u>					
Unauthorized overdrafts on current accounts	no	16	24.00	52.50	103.00
Authorized overdrafts on current accounts	no	11	14.33	41.48	48.15
3-36 month consumer and cash loans	no	2	28.01	30.13	30.33
3-36 month consumer and cash loans	yes	15	11.00	15.82	28.66
3-year automobile loans	yes	8	11.14	13.45	17.09
10-year mortgage loans	yes	9	6.89	10.01	14.41

Source: Bank lending survey, Aug-Oct 2005.

Note: All interest rates are given on annual level in a form of nominal rates. Inflation rate September 2005 to September 2004 was 16.5%, in Euro-zone around 2%, annualized exchange rate (dinar/euro) index for the same period was 113.6. The prevailing interest rate refers to the rate offered in most of the loan contracts with one bank.

TABLE 2-2. Average Deviation of Interest Rates from Prevailing Within Banks

Type of client / loan	For the least risky clients			For the most risky clients		
	No. of observations (banks)	in % of prevailing interest rate	in percentage points	No. of observations (banks)	in % of prevailing interest rate	in percentage points
<u>Large enterprises</u>						
Revolving loans and overdrafts on business account	8	-23.7	-4.4	7	65.4	5.9
Loans for working assets for 12 months	11	-33.0	-7.1	10	27.3	4.9
Investment loans on 5 years	7	-14.7	-1.4	6	67.3	6.6
<u>SME's</u>						
Revolving loans and overdrafts on business account	12	-26.0	-5.2	12	23.0	4.2
Loans for working assets for 12 months	14	-25.4	-5.4	13	29.9	4.6
Investment loans on 5 years	11	-10.5	-1.0	10	22.6	2.2
<u>Households</u>						
Unauthorized overdrafts on current accounts	4	-21.0	-9.8			
Authorized overdrafts on current accounts	4	-19.7	-7.1			
Consumer and cash loans from 3 to 36 months	7	-6.5	-1.0			
3 year car loans	3	-12.6	-1.7			
Mortgage loans on 10 year	4	-9.7	-1.1			

Source: Bank lending survey, Aug-Oct 2005.

Note: Interest rate data in the questionnaire, for each type of loan, refers to: prevailing interest rate, interest rate to the least risky clients and interest rate to the most risky clients. Simple averages are calculated on specific deviations within banks.

Competition and supply

Despite a relatively high level and dispersion of interest rates on the credit market, the survey also presented evidence of the accruing competition among banks. The pattern of answers provided by banks to the question of how interests, fees and non-price lending terms were affected by competitor pressures strongly supports the evidence that competitors' movements in interest rates determinately induced changes in own lending interest rates in respondent banks (TABLE 2-3). Moreover, banks explicitly reported that competitive pressures affected their lending terms (TABLE 2-4). Both with lending to enterprises and to households, the

strongest pressures were reflected in interest rates, and those weaker on fees and other non-price related lending terms.

Competitive forces have more impact on lending terms offered to individual clients (households) rather than enterprise customers. In total 15 out of 19 interviewed banks stated that pressures from competition were relevant for their changes in lending rates to individual clients (households) and 12 out of 19 banks stated the same for rates with lending to enterprises. Nonetheless, five banks stated that they had not revised interest rates to enterprises despite pressure from competition. It follows from the previous that while the banking sector was increasingly more subject to competition in terms of lending terms, the competitive pressures might be more pronounced on a certain segment of the lending market, since some banks declare that they were not affected by competitive pressures (TABLE 2-4).

TABLE 2-3. Summary of answers: Question – “Which of the following factors caused changes of interest rates on your bank’s credits in the first half of 2005?”

	Credit to enterprises	Credit to households
Changes in one or more funding rates	4	1
Regulatory changes affecting costs	4	3
Change of interest rates or non-price lending terms among competitors	10	14
Changes in demand conditions	3	6
Other	4	2

Source: Bank lending survey, Aug-Oct 2005

Note: Banks were allowed to choose more than one answer. 18 out of 19 interviewed banks provided an answer to this question.

TABLE 2-4. Competitive pressure and its effects on lending terms

	Credit to enterprises			Credit to households		
	interest rate	additional charge	non-price lending	interest rate	additional charge	non-price lending
Competitive pressures affect the loan conditions in our bank.	12	9	7	15	11	8
We feel competitive pressure, but we have no room to change our lending terms.	1	1	1	0	2	0
We feel the pressure by competition but we do not change our lending terms as we have other ways to adjust.	5	6	5	2	2	2
Competitive pressures do not affect loan conditions in our bank.	1	1	3	1	1	4

Source: Bank lending survey, Aug-Oct 2005.

Note: For each lending term aspect (interest rates, additional charges and non-price lending terms) banks were asked to select one of the four given answers. All 19 surveyed banks provided an answer to this question.

The field survey also found that the main obstacle for further credit expansion toward enterprises was the lack of collateral means and the lack of screened profitable projects, which is especially the case in the answers of foreign-owned banks. On the other hand, for domestically-owned banks, the lack of funding and regulatory barriers seem to play crucial roles. The finding indicates that there are segments on the market and that some banks are not present in all segments in the same manner. That is, while certain banks would ration some clients, other banks would grant them a loan.

TABLE 2-5. Key barriers to further credit expansion in the first half of 2005

	credits to enterprises (13 respondent banks)				credits to households (11 respondent banks)			
	foreign owned banks	state owned banks	other private banks	total for all banks	foreign owned banks	state owned banks	other private banks	total for all banks
Lack of funding	1	2	0	3	0	2	1	3
Lack of bankable projects	3	1	0	4	1	1	0	2
Lack of collaterals	5	1	1	7	2	0	0	2
Regulatory barriers	1	0	2	3	3	0	1	4
Other	0	0	0	0	0	0	0	0

Source: Bank lending survey, Aug-Oct 2005.

Funding

On the funding side, the result of the question on the structure of bank liabilities and relative pricing of different items provided insight on an extremely uneven distribution across banks (TABLE 2-6, TABLE 2-7.,

TABLE 2-8). Thus, one respondent bank finances 80% of its liabilities from long-term deposits and loans from foreign entities while another bank has 41% of liabilities in dinar term deposits from enterprises. Long-term liabilities apparently represented a quite limited source of funding and mainly related to the refinancing lines from foreign entities (13% in average). Though bank liabilities are predominantly in foreign currency, the currency structure varies across banks. Thus the share of local currency denominated liabilities goes from 5% to 60% with an average of 26%.

As banks were asked to rank their liabilities items by their relative cost, the results revealed that the same liability category may have great variation in relative cost from one bank to another. With even four liability categories, the relative cost that banks pays are ranked from the lowest to the relatively highest vary with different banks. This finding is most probably a reflection of the fact that foreign banks, unlike local banks, have access to relatively cheap funds from international financial markets in the form of refinancing lines from their headquarters. Domestic deposits, although relatively more expensive than these foreign lines, represent then the main source of financing for local banks.

TABLE 2-6. Share of different items in bank liabilities

Structure of liabilities	Share in total liabilities as of 30 June 2005 (in %)		
	Registered minimum, in %	Simple mean for 19 banks, in %	Registered maximum, in %
Interbank loans for liquidity	0.0	0.6	6.4
Loans and deposits from foreign entities		20.9	
Short-term	0.0	7.6	33.0
Long-term	0.0	13.2	80.0
Households' deposits		32.7	
Dinar deposits			
Transaction deposits	0.0	7.0	42.0
Term deposits	0.0	0.4	1.8
Foreign currency deposits			
Transaction deposits	3.5	12.6	32.9
Term deposits	2.0	12.8	29.0
Enterprise deposits		32.9	
Dinar deposits			
Transaction deposits	1.0	12.9	25.2
Term deposits	0.0	5.6	41.1
Foreign currency deposits			
Transaction deposits	0.7	8.0	21.0
Term deposits	0.1	6.4	30.0

Source: Bank lending survey, Aug-Oct 2005.

Note: All 19 interviewed banks didn't coherently answer this question. Some gave shares in total liabilities and capital while others gave, as was asked, shares in total liabilities (classes of accounts 4 and 5). Due to the previous, the totals of shares of all items do not amount to 100%.

TABLE 2-7. Currency structure of bank liabilities

Currency structure of liabilities	Registered minimum, in %	Simple mean for 19 banks, in %	Registered maximum, in %
Liabilities in dinars	5.0	26.4	60.2
Liabilities in foreign currency	21.2	60.6	94.5

Source: Bank lending survey, Aug-Oct 2005.

TABLE 2-8. Ranking of the relative cost of the each category of liabilities (from 1 'the lowest' to 11 'the highest')

Liability item	Number of observations by item	Observed minimum	Simple average, by item	Observed maximum
Interbank loans for liquidity	10	1	6.8	11
Loans and deposits from foreign entities				
Short-term	15	2	5.7	9
Long-term	12	1	7.5	11
Households' deposits				
Dinar deposits				
Transaction deposits	16	1	3.3	10
Term deposits	15	1	6.3	10
Foreign currency deposits				
Transaction deposits	15	2	4.5	8
Term deposits	15	1	7.0	11
Enterprise deposits				
Dinar deposits				
Transaction deposits	16	1	3.4	9
Term deposits	15	1	5.5	11
Foreign currency deposits				
Transaction deposits	15	1	3.0	7
Term deposits	15	1	5.1	10

Source: Bank lending survey, Aug-Oct 2005.

Interbank liquidity market

The section of the survey covering the functioning of the interbank liquidity market reveals that there is an extremely different perception of this market activity and opportunity by different banks. Moreover, the participation of banks varies as well as contract terms and the type of ownership seems to play a role in that variation. Being asked to evaluate interbank liquidity market, the majority of answers qualify this market as active (TABLE 2-9). However, a significant portion of answers indicate that banks perceive that interest rates on this market are too high, so these banks prefer to use some other ways to bridge the liquidity shortages, as well as that this market is insufficiently liquid. All five banks that did evaluate the market as 'not liquid enough' are foreign banks. Four out of the five answers that qualify the interest rate as too high come from domestic banks.

TABLE 2-9. Banks' evaluation of the inter-bank liquidity market (based on total 19 answers)

Your evaluation of domestic interbank liquidity market (<i>Write 1 for all correct answers</i>)		foreign-bank owned bank	state-owned bank	other private	total
a)	active	3	4	0	7
b)	inactive	2	1	0	3
c)	interest rate too high so the bank rather uses some other method to bridge illiquidity	1	2	2	5
d)	insufficiently liquid	5	0	0	5

Source: Bank lending survey, Aug-Oct 2005.

The willingness of the banks to lend to other banks varies significantly across banks. The number of banks that one bank is ready to lend to through the interbank market goes from 3 to 40 (the total number of banks in Serbia at the time of the survey), TABLE 2-10. This result suggests a different risk perception of banks among themselves as well as a different risk appetite across banks. Foreign-owned banks and state-owned banks appear to be more prudent than domestic private banks. From the answers on the question on frequency of placements to other banks, it follows that about two thirds of banks (11/17) place funds with other banks daily, much more (13/17) banks place once a week as well as once a month. All respondent banks did place on the interbank market in the last six months (TABLE 2-11). It follows that foreign-owned banks place the most frequently on the interbank market. The last implies that foreign banks are probably more liquid than domestic banks.

TABLE 2-10. Number of banks that one bank is ready to place to, overview of the answers

Banks by ownership type	Number of observations	Number of banks that one bank is ready to place to		
		Minimum	Simple mean	Maximum
Foreign-bank owned	7	5	19.29	33
State-owned	2	3	9	15
Other private	2	7	23.5	40
Total	11 out of 19	3	18.82	40

Source: Bank lending survey, Aug-Oct 2005.

TABLE 2-11. The frequency of transaction on the inter-bank liquidity market

Q: Has your bank placed free funds on inter-bank money market in the last six months:

(Write 1 for all positive answers):

	foreign- bank owned bank (10)*	state- owned bank (7)*	other private (2)*	total
a) 2 days	7	3	1	11
b) 7 days	8	4	1	13
c) 1 month	8	6	1	15
d) 6 months	10	6	1	17
e) 1 year	10	6	1	17

Source: Bank lending survey, Aug-Oct 2005.

Note: * Total number of interviewed banks

The inter-bank market appears to be the most frequent option for providing liquidity for a bank. The sale of securities and borrowing from abroad follow by their frequency, which is about twice smaller. The prevailing way of liquidity management varies with the ownership type of the banks. Only foreign banks stated that they used loans from abroad (probably from their mother bank) as a source for missing liquidity. Foreign banks also use the sale of securities in order to manage their liquidity shortages much more frequently than other banks. The dominant way for resolving liquidity shortages for state-owned banks is borrowing from the inter-bank money market. Though only one local private bank answered this question, its answer points to the similar pattern to state-owned banks for providing urgent liquidity (from domestic inter-bank market or selling out securities), TABLE 2-12.

TABLE 2-12. Preferences in bank liquidity management

Q: In cases of high pressures on bank liquidity, what are the ways you mainly use to bridge liquidity shortages?*

	foreign owned bank	state- owned bank	other private	total
a) by withdrawing compulsory reserve	4	1	0	5
b) by getting a loan on domestic inter-bank market	7	4	1	12
c) by getting a loan abroad	5	0	0	5
d) by sale of securities	4	1	1	6
e) in some other way	0	0	0	0

Source: Bank lending survey, Aug-Oct 2005.

Note: * Banks were able to choose more than one answer

On the other side, banks appear to hold in general an excess liquidity on their accounts. About 75% of interviewed banks (14/19) state that they hold on average deposits above the stipulated mandatory reserve requirement in 2005. This proportion is similarly distributed across observed ownership categories. While banks have usually stated more than one different motive, the rationale behind such bank liquidity surpluses that may even indicate a suboptimal liquidity management, are summarized as follows. These motives are (1) precaution, (2) everyday operation, and (3) inability to find good investment projects in any moment. Under the precaution motives the following causes have been sensed: in the case of unexpected outflows of funds, this is due to a high share of transaction deposits in order to meet the obligation and in the case of deposit withdrawals, for purchase of foreign currency.

Several banks revealed that they are experiencing a lack of good placement opportunities both to legal entities and to other banks (on the inter-bank market). Another motive that appears in bank answers is that the opportunity cost of holding surplus liquidity would be compensated by the exceptional placement opportunity that is worth waiting on and can arise in the future. The excess of liquidity above the prescribed obligatory reserve was not, however, held by all interviewed banks. Some of the banks are probably able to perform a more precise liquidity management than others.

When asked about the terms of the last inter-bank loan extended, the banks stated that about 70% were overnight loans while the maturity extended to 90 days. Little bit more than half of these loans were collateralized while the most frequent collateral used was a bill of exchange. About 20% of these loans (4/18) contained foreign currency indexation clause while the rest were pure local currency loans. Although, the survey was conducted during three months period from August to October 2005 so that the banks' answers do not all refer to the same moment, a significant variation of interest rates is registered.

Thus, in a category of overnight loans, the interest rate vary from 6% to 14, 25% p.a. across banks, with the average of 9,89% for the 12 banks that had this maturity in the last inter-bank loan prior to the interview (TABLE 2-13). For a 90-day inter-bank loan this interest rate varied from 9% to 17% across three responding banks declaring 90 days maturity in the last extended interbank loan. Although the collateral or indexation clause could improve the risk of the loan, such dispersion in interbank loans interest rates could represent an indication of the segmented, i.e. heterogeneous, banking sector in terms of risk and/or of bank market position.

TABLE 2-13. Interest rates on the last inter-bank loan, (in % p.a.)

Maturity in days	Number of observations	Observed minimum	Simple average of interest rates	Observed maximum
1	12	6.0	9.9	14.3
7	1	11.0	11.0	11.0
30	1	17.0	17.0	17.0
90	3	9.0	11.7	17.0

Source: Bank lending survey, Aug-Oct 2005.

The several main features of the bank competition in the lending market may be taken from the previously presented survey results. These are: (1) the existence of certain segmentation on the lending market reflected in high dispersion of interest rates on loans, (2) the presence of live competitive pressures on the market, and (3) sources of competitive advantage partly come from the funding side in a way that certain banks are less constrained by the financing availability and price. In the following empirical part, the main motivation is to investigate these hypotheses in order to strengthen the evidence and explain the outcome of competition within the liberalized credit market in transition economies during pre-crisis financial expansion.

2.4. Theoretical Framework

Segmentation of the lending market due to market imperfections: theoretical underpinnings

The previously presented findings from the field survey (section 2.3.3) and banking sector structural characteristics, give us some hypothesis about the segmentation of the lending market and of the presence of the competition between new entering foreign banks and existing domestic banks. In order to examine further, on the Serbian example, the pattern of the segmentation, we take the propositions of the following theoretical model. The model, proposed by Dell’Ariccia and Marquez (2004), explains exactly the development in a liberalized credit market with increasing competition led by the entry of foreign banks and with rapid credit growth at the same time. During the last two decades, these developments have been typical for all transition economies, with the most intensive pace in the first years after the liberalization. Moreover, the period of financial liberalization in the transition region in the second half of the 1990s and until the global crisis was marked by the abundance of the

liquidity on the international financial market. Serbia's case is an example of these developments and is going to be the subject of the following empirical examination.

Dell'Ariccia and Marquez (2004) develop a theoretical model which basically stresses the role of information in shaping bank competition. The main setting of the model is that the lender with an informational advantage competes for borrowers with an outside lender with worse information, but potentially with a cost advantage in extending a loan. They show that the informed lender's informational advantage provides it with some degree of market power and leads to borrower capture, as adverse selection makes it difficult for borrowers to obtain credit from outside lenders.

The model supposes a continuum of borrowers with investment projects (that requires capital of 1) having a pay-off of R with probability θ and 0 with probability $1 - \theta$. R is observable and contractible by both lenders and borrowers while θ is unknown to both before entering the credit relationship. θ is uniformly distributed between 0 and 1, with average success probability $\bar{\theta} = 1/2$. To insure that lending occurs in equilibrium, it is assumed that $R\bar{\theta} > 1$, but also that R is bounded above in some economically meaningful way, so that there is sufficient number of borrowers without positive net present value projects. There are two kinds of borrowers in the market with the same distribution over types: a fraction λ with a type of borrower which θ is known to any lender and fraction $1 - \lambda$ of a borrower type which θ is known only to a given lender.

The knowledge about a borrower is obtained through either monitoring or having access to books or simply through being able to better observe the kind of projects in which a borrower invests. For example, one interpretation is that a given lender conducts a credit screen of each customer, and $1 - \lambda$ represents the probability that the credit screen produces private information for the bank. Alternatively, $1 - \lambda$ can also represent the probability that the success rate of any given borrower's project is correlated across time, so λ represents the fraction of the population whose type will be unknown to that borrower's lending bank. It is assumed that lenders are unable to distinguish between borrowers that are entirely unknown and those that are being rejected by a competing lender or who are simply switched lenders, to take advantage of lower rates. In this sense, a bank with knowledge of a particular borrower's type has an advantage over competing lenders, as other lenders less precisely determine an applicant borrower's creditworthiness.

This information structure generates lender-client specificity, as neither the bank nor the borrower can credibly communicate the type of information to other lenders. The degree of this specificity, however, varies across segments of the market. It captures this idea by assuming that the proportion of known and unknown borrowers varies across market segments. The market, therefore, consists of a continuum of segments, each characterized by its proportion of unknown borrower's, λ , where λ is public information.

There are two lenders in the market. It is assumed that lender 1 enjoys an informational advantage, so that in each segment he has perfect information about $1 - \lambda$ of borrowers. That lender has access to an unlimited supply of funds at a constant gross interest rate (normalized to 1) while Lender 2 (uninformed) has no information about individual borrowers, and has access to an unlimited supply of funds at a constant gross rate, $\delta \in [1/2, 1]$ (for $\delta < 1/2$ if lender 2 captures the whole market of unknown borrowers while for $\delta > 1/2$, lender 1 has an overwhelming advantage in terms of both information and cost). In the context of liberalized banking market in a transition economy, like in our study, lender 1 represents the local bank segment with superior knowledge and relationships with the local market and lender 2 represents the entrant foreign banks with a lower cost of funds. Borrowers are thus identified by two parameters: θ as a measure of their quality (creditworthiness) and λ as the inverse of a measure of the adverse selection problem competing lenders face, which is equivalent to the proportion of unknown borrowers in their market segment. The model characterizes the two stage game equilibrium of banking competition.

The timing of the model is as follows. Competition for borrowers in each segment occurs in two stages. First, both lenders simultaneously choose an interest rate for the pool of borrowers unknown to them (λ plus any rejected borrowers). Lenders choose their gross interest rate from the set $[0, R] \cup \{ \emptyset \}$, where \emptyset represents not offering a loan (denying credit). Then, after observing the realized rates for all lenders, lender 1 chooses an interest rate for its known customers. Essentially, we allow all borrowers to seek competitive offers, but assume that the informed lender may make a counteroffer to known customers it wishes to retain. These rates may be type-contingent, as they apply to borrowers whose quality is known to lender 1. Borrowers act last by choosing the loan at the lowest available interest rate.

By analyzing different market segments, three unique equilibria are identified in respect to the level of information symmetry λ . Thus, the proposition no.1 states the following unique equilibria to the two-stage game.

1. For $\lambda > \lambda^* \equiv (2\delta - 1) / (3 - 2\delta)$, both lenders bid $r = 1/\theta^*$. Lender 1 obtains zero unknown borrowers, while lender 2 captures the entire market and obtains positive profits.

2. For $\lambda < \lambda^* \equiv (2\delta - 1) / (R^2 - 1 - 2\delta(R - 1))$, lender 2 does not bid. Lender 1 offers the monopolistic interest rates, $r_1 = R$, and makes positive profits, lending to all unknown and all creditworthy known borrowers.

3. For $\underline{\lambda} < \lambda < \lambda^*$, the unique equilibrium is characterized by a distribution function over strategies (interest rates and credit denial probability) for each lender, $F_i(r)$, $i=1,2$, where $F_i(r) = \text{prob}(r_i \leq r)$. In equilibrium, the uninformed lender makes zero expected profits. The informed lender (lender 1) makes strictly positive expected profits from all its customers, known and unknown.

In other words, if λ is below the bottom threshold (minimum size of information asymmetry) lender 1 offers the monopolistic interest rate and captures the whole market while lender 2 bids the whole market for a λ larger than λ^* . The true competition between the two lenders occurs only when λ is between $\underline{\lambda}$ and λ^* , so that the following proposition of the model are based on this assumption. In that case, the unique equilibrium is characterized by a distribution function over strategies (interest rate and credit denial probability) for each lender. The informed lender makes strictly positive expected profits from all its customers, known and unknown, while the uninformed lender makes zero expected profits.

The proposition no. 2 characterizes how the equilibrium expected interest rates and credit allocation across sectors:

For $\underline{\lambda} < \lambda < \lambda^*$

1. The expected creditworthiness of the marginal borrowers ($E[\bar{\theta}]$) obtaining credit from an informed lender is increasing in: λ : $\partial E[\bar{\theta}] / \partial \lambda > 0$.

2. The expected interest rate offered by each lender to unknown borrowers is decreasing in λ : $\partial E[r_1] / \partial \lambda < 0$ and $\partial E[r_2] / \partial \lambda < 0$.

It follows that the average of all borrowers obtaining financing from the informed lender is increasing in λ .

As the severity of the information asymmetry decreases (i.e. as λ increases), the uninformed lender bids more aggressively without fear of being saddled with only the informed lender's "lemons", those identified as being poor credit risks. This implies not only that $E[r_2]$ decreases, but also that the probability that lender 2 bids increases. The fact that the uninformed lender can bid more aggressively when subject to a lower adverse selection problem forces the informed lender to bid more aggressively as well, and hence reduces $E[r_1]$. This further implies that the expected creditworthiness of the marginal borrower obtaining credit from an informed lender, $E[\bar{\theta}]$, increases in λ , as lender 1 no longer finds it optimal to match lender 2's lower rate for previously marginal borrowers. Note also that the mass of known borrowers granted a loan by the informed lender, $1-E[\bar{\theta}]$, is reduced as its informational advantage decreases. Hence, this result verifies our earlier interpretation of borrowers for which information asymmetries for the outside bank are greater as captive borrowers, in that they suffer from an inability to easily obtain a competitive outside loan offer.

An important implication for this result, highlighted in the proposition, is that, in equilibrium, the average quality of the borrowers that form an informed lender's portfolio is lower for more captive market segments. The total borrowers financed by the informed lender are comprised of the known borrowers it chooses to retain, as well as any unknown borrowers it finances. Proposition 1 demonstrates that, in equilibrium, the informed lender finances the pool of unknown borrowers with some fixed probability that is a function of its information advantage, λ . Since this probability is decreasing in λ , Proposition 2 implies that the informed lender's overall portfolio improves in λ as well. Another way of stating this is that, since profits depend on both the quality of a borrower as well as the adverse selection faced by the uninformed bank concerning the borrower, low quality but highly captive borrowers can obtain informed financing even if better quality but less captive borrowers are denied this financing, and they may have to switch to alternative sources of credit. The credit reallocation in case of a change to competitive environment is modeled as a shock to δ , which alters the relationship between lender 1's information advantage and the uninformed lender's cost advantage. It is illustrated by the following two results given in proposition no.3 and proposition no.4.

Proposition no.3 for $\underline{\lambda} < \lambda < \lambda^*$, the effect of a change is δ on the quality of the expected marginal borrower ($E[\bar{\theta}]$) obtaining credit from an informed lender is larger in markets with

lower information asymmetries. Specifically: $\frac{\partial^2 E[\bar{\theta}]}{\partial \lambda \partial \delta} < 0$

This result demonstrates that following a cost shock, the proportional change in informed lending is greater in markets characterized by smaller adverse selection problems for uninformed lenders. When curtailing credit (which corresponds to the case of a decrease in δ), informed lenders reduce credit to low quality borrowers first, but the proportion of the borrowers' cut is greater in markets where information asymmetries are smaller. One clear implication is that for two different segments characterized by λ_1, λ_2 , with $\lambda_1 < \lambda_2$, a lower quality borrowers of type $\theta_1 < \theta_2$ can be retained by the informed lender in market 1 even as a higher quality borrower of type θ_2 is released in market 2. This is exactly what we term the fight to captivity effect. That is, when suffering a cost shock, informed lenders are willing to cut higher quality borrowers in less captive markets and reallocate their portfolios toward more captured customers.

Proposition no. 4 for $\underline{\lambda} < \lambda < \lambda^*$ the effect of a change is δ on the expected interest rate charged to known borrowers by the informed lender, $r_{1\theta}$ is larger in markets with lower information asymmetries. Specifically: $\frac{\partial^2 E[r_{1\theta}]}{\partial \lambda \partial \delta} > 0$.

Intuitively, when the cost of funds for the uninformed lender increases, the latter is forced to pass some of it onto borrowers by charging a higher interest rate and by bidding less aggressively. However, the effectiveness in increasing the revenue of increased rates is limited by adverse selection, which is less severe for high value of λ . Consequently, in segments of the market characterized by greater information asymmetries (lower λ), the uninformed lender can pass-through onto interest rates a smaller proportion of the cost of funds increase. This is compensated by the fact that a greater reduction in the probability of bidding induces the informed lender to bid less aggressively, increasing the uninformed lender's probability of winning whenever it bids.

The results above demonstrate that the lender's profits can vary along two dimensions, quality and degree of informational capture. For a given degree of information asymmetry, higher

quality borrowers generate higher rents. However, there is a second effect operating through informational capture. Given the quality of a borrower (the success probability θ), borrowers in markets subject to greater information asymmetries (and therefore more captured) also generate higher rents. It is the interaction with this second effect that has been previously largely unexplored. This result has an interpretation in terms of borrowers' elasticity of demand for credit from the informed lender. Less captive borrowers are precisely borrowers that have a more elastic demand for loan as they have less difficulty signaling their information to outsiders. The impact of a reduction in lending by an inside lender should therefore be felt more in this market than in the market of more captive borrowers, who have a less elastic demand for loans.

To the extent that in this model asymmetric information is the only obstacle to competition, this effect can be interpreted as the classical result that the cost pass-through onto prices is higher in more competitive markets. It should be pointed out that, while less captured borrowers find it more difficult to obtain informed financing, this does not necessarily imply that they are adversely affected as a result of the lowering of the cost of funds for the uninformed competitor. In fact, the logic of this section, and Proposition 4, suggest these borrowers benefit precisely because they have access to the external sources of financing.

In cooperating the negative correlation between borrowers quality, θ , and the degree of adverse selection in the market, λ , that is a likely exit in practice, the model provides an important implication concerning the quality of the portfolio of the informed lender. Uninformed lenders, attracting the less captive borrowers, are likely to attract the more creditworthy ones as well, leaving the informed lender to deal primarily with loans associated with captive borrowers, which are less liquid to deal and are characterized by higher risk. This can lead the informed lender's portfolio to worsen following an increase in its relative cost of funds, or following the entry of a low-cost but uninformed competitor into a previously protected market. There is, however, a countervailing effect.

As demonstrated in Proposition 2, for a given level of the information asymmetry (λ), the informed lender's portfolio should improve as its competitor's cost advantage increases. Therefore, whether lender 1's overall portfolio improves or worsens as a result of increased competition by lender 2 depends on the degree to which quality and captivity are correlated. To model the assumed positive correlation between θ and λ , the authors (Dell'Ariccia and Marquez, 2004) extend the model by letting θ be uniformly distributed within an interval that

is increasing in λ . Specifically, they assume that θ is uniformly distributed in $[(1-\delta)\lambda, (1-\Delta)\lambda + \delta]$. This implies that $E[\theta/\lambda] = (1-\delta)\lambda + \delta/2$. The rationale for this specific (linear) form is that it implies that at $\lambda=0$, $E[\theta] = \delta/2$, and at $\lambda=1$, $E[\theta] = 1-\delta/2$. In other words, the interval is one that starts at 0 and increases in λ , so that at $\lambda=0$, the lower bound of the support is $\theta=0$, and at $\lambda=1$, the upper bound of the support is $\theta=1$.

In order to illustrate the basic forces and tradeoffs faced by the informed lender, the model is also simplified somewhat. It is supposed that there are only two market segments, with degrees of information asymmetry given by λ_l and λ_h , and that initially only lender 1 is active in the market. In the λ_h segment, λ_h is sufficiently high that if lender 2 were to enter, it could acquire all the unknown borrowers and squeeze lender 1 out of the market (this implies, from Proposition 1 that $\lambda_h > \lambda$). Lender 2 would then offer a rate of $r_2 = E[\theta/\lambda_h] = (1-\delta)\lambda_h + \delta/2$. By doing so, lender 2 also would finance all known borrowers from lender 1 for whom $\theta r_2 < 1$. At the other extreme, in segment λ_l , information asymmetries are sufficiently large that lender 2 would not choose to enter (so that $\lambda_l < \lambda$). A further simplification is obtained by choosing λ_l such that the lower bound of the support for θ in this market segments is equal to $1/R$. This last condition simply implies that lender 1 lends to all its known borrowers in this segment.

Proposition no. 5 fix λ_l and λ_h as defined above. Allowing lender 2 to enter and compete with lender 1 decreases the quality of lender 1's overall loan portfolio if $E[\theta/\lambda_h] > E[\theta/\lambda_l] + \delta/2$.

The proposition states that if the degree of correlation between the quality of the borrowers (θ) and the degree of information asymmetries about them (λ) is sufficiently high, the informed lender's portfolio will worsen as a result of its competition with the uninformed lender. A sufficiently high correlation can overcome the countervailing force mentioned above. When the informed lender competes with another lender, it has an incentive to decrease lending to more marginal quality borrowers for each level of information asymmetry, even if it also is forced to reallocate its lending towards more captured borrowers. If these captured borrowers are on average significantly worse than the less captive ones, the informed lender's portfolio will worsen. This issue is of particular relevance for a country undergoing a financial liberalization, opening its borders to entry by foreign lenders. The proposition demonstrates that lowering regulatory barriers to entry and integrating with a broader market has potentially negative consequences for the domestic banking system. As a result of the deregulation, the

local banking system may find itself with a deteriorated and less liquid loan portfolio and, thus, more prone to fall into financial distress in case of macroeconomic downturns.

To recapitulate, there are three main results outlined by the model developed by Dell'Ariscia and Marquez (2004). They are in line with the basic intuition that the informed lender faced with competition from the uninformed lender, the last having cost advantage, shifts its lending toward market segment with less transparent but more captive borrowers. In the same time, the informed lender's information advantage provides to him some degree of market power and higher profit from more captive borrowers. Namely, first result is that the degree of borrower capture and spreads on bank loans are higher in markets subject to larger information asymmetries. The previous allows the informed lender to profitably finance borrowers that are less creditworthy in these markets. An important implication of this result is that the average quality of borrowers obtaining financing from the informed lender is decreasing in its informational advantage. Consequently, there are compositional differences in banks' portfolios across market sectors characterized by different degrees of asymmetric information about borrowers.

Another result is that when faced with greater competition from outside lenders, informed banks shift their credit allocation toward sectors where their competitors face greater adverse selection problems. In other words, when forced to curtail their loan portfolio, informed banks reduce lending to a greater extent in less captive sectors, and retain larger market shares in the more captive but more profitable sectors. This reallocation is qualified by the authors of the model as 'a flight to captivity' (as the analogy of a flight to quality), since it implies that banks reallocate their portfolio towards more captive borrowers when a competitive environment forces them to alter their lending pattern. Since loans to borrowers in more competitive sectors are also the most liquid ones, the model also proves that increases in the competitiveness of outside lenders leads to greater interest-rate reduction for borrowers in the low information-asymmetry sector since these borrowers are most able to take advantage of the competition from outside lenders (i.e. foreign banks).

Finally, the model shows that, if a strong negative correlation between borrower quality and degree of information asymmetry exists, an increase in the competitiveness of the uninformed lender can lead to a worsening of the informed lender's overall portfolio of loans. The previous is derived from the fact that uninformed lenders are better at attracting borrowers in sectors subject to lower information asymmetry, which are more creditworthy. This in turn

leaves the informed lender to deal with loans associated with more captured (but also high risk) borrowers.

The previously presented theoretical framework is translated to the case of a transition economy's banking sector in the following manner. The competition for borrowers between a lender with an informational advantage (local banks) and an outside lender (foreign-bank owned banks) with less information, but with a cost advantage (due to access to cheaper refinancing from its mother institutions based in developed markets), creates market segmentation in the following manner: having less information about local borrowers, foreign new entrants focus their lending on the more transparent market segment, which is then the more competitive one. Foreign banks charge lower spreads, and the quality of their assets is on average higher relative to domestic incumbent banks.

On the other hand, the model shows that when faced with greater competition from outside lenders, 'informed' domestic banks shift their credit towards the sector where their competitors face greater adverse selection problems. They refer to this reallocation as a 'flight to captivity'. In these, less competitive market segments, spreads are higher, demonstrating certain market power of banks toward their less transparent and consequently more captive clients. The model demonstrates that, as a consequence, the average quality of borrowers obtaining financing from the informed lender is decreasing in its informational advantage, when a negative correlation between borrower quality and degree of information asymmetry is strong enough. Hence, there are compositional differences in banks' portfolios across market segments characterized by different degrees of asymmetric information about borrowers.

2.5. Estimation Methodology and Estimation Specification

After having detected the presence of the competition as well as some signs of market segmentation manifested in highly dispersed lending interest rates across banks and types of borrowers from the field survey of Serbian banks, and having presented the theoretical background of our hypothesis, we proceed with the empirical analysis. The idea here is to use the presented theoretical framework and to examine further the underlying pattern of competition among banks. As a possible explanation could lay in the concentration of market

power (higher margins) and/or concentration of risks across different banks – both scenarios indicates a segmentation of the lending market – we essentially seek to explain the sources of such segmentation. We proceed in the following logical sequence along this empirical part of the paper: first we identify the existence of differential in banking spreads between ownership categories of banks, and we further test the effect of increasing foreign bank presence on average bank asset quality of the domestic banks.

More concretely, in the Serbian example, as a representative case of any transition economy, foreign banks tend to be more present on the market of internationally known corporations and well known large enterprises. These banks are in a position to charge lower spreads and to offer lower interest rates than their local counterparts, enjoying extensive refinancing from their mother banks in order to attract these borrowers. Domestic banks, in light of the model, are likely to remain more present in lending to less transparent but more ‘captive’ borrowers with which they have long lasting relationships. Therefore, they are in a better position to evaluate their projects as creditworthy even though the available information would not show the same level of attractiveness. Since on this market, domestic banks do not face foreign competition, they are in a position to charge relatively higher spreads than is the case with the more transparent segment of clients. Hence, their portfolio is likely to deteriorate in average quality (i.e. in information, correlated with the quality, i.e. ‘apparent’ quality) with increased presence of foreign banks. For the specific case of the Serbian banking system, the described setting is represented in a schematic way in FIGURE 2-2 in the concluding section 2.7. Motivated by the presented evidence from the field and the theoretical propositions of the Dell’Aricca and Marquez (2004) model, in empirical estimations that follow, we seek to verify the existence of market segmentation due to the competition between the two ownership categories of banks.

We proceed with presenting the empirical methodology used. Then we present our dataset, and the choice of certain variables for our analysis, and the specification of the estimated model. Then we define all employed variables and comment on their descriptive statistics. We further present the results of the estimation. We emphasize the indicator of asset quality since, unlike other variables widely used in the literature for describing identical features, we use an already exploited variable of provisions for risky assets to total assets – we name it as elsewhere (asset quality), but we interpret it in a somewhat modified way as it is going to be presented in the section with the interpretation of the results.

2.5.1. Model Specification

We estimate two separate regressions in order to analyze the structure of the lending market. The first one aims to analyze the determinants of the banks' spreads in line with the theoretical proposition presented in section 2.4 where domestic banks faced with foreign competition tend to concentrate on more captive market segment where they realize higher margins. Bank spread in this case is an indicator of a bank's market power. The second one explores the determinants of the banks' asset quality, i.e. riskiness of the banks' portfolios since the model we use in the explanations of the lending market structure proposes that the competition in new liberalized lending markets lead to distinction of two segments of banks and clients that differ by their risk level. We present the results of our regression in the following text.

(1) Banking spreads

This estimation aims to allow an analysis of the determinants of bank market power, paying special attention to the effect of bank ownership. We use the banks' Net interest margin as the dependent variable (also called 'spread' in some literature). The model specification is motivated by two existing frameworks already explored in relevant literature. We apply the dealership approach and the firm-based theoretical framework for estimation specification. The dealership approach for analysis of banks is developed by Ho and Saunders (1981), extended by Allen (1988). The dealership approach is particularly convenient for analyzing bank spreads in the Serbian case since most bank activities consist of credit granting and deposit taking (the securities business is very poorly developed, as well as services), just as the model assumes. Firm-theoretical framework uses micro-model of banking firm, based on the approach of Klein (1986) and Monti (1972) and extended by Zarruck (1989) and Wong (1997).

The estimated model for bank interest margin has the following form:

$$(2.1) \quad \text{Net_interest_margin}_{i,t} = \alpha_0 + \alpha_1 \text{Administrative_costs}_{i,t} + \alpha_2 \text{Funding_cost}_{i,t} + \alpha_3 \text{Equity}_{i,t} + \alpha_4 \text{Market_share}_{i,t} + \alpha_5 \text{Short_term_loans}_{i,t} + \alpha_6 \text{Enterprise_loans}_{i,t} + \alpha_7 \text{Foreign_bank_share}_t + \alpha_8 \text{Foreign_bank}_{i,t} + \alpha_9 \text{State_owned_bank}_{i,t} + \alpha_{10} \text{Merged}_{i,t} + \alpha_{11} \text{D2001}_t + \varepsilon_{i,t}$$

where i is a bank and t refers to the time period considered.

(2) *Asset quality: information*

This estimation aims to further analyze the determinants of bank asset quality since the presented theoretical framework (Dell’Ariccia and Marquez, 2004) suggests that high spreads are occurring in markets subject to large information asymmetry. An important implication of this result is that the average quality of borrowers obtaining financing from the informed lender is decreasing in its informational advantage. Thus, the analysis of asset quality as the dependent variable in light of ownership differences among banks makes sense in this paper.

The estimated model for bank asset quality is based on parsimonious choice of RHS variables with the idea to include all reasonably possible factors measurable with the available dataset that can influence asset quality, but excluding everything that could cause a seriously biased estimation parameters due to endogeneity or multicollinearity between variables. The model has the following form:

$$(2.2) \quad \text{Asset_quality}_{i,t} = \alpha_0 + \alpha_1 \text{Equity}_{i,t} + \alpha_2 \text{Adiministrative_cost}_{i,t} + \alpha_3 \text{Market_share}_{i,t} + \alpha_4 \text{Liquidity}_{i,t} + \alpha_5 \text{Enterprise_loans} + \alpha_6 \text{Short_term_loans} + \alpha_7 \text{Foreign_bank_share}_t + \alpha_8 \text{Foreign_bank}_{i,t} + \alpha_9 \text{State_owned_bank}_{i,t} + \alpha_{10} \text{Merged} + \alpha_{11} \text{D2001}_t + \varepsilon_{i,t}$$

where i is a bank and t refers to the time period considered.

2.5.2. Dataset

Our dataset is composed of individual bank data covering the entire Serbian banking sector. Individual bank data consists of annual detailed financial statements (balance sheet and profit and loss account). This database was created thanks to the National Bank of Serbia, which provided the detailed content of the banks’ accounts that enter the official financial statements. We use data for the period 2001-2005 for all licensed banks. Unlike most studies based on a degree of coverage of a banking system with data available from the BankScope database, our dataset covers 100% of the banking system. The majority of empirical conclusions on bank performance in transition economies are based on data from the BankScope database, which potentially suffer from a serious composition bias towards large banks³⁹.

³⁹ Ehrmann, et al. (2003) estimate the effects of monetary policy across banks on both BankScope (commercial database with a partial coverage of national banking systems) and Eurosystem data (covering full population of banks in a country, collected by national central banks) in four large countries of the euro area. They find significantly different results on BankScope data with incomplete coverage.

According to our knowledge, there is no previous study of one banking system in transition as a whole, based on micro level financial data. However, as some banks have been closed, and others obtained licenses or took over/merged with another bank during the observed period, we have to deal with an unbalanced panel dataset. At the same time, some banks that have an official having license have been inactive, so we were obliged to exclude them from our sample and estimations (by treating them as 'quasi-operating'). The criteria for treating a bank as quasi-operating were the following: no change in accounting data compared to the previous year; zero balance of accounts such as cash or reserves with the central bank; officially revoked license the following year; financial statements obviously show that the bank has no credit activity in the respective year; no increase in the balance of loans to non-financial sector; and zero expenses for provisions for risks.

This dataset is also unique due to the fact that it takes into account the change in accounting methodology and the modification of the official presentation for banks' financial statements in Serbia in the course of the observed period (between 2002 and 2003)⁴⁰. Namely, the official map of accounts⁴¹ and the official scheme of annual financial statements⁴² have been modified during the period under consideration in this study. In order to obtain a comparable series of data, we mapped the accounts across two different regulatory frameworks. This was possible thanks to the insight and the availability of the detailed content of the accounts from the individual banks' general ledger. The procedure of homogenization of the time series from the dataset consisted in adapting the accounts used for construction of variables using mapping of accounts to reflect the same methodology pre- and post-change in regulation on bank chart of account and bank financial reporting. We believe that our final dataset has the most coherent and methodologically proper content that was possible to attain, taking into account all sources of distortions that were present and that we were aware of. This kind of distortion is common for all transition economies, representing a serious obstacle for quantitative analyses of these economies. However, we have not found a discussion dedicated to this methodological issue in any studies analyzing banking systems based on the accounting data from banks.

⁴⁰ The only similar evidence of data work, according to our knowledge, is performed by A. Karas and K. Schoors on the construction of the dataset of Russian banks, and the procedure is described in details in an anecdotally named article 'Heracles or Sisyphus? Finding, cleaning and reconstructing a database of Russian banks'.

⁴¹ National Bank of Serbia, Rules on the chart of accounts and content of accounts within the chart for banks and other financial organisations

⁴² National Bank of Serbia, 2003 Rules on forms and content of individual items in financial statement forms to be completed by banks and other financial organizations.

We did dispose of 218 observations (quasi-operating banks excluded) for the period (2001-2005) which referred to a sample of 81 different banks. The distribution of observations across years and bank types is given in TABLE 2-14.

TABLE 2-14. Distribution of observation across bank types

Year	Bank type by ownership			Total	% of total
	State owned	Domestic private	Foreign owned		
2001	27	20	5	52	24%
2002	19	19	7	45	21%
2003	16	15	11	42	19%
2004	15	15	11	41	19%
2005	12	8	18	38	17%
Total	89	77	52	218	100%
% of total	41%	35%	24%	100%	

Source: Author's calculations

2.5.3. Definition of Variables

The definition of variables presented is largely drawn from literature⁴³ and is presented in TABLE 2-20. In Equation (1), the variable *Net interest margin* is calculated as interest income minus interest expense over total bank earnings assets that the income and expense refer to. This variable is often used as an indicator of the efficiency of the banking sector. Efficiency refers to the ability of the financial sector to provide high quality products and services at the lowest costs. To a large extent efficiency is directly related to competition because more competitive systems invariably turn out to be more efficient (all other things being equal). The last statement holds on the aggregate level for the entire banking system. On the individual bank level, however, a higher spread charged by a bank to some stands as an indicator of the bank's market power, with control for all other components being operational costs, funding costs and risk related provision as well as for asset and liabilities structure.

In the equation (1), we control for capitalization, calculated as the ratio of equity over total assets (variable *Equity*) on RHS, since we do not dispose of a unique implicit cost of capital necessary to have appropriate comparable values of market power (a markup pricing approach). Different levels of financing through own capital have an impact on spread, so that this variable serves for controlling the spread differences among banks due to the construction

⁴³ See for example: Vittas, D. (1991) 'Measuring Commercial Bank Efficiency, Use and Misuse of Bank Operating Ratios', IMF WPS; and also 'Financial Sector Assessment: A Handbook', IMF/the World bank, September 2005; and 'Compilation Guide on Financial Soundness Indicators', IMF, 2003 for detailed issues to be considered in the use of different measures of bank performance.

of the spread variable (interest income minus interest expense on deposits, but not taking the cost of equity into account). We do not interpret capitalization as a solvency measure, since there are some specific features of transition banking where a capital market is neither developed nor efficient, so that the capitalization ratio is ambiguous. For example, in some cases a higher capital to asset ratio is a sign of a sound bank, but a very high capital to asset ratio could equally be a sign that the bank is not active since is not able to attract enough deposits and/or serves its founders for some other activities. At the same time, this ratio can in some cases be differently influenced by regulations across different types of banks (for example: increase in the rate of compulsory reserve requirement on deposits from abroad received by foreign-owned banks from their mother institutions resulted in an increase in the capital of these banks in order to circumvent this regulatory requirement).

Funding costs is a variable measuring the average interest rate that the bank pays for its funding (collected deposits and received loans). It is calculated as the ratio of accrued interest expense to total bank's debt. *Market share*, a proxy for bank size, is measured by the bank's participation in the total assets of the banking sector. *Administrative costs* is the ratio of operating expenses over assets. This variable intends to capture the operational efficiency of a bank as well as monitoring costs⁴⁴. *Enterprise loans* capture the share that loans given to enterprises in total assets of a bank. The variable *Short-term loans* are an indicator of the share of loans with maturity up to one year in a bank's total loans. We are interested in the effect of this ratio on banking margins since our field survey observed a significantly higher dispersion of interest rates in short-term loans (relative to long-term ones) across banks for all types of borrowers. Thus our aim is to verify whether banks exert higher market power with short-term lending.

Foreign bank is an 'ownership' dummy variable which equals 1 for banks owned by a foreign bank. *State-owned bank* is a dummy for state-owned banks. The criterion for coding ownership as foreign, state or domestic private is the following: we consider a bank as majority-owned by a foreign bank, the state, or a private domestic owner if it has more than 50% of capital in possession of one ownership type. The variable *Merged* is a dummy that

⁴⁴ As underlined by Vittas, D. (1991), "Important consideration in assessing bank efficiency is the range and quality of services offered to both corporate and individual customers. Banks that offer a limited range of services, operate a small number of branches, do not use computerized facilities and rely on labor intensive and slow processing methods, will tend to have low operating costs. In effect, such banks transfer the operating costs of banking to their customers. In contrast, banks that offer a wide range of services, operate large branch networks and invest heavily in computer facilities and electronic processing in order to enhance the quality of their services will tend to incur larger costs and will thus report higher operating cost ratios than banks with a limited range and low quality of services."

equals 1 for a bank that was taken over by another bank or merged with another bank, for the year when the takeover took place and for all previous years. This variable aims basically to control for the potential bias that would result from specificities of banks that are ‘candidates’ for a takeover, i.e. from the performance specificities of remaining banks. *D2001* is a dummy variable for the first year of economic reforms (2001), when most restructuring and new regulations concerning the banking sector took place. *Foreign bank share* is the share of loans in the hands of foreign banks in the whole banking system at the end of each year in the period of interest.

In the equation (2), the ratio of provisions for bad assets to total earnings assets is used as a proxy for bank asset quality so that higher value of the variable means lower asset quality. It is calculated based on accounting information on bank clients as prescribed by the criteria set by the central bank⁴⁵. These criteria are presented in synthetic form in TABLE 2-22. They basically attempt to capture the risk of the borrower. Thus, it should be interpreted as the apparent quality of the borrower (the quality observable by any bank) as this interpretation contains an element of information asymmetry. Borrowers classified in a riskier category (C, D or E, see TABLE 2-22) are then subject to higher provisions for the bank as provisions are regulated and based on available accounting information (profit and loss, cash flows). Taking into account these criteria, we do not deny that there is a strong correlation between the poor image obtained about the client based on this information and its credit risk.

The correlation is, in our opinion, not complete since, being regulated, the criteria for provisions do not take into account some soft information that could mitigate, if not completely negate, the image based on hard information, and captured by the *Asset quality* variable. This interpretation is well captured by the framework of another theoretical model developed by Detragiache, et al. (2006), where banks are supposed to screen two types of information from clients: hard information and soft information. In their theoretical model, foreign banks are better than domestic banks at monitoring “hard” information, such as accounting information or collateral values, but not at monitoring “soft” information, such as the borrower’s entrepreneurial ability or trustworthiness.

⁴⁵ Decision on Criteria for the Classification of Balance Sheet and Off-balance Sheet Items According to the Level of Collectibility and Special Provisions of Banks and Other Financial Organisations (RS Official Gazette, No. 37/2004, 86/2004 and 51/2005)

2.6. Estimation Results

We ran both OLS, GLS, or fixed effect, estimators in the set of regressions. We only partly control for the attrition problem of our panel dataset, by introducing the variable *Merged* in order to capture the effect that some banks ceased their operation by being taken over by another bank. An interesting set of observations, which is outlined below, came to light.

2.6.1. Net interest margin: market power

Using the entire population of banks, we observe the determinants of the banks' margins. We estimate a panel GLS regression and OLS regression, presented in Table 2-15.

The most interesting finding in this estimation is that, after controlling for the impact of various costs, the structure of assets, and bank's market share, we do find that ownership matters for bank interest margin. Foreign banks, on average, charge lower margins over the cost of funding than their domestic counterparts. State ownership, however, does not have a significant impact on the charged margins of domestic banks.

The variable *Foreign bank presence* does not influence interest rate margins. One factor could explain the fact that the margins of domestic banks do not reduce due to the presence of foreign competitors. Foreign banks attract higher quality clients (or at least those with a better reputation, i.e. more transparent information), and they offer them lower interest rates. Domestic banks' portfolios are likely then to remain with more obscure clients, which have more opaque information about their business. Instead, local banks maintain longer relationships with such clients and have a better insight into their risk. This gap between foreign and domestic banks in terms of spread may well characterize the Serbian lending market segmentation as suggested by the theoretical model (Dell'Ariccia and Marquez, 2004) where this segmentation is driven by differences in funding costs across ownership categories⁴⁶. Another explanation for the fact that foreign bank presence (variable *foreign bank share*) does not have a significant effect on the general level of bank margins is proposed by Peria Soledad Martinez and Mody (2004) in their study of the determinants of bank spreads in Latin America. The latter result that they also arrive at does not necessarily mean for them that foreign bank presence does not introduce stronger competition resulting in

⁴⁶ A simple t-test on funding cost differences over ownership categories shows a statistical significance at 1% - with higher funding costs for domestic banks.

a reduction of interest margins, but that a ‘spillover’ effect of foreign bank presence on local banks’ spreads occurs probably through administrative cost reductions.

We also registered the impact of competition on bank interest rates through an on-site banking survey. At the same time, household lending terms were more subject to competition than the terms of lending to enterprises in the period under consideration. Competitive pressures, however, do not equally affect all respondent banks. Some banks appear to not be concerned by competition at all.

Both findings – from the estimation and the on-site survey – show that enterprises seem to be relatively more tied to banks than households, since loans to enterprises are less subject to competition and lead to higher margins. Information asymmetry could be a possible explanation, since it is likely to be more pronounced between enterprises and banks than between households and banks. Many firms in early transition are not in a position to choose the terms of loans, but rely on a bank that follows their operations and has better inside information. These firms are not necessarily of dubious quality, but the official information in their accounting data does not attract financing from other banks. Relationship lending is one way of resolving this and is associated with higher spreads on loans to more captive borrowers.

Banks with short-term lending more represented in their loan portfolios are able to realize higher margins. This finding is consistent with our survey results reported in TABLE 2-1, where short-term lending interest rates vary the most across banks. Not surprisingly, banks with a greater market share are able to charge higher spreads, according to our results. Bank size is likely to be a source of certain market power.

After controlling for differences in capitalization ratios (*Equity* variable), for reasons discussed in Section 2.5.3, we are interested in controlling for differences in *Funding costs*. The effect of this variable is not significant⁴⁷. We, however, keep it in our regression in order to eliminate any effect on spreads arising from funding costs, and thus be sure that the higher spread is not due to the lower interest rates paid on banks’ funding (since competition on the deposit market is not the subject of this paper), but that it comes from the higher interest rate charged on loans, all other factors being constant.

⁴⁷ This means that there is probably no need for concern about the endogeneity problem here.

Administrative costs have a positive and significant impact on bank margins. Banks with higher administrative costs have more market power in a specific market segment, where it is plausible that they are able to maintain a certain level of spread.

Table 2-15. Estimation results for interest margin

	GLS (random effects)	OLS
Variable	(1)	(2)
Administrative costs	0.441 (5.87) ***	0.324 (4.99) ***
Funding cost	-0.153 (-1.88) *	-0.122 (-0.83)
Equity (over assets)	0.057 (4.26) ***	0.068 (4.01) ***
Market share	0.156 (1.90) *	0.159 (2.37) **
Short term loans	0.032 (3.02) ***	0.041 (4.27) ***
Enterprise loans	0.036 (3.53) ***	0.029 (2.49) **
Foreign bank share	0.009 (1.00)	0.016 (1.51)
Foreign bank	-0.020 (-2.91) ***	-0.023 (-4.23) ***
State-owned bank	0.000 (-0.02)	-0.003 (-0.54)
Merged	0.008 (0.84)	0.007 (1.07)
D2001	0.016 (2.72) ***	0.014 (1.73) *
Constant	-0.029 (-0.03) **	-0.027 (-1.85) *
Observations	218	218
R-squared	0.5349	0.5521
F-test, individual effects=0, p-value	0,0000	
Hausman specification test, p-value	0.2228	

Notes: t-statistics are in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%

As we have indentified the difference in interest margins due to the ownership of banks, and knowing that there is a difference in funding costs in favor of foreign, we proceed now to the

estimation of asset quality. It will allow us to obtain a complete picture of the lending market structure as possible.

2.6.2. Asset quality: measured by “hard” Information

Foreign banks have higher asset quality measured as a ratio of provisions for bad assets over total earning assets than domestic banks (estimation 1 and 2, TABLE 2-16.). As we already argued that the variable *Asset quality* captures the quality of hard information about bank borrowers, this finding is in line with the proposed explanation of market segmentation, resulting in the fact that new entering banks, faced with asymmetric information, are more inclined to the segment of transparent borrowers. The usual argument that foreign banks have better risk management practices resulting in lower overall credit risk of their portfolio possibly holds but does not exclude our explanation either.

Since many foreign-owned banks entered the banking sector by purchasing a local bank, one may argue that the acquisition helped them acquire an information base about clients and that the explanation based on information asymmetry would not hold. We consider that while foreign banks in most cases used the purchase of a local bank as a mode of market entry, they adopted new strategies once in the market. Namely, with extensible refinancing, foreign banks aim to gain market share and widen their client base, thus the existing acquired client base represents only a tiny stake of the growing loan portfolio for this kind of banks. Therefore, we can assume that there is probably significant information asymmetry between foreign banks and local firms on the credit market in Serbia. Detragiache, et al. (2006) use the same reasoning when they argue that foreign banks naturally have no long tenure relation with firms. In their theoretical model analyzing the impact of foreign bank entry in poor countries, they assume that in these cases foreign banks are less prone to lend to difficult borrowers in terms of information availability, while most potential borrowers in such countries lack usable collateral and reliable accounting information. They add that even when foreign banks enter by purchasing local banks, local market knowledge and relationships with customers may be lost, as distant managers need to impose formal accountability to monitor local loan officers.

Simultaneously, the increasing foreign bank presence measured by the variable *Foreign bank share*, in estimation 1 and 2 in TABLE 2-16., decreases the average quality of banks' portfolios in the whole banking sector. However, this effect is due only to the increasing asset opacity of domestic banks, since the estimated coefficient is higher and more significant on the subset of domestic banks (estimation 3 and 4, TABLE 2-16.) while it does not exist when

the regression is run only on the foreign bank sub-sample (estimations 5 and 6). We are aware that the effect might be due to the fact that the variable *Foreign bank share* captures some time trend and could thus be correlated with all sorts of macro-economic and macro-institutional trends. Above all, it could be correlated with asset quality since it may capture the improvements in enforcement of prudential norms. However, the overall share of classified assets in total banking assets does not significantly increase in time during the observed period while foreign bank presence does, so that the simple correlation of these two variables (*Foreign bank share* and *Asset quality*) is, though positive and significant, quite low (0.16, see Appendix to this chapter, TABLE 2-21). In addition, we use the time dummy that equals 1 for year 2001 when the most important shift in prudential supervision enforcement took place.

From the finding above it is quite possible that domestic banks pushed by competition pressures tend to lose their higher quality clients and move toward a riskier overall portfolio of borrowers. More transparent borrowers seem to benefit more from increasing competition since they become targets of newly entering foreign banks, the latter phenomena having already been defined in literature as “cream skimming”. Another interesting result of the estimation of asset quality is that domestic banks extending a relatively higher percentage of their loans on the short-term, are likely to have better asset quality (lower credit risk), all other things being equal. Interestingly, *Short-term loans* have a positive and significant impact on bank margins (TABLE 2-16), as explained in part 2.6.1. Short-term lending seems to be then less competitive than long-term lending, as documented also by the greater dispersion of interest rates registered in our on-site survey. The relatively higher share of loans given to enterprises has no incidence on the overall asset quality of banks. Lending to enterprises, however, provides higher margins (TABLE 2-16) and it may then be considered as less competitive and more based on established relations with banks than lending to the household is.

TABLE 2-16. Estimation results for bank asset quality

Variable	All banks		Domestic banks		Foreign banks	
	FE	OLS	GLS	OLS	GLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
Equity (over assets)	0.162 (1.53)	0.188 (2.67) ***	0.204 (2.78) ***	0.204 (2.35) **	0.114 (3.18) ***	0.116 (2.40) **
Administrative costs	0.425 (0.85)	0.226 (0.70)	0.196 (0.45)	0.196 (0.48)	0.279 (1.33)	0.413 (2.69) ***
Market share	-0.832 (-1.15)	0.242 (0.83)	0.331 (0.74)	0.331 (0.84)	0.224 (1.14)	0.252 (1.58)
Liquidity	0.098 (1.01)	-0.020 (-0.37)	-0.010 (-0.10)	-0.010 (-0.12)	0.050 (1.21)	0.048 (1.23)
Enterprises loans	0.010 (0.14)	0.044 (0.93)	0.057 (0.94)	0.057 (0.93)	0.038 (1.35)	0.052 (2.35) **
Short term loans	-0.030 (-0.38)	-0.156 (-2.44) **	-0.212 (-3.23) ***	-0.212 (-2.47) **	-0.035 (-1.00)	-0.054 (-1.42)
Foreign bank share	0.131 (2.28) **	0.102 (1.73) *	0.182 (2.44) **	0.182 (2.19) **	0.031 (0.92)	0.014 (0.46)
Foreign bank	-0.060 (-1.08)	-0.057 (-2.14) **			-0.021 (-0.54)	
State-owned bank	0.161 (1.92) *	0.042 (1.58)	0.027 (0.91)	0.027 (0.94)		
Merged		-0.020 (-0.93)	-0.026 (-0.65)	-0.026 (-0.95)	-0.005 (-0.24)	-0.002 (-0.17)
D2001	-0.021 (-0.59)	-0.011 (-0.39)	-0.002 (-0.04)	-0.002 (-0.05)	0.012 (0.62)	0.017 (1.21)
Constant	-0.033 (-0.35)	0.101 (1.58)	0.113 (1.37)	0.113 (1.44)		-0.015 (-0.4)
Observations	218	218	166	166	52	52
R-squared	0.1527	0.2613	0.2337	0.2337	0.4695	0.4809
F-test, individual effects=0, p-value	0.0421		0.1019		0.1664	
Hausman specification test, p-value	0.0190		0.4033		0.3622	

Notes: t-statistics are in parentheses; *significant at 10%; **significant at 5%; ***significant at 1%

2.7. Conclusion

The opening of the banking market in Serbia was associated with enhanced competition for borrowers, as evidenced both from the on-site banking survey we conducted and from an original dataset covering all banks operating in Serbia in the period from 2001 to 2005. As we show in the paper, interest rates however remain extremely dispersed, varying significantly across banks.

Competition on the banking market open to foreign bank entry is likely to produce segmentation on the credit market. The segmentation and concentration of certain bank types on certain segments is determined by bank ownership. The latter being a factor of the cost structure of banking resources as well as of informational friction on the lending market, rather than a determinant of management quality. This is well supported by recent theoretical models for liberalized lending markets with foreign bank entry and competition. Though we only have 5 years of banking data available, we use detailed financial statements for the entire

population of Serbian banks. We empirically explain the segmentation of the lending market caused by information asymmetry and differences in funding costs across ownership categories of banks (domestic vs. foreign). Thus we confirm the basic propositions of the theoretical model. We also clarify our intuitive hypothesis concerning the lending market structure in the Serbian transition banking sector formed on the basis of on-site interviews with the management of 19 banks covering 66% of total banking assets in Serbia by the end of 2005.

Our main finding is that, although an increasing presence of foreign banks is associated with a deepening of financial intermediation, resulting in an excessive credit offer in the Serbian economy, and although significant credit growth introduces sharper competition in the lending market, the lending market is getting segmented. It seems that more transparent borrowers benefit from competition more, since they belong to the segment where foreign banks are more present, and offer better lending terms. We find empirical evidence that increasing presence of foreign banks increase risk within domestic banks that already operate in the market.

For better understanding of our main findings, we propose in Figure 1, a stylized presentation of the structure of the lending market and the main flows in the banking sector. We believe that the implication of our findings concern financial stability on one side and monetary policy transmission on the other side.

From the aspect of financial stability, there is no decreasing quality of the overall credit market due to increasing competition, although the average quality of the assets of domestic banks is decreasing with higher competition from foreign banks; in an environment of credit expansion, vulnerability might increase on the more opaque part of the banking sector and central bank policies should supervise it particularly in order to ensure more stable financial intermediation. On the other hand, due to the existence of two different segments of clients in the lending market and the simultaneous evolution of information friction in time (see Kim, et al., 2005), one could imagine that the information advantage could start to disappear for domestic banks. Then, if their cost disadvantage does not improve at the same pace, we could expect, still in light of the used theoretical framework, that foreign-owned banks could capture the whole better quality lending market and that local banks may stay with only bad quality clients that are rationed by foreign banks. As a matter of availability of loans, the latter scenario will not have particularly worrisome consequences. Yet, from a systemic stability

point of view, we would suggest some special attention and further investigation and particular accent on supervision of local domestically-owned bank.

Understanding the structure of the banking system and the mechanism of interactions in the lending market could shed some light on the transmission mechanism of monetary policy and its effectiveness. Instead of observing banks as a passive aggregate, the understanding of banks as independent entities that interact with their environment is a useful hypothesis for further research on the monetary system in transition countries.

One of the implications of the research and its results presented in this chapter is that as a result of deregulation, the local banking system may find itself with a deteriorated and less liquid loan portfolio and, thus, more prone to fall into financial distress in case of macroeconomic downturns, along all benefits associated with the entry of foreign banks that exceed the scope of this chapter. These are above all: better management practices, superior technology, more market discipline, etc. Consequently, the results of this chapter should not be taken as an argument against financial liberalization, but rather as a discussion of some of the risks associated with it.

Certainly one of implications might stand in the need for a more prudent approach in the supervision of the small banks and domestic banks as according to our findings, they may be more present in the riskier market segment. The failure of two state-owned banks and difficulties in a few other small local banks occurring in Serbia (the case analyzed in this chapter) three years after the crisis breakthrough, reflect the consequence of the findings developed in this chapter.

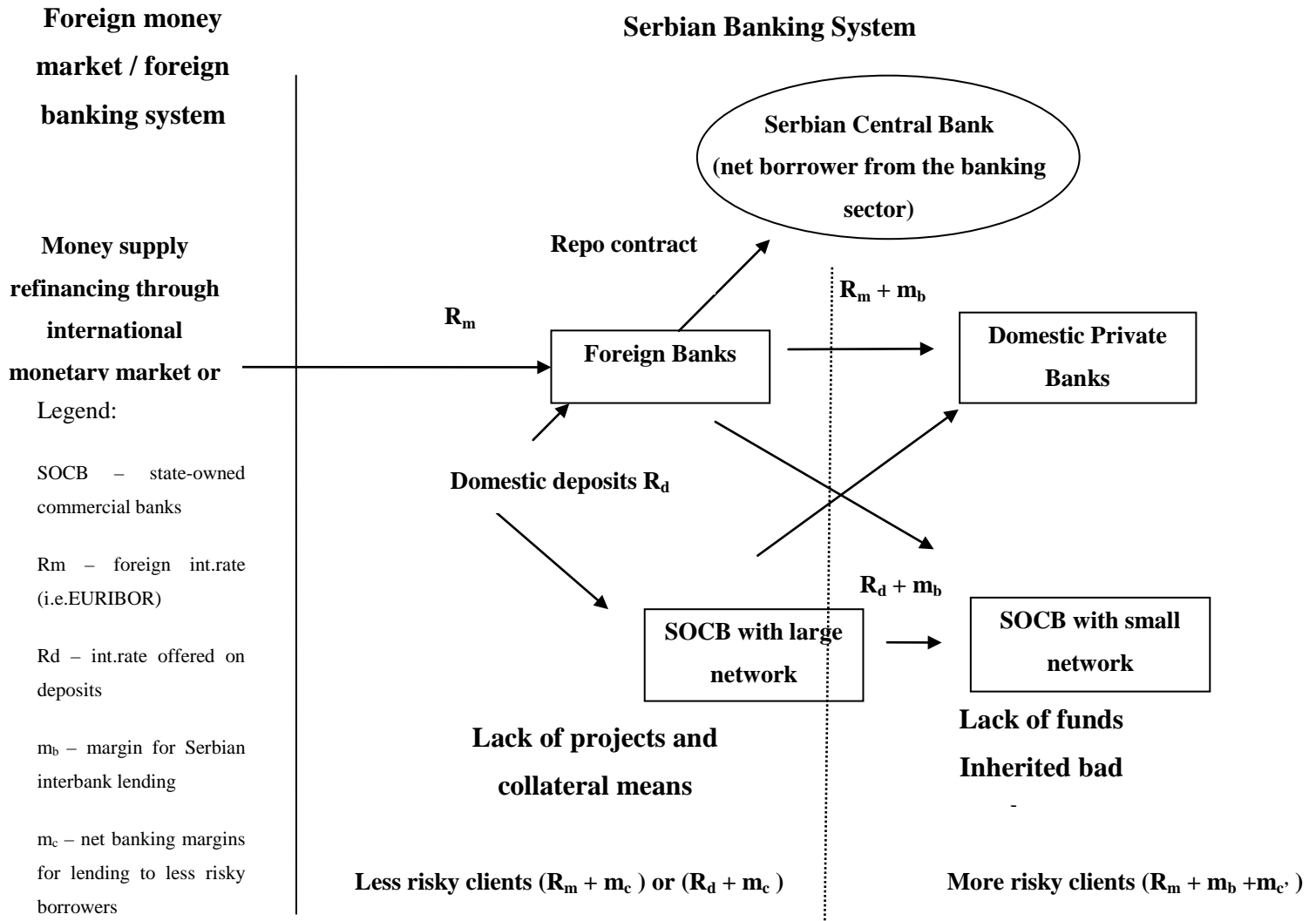
The registered information asymmetry in the lending market including segments where banks have more market power and borrowers are less transparent and less price-sensitive may generally pose obstacles for the transmission of monetary policy. The interest channel may be less operative in such conditions. In the next chapter, the main issue that we will explore is the role of bank credit in monetary policy transmission.

The findings and implications from this study happened to be well founded as in Serbia, after five years of the crisis, almost all of the remaining 'domestic' banks came into difficulties. Some of them went into default; some are under the process of consolidation supervised by the relevant state authority. The risk seems to have been generated in the times of expansion, where, faced with competition from new entering foreign banks, the local banks exposed

themselves to much riskier market segment as described in this chapter using the existing theoretical model of Dell’Aricia and Marquez (2004). In that respect, the findings regarding risk concentration suggested from this study of the credit market in the phase of rapid credit growth following the liberalization are shown as relevant during the crisis when the risks materialized as defaults.

The policy implications from the finding of this study should focus on (1) mitigation of information asymmetry on one side and (2) close monitoring of some market segments that are subject to higher average level of risk. Certain type of banks such as local banks in the examined case may be undertaking more risk and supervisors should more closely monitor these banks. Also, the enforcement of more transparency and the education of enterprises in the adequate use of financial services in circumstances of rapid credit liberalization in order to avoid risk accumulation are recommended. More incentives should also be imposed on banks to analyze borrowers’ risk and to finance small and medium enterprises by reasonable rates. Some regulatory costs imposed on banks may be reduced. Rating agencies and business and credit registries should be encouraged. General knowledge on financial markets should be improved once a country starts to open up to international financial flows and to introduce market institutions.

FIGURE 2-2. Stylized features on the structure and flows in the banking sector in Serbia



Source: Author

Appendix to Chapter 1.

A.1. Questionnaire used in banking survey of lending terms in Serbia, August-September 2005

QUESTIONNAIRE to be completed

(...) means "see instructions"

0 The majority owner of your bank is: (*Write 1 for correct answer*)

- a) foreign bank
b) state
c) other legal entities or physical persons

A **TYPE OF LOANS AND STRUCTURE OF LOAN PORTFOLIO (in mj in million dinars)**

Methodology (groups of accounts)

A 1	Loan structure in your bank as of 31 December 2004	Methodology (groups of accounts)		Short term loans	Long term loans
		Short term	Long term		
1	Public sector (state and local governments)	202, 212, 252, 262	232, 282		
2	Enterprises	201, 210, 211, 251, 261	231, 281		
3	Households <i>Out of this: Entrepreneurs</i>	213	233		
4	Other clients	205, 215, 255, 265	235, 285		

Methodology (groups of accounts)

A 2	Loan structure in your bank as of 30 June 2004	Methodology (groups of accounts)		Short term loans	Long term loans
		Short term	Long term		
1	Public sector (state and local governments)	202, 212, 252, 262	232, 282		
2	Enterprises	201, 210, 211, 251, 261	231, 281		
3	Households <i>Out of this: Entrepreneurs</i>	213	233		
4	Other clients	205, 215, 255, 265	235, 285		

ENTERPRISES SECTOR

A 3	Structure of loans to enterprises, according to the size of the enterprise (...)	Balance / estimation on Dec. 31, 2004.	Balance / estimation on June 30, 2005.
		Public companies (large, medium and small)	
Other large companies (according to the legal definition) (...)			
Other SMEs (according to the legal definition) (...)			

A 4	Structures of short term loans to enterprises, according to the purpose of the loan (...)	Balance on Dec. 31, 2004.	Balance on June 30, 2005.
		1 Revolving loans and borrowings as per business current accounts	
2 Other short term loans			
Out of this:			
up to 3 months			
from 4 to 12 months			
For export (export preparation and crediting)			
For agriculture			

A 5	Structure of long term loans to enterprises, according to the purpose of the loan (...)	Balance / estimation on Dec. 31, 2004.	Balance / estimation on June 30, 2005.
		Loans from 13 to 60 months	
Loans over 60 months			
For export (export preparation and crediting)			
For agriculture			
For working assets and supplies			
For purchase of enterprises in privatization			
Loans for fixed assets, expansion of capacities, investments			
Loans for real estate			

HOUSEHOLDS		Balance on Dec. 31, 2004.	Balance on June 30, 2005.
A 6	Structure of loans to households		
	1 Overdrafts on current accounts		
	2 Cash and consumer loans up 12 months		
	3 Loans from 13 to 60 months		
	Out of this:		
	Consumer and cash loans		
	Car loans		
	Mortgage loans		
	4 Loans over 60 months		
	Out of this:		
	Consumer and cash loans		
	Car loans		
	Mortgage loans		

B		MODEL OF INTEREST RATES		
B 1	In the Instructions under question B1 several models of interest rate calculation are described. What models of interest rate calculation are applied in your bank? Write 1 in the adequate sections based on the models offered in the Instructions (...)	Calculation by monthly proportional method	Calculation by monthly conformity method	Annual calculation
	Model (a)			
	Model (b)			
	Model (c)			
	Model (d)			
	Model (e)			
	Model (f)			
	Model (g)			
	Other model (h) (...)			
	Describe model (h)			

B 2 If you apply models (c) and (f), how are variable amounts in the interest rate structure defined?

B 3 Which model of the offered ones under question B1 is used in the majority of loan agreements in your bank (...)?

B 4 What is the percentage of the total loan amounts in your bank that contains currency clause (*make an estimation*)?

B 5 In what way is foreign exchange clause applied in your bank? Write 1 for correct answer.
 a) Loan is considered as granted in foreign currency, so the dinar countervalue amount of the calculated foreign currency installment is paid on the occasion of every payment, calculated according to the
 b) In some other way.
 Describe

C		INTEREST RATES (...)			
LARGE ENTERPRISES		Prevailing effective interest rate	Interest rate model under question B1	Effective interest rate for lowest risk loans	Effective interest rate for highest risk loans
C 1	Actually applied interest rates on the loans to large enterprises				
	Revolving loans and overdrafts on business account				
	Loans for working assets for 12 months				
	Dinar loans guaranteed by 100% foreign currency deposit on 12 months				
	Investment loans on 5 years				

C 1.1. Does in some cases the amount of placement to large enterprises effect the decrease of effective interest rate?
 If yes, explain how it does:

C 1.2. What is the longest period of the grant of long term investment loans to large enterprises in 2005?

C 1.3.	Term mentioned under question C1.2. was in 2004: (Write 1 for correct answer)	
	a) longer	
	b) shorter	
	c) unchanged	

SME's					
C 2	Actually applied interest rates on the loans to SME's	Prevailing effective interest rate.	Interest rate model under question B1	Effective interest rate for lowest risk loans	Effective interest rate for highest risk loans
	Revolving loans and overdrafts on business account				
	12 months loan for working assets and supplies				
	5 year investment loan				

HOUSEHOLDS				
C 3	Actually applied interest rates on the loans to households	Prevailing effective interest rate	Interest rate model under question B1	Effective interest rate for lowest risk loans
	Unauthorized overdrafts on current accounts			
	Authorized overdrafts on current accounts			
	Consumer and cash loans from 3 to 36 months			
	3 year car loans			
	Mortgage loans on 10 year			

D BANK'S LIABILITIES				
D 1	Structure of liabilities (...)	Methodology (account groups)	Share in total liabilities (groups 4 and 5) as of 30 June 2005 (in %)	Rank from 1 (the lowest) to 11 (the highest) the cost of each liability for the bank on 30 June 2005
	Interbank loans for liquidity	406,407		
	Short term liabilities to foreign persons	503, 508, 513, 522, 536, 543, 548, 553, 562, 572, 576		
	Long term liabilities to foreign persons	572, 576		
	Household transaction deposits in dinars	502, 507		
	Term household deposits in dinars	512, 532		
	Enterprise transaction deposits in dinars	500, 505		
	Term enterprise deposits in dinars	510, 530		
	Household transaction deposits in foreign currency	542, 547		
	Term household deposits in foreign currency	552, 571		
	Enterprise transaction deposits in foreign currency	540, 545		
	Term enterprise deposits in foreign currency+D365	550, 570		

D 2 Interbank liquidity market	
D 2.1.	In cases of high pressures on bank liquidity, what are the ways you mainly use to get missing liquidity
	a) by withdrawing compulsory reserve
	b) by getting a loan on domestic interbank market
	c) by getting a loan abroad
	d) by sale of stocks
	e) in some other way

D 2.2. Has your bank placed free funds on interbank money market in last:
(Write 1 for all positive answers):
 a) 2 days
 b) 7 days
 c) 1 month
 d) 6 months
 e) 1 year

2.3.1. Has your bank had funds surplus above stipulated compulsory reserve in average on its account in in 2005?

Yes	No
-----	----

2.3.2. If your answer to question 2.3.1. is positive, what is the basic reason to keep surplus of liquid funds?

2.3.3. What is the number of banks out of total banks your bank is ready to place short term liquidity borrowing at this moment?

D 2.4. What was the borrowing period you granted to other bank last time?

D 2.4.1. Does the interbank loan mentioned under question D2.4. include foreign exchange clause? Encircle:

Yes	No
-----	----

D 2.4.2. Were stocks or some other security used as the base for the loan mentioned under question D2.4. ?

Yes	No
-----	----

 What instruments are in question?

D 2.5. Your estimation of domestic interbank liquidity market*(Write 1 for all correct answers)*
 a) active
 b) inactive
 c) interest rate too high so the bank rather uses some other method to bridge illiquidity
 d) insufficiently liquid

D 2.6. What was the interest rate of the borrowing under question 2.4. your bank granted?

D 2.7. What was the interest rate your bank borrowed at from other bank last time?

D 2.8. What is the interest rate that is kept at your bank every day?
 Abroad
 In the country

D 2.9. What are the sources to keep the interest rate mentioned under question 2.8 in the country?

D 3

Deposit interest rates in your bank (...)	Valid effective interest rate	Change in first half of 2005. + (increase), - (decrease), = (level off)	Expected changes until Dec. 31, 2005. + (increase), - (decrease), = (level off)
Households deposits			
Sight deposits			
Term dinar deposits on 12 months			
Term dinar deposits on 3 years			
Sight foreign currency deposits			
Specific-purpose foreign currency deposits for loan security			
Term foreign currency deposits on 12 months			
Term foreign currency deposits on 3 years			
Corporate (enterprises) deposits			
Dinar transaction deposits			
Term dinar deposits on 12 months			
Foreign currency transaction deposits			
Term foreign currency deposits on 12 months			

D 3.1. Which of the mentioned factors influenced the change of interest rates on deposits in 2005?

(Write 1 for all correct answers)

- a) pressure by competition
- b) rise/decrease in prices of alternative sources
- c) some other factor

D 3.2. If b) under question 3.1 is encircled, what are those sources?

--

D 3.3. If c) under question 3.1 is encircled, what are those factors?

--

E FACTORS THAT INFLUENCE THE INTEREST RATES LEVEL
LOANS TO ENTERPRISES

E 1 How many times has the decision on interest rates for loans to enterprises been changed at your bank since the beginning of 2005?

E 1.1. How does the last change of the decision under question E1 reflect? (*Write 1 for all correct answers*)

a) in decrease of total level of interest rates

b) in increase of total level of interest rates

c) in change of elements that are calculated in final interest rate

d) in something else

E 1.1.1. If your answer is (c) under question E1.1., describe the change.

E 1.1.2. If your answer is (d) under question E1.1., specify the cause.

E 1.2. Which of the mentioned factors influenced the change of decision under question E1 most frequently?
Write 1 for correct answer.

a) change of one or more adverse interest rates

b) change of regulations resulting in change of costs structure

c) change of interest rates or other non price-like conditions with competition banks

d) change in demand for different types of loans

e) other

Specify:

E 2.1.1. In case of what loan product to enterprises (under questions A4 and A5) demand exceeds supply mostly?

E 2.1.2. In case of what loan product to enterprises (under questions A4 and A5) demand is behind supply mostly?

E 2.2. What was the basic limitation to your further expansion of loans to enterprises in first half of 2005?
Write 1 for correct answer

a) lack of sources

b) lack of quality projects

c) lack of good loan security funds

d) limitations by regulations

e) other (*specify*): _____

E 2.3. If the conditions in the previous quarter (source price /your loan policy) enabled you to place loans at 2% lower interest rates, would you be able to increase placement to enterprises under the same security conditions?

	Yes	No
--	-----	----

E 2.3.1. If your answer to the previous question is positive, what would be the extent of mentioned placement increase?

E 2.3.2. Quality of placement under question 2.3. would then: (*Write 1 for correct answer*)

a) be decreased

b) remain the same

c) be increased

E 3 **Effects of the competition in banking sector**

E 3.1. In case of placements to enterprises, how does the competition effect interests, compensations and non price-like loan conditions?

In each column write 1 for adequate answer.

	Interests	Compensations	Non price-like conditions
Competition conditions effect the change of loan conditions in our bank			
We are exposed to the pressure by competition, but we have no room to change the conditions			
We feel the pressure by competition but we do not change the conditions for we have room to adjust to the conditions in other way			
Competition conditions do not effect loan conditions in our bank			

E 3.2. What position do the following elements take in your marketing strategy towards enterprise sector?

	They have a very important position	They take a relatively important position	It is not important for marketing strategy
Low interest rates			
Low compensations			
Efficiency of services			
Flexibility			
Width of products and services offered to a client			
New products and services			
Direct contacts with clients			
Advertising campaigns			
Accessibility and availability of your services			
Something else (<i>Specify</i>) :.....			

E 4.1. List 3 means of security that are mostly used in your bank for loans to loans to enterprises:

1	
2	
3	

E 4.1.1. What means of loan security to enterprises are most efficient under current conditions and why, in your opinion?

--

E 4.1.2. What means of loan security to enterprises are least efficient under current conditions and why, in your opinion?

--

E 5.1. Does it happen in your bank that two loans classified in the same risk category according to the criteria stipulated by NBS, of the same value and period, with the same security instruments, at the same time, to enterprises of the same size and business, would be placed at different interest rates?

Yes	No
-----	----

E 5.2. If your answer to question E5.1. Is positive, what is the reason?

--

HOUSEHOLDS LOANS

- E 6 When was the decision on interest rates on household loans changed in your bank last time?
- E 6.1 How did the change of decision under question E6 reflect? (*Write 1 for all correct answers*)
- a) in decrease of total level of interest rates
 - b) in increase of total level of interest rates
 - c) in change of elements that are calculated in final interest rate
 - d) in something else
- E 6.1.1 If your answer is (c) to question E6.1., describe the change.
- E 6.1.2 If your answer is (d) to question E6.1, specify the cause.
- E 6.2 Which of the offered factors crucially effected the change of decision under question E6?
Write 1 for correct answer.
- a) change of one or more adverse interest rates
 - b) change of regulations resulting in the change of costs structure
 - c) change of interest rates or other non price-like conditions with competition banks
 - d) change in demand for various types of loans
 - e) some factors not mentioned above
- Specify:**
- E 7.1.1 In what types of placements to households(under question A6) demand exceeds supply mostly?
- E 7.1.2 In what types of placements to households (under question A6) demand is behind supply mostly?
- E 7.2 What was the basic limitation to your further expansion of loans to households in first half of 2005?
Write 1 for correct answer
- a) lack of sources
 - b) lack of quality projects
 - c) lack of good loan security means
 - d) limitations of regulations
 - e) other (*specify*): _____
- E 7.3 If the conditions in the previous quarter (source price /your loan policy) enabled you to place loans at 2% lower interest rates, would you be able to increase placement to enterprises under the same security conditions?
- | | |
|-----|----|
| Yes | No |
|-----|----|
- E 7.3.1 If your answer to the previous question is positive, what would be an approximate amount of the mentioned placement increase?
- E 7.3.2 Quality of placement under question 7.3. Would than: (*Write 1 for correct answer*)
- a) be decreased
 - b) remain the same
 - c) be increased

E 8 **Effects of the competition in banking sector on the interest rates on loans to households**

E 8.1. In case of placements to households, how does the competition effect interests, compensations and non price-like loan
In each column write 1 for adequate answer.

	Interests	Compensations	Non price-like conditions
Competition conditions effect the change of loan conditions in our bank			
We are exposed to the pressure by competition, but we have no room to change the conditions			
We feel the pressure by competition but we do not change the conditions for we have room to adjust to the conditions in other way			
Competition conditions do not effect loan conditions in our bank			

E 8.2. What position do the following elements take in your marketing strategy towards household sector?

	They take a very important position	They take a relatively important position	It is not important for marketing strategy
Low interest rates			
Low compensations			
Efficiency of services			
Flexibility			
Width of offered products and services to clients			
New products and services			
Direct contacts with clients			
Advertising campaigns			
Accessibility and availability of your services			
Something else:.....			

E 9 List 3 means of security that are mostly used for loans to households in your bank:

1	
2	
3	

E 9.1. What means of security of loans to households are most efficient under current conditions and why, in your opinion?

E 9.2. What means of security of loans to households are least efficient under current conditions and why, in your opinion?

E 10 In case of loans to enterprises how much does the classification of a concrete client according to the criteria by NBS (to A, B, V, G, D) effect the value of interest rate? Write 1 for correct answer.

- a) It does not effect at all
- b) It effects, but not crucially
- c) It effects considerably, but other factors effect, too
- d) It effects crucially

Source: Author

Instructions regarding Section B, Question B1:

The Table sections are to be marked with 1 for all the models of interest rate calculation that are used in your bank.

Models of interest rate calculation:

Model (a) – Loan does not include indexing foreign currency clause, the contracted interest rate does not vary during loan period

Model (b) – Loan does not include indexing foreign currency clause, the contracted interest rate is variable depending on the source price of bank funds

Model (c) – Loan does not include foreign currency clause, the contracted interest rate is variable by adding rate of increase in retail prices to the fixed amount

Model (d) - Loan does not include foreign currency clause, the contracted interest rate is variable by adding rate of increase in retail prices to the variable amount

Model (e) – Loan does not include foreign currency clause, the contracted interest rate is variable by adding variation of foreign exchange rate to the fixed amount

Model (f) – Loan includes foreign currency clause, the contracted interest rate is fixed during loan period

Model (g) – Loan includes foreign currency clause, the contracted interest rate is variable during loan period

Model (h) – In our bank we apply a model of interest rate calculation that is different from the above mentioned ones

- If there is any other model that is applied in your bank but is not offered herein, add its brief explanation under section (h) following other models in the list.

- If the method of interest application is only partially in compliance with some of the offered models, explain the specific properties relating to its application for that very model (e. g. “it is applied only if index of retail prices is higher than x% monthly, otherwise, model under (e) is applied”).

TABLE 2-17. Macroeconomic and banking sector indicators for Serbia

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GDP, in EUR million	16,030.3	17,327.5	19,012.4	20,302.8	23,305.9	28,473.9	32,678.9	28,959.2	27,988.1	31,472.4	29,932.3
Banking sector assets, in EUR million	5,836.1	6,614.7	7,697.7	10,692.3	16,130.2	21,218.4	21,632.4	24,419.7	26,039.7	27,732.2	27,821.1
Banking sector assets, in % of GDP	36.4%	38.2%	40.5%	52.7%	69.2%	74.5%	66.2%	84.3%	93.0%	88.1%	92.9%
Domestic credit, in EUR million	2,075.5	3,323.2	4,175.5	5,931.8	7,459.5	10,352.5	12,494.9	13,418.8	15,428.3	16,727.5	16,849.1
Domestic credit, in % of GDP	12.9%	19.2%	22.0%	29.2%	32.0%	36.4%	38.2%	46.3%	55.1%	53.1%	56.3%
Cross border credit, in EUR million	726.7	983.4	1,435.7	2,549.8	4,112.7	7,248.2	11,043.4	10,413.6	9,617.4	8,988.0	9,434.1
Cross border credit, in % of GDP	4.5%	5.7%	7.6%	12.6%	17.6%	25.5%	33.8%	36.0%	34.4%	28.6%	31.5%
Number of banks	50	47	43	40	37	35	34	34	33	32	31
Share of foreign-owned banks in total assets of banking system	27.0%	38.4%	37.7%	66.0%	78.7%	75.5%	75.3%	74.8%	75.1%	78.8%	80.0%
NPL, in %							11.3%	15.7%	16.9%	19.0%	18.6%
Loan-to-deposit ratio	89.9%	117.7%	127.1%	131.2%	108.8%	101.9%	126.6%	119.2%	130.7%	128.7%	127.7%
Nominal credit growth (adjusted for fluctuations of FX rate), in %	N/A	24.6%	30.6%	45.6%	24.1%	38.4%	23.4%	10.2%	19.6%	8.3%	3.5%

Source: National Bank of Serbia, Statistical Office of Serbia

TABLE 2-18. Asset and liabilities structure of banks by ownership type, evidence from the database

	2000			2001			2002			2003			2004			2005		
	State owned banks	Dom. private banks	Foreign- owned banks	State owned banks	Dom. private banks	Foreign- owned banks	State owned banks	Dom. private banks	Foreign- owned banks	State owned banks	Dom. private banks	Foreign- owned banks	State owned banks	Dom. private banks	Foreign- owned banks	State owned banks	Dom. private banks	Foreign- owned banks
(in % of total assets)																		
Assets																		
Fixed assets	2.58	7.30	n.a.	2.77	6.16	2.11	6.71	7.91	3.29	8.70	7.76	3.39	9.23	8.91	2.93	8.48	10.47	4.38
Loans to other financial institutions	15.78	8.61	n.a.	27.34	9.05	14.06	8.24	9.87	26.03	11.92	11.49	19.01	13.40	10.19	14.55	3.78	5.92	4.29
Loans to citizens	0.34	1.72	n.a.	0.45	1.53	1.72	5.04	4.50	5.01	7.72	5.99	10.73	9.50	7.62	19.22	12.02	7.26	18.40
Loans to enterprises	29.30	23.70	n.a.	25.17	28.80	4.64	43.77	38.42	14.68	35.60	35.78	33.12	33.77	33.63	40.15	30.15	38.06	35.62
Loans to government	34.50	0.50	n.a.	22.29	1.32	0.00	2.73	1.66	0.00	3.04	0.92	0.00	3.21	0.73	0.00	0.99	2.27	0.28
Securities held	0.86	2.82	n.a.	0.65	3.92	0.19	1.62	2.24	2.50	1.95	1.71	4.61	1.79	2.21	2.57	4.09	3.52	1.65
Shares in equity	0.94	3.09	n.a.	1.09	2.10	0.01	0.77	1.17	0.00	1.43	1.86	1.13	1.71	1.35	2.59	0.74	2.00	1.46
Other assets	10.48	17.44	n.a.	15.17	20.94	41.24	15.13	12.23	23.31	10.81	8.78	11.86	10.71	10.72	5.60	10.30	7.52	4.18
Cash and cash equivalents	5.21	34.82	n.a.	5.07	26.18	36.03	15.99	22.00	25.17	18.82	25.70	16.15	16.68	24.65	12.39	29.46	22.97	29.73
(in % of total liabilities)																		
Liabilities																		
Equity	-0.07	41.66	n.a.	-36.30	39.83	15.21	14.78	33.45	12.88	23.10	31.53	14.76	22.75	29.28	10.21	18.47	43.50	12.29
Deposits and loans from other loc.banks	29.39	3.90	n.a.	25.18	3.83	3.85	10.23	6.34	8.74	11.45	8.38	5.98	8.04	4.88	8.59	5.11	5.30	3.23
Deposits and loans from foreign entities	16.35	2.81	n.a.	32.05	1.31	4.87	5.39	1.95	5.74	4.47	2.18	14.08	4.79	3.17	31.02	3.70	2.93	32.81
Citizens FX deposits	32.70	2.96	n.a.	23.57	4.97	40.21	10.59	9.69	38.31	17.06	13.27	33.07	24.14	17.42	23.20	31.66	10.97	23.96
Citizens dinar deposits	0.35	0.70	n.a.	0.50	0.81	0.11	5.31	2.21	0.56	6.87	2.38	1.10	5.98	2.43	1.01	5.88	1.70	1.97
Deposits and loans from enterprises	4.64	27.38	n.a.	4.65	28.04	30.46	18.91	31.30	26.90	21.70	35.85	27.81	20.77	31.91	21.86	21.99	24.98	18.30
Government deposits and loans	0.55	1.02	n.a.	0.87	4.16	22.00	7.98	4.58	1.95	4.98	0.94	0.28	3.95	4.34	0.65	4.39	3.18	1.81
Other liabilities	16.08	19.56	n.a.	49.48	17.05	5.08	26.80	10.47	4.92	10.38	5.48	2.92	9.58	6.58	3.46	8.80	7.44	5.64

TABLE 2-19. Field survey coverage

	All banks			Surveyed banks			
	Total asset as of September 30, 2005	Share in total assets as of September 30, 2005	No. of banks	Total asset as of September 30, 2005	Share in total assets as of September 30, 2005	No. of banks	Coverage in % (4/1)
	in million of dinars	in %		in million of dinars	in %		in %
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All banks	672,065	100.0	41	444,029	100.0	19	66.1
Ownership (major owner) as of October 25, 2005:							
State	211,610	31.5	16	121,315	27.3	7	57.3
Private (excluding foreign banks)	34,920	5.2	7	10,560	2.4	2	30.2
Foreign banks	425,535	63.3	18	312,154	70.3	10	73.4
Size as of 30/06/2005:							
Large banks (>5% banking sector assets)	321,088	47.8	5	282,136	63.5	4	87.9
Medium banks (1,5-5% banking sector assets)	240,745	35.8	15	100,075	22.5	6	41.6
Small banks (<1,5% banking sector assets)	110,232	16.4	21	61,818	13.9	9	56.1

Source: NBS; own calculations

TABLE 2-20. Variables definition and descriptive statistics

Variable	Definition	All banks (218 observations)		State-owned banks (89 observations)		Domestic private banks (77 observations)		Foreign-owned banks (52 observations)	
		Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Net interest margin	Interest income minus interest expense accrued over earning assets (total assets net of fixed assets)	0.058	0.040	0.052	0.036	0.080	0.044	0.034	0.019
Asset quality	Provisions for non-performing assets over total assets	0.109	0.149	0.156	0.055	0.103	0.113	0.037	0.041
Liquidity	Excess reserves over assets (cash and sight deposits with central bank in total assets)	0.224	0.148	0.190	0.156	0.257	0.146	0.235	0.128
Equity (over assets)	Bank capital (plus reserves) over assets	0.274	0.233	0.201	0.255	0.409	0.186	0.196	0.155
Funding cost	Interest expenses to total loans and deposits received by bank	0.027	0.027	0.024	0.018	0.037	0.037	0.016	0.011
Market share	Share of loans held by bank in loans of whole banking sector	0.023	0.036	0.029	0.043	0.012	0.020	0.029	0.037
Administrative costs	All operating expenses over assets	0.065	0.036	0.066	0.038	0.072	0.036	0.054	0.031
Enterprises loans	Loans to enterprises in total loans	0.313	0.910	0.316	0.214	0.330	0.147	0.283	0.167
Short term loans	Share of loans up to 1 year of maturity in total loans	0.704	0.272	0.545	0.315	0.864	0.105	0.741	0.206
Foreign bank share	Share of loans held by foreign banks in loans of whole banking sector	0.290	0.234	0.253	0.227	0.251	0.210	0.412	0.242
Foreign bank	Dummy equal to 1 for bank owned by a foreign bank	0.239	0.427	0.000	0.000	0.000	0.000	1.000	0.000
State owned bank	Dummy equal to 1 for state owned bank	0.408	0.493	1.000	0.000	0.000	0.000	0.000	0.000
Merged	Dummy equal to 1 for bank closed in a observed period	0.101	0.302	0.112	0.318	0.091	0.289	0.096	0.298
D2001	Year dummy for 2001, first year of reforms	0.239	0.427	0.303	0.462	0.260	0.441	0.096	0.298

TABLE 2-21. Correlation matrix of variables

	Net interest margin	Asset quality	Liquidity	Equity (over assets)	Funding cost	Administrative costs	Market share	Enterprises loans	Short term loans	Foreign bank share	Foreign bank	State-owned bank	Merged	D2001
Net interest margin	1.0000													
Asset quality	0.1404*	1.0000												
Liquidity	0.0538	-0.1313	1.0000											
Equity (over assets)	0.5865*	0.1822*	0.1051	1.0000										
Funding cost	0.2064*	0.2632*	-0.0863	0.3243*	1.0000									
Administrative costs	0.4460*	0.1485*	0.2098*	0.2660*	0.1455*	1.0000								
Market share	-0.2472*	-0.0052	-0.1716*	-0.5065*	-0.1386*	-0.2710*	1.0000							
Enterprises loans	0.2788*	0.2578*	-0.1008	0.3336*	0.2786*	0.0581	-0.0206	1.0000						
Short-term loans	0.4559*	-0.2297*	0.4475*	0.4656*	0.0841	0.2796*	-0.2655*	-0.0974	1.0000					
Foreign bank share	0.1222	0.1601*	0.1347*	0.0706	-0.0386	0.4063*	0.0664	0.1490*	0.0522	1.0000				
Foreign bank	-0.3347*	-0.2696*	0.0511	-0.1828*	-0.2239*	-0.1768*	0.0881	-0.1762*	0.0789	0.2909*	1.0000			
State-owned bank	-0.1277	0.2601*	-0.1835*	-0.2531*	-0.0864	0.0099	0.1455*	-0.0651	-0.4868*	-0.1343*	-0.4681*	1.0000		
Merged	-0.0228	-0.1057	0.0519	-0.0797	0.1493*	0.0021	-0.1527*	-0.1166	0.0034	-0.1569*	-0.0097	0.0303	1.0000	
D2001	-0.2039*	-0.1446*	-0.1380*	-0.2059*	0.0186	-0.4931*	-0.0635	-0.2913*	-0.1946*	-0.6446*	-0.1887*	0.1245	0.1333*	1.0

*significant at 5% level

TABLE 2-22. Criteria for Classification of Bank Claims in Accordance with Degree of Collectability, 2005

Criteria ¹⁾	Risk categories				
	A	B	C	D	E
Overdue payment by	30 days, exceptionally	31 to 90	91 to 120	121 to 180	over 180 days
Assessment of borrower's cash flows	harmonized	appropriate (i.e. positive cash flow in the previous business period) but actual financial picture point out to potential future problems	inappropriate, assets and liabilities maturity structure does not correspond to the borrower's activity	illiquid borrower	borrower is under bankruptcy
Borrower's capital structure and level			capital structure and level do not correspond to the borrower's activity	unsound borrower	
Borrower's disclosed profit				disclosed loss	
Legal status of the claim					legally disputed
Borrower's file with bank					uncompleted and not up to date
Household loans collateralization and provision with adequate income					loan collateralized with deposit of less than 20% of outstanding loans, monthly payment exceeds 30% of monthly household's income

Source: NBS, Decision on the Classification of Bank Balance-sheet Assets and Off-balance-sheet Items, 2005.

1) All claims on a single borrower (except when legally disputed) are put into one category – the least favorable one for that borrower.

Chapter 3. Monetary Policy Transmission in Emerging Europe: the Role of Bank Credit and Other Challenges*

3.1. Introduction

The challenging task of keeping inflation stable and having the efficient monetary policy transmission mechanism are directly connected with the degree of financial integration of a country within the international capital flows. The last issue becomes even more important in the case of small open economies as those from Emerging Europe. The integration, as it is presented in Chapter 1, implied the opening of capital account for foreign inflows that were mostly in ‘downhill’ direction until the crisis, i.e. the Emerging Europe, was the net importer of foreign capital. It led to strong FDI inflows during early transition and foreign debt in the later phase until the crisis. The relatively high inflows resulted in credit boom episodes spurring demand and pushing up inflation.

In combination with the heritage of low credibility in domestic currency and domestic savings predominantly in foreign currency, foreign financial inflows also contributed to the high level of financial euroization of the economies in this region. In the course of their transition to the market economy, countries from the region introduced monetary frameworks with institutional foundations already in practice in developed market economies. The adopted framework differs across countries going from currency board, and some sort of currency peg, to implicit or explicit inflation targeting regimes, including, more or less, the free float of exchange rates. In all these economies, the exchange rate played an important role in monetary policy transmission and was used as an anchor for price stabilization in some periods. Keeping the nominal exchange rate stable was not particularly difficult during the periods of net foreign currency inflows from abroad, as these inflows were generating

* The part of the study presented in this chapter was published in *Quarterly Monitor of Economic Trends and Policies in Serbia, 2008, No.10*, under the title ‘Monetary policy - transmission channels to prices: a year of inflation targeting’

appreciation pressures and often caused the need to intervene through sterilized interventions for local monetary authorities. Maintaining nominal exchange rate stability or, more precisely, avoiding excessive depreciation pressures despite large current account deficits in these economies, was thanks to significant net foreign financial inflows.

With the crisis, all of those economies having a floating exchange rate regime, suffered from depreciation pressures resulting from sudden stops in foreign funds and even outflows. On top of that, given the financial euroization of these economies, the local currency interest rate movements had intuitively a narrowed space to maneuver the impact of the local aggregate demand through changes in investment and saving decisions of economic agents as prescribed by the theory of the classical (“textbook”) interest rate mechanism. The lending market, characterized by high information asymmetry, reflected in relatively high and dispersed interest rates depending on market segment⁴⁸. Additionally, it signals that the transmission mechanism of monetary policy may be distorted. Moreover, given that a bank is central to the economy in terms of financial intermediation in these countries, the assessment of the role of bank credit in monetary policy transmission becomes more important.

To resume, on one hand there was a credit boom (partly a “catching up” as financial intermediation started from very low basis), and credit was an important driver of demand growth and of the consequent real sector output convergence; it should therefore be a key channel for monetary policy. On the other hand, market frictions in lending market segmentation, low elasticity of demand for loans to interest rates, high margins still reflecting a low level of bank competition and the significant impact of direct exchange rate channel, all put a shadow on the classical mechanism of monetary policy transmission through credit and point to many possible distortions.

Though the complete understanding of the monetary policy transmission is unreachable, and even that it is still referred to as a ‘black box’⁴⁹, in developed countries, it is commonly agreed that a thorough understanding of monetary policy transmission is a necessary precondition for an effective monetary policy implementation, especially in an inflation targeting framework⁵⁰. In other words, though the final impact of changes in monetary policy stance (through changes of instruments under the central bank’s direct control) on real flows and prices depends on the simultaneous behavior of various economic sectors influenced by many other

⁴⁸ As shown in the Chapter 2 on the basis of a field survey of lending term in Serbian banking sector in 2005.

⁴⁹ The term is firstly introduced by Bernanke and Gertler (1995)

⁵⁰ Amato and Gerlach, 2002

factors, the better the understanding of the monetary policy transmission mechanism, the more effective it would be the monetary policy in its goals. The understanding of the degree of harmonization of transmission channels to those in the Eurozone is also a key prerequisite for the successful economic integration of new and future EU members to the monetary union.

The motivation for examining bank lending channels in this thesis results, on one side, from the fact that banks dominate the financial market in transition Europe and credit market development plays a crucial role in real economy convergence. In parallel, by generating demand, it represents a source of inflationary pressures. Yet, after the crisis, by the net outflow of foreign financing, bank lending created pressures on local currencies and also inflationary tensions from that angle. On the other side, the lending market is not homogenous, as already suggested by the findings of Chapter 2. Contrary to the theoretical concepts, the lending market is a sum of heterogeneous segments that may react in different ways to policy variables, such as the reference interest rate.

Banks dominate financial intermediation in Emerging European economies. Therefore, the credit channel is of relatively larger importance for transition countries comparing to other channels and comparing to its importance in developed countries. Unlike the developed economies with deep and active stock and bond markets, businesses in transition economies are relying mostly on the banking sector, bank loans being the most important source of external formal borrowing⁵¹.

The transition process in these economies was characterized by a “catching up” in credit and financial intermediation that lasted until the global crisis. Namely, fast financial deepening and credit booms were partly a result of very shallow financial intermediation (i.e., a release of financial constraint, but also of an abundant supply of bank credit). Demand was strong and seemed characterized by low price elasticity in particular in the segment of lending to households. In these circumstances, besides a critical role of credit and banks in the fast monetization of the economy, credit supply was even more important for the monetary policy as demand was strong and relatively inelastic to the interest rate level. Moreover, market frictions arising from information asymmetries, as documented in the findings of Chapter 2, add to the relevance of bank lending channels in a way that, unlike the interest rate channel which relies on theoretical presumption of smooth functioning of financial market mechanism, the bank lending channel is meant to account for the existence of information

⁵¹ EBRD, 2006

asymmetry in the financial market. In addition, the crisis has taught us that policy makers needed to deliver more than stable consumer prices and that focus on that goal may lead to neglect of the growth sustainability goal and to asset price bubbles. In these circumstances, dismantling the monetary transmission mechanism through credit channel becomes an important building block for understanding the monetary policy transmission and for the improvement of its effectiveness.

The focus of empirical research in this chapter, as in the previous one, is on the Serbian economy. As explained in the Introduction, a single country approach allows more precise insights and to take care of all possible caveats that might arise when the estimation is done from a cross-country perspective. However, we are aware of the fact that too small a sample may lead to a lack of robustness in the results due to a relatively short period. To compensate for that, the empirical findings and the history on monetary policy are enriched by the thorough description of analytical insights regarding the obtained results on the monetary policy transmission.

These descriptions are an inseparable part of the “story” on bank lending channels, given the complexity of the framework, including two currencies that are practically in use, the exchange rate mechanism, the carry trade, the foreign bank presence, and lending in foreign currency. Therefore, the detailed description of the monetary policy framework (that is inflation targeting) as well as of its developments, before the empirical estimation, is the best way to provide a well-grounded discussion of the empirical findings and for interpretation of results. In that sense, one country approach is favorable.

The absence of close to the field perspectives may weaken both the definition of the elements of the empirical model as well as the resulting interpretations. As a matter of representativeness, Serbia has all typical characteristics of an emerging economy in Europe in terms of monetary policy transmission. Also, its monetary policy determinants depict well the general problematic. It is however worth mentioning that in terms of price stability, Serbia has one of the worst performances over the previous decade (and even before it). This is probably the consequence of the failure of institutions that equally explain the ‘great divide’ in transition (Berglof and Bolton, 2001). The last do not mean that the case is different, but that typical vulnerabilities are even more accentuated as Serbia entered later into transition (including financial integration process) after difficult political times when the economy was also harmed significantly.

The central idea of this chapter is to examine whether there is a credit channel in the transmission of the monetary policy in Serbia. For this analysis we dispose of an original complete dataset of individual bank balance sheet data. We focus on the bank lending channel as a part of the broad credit channel. We empirically examine its first stage, i.e. the effect of monetary policy on the bank loan supply. The second stage of the credit channel (i.e. the impact of loan supply on production, demand and prices) is impossible to capture with bank level data and it is consequently less examined in the literature. In examining the bank lending channel, we use the approach of Kashyap and Stein (1995). This approach enables me to check not only the effect of the interest rate on bank lending (here not explicitly distinguishing the demand from supply response), but also to examine whether the impact of a monetary policy change on bank lending differs depending on the size of banks, the capital strength, the liquidity and the ownership structure. The last strategy allows distinguishing a supply response (if such a response exists). The bank supply response to changes in monetary policy would imply the existence of the bank lending channel. We use an original panel dataset covering the whole Serbian banking sector over the period 2006–2012, and we employ dynamic panel estimation.

The result in terms of the interest rate channel are rather inconclusive, the coefficient describing the effect of monetary policy instrument (interest rate) on lending growth being statistically significant only in some model specifications. The findings equally show evidence of an interest rate channel in the pre-crisis period. As far as the bank lending channel is concerned, the findings show weak or no evidence of its presence. None of the bank characteristics play a role in distinguishing the reaction of banks' credit activity to changes in the monetary policy. One should bear in mind the specific monetary policy context in a small open economy with a high degree of financial integration and floating exchange rate highly exposed to foreign financial flows.

Unlike other studies of this kind, besides local reference rate as an indicator of monetary policy, we equally test for the potential effect of foreign interest rate, Euribor, on local lending; this indicator is used as a proxy of monetary policy changes in the Eurozone. We equally test for the impact of real GDP growth and prices as indicators of demand, while taking into account the effect of changes in foreign currency rate. The last variable is used to capture the pure accounting effect that may “mask” the growth in lending coming from the changes in the stock of foreign currency indexed loans due to exchange rate fluctuations. Our findings point to rather weak evidence for all macroeconomic determinants, even though in

some model specifications the coefficients are statistically significant and present the intuitive direction of influence (sign). This analysis is, to my knowledge, the first realized for the case of the Serbian banking sector using complete dataset with bank balance sheet data.

Furthermore, we put these micro level findings in the broader macroeconomic context in the observed period. By doing that, we provide a rationale for the weak evidence of bank lending channel; we point to some vulnerability in terms of room of maneuver for an effective monetary policy in a country in transition, such as Serbia.

The remainder of this chapter is organized as now outlined. Section 3.2 contains a short review of the theory of the monetary policy transmission mechanism including all relevant channels. Section 3.3 presents the practice and empirical findings on monetary policy transmission in Emerging Europe, with special attention on those countries that operate in an inflation targeting framework. Section 3.4 overviews the main pillars of inflation targeting framework, as we consider it a crucial background for any analysis of the transmission mechanism given that policy setting itself impacts the behavior of economic agents (Lucas critique). Section 3.4 contains the comprehensive presentation of details on the theoretical concept of bank lending channel, while illustrating the theoretical model that serves as a background of the ruling empirical approach in detecting the bank lending channel. Section 3.5 contains the description of empirical methodology, the data, the estimations and main results of the assessment of the bank lending channels in Serbia. Section 3.6 includes discussion of results but also the description of macroeconomic trends related to monetary policy transmission in the same period as the estimated model. These descriptions may bring additional information needed for the interpretation of results. Section 3.7 concludes.

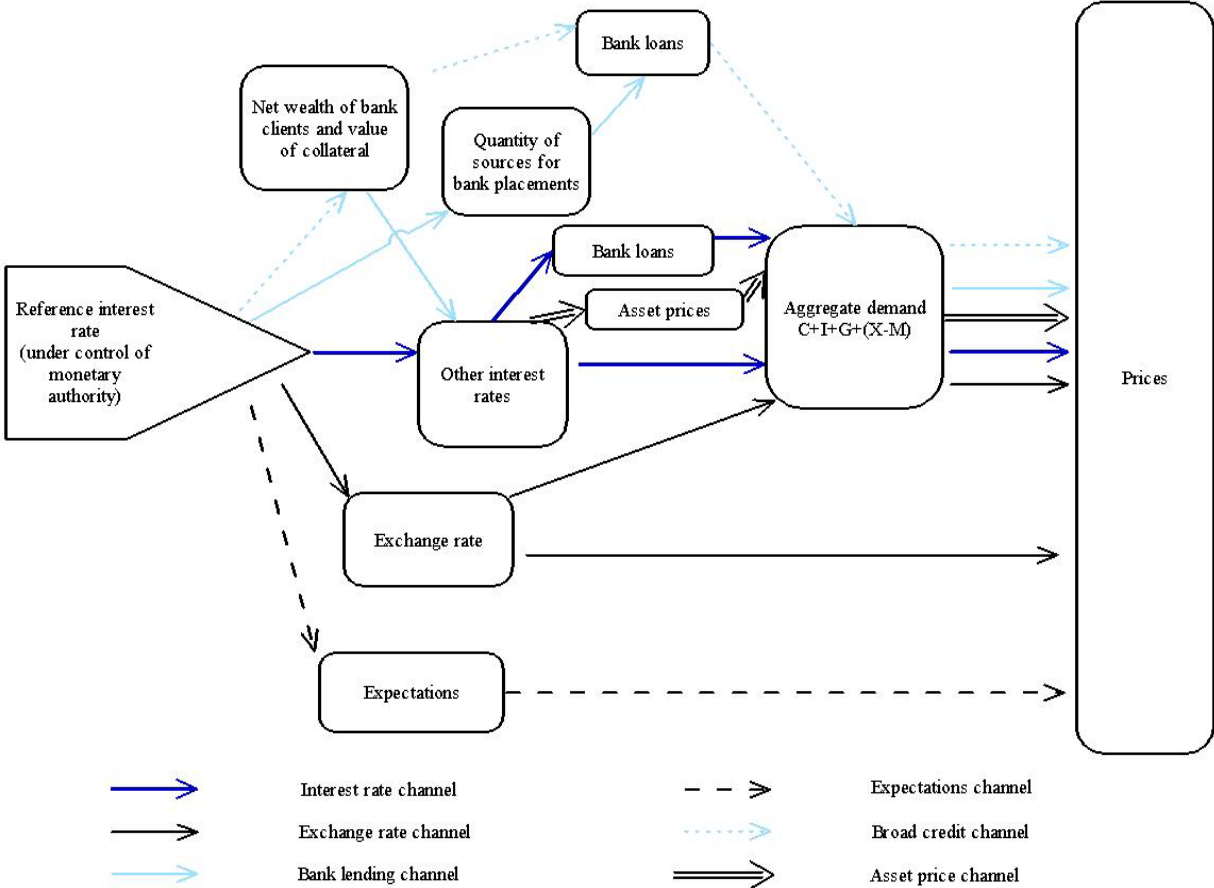
3.2. Monetary policy transmission – theory and empirical evidence: overview of main channels

“The transmission mechanism describes how private-sector agents respond to the policy actions of the monetary authorities, and how the monetary authorities and the private sector then interact. Important factors conditioning the behavior of economic agents (and the policy maker, for that matter) are institutional and structural factors, in particular those determining the functioning of markets, the financial behavior of firms and financial intermediaries and the composition of their balance sheets. These factors are not constant, but subject of ongoing

change. Moreover, economic agents operate in uncertain environment, so their decisions are based on expectations regarding factors relevant for those decisions....” (Berk, 1998)

The theoretical and empirical research on the transmission channels of monetary policy can be summarized in the form of five main channels through which prices are influenced: (a) the interest rate channel, (b) the credit channel separable into bank lending channel and broad credit channel, (c) the asset prices channel, (d) the exchange rate channel and (e) the expectations channel.

FIGURE 3-1. The monetary transmission mechanism



Source : Author

Interest rate channel

The interest rate channel is the main (“textbook“) channel which explains the impact of interest rate on prices. It consists of the following two stages: (1) transmission from the short-term nominal rate, which is under the influence of the central bank, to short-term and long-term real interest rates, and (2) the impact of the real interest rate on aggregate demand and output. More specifically, first, changes in real interest rates on the money market and real

interest rates on bank credit due to a change in the nominal interest rate of the central bank, will determine a change in the components of aggregate demand (consumption and investment, C and I). This will give rise to a change in the use of resources, which will then exert an impact on the change in prices, with a time lag. Specifically, higher interest rates will result in reduced household spending, mostly because they act as an incentive to save and discourage households from taking out new loans.

Second, an increase in interest rates will make companies more reluctant to make new investments, resulting in a drop in new investment in the coming period. Thus, due to a drop in both consumption and investment, total demand of households and companies will decline. Lower total demand will result in reduced economic activity. Likewise, the link between the level of economic activity and prices is explained by means of the so-called Phillips curve, according to which prices and wages normally grow more slowly at a lower level of production activity. The adjustment of prices and wages is usually not simultaneous, i.e., a decline in economic activity brings about a reduction in prices and wages only after a certain period of time because they are not adjusted on a regular monthly basis but rather less frequently. Accordingly, the assumptions for the effect of the interest rate of the central bank on prices in a country (the operation of the interest rate channel) are the following: (1) that the short-term interest rate which is directly controlled by the central bank is transmitted to other interest rates with longer maturities (the so-called yield curve), and (2) that this changed interest rate on savings deposits and long-term borrowing really constitutes an important element in the decisions of households and companies about their consumption/saving and investments. In addition, it is necessary for the changed level of output to affect companies, i.e., their decisions on the level/change of prices and wages.

Credit channel

The previously explained channel relies on the strong assumption of friction-free capital markets: bond and loans are perfect substitutes and banks play a passive role in the economy, solely that of attracting deposits. However, due to capital market imperfections (i.e. information asymmetry), the transmission mechanism, as postulated by the interest rate channel theory, is perturbed in a way that a special role is given to banks.

Unlike the interest rate channel, where the interest rate influences the demand and thus affects the volume of new bank credit, there is another channel which changes the price of raising funds for banks through the interest rate of the central bank, resulting in a change in supply of

credit. That other channel is called the credit channel, in the narrow sense, or the bank lending channel. The credit channel was first introduced in the theoretical debate on the transmission of monetary policy in the paper by Bernanke and Blinder (1988), when it was established that just the interest rate channel is not sufficient to explain the changes in aggregate demand, because its response to changes in long-term interest rates (costs of financing new investment) is not strong enough. According to the authors, the credit channel is the channel which intensifies the operation of the interest rate channel.

It is believed that banks which have a higher capitalization, higher total assets and with better liquidity position can shield from monetary policy and are therefore less exposed to the credit channel. They have room for maneuvers needed to avoid a rise in the price of funding for new investment; this has been reflected to the same degree in the volume of credit they extend.

The existence of the bank lending channel was empirically confirmed in developed countries. Among the existing evidence, we make reference to two major studies that were based on individual bank balance sheets data in the USA. Specifically, on a sample that comprised some 13,000 banks, it was shown that, in addition to the fact that changes in monetary policy (i.e., the reference interest rate) affect credit growth in all banks, monetary policy acts differently on credit growth depending on certain characteristics of banks: the amount of their equity, size and liquidity. Thus, it was concluded that banks that have better coverage by capital, larger banks, and banks with better liquidity position contain to a lower extent their credit growth following the tightening of monetary conditions, because they can better neutralize a drop in liquidity given their lower degree of dependency on the money market. It followed a large number of studies on the existence of the balance sheet channel in other developed countries with the use of a similar methodology.

Recent studies in the euro area countries have shown that the reference rate of the central bank has a general influence on credit growth – but that only liquidity of banks brings about the different distribution of the effects of monetary policy among banks, which would point to the possible existence of the credit channel. Research in transition countries often shows contradictory results and brings scarce evidences in support to the existence of the credit channel. We will present with more details the empirical researches about the bank lending channel in transition economies in the subsection 3.3.2.

The bank lending channel transmission mechanism operates in circumstances where there are companies which depend on banks for financing (they cannot substitute bank financing by

issuance of bonds on the capital market), as well as provided that banks cannot perfectly substitute loans by some other type of investment in their balance sheets. Likewise, there is the credit channel in the broad sense or the balance sheet channel. It is reflected in the phenomenon that a rise in real interest rates caused by an increase in the reference interest rate can result in reduced profitability of companies and a lower net value of their assets. For that reason companies become less attractive borrowers and banks reduce the total volume of new credit.

Asset price channel

Asset prices play also a certain role in the transmission of the monetary policy – via the so called asset price channel (Mishkin, 2001). The central idea of this concept is that the change in interest rate also changes the price of assets thus affecting the net wealth of companies and households. The rise in net wealth in turn enhances consumption. It also increases the value of collateral and the net value of companies, while increasing their ability to borrow. This second mechanism is also known as the amplifier of the credit channel – called ‘balance sheet channel’.

Exchange rate channel

Changes in the nominal exchange rate – both those caused by the activity of a central bank, and those that are spontaneous, resulting only from supply and demand on the foreign exchange market – can have an effect on prices. This is a transmission channel which, unlike the interest rate channel, operates in a very short period of time primarily through an adjustment in import prices and the prices of domestic products which are competing with imported goods in line with changes in the nominal exchange rate. Then headline inflation – the price index – also changes proportionally to the extent to which it includes these products. Thus, with the local currency depreciation (appreciation), the prices go up (down); for the same price of an imported good in euro one would need to pay a higher (lower) amount in local currency.

The importance of the exchange rate channel and the speed of its response to prices is, as one can conclude, very much conditional upon: (a) the competition on the market for imported goods and their competing domestic counterpart products, if any; (b) the method of price fixing used by sellers – in foreign currency or in local currency; and (c) the direction in which the exchange rate is changing – this channel probably is not of the same intensity in the case

of a depreciation or an appreciation of the domestic currency, because prices can exhibit higher inertia when it comes to the adjustment in one direction compared to the opposite one.

Likewise, in addition to the above described direct impact on prices, in an open economy the exchange rate also exerts an indirect influence through its effect on exports and imports (if the Marshall-Lerner Condition operates), and thus on net exports ($X-M$) which constitute one component of total demand ($C+I+G+X-M$).

Last but not least, in a highly euroized economy, it is possible that changes in domestic currency rate affect the creditworthiness of clients and, thus, impact the volume of new loans as well as the total aggregate demand (Leiderman, et al, 2006). Specifically, the local currency depreciation when a large portion of total loans is indexed to a foreign currency, increases the liabilities of companies and households, reducing their ability to borrow further.

In an inflation targeting regime, a central bank conducts monetary policy by relying on the reference interest rate as the main instrument. Nevertheless, the effect of the exchange rate on prices is still possible under the conditions of a flexible exchange rate, which is an integral part of inflation targeting. This so-called exchange rate channel is important in the transmission of monetary policy in open economies (Svensson, 2000). It is even more important in those economies in which there is a high level of “dollarization” (Leiderman, et al, 2006), or “euroization” in the case of transition economies in Europe, when a large number of transactions, prices, claims and liabilities are calculated and denominated in a foreign currency.

A central bank can exert influence on the exchange rate by means of direct interventions on the foreign exchange market, which are only an auxiliary instrument within the framework of inflation targeting reserved for the cases of excessive volatility of the exchange rate that threaten the stability of the financial system. Moreover, a central bank can also indirectly influence the exchange rate by means of the interest rate. If the interest rate in one country is higher than the interest rate in some other country, that will attract foreign investors who, later on, (in order to invest in domestic securities with a higher interest rate) create additional demand for the domestic currency. This will cause, in the short run, an appreciation of the domestic currency. This type of transaction is known as “carry trade”.

Expectations channel

Expectations regarding inflation in the coming period are an important factor in the setting of wages and prices in enterprises. Specifically, in addition to inflation in the current period, it has been established that economic agents take into account all currently available information on price movements in the coming period. In other words, if in one country the economic agents are convinced that the central bank will take, in the coming period, all available measures to maintain price stability, despite some current threats to increase prices, they will not consider the complete materialization of these results in their decisions related to prices and wages in the coming period. If, however, the expectations go above the target announced by the central bank in its policy, it is a positive sign for the central bank that it has to respond even more through its monetary policy to the existing threats for the price stability in order for inflation to be in line with the target over the upcoming period. This is the origin of the importance of inflationary expectations, i.e., the importance of their stabilization also known as ‘anchoring’. This is the case when an important role is played by an integral part of the inflation targeting concept, which refers to constant communication of a central monetary authority with the public, the publication of the targeted inflation rate, and the commitment of a central bank to meet it, as well as the strengthening of the transparency in the work of the central bank. The mechanism explained above is known as the expectation channel of the monetary policy transmission.

Characteristics of expectations vary from country to country, and they could evolve in time within the same country. They can go from very inert (when agents adjust less their expectations regarding the inflation rate in the coming period to the impulses created by the information on changes in the economic sphere related to the upcoming period, but rather relying on the experience from the past period) to very responsive ones (such that prices change quickly on just a weak impulse, i.e. information which can affect expectations vis-à-vis inflation in the coming period as past experiences are much less important).

3.3. Monetary policy in European transition countries

In this section we give an overview of the practice of monetary policy and empirical findings on the monetary policy transmission mechanism in Emerging Europe in the period going from

their economic transition until today when some of these economies had even entered into the European Monetary System with the adoption of the common currency. However, we focus here on those transition countries that decided to keep their own monetary policy independence over the observed period. As one can see, practice is diverse as well as the success in price stabilization. Though different from one country to another, monetary policy transmission mechanism has some common characteristics across countries. However, a feature of the region's monetary policy consists in the lack of strong evidence on monetary policy transmission channels, partly due to the difficulty of the empirical research.

3.3.1. Monetary policy practice

The economic structure and institutions of transition economies of Eastern Europe and the former Soviet Union have evolved and so did their economic policies. Initially all these countries had fiscal and monetary institutions ill-suited for a market economy. As transition progressed, a new system of money and banking was created in order to implement market economy monetary policies and improve financial intermediation. Monetary policy options were, however, severely limited in the early transition period. Initially, transition economies applied a fixed nominal exchange rate anchor as the monetary policy of choice. Most transition economies started their economic transformation with no or ad hoc monetary policy frameworks. Central banks were not independent and they had conflicting final objectives, including foreign and fiscal sustainability, output stabilization, financial stability, and price stability. Targeting a monetary aggregate (base or reserves) proved untenable as these were difficult to measure; at the time, money demand was unstable and foreign inflows from privatization receipts, foreign assistance and private debt, inter alia, distorted measures of base money.

In addition, there were large, often unpredictable, transition shocks that compounded measurement of monetary aggregates. During the early transition period the long and varying lags between changes in money and changes in inflation introduced too much uncertainty at a time when building central bank credibility was essential. A fixed nominal exchange rate anchor served two important purposes. First, it was a highly visible policy target, which the central bank could manage and, therefore, effectively gain credibility. Second, there was a real need to limit exchange rate volatility in order to promote international trade and investment during a period when these economies were opening to world markets.

Within a few years, however, the disadvantages of a fixed exchange rate policy became apparent: loss of monetary autonomy, the potential for currency mismatches within the banking system and speculative attacks leading to financial and banking crises, and equilibrating the real exchange rate only via domestic price changes and real output decreases. Relatively quickly many transition economies moved to a heavily managed exchange rate policy as other options were explored. Only with the maturing of institutions and domestic financial markets did alternative monetary policies, inflation forecast targeting in particular, become a viable option.

Monetary policy in transition economies has undergone profound change since the beginning of the economic transition process. Coherent monetary policy frameworks were put in place with price stability becoming the single policy objective. Central banks became institutionally independent. A privatized banking sector (mostly) with strong foreign involvement and only shallow financial markets started functioning, making possible the shift from the administrative to the market-based instruments of the central banks.

The typical evolution in monetary policy practice during transition can be summarized as the initial exchange rate based stabilization followed by the introduction of the money market and the growing role of the reference interest rate. This was coupled with the development in financial markets, providing a shift to some kind of inflation targeting or to currency boards in some of those countries. While in the initial stabilization the control of government spending (hard budget constraint) which was followed by some kind of monetary targeting and exchange rate targeting (fixed exchange rate or some kind of peg) had a prominent role in curbing the inflation, they left place for more sophisticated market instruments of monetary policy in the later phase of transition⁵².

However, the relatively high financial euroization remained a common characteristic of almost all transition economies; this means that the pass-through of exchange rate to prices remained relatively high. Initially the sources of monetary growth laid mainly in government spending and “re-monetization”. However, the new establishing market-based banking system, driven by the entry of large multinational banks, provided a place for a rapid credit growth. Thus, in the later phase of transition, when most countries imposed the hard budget constraint to the economy and relatively stabilized inflation expectations, the major challenge

⁵² de Melo and Denizer, 1997, provide an overview of monetary policy framework and instruments by countries, at early stage of transition (from 1989 to 1997) and the patterns of transition to market-based instruments.

for the monetary policy became the handling of the rapid credit growth arising as a consequence of capital entry from abroad through the foreign banks representing a growing share in the total banking assets of these countries.

A number of countries have introduced inflation targeting over the last 10 years (Czech Republic, Poland, Hungary, Romania, and Serbia). Some of them switched to currency board arrangements (Bulgaria, Estonia, and Lithuania) and some others with stronger external position have stayed at some form of exchange rate targeting (Croatia), as presented in TABLE 3-1 below. Few of them have already adopted the Euro, namely Slovenia in 2007, Slovakia in 2009, and Estonia in 2011.

TABLE 3-1. Monetary Policy Frameworks, Exchange Rate Regimes, and Inflation Rates in Transition Economies, 1993-2008

	Monetary policy framework			Exchange rate regime			Average annual inflation (in %)		
	1993	2008	2012	1993	2008	2012	1993	2008	2012
<i>Baltic countries</i>									
Estonia	CB	CB	ECB	CB	CB	EURO	89.8	6.6	4.2
Lithuania	CB	CB	CB	PEG	CB	CB	410.2	5.7	3.2
Latvia	ET	ET	ET	PEG	PEG	PEG	90.8	10.1	2.3
<i>Central and Eastern Europe</i>									
Czech Republic	ET,MT	IT	IT	PEG	FLOAT	FLOAT	20.7	2.9	3.3
Hungary	ET,	IT	IT	PEG	FLOAT	FLOAT	22.5	8.0	5.7
Poland	ET	IT	IT	PEG	FLOAT	FLOAT	35.3	2.5	3.7
Slovakia	ET, MT	IT	ECB	PEG	ERM-2	EURO	23.2	2.8	3.7
Slovenia	ET	ECB	ECB	UPEG	EURO	EURO	32.9	3.6	2.6
<i>South-eastern Europe</i>									
Bulgaria	CT,ET	CB	CB	FLOAT	CB	CB	73.1	8.4	2.4
Croatia	ET	ET	ET	UPEG	IPEG	IPEG	15.4	2.9	3.4
Romania		IT	IT	PEG	FLOAT	FLOAT	256.1	4.8	3.3
Serbia	NOMPF	IT	IT	PEG	FLOAT	FLOAT	N.A.*	8.6	7.3
<i>CIS</i>									
Russia	NOMPF	ET	ET	FLOAT	IPEG	IPEG	873.1	9.0	5.1
Ukraine	NOMPF	ET	IT		PEG	FLOAT	5371.0	12.8	0.6

Source: inflation data are obtained from the EBRD website; Information on monetary policy and exchange rate regimes is taken from central bank publications and relying on national experts.

Note: monetary policy: NOMPF=no monetary policy framework, CB= currency board, ET=exchange rate targeting, MT= monetary targeting, CT=credit targeting, IT=inflation targeting, ECB=joined the common currency, i.e. Euro. Exchange rate regimes: CB=currency board, PEG=officially announced exchange rate peg, UPEG=unofficial exchange rate peg, FLOAT=managed or free float.

*Serbia has registered a hyperinflation in 1993, the official annual inflation in 2012 in Yugoslavia was 19,810.2%.

The Czech Republic, Poland and Hungary were the first three transition economies to adopt inflation targeting; and it took from 8 to nearly 12 years into the transition, including a determination to move into the euro area, to the moment that policy makers decided to adopt inflation targeting in some form. But even for these early adopters it is unclear whether or not their policy actions are comparable to the inflation targeting frameworks adopted by central banks in well-developed market economies in terms of monetary policy effectiveness.

The Czech Republic had a narrow exchange rate band regime before 1996, when the band was widened to $\pm 7.5\%$. Not much later, in May 1997, the band was swept away by a speculative attack, and the koruna was floated with occasional central bank interventions. Inflation targeting was introduced in December 1997 and the Czech Republic was thus the first transition economy to adopt an inflation targeting framework for its monetary policy.

Contrary to the Czech “big bang” approach in switching by abandoning the fixed exchange regime and moving to inflation targeting, the Polish authorities made their exchange rate regime flexible gradually. Poland used a pre-announced crawling band for most of the 1990s, but the band was widened to $\pm 15\%$ in several steps. There were heavy central bank interventions until 1997, which is also reflected in the relatively stable rate within the band. However, since early 1998, the rate was allowed to move freely within the wide band. In April 2000, the band was abolished and inflation targeting was introduced with a freely floating exchange rate.

In Hungary, a pre-announced crawling band regime was introduced in March 1995 after a long period with an adjustable peg. The adopted band was narrow at $\pm 2.25\%$. However, the market rate eventually evolved like in a crawling peg, since it was almost continuously at the strong edge of the bands (with the exceptions of the period of the Russian and Brazilian crises in late 1998 and early 1999). The band was widened substantially in May 2001 to $\pm 15\%$ and inflation targeting was introduced. However, at this time the exchange rate band and its crawling devaluation were kept. The rate of crawl was reduced to zero in October 2001. Following a strong appreciation pressure in early 2003, in June 2003 the band was unexpectedly devalued by 2%. In February 2008 the band was abandoned and free floating was introduced.

Romanian monetary policy framework has changed throughout transition, from broad money targeting (1990-1996) to high powered money targeting (1997-2005), and finally to inflation

targeting (August 2005). From the beginning of the 90s until 2004 the National Bank of Romania (NBR) pursued a managed floating exchange rate strategy targeting a euro/US dollar currency basket, whose weights were changed at various intervals. The policy has been successful in bringing the inflation down from around 60% in early 2000 to 9% at the end of 2004. However, in order to prevent the persistence of excess liquidity in the financial system, the Romanian central bank (NBR) was forced to sterilize its interventions in the foreign exchange market. This, in turn, imposed high operational costs on the part of central bank. An essential condition for the provisory completion of EU negotiations was the opening of the capital account. The measure kept being postponed until April 2005 when the NBR had to partially remove one of the last restrictions on capital controls, allowing foreigners to hold domestic denominated bank deposits. It was feared the move would spark off an inflow of foreign funds that would seek to take advantage of high interest rate differentials. Arguing that a managed floating regime would be difficult to follow in these circumstances, the NBR announced a shift in its monetary policy towards an inflation targeting regime.

3.3.2. What we know on monetary policy transmission in Emerging Europe

The overall literature on monetary policy transmission in transition economies is quite fragmented⁵³. A strong evidence of the relative size of different channels in monetary transmission is lacking, both for individual countries and for transition economies as a group. Some attempts exist though, but with no unique and coherent conclusion. Most of these studies and general findings on transmission of monetary policy in the transition economies suffer from a common pitfall resulting from large institutional and structural changes, as highlighted by Darvas (2008, p. 140): "...studying the NMS (New member states) with standard techniques raises an elementary problem that is related to time varying parameters. First, both common sense and the Lucas Critique suggest that changes in monetary regimes are likely to affect the transmission of monetary policy. For example, a shift from exchange rate targeting to inflation targeting may weaken exchange rate pass-through, because an exchange rate change can be regarded as permanent in the former but not in the latter regime. During the last decade a number of NMS, like the Czech Republic, Hungary and Poland, made their exchange rate regimes more flexible and changed the way of conducting their monetary policy, reaching an inflation targeting framework at the end. Regimes change call into question the usefulness of studying the available sample period of these countries with fixed parameter models. ... Second, these countries have undergone substantial structural

⁵³ Egert and MacDonald (2008) characterize it as segmented in their excellent survey of the literature.

changes since their transition from the socialist economic system in the early nineties and these changes might have affected the parameters of response function of monetary policy even if the regime was unchanged.”

Evidence on presence and relative importance of different channels

Some general findings may be extracted from the existing literature to describe the transmission channels. The empirical research on countries of Central and East Europe has shown that at the beginning of the use of the inflation targeting (IT) framework, there is a weak interest rate pass-through, from the interest rate under direct control of the monetary authorities to the interest rates on the money market and other interest rates in the country (on savings, loans, and debt contracts with longer maturities). This mechanism represents the first stage of the interest rate channel. The pass-through grows stronger with time so the long-term pass-through becomes ever more complete, i.e., closer to one. Likewise, it has been noted that the response period of other interest rates to changes in the reference rate gets shorter with time; this was shown by Crespo Curesma, et al. (2004) through their empirical estimates over the Czech Republic, Poland and Hungary for the period 1994–2002.

Research has also shown that there is high heterogeneity in the adjustment of interest rates on loans to changes in the reference rate, both between banks, and within one bank, among different types of loans. A higher pass-through was recorded in the case of banks that are less profitable and less capitalized, probably due to smaller room for maneuver, i.e., higher dependency on the money market and lower spreads (Chmielewski, 2003). A *higher pass-through* was established in the case of short-term than in that of long-term loans, and in the case of loans to enterprises than in loans to households (that might be explained by higher spreads on loans to households). As for the *second stage* of this channel (i.e. the effect of changes in other interest rates, which are under the influence of the reference rate, on the real sector – on economic activity and demand), the evidence for transition countries is rather scarce.

In developed countries in Europe, it was empirically established that a rise in the reference interest rate results in a cut in enterprises investment (Chatelain, et al. 2001). Empirical studies on the existence of the exchange rate channel, which is measured by the so-called *exchange rate pass-through to prices*, show that this is an important channel in transition economies (TABLE 3-2). The studies also find that over time, from the mid-1990s onwards, the intensity of the transmission of changes in the exchange rate to prices has been

diminishing in those countries. The above mentioned effect is associated with stabilization (i.e., the curbing of inflation in those countries), which contributed to a decline in the exchange rate pass-through⁵⁴.

TABLE 3-2. Overview of the Exchange Rate Pass-Through to Prices in Transition Countries

Country	Import prices	Manufacturing prices	Consumer prices
average of results from all available studies for each specific country, in %			
<i>Average for the sample of 12 transition countries</i>	70	52	33
Czech Republic	65	41	23
Hungary	87	57	30
Poland	84	60	31
Slovakia	101	73	35
Slovenia	40	78	53
Croatia	...	17	22
Russia	...	23	40
Serbia	40-52*		

Source: Data is taken from the overview study by Coricelli, et al. (2006) for all countries except Serbia. For Serbia, the source is Mladenović and Petrović (2005). The authors use core price instead of the CPI for the period 2001-2005.

Though there is a lack of empirical evidence on the expectations and their role for the inflation, many studies on exchange rate and monetary policy regimes during transition stress the important role of fixed exchange rates and peg in initial anchoring of the inflationary expectations (Jonas and Mishkin, 2003). Many authors underline the increasingly important role of expectations in the inflation targeting regime of monetary policy (e.g. Amato and Gerlach, 2002). One of rare studies on the validity of expectation channel is that of Fendel, et al (2008). Using forecasts for the short-term interest rate, the inflation rate and output growth for ten emerging markets in Latin-America, Central and Eastern Europe out of which six economies are inflation targeting economies, the authors estimate expected Taylor-type rules. They provide evidence for differences in the expectation formation process in the sense that the Taylor principle fairly holds for countries that adopt an inflation targeting system, while for the other countries it fails. This way they provide a new test for the evidence that financial market expectations are formed differently under inflation targeting regimes.

⁵⁴ Frankel, et al (2005), and Bitans (2004)

The relative importance of different channels of monetary policy transmission and some evidence on bank lending channel are obtained by using the VAR methodology. The Vector Auto-Regression (VAR) approach is a very common methodology used in the area of research on monetary policy transmission mechanisms. By using a VAR, it is possible to determine a monetary policy shock and then to examine the response of endogenous variables to a monetary policy impulse. These studies use prices, output, exchange rate and money or credit aggregates as endogenous variables. They are, this way, able to examine the characteristics of monetary policy transmission mechanism and to distinguish the relative importance of three channels of monetary transmission: interest rate channel, exchange rate channel, and credit channel. The researches based on VAR in the transition region generally find that there is evidence of an exchange rate channel particularly in the early period of transition, and some evidence of an interest rate channel, while the evidence of a credit channel is rather poor. However, some of those studies reveal the increasing significance of the credit channel and diminishing relevance of the exchange rate channel accompanying the development of markets and EU integration of transition countries.

Klos and Wrobel (2001) studied the monetary policy channels in Poland using data from 1995 to 2000. They show that a shock in short-term interest rates causes real credit to drop in the short-run and stabilize at a lower level afterwards. This analysis uses the method of a structural VAR, with a relatively modest set of variables: the consumer price index, the credit to non-financial sector (in real terms), and the National Bank of Poland intervention rate as a policy instrument.

Creel and Levasseur (2005) use a structural VAR model with short-term restrictions to investigate the relative importance of interest rate, exchange rate, and credit channels in the monetary policy transmission in the Czech Republic, Hungary and Poland over the period 1993:1-2004:3, using monthly data. They find that none of the channels is very powerful for the monetary policy transmission in the three countries. Nevertheless, the exchange rate and the interest rate channels play a growing role over the period in Poland, compared to the Czech Republic and Hungary. Regarding the existence of the credit channel, the authors show evidence of a rather weak credit channel, a conclusion that can directly stem from the architecture of the financial and banking sectors in the three CEE countries. For Poland, they find that after the initial decrease, credit recovers.

Hericourt (2006) studies the monetary policy transmission in the eight Central and Eastern European countries that integrated in the EU in 2004: Czech Republic, Poland, Hungary, Slovakia, Slovenia, and three Baltic states – Estonia, Latvia, and Lithuania. The purpose of the study is to assess the relative importance of each of the three monetary policy channels usually acknowledged in the literature (interest rate, exchange rate, domestic credit) for these countries. The author uses the general framework of VAR models and estimates different specifications for each country. The main result of the study is optimistic from the perspective of the close integration of these countries into the euro area; it emphasizes the already existing similarities between these countries and the euro zone, and the ongoing homogenization process.

With regards to the role of banks in the monetary transmission and the impact of the interest rate impulses on bank credit, this study finds that domestic credit responses to an interest rate shock are never significant, apart from a decrease in Estonia. According to the author, the lack of domestic credit response to monetary tightening can be explained in terms of a structural permanent excess in banking sector liquidity over the observed period due to strong capital inflows in the context of relatively fixed exchange rate policies before the switch of the late 1990s. However, the same study reveals that the situation is likely to have modified since the end of the 1990s. Namely, the interest rate channel and the credit channel are slightly gaining in importance, while the exchange rate channel is weakening in these countries. In some countries (the Czech Republic, Poland, and Slovenia) the interest rate channel has even taken over the exchange rate one. The growing role of the interest rate in credit variance seems to support the hypothesis of a developing credit channel in most of the countries studied.

Apart from Estonia, where the contribution of the interest rate to credit variance decreases over the sub-sample, all other countries see an impact of the interest rate on increasing credit, with a sharp trend for the Czech Republic, Latvia, and Slovenia. This is quite an important phenomenon, especially for those countries where credit itself seems to have a rising impact on output and prices, i.e. Estonia, Latvia, Poland, and Slovenia. Conversely, its influence is shrinking in the Czech and Slovak Republics, while it is impossible to make any inter-period comparisons for Hungary and Lithuania. The previously quoted outcomes of the variance analysis performed within the study point to the possible convergence of monetary policy transmission mechanisms towards euro area standards (i.e. the predominant role of the interest rate for influencing output and prices, supported by a credit channel).

Darvas (2008) used structural time-varying coefficient vector auto-regression in order to solve the problem arising from the fact that changes in monetary policy regimes make reduced-form models like standard VAR inappropriate, in line with the Lucas Critique. This study covers three new member states of the EU: Poland, Hungary, and the Czech Republic, and the period of the analysis lies between 1993Q1 and 2008Q2. The four standard endogenous variables that are typically used for monetary transmission VARs are used in this study: output, price, interest rate, and real exchange rate. The author compares the monetary transmission in these three countries with that in the euro area. The findings indicate that in the euro area the impact of a monetary shock on output has decreased in time while in the new member states of the EU both decreases and increases can be observed.

By the end of the observed period, monetary policy was the most powerful in Poland and comparable in strength to that in the euro area. The least powerful responses were observed in Hungary while the Czech Republic lied in between. They explain the last result by the credibility of monetary policy, openness and the share of foreign currency loans in these countries. Credibility of the monetary policy was the weakest in Hungary, while inflation was higher than both in the Czech Republic and Poland all over the observed period. Poland adopted a very tight monetary policy even in an economic downturn and this could have contributed to the high credibility of monetary actions. The Czech Republic's monetary policy was not as aggressive as in Poland; it was nonetheless quite successful, since the average inflation was the lowest among the three new member states over the period of observation. Another factor that could explain the results of this study is the openness of the economy since output developments in more open economies depend more on the foreign business cycle compared to the less open economies. The Czech Republic and Hungary are rather open, while Poland is fairly closed. Furthermore, the share of foreign currency loans in total loans was higher in Hungary than in the Czech Republic and Poland, constraining the effectiveness of domestic monetary policy.

Evidence on credit channel: bank balance sheet data models

Credit channel is usually separately studied through a methodology that was first introduced by Kashyap and Stein (1997) and Kishan and Opiela (2000). All studies on this bank lending channel presented below are based on their methodology. Kashyap and Stein (1997) and Kishan and Opiela (2000) were the first who produced strong evidence in support of the

existence of the bank lending channel previously theoretically recognized⁵⁵ but weakly supported by the empirical research⁵⁶. These studies examine detailed balance sheet data from the USA banking sector. The first of its kind is the study by Kashyap and Stein (1997), '*What do a million observations on banks say about the transmission of monetary policy*'. Their study is based on dataset that includes quarterly observations of every insured U.S. commercial bank from 1976 to 1993. Their use of bank liquidity and bank size as proxies for information asymmetry, established the significant impact of monetary policy on loan supply. The detection strategy consisted of distinguishing the stronger impact on less liquid and smaller banks⁵⁷. Later on, the study by Kishan and Opiela (2000) used the U.S. banking data on the quarterly basis, from 1980 to 1995 (13,042 banks in total). Their findings contain evidence of the existence of the bank lending channel using the same detection strategy as Kashyap and Stein (1997), but this time using bank capital as a proxy for information asymmetry.

The Monetary Transmission Network of the European System of Central Banks (ESCB) provided a detailed analysis of the transmission mechanism in the current euro area member countries (Angeloni, et al., 2003). Many studies produced within this network treat the existence of the bank lending channel⁵⁸. Ehrmann, et al. (2002) find evidence of the presence of the bank lending channel in France, Italy, and Germany. Hernando (2001) finds no bank lending channel in Spain while Farinha (2001) finds evidence on the presence of the bank lending channel in Portugal. As for Emerging Europe, there are several individual country studies and cross country studies on the bank lending channel. Their evidence is rather heterogeneous and somewhat even anecdotal.

Different authors of some individual country studies arrive at opposite evidence for the same country and same period. Some of the findings are even contra-intuitive. There are also studies that show opposite findings for different periods in the same country. Many of those studies, especially the cross-country ones, are based on the publicly available database BankScope, which has as a disadvantage that the samples are biased towards large-sized banks. Moreover, the data are often incomplete in terms of banking sector coverage. The data

⁵⁵ Bermanke and Blinder (1988), and Bermanke and Gertler (1995)

⁵⁶ See Kashyap and Stein (1993) for the presentation of the relevance of bank lending channel and empirical literature review up to then.

⁵⁷ Their study, however, did not allow making precise statements about the quantitative importance of the bank lending channel.

⁵⁸ ECB conference dedicated to transmission of monetary policy in Euro area
http://www.ecb.int/events/conferences/html/policy_transm.en.html

from this base have an annual frequency. The evidence is not homogenous across countries. Yet, some individual country studies use micro level bank data from local sources in certain countries in the euro area⁵⁹.

The confusion resulting from incomplete data is probably present behind the existing individual country and cross country studies of the bank lending channel in Emerging Europe. These studies bring no clear evidence on the presence, significance and persistence of the bank lending channel in these countries on the basis of Kashyap and Stein's (1997) methodology. Havrylchyk and Jurzyk (2005) find that better liquidity position enables banks in Poland to insulate loans from monetary policy actions. Weak evidence is found for the size of banks. However, the estimated coefficient for the variable "size" indicates that smaller banks are in a better position to shield them from monetary policy, this result being completely counterintuitive. In the same study, bank capitalization turns out to play no role in the lending behavior of banks. This finding is contrary to Wrobel and Pawlowska (2002), who find that size and capitalization explain Polish bank lending behavior due to a monetary policy change in a standard (intuitive) manner, i.e. larger and more capitalized banks react less to monetary policy change. Yet, Wrobel and Pawlowska (2002) find that liquidity matters for bank lending behavior in face of monetary policy move, but this time in opposition to Havrylchyk and Jurzyk (2005), in the counterintuitive way: more liquid banks are more responsive to an increase in policy rate than less liquid banks.

This result can be explained, according to the authors, by the over-liquidity of the Polish banking sector in the observed period. A similar result is brought to light by the study of Matousek and Sarantis (2009) on a sample of banks from the BankScope database for the time span 1994 to 2003. According to them, in Poland, all bank characteristics appear significant,

⁵⁹ An excellent illustration of the misleading findings when bank lending channel is analyzed on BankScope data versus all banks data from local data sources (individual bank balances from local bank authorities) is shown in the study by Ehrmann, et al. (2002) for four European countries. The authors performed a set of country by country regression for France, Italy, Germany and Spain using both BankScope data and complete national datasets from local bank authorities. Their finding is that the results generally do not coincide. For most of the estimated BankScope data-based models, a tightening of monetary policy leads to the expected decrease of loans. However, their results lacked significance and robustness (with the exception of Germany). The most extreme case, according to these authors, is France, where not a single coefficient turns out to be significant and several coefficients even change signs across different model specifications. Also in Spain and Italy, the coefficients on the macro variables (real GDP and prices) depend on the exact model specification, and frequently change sign. The same regressions, when they are run on complete national data sets, give robust and significant coefficients for both monetary policy variable and crossed monetary policy variable with bank characteristics. The coefficients are with the expected sign. The same stands for coefficients with macro variables. It is worth mentioning that the BankScope data coverage for transition economies banks is likely to be even poorer than for banks in developed economies.

but only capitalization has the expected negative sign as more capitalized banks react less to changes in monetary policy, while more liquid and larger banks react more.

Pruteanu (2004) analyzed the overall effect of the monetary policy changes on the growth rate of loans and the characteristics of the supply of loans in the Czech Republic using quarterly data, from 1996 to 2001. The findings show that changes in monetary policy alter the growth rate of loans with stronger magnitude in the 1999-2001 period than in the 1996-1998 period. For the 1996 to 1998 period, the cross-sectional differences in the lending reactions to monetary policy shocks are due to the degree of capitalization and liquidity. For the subsequent period from 1999 to 2001, the distributive effects of the monetary policy are due to the size of the bank as well as the bank's proportion of classified loans. Matousek and Sarantis (2009) find that all three bank characteristics (i.e. size, liquidity, and capitalization) have significant and expected negative signs in the Czech Republic in the period going from 1994 to 2003.

The existence of the bank lending channel is examined for Hungary using quarterly data, from 1995:Q1 to 2004:Q3 by Horvath, et al. (2006). Besides the usual bank specific variables (size, liquidity, and capitalization), it equally considers the foreign ownership. The novelty of this study is that it first tests the existence of the asymmetric effect of changes in monetary policy to the bank's average cost of funding in respect to bank characteristics (size, liquidity, capitalization, and foreign ownership). Another novelty is that it tests whether demand of loans can be considered homogenous across banks with respect to some bank characteristics. If this hypotheses have been violated, one cannot interpret the coefficients with crossed variable (monetary policy and bank characteristic) in the model reflecting only the effect from the shift in loan supply, it will rather reflect both supply and demand effects. The authors show evidence of a demand for loans that can be considered reasonably homogenous across banks with respect to the share of foreign ownership and the size of banks. The main findings in terms of bank lending channel are that an increase in the policy rate induces a larger increase in the average cost of funding for smaller, less capitalized and for domestic-owned banks. Matousek and Sarantis (2009) find weak evidence of bank lending channel in Hungary in their study based on BankScope data for the period from 1994 to 2003. According to their findings, size and liquidity are the only bank characteristics that are significant but they do not find them robust to specification of the model.

The bank-lending channels for Estonia are analyzed using quarterly data from 1996 to 2004 by Juks (2004). The empirical analysis provides evidence in favor of the bank-lending channel. First, well-capitalized banks seem to experience a smaller outflow of deposits after a monetary contraction. As a consequence, a monetary policy shock, which leads to a drain of deposits from the banking sector, has the highest effect on deposits of less capitalized and more risky banks. Second, the liquidity position of banks seems to be an important determinant of loan supply, suggesting that more liquid banks are able to maintain their loan portfolios. Nevertheless, less liquid banks must reduce their loan supply after monetary policy contraction.

The bank lending channel in Latvia is analyzed by Benkovskis (2008). Empirical analysis on bank level data from the central bank of Latvia database for 23 Latvian banks for the period from 1889:Q2 to 2006:Q4, show the total loan growth on average is not significantly affected by a monetary shock, either foreign or domestic. However, there is some evidence of an asymmetric reaction of the loan supply to a domestic monetary shock in respect to capitalization as a bank characteristic, which could be an evidence of the bank lending channel in Latvia. However, the weighted average reaction of the total last loan growth is affected by domestic monetary policy only. Turning to the asymmetric reaction of different banks to a domestic monetary shock, there is a statistically significant difference depending on the level of capitalization as in the case of total loans while other bank specific characteristics do not appear to be statistically significant. Yet, Matousek and Sarantis (2009) find evidence of the bank lending channel in the pooled panel of banks in three Baltic states, Estonia, Latvia, and Lithuania, for the period from 1994 to 2003.

Contrary to Juks' research (2004) for Estonia evidencing capitalization and liquidity as sources of distributional effect of monetary policy across banks, and Benkovskis (2008) identifying only capitalization, these authors find that size and liquidity are bank characteristics that induce different supply reaction to monetary policy changes. According to Golodniuk (2005), who analyzed the functioning of bank lending channel in Ukraine on annual data for 149 Ukrainian banks in the period from 1998 to 2003, banks in this country react differently to changes in money market interest rate only as a function of capitalization but not as a function of size and liquidity. De Souza (2006) uses a panel of annual balance sheet data on 323 Russian banks from 1995 to 2003 provided by BankScope, representing roughly two thirds of the total assets of the banking system, and test whether lending responses to a change in monetary policy differs, depending on the balance sheet strength of a

bank. His results suggest that banks (especially private ones) with lower than average assets are more affected by monetary policy actions than average banks, which is consistent with bank lending channel hypothesis.

This work, using annual data covering 1995 to 2003 and applying GLS (fixed and random) and GMM estimators, finds only limited signs that the bank lending channel is operational in Russia: the higher the assets and/or capital, the less sensitive a bank is to changes in monetary policy. These results seem to be stronger for a sample without the Russian state-owned banks and limited to the period 1995 to 1999 (for all private banks; for Russian private banks only, the results are stronger using the full sample), when excess liquidity was not a permanent feature of the Russian money market. In Croatia, according to Lang and Krznar's (2004) analysis on monthly data from commercial banks' balance sheet for the period June 1999 to December 2003, there is an expected negative significant influence of monetary policy on bank lending.

However, these authors find that size, capitalization and liquidity matter for distribution of effects of monetary policy, but with the opposite sign. Namely, large, more liquid and better capitalized banks react more to changes in monetary policy than small, less liquid and less capitalized banks. This finding stands in contrast with theory on the bank lending channel. On the other hand, the variable ownership impacts the bank lending reaction to the monetary policy in an expected manner, as proposed by the bank lending channel theory. The previous findings hold both when using nominal money market interest rate and the index of monetary policy stance which combines changes in money market rate and changes in exchange rate as indicators of monetary policy. To resume, there is little and contra-intuitive evidence for the existence of the bank lending channel in Croatia, according to this study.

There are several cross-country studies analyzing the bank lending channel in transition economies. Some of them pool together the bank level data for several countries like Schmitz (2004), Koehler, Hommel and Grote (2005), and Jimborean (2008). The others consider this procedure as biased due to important differences across the observed economies and analyze and compare the results for the bank lending channel by country (Matousek and Sarantis, 2009).

The following two studies by Schmitz (2004) and Koehler, Hommel and Grote (2005) are interesting from the perspective that they include not only the domestic short-term interest rate, but also the short-term interest rate from the Eurozone as an indicator of foreign

monetary policy stance, which could intuitively influence domestic lending due to the large presence of foreign banks in these countries. Schmitz (2004) analyzes the bank lending channel of monetary policy transmission in the EU new member countries: the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia. It makes use of a pooled panel of annual balance sheet data from BankScope database covering 261 banks in this region in the period from 1991 to 2001. The estimation results show that banks contract their lending in response to an increase of the Euro zone short-term interest rate, but show only a weak reaction after changes of the domestic monetary policy indicator. Inflation and GDP growth are important determinants of bank lending and the coefficients have the expected signs. The real effective exchange rate is introduced as a further important macroeconomic variable and shows the expected positive sign. Controlling for the banks' ownership structure is crucial for understanding how banks react to monetary policy.

The banking sector in the EU new member countries can be subdivided into two groups along the ownership structure. In particular, the group of foreign-owned banks adjusts more strongly their lending after an increase in the euro area interest rates than their domestic competitors. By correcting for this effect, there is only weak evidence for a bank lending channel working through the size of a bank vis-à-vis the domestic monetary policy. Bigger banks show a weaker response to monetary policy. Bank liquidity or capitalization does not play a role for the loan supply response after a monetary policy change. In the response to the euro area monetary policy indicator, a differential loan supply response cannot be found. Comparing these results to the findings of the literature allows the author to answer the question whether the role of banks in monetary policy transmission is different between current and future EMU members.

It has been shown that bank lending in the EU new member countries contracts significantly after a monetary tightening, which is similar to the results found by Ehrmann, et al. (2003) for the euro area. Banks in the EU new member countries respond to the same interest rate as the euro area banks since they react strongly to the euro area monetary policy indicator and show only a very weak reaction to the respective domestic interest rates. This effect can be explained by the reaction of the large group of foreign-owned banks in the EU new member countries. The subdivision into the foreign- and domestic-owned banks is essential for the understanding of the behavior of banks towards monetary policy; this is very different to the euro area situation, where foreign-owned banks constitute a negligible small group. Since acceding, country banking systems are increasingly and even predominantly foreign-owned.

An even stronger effect of euro area monetary policy on EU new member countries' bank lending should be expected in the years to come. Regarding the evidence of a bank lending channel there is at best weak evidence for the importance of a bank's size to characterize a bank's reaction to monetary policy in the EU new member countries. Bigger banks react less strongly to domestic monetary policy than smaller banks. Factors like liquidity and capitalization of a bank are not important for the way a bank adjusts its lending to interest rate changes. This is opposed to the findings of Ehrmann, et al. (2003) for the euro area, where less liquid banks show a disproportionately strong response to monetary policy.

Koehler, Hommel and Grote (2005) analyze the monetary transmission in three Baltic countries: Latvia, Lithuania, and Estonia. Data on bank lending and bank characteristics have been taken from the BankScope database of Bureau van Dijk and contain annual information on bank balance sheet position as well as profit and loss data for 36 commercial banks in the Baltic region for the period between 1997 and 2004. Since the three countries have the currency board for their exchange rate regimes, these authors introduce both domestic and foreign interest rate as monetary policy variable. The results indicate that the loan growth rate is not determined by the domestic money market rate, but rather by the European monetary policy indicator. Bank size furthermore does not significantly influence the lending behavior of banks. This might be due to the fact that liquidity and capitalization have counterbalancing effects, since interest rate changes are, on the one hand, less strongly felt by small and liquid banks. On the other hand, however, small and well capitalized banks react more strongly to monetary policy shocks. Therefore, the effect of an interest rate change on small and liquid, but highly capitalized banks is indeterminate and the coefficient of size insignificant. The regression results furthermore suggest that distributional monetary policy effects are mainly caused by differences in liquidity, like in the study by Juks (2004) for Estonia.

Roman Matousek and Nicholas Sarantis (2009) investigate the role of banks in the monetary transmission mechanism in 8 Central and Eastern European countries that joined the EU in May 2004: the Czech Republic, Hungary, Poland, Slovak Republic, Slovenia and three Baltic states. Although selected countries apply different monetary policy regimes, the authors consider all these monetary regimes as consistent with inflation objectives as one of the Maastricht monetary criteria. They use the bank balance sheet data from BankScope database for the time span from 1994 to 2003. Given the significant heterogeneity across CEE countries due to the application of different monetary, fiscal and transition policies, these authors argue that pooling the data for all countries would produce biased estimates about the

transmission mechanism. They only pool data from three Baltic countries due to the very small number of banks in these countries. For all other countries they estimate the model separately. Their model is consistent with Kashyap and Stein (2004) methodology for identification of the bank lending channel. Their empirical results support the hypothesis that there exist bank lending channel in all CEE countries, though its strength varies across countries.

In the case of the Czech Republic, all three bank characteristics (size, liquidity and capitalization) are significant and have the expected signs. The similar pattern is observed in the Baltic states with regards to bank size and liquidity. All bank characteristics are also significant in Poland, but only capitalization has the expected negative sign. In the cases of the Slovak Republic and Slovenia, there is evidence of a significant role for all three bank characteristics, but only when they enter on their own so that they are not robust to model specification. The weakest evidence of bank lending channel is found in Hungary where only size and liquidity is found to have significant coefficient but only when they enter on their own. The authors conclude that overall, bank size and liquidity appear to play the most significant role in discriminating banks' response to changes in the monetary policy stance in eight new EU member states from Central and Eastern Europe.

These authors go a step further from the analysis of this first stage of the bank lending channel. They follow the methodology employed by Ashcraft (2006) for the USA. The last author argues that evidence of a differential response of loan supply to changes in monetary policy across banks does not necessarily imply the presence of a significant bank lending channel. Namely, the shifts in loan supply across banks may not imply the significant shifts in aggregate loan supply if the drop in lending by small, illiquid and undercapitalized banks is picked up by large, liquid and capitalized banks. They argued also that the second stage of the bank lending channel has also to be investigated, that is, whether changes in bank lending lead to changes in aggregate economic activity.

Matousek and Sarantis (2009) thus aggregate the bank data up to the country level and calculate then the share of the largest, more liquid and more capitalized banks in each country. Then they run the same regression used for identification of the bank lending channel but on the pooled dataset for three countries and interacting the term for money market rate with the share of the largest, most liquid and most capitalized banks. Contrary to the finding by Ashcraft (2006) for the USA economy, these authors find that the increase in the loan market

share of large, highly liquid and capitalized banks does not offset the negative response of aggregate (country) loan growth to shifts in monetary policy. Analyzing the second stage of the bank lending channel, these authors find that firms in CEE do not seem able to replace bank loans with other sources of finance, which implies that the differential bank response to shifts in monetary policy does affect real economic activity.

Unlike the previous study, Jimborean (2009) pools together the BankScope data for banks in ten CEE, SEE and Baltic countries: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia. She uses disaggregated micro-level bank data for commercial banks over the period from 1998 to 2006. An analysis on pooled data from all countries is performed first, and no robust results are found. The lack of robust results might be explained both by the short period of analysis and the heterogeneity of the commercial banks in the sample. The three groups of countries are formed according to their ratio of loans to deposits. Afterwards, the analysis is carried out on each group in order to identify the possible differences in the behavior of banks inside each group due to a restrictive monetary policy. At the same time, the author considers the fact that certain features, particular to each country, may have a potential influence on the behavior of banks.

The results show evidence of the existence of the bank lending channel in countries like Bulgaria, Czech Republic, Poland and Romania, but this could have not be confirmed on the entire sample of countries. Namely, the analysis on all the banks showed that size was the only bank characteristic that discriminates lending activity of the commercial banks in all ten countries. When considering the three different groups of countries, she obtained the following outcome. For the first group, with an average loan to deposit ratio above 100.73% – size affects banks behavior, while capitalization shows counterintuitive effect – well capitalized banks are relatively more affected by a monetary policy change. In the second group of countries with a loan to deposit ratio between 76.34% and 100.73%, all three bank characteristics have the expected effect on the lending activity of commercial banks: smaller, less liquid and less capitalized banks are reducing more their lending activity in the aftermath of a monetary policy change; this result is obtained in the model with three characteristics simultaneously. In the third group she obtains a counterintuitive result for liquidity, while the other bank characteristics do not have significant coefficients.

All existing studies mentioned above demonstrate the complexity of transmission mechanism, which is reinforced in the environment of institutional change as it was the case for Emerging

Europe. Moreover, the openness of these economies resulting from their financial integration probably reduces the effectiveness of the bank lending channel (i.e. makes local credit supply less dependent and less affected by local monetary policy changes). Another characteristic of the above presented studies on the bank lending channel is that not much attention is given to the applied institutional framework for monetary policy, neither in single country studies nor in cross country studies where different regimes of monetary policy exist.

In the following sections we will pay special attention to the inflation targeting setting which was the choice of several countries in the region; they decided to keep formal monetary policy independence with interest rate as a main instrument and accepted a floating exchange rate regime. It is worth understanding it before the analysis of monetary policy and before the estimation of the bank lending channel as it crucially determines the interpretation of the result.

3.3.3. Inflation targeting framework

Inflation targeting involves five key elements: 1) the public announcement of medium-term numerical targets for inflation; 2) an institutional commitment to price stability as the primary, long-run goal of monetary policy and a commitment to achieving the inflation goal; 3) an information inclusive strategy in which many variables and not just monetary aggregates are used in making decisions about monetary policy; 4) increased transparency of the monetary policy strategy through communication with the public and the markets about the plans and objectives of monetary policymakers; and 5) increased accountability of the central bank for attaining its inflation objectives (Mishkin 2002). It is widely recognized that there are several critical prerequisites for inflation targeting (Svensson, 2000). The first is the institutional capacity of the central bank to forecast inflation, the intermediate target, and utilize an array of instruments to meet the target. The second is reasonably well-functioning, sound financial markets that link central bank instruments, a particular interest rate, to the ultimate policy variable, a measure of inflation. Third, the central bank must be operationally independent of the government and free of fiscal obligations, that is, fiscal dominance must be absent. Fourth, a market-oriented economic structure with predominantly deregulated prices, low level of 'euroization' and low exchange rate pass-through must be in place (or nearly so). Finally, there must be a political willingness, both within the central bank and the government, to support a commitment to low inflation.

Svensson (2000) has originally constructed the pillars of inflation targeting framework for a small open economy. The underlying approach, based on conventional wisdom, was the ‘one target on instrument’ being inflation and reference interest rate. Recently Ostry, et al. (2012) in their paper argue that the strict adherence to one target one instrument framework is not the best option for an emerging market economy and that the legitimate choice could be two targets (inflation and exchange rate) and two instruments (reference interest rate and sterilized interventions).

Inflation targeting (IT) in Serbia has been in place since August 2006⁶⁰ in an implicit form. That regime, incidentally, has been in use in a large number of developed countries since the 1990s⁶¹, and several transition countries in Europe have introduced it, as described above. The framework implies that the central bank announces in advance a defined target for inflation in the coming period, and then commits itself to the achievement of that objective. The main monetary policy instrument within this regime is the reference (repo) interest rate. The Serbian central bank, by using that rate on repurchasing agreements (so called repo rate), withdraws liquidity from the system or vice versa, injects it back into the system through transactions with banks that appear on the market for reserve money, commensurate with the interest in short-term repos. The reserve requirement ratio is just an auxiliary instrument in the hands of the monetary authorities. IT also implies a flexible exchange rate, as well as marked transparency of monetary policy, which is achieved through frequent communication of the central bank with the public – sharing information on its targets and intentions for the coming period regarding monetary policy. Likewise, it is believed that the expectations of the public vis-à-vis price stability are thus reinforced, by building confidence in the commitment on the part of the central bank to achieving the set target.

In addition to the repo interest rate set by the central bank of Serbia (NBS) through its decisions, which constitutes the basic monetary policy instrument, also in use are: (a) the reserve requirement ratio on deposits of commercial banks, which has only an ancillary role,⁶² and (b) interventions on the foreign exchange market, which are considered as an indirect instrument. The exchange rate regime of free float is introduced, but the central bank has not

⁶⁰ The Memorandum of the National Bank of Serbia on the Principles of a New Monetary Policy Framework, 30 August 2006. The NBS has officially switched to a new monetary policy framework by virtue of this document, which has been announced as a „road toward inflation targeting.

⁶¹ It was first introduced by New Zealand, followed by Canada, the UK, Sweden, Finland, Australia, and Spain.

⁶² The Memorandum of the National Bank of Serbia on the Principles of a New Monetary Policy Framework, 30 August 2006, p.6.

ruled out the possibility to intervene, particularly if fluctuations over the short run threaten to jeopardize the financial stability of the market.

Since a central bank cannot directly influence prices, although its primary objective is price stability⁶³, it exerts influence, through direct control over the monetary policy instruments, on macroeconomic flows which, at the end of the day, produce a certain price level. One of the preconditions for the successful conduct of monetary policy is, therefore, a good knowledge of all transmission mechanisms that exist on the path from the interest rate of the central bank to prices, and which can be influenced, to a certain degree and in a particular period of time, by monetary policy instruments. These so-called transmission mechanisms of monetary policy are complex and often called in the economic literature the black box⁶⁴ since they consist of multiple parallel channels with different and changeable lags in the response of the final target (price) to the changes in the instrument controlled by the central bank (the short-term interest rate). Similarly, different channels have different importance in the transmission of impulses originating from the same monetary policy instrument: (a) in different countries and (b) in different periods of the development of the economic system in a single country.

Still, the long-term successful practice of many central banks in the world shows that it is possible to establish a framework/rule by which one can be guided in the conduct of monetary policy. That rule rests on good knowledge of the functioning of a specific economy and transmission mechanisms of monetary policy characteristic of that economy. That requires models which contain in themselves the basic macroeconomic relations in a country.

Central banks rely on well elaborated econometric models that integrate within them, in the form of a number of related equations, the behavior over time and mutual influence of basic macroeconomic variables. Such a model (or sometimes several different models) is often combined with the “soft facts” and “experience” of monetary policy decision-makers in definition of the final reaction by the monetary authority. By using the model, the inflation targeting central bank first arrives at a forecast for inflation in the coming period. Then, as the end-result, it obtains a simple instruction in terms of the necessary level of the reference interest rate (that it has the right to change by its own decisions) in order to bring the projected inflation for the coming period (inflation that would have happened without a change in the rate) to the level announced as a target for that same period. One such model has been

⁶³ The statutorily defined primary objective of the NBS is to ensure price stability. Article 3, The Law on the NBS, RS Official Gazette no. 72/2003

⁶⁴ Bernanke and Gertler (1995)

developed in Serbia as well, as part of the activities for the introduction of a new monetary policy framework (IT).

The case study of monetary policy practice in Serbia

For illustration purposes, we present here an example of a simple model for monetary policy analysis that is usually established by the assistance from the IMF in inflation targeting countries. It is called Forecasting and Policy Analysis System (FPAS)⁶⁵ and it is used for forecasting, analysis of policy alternatives, and risk assessment. It is a structural model based on short-term and medium-term interaction between monetary policy, output, inflation, and the exchange rate. That model, as a result of system of simultaneous equations, gives to the central bank a basis for the adoption of a decision on monetary policy in the coming period. It contains a summary of experiences from many countries in which those models are applied and instructions of the author for the specifications of such models and for the selection of values of coefficients.

The presented model hereafter is a simplified version and is taken from an IMF report for Serbia⁶⁶ together with indicative parameters provided by the same document and given in TABLE 3-3. In four basic equations the most important relationships between the interest rate of the central bank, aggregate demand, supply, the exchange rate, and inflation are contained. They include: (1) the equation of aggregate demand or the output gap (the so-called IS curve), (2) the price fixing equation (adjusted Philips's Curve which takes expectations into account), (3) the exchange rate equation – the so-called uncovered interest parity, and (4) the equation of the monetary policy response – so-called Taylor's Rule. Thus, the model embodies the principle that the role of monetary policy is to provide an anchor for inflation and inflation expectations and is grounded in theory on inflation targeting (Svensson, 2000).

(1) Aggregate demand: measured by the output gap – the variable $ygap$ (by the deviation of the actual quarterly GDP from the medium-term trend)

$$ygap_t = \beta_1 ygap_{t+1} + \beta_2 ygap_{t-1} - \beta_3 RRgap_{t-1} + \beta_4 zgap_{t-1} + \beta_5 ygap_t^{EU} + \varepsilon_t^{ygap}$$

where $RRgap$ constitutes a deviation of the real interest rate from the equilibrium value (which can be approximated by the medium-term trend), the variable $zgap$ stands for the deviation of the real exchange rate from the medium-term trend, and ε random deviation.

⁶⁵ Developed by Berg, A. Karam, Ph. and Laxton D, (2006)

⁶⁶ IMF Country Report for Serbia No.08/55. Model is developed by E. Mottu

(2) Core (targeted) and headline inflation: the Phillip's curve, rational expectations, aggregate supply equation:

$$\pi_t = \alpha_1 \pi_{t+4} + (1 - \alpha_1) \pi_{t-1} + \alpha_2 ygap_{t-1} + \alpha_3 (z_t - z_{t-1}) + \alpha_4 \pi_{rpoil,t} + \alpha_5 \pi_{rpoil,t-1} + \varepsilon_t^\pi$$

$$\pi_{core,t} = \alpha_{c1} \pi_{t+4} + (1 - \alpha_{c1}) \pi_{t-1} + \alpha_{c2} ygap_{t-1} + \alpha_{c3} (z_t - z_{t-1}) + \alpha_{c4} (\pi_{t-1} - \pi_{c,t-1}) + \varepsilon_t^{\pi_{core}}$$

(3) The dinar exchange rate: the equation of the uncovered interest parity, the relationship between the differential of interest rates and exchange rate

$$z_t = \delta_1 z_{t+1} + (1 - \delta_1) z_{t-1} - (RR_t - RR_t^{EU} - \rho_t^*) / 4 + \varepsilon_t^z$$

where z stands for the real exchange rate, RR^{EU} the real interest rate on the money market of the euro area, and ρ^* the premium for investing in Serbia.

On the basis of projected values for the period t , which arise from the relationships in the first three equations of the model, in the equation (4) the instruction for the central bank is obtained – the level of the nominal interest rate of the central bank RS , which is necessary to achieve the inflation target. That is, to bring the forecast inflation, in the case of status *quo* with respect to monetary policy π_{t+4} in the coming period, down to the targeted π_{t+4}^* .

(4) Taylor's Rule type equation: instructions for monetary policy

$$RS_t = \gamma_1 RS_{t-1} + (1 - \gamma_1) * [RR_t^* + \pi_t + \gamma_2 (\pi_{t+4} - \pi_{t+4}^*) + \gamma_3 ygap_t] + \varepsilon_t^{RS}$$

where RR^* stands for the equilibrium interest rate in Serbia over the observed period.

TABLE 3-3. Definition of variables and indicative parameters from IMF (2008)

Equations and variables	Coefficient	Range		Serbia	Euro Area	Czech Republic	Romania
		From	To				
(1) Output gap ($y_{gap,t}$)							
Lagged output gap ($y_{gap,t-1}$)	β_2	0.5	0.9	0.5	0.6	0.6	0.75
Lead output gap ($y_{gap,t+1}$)	β_1	0.05	0.15	0.1	0.1	0.1	0.1
Lagged real interest gap ($RR_{gap,t-1}$)	β_3	sum 0.1	sum 0.3	0.02	0.15	0.1	0.1
Lagged real exchange rate gap ($y_{gap,t-1}$)	β_4			0.08	...	0.1	0.02
Foreign activity (e.g. Euro Area output gap) (y_{gap}^{EU})	β_5			0.1	0.15
(2a) Headline inflation (p_t)							
Expected inflation for the next period (p_{t+1})	α_1	0	1.0	0.3	0.2	0.2	0.25
Lagged output gap ($y_{gap,t-1}$)	α_2	0.25	0.5	0.25	0.3	0.3	0.3
Change in real exchange rate ($z_t - z_{t-1}$)	α_3			0.3	...	0.1	0.08
Change in oil price ($p_{rpoil,t}$)	α_4			0.03	0.004		
Lagged change in oil price ($p_{rpoil,t-1}$)	α_5			0.03	0.004		
(2b) Core inflation ($p_{core,t}$)							
Expected inflation in the future period (p_{t+4})	α_{c1}	0	1.0	0.4	0.2	0.2	0.25
Lagged output gap ($y_{gap,t-1}$)	α_{c2}	0.25	0.5	0.2	0.3	0.3	0.3
Change in real exchange rate ($z_t - z_{t-1}$)	α_{c3}			0.35	...	0.1	0.08
Lagged difference headline inflation - core inflation ($p_{t-1} - p_{core,t-1}$)	α_{c4}			0.25	0.25	0.25	0.25
(3) Foreign exchange rate (z_t)							
Expected real exchange rate in the next period (z_{t+1})	δ_1	>0	1.0	0.4	...	0.4	0.4
(4) Monetary policy rule - Taylor rule (RS_t)							
Lagged reference interest rate (RS_{t-1})	γ_1	>0.5	1.0	0.5	0.5	0.5	0.4
Forward gap between forecasted and targeted inflation ($p_{t+4} - p^*_{t+4}$)	γ_2	>0	5.0	2.0	2.0	2.0	2.5
Output gap (y_{gap})	γ_3	>0		0.5	0.5	0.5	0.5

Source: IMF, 2008

3.4. Theory on credit channel and bank lending channel – credit view vs. money view: background for the empirical research

We have already seen the main features of credit channel: how it works, how do we investigate about its presence in an economy, and what are the main hypotheses for its existence. Here, we will present the theoretical evolution of the credit channel as a result of debate on lending views arisen in the 1980s, against the previously dominant ‘money view’. Also, we will show the simple theoretical model illustrating the theory on the bank lending channel and serving as the basis for the empirical model.

The connection between credit and the macro economic development has long since been a central topic of debate in macroeconomics. Gertler (1988), and Kashyap and Stein (1993) give excellent surveys of the literature on the credit channel. Already in the 1930s, after the Great Depression, the macroeconomic role of credits was emphasized. Fisher (1933) argued that it was the bad performance of the financial markets that caused the deep recession at that time. During the 1960s the interest for this link fell. Instead, the importance of money was accentuated. One reason for this was that empirical results pointed to a strong correlation between money and real variables (e.g. Friedman and Schwartz (1963). Further, theoretical research suggested that the financial system should not have any significant impact on the macro economic development. Modigliani and Miller (1958) show that, under certain conditions, a firm’s capital structure is economically irrelevant. The result of Modigliani and Miller builds in large on the assumption of complete markets, i.e., perfect information.

During the 1970s the assumption of perfect information came under increased criticism and new literature of incomplete markets began to grow, starting with Akerlof’s paper from 1970 on the "lemons" problem⁶⁷. He illustrated how asymmetric information between buyers and sellers about product quality distorted the market equilibrium. Studies of the importance and implications of asymmetric information problems in the financial markets followed. New development in micro economic theory together with growing difficulties in explaining macro economic development with the conventional monetary theory led to a renewed interest in credits.

⁶⁷ Presented in more details under Chapter 4, section 4.2.3.

When credit came in focus again it also influenced the research on how monetary policy affects the economy. Bernanke (1983), and Blinder and Stiglitz (1983), for example, discussed the real effects of loanable funds. The new views of how the transmission of monetary policy works, under the assumption of incomplete capital markets, are usually called the "credit view" or "lending view" of monetary policy.

The "credit" view (school) is often compared with the "money" or Monetarist view (school). The two schools differ most fundamentally over the modus operandi of monetary policy – whether it is based on the amount of the money supply, or on the availability of credit. This basic conceptual difference leads to different views regarding the implementation of monetary policy: how it should be measured, when and how it should be used, and what it might accomplish.

The credit channels that are now analyzed in the literature are most often referred to as the bank lending channel (Bernanke and Blinder, 1988 and 1992; Miron, et al., 1994; and Stein, 1995) and the balance-sheet channel (Brunner and Meltzer, 1988; Bernanke and Gertler, 1989; and Gertler and Gilchrist, 1994). The starting point of these models is that there is asymmetric information in the financial market. Lenders can for example have an information disadvantage about the borrower's type, i.e., his project opportunities, the expected ex-post return on the project (adverse selection), and the effort made by the investor (moral hazard). This creates incentive problems that can make it very expensive for borrowers to obtain external financing since lenders have to gather costly information about the borrower and/or try to write the contract in a way that reduces the information problems. The lender can for instance demand collateral or design contracts that can be re-negotiated. In a world with imperfect information, borrowers then have imperfect access to credit markets.

More precisely, the balance-sheet channel, which works through the total amount of credits in the economy, assumes that information asymmetries introduce a wedge between the price of uncollateralized external funds and the price of internal funds. This wedge depends inversely on the borrower's collateralizable net worth. An exogenous disturbance, for example a change in the stance of monetary policy, which reduces the value of the collateral, then, widens the wedge and the cost of external finance increases. This might intensify the effect of the initial shock, since raised costs of finance result in lower investment spending, which means that the demand in the economy is depressed further. A lower demand in itself can reduce the value of the collateral even further, and investments fall more. Credit market

frictions then amplify the impact of the initial disturbance on the spending decision of the borrowers.

In the bank lending channel, banks have a special role since they are assumed to be better at handling problems with asymmetric information than are direct lenders that operate in the bond market. Banks are more efficient than others at screening and monitoring borrowers if banks, for example, specialize in producing information, if banks have long-term relationships with their customers, and/or because lending and other intermediary services are complementary activities. Banks, therefore, give loans to borrowers that, because they are subject to asymmetric information problems, find it costly or perhaps impossible to issue bonds in the private bond market. These borrowers are therefore, in a sense, bank "dependent". Bank loans are then a form of inside debt since banks have information about the borrower that is not available to other securities holders. Banks then reduce the wedge introduced by the information asymmetries, but not completely since banks are assumed to have rising marginal costs for their lending.

Changing the relation between the possession of bonds and loans in its portfolio has economical consequences for the bank, if it is at all possible. If banks are assumed not to be able to issue certificates of deposit (CDs) there is of course a limit for how much their lending can be extended. If bonds further are assumed to work as a buffer to unforeseen deposit withdrawal there are costs involved with raising the loan stock by selling out bonds. If they are allowed to issue CDs and the supply schedule for CDs is upward sloping, the result is the same. Loans from an intermediary and bonds issued at the bond market can therefore not be seen as perfect substitutes, which are often assumed in the macroeconomic literature. The consequence of the assumption that both borrowers and lenders find loans and bonds as imperfect substitutes is that the central bank gets a separate channel to influence bank lending since it can control the amount of deposits and thereby the supply of loans in the economy.

We will present here the original theoretical model illustrating the bank lending channel introduced by Bernanke and Blinder (1998) by incorporating bank loans in the traditional IS-LM model. In contrast with the IS-LM model, in which there are only two categories of bank assets – reserves and bonds (as equivalent for all interest bearing assets) – there are three financial assets in the Bernanke and Blinder model. These are reserves (R), bonds (B) and bank loans (L). Deposits (D) are banks' liabilities. The representative bank's balance sheet can be written in the following way.

$$(3.1) \quad B + L + R = D$$

It is assumed that reserves are held only to meet legal reserve requirements (r^r), i.e.:

$$(3.2) \quad R^d = r^r \cdot D$$

Given the total assets constraint and after meeting reserve requirements, banks choose between bonds and loans according to interest rates on these two investments. If i^l is the interest on loans and i^B is the interest rate on bonds (the return on bonds), the bond demand is a part b of banks' liquid sources, defined as $(1-r^r) \cdot D$. This depends positively on yields on bonds and inversely on the interest rate on loans (opportunity costs for holding bonds):

$$(3.3) \quad B = b(i^B, i^L) \cdot (1-r) \cdot D, \text{ where } \frac{\partial b}{\partial i^B} \geq 0, \quad \text{and} \quad \frac{\partial b}{\partial i^L} \leq 0$$

In the same way the loan supply can be expressed as a part l^s of banks' liquid sources related positively to the interest rate on loans and inversely to yields on bonds (loans' opportunity costs):

$$(3.4) \quad L^s = l^s(i^L, i^B) \cdot (1-r^r) \cdot D, \text{ where } \frac{\partial l^s}{\partial i^L} \geq 0, \quad \text{and} \quad \frac{\partial l^s}{\partial i^B} \leq 0$$

Loan demand is assumed to depend on the interest rate on loans and on the level of economic activity (Y):

$$(3.5) \quad L^d = l^d(i^L, Y), \text{ where } \frac{\partial l^d}{\partial i^L} \leq 0, \quad \frac{\partial l^d}{\partial Y} \geq 0$$

In equilibrium, loan supply should be equal to loan demand:

$$(3.6) \quad l^d(i^L, Y) = l^s(i^L, i^B) \cdot (1-r^r) \cdot D = l^s(i^L, i^B) \cdot \left(\frac{1-r^r}{r^r} \right) \cdot R^s$$

Where R^s denotes reserves supply determined by central bank. The above equation can be solved for the interest rate on loans as a function of yields on bonds and reserves supply:

$$(3.7) \quad i^L = \phi(i^B, Y, R), \text{ where } \frac{\partial \phi}{\partial i^B} \geq 0, \quad \frac{\partial \phi}{\partial Y} \geq 0, \quad \frac{\partial \phi}{\partial R} \leq 0$$

If we place the market equilibrium condition of the loans (3.7) into the general formula of the IS curve, linking output demand to interest rates on loans and bonds:

$$(3.8) \quad Y = Y(i^L, i^B) \quad \frac{\partial Y}{\partial i^B} \leq 0, \frac{\partial Y}{\partial i^L} \leq 0$$

We obtain a modified aggregate demand relationship as follows:

$$(3.9) \quad Y = Y(i^B, \phi(i^B, Y, R))$$

The above shown relationship is called the CC curve (“commodities and credit” curve)⁶⁸. In the CC curve monetary policy has an effect on aggregate demand both through the interest rate channel and the bank lending channel. Changes in the monetary policy generate adjustment in the bond rate (i^B), which influences the level of economic activity – this is the traditional interest rate channel. Moreover, changes in reserves’ supply (R^S), treated as a policy variable, has direct effect on the bank loan supply: a rise in reserves allows banks to expand deposits and increase the supply of loans – this is the bank lending channel. Reserves’ supply can be easily substituted with the reserve money (M^0) using the deposit multiplier. The market equilibrium condition of the loans (3.6) rewritten in terms of the reserve money looks as follows:

$$(3.10) \quad l^d(i^L, Y) = l^s(i^L, i^B) \cdot (1 - r^r) \cdot D = l^s(i^L, i^B) \cdot \left(\frac{1 - r^r}{c + r^r} \right) \cdot M^0$$

where c indicates the ration between cash in circulation and deposits.

There are two necessary theoretical assumptions that must hold in order for the bank lending channel to operate in practice. First, is the imperfect substitutability between loans and other assets in the banks’ balance sheet and second is the imperfect substitutability between bank loans and other forms of financing in the firms’ balance sheet. Put differently, the previous mechanism operates in the circumstances where there are companies which depend on banks for financing, i.e. they cannot substitute bank financing by issuance of bonds on the capital market (Second assumption), as well as ensure that banks cannot perfectly substitute loans by some other type of investment in their balance sheets (First assumption).

The empirical identification strategy for the bank lending channel is based on the work of Kashyap and Stein (2000), as there is no possibility of direct identification of the supply reaction of bank loans to the changes in the monetary policy since one cannot distinguish the

⁶⁸ Bernanke B.S., Blinder A.S. (1988), p.436

demand from the supply reaction. These authors' main identification principle consist in identifying if there are heterogeneous effects of the monetary policy changes on the credit policy of banks – which depend on the level of information asymmetries. The last are approximated by different characteristics of banks, namely size, liquidity, capitalization, and the origin of the owner (local/foreign).

We will present here the simple model illustrating the idea of the empirical test. It is a simplified version of the model of the profit-maximizing bank presented in Ehrmann, et al. (2002), the more elaborated model of the bank lending channel being developed in Stein (1998).

The balance sheet identity of bank i is defined as:

$$(3.11) \quad L_i + S_i = D_i + B_i + C_i$$

where L_i is the volume of loans, S_i securities, D_i the volume of (secured) deposits, B_i the level of non-secured funding and C_i the capital of bank i . Bank i acts on a loan market characterized by monopolistic competition. The demand for (nominal) bank loans L^d is given by:

$$(3.12) \quad L_i^d = -a_0 \cdot r_{L,i} + a_1 \cdot y + a_2 \cdot p$$

The bank's individual loan rate is given by $r_{L,i}$. y denotes aggregate real output, p the price level. All coefficients are assumed to be positive: $a_0, a_1, a_2 > 0$.

For simplicity, it is assumed that bank capital is linked to the level of loans (as in the Basle requirements) and the bank's holding of securities to the level of deposits (liquidity risk):

$$(3.13) \quad C_i = k \cdot L_i$$

$$(3.14) \quad S_i = s \cdot D_i$$

Deposits D_i are secured, but do not bear interest. They are demanded because of their role as a means of payment. Deposit demand is therefore, according to a "money demand"-type function, negatively related to the interest rate of an alternative risk-free asset, r_s , which we take to be the monetary policy rate:

$$(3.15) \quad D = -b_0 \cdot r_s$$

where $b_0 > 0$. Since banks do not remunerate these deposits, they cannot influence the amount of deposits held at the single bank, D_i . This is exogenous to the bank and it will drop after a monetary tightening (i.e. after an increase in r_S).

However, banks have access to an alternative source of funds, which is unsecured and for which the bank has to pay interest. Banks are perceived to be risky, and the suppliers of unsecured finance to banks therefore ask for an external finance premium. The interest rate they pay, $r_{B,i}$, is thus the risk free rate, r_S , plus this premium. The external finance premium depends on a signal of bank's health, x_i , which can be observed by all market participants. The higher the x_i , the lower the external finance premium:

$$(3.16) \quad r_{B,i} = r_S \cdot (\mu - c_0 \cdot x_i)$$

where $\mu - c_0 \cdot x_i \geq 1 \quad \forall i$. Bank i cannot raise unsecured funds if it offers less than $r_{B,i}$, whereas it can raise any amount of funds if it pays at least $r_{B,i}$. Given $r_{B,i}$ is a cost factor, bank i will not be ready to pay more than $r_{B,i}$.

The profit of bank i , π_i , is given by:

$$(3.17) \quad \pi_i = L_i \cdot r_{L,i} + S_i \cdot r_S - B_i \cdot r_{B,i} - \psi_i$$

where ψ_i captures bank-specific administrative costs and the remuneration costs for the required capital holdings. Here, it is also assumed that $B_i > 0$. Inserting equations (3.11) to (3.15) in the equation (3.17), and assuming equilibrium in the loan market, yields:

$$(3.18) \quad \pi_i = L_i \cdot \left(-\frac{1}{a_0} \cdot L_i + \frac{a_1}{a_0} \cdot y + \frac{a_2}{a_0} \cdot p \right) + s \cdot D_i \cdot r_s - ((1-k) \cdot L_i - (1-s) \cdot D_i) \cdot r_{B,i} - \psi_i$$

Setting the first order condition to zero, i.e. $\delta\pi_i/\delta L_i=0$, and inserting (3.16) yields:

$$(3.19) \quad L_i = \frac{a_1}{2} \cdot y + \frac{a_2}{2} \cdot p - \frac{a_0 \cdot \mu \cdot (1-k)}{2} \cdot r_s + \frac{a_0 \cdot c_0 \cdot (1-k)}{2} \cdot x_i \cdot r_S - \frac{a_0}{2} \cdot \frac{\partial \psi_i}{\partial L_i} .$$

In the traditional “money view” there are no informational asymmetries and, hence, no external finance premia. $r_{B,i}$ is equal to r_S for all banks and there are no differences in the response to monetary policy across banks. A monetary policy tightening (i.e. an increase in r_S) leans to a reduction in deposits according to equation (3.15). Banks can keep the asset side of

their balance sheet unchanged only if they increase other sources of funding B_i accordingly. But, the interest rate a bank has to pay for these funds was increased by the monetary policy tightening according to (3.16). Banks pass at least part of this higher costs to their loan rate ($r_{L,i}$), which in turn reduces loan demand. In the presented model, this implies a negative coefficient of r_s in equation (3.19).

However, if a bank lending channel is at work, the cost for raising non-secured funds faced by a bank should depend on the degree to which it suffers from informational frictions in financial markets. In the model, this implication is mirrored by the assumption that different banks face different costs for raising non-secured deposits (i.e. $c_0 > 0$). This differentiation would force some banks to reduce their lending by more; specifically those that face higher costs of raising non-secured deposits because they have a low value of bank characteristic x_i . If, as it is assumed in the model, loan demand is homogenous across banks, regardless of their value of x_i , a differential loan reaction to monetary policy identifies a loan supply movement. Whether such a differential reaction is present, can be captured by the coefficient on the interaction term $x_i \cdot r_s$, $\frac{a_0 \cdot c_0 \cdot (1-k)}{2}$

If this coefficient is significantly positive, the assumptions of the model imply that monetary policy affects loan supply.

The assumption of a homogenous reaction of loan demand across banks is therefore crucial for the identification of loan supply effects of monetary policy. It excludes cases where, for example, large or small banks' customers are more interest rate sensitive. Given that bank loans are the main source of external financing for firms in transition economies (see sections 1.3 and 1.4 in Chapter 1. , and readily available substitutes in times of monetary tightening are very limited even for relatively large firms, this is seen as a reasonable benchmark for most countries.

3.5. Empirical estimation of the bank lending channel in Serbia

3.5.1. Estimated model

Summing up the descriptive evidence on the lending channel in Serbia is mixed. Most of the factors, e.g. market concentration, high degree of non-resident ownership leading to a significant level of liabilities to foreign monetary and financial institutions, and low share of

loans in dinars indicate that the lending channel should be weak. On the other hand, the high degree of bank dependency of local borrowers, low level government presence, as well as decreased liquidity and capital ratios speak in favor of the presence of the lending channel. Moreover, Serbia's banking sector is rather diversified, and there are a large number of smaller banks whose balance sheet structure and hence liquidity and capital adequacy indicators, among others, diverge substantially from the banking sector's averages. Therefore, in order to draw conclusions about the role of Serbia's banking sector in monetary policy transmission, we need to perform some formal empirical tests.

Like the majority of the recent empirical literature that uses an improvement of Kashyap and Stein's (2000) approach, taken in Ehrmann, et al. (2002), we use the following model that is based on the equation (9) but in first differences, introducing some dynamics in that way:

$$(3.20) \quad \Delta \log(L_{it}) = \alpha_i + \sum_{j=1}^l \beta_j \Delta \log(L_{i(t-j)}) + \sum_{j=0}^l \gamma_j \Delta r_{t-j} + \pi_j \sum_{j=0}^l \Delta r_{t-j}^{EUR} + \sum_{j=0}^l \mu_j \Delta \log(GDP_{t-j}) + \sum_{j=0}^l \xi_j p_{t-j} + \theta z_t + \varphi X_{i(t-1)} + \sum_{j=0}^l \lambda_j X_{i(t-1)} \Delta r_{t-j} + \varepsilon_{it}$$

with $i=1, \dots, N$ and $t=1, \dots, T$ and where N denotes the number of banks and T is the time index going from 2006:q1 to 2008:q1. l stands for the number of lags (in our case $l=1$)⁶⁹. L_{it} presents the loans of bank i in quarter t to the private non-banking sector. Δr_t represent the first difference of a nominal interest rate with 14-days repo contracts being a main instrument of monetary policy and Δr_t^{EUR} represents the first difference in interest rate on the money market in the euro area. $\Delta \log(GDP_t)$ is the growth rate of real GDP, p_t is the inflation rate – both included to control for demand shocks. z_t is the rate of nominal appreciation of the dinar exchange rate against euro. The bank specific characteristics are given as X_{it} . α_i stands for the bank specific effects and ε_{it} for an error term. $\beta, \gamma, \pi, \mu, \xi, \theta, \varphi, \lambda$ are parameters to be estimated. The detailed variables definition and descriptive statistics are given in TABLE 3-8.

The underlying idea of the bank lending channel approach is that banks react to a change in the interest rate by adjusting new loans⁷⁰. Due to the limitation linked to the dataset originating from the banks' accounting, we use the first difference of the logarithm of stock of

⁶⁹ Because of the relatively short period of analysis, the model is estimated for the current period with one lag.

⁷⁰ Sevestre (1997) gives detailed explanation why this substitution of (unobservable) new loans by stock of loans leads to unbiased results in the case of panel data estimation.

loans as the approximation of the flow of loans and of the new loans in the quarter under consideration. Our dependent variable is the growth rate of the stock of loans. In order to avoid the seasonality of the loans growth, we use (t-4) difference and obtain the year-on-year growth rate for each quarter. We use the growth rate of real GDP and inflation in order to control for cyclical movements that affect the demand for loans. The exchange rate change in the period t is used to control for the direct change of the stock of loans due to the evolution of the dinar/euro exchange rate i.e. the re-calculation of the dinar value of loans initially placed with indexation clause versus euro⁷¹. Thus, we believe that with parameter γ the monetary policy component of the interest rate changes is isolated. These set indicators are used by the vast majority of studies in the area.

We have decided to introduce the four bank characteristics together, since they are not independent from each other; including them separately in a model is likely to generate an omitted variable bias. Since foreign banks may represent an invaluable source of capital for firms (Giannetti and Ongena, 2007), another characteristic to look at is ownership. Due to asymmetric information problems, small banks can have greater difficulties in raising non-deposit funds in order to offset monetary policy tightening and keep the loan supply at a desired level. In other words, after a monetary policy tightening, small banks reduce lending more than large banks (Kashyap and Stein, 1995). Liquid banks find it easier than low liquidity banks to shield their loan portfolios and can thus offset monetary policy tightening. Specifically, after an increase in the central bank interest rate, they can reduce their portfolios of liquid assets (e.g. bonds) to avoid cutting loans. The rationale for such buyer-stock behavior of banks is (i) the existence of credit lines that protect the credit relationships with clients, and (ii) the lack of a secondary market for intermediated loans (Bernanke and Blinder, 1992; Kashyap and Stein, 2000). Poorly capitalized banks have more limited access to non-deposit financing and, therefore, they reduce lending more than capitalized ones (Peek and Rosengren, 1995). A negative coefficient on the interest rate implies that the growth of loans slows after a monetary policy contraction.

Following the literature, we consider four measures of bank characteristics: size, liquidity, capitalization and ownership. The first three characteristics are most commonly used in studies of this type⁷² while foreign ownership is much less represented in the literature.

⁷¹ About 70% of total loan stock in Serbia, according to National Bank of Serbia data

⁷² 'Size' is first introduced in Kaishap and Stein (1995); 'Liquidity' in Kaishap and Stein (2000); 'Capitalisation' in Reek and Rosengreen (1995)

$$Size_{it} = \log A_{it} - \frac{1}{N_t} \sum_i \log A_{it}$$

$$Liquidity_{it} = \frac{L_{it}}{A_{it}} - \frac{1}{T} \sum_t \left(\frac{1}{N} \sum_i \frac{L_{it}}{A_{it}} \right)$$

$$Capitalization_{it} = \frac{C_{it}}{A_{it}} - \frac{1}{T} \sum_t \left(\frac{1}{N} \sum_i \frac{C_{it}}{A_{it}} \right)$$

Size is measured by log of total assets, A_{it} . Liquidity is defined as the ratio of liquid assets L_{it} (cash, reserves with central bank, and securities) to total assets. Capitalization is given as the ratio of capital and reserves C_{it} to total assets. All tree indicators are normalized with respect to their average. Liquidity and capitalization are normalized with respect to their mean across all banks over the whole sample period. The average of the interaction term is $X_{i(t-1)} \Delta r_{t-j}$ therefore zero and parameters λ_i are directly interpretable as the overall monetary policy effects on loans. For the indicator Size, we remove only cross sectional mean in each time period. Thus we remove a general trend of growing financial sector.

Since foreign banks may represent an invaluable source of capital for firms (Giannetti and Ongena, 2007), another characteristic to look at is ownership. Bank ownership is defined by a dummy variable for each ownership category: 0 for a bank mostly held by local owner and 1 for banks with majority foreign capital. For majority we use a 51% threshold.

The parameter of our interest are those in front of the monetary policy indicator (γ_j) which captures the overall monetary policy impact on bank lending⁷³, and the coefficient in front of the interaction term (λ_j). The latter coefficient, if significant, represents the distributional effect of monetary policy across different bank categories. We would expect the positive coefficient on the interaction term of the bank specific characteristic with the interest rate as monetary policy indicator. That would mean that there are distributional effects of monetary policy across banks. That is, that larger, better capitalized, more liquid, and banks owned by a foreign bank are in a position to react less to monetary policy changes. The coefficient of the bank characteristic variables (φ) has an illustrative role describing the linear relationship between growth rate of loans and bank characteristic.

⁷³ This effect could be the result of changed demand as of changed supply of loans or of both.

Otherwise stated, banks with lower external finance costs due to a lower degree of information asymmetry (captured by one of indicators of four bank characteristic) would react less to a change in monetary policy in comparison with banks with higher external finance premium due to a higher degree of information asymmetry. However, as highlighted by Ehrmann, et al. (2002), a non-significant coefficient for the interaction term may indicate either the absence of a bank lending channel or that our chosen characteristic does not appropriately discriminate banks according to the external finance cost.

3.5.2. Data base description

Unlike the majority of studies of bank lending channel that are the BankScope data, which suffers from the well known defaults of bias toward large banks, in this study we use data on all banks from a local source, i.e. from the central bank database. The period observed is also homogenous in terms of monetary policy regime – it covers the monetary transmission only during the period of inflation targeting. The data used are balance sheet data for Serbian banks on quarterly basis, covering the period 2006:q1 to 2012:q3. There are no previous studies for Serbia on the bank lending channel or studies using the same dataset. As we have already discussed in the review of the literature on empirical research of the bank lending channel in transition countries, the large majority of studies have so far been using the publicly available database BankScope, which are incomplete, and has as disadvantages the fact that the samples are biased towards large-sized banks and have annual frequency⁷⁴.

During the observation period there were several takeovers and mergers of banks. This could create a potentially severe problem since the bank that takes over a small bank usually keeps its identity in the year of the merger but gets a consolidated balance sheet with the target bank that ceases to operate as a legal entity. As the main variables represent first differences of certain positions or items in the balance sheet, mergers in a certain period could cause a misleading result. Namely, the growth of bank loans as our dependent variable could show a much higher value after the merger that is not a reflection of the growth of portfolio of the same bank relative to its level before the merger but the joint result of its autonomous loans growth and the growth in loan portfolio due to its merger with the portfolio of the target bank.

We use the following strategy for the treatment of mergers: the merger is considered to give birth to a new bank while the merging banks are kept in the sample for the period preceding the merger. We dispose with an unbalanced panel comprising of 40 different banks over the

⁷⁴ Ehrmann, et al., 2000

2006:q1 to 2012:q3 period and 882 observations in total. We use data only from 2006 since that is the moment of the introduction of the inflation targeting framework in conduct of monetary policy, which also consisted in an increase of the activity and importance of the reference interest rate and of the money market. Using data prior to 2006 would distort the results and it is meaningless from the perspective of the bank lending channel analysis.

3.5.3. Methodology and Results

Estimation Method

Due to the inclusion of lagged dependent variables on the right hand side in the empirical model, which considers the individual effect as well, ordinary least squares (OLS) estimation would be inconsistent and biased and cannot be applied. Therefore, the generalized method of moments (GMM) estimator suggested by Arellano and Bond (1991) is used. This estimator yields more robust estimates, provided that the models are not subject to serial correlation of order two and provided that the set of instrument variables that are used are valid. The Arellano-Bond (1991) estimation starts by transforming all regressors, usually by differencing, and uses the Generalized Method of Moments (Hansen, 1982). The Arellano-Bover/Blundell-Bond estimator augments the Arellano-Bond by making an additional assumption, that the first differences of instrument variables are uncorrelated with the fixed effects. This allows the introduction of more instruments and can improve the efficiency.

We apply the Windmeijer (2005) finite-sample correction, without which the standard errors in two-step estimation tend to be significantly downward biased because of the large number of instruments. A crucial assumption for the validity of GMM is that the instruments are exogenous and tested by the Sargan/Hansen test (for the joint validity of instruments) and the Difference-in-Hansen test (for the validity of a subset of instruments). The GMM validity also depends on the assumption that the model is not subject to serial correlation in ε_{it} . A common feature of Arellano-Bond and Arellano-Bover/Blundell-Bond methodologies is the increased number of instruments.

According to Roodman (2008), in small-samples numerous instruments can cause different kinds of problems, such as: the over-fitting of endogenous variables, imprecise estimates of the optimal weighting matrix, downward bias in two-step standard errors and a weak Hansen test of instrument validity. We seek to avoid the proliferation of instruments by collapsing

them⁷⁵ and limiting the lag depth. The collapsed instruments are the second lags of the dependent variable, the bank specific characteristics and interaction terms included in each equation. The monetary policy indicator is considered to be exogenous. Real GDP growth, inflation and change in the Euribor rate (as a proxy for foreign monetary policy) are also exogenous. Potential endogenous variables are growth of loans and exchange rate.

Both the short and long-run elasticities of the model are reported. The long-term coefficient of a variable is computed as the sum of its coefficients (of its lags and current values, where applicable) divided by one, minus the sum of the coefficients of the lags of the dependent variable. For instance, the long-run elasticity of the dependent variable with respect to monetary policy for the average bank is given by $\sum_{j=0}^l \gamma_j / (1 - \beta_1)$.

The maximum lag length L chosen is two for the dependent variable as well as all the other endogenous variables; the more lags generated, on average, the lower the significance of the variables.

It is known that the two-step standard errors tend to be biased downward in small samples. For this reason, the one-step results are generally recommended for inference on the coefficients, although the two-step Sargan test is recommended for inference on the model specification. However, many coefficients tend to become insignificant when using the one-step estimator, and for that reason the two-step estimation results are reported.

Estimation Results

First we show the baseline model with no bank characteristics included in the RHS variables (TABLE 3-4). The overall impression is that in the short-term we find some expected impacts while in the long-term they become insignificant. The results of the regression highlight the evidence of the statistically significant influence of changes in the main monetary policy instrument (the reference interest rate) on the growth rate of loans for the entire period observed. As expected, the coefficient is negative. Here we cannot still distinguish whether the lower growth of bank loans to private non-banks after the tightening of monetary conditions is a result of the decreasing loan demand or the decreasing loan supply by banks as

⁷⁵ One instrument is created for each variable and lag distance, rather than one for each time period, variable, and lag distance. This reduces the statistical efficiency in large samples but, in small samples it can avoid the bias that arises as the number of instruments increases towards the number of observations (Rodman, 2008).

their reserves and collected deposits are getting scarce, or both. The inflation as a proxy for the demand factors has positive but not significant coefficient, measuring its influence on the growth rate of loans. The real GDP growth have positive and significant short-term coefficient for the overall period.

All specifications for the direct linear influence of changes in the local currency exchange rate to euro are controlled. The rationale behind this is that despite the implicit inflation targeting and proclamation of the short-term nominal interest rate as the main monetary policy instrument, it is well known that the important place of the exchange rate in the monetary policy transmission⁷⁶ remains. We find a negative significant influence of the changes in value of the local currency relative to the euro as foreign currency of reference to the growth rate of bank loans. The last implies that dinar appreciation leads to lower growth of loans, *ceteris paribus*. The sign of this coefficient is expected. This finding probably refers to the direct – computational (accounting) impact. Namely, as the majority of bank loans are indexed to euro, the changes in dinar:euro exchange rate lead to the recalculation of the stock of loans by the end of each accounting period with the new exchange rate. This fall in stock of loans (in the case of dinar appreciation) is not due to the autonomous decrease in bank loan activity. It is due to the fact that the part of the loan portfolio that is indexed to the euro, which could be even the same one as at the end of the previous quarter, is adjusted for the evolution of the exchange rate.

Our regression model with the interest rate from the euro area is further amended. As we have described, the banking system is to a large extent financed from foreign funds. Thus, we use the average quarterly three months change in the Euribor among the right hand side macro variables.

A crisis dummy is introduced in order to control for a severe shock to the economy resulting from a sudden financial markets contraction in the last two quarters of 2008 and first quarter of 2009. However, the coefficient is not significant and it probably results from the fact that its effect is already captured by real GDP growth given sharp contraction in economic output in the same period.

⁷⁶ “There are several reasons why it may be appropriate to attach a greater weight to the exchange rate in Emerging market and transition economies. First, with relatively thin foreign exchange markets, pronounced shocks and large capital flows, neglect of the exchange rate may lead to excessive exchange rate volatility. Second, for those central banks that lack a track record of monetary stability, the exchange rate naturally serves as a focal point for inflation expectations. Depreciations have therefore tended to have a large inflationary impact in EMEs with poor inflation histories,” (Amato and Gerlach, 2002, p.786).

We rerun the same model on two separate periods – first until the crisis spill over, i.e. from June 2006 to June 2008, and second from the crisis onwards. The result changes to reveal that the direct effect local monetary policy on growth of credit is not significant in either of the two sub-periods. Yet, the euro area money market rate reflecting foreign monetary policy gets significant negative coefficient in the period until the global crisis. This finding suggests that in the pre-crisis period, local banking system supply (or demand) was much more influenced by Eurozone monetary conditions than local ones. This is not strange given that the majority of new financing was funded from refinancing lines through the headquarters of foreign banks from the Eurozone. In the long run this coefficient is again not significant, as all other coefficients.

Long run coefficients for all variables in all model specifications in terms of the covered period became insignificant. This finding is probably a consequence of not long enough periods in the sample, but contributes to the argument of the general low impact of monetary policy on credit activity – on both demand and supply for loans.

The AR1 and AR2 tests for both estimations (1 and 2) indicate that the first-order autocorrelation is present in residuals, while the second-order autocorrelation is not. As noted before, the presence of the first-order autocorrelation does not imply inconsistency of the estimates. However, the presence of the second-order autocorrelation would imply inconsistency. The Sargan test statistics suggest that a chosen set of instruments is valid.

TABLE 3-4. Baseline model

	The whole period from June 2006 to September 2012		Pre crisis period from June 2006 to June 2008		Crisis period from September 2008 to September 2012	
	Short run coeff.	Long run coeff.	Short run coeff.	Long run coeff.	Short run coeff.	Long run coeff.
Monetary policy (repo rate)	-0.022 (0.009)**	-0.220 (0.227)	-0.021 (0.018)	-0.192 (0.301)	-0.005 (0.011)	-0.214 (0.650)
Euribor	0.012 (0.051)	0.113 (0.469)	-0.227 (0.058)***	-2.091 (2.338)	-0.009 (0.038)	-0.407 (1.936)
Exchange rate index (RSDEUR)	-0.009 (0.004)**	0.088 (0.063)	-0.004 (0.006)	-0.039 (0.079)	0.000 (0.006)	0.002 (0.260)
Real GDP	0.502 (0.003)**	4.873 (3.912)	0.362 (0.169)**	-3.336 (3.866)	-0.305 (0.236)	-14.221 (34.489)
Prices	0.003 (0.003)	0.029 (0.047)	0.011 (0.004)**	0.099 (0.123)	-0.003 (0.002)*	-0.155 (0.373)
Crisis_dummy_lag1	-0.084 (0.093)	-0.084 (0.093)				
p-value AR1/AR2	0.001/0.143		0.010/0.661		0.008/0.144	
Hansen test (2nd step) p-value	0.197		0.656		0.055	
Difference-in Hansen test for levels, p-value	0.501		0.399		0.045	
Number of instruments	11		11		11	
Number of banks	40		39		34	
Number of observations	882		362		520	

*/**/** denotes significance at the 10%/5%/1% level. Standard errors are in parentheses.

The same model including four bank characteristics on the RHS in order to test the existence of the bank lending channel (TABLE 3-8) is analyzed. We include each characteristic alternatively in the separate model to avoid the endogeneity as some of them may be interrelated. We include together bank characteristic and interaction term in the same model. We also again obtain the significant and negative coefficient with the monetary policy variable in three out of four model specifications. In the long run these coefficients again become statistically insignificant. The last confirms our finding from the baseline model that there is some impact on the bank loans of the reference interest rate under the direct influence by the central bank but only in the short-term while it is uncertain whether it is a result of supply or demand reaction. This finding is intuitive and consistent with the theory on the interest rate channel and the credit channel. The variable for exchange rate of local currency (*Exchange rate index RSDEUR*) is also statistically significant with negative coefficient as in a baseline model.

Our results reveal that *Size* does not play a role in credit growth. The intuitive result for variable *Liquidity*, i.e. positive and statistically significant coefficient, imply that more liquid banks register stronger growth in lending. Yet, higher capitalization appears to result in lower rate of loan growth and vice versa. This finding is not particularly in line with the empirical methodology for detection of bank lending channel. However, it is quite possible as an outcome as more capitalized banks are more prudent and have less appetite for the expansion of lending.

When looking for the distributional effects of monetary policy across banks with different characteristic, we have no result confirming the existence of the bank lending channel in any of the model specifications. All bank characteristics that we use (variables *Liquidity*, *Capitalization*, and *Foreign ownership* of bank capital) do not appear to have any impact on the propagation of monetary policy.

TABLE 3-5. Model with bank characteristics and interaction term with monetary policy: size, liquidity, and capitalization

	Short run coeff.	Long run coeff.	Short run coeff.	Long run coeff.	Short run coeff.	Long run coeff.
Monetary policy (repo rate)	-0.021 (0.009)**	-0.538 (1.115)	-0.018 (0.011)	-0.209 (0.229)	-0.023 (0.008)***	-0.164 (0.119)
Euribor	0.002 (0.054)	0.042 (1.366)	0.021 (0.052)	0.238 (0.558)	0.039 (0.053)	0.279 (0.339)
Exchange rate index (RSDEUR)	-0.008 (0.004)**	-0.202 (0.398)	-0.008 (0.004)**	-0.944 (0.077)	-0.011 (0.004)***	-0.076 (0.037)**
Real GDP	0.359 (0.224)	9.132 (18.647)	0.246 (0.275)	2.847 (3.582)	0.667 (0.211)***	4.693 (2.362)***
Prices	0.002 (0.003)	0.052 (0.145)	0.003 (0.003)	0.029 (0.047)	0.002 (0.003)	0.013 (0.023)
Crisis_dummy_lag1	-0.094 (0.088)	-2.403 (-5.677)	-0.054 (0.086)	-0.625 (1.232)	-0.043 (0.095)	-0.299 (0.710)
Size	0.001 (0.273)	0.033 (0.653)				
Monetary policy X Size	0.000 (0.006)	0.001 (0.158)				
Liquidity			0.723 (0.292)**	8.359 (8.354)		
Monetary policy X Liquidity			0.053 (0.073)	0.609 (0.937)		
Capitalization					-0.347 (0.169)**	-2.439 (1.341)*
Monetary policy X Capitalization					0.002 (0.039)	0.017 (0.270)
p-value AR1/AR2	0.002/0.158		0.001/0.194		0.001/0.132	
Hansen test (2nd step) p-value	0.193		0.240		0.404	
Difference-in Hansen test for levels, p-value	0.195		0.646		0.771	
Number of instruments	15		15		15	
Number of banks	40		40		40	
Number of observations	882		878		882	

*/**/** denotes significance at the 10%/5%/1% level. Standard errors are in parentheses.

We would expect that foreign ownership plays a significant role and provides that foreign banks can react to a lower degree to the changes in local monetary conditions since they rely on excessive financing by their mother institutions. Nevertheless, we do not observe that result in respect to local monetary policy. Interestingly, we observe a positive and statistically significant coefficient for interaction term between *Euribor* changes reflecting monetary policy in the Eurozone and variable foreign ownership. The interpretation would say that local foreign banks increase lending relatively more than local banks following the increase of the Euribor rate and vice versa. This finding looks contra-intuitive. We may suppose however that this variable captures a shift in money market rates from relatively high before the crisis (when local credit growth was also high) to a reduction to low levels after the crisis when local credit was slowing down. These coefficients remain significant even in the long-term unlike all others.

TABLE 3-6. Model with foreign ownership as bank characteristic and interaction terms with both local and foreign monetary policy

	Short run coeff.	Long run coeff.	Short run coeff.	Long run coeff.	Short run coeff.	Long run coeff.
Monetary policy (repo rate)	-0.023 (0.011)**	-0.201 (0.199)	-0.024 (0.009)**	-0.219 (0.193)	-0.024 (0.009)***	-0.214 (0.182)
Euribor	0.018 (0.052)	0.157 (0.428)	0.059 (0.054)	0.528 (0.429)	0.058 (0.054)	0.519 (0.424)
Exchange rate index (RSDEUR)	-0.010 (0.004)**	-0.086 (0.057)	-0.014 (0.004)***	-0.123 (0.071)*	-0.014 (0.004)***	-0.121 (0.068)*
Real GDP	0.523 (0.196)**	4.627 (3.434)	0.605 (0.183)***	5.408 (3.559)	0.604 (0.182)***	5.351 (3.457)
Prices	0.003 (0.004)	0.259 0.042	0.001 (0.004)	0.008 (0.035)	0.001 (0.004)	0.009 (0.035)
Crisis_dummy_lag1	-0.080 (0.095)	-0.712 (1.039)	0.006 (0.104)	0.053 (0.913)	0.006 (0.103)	0.049 (0.906)
Foreign ownership	0.013 (0.013)	0.114 (0.122)	0.018 (0.014)	0.163 (0.132)	0.018 (0.014)	0.159 (0.124)
Monetary policy X Foreign ownership	0.001 (0.008)	0.006 (0.069)	0.000 (0.007)	0.004 (0.061)		
Euribor X Foreign ownership			0.093 (0.024)***	0.831 (0.476)*	0.093 (0.024)***	0.820 (0.455)*
p-value AR1/AR2	0.001/0.145		0.001/0.156		0.001/0.145	
Hansen test (2nd step) p-value	0.174		0.546		0.174	
Difference-in Hansen test for levels, p-value	0.463		0.468		0.463	
Number of instruments	13		14		14	
Number of banks	40		40		40	
Number of observations	882		882		882	

*/**/*** denotes significance at the 10%/5%/1% level. Standard errors are in parentheses.

3.6. Challenges to effective monetary transmission: the analysis of the case of Serbia

As we have demonstrated in the previous empirical estimation, the evidence on the existence of both the interest rate and credit channel is weak in the case of Serbia after applying the relevant methodology for investigation of these channels. Here, we are going to examine the potential factors that may contribute to this situation. All these factors are only statistically described, but provide a solid explanation for the empirical finding. They are based on several years of observation of the lending market and monetary conditions, including monetary policy decisions and its impact in Serbia.

The lack of competition among banks

Interest rates of banks on loans and deposits do not respond fully to the changes on the money market due to incomplete competition among banks. In the case that a bank has a high enough

margin (mark up price), we may imagine the situation in which refinancing costs (reference rate) go down, a bank does not have to change the interest rate it charges on loans. As it is evidenced in the study presented in Chapter 2. the results of the bank lending survey show an unusually high disparity in the recorded interest rates on the same type of loans in different banks, as well as unjustifiably high effective interest rates on certain types of loans in individual banks (e.g. 35.8% p.a. on a loan of up to 12 months for working capital, indexed to a foreign currency, for small- and medium-sized companies). Such a high level of interest rate cannot be explained only by the higher risks of a particular type of client, but, clearly, by a monopolistic position of banks and an insufficiently sensitive demand to the price of financing.

Lack of price elasticity of demand for credit

It seems that demand for certain types of loans is not sensitive to the variations in interest rate. That is evidently the case of loans to households. This applies in particular to short-term loans where interest rates are extremely high and the differences among banks unusually wide, as registered by the same survey. In the same manner, there is evidence that about 33% of the population who use loans consider that the key criterion in deciding on taking out a loan is the monthly installment (which, let us recall, declines with the extension of the repayment period although the interest rate remains high), while 29% sees as the key criterion the sum of money which has to be repaid, while a mere 26% of loan beneficiaries consider that the key criterion in deciding on borrowing is the interest rate⁷⁷. An anecdotal example is also a statement of a manager of a big bank in Serbia that the basic criterion for the majority of citizens is the speed at which a loan is extended, while the level of the interest rate plays a secondary role. In the same survey it was established that 48% of loan beneficiaries do not know what an indexed loan means (indexation of a loan to a foreign currency, which means that with the depreciation of the dinar rate the debt and the installment of the loan also go up, which often does not apply vice versa, in the case of appreciation), and 31% do not pay attention to the rate at which a bank calculates the amount borrowed.

Short-term flows: Carry trade and high foreign exchange rate pass-through to prices

A relatively high level of inflation and strong volatility were characterizing the whole period irrespective of the monetary policy regime. Besides food and fuel prices that contribute

⁷⁷ A survey of the general public in 2007 on financial literacy in Serbia (by the agency Medium Gallup).

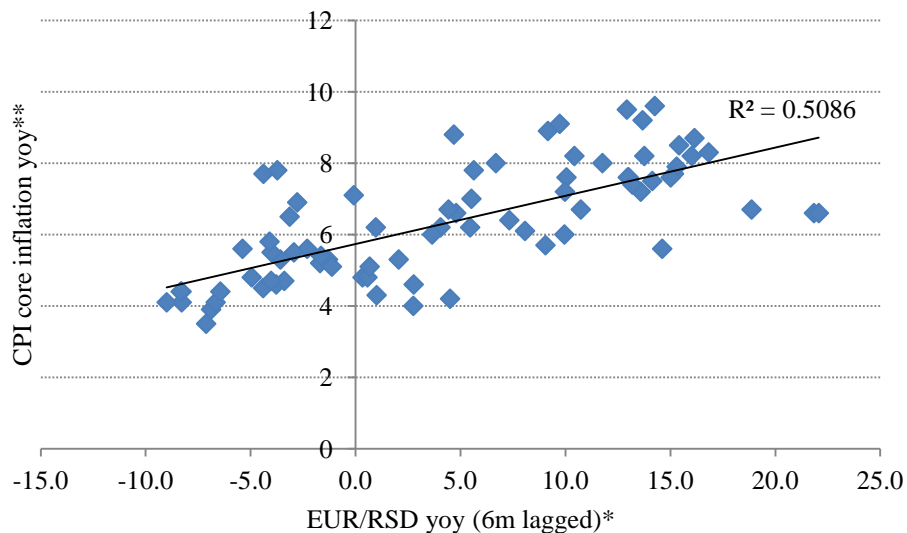
significantly to inflation and inflation volatility, the exchange rate is another important price determinant (FIGURE 3-3). But unlike the first two that are out of monetary policy control, the exchange rate level is tightly related to the monetary policy main instrument, i.e. the money market local currency interest rate. Namely, in circumstances of liberalized foreign financial inflows, any positive differential between local currency interest rate (reference repo rate) and money market interest rate from international market (e.g. Euribor) combined with the expectations that local currency depreciation, would not neutralize this differential in the following period (uncovered interest parity) but would trigger carry trade inflows into local repo market where banks place dinar liquidity into reverse repo operation with the central bank or into local currency debt markets in the form of T-bills (FIGURE 3-5).

In the environment of a shallow foreign exchange market, these carry trade inflows result in dinar nominal exchange rate appreciation that subsequently help monetary authorities in curbing inflation (FIGURE 3-4). Thus, the exchange rate channel is probably the most powerful channel of monetary policy transmission that is indirectly (via effect of interest rate differential on foreign carry trade inflows and to exchange rate) used to stabilize prices in times of inflationary pressures. In the same manner, and in the opposite direction, any (international) financial market jitters reflecting in a reversal in carry trade positions in local currency would result in inflationary pressures via exchange rate depreciation given a very shallow foreign exchange market. The consequence of the previously described framework to the integrity and maneuver space of monetary policy is that in times of economic downturn when usually fundamentally driven inflows (like foreign direct investments for example) are scarcer, and local currency tend to depreciate, local monetary authorities are forced to increase and keep high the level of the nominal local currency interest rate in order to prevent carry trade outflows and additional pressures on currency (and prices).

As one can notice on FIGURE 3-5, net inflows in local currency debt to Treasury bills and reverse repo contracts seems highly correlated with the approximation of yield on foreign (Euro) investments in dinar. Specifically, we calculated the yield that one investor gets from a Euro denominated amount switching to Dinar and investing in local papers. For the local nominal rate we used reference rate, and for the evolution of exchange rate we approximated by the preceding three months change in Dinar value versus Euro (annualized) as it may serve as a proxy for (short-term) investors' expectation on the future evolution of the interest rate. Though some of inflows finish in treasury bills of longer maturity the investors are however able to exit the local currency as they enter it using swap operations including the stop loss

clause that activates after a defined threshold of local currency depreciation. For the euro area interest rate, we used the three months Euribor rate in calculation of proxy for the final yield.

FIGURE 3-2. Inflation and exchange rate: January 2007 to June 2013

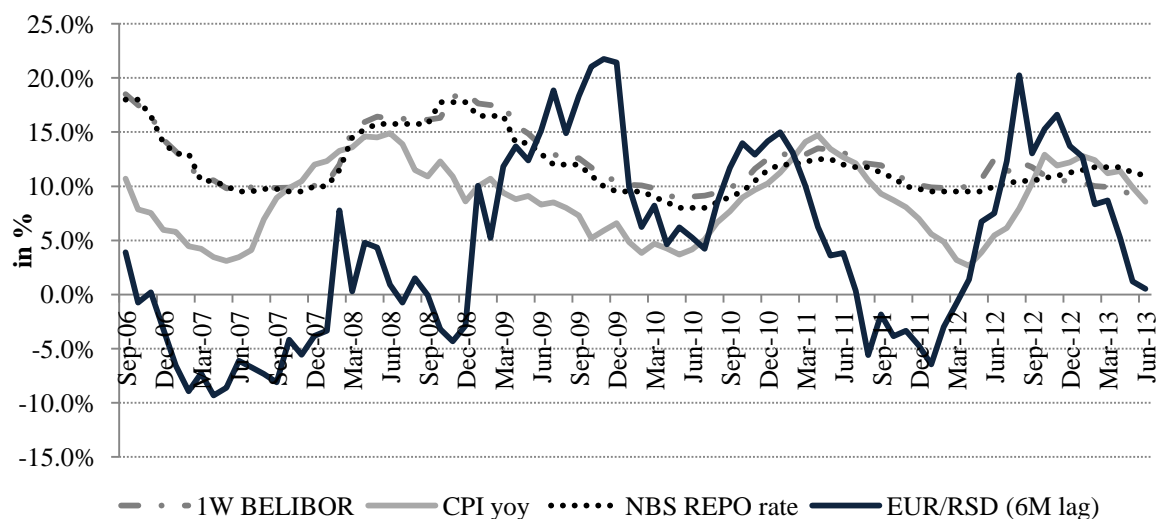


Source: NBS, Statistical office of Serbia, own calculations.

* Growth refers to depreciation, contraction to appreciation

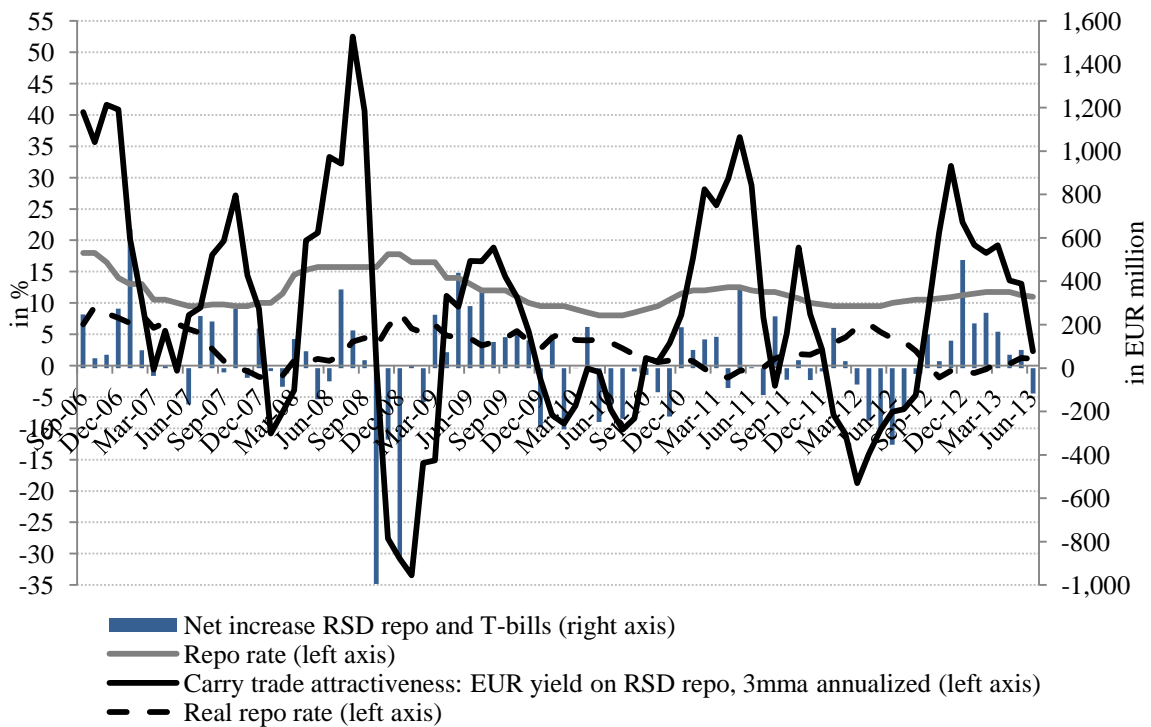
** Core inflation excludes energy, food, alcohol and cigarettes from the overall CPI index. The core CPI data are available only from January 2007

FIGURE 3-3. Inflation, interest rate and exchange rate changes



Source: National Bank of Serbia; Statistical Office of the Republic of Serbia

FIGURE 3-4. Carry trade attractiveness

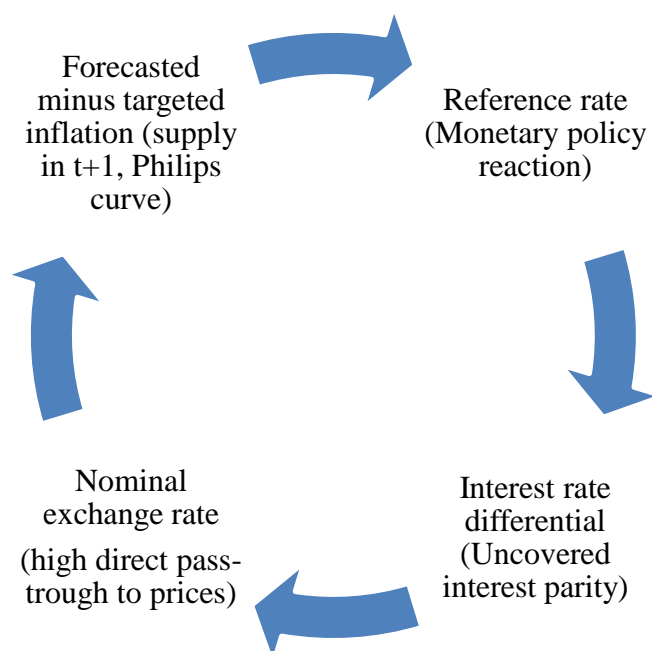


Source: National Bank of Serbia; Statistical Office of the Republic of Serbia

Within the local currency interest rate channel, the central bank has to be always aware of the indirect impact of its reference rate on exchange rate movements. More precisely, if the central bank decides to lower a local benchmark interest rate, thus lowering the return on the money market placements of foreign funded market players, the central bank risks the outflow of funds temporarily parked in local currency contracts. That operation could then trigger a wave of outflows and induce local currency exchange rate depreciation, and vice versa. Once this mechanism is activated by an exogenous shock and foreign inflows suddenly reverse causing depreciation of local currency (like with the Lehman crisis), even though the real activity is in danger of recession, the central bank has an inherent limit in relaxing reference interest rate. Namely, lowering the interest rate together with the exchange rate depreciation would lower the yield on carry trade and would risk additional foreign currency outflows. Even more, the central bank in these circumstances may be forced to increase its reference rate to induce some additional foreign currency liquidity inflows in order to stabilize the currency. This local interest rate – exchange rate link combined with a high transmission of exchange rate movements to local prices – represents a large limitation for the local monetary policy. FIGURE 3-6 illustrates this vicious cycle of local rate setting being a ‘hostage’ of

short-term cross-border flows and local prices that are strongly influenced by the exchange rate movements. In the framework of the model used for monetary analysis in the inflation targeting regime as one presented in the subsection 3.3.3, the FIGURE 3-10 in the appendix offers a simplified schematic representation of the model with slight modification illustrating the circular reference to the local policy rate.

FIGURE 3-5. Monetary policy ‘loop’ in small open economy



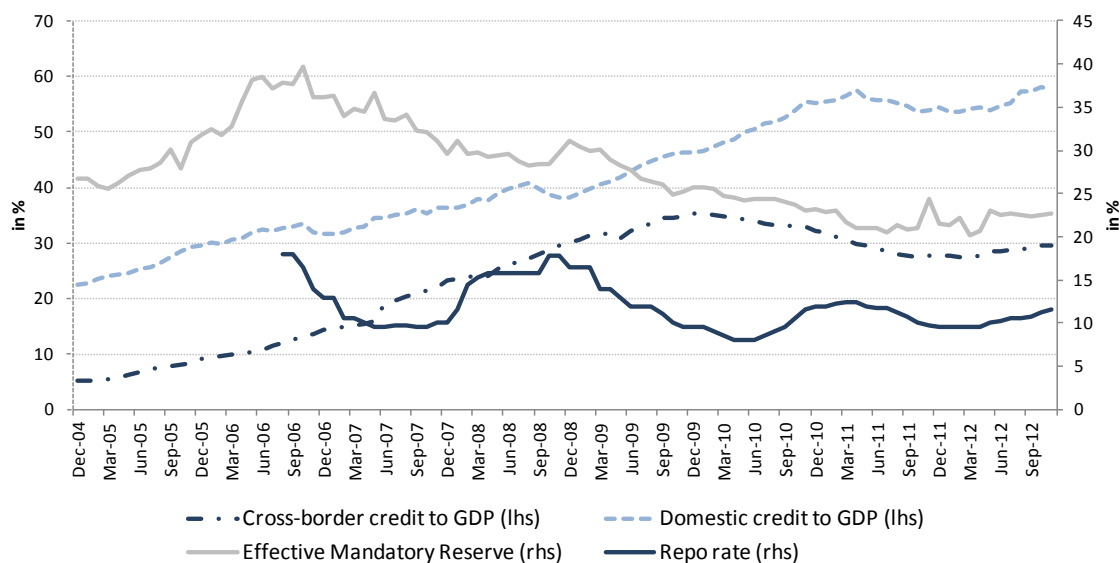
Source: the author

Cross border financing

A large number of banks are refinanced from foreign sources, in addition to domestic sources. To that extent, the interest rate of the central bank constitutes a potential investment for these banks, rather than the price of the source. It, in turn, sets some kind of a floor for other interest rates charged by those banks. However, it in no way affects the costs of funding sources of these banks to the extent to which the interest rate on the money market of the European Monetary Union (EURIBOR), for example, or the ultimate reference rate of the European Central Bank does. Likewise, a large portion of bank credit in Serbia (as much as 70% according to the official statistics) has been invested as indexed to a foreign currency, which means that the revenue of banks from such loans is constant when converted into euros and almost insensitive to domestic monetary conditions if a bank has matched these loans with total liabilities in foreign exchange.

Similarly to banks, local companies are in large extent financed directly from abroad. The relevant data for Serbia are also very illustrative (FIGURE 3-5). In some periods, cross border lending might have been used to circumvent local monetary and prudential measures that aimed to render credit more expensive. More on this issue is presented under Chapter 2. and Chapter 1. section 1.4.

FIGURE 3-6. Domestic and cross-border loans and monetary policy instruments



Source: NBS, author's calculations

Relatively high reliance on other types of financing beyond bank credit

Besides bank credit, the enterprises use informal borrowing and trade credit as a source of external funds but rely dominantly on accumulated profit, i.e. own internal financing, at the same time. In that manner, the EBRD/World Bank Business Environment and Enterprise Performance Survey in 2002 and 2005 provided insights into the structure of the financing of enterprises in transition (TABLE 3-7). According to the same survey, a large proportion of firms in transition countries do not receive bank loans. This is especially true for small firms. Among different types of financing available to enterprises (TABLE 3-7), internal finance accounts for the largest share of total financing for both working capital and fixed investments⁷⁸.

⁷⁸ EBRD, 2006

TABLE 3-7. Financing available to enterprises (as a percentage of total financing)

	Working capital financing				
	Internal finance	Borrowing from banks	Equity	Trade credit	Other
CEB	68.0	10.1	6.9	6.2	6.6
SEE	73.2	12.9	1.0	5.6	5.8
CIS	77.3	10.1	2.0	4.0	6.0

	Fixed investment financing				
	Internal finance	Borrowing from banks	Equity	Trade credit	Other
CEB	62.4	14.3	6.5	1.9	12.0
SEE	70.8	17.7	0.9	2.4	6.8
CIS	77.2	11.6	1.9	1.8	6.9

Source: EBRD Transition report 2006. EBRD/World Bank Business Environment and Enterprise Performance Survey, 2005.

3.7. Concluding remarks

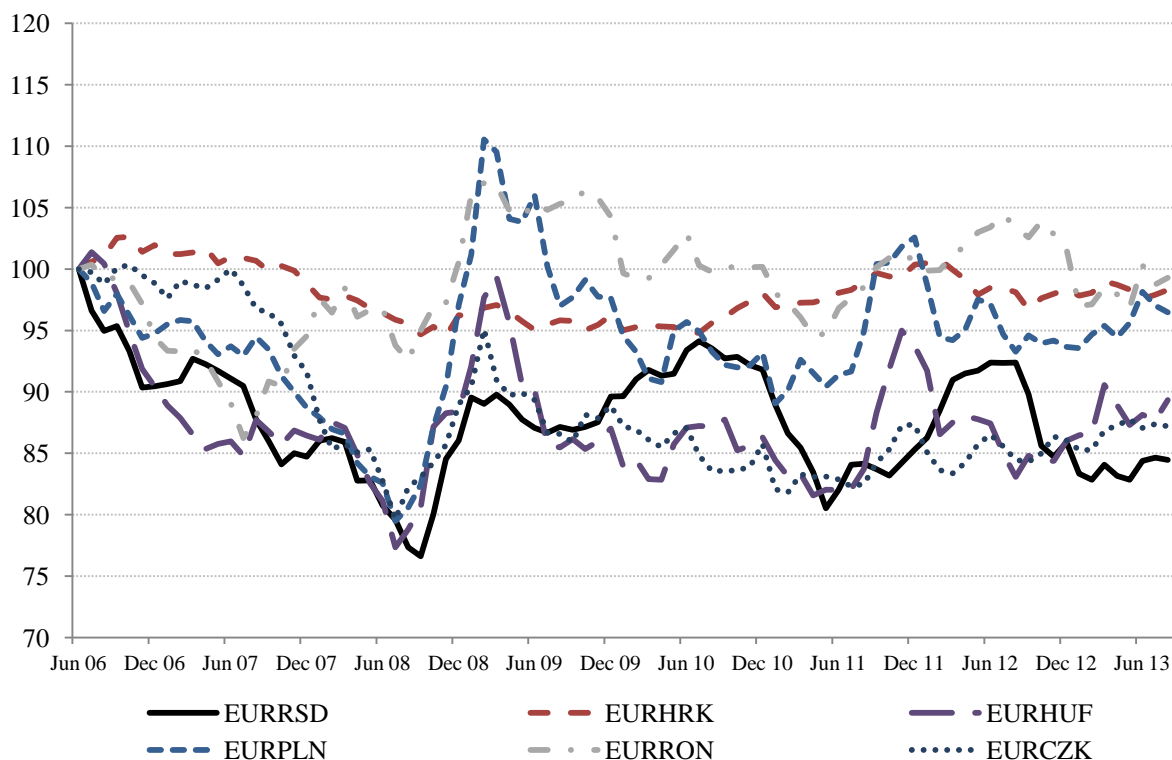
Our main finding from the empirical part of the study on monetary policy transmission presented in this chapter is that monetary policy has a limited impact on bank lending. It bears a resemblance to other studies of this type that treat transition countries in a sense that the last do not show particularly coherent findings while some of them in some periods prove the existence of the bank lending channel. However, this evidence is weak.

The IT concept has proven itself to be a good framework in many countries where it is applied because it had successful policies as a result (although often expensive in the initial years) – managed to decrease inflation and keep it at a low level, although deviations from the target always occurred in certain periods of application. Still, it is important to know that for any degree of successfulness to be gained from its implementation, according to reference literature on inflation targeting⁷⁹, there are several prerequisites to be met, such as: (1) independence of the central bank, (2) elasticity of the economy to changes in the interest rate and in the exchange rate, (3) the existence of an econometric model and of good understanding of transmission mechanisms of monetary policy, and (4) tight and responsible fiscal policy. Only the third condition, and to a certain extent the first one, are under the control of the central bank; which, if it is trying to fight for stable inflation by itself, in the absence of a tight fiscal policy, doomed to pay a far higher price for that, while the inflation targeting framework as a concept only helps it to efficiently attain the set target on inflation in the upcoming period.

⁷⁹ Amato and Gerlach (2002)

Given the exposed results in this chapter, one additional condition in respect to the effectiveness of monetary policy may be attached to the previous, as a result of the examination of the credit channel in Serbia exposed in this chapter. It is the deep local foreign exchange market or the absence of short-term financial flows from abroad. Specifically, circumstances of open short-term financial flows, in combination with a relatively shallow local market where the exchange rate continues to be a significant anchor of monetary policy, results not only in more expensive monetary policy but also in the low effectiveness of the whole concept of inflation targeting. The high price is reflected in high paid interest on repo operations of the NBS, but also in a higher required degree of appreciation of the domestic currency so that prices can be rapidly brought down, with a view to consistently meeting the set target of the NBS regarding annual inflation. Obviously, this strong appreciation, which diverges from its fundamental determinants, along long time horizon ruins the competitiveness of the local economy, exports, and the current account balance in the balance of payments. Moreover, the long persistence of real appreciation may lead to the Dutch disease effect and systemic underdevelopment of tradable sectors. In the next Chapter, we will treat the issue of uneven sector development and the role of financing in it.

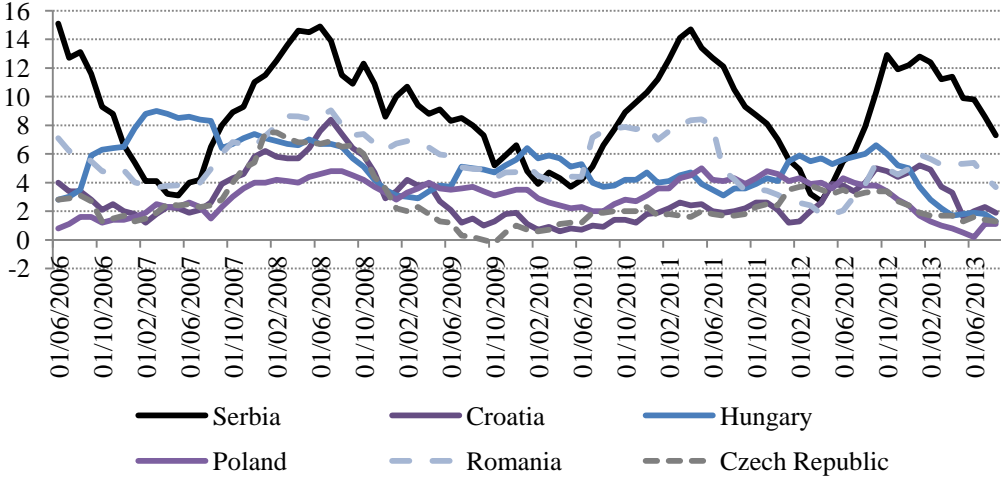
FIGURE 3-7. Real exchange rate, inflation targeting countries



Source: Bloomberg

In parallel to that, the inflation trend in small open inflation targeting economies in Europe seems much correlated among countries, implying that local inflation is much more under exogenous impacts than under control of local monetary policy. These external impacts are such as (a) credit expansion driven demand boom prior to crisis in 2007 and 2008, (b) global markets downturn and risk aversion (leading to depreciation of local currencies and causing inflation) as it was the case in end 2008 and first half of 2009, (c) global rise in food prices as it was the case in end 2008 and first half of 2009, (d) the FED’s taper off announcement in May 2013 again transmitting to risk aversion and depreciation of currencies.

FIGURE 3-8. Inflation rate, year-on-year, in %



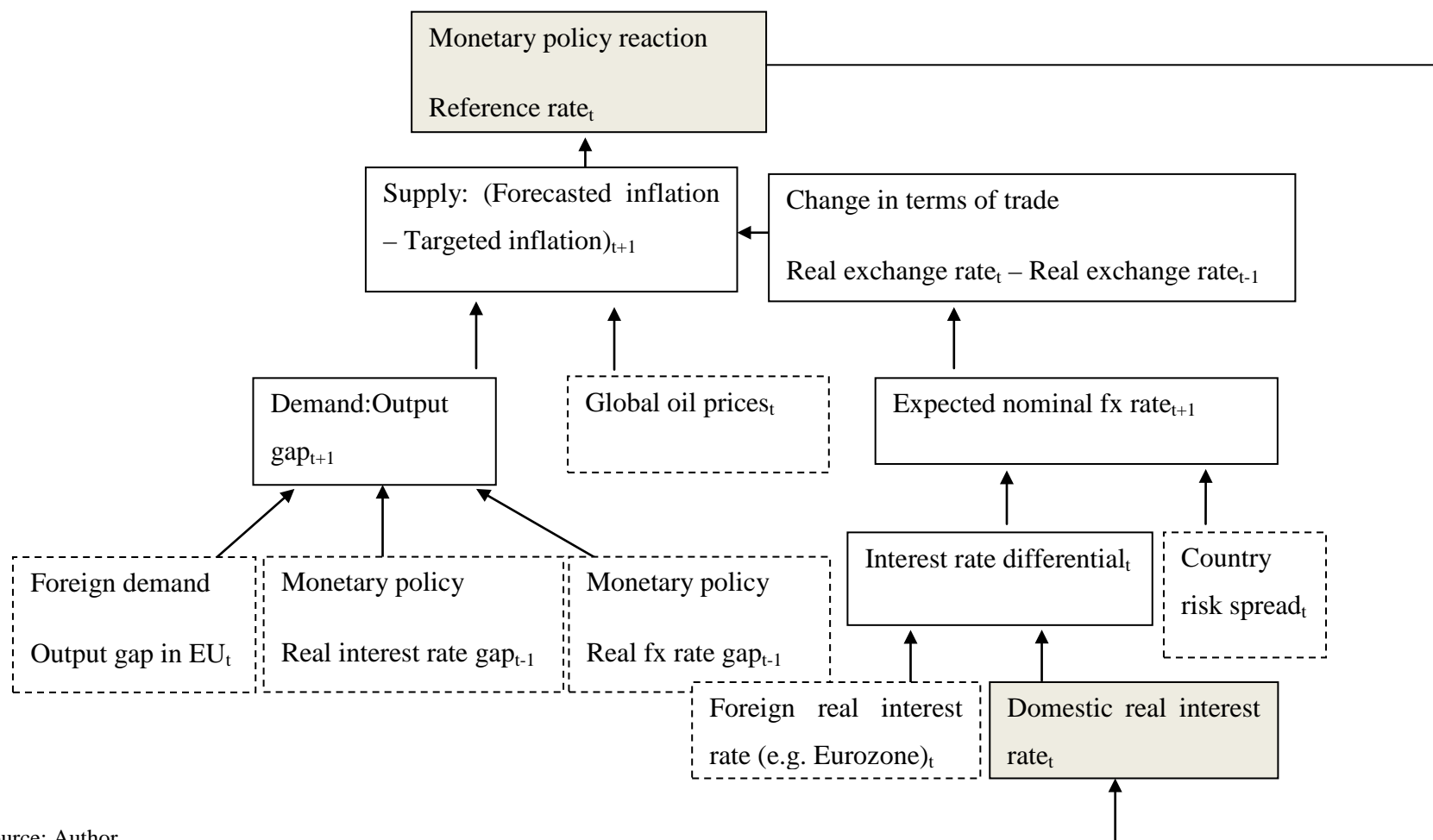
Source: Bloomberg

Appendix to Chapter 3.

TABLE 3-8. Variables definition and descriptive statistics

Variable	Definition	Mean	Standard deviation	Minimum	Maximum
Growth rate of loans	First difference (t-4) of logarithm of stock of gross loans of a bank at the end of period (quarter)	0.022	0.872	-4.231	2.869
Monetary policy	First difference (t-1) of average interest rate during the period (quarter) on repo market under control of the central bank	-0.040	1.967	-4.787	4.167
Euribor	First difference (t-1) of average Euribor 3M interest rate during the period (quarter)	-0.018	0.507	-2.385	0.780
Exchange rate	Quarterly index of dinar exchange rate EURRSD, end of period, transformed on the annual level. Increase in index means depreciation and vice versa.	94.611	7.595	82.352	108.826
Real GDP	First difference (t-4) of log of real quarterly GDP	0.045	0.072	-0.063	0.241
Prices	Six months average of monthly inflation (retail price) transformed on the annual level	10.567	5.450	-0.600	19.060
Crisis_dummy	Dummy variable for the crisis shock, equals 1 for 2008:q3, 2008:q4 and 2009:q1, zero otherwise.			0	1
Size	Log of total assets normalized over the sample mean in each quarter (t)	0.000	1.199	-4.024	2.429
Monetary policy X Size					
Liquidity	Ratio of liquid assets (cash, reserves and securities) to total assets, normalized over the whole sample mean across the whole timespan	0.000	0.124	-0.294	0.507
Monetary policy X Liquidity		-0.033	0.249	-1.448	1.381
Capitalisation	Ratio of capital and reserves to total assets, normalized over the whole sample mean across the whole timespan	-0.034	0.139	-0.255	0.406
Monetary policy X Capitalization		0.011	0.300	-3.139	1.390
Foreign bank	Dummy variable for ownership type: 1-bank owned by the foreign bank; 0-bank owned by state or local company			0	1
Monetary policy X Foreign bank		-0.078	1.357	-4.787	3.798

FIGURE 3-9. Schematic representation of monetary policy in inflation targeting regime



Source: Author

Note: Solid outlined boxes refer to endogenous variables while dashed line outlined boxes refer to exogenous ones

Chapter 4. Financial Integration and Macroeconomic Sustainability: a Sector Approach to Access to Finance and the Pre- Crisis Growth Model*

4.1. Introduction

“The availability and access to finance can be a crucial influence on the economic entitlements that economic agents are practically able to secure. This applies all the way from large enterprises (in which hundreds of thousands of people may work) to tiny establishments that rely on microcredit,” (Amartya Sen, 1999).

The rapid financial development, presented in Chapters 1 and 2, were a powerful driver of growth and income convergence in all European transition economies until the sudden hit of the global crisis (Chapter 1, Section 1.3). During the financial expansion and credit boom, financial inflows were abundant and the pace of financial “leveraging” of companies and households was particularly strong. Amidst such developments, access to finance was naturally eased thanks to these financial inflows channeled through banks to households and companies. When banks are the major lenders to the economy, as is the case in all transition economies, then the level and direction of real investment crucially depends on the decisions of banks as to which projects are to be financed and which are not. The recall of the five main channels through which the development of the financial system influences economic growth, help to set the framework of underlying growth effects in the period of rapid financial development. As summarized by Levine (1997), economic growth is influenced by the development of the five different ways, keeping in mind the main functions provided by the financial system in an economy. First, financial development improves mobilizing and

* One part of the study presented in this chapter is a result of a joint paper prepared with M. Vladimir Cupic and published in *Ekonomika preduzeca*, a Journal published by the Serbian Economic Association, 2010, vol. 58, number. 1-2, p. 50-58, ‘Financial integration and access to finance in transition economies: A sectoral approach’

pooling of savings in an economy. Secondly, the better supply of information will lead to a more optimal allocation of resources. Thirdly, there will be better incentives for monitoring of investments and implementation of corporate governance. Fourthly, it will become easier to trade, diversify and manage risks. Fifthly, transactions concerning goods and services will be facilitated. All these advantages of having a sound financial sector can contribute in two different ways to a higher per capita economic growth. Firstly, these advantages will lead to a higher capital stock (capital accumulation) and secondly they can speed up technological development. In this perception, a higher allocative efficiency leads to an increasing propensity to both save and invest, which stimulates capital accumulation and technological renewal. In the end, this will boost economic growth.

On the other hand, as documented in Chapter 2. liberalization coupled with credit boom and the resulting financial development could also be an environment where the specific market frictions occur. These may result in credit market segmentation and uneven terms of lending to different type of borrowers. The structure of the lending market that is explained in Chapter 2, may also lead to an uneven access to credit by different type of borrowers.

The comprehensive enterprise level survey, Business Environment and Enterprise Performance Survey (BEEPS), organized by European Bank for Reconstruction and Development and World Bank and conducted in all transition countries in 2008/2009 and previously in 2005 and 2002, offers a unique opportunity to explore the perception of enterprises regarding their business environment including the matter of the financing of their business. Summarizing the enterprise level answers from this survey to the question about their major business obstacle, the obtained result brings a somewhat puzzling result. Namely, amidst the intensive financial inflows in the form of foreign lending directly or through locally present foreign banks, that had brought the financial intermediation at the comparable level with developed market economies (TABLE 1-2), 'the access to finance' represented the second largest obstacle for their business activities (after tax rates), as presented in TABLE 4-1.

TABLE 4-1. Major business obstacle, summary for 18 European transition countries (list in Appendix)

Question: "Most serious obstacle affecting the operation of this establishment"

Obstacles	Frequency	Percent
Tax rates	1,176	15.15
Access to finance	992	12.78
Practices of competitors in the informal sector	905	11.66
Political instability	892	11.49
Inadequately educated workforce	814	10.49
Corruption	439	5.66
Does not apply	356	4.59
Crime, theft and disorder	163	2.10
Electricity	306	3.94
Don't know	411	5.30
Tax administration	295	3.80
Business licensing and permits	191	2.46
Access to land	171	2.20
Labor regulations	266	3.43
Customs and trade regulations	139	1.79
Courts	164	2.11
Transport	81	1.04
Total	7,761	100.00

Source: BEEPS

Financial inclusion, or broad access to financial services, is usually defined as an absence of price or non-price barriers in the use of financial services while the existence of such barriers from the borrowers' perspective is defined as a financial obstacle. Of course, it does not mean that all households and firms should be able to borrow unlimited amounts at prime lending rates. Even if banks are competitive and employed the best financial technology, prices and interest rates charged and size of loans in the market economy will necessarily depend on the creditworthiness of the customer. Improving access then, means improving the degree to which financial services are available to all at a fair price. The specific feature of credit markets provide that market equilibrium may not occur even where demand equals supply.

In their famous paper, Stiglitz and Weiss (1981) show that information problems can lead to credit rationing even in equilibrium. That is because banks making loans are concerned not only about the interest rate that they charge on the loan but also about the riskiness of the loan. Also, the interest rate the bank charges may itself affect the riskiness of the pool of

loans, either by attracting high-risk borrowers (adverse selection effect) or by adversely effecting the actions and incentives of borrowers (moral hazard effect). Moreover, the price of credit can also be the barrier. Even when supply and demand do intersect, the equilibrium price for a loan (including the fees and minimum requirements) may be too high, making them unaffordable for a large proportion of potential borrowers. In this case, there is no rationing but it still leads to financial exclusion.

Besides the significance of access to finance for economic development, the main hypothesis that we examine in this chapter is that the persistent unequal access to finance may determine the economic structure in a way that it can impact the macroeconomic stability. The evidence from Latin America shows that financial liberalization in the 1990s had led to changes in trade patterns as the non-tradable sector had been the privileged recipient of foreign funds (Fanelli and Keifman, 2002). During economic transition in CEE, some sectors were more significant receivers of credit fuelled from financial integration and foreign inflows than others. The last refers particularly to the real estate and construction sectors that became important drivers of economic growth in many countries (Transition report, 2010, p.45). That in turn contributed to inflation in asset prices as the share of construction in total value significantly added an increase in almost all transition countries from 2000 to 2007, while house prices also surged in correlation with credit growth.

As presented in Chapter 1. section1.3, financial integration, reflected in significant foreign direct investment and foreign debt inflows following the initial financial liberalization, was directly connected to a widening of the current account gap as well as to the income convergence of these economies. With the global financial crisis, the applied growth model in transition economies that was based on financial integration and the import of foreign savings has come under question as, in parallel with economic growth, it was responsible for the accumulation of many macroeconomic vulnerabilities. Since the crisis, there is a raising awareness with economic policy designers on the need to improve domestic export capacity and competitiveness across the region. The problematic in defining the new sustainable pillars of economic growth in European transition economies that is coherent with macroeconomic stability remains a big challenge for future research as well as finding credible sources of growth. The main problematic consists in controlling fiscal and current account deficits and providing sustainable growth.

For a reduction of the current account deficit, the tradable sector of the economy is particularly important – to provide growth through rise in net export. As it was concluded in the study of monetary policy, in Chapter 3. one of the possible factors behind large underperformance of export versus import may be found in a Dutch disease-like effect. Namely, it was strongly possible that large financial inflows were contributing constantly to real appreciation of local currencies in the countries of Emerging Europe before the crisis. The last could have reflected in the underdevelopment of tradable goods production contributing to current account gaps.

The idea of this Chapter is to examine the financing obstacle of enterprises across the region of Emerging Europe. The approach consists of analyzing the access to finance and other financing terms. The main determinants of access to finance (financing obstacle) are examined using probit estimation based on data from the enterprise level survey (BEEPS). It is of primary interest to determine the firm level characteristics effect on the degree of the financing obstacle. Particular attention is placed on the effect of the industry sector (manufacturing industry versus other industries) in order to formulate the hypothesis on the effects of the financing obstacle on the overall economic structure and trade deficit.

In what follows, we first present the related literature in section 4.2. The data base is presented in section 4.3 followed by the estimation methodology and results in section 4.4. The discussion of results is given in section 4.5 and in section 4.6, we conclude.

4.2. Review of the relevant literature

There are three streams in literature that should be referred to in the analysis of the micro-level financing obstacle and its macroeconomic implications. The first is the whole growth-finance nexus including long lasting debate on the causality direction, the empirical evidences, and the theory on capital accumulation and its financing that is presented within subsection 4.2.1. The second consist of various empirical studies examining firm level financing obstacle determinants, which is described in subsection 4.2.2. Among this list of existing empirical studies, according to my knowledge, there is none that examines the sector of business activity as a determinant of financing obstacle as it is going to be considered in this chapter. The third line of literature that is related to this study is the theory on information asymmetry, credit rationing, and financial constraint. We present it in the subsection 4.2.3.

4.2.1. Finance, financial liberalization and growth

There is a long-lasting record in both theoretical and empirical literature on the role of financial development in economic growth. Bagehot (1873), in his classic *Lombard Street*, emphasized the critical importance of the banking system in economic growth as banks could actively spur innovation and future growth by indentifying and funding productive investments. Equal reference is in the work of Schumpeter (1911) who argues that financial services are vital in promoting economic growth. In this view production requires credit to materialize, and one ‘can only become an entrepreneur by previously becoming a debtor’. What (the entrepreneur) first wants is credit. Before he requires any goods whatever, he requires purchasing power so that he is the typical debtor in capitalist society. In this process, the banker is the key agent. Schumpeter (1911) is very explicit on this score: “The banker, therefore, is not so much primarily the middleman in the commodity ‘purchasing power’ as a producer of this commodity... He is the actor of the exchange economy”.

Keynes (1930, vol.II, p.220) also argued for the importance of the banking sector in economic growth. He suggested that bank credit “is the pavement along which production travels, and the bankers, if they knew their duty, would provide the transport facilities to just the extent that is required in order that the productive powers of the community can be employed at their full capacity”. On the opposite line of thinking, Robinson (1952, p.86) argued that financial development follows growth, and articulated this causality argument by suggesting that “where enterprise leads finance follows”. Although growth may be constrained by credit creation in less developed financial systems, in more sophisticated systems finance is viewed as endogenously responding to demand requirements. These lines of arguments suggest that the more developed a financial system is the higher the likelihood of growth causing finance. In Robinson’s (1952) view then, financial development follows growth or, perhaps, the causation may be bi-directional.

Building on the work of Schumpeter (1911), McKinnon (1973), and Shaw (1973) propounded the ‘financial liberalization’ thesis arguing that government restrictions on the banking system restrain the quantity and quality of investments. More recently the endogenous growth literature has suggested that financial intermediation has a positive effect on steady-state growth (see Pagano, 1993, for a survey), and that government intervention in the financial system has a negative effect on equilibrium growth rate (King and Levine, 1993). These developments can be considered as an antidote to the thesis put forward by Modigliani and Miller (1958) that the way firms finance themselves is irrelevant (their ‘irrelevance

proposition’); which is consistent with the perception of financial markets as independent entities from the rest of the economy, so that finance and growth are unrelated. On the other hand, there are still economists who would argue that finance and growth are unrelated.

A good example of this view is Lucas (1988) who argues that economists “badly over-stress” the role of the financial system, thereby reinforcing the difficulties of agreeing on the link and its direction between finance and growth. The difficulty of establishing the link between financial development and economic growth was first identified by Patrick (1966) and further developed by McKinnon (1988) who argued that “although a higher rate of financial growth is positively correlated with successful real growth, Patrick’s (1966, p.390) problem remains unresolved: What is the cause and what is the effect? Is finance a leading sector in economic development, or does it simply follow growth in real output which is generated elsewhere?” The relationship between financial development and economic growth is, therefore, a controversial issue, which could be resolved potentially by resorting to theoretical arguments backed up by convincing empirical evidence.

A recent attempt to explore this aspect of the debate has been attempted by King and Levine (1993) who have argued that Schumpeter (1911) may very well have been ‘right’ with the suggestion that financial intermediaries promote economic development. This is an early attempt to tackle this issue of the strength and causation of the relationship between finance and economic development. It is more ‘aggregate’ and more recent but also refers to the need for further work. In their attempt to resolve the ‘causality direction’ Arestis and Demetriades (1996) demonstrate that the results of King and Levine (1993), which are obtained from cross-section country studies, are not able to address the issue of causality satisfactorily, and proceeded to produce two types of evidence in this context. The first is to show that King and Levine’s (1993) causal interpretation is based on a fragile statistical basis. Specifically, it is shown that once the contemporaneous correlation between the main financial indicator and economic growth has been accounted for, there is no longer any evidence to suggest that financial development helps predict future growth. The second type of evidence demonstrates that cross-section data sets cannot address the question of causality in a satisfactory way.

To perform such a task, time series data and a time series approach are required, as for example in Granger (1988), among others. Adopting the latter approach and using co-integration techniques as well as data for 12 representative countries, it is shown that there are systematic differences in causality patterns across countries. It thus emerges that Arestis and

Demetriades (1997) were correct in at least voicing those concerns. When summarizing the enormous body of empirical evidence on finance and growth, Levine (2004, p. 85) distinguishes the following types of evidence: cross-section studies, panel studies, pure time-series investigations, country case studies, and industry and firm level analyses. The overall conclusion of this review is that “while subject to ample qualifications and countervailing views, the preponderance of evidence suggests that both financial intermediaries and markets matter for growth even when controlling for potential simultaneity bias”. The problem is that there are still ‘ample qualifications and countervailing views’ which are significant.

The same study notes additional problems in the choice of right variables in the existing empirical studies (p. 88). The empirical measures do not always account for the functions assigned to them; the determinants of financial development are not well understood. According to him, it is the case that ‘political, legal, cultural and geographical factors influence the financial system’ and yet a great deal more work ‘is required to better understand the role of financial factors in the process of economic growth’. Other studies suggest further problems. One IMF study (Favara, 2003) fails to establish significant coefficients on financial variables in instrumented growth regressions. Interestingly enough, Rousseau and Wachtel (2001) report that in countries with high inflation the possible effects of finance on growth weaken substantially. These contributions add to the unconvincing empirical support of the financial liberalization thesis.

With so much emphasis on the financial liberalization thesis in the context of the growth-finance nexus, here follows a brief review of its theoretical premise and its policy implications. The financial sector of an economy provides real services, whereby financial instruments, markets and institutions arise to ameliorate market frictions; they can mitigate for effects of incomplete information and transaction costs. In fact, Levine (2004, p. 5) recapitulates that the financial system provides the following functions: “produce information ex ante about possible investments and allocate capital; monitor investments and exert corporate governance after providing finance; facilitate the trading, diversification and management of risk; mobilize and pool savings; ease the exchange of goods and services.” Even so, Lucas (1988, p.6) dismisses finance as an ‘over-stressed’ determinant of economic growth and, as noted above, Robinson (1952) assumed a passive role for finance. At the other extreme, Miller (1988, p. 14) suggests that “financial markets contribute to economic growth is a proposition too obvious for serious discussion.” The middle ground is covered by the idea that the finance-growth nexus cannot be safely ignored without endangering our

understanding of development and economic growth (Bagehot, 1873; Schumpeter, 1911; Gurley and Shaw, 1955; Goldsmith, 1969; McKinnon, 1973; and Shaw, 1973). No wonder that interest in the finance-growth nexus has been expressed ever since ancient times and continuous unabated to today.

Despite the concerns about the causality direction, the result of the rich literature in this field, particularly concerning developing countries, can be summarized in the following main conclusions, as presented in the referent review of the empirical literature on financial development and economic growth. Though admitting that “we are far from definitive answers to the question: Does finance cause growth, and if it does, how?,” Levin (2004, p. 3) highlights the following three tentative observations from the existing work, “without ignoring the weaknesses of and the absence of complete unanimity of results.” Taken as a whole, the bulk of existing research suggests that “(1) countries with better functioning banks and markets grow faster, but the degree to which a country is bank-based or market-based does not matter much, (2) simultaneity bias does not seem to drive these conclusions, and (3) better functioning financial systems ease the external financing constraints that impede firm and industrial expansion, suggesting that this is one mechanism through which financial development matters for growth.”

In interpreting the empirical results obtained in the context of the study of financing obstacles, we will take the stance that financial development promotes growth and that those firms that have access to finance are able to grow their businesses.

4.2.2. Empirical literature on firm level financing obstacle

After having presented the more general context of views on finance and growth relation, in this sub-section we overview the existing empirical literature on financing obstacles in which the further study we produce is situated. Not one of these studies, neither on the wide sample of countries nor in the Emerging Europe, considered the industry as a variable of interest when examining the firm financing obstacle and its macroeconomic implications. In the following review on the firm level financing obstacle, we first present the studies with global coverage. Further on, we narrow the focus to transition economies. The last studies are all exploring the firm level survey on the business environment that is also explored in the empirical part of this study.

Global coverage studies of the firm financing obstacle

Since a seminal paper by Fazzari, Hubbard, and Petersen (1988) [henceforth, FHP], a large body of empirical literature has emerged to estimate financing constraints of firms (see the surveys by Schiantarelli, 1995, Blundell, et al., 1996, Hubbard, 1998, and Bond and Van Reenen, 1999). This literature relies on the assumption that external finance is more costly than internal finance due to asymmetric information and agency problems, and that the “premium” on external finance is an inverse function of a borrower’s net worth. A firm is defined to be financially constrained if a windfall increase in the supply of internal funds results in a higher level of investment spending. Following FHP, it is usually assumed that there are cross-sectional differences in effects of internal funds on the firms’ investment, so that investment follows the optimal path for a priori unconstrained firms but a sub-optimal path for constrained firms.

Subsequently, researchers have applied different a priori classifications of firms to distinguish financially constrained and unconstrained firms. Beck, et al. (2004) use a unique firm-level survey database, consisting of 10,000 firms from 80 countries, to focus on two questions. First, how successful are these a priori classifications in distinguishing between financially constrained and unconstrained firms? Second, and more generally, they examine the determinants of the financing obstacles of firms. The World Business Environment Survey (WBES) that was used in this study is a unique firm-level survey database, which offers a number of advantages. First, the database provides information on the firm’s perception of the degree to which it is financially constrained or not. Therefore, unlike previous studies that inferred financing constraints from company financial statements using different methodologies, the firm level survey provides a measurement of the firm’s financing obstacles directly from the data. Second, the database contains information on a broad cross-section of different types of firms in a large number of countries, including a large number of small- and medium-sized enterprises. Therefore, unlike previous studies focused either on a sample of large, listed firms, or on firms in a limited number of countries, they are able to study how financing obstacles differ not only across countries, but also across firm size.

As smaller firms are generally considered to face larger financing obstacles, it seemed particularly important to investigate this largely ignored segment of the firm population. Their results indicate that many of the previously used a priori groupings are indeed effective in classifying financially constrained firms. However, they find that certain groupings are more

effective than others. Specifically, age, size and ownership structure are effective categorizations of firms when studying financing obstacle; older, larger and foreign-owned firms report lower financing obstacles. Variables capturing these firm characteristics not only enter statistical significance in the regressions, but also explain large variations in firms' financing obstacles. They also explore whether financial and economic development helps alleviate the financing obstacles of the firms that report being the most constrained. While they find that firms in countries with higher levels of financial intermediary development, stock market development, legal system efficiency, and higher GDP per capita report, on average, have lower financing obstacles, they conclude that the underlying institutions driving both financial and economic development seem to be the most important country characteristic explaining cross-country variation in the firms' financing obstacles. While they explore the determinants of self-reported financing obstacles, they do not explore the relation between financing obstacles and the actual firm growth neither do they pay attention to the firm-level industry of business. In their study, Beck, et al. (2004) generally focus on the role of country-level financial and institutional development in overcoming the constraining effect of financing obstacles rather than on micro level obstacles that they register and their macroeconomic implications.

Some more insights into the link of financing and growth is provided by Rajan and Zingales (1998) who detect that link through the difference in financing needs across industries. The authors consider that capital markets make a contribution to growth by reallocating capital to the highest value use without substantial risk of loss through moral hazard, adverse selection or transaction costs. This implies that the lack of financial development should disproportionately hinder firms who are typically dependent on external finance. From this hypothesis two testable facts follow: (i) Industries which are more dependent on external financing grow faster in more financially developed countries; (ii) Given that new firms depend more on external finance, financial development favors growth by disproportionately improving the prospects of young firms. One problem in testing these hypotheses is that the true optimal capital structure of firms cannot be observed in financially underdeveloped countries.

Rajan and Zingales (1998) make two assumptions in order to overcome this problem and identify the "technological" demand for external financing that a firm operating in a specific industry would choose in a perfect capital market. The first is that capital markets in the United States, especially for the large firms listed on the stock exchange, are relatively

frictionless and, therefore, it is reasonable to assume that the observed ration of external finance reflects the technological demand for external financing of the industry. Second, such a technological demand carries over to the same industries in other countries. On the basis of these assumptions, they identify the industry's technological demand for external finance using US data. The Rajan and Zingales (1998) study utilizes these External Dependence Rations (EDRs) to test the two aforementioned hypotheses using a panel of developed and developing countries. Their main conclusion is that "financial development has a substantial supportive influence on the rate of economic growth and this works, at least partly, by reducing the cost of external finance to financially dependent firms."

Two relevant conjectures arise from these results. The first is that "the existence of a well-developed (capital) market in a certain country represents a source of comparative advantage for that country in industries that are more dependent on external finance." The second is that "the costs imposed by a lack of financial development will favor incumbent firms over new entrances. Therefore, the level of financial development can also be a factor in determining the size composition of an industry as well as its concentration." More insights on the link of micro-level firm's financial obstacle to the overall economic structure and trade balance is provided in one study of Latin America. Building their argument on two conjectures from Rajan and Zingales (1998), Fanelli and Keifman (2002) investigate the hypothesis that the level of financing deepening impacted on domestic competitiveness and trade patterns in Argentina during the 1990's after financial liberalization. They found almost perfect negative collation between the pattern of inter-industry trade of Argentina and EDRs computed by Rajan and Zingales (1998). This suggests that the lack of financial development is distorting the pattern of trade against sectors that are dependent on external finance. All previous studies focus on the general country-level degree of financial development, as a variable of interest, in describing the financial constraint of the business sector.

Similarly, there is a stream in the literature on access to finance that instead of focusing on a country's financial development, investigates the effect of the presence of foreign banks on the presence of financial constraint in some countries. This literature, on the global scale, provides rather ambiguous evidence on the effect of the presence of foreign banks on access to finance. A large number of literature has found that foreign bank presence is associated with higher access to loans (Clarke, et al., 2006), higher firm-level sales (Giannetti and Ongena, 2009) and lower loan rates and higher firm leverage (Ongena and Popov, 2011). On the other hand, Berger, et al. (2001), Mian (2006), and Gormely (2009) show that foreign

banks tend to finance only larger, established, and more profitable firms. Such evidence is mostly derived from experiences during “good times”. In transition economies, foreign bank entry is rather considered as a motor of financial development and increased access to finance (review of the literature and developments in course of banking sector reforms is presented in section 1.4.)

Transition economies: studies of firm level financing obstacle using enterprise level survey

There is a set of recent empirical studies exploring the financing obstacle in both its determinants and its role in boarded macroeconomic outcomes as indicator of financial development. These studies are all based on the valuable enterprise level survey provided by EBRD and World Bank in several turns from 1999 to 2009 in a wide list of countries, including all transition countries. Gorodnichenko and Schnitzer (2010) examined how financial constraints affect the firm’s innovation activities. Their econometric results based on instrumental variable estimates unambiguously suggest that innovative activities of firms are strongly negatively influenced by financial frictions. They find that one standard deviation of their measures of financial constraints explains around 20% of the observed variation in product and process innovations, and hence the effects are economically highly significant. Moreover, they show that domestically owned firms innovate less and indeed are more likely to be negatively affected in their innovation activities by financial constraints than foreign firms; which helps to explain why domestically owned firms do not catch-up.

Among the private domestically owned firms they find that smaller firms, younger firms, and firms in service sectors are more negatively affected when compared to larger and older firms and firms in the manufacturing sector. They subject the sensitivity of their findings to a variety of robustness checks, controlling, for example, for labor productivity, demand shocks, or collateralization of innovation activities, and find that their results are remarkably robust. Finally, they document that financial frictions measured at the firm level are strongly negatively correlated with the macroeconomic measure for productivity. Thus, their analysis lends support to our argument that financial frictions constitute one potential microeconomic channel, restraining macroeconomic productivity and growth by adversely affecting innovation.

Bernini (2012) contributes to empirical literature on the determinants of financial constraints by testing whether competitive pressure to reduce costs and introduce new products affects

both the firms' credit demand, and their prospects of obtaining loan at favorable conditions. By pooling firm-level observations from the economies of East Europe and Central Asia, the author first investigates the relationship between competitive pressure perceived by the firms' managers and the extent to which financial constraints constitute a problem for their operations. Then, she constructs measures of credit rationing exploiting survey information on the firms' credit status. Heckman selection models are used to investigate separately the correlation between competition, credit demand, and credit supply.

This study also contributes to the empirical literature on trade and financial constraints in two different ways. First, it is shown that domestic competition and credit rationing do not hold for exporters. This result supports the hypothesis that the firms' export status improves ex-post their access to finance. The analysis is conducted on survey data from BEEPS administrated in different waves to over 27,000 manufacturing and service firms from 27 transition economies of Eastern Europe and CIS. BEEPS data have been previously used to study the determinants of credit rationing at the firm-level often incorporating a categorical variable representing the market structure in which borrowers operate on the right hand side of econometric models. However, previous studies have not exploited more specific information in the dataset regarding the importance of domestic and foreign competitive pressure in the firms' decisions to reduce costs and to innovate products. Instead, this study uses this information to capture the effect of competitive pressure on financial constraints, because it is more directly related to firm selection than the number of competitors in the market.

Hashi and Toci (2010) assess the significance and determinants of financing constraints, credit rationing and financing obstacles faced by firms in the SEE region by using a wide range of indicators and a large data set from the three rounds of BEEPS. These indicators include the proportion of investment expenditure financed by internal funds and bank loans, the probability of applying for a loan and being rejected, the probability of being a discouraged borrower and the importance of finance as an obstacle to the growth of firm. The empirical results suggest that the cohort of small firms is relatively more constrained. Compared to the group of larger firms, small firms rely more on internal funds and less on bank loans to finance investment, are less likely to apply for a loan, are more likely to be refused a loan, are more likely to fall within the group of discouraged borrowers, and more likely to face greater difficulties in accessing both short-and long-term loans. Furthermore, finance, high interest rates, and high collateral requirements pose a greater obstacle to the operation and growth of

small firms than larger firms. In terms of ownership, the evidence indicates that foreign-owned firms face lower financing constraints compared to their domestic counterparts and state-owned enterprises (SOEs). This may be explained by their ability to access financial sources from their parent companies and banks in their home countries. The estimates suggest that they do not rely much on the domestic banking sector – presumably because of better financing conditions in their home countries. State-owned firms, on the other hand, seem to face credit constraints from the financial sector, suggesting some hardening of budget constraints in the SEE region, at least in the bank-firm relationship.

There was some support for the ‘bank screening hypothesis’. It was found that more profitable firms, those with better prospects and firms that implement accounting standards, face fewer constraints – implying that banks do engage in screening their applicants to reduce information asymmetries and are able, to some extent, to distinguish ‘good’ from ‘bad’ borrowers. However, the bank screening hypothesis is not the only explanation. To the extent that screening is limited to observable characteristics of firms that make up each risk class, the unobserved heterogeneity remains within each class and credit rationing may still continue. There is also some evidence of self-selection in the credit market since firms with poor prospects do not enter the market (i.e. the likelihood of adverse selection is less than expected). The evidence also suggests that there has been a substantial decrease in financing constraints in all firms than for larger ones, indicating a shift in the lending technology of banks towards the small business sector. This may be a natural evolution, given the dominance of this sector in the countries under investigation.

Radulescu (2010) provide some evidence on the extent and impact of credit rationing in 28 transition countries using firm level data from the EBRD survey (BEEPS). The empirical results show that about 10% of firms in CEE and 25% of firms in CIS are credit constrained. Price constraints are more widespread than quantity constraints, with only 2,6% of firms in CEE and 5,6% in CIS declaring themselves rejected by banks, discouraged or simply not being able to get a loan of the required size and/or maturity. The share of constrained firms appears to be lower in countries that have reformed their banking systems by introducing bank regulation, not just by liberalizing the credit allocation and interest rates. There is evidence of the impact of credit constraints on firm activity, in particular on firm fixed investment, employment growth, propensity to invest in R&D, and to introduce new products and services. At firm level about 9% of fixed investment is shaved off by credit constraints while the negative effect on employment growth is within 15-20%. The effect on introducing new

products is rather more ambiguous, with a conservative estimate of 25% reduction in the propensity to develop new products. Quantity constraints seem to have no impact on R&D spending although price constraints make firms at least 8% less likely to spend.

Finally, a recent World bank study dedicated to the evaluation of how the relevance of main obstacles in firm growth in CEE and Central Asia – such as access to finance, skills and qualifications of labor – and how the quality of infrastructure has evolved with the global crisis, explores the results of the BEEPS survey which was designed to capture the firm's perception of these obstacles. The probit model has been estimated with dependent dummy variables having access to finance being no obstacle as 1 and access to finance qualified as minor, moderate, major or very severe obstacle as 0. The model has been run on a balanced panel of firms participating in three rounds of the survey – 2002, 2005 and 2008. The estimated model exploited a variation over time in the firms' reported financial constraint over the period between the three consecutive surveys.

The estimation results reveal firm size as the key firm characteristic in financial constraint analysis. It was found that being a large firm decreased the probability of finance being an obstacle in the 2002 and 2005 surveys while the interpretation was not so clear for the 2008 turn. Namely, it seemed that in 2008 the large firms were hit more significantly with financial constraint (multiple of year dummy for 2008 and size dummy) while they were still less financially constrained in comparison to the small- and medium-sized firms (Size dummy only). The authors interpret this ambiguous finding by complementing it with the additional estimation of the determinants of loan demand during the crisis using a dummy “applied for loan” being 1. That result indicated that large firms were much more likely to apply for credit in 2002 than others as well as in 2005, while the gap grew significantly larger in 2008 – indicating that the large firms were much more apt than others to apply for external sources of funding in response to the dramatic drop in demand.

Though the description of estimated model states that sector dummies for Manufacturing and Services have been included in the model, besides many relevant factors that we also consider in the further analysis, the reported results omit the resulted coefficients, neither does the discussion relates to this dimension of access to finance. The problematic aspect of this study lies also in the fact that the 2008 survey is considered as incorporating the effects of the crisis completely – while this may not always be the case as many of the countries from the region did not feel the major impact of the crisis before the end 2008 and first quarter of 2009. Also,

the respondent perception of business obstacles may be biased with the past experience rather than the actual moment when the full crisis effects on business operation had not been manifested yet.

Nevertheless, no one of the previously presented empirical researches on firm access to finance considered a sector of business activities as a variable of interest. We find it particularly important given the prevailing economic structure in most of the European transition economies, which is characterized by significant trade deficit and competitiveness of tradable industry, is lagging behind developed European economies. This issue becomes even more relevant in light of the prolonged sovereign debt crisis in the Eurozone putting more pressure on financial independent economies with trade deficit and strong links to core Europe economies.

De Hass and Peeters (2004) investigate the extent to which the financial system in Bulgaria, the Czech Republic, Estonia, Hungary, Poland, Romania, the Slovak Republic, Slovenia, Latvia, and Lithuania have facilitated firms to reach their capital structure targets. The authors use a dynamic capital structure model to study the adjustment process of firms towards their target capital structures. They endogenize both the target leverage ratio and the adjustment speed and apply the model to micro-level data (firm-level) for 10 CEE countries (1993 to 2001). Compared to a static capital structure model, their dynamic model increases the explanatory power significantly. Generalizing the adjustment speed by making it firm-specific and time-specific adds further power, but the importance of this differs across countries.

The data show that actual CEE leverage ratios are mostly still (considerably) below Western standards, although there is a clear upward trend in the leverage of firms in almost all countries. The gradual development of the financial system has enabled firms to reach higher debt levels. Based on estimations, the authors show that in most countries there is also a tendency for firms to gradually bring their actual leverage closer to their internal targets, although adjustment speeds are relatively low. Yet, across the board firms are still underleveraged and in some countries especially small and very small firms have become more underleveraged after the financial crises during the second half of the 1990s. They also find that in several countries, foreign firms have been able to get closer to their targets, or even overshoot them, whereas domestic firms stayed underleveraged. As regards the determinants of the firms' leverage, the authors of the study find differences between countries in regards that explanatory variables are large, implying that capital structure models

are only to a limited extent “portable” across countries. Nevertheless, they find that profitability and age are very robust determinants of target capital structures. These results contribute to the understanding of the role that credit markets are currently playing in CEE.

In particular it follows from the study that (1) firms’ leverage targets are negatively influenced by their profitability and positively by their age, (2) adjustment speeds are relatively low, and that (3) firms that are further away from their leverage target adjust faster than firms that are already close to their target. All three findings point to the importance of information asymmetries between firms and banks, by far the main suppliers of external finance in CEE. As a result, external finance premiums are relatively high, making it rational for especially profitable firms to rely on internal financing. At the same time, such pecking order behavior means that capital structure adjustments are only slowly implemented. Also, firms that are not too far away from their leverage target do not find it worthwhile to get back on track immediately, probably because the costs of doing so outweighs the benefits. Only when firms get too under or overleveraged do they resort to some kind of financial restructuring to get back to their target leverage.

Although the development of the CEE banking systems has enabled firms to reach higher debt levels, bringing them closer to their own targets, the costs associated with external funding are still relatively high. From a policy perspective this means that there seems to be ample room in CEE to further deepen, both quantitatively and qualitatively, the financial systems. This will not only increase the value of firms, but will also stimulate real economic development in these countries. Future research may apply dynamic capital structure models to a wider range of Western (European) countries as well, so that more definite conclusions can be drawn about the relative merits of different financial systems in allowing firms to optimize their value by staying close to their internal leverage targets.

4.2.3. Credit rationing, financial constraint, information asymmetry – theoretical background

Having presented the empirical literature on access to finance and financial constraint, we consider it worth expounding here a few essential principles that rule the creditor-borrower relationship and explain the existence of financial intermediaries. They are two milestone studies on information asymmetry. We will refer to these basic principles in the interpretation of empirical results that follow this literature review.

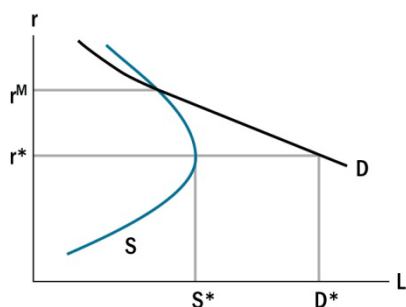
In a famous paper, Stiglitz and Weiss (1981) provide a compelling explanation for why credit markets are different from other markets. They show that information problems can lead to credit rationing even in equilibrium. That is because banks making loans are concerned not only about the interest rate they charge on the loan but also about the riskiness of the loan. Also, the interest rate a bank charges may itself affect the riskiness of the pool of loans, either by attracting high-risk borrowers (adverse selection effect) or by adversely affecting the actions and incentives of borrowers (moral hazard effect). Both effects exist because even after evaluating loan applications, the banks do not have complete information on their borrowers. When the interest rate (price) affects the nature of transaction, market equilibrium may not occur where demand equals supply. The adverse selection aspect of interest rates is a consequence of different borrowers having different probabilities of repaying their loan. The expected return to the bank obviously depends on the probability of repayment, so the bank would like to be able to identify borrowers who are more likely to repay.

It is difficult to identify good borrowers, which is why a bank uses a variety of screening devices, including the interest rate. Those who are willing to pay high interest rates may, on average, be worse risks; they are willing to take higher to gain higher returns if successful, but such high returns are generally associated with a higher probability of failure, making it less likely that the loans will be repaid. The average “riskiness” of those who are ready to borrow increases as the interest rate rises, possibly reducing the bank’s profits. Similarly, as the interest rate and other terms of the contracts, such as collateral requirements, change, the behavior of the borrower is likely to change. Stiglitz and Weiss show that higher interest rates lead to moral hazard, i.e., they induce firms to undertake riskier projects with lower probability of success but higher payoffs when successful. In a world with imperfect and costly information that leads to adverse selection and moral hazard problems, the expected rate of return to the bank will increase less rapidly than the interest rate and, beyond a point, may actually decrease, as shown in FIGURE 4-2.

The interest rate at which the expected return to the bank is maximized, r^* , is the “bank-optimal” rate. The bank will not want to raise the interest above this rate, even though demand may still exceed the funds available for lending. This also suggests that the supply of loans will be backward-bending, at interest rates above r^* . Clearly, it is conceivable that at r^* , the demand for funds (D^*) exceeds the supply of funds (S^*) as shown in FIGURE 4-1. In the absence of rationing, with excess demand for loans, unsatisfied borrowers would offer to pay a higher interest rate to the bank, bidding up the interest rate until demand equals supply at r^m .

Although supply does not equal demand at rate r^* , it is the equilibrium interest rate. Since it is not profitable to raise the interest rate when the bank faces excess demand for credit, the model shows that the bank will deny loans to borrowers who are observationally indistinguishable from those who receive loans. The rejected applicants would not receive a loan even if they offered to pay a higher rate. Hence they are denied access.

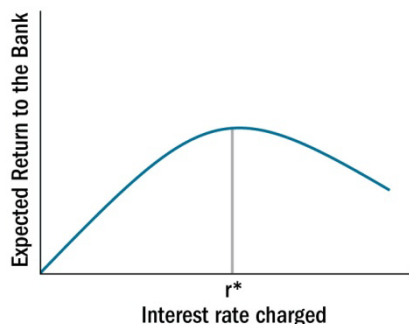
FIGURE 4-1. Supply and demand for loans



Note: D = demand, S = supply; r = interest rate.

Source: Stiglitz and Weiss (1981)

FIGURE 4-2. Expected return for bank with imperfect information



Note: D = demand, S = supply; r = interest rate.

Source: Stiglitz and Weiss (1981)

Akerlof in his famous paper ‘Market for lemons: quality uncertainty and the market mechanism’ (1970), introduces the problem of information asymmetry in the market. He uses the market for used cars as an example of the problem of quality uncertainty. A used car is one in which ownership is transferred from one person to another after a period of use by its first owner and its inevitable wear and tear. There are good used cars (“cherries”) and defective used cars (“lemons”), rated by several not-always-traceable variables such as the owner’s driving style, quality and frequency of maintenance and accident history. Because

many important mechanical parts and other elements are hidden from view and not easily accessible for inspection, the buyer of a car does not know beforehand whether it is a cherry or a lemon. So the buyer's best guess for a given car is that the car is of average quality; accordingly, he/she will be willing to pay for it only the price of a car of known average quality. This means that the owner of a carefully maintained, never-abused, good used car will be unable to get a high enough price to make selling that car worthwhile. Therefore, owners of good cars will not place their cars on the used car market. The withdrawal of good cars reduces the average quality of cars on the market, causing buyers to revise downward their expectations for any given car. This, in turn, motivates the owners of moderately good cars not to sell, and so on. The result is that a market in which there is asymmetric information with respect to quality shows the bad drives out the good.

Suppose we can use some number, q to index the quality of used cars, where q is uniformly distributed over the interval $[0,1]$. The average quality of a used car which could be supplied to the market is therefore $1/2$. There are a large number of buyers looking for cars who are prepared to pay their reservation price of $(3/2)q$ for a car that is of quality q . There are also a large number of sellers who are prepared to sell a car of quality q for the price q . If quality were observable, the price of used cars would therefore be somewhere between q and $(3/2)q$, and the cars would be sold and everyone would be perfectly happy. If the quality of cars is not observable by the buyers, then it seems reasonable for them to estimate the quality of a car offered to market using the average quality of all cars. Based on this estimation, the willingness to pay for any given car will therefore be $(3/2)q_{avg}$, where q_{avg} is the average quality of all the cars. Now, assume that the equilibrium price in the market is some price, p , where $p > 0$. At this price, all the owners of cars with quality less than p will want to offer their cars for sale. Since again, quality is uniformly distributed over the interval from 0 to this p , the average quality of the cars offered for sale at p will be worth only $p/2$. We know however that for an expected quality worth $p/2$, buyers will only be willing to pay $(3/2)(p/2) = (3/4)p$. Therefore, we can conclude that no cars will be sold at p . Because p is any arbitrary positive price, it is shown that no cars will be sold at any positive price at all. The market for used cars collapses when there is asymmetric information.

Having presented the empirical studies and theoretical concepts that are relevant for our research objective, the remainder of this chapter is dedicated to the original empirical analysis.

4.3. Description of the database

In order to examine the determinants of a firm's access to finance and relationship between access to finance and sector of activity, we use the enterprise level data from the Business Environment and Enterprise Performance Survey (BEEPS). BEEPS is a joint initiative of the European bank for Reconstruction and Development and the World Bank. The objective of the BEEPS survey was to obtain feedback from enterprises in the EBRD countries of operation on the state and private sector as well as to help build a reliable dataset which could help to track changes in the business environment in these countries. The entire dataset consists in total of 29,386 interviews of enterprises in 29 transition countries of Europe and CIS, in four turns (1999, 2002, 2005 and 2008/2009), always referring to fiscal year preceding the survey. It was collected on the basis of face-to-face interviews with owners, managers or finance officers via site visits by surveyors trained according to a standardized methodology.

The survey contains very detailed questions on all important elements of enterprise characteristics, performances, as well as their perception of the business environment. Besides general information on business entity, the questionnaire contains sections covering interviewed firm manager's view and company data on infrastructure and services, sales and supplies, the degree of competition, innovation, capacity, inspections, certificate, land and permission, crime, finance, business-government relation, labor, and business environment and performance. The firm level data from BEEPS is combined with country level macroeconomic and financial sector data from EBRD, World Bank, and IMF data basis. These data include per capita GDP, current account deficit, credit to GDP, EBRD transition and financial reforms indices, and share of foreign banks. The aim of use of this kind of country level data is to obtain additional quality of the access to finance determinants.

Respondent firms come from 6 different sectors: construction, manufacturing (11 sub-sectors), transport, wholesale and retail trade, information technology, and hotels and restaurants. It does not include agriculture and mining as well as government departments (military, police, education, health) since there were no up-to-date and reliable statistics relating to that universe in the surveyed countries⁸⁰.

The sample was structured to be representative for each country with specific quotas in terms of region, sector and enterprise size using the variable 'Total sales'. The number of firms

⁸⁰ For details see 'BEEPS 2008-2009, a report on methodology and observations'

covered is roughly proportional to the number of firms in the country, ranging from 260 in Albania to 1592 in Poland. The survey tried to achieve representativeness in terms of the size of the firms it surveyed: between three quarters and nine tenths of the firms surveyed are “small” (less than 20 workers) and only around 5% of the firms surveyed are “large” (more than 100 workers)⁸¹. The survey also aimed to achieve representativeness in terms of private vs. public firms, firms with access to foreign product markets, and firms which receive government subsidies.

For the purpose of our analysis of the credit constraint determinants, we base the estimated model on the three turns of the survey, namely 2002, 2005 and 2008, where the 2008 turn was actually held during late 2007 and during 2008 and 2009, depending on the country. Since the content of the questionnaire in each survey was modified, in order to test the homogenous set of variables we base the unbalanced panel data provided by the EBRD that includes consolidation of the consistent part of the questionnaire over turns of the survey. Out of 29 transition countries from Europe and Asia, the dataset is reduced to 18 European transition economies listed in the appendix at the end of this chapter, in TABLE 4-10 including the overview of the number of firms by country and by year of the survey.

4.4. Estimation methodology, variables definition and results

In this empirical part, on the basis of the presented dataset, we intend to examine the determinants of firm level financing obstacle, on one side, and the characteristics of demand for loans, on the other side. In both estimations we put a special focus on the firm’s industry. In this section, after presenting the equation for the estimated model, we describe the variables. First is presented the construction of all dependent variables used both as proxy for financing obstacle as well as for different sides of demand for loans. After that, we explain the choice and construction of explanatory variables – both the firm level ones as well as country level ones. Finally we present and describe the results including the findings from the estimated model accompanied with some illustrations from simple descriptions of the database.

⁸¹ See <http://www.ebrd.com/country/sector/econo/surveys/beeps.htm> for further detailed reports on the representativeness of the survey

Both in testing the determinants of the access to finance as obstacle and in testing the loan demand, we use the probit estimation technique and estimate the model of the following form:

$$(4.1) \quad Y_i = \alpha + \beta X_i + \lambda S_i + \gamma F_i + \delta C_i + \mu T_i + \varepsilon_i$$

with $i=1, \dots, N$ where N denotes the number of firms. Y is the dummy variable constructed to capture the firm's financial constraint in the first set of estimations while in the second part of the estimations it refers to dummy variables that capture demand for loans. Details on construction of dependent variable alternatives are presented in the next subsection and in the appendix to this chapter (TABLE 4-11). X represents the vector of firm characteristics that includes size, age, percentage of sales exported, foreign ownership, government ownership, variable capturing ISO certification, and dummy variable for audited financial statements. The X vector also includes measure of firm performance such as employment growth as well as market position captured by the pressures from competition and from customers that are observed by the firms. S stands for a sector dummy which is the main variable of interest. F represents a vector of country level characteristics such as financial development, overall level of credit risk, advancement in banking sector reforms and real GDP growth. C is the vector of country dummies for 17 (out of 18) countries covered by the survey. T represents the dummy variable that controls for the timing of the survey. In that respect, in the estimation results presented in this study, we use only the crisis dummy to control for the financial crisis effect on the overall access to finance resulting from a sudden credit crunch. ε is the error term.

4.4.1. Construction of the dependent variables

Indicators of access to finance

In order to estimate the determinants of financial constraint we constructed two alternative indicators: *Access_to_finance_1* and *Access_to_finance_2* based on the available data from the survey. We consider both indicators as good proxies for financial obstacle. The first has better coverage in terms of time as it is represented in all turns of the BEEPS survey (17,758 observations), while the second is included only in last two turns (7,751 observations). The dependent variable (LHS) *Access_to_finance_1* is a dummy which equals 1 if the firm qualified its degree of the access to finance obstacle (which includes availability and cost, interest rates, fees, and collateral requirements) as a 'major obstacle' or a 'very severe obstacle' for the establishment's current operations. It equals 0 for the qualifications: 'no obstacle', 'minor obstacle', or 'moderate obstacle'.

We use another alternative dependent variable for capturing the measure of a firm's financial constraint, *Access_to_finance_2*. It is constructed from the question in which the firm manager is asked about his major obstacle in the business environment. It equals 1 if, among the various alternative answers offered as business obstacles, a firm chooses 'access to finance' as the major one. It equals 0 for any other stated answer from the list. The overview of distribution of answers for the list of obstacles is presented in TABLE 4-1.

Indicators of demand for loans

In order to get more insight into demand for loans, four additional dependent variables are extracted from the survey. These are: *Have_loan*, *No_need_loan*, *Interest_rate_not_favorable*, and *Not_favorable_loan_terms*. *Have_loan* is a dummy variable that equals 1 if a company has a loan or credit line in use at the time of the survey, and 0 otherwise. The following three dependent variables that we use are derived from two related questions from the survey. First is "Did this establishment apply for any line of credit or loan in the fiscal year preceding the survey?" If a firm stated that it did not apply for a loan or a line of credit, then it was asked another question regarding the main reason for that: "What was the main reason why this establishment did not apply for any line of credit or loan in the fiscal year preceding the survey?". The variable *No_need_loan* is constructed in a way that it equals 1 if the company stated that the main reason for not using a loan is that it had no need to take a loan. The last two variables relate to the same question but to another two options. The variable *Interest_rate_not_favorable* is a dummy deducted from the answer that company considers that interest rates are not favorable. *Not_favorable_loan_terms* refers to the answer that other loan terms are not favorable such as maturity, size of loan, and collateral requirements.

4.4.2. Definition of independent variables

Among the explanatory variables, our main variable of interest in this research is the variable *Manufacturing*. It is a dummy derived from the answers to the question on the activity sector of the enterprise, as observed by the interviewer. Since there is often the discordance between the declared industry sector of a company and the factual industry sector of its core operations, we find it more objective to use the observed sector as more probably corresponding to the effective business of the surveyed firm. It equals 1 if the firm operates in the manufacturing industry while all other business sectors are treated as 0. They include: construction, transport, wholesale and retail trade, information technology, and hotels and

restaurants. The summarized statistic on the distribution of dependent variables describing financing obstacle (*Access_to_finance_1* and *Access_to_finance_2*) across categories of the industry sector (variable *Manufacturing*) depicts more frequent problems in access to finance within manufacturing businesses than within other industries, TABLE 4-2.

TABLE 4-2. Access to finance obstacle vs. industry, overview of database

	Manufacturing business		Other industries (non-manufacturing)		All sectors	
	Number of obs.	Share in Total, in %	Number of obs.	Share in Total, in %	Number of obs.	Share in Total, in %
Access to finance is Major obstacle or Very sever obstacle	1,613	24	2,251	20	3,864	22
Access to finance is Moderate obstacle, Minor obstacle of Not an obstacle	5,035	76	8,859	80	13,894	78
Total Access to finance_1	6,648	100	11,110	100	17,758	100
Access to finance is the major business obstacle	501	15	501	11	1,002	13
Access to finance is not the major business obstacle	2,752	85	3,997	89	6,749	87
Total Access to finance_2	3,253	100	4,498	100	7,751	100

Source: BEEPS

We control for all reliable enterprise characteristics available in the questionnaire which could impact its access to finance. Thus, on the RHS, we include the variable *Foreign_capital* for the dominant share of foreign capital in total equity of the company, and the variable *State_capital*, as a dummy variable that relates to the government as dominant owner of the company. The intuition here is that foreign ownership may reduce the companies' financial constraints through access to international capital and by the effect of the reputation of the companies to reduction of the information barrier vis-a-vis bank. With state ownership, the intuition is mixed: it can reduce financing obstacle as a consequence of "soft budget constraint"⁸² but also as a result of implicit state guaranty and better risk perception from the point of view of banks. On the other hand, relatively lower performance of state companies may result in credit rationing by banks and in lower access to credit by some state companies. We also control for the potential illiquidity problems of the company, which could explain its

⁸² Kornai (1979)

access to finance in a way that these problems reflect in increased risk of the company and more difficult access to external finance.

For that purpose, a dummy variable *Overdue utilities or taxes* is constructed. It equals 1 in the cases where a company has overdue payments for 90 days or more for utilities and taxes in the preceding year. We are aware however, that potential endogeneity may occur in case of this variable. Hypothetically, a firm can be late in payments for utilities or taxes due to its difficult access to finance. This should not be a case as ‘overdue payments’ is a fact that relates explicitly to the year prior to survey. On the other hand, the perception of a firm’s manager on business obstacle is rather related to the moment of the survey and possibly relies on a broader horizon of the respondent’s experience. We introduce the size dummies *Small* and *Large*, thus obtaining the marginal effects to the probability of financial constraint versus medium-sized enterprise. The firm is classified as small if it has less than 2 employees and as large if it works with 100 or more employees.

We verify also if the exporting companies benefit from an easier access to finance. For that purpose the variables describing the share of company sales placed to foreign markets in total sales – the variable *Sales exported* – is used. It is expected to find its positive impact to the perception of business performance by the bank as a proxy for an access to foreign market. We control for the pressures of the domestic competitors (variable *Pressures_domestic_competitors*), foreign competitors (*Pressure_foreign_competitors*), and customers (*Pressures_customers*), which represent the answers to the questions of the following type: “How important is pressure from domestic competitors/foreign competitors/customers in affecting decisions to develop new products or services and markets?” We control for the log of the establishment’s age (variable *Ln(old)*) with the intuition that companies with longer history of business may be perceived as more transparent, less risky, and faced with less financial obstacle.

The following two variables also aim to capture the transparency and quality of the firm. First is the variable *Audited financial statements* as a dummy controlling for the fact that the company’s financial statements were audited in the previous fiscal year. The same intuition holds for the control variable *Quality_certification* reflecting the fact that the company has an internationally recognized quality certificate. We control for the growth rate of employees comparing number of employees in the year prior to survey to the level from three years earlier (variable *Employees_growth*). This variable is constructed as the available proxy for

company performance. According to the available content of the survey there is no better way to capture the firm's performance. It is expected to obtain negative effect of the last variable to the probability that the firm is financially constraint.

We also include in the model several measures of country specific macroeconomic and financial development characteristics: natural logarithm of per capita GDP in year before the survey (variable *Ln_GDP_per_capita*) to capture for general income level in the market; credit to GDP (variable *Credit_to_GDP*); number of banks (variable *Ln_nr_banks*) constructed as a natural logarithm of number of banks in the country of observation; and dummy for level of attained banking sector reforms as measured by EBRD banking reform indicator (variable *EBRD_banking_reform_4*), were all introduced to control for the general level of financial development. The last variable for banking sector reforms is a dummy that equals 1 if the indicator in the year preceding the survey is 4 corresponding to the most advanced degree of transition reforms in the field of the banking sector. Among country specific macroeconomic and financial variables in certain specification of the model we also use current account deficit (variable *CAD*), level of non-performing loans (variable *NPL*), and share of foreign banks (variable *Foreign_banks_share*).

Being aware of the fact that the timing of the last BEEPS survey – the year 2008/2009, coincides with the beginning of the financial crisis in developed economies, when the credit crunch may generally have started to transmit to the transition region inducing more constraint on enterprise financing, we control with the *Crisis_dummy* which equals 1 if a survey falls in the last quarter of 2008 and along 2009. The idea is to capture the fact that one of the main crisis transmission channels – financing channel – did have an impact on the firm's perception on access to finance in this period substantially. We introduce country dummies for taking account of the country-specific effect on the access to finance and year dummies to control for time specific effects in different years of the survey.

4.4.3. Results from the empirical estimation

Based on the described database, methodology and constructed variables, we obtain the following estimation results on determinants of financial constraint and we describe some characteristics of demand for loans.

Results for determinants of financial constraint

The estimation strategy consists of the following. First we examine the determinants of firm financial constraint using the variable for financial constraint. We rerun the regression using two alternative dependent variables (*Access_to_finance_1* and *Access_to_finance_2*). The results for the estimation of the variable *Access_to_finance_1* is presented in TABLE 4-3 and TABLE 4-4. Further on, we test the financial obstacle determinants for the subset of firms that do not use any loan or line of credit (condition that variable *Have_loan* is equal 0) in order to get a bit sharper view on the population of firms that are practical out of the credit market. Parts of these firms are simply rationed by banks as too risky. The others do not need external financing while some of them perceive loan supply as inappropriate for their needs. By doing this estimation we try to extract the firm characteristics that increase probability to face financial obstacle. In that way we may describe which kind of companies are more likely to be rationed. We control for all available firm characteristics, as in estimation on full sample. The results are presented in TABLE 4-5.

By running the probit model, we garner strong evidence that the fact that an enterprise operates in the manufacturing industry increases the probability that the enterprise faces the access to finance in all specification of the model. The same finding holds on the sub-sample of firms that do not use any loan or credit line in the time of the survey after controlling for all relevant enterprise characteristics including those that control for a firm's risk and, therefore, the possibility that it is simply rationed by banks. It is not likely that the fact that a company operates in the manufacturing business impacts per se the risk of the business. The significant coefficient for *Manufacturing* in this case may imply that for some other reason the companies in production of tradable goods are relatively more financially constrained than firms in other industries, such as services. The last hypothesis holds only if both manufacturing and other industries' average risk is at a similar level so that the estimation result is not an outcome of the fact that banks ration more manufacturing businesses due to their relatively higher risk than in other industries. We have however controlled for all determinants of risk of a firm that are observable from the available data from the survey.

Other results from the estimation related to controlling the marginal effects of the variables to the probability that a company faces access to finance as an obstacle are mostly in line with the intuition. We arrived at the expected result that small enterprises have more difficulties in accessing finance than medium ones. Similarly, large enterprises are in a more favorable

position than medium and small ones. The last is in line with the literature on SME financing such as Beck and Demirguc-Kunt (2006). The fact that a company exports a larger share of its sales does not have a significant impact to its access to finance. Foreign owned companies have less severe financial constraint than domestic ones. State ownership apparently has no effect on a company's access to finance. In the model specifications using *Access_to_finance_1* the coefficients with *State_capital* are not significant, while in models with *Access_to_finance_2* as dependent variable, the coefficient is positive and significant at 10% or at 5% in some specifications while its value is very low. This finding is in line with intuition that some state companies may have easier access to finance and some others may have it more difficult in comparison to private ones. Another intuitively expected finding is that companies with liquidity problems (overdue payments of utilities and taxes) would face higher probability of being financially constrained.

A company's age has no statistically significant effect on its access to finance. The fact that a company had its financial statements audited by an independent auditor eases its access to finance in models using the first version of the dependent variable with larger coverage while the alternative version of the dependent variable is not influenced by the variable *Audited_financial_statements*. Possession of quality certificates has no effect on access to finance according to the estimation results. *Employees_growth* as a variable that is a proxy for a firm's performance has negative and statistically significant coefficient in models with the dependent variable *Access_to_finance_1*, while coefficients are not significant in any specification using *Access_to_finance_2* as RHS variable. Market pressures that a company faces from competitors, both domestic and foreign, increases the probability of a firm's financial constraint in the model using the first alternative of the dependent variable while in the second alternative it has no statistical significance.

We also control for macroeconomic characteristics as there are 18 countries in the sample with different shapes of their financial systems and economies. These results have shown that companies in countries with higher per capita income and a higher EBRD grade in banking sector reforms and higher level of credit to GDP (only in models with *Access_to_finance_2* as dependent variable) face less probability to encounter financing obstacles. Firms in countries with a higher non-performing loans level face greater financing obstacles. The number of banks has the opposite sign in two specifications of the model using alternative proxies for financing obstacles while the higher level of GDP per capita reduces the probability that the firm faces financing obstacles in the model with *Access_to_finance_1* as the dependent

variable while the coefficient is positive but not significant in the model with *Access_to_finance_2* as the dependent variable. Crisis dummy in some specification had statistically significant and positive marginal impact on firm-level financial constraint probability. We control for country dummies and we report the results in the appendix to this chapter in TABLE 4-15.

TABLE 4-3. Probit model : Dependent variable: Access_to_finance_1, marginal effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Manufacturing_dummy	0.032 (0.007)***	0.049 (0.008)***	0.050 (0.008)***	0.052 (0.008)***	0.051 (0.008)***	0.051 (0.008)***	0.054 (0.008)***	0.039 (0.008)***
Large	-0.030 (0.010)***	-0.022 (0.010)**	-0.022 (0.010)**	-0.020 (0.010)*	-0.020 (0.010)**	-0.022 (0.010)**	-0.017 (0.010)	-0.026 (0.010)***
Small	0.022 (0.008)***	0.018 (0.008)**	0.014 (0.008)*	0.014 (0.008)	0.013 (0.008)	0.014 (0.008)*	0.012 (0.009)	0.016 (0.008)*
Sales_exported	0.000 (0.000)**	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Foreign_capital	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***
State_capital	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Overdue_utilities_taxes	0.148 (0.016)***	0.132 (0.016)***	0.134 (0.016)***	0.132 (0.016)***	0.136 (0.016)***	0.126 (0.016)***	0.113 (0.016)***	0.146 (0.016)***
Ln_old	0.003 (0.005)	0.008 (0.006)	0.005 (0.006)	0.005 (0.006)	0.004 (0.006)	0.003 (0.006)	0.002 (0.006)	0.002 (0.005)
Pressure_domestic_competitors	0.025 (0.009)***	0.025 (0.009)***	0.023 (0.009)***	0.023 (0.009)**	0.022 (0.009)**	0.018 (0.009)**	0.023 (0.009)**	0.021 (0.009)**
Pressure_foreign_competitors	0.040 (0.009)***	0.043 (0.009)***	0.043 (0.009)***	0.042 (0.009)***	0.043 (0.009)***	0.042 (0.009)***	0.036 (0.009)***	0.045 (0.009)***
Pressure_customers	0.003 (0.009)	0.002 (0.009)	0.002 (0.009)	0.002 (0.009)	0.002 (0.009)	0.001 (0.009)	0.003 (0.009)	0.000 (0.009)
Audited_financial_statements	-0.013 (0.008)*	-0.033 (0.007)***	-0.035 (0.008)***	-0.037 (0.007)***	-0.038 (0.007)***	-0.029 (0.008)***	-0.033 (0.008)***	-0.029 (0.007)***
Quality_certification	0.005 (0.009)	0.010 (0.009)	0.005 (0.009)	0.005 (0.009)	0.005 (0.009)	0.007 (0.009)	0.007 (0.009)	0.004 (0.009)
Employees_growth	-0.020 (0.007)***	-0.027 (0.007)***	-0.024 (0.007)***	-0.024 (0.007)***	-0.024 (0.007)***	-0.027 (0.007)***	-0.024 (0.007)***	-0.019 (0.007)***
Crises_dummy	0.039 (0.009)***	0.026 (0.009)***	0.018 (0.008)**	0.020 (0.009)**	0.017 (0.008)*	0.018 (0.008)**	0.019 (0.009)**	0.036 (0.009)***
Ln_GDP_per_capita		-0.034 (0.005)***						
Foreign_banks_share			-0.001 (0.000)***					
Credit_to_GDP				-0.001 (0.000)***				
CAD					0.001 (0.000)***			
EBRD_banking_reform_4						-0.072 (0.007)***		
NPL							0.002 (0.000)***	
Ln_nr_banks								0.072 (0.005)***
Observations	15,199	14,548	14,541	14,541	14,548	14,524	13,753	14,541
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
pseudo R ²	0.05	0.03	0.03	0.03	0.03	0.03	0.02	0.04

* p<0.1; ** p<0.05; *** p<0.01

TABLE 4-4. Probit model: Dependent variable: Access_to_finance_2, marginal effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Manufacturing_dummy	0.048 (0.009)***	0.042 (0.010)***	0.042 (0.010)***	0.043 (0.010)***	0.043 (0.010)***	0.044 (0.009)***	0.042 (0.010)***	0.046 (0.010)***
Large	0.005 (0.012)	0.003 (0.012)	0.003 (0.012)	0.003 (0.012)	0.000 (0.012)	0.004 (0.012)	0.008 (0.013)	0.005 (0.012)
Small	0.021 (0.010)**	0.021 (0.010)**	0.021 (0.010)**	0.022 (0.010)**	0.018 (0.010)*	0.023 (0.010)**	0.019 (0.011)*	0.021 (0.010)**
Sales_exported	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Foreign_capital	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***
State_capital	0.001 (0.000)	0.001 (0.000)	0.001 (0.000)	0.001 (0.000)	0.001 (0.000)	0.001 (0.000)	0.001 (0.000)	0.001 (0.000)
Overdue_utilities_taxes	0.059 (0.023)**	0.049 (0.023)**	0.050 (0.023)**	0.046 (0.023)**	0.052 (0.023)**	0.059 (0.022)***	0.034 (0.024)	0.050 (0.023)**
Ln_old	-0.003 (0.006)	0.004 (0.006)	0.004 (0.006)	0.004 (0.006)	0.003 (0.006)	0.003 (0.006)	-0.001 (0.006)	0.004 (0.006)
Pressure_domestic_competitors	0.001 (0.013)	-0.012 (0.012)	-0.012 (0.013)	-0.011 (0.012)	-0.014 (0.013)	-0.015 (0.012)	-0.012 (0.013)	-0.003 (0.013)
Pressure_foreign_competitors	0.009 (0.012)	0.005 (0.013)	0.005 (0.013)	0.004 (0.013)	0.004 (0.013)	0.009 (0.013)	0.009 (0.013)	0.006 (0.013)
Pressure_customers	-0.003 (0.012)	-0.008 (0.012)	-0.008 (0.012)	-0.006 (0.012)	-0.009 (0.012)	-0.012 (0.012)	-0.009 (0.013)	-0.003 (0.012)
Audited_financial_statements	0.014 (0.010)	0.009 (0.009)	0.009 (0.010)	0.011 (0.010)	0.011 (0.010)	0.011 (0.009)	0.006 (0.010)	0.007 (0.009)
Quality_certification	0.006 (0.010)	0.004 (0.010)	0.004 (0.010)	0.005 (0.010)	0.005 (0.010)	0.007 (0.010)	0.004 (0.010)	0.003 (0.010)
Employees_growth	-0.005 (0.009)	-0.005 (0.009)	-0.005 (0.009)	-0.005 (0.009)	-0.003 (0.009)	-0.004 (0.009)	-0.010 (0.009)	-0.007 (0.009)
Crises_dummy	0.033 (0.018)*	0.024 (0.011)**	0.023 (0.010)**	0.016 (0.011)	0.021 (0.010)**	0.021 (0.010)**	0.010 (0.011)	0.003 (0.012)
Ln_GDP_per_capita		-0.004 (0.007)						
Foreign_banks_share			-0.000 (0.000)					
Credit_to_GDP				-0.001 (0.000)***				
CAD					0.002 (0.001)***			
EBRD_banking_reform_4						-0.027 (0.009)***		
NPL							0.013 (0.002)***	
Ln_nr_banks								-0.025 (0.008)***
Observations	6,173	6,065	6,065	6,065	5,983	6,255	5,747	6,065
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
pseudo R ²	0.04	0.01	0.01	0.02	0.02	0.02	0.02	0.02

* p<0.1; ** p<0.05; *** p<0.01

TABLE 4-5. Distribution of observation of 'Access to finance' as business obstacle across firms split by their use of loan financing

	Have a loan		Do not have a loan		Total	
	Number of obs.	Share in Total, in %	Number of obs.	Share in Total, in %	Number of obs.	Share in Total, in %
Access to finance is Major obstacle or Very sever obstacle	1,031	25	726	20	1,757	23
Access to finance is Moderate obstacle, Minor obstacle of Not an obstacle	3,074	75	2,824	80	5,898	77
Total Access to finance_1	4,105	100	3,550	100	7,655	100
Access to finance is the major business obstacle	648	16	347	10	995	13
Access to finance is not the major business obstacle	3,457	84	3,203	90	6,660	87
Total Access to finance_2	4,105	100	3,550	100	7,655	100

Source: BEEPS

TABLE 4-6. Probit model on sub-sample of firms that do not use a loan or a credit line: marginal effects

	Dependent variable: Access_to_finance_1	Dependent variable: Access_to_finance_2
	(1)	(2)
Manufacturing_dummy	0.042 (0.016)***	0.040 (0.012)***
Large	-0.047 (0.022)**	0.008 (0.018)
Small	0.027 (0.017)	0.027 (0.012)**
Sales_exported	0.000 (0.000)	-0.000 (0.000)
Foreign_capital	-0.001 (0.000)***	-0.001 (0.000)**
State_capital	0.003 (0.001)***	0.001 (0.001)
Overdue_utilities_taxes	0.070 (0.041)*	0.033 (0.031)
Ln_old	0.008 (0.010)	-0.009 (0.008)
Pressure_domestic_competitors	0.046 (0.022)**	-0.003 (0.016)
Pressure_foreign_competitors	0.021 (0.022)	-0.014 (0.015)
Pressure_customers	0.007 (0.022)	0.012 (0.016)
Audited_financial_statements	-0.028 (0.017)*	-0.016 (0.012)
Quality_certification	0.018 (0.020)	0.018 (0.014)
Employees_growth	-0.027 (0.016)*	-0.017 (0.012)
Crises_dummy	-0.056 (0.037)	0.025 (0.022)
Observations	2,828	2,828
Prob > chi2	0.0000	0.0000
pseudo R ²	0.08	0.05

* p<0.1; ** p<0.05; *** p<0.01

Results for determinants of loan demand

We also test for the characteristics of the probability that a firm uses a loan or a credit line by running the probit model using as dependent variable *Have_loan* and testing for all relevant firm characteristics. This exercise gives some insight into the shape of the demand for loans that is financed by banks, i.e., that are not constrained on external financing – loans and credit lines. In order to test the characteristics of the unconstrained firms which do not appear in the demand for loans, we run the probit model estimation using *No_need_loan* as LHS variable. Additionally, we analyze the determinants of the probability that a firm declares the price barrier in access to finance, using *Interest_rates_not_favorable*. Finally, we add another barrier aside from the price obstacle. We test for other terms of loan supply that are perceived as not favorable and that leaves firms out of demand for loans. The dependent variable relates to the terms of loan supply: ‘loan size or maturity is insufficient’ and ‘collateral requirements are too high’ translated into dummy variable *Not_favorable_loan_terms*. The results of the estimation are presented in TABLE 4-8.

From the summary of answers on reasons for not applying for a loan or a credit line, across the variable *Manufacturing*, presented in TABLE 4-7, we already record the less represented answer that a firm does not need a loan, with 66.8% for manufacturing businesses against the 72.9% of other industries, on the sample of 6,966 firms from the transition countries in Europe that did not apply for a loan in the year prior to the year of the survey.

We find from estimation of the determinants of variable *Have_loan* (TABLE 4-8) strong evidence in support of the fact that manufacturing firms are more probable borrowers on the existing loans pointing to the fundamental importance for this industry to have adequate access to finance in order to develop the businesses. The same is confirmed from the estimation of the probability that the company does not need a loan (variable *No_need_loan*). Namely, the firm operating in the manufacturing business is less likely to ‘need no loan’ as the reason for not having applied for a loan. This result is statistically significant. Moreover, testing the determinants of the probability that the reason for not having a loan is because of too high interest rates and unfavorable loan terms such as maturity, loan size, and collateral requirement, result in the same line of arguments. Manufacturing businesses are more likely to face these obstacles.

TABLE 4-7. Distribution of answers on reasons why firm did not apply for a loan or a credit line – by business sector (manufacturing and other industries)

	Manufacturing business		Other industries (non-manufacturing)		All sectors	
	Number of obs.	Share in Total, in %	Number of obs.	Share in Total, in %	Number of obs.	Share in Total, in %
"What was the main reason why this establishment did not apply for any line of credit or loan in fiscal year preceding the year of survey?"						
Application procedures for loans or lines of credit are complicate	135	5.0	203	4.7	338	4.9
Collateral requirements are too high	142	5.3	141	3.3	283	4.1
Did not think it would be approved	69	2.6	96	2.2	165	2.4
Don't know	60	2.2	103	2.4	163	2.3
Interest rates are not favorable	367	13.7	450	10.5	817	11.7
It is necessary to make informal payments to get bank loans	24	0.9	12	0.3	36	0.5
No need for a loan - establishment has sufficient capital	1,787	66.8	3,126	72.9	4,913	70.5
Other	71	2.7	130	3.0	201	2.9
Size of loan or maturity are insufficient	21	0.8	29	0.7	50	0.7
Total	2,676	100	4,290	100	6,966	100

Source: BEEPS

Among other results on the impact of explanatory variables in the models is evidence that small firms are less likely to use a loan and less likely to need a loan contributing to the conclusion that the financial system is set in a way that small firms face more financing obstacles. Foreign-owned firms are less likely to use a loan, probably in line with the fact that FDI's have access to capital from their owners and rely less on external financing. This result is coherent with the result on specific reasons for not having applied for a loan. Namely, foreign firms are more likely to answer that they need no loan while they are less likely to find interest rates as too high and other loan terms as not favorable. This finding corresponds to the hypothesis that foreign companies are more in a position to get better loan terms or to take cross-border loans at more favorable interest rates. The last explanation is also coherent with the results and interpretations of the model presented in Chapter 2, with the reference to the theoretical model (Dell'Ariccia and Marquez, 2003).

TABLE 4-8. Probit model for determinants of loan demand: marginal effects

	Dependent variable: Have_loan	Dependent variable: No_need_loan	Dependent variable: Interest_rates _not_favorable	Dependent variable: Not_favourable _loan_terms
	(1)	(2)	(3)	(4)
Manufacturing_dummy	0.034 (0.015)**	-0.062 (0.014)***	0.026 (0.009)***	0.046 (0.011)***
Large	0.100 (0.019)***	0.035 (0.019)*	-0.020 (0.012)	-0.026 (0.015)*
Small	-0.157 (0.016)***	-0.040 (0.015)***	0.021 (0.010)**	0.036 (0.012)***
Sales_exported	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Foreign_capital	-0.002 (0.000)***	0.001 (0.000)***	-0.001 (0.000)***	-0.001 (0.000)***
State_capital	-0.002 (0.001)***	-0.001 (0.000)*	-0.001 (0.000)***	-0.000 (0.000)
Overdue_utilities_taxes	0.071 (0.033)**	-0.215 (0.036)***	-0.007 (0.020)	0.080 (0.030)***
Ln_old	0.019 (0.010)*	-0.008 (0.010)	-0.003 (0.006)	-0.003 (0.008)
Pressure_domestic_com	0.014 (0.020)	-0.016 (0.017)	0.017 (0.011)	0.028 (0.014)**
Pressure_foreign_compe	0.010 (0.020)	0.004 (0.017)	-0.020 (0.011)*	-0.027 (0.013)**
Pressure_customers	0.003 (0.020)	-0.014 (0.017)	0.018 (0.012)	0.021 (0.014)
Audited_financial_state	0.052 (0.015)***	0.043 (0.014)***	-0.006 (0.009)	-0.013 (0.011)
Quality_certificate	0.026 (0.016)	0.049 (0.016)***	-0.029 (0.010)***	-0.043 (0.012)***
Employees_growth	0.101 (0.015)***	0.036 (0.013)***	-0.010 (0.009)	-0.014 (0.011)
Crisis_dummy	0.014 (0.032)	-0.025 (0.019)	0.011 (0.012)	0.010 (0.015)
Credit_to_GDP	0.001 (0.001)***	-0.004 (0.001)***	0.001 (0.000)**	0.003 (0.001)***
Observations	5,948	5,494	5,583	5,583
Prob > chi2	0.0000	0.0000	0.0000	0.0000
pseudo R ²	0.10	0.07	0.09	0.08

* p<0.1; ** p<0.05; *** p<0.01

TABLE 4-9. Distribution of observations on reasons for not applying for a loan across the status of existing external debt

	Have a loan		Do not have a loan		Total	
	Num. of obs.	Share in Total, in %	Num. of obs.	Share in Total, in %	Num. of obs.	Share in Total, in %
"What was the main reason why this establishment did not apply for any line of credit or loan in fiscal year preceding the year of survey?"						
Application procedures for loans or lines of credit are complicate	56	3.8	167	5.3	223	4.8
Collateral requirements are too high	47	3.2	152	4.8	199	4.3
Did not think it would be approved	53	3.6	63	2.0	116	2.5
Don't know	69	4.7	53	1.7	122	2.6
Interest rates are not favorable	133	9.1	470	14.9	603	13.1
It is necessary to make informal payments to get bank loans	18	1.2	17	0.5	35	0.8
No need for a loan - establishment has sufficient capital	1,001	68.4	2,117	67.3	3,118	67.7
Other	71	4.8	71	2.3	142	3.1
Size of loan or maturity are insufficient	16	1.1	34	1.1	50	1.1
Total	1,464	100	3,144	100	4,608	100

Source: BEEPS

4.5. Discussion of results, conclusion, and policy implications

The empirical estimation presented in the previous section provides strong evidence on the representative sample of firms in 18 European transition countries, that manufacturing firms face relatively more problems in accessing finance for their businesses than other sectors. The result is robust after controlling for the firm's size, owner (state, private or foreign), transparency (quality of accounting and possession of quality certificates), pressures from competition on the local and international markets, age, ownership, and country-level characteristic of the financial system. The same finding is confirmed on the sub-sample of companies that not use a loan. By running separate models for determinants of the probability that a firm uses a bank loan it was revealed that manufacturing businesses rely more on bank loans. Further on, by testing the determinants of the likelihood that a firm uses a bank loan, we obtained the statistically significant result that manufacturing businesses rely relatively more on external financing. By testing the reasons for the absence of demand for loans on the subsample of firms that did not ask for a loan or a credit line in the year preceding the survey, the evidence points to the fact that manufacturing firms are less likely to answer that they do

not need a loan, while they are more likely to face obstacles in the price of borrowing and in other terms.

How can the finding that manufacturing businesses face more financial constraint in transition economies be interpreted? The supply of loans is determined by the banking sector situation and the last was critically influenced by inflows of foreign capital which was relatively cheap during the observed period (except in late 2008 and 2009, and we control for that) and of the relatively short-term. On the other side, local deposits by citizens are also of relatively short-term. One of possible constraints may be found in the fact that the supply of loans is consequently of relatively short maturity. The last may not match with the financial needs of manufacturing businesses (they may need long-term investment loans). Another – price explanation (as evidenced also from empirical estimation) may result in the following mechanism. The interpretation is based on the information asymmetry theory. Since the majority of loans are intermediated by foreign banks, as uninformed lenders, these banks account in their cost of capital a certain market risk. The expected return on investment by an uninformed foreign investor in emerging markets is closely related to the sovereign rating of the country. Since there is no perfect solution to price the risk of an investment in the economies with underdeveloped financial markets and scarce information, most of the recommended models for calculating the expected return (cost of capital) consist of including the risk premium for the country risk corresponding to the sovereign rating. Thus, the overall risk of the economy is assigned to all potential investments to businesses in that economy. Moreover, additional premiums for specific sectors of the economy from developed markets are usually added to the risk free interest rate from developed markets⁸³.

This risk, preliminarily priced as a high one, faces some lenders from lower risk businesses (lower return rates, and longer periods of return of investment, such as most of the manufacturing industry, but probably less risk in terms of long-term volatility) with discouraging costs of borrowing and leaves them out of the lending market. This expected return translated into lending interest rates could induce the well known “lemon problem”⁸⁴ on the lending market where less risky (less profitable) borrowers get out from the market when they are offered an interest rate on external financing corresponding to the average risk. This interest rate is probably unbearable for enterprises in sectors of activity where periods of return of investment are longer and returns are lower, but more stable and less risky

⁸³ F. Bancel and T. Perrotin, 1999 ; Vernimmen, 2006

⁸⁴ Akerlof, 1970

comparing to the overall country/market risk. It can be the case of the manufacturing industry in transition countries which accounts for the major part of exports at the same time.

In other words, the overall price of financing may have been too high for the majority of manufacturing businesses. Namely, the manufacturing businesses are not equally profitable (at least not in the short run) as the real estate, construction, or trade businesses (in the period of boom in demand and consumption) but need a longer perspective for the development of investment and market for products. Thus, we might have witnessed a 'lemon problem' phenomenon during the financial expansion period. At the same time the supply of loans was abundant but given its relatively high price levels, the 'good risks' were out of the market demand as the interest rate level was unbearable for their businesses. Those businesses that could estimate by themselves the burden of loan financing to their cash flow were 'good risks'. On the other hand, more profitable businesses at the time (but more volatile once the crisis hit) or those unable to estimate their future cash flow once they borrow from a bank, were on the demand for loans side.

The relative interest rate level was high as a result of information asymmetry. Namely, by the rules of the financial markets, once a country is not in good macroeconomic shape it receives a lower rating, which implies a spread on the risk free rate. This spread is lowest for sovereign debt, and builds on top of that for other businesses and citizens in that country. Besides a higher interest rate induced from the higher country spread, the market power in some market segments (of less transparent borrowers) registered and described in the Chapter 2. , may also result in a certain mark-up, i.e. in higher rates as a result of the market power of banks versus certain client categories. This last finding is probably in line with the main hypothesis in the explanation behind the financial constraint of manufacturing businesses.

Translating the last phenomena on the macroeconomic scale, this distortion in the lending market may push uneven growth in sectors with higher returns (able to pay high interest rates). These are more likely services sectors, which unlike manufacturing sectors do not participate in the overall exports of the country. In that way, besides pushing growth, this mechanism also contributes to unsustainable levels of the current account deficits in these countries, which, together with high levels of accumulated external debt, create the high external financing needs of these countries, all three variables being strong determinants of the country's risk perception by international rating agencies.

One interpretation of these findings is that finance does matter for growth as an uneven development of tradable and non-tradable sectors in transition economies in the period of large financial inflows reflected in current account deficits. We may suppose that at least part of the origin of these deficits was in uneven access to finance. Further investigation of reasons within the access to finance obstacle is necessary. It may have something to do with the specific features of financial intermediation in transition economies during the credit expansion.

We have brought here some insights that could generate specific policies aimed at helping the problem of information asymmetry in pricing the lower risks in transition economies. If the proposed mechanism is in place in transition economies, it opens a new stream for future research. Moreover, it offers a valuable path for innovative policies solutions in transition countries, which could help mitigate the accumulated macroeconomic imbalances and provide the environment for future economic development based on financial integration at the same time.

One of the possible solutions that naturally emerge would be the reconsidering of the role of the state in financial intermediation in these countries. We are all aware of the benefits of denationalization of the banking sector in transition economies and the withdrawal of the state from direct impact on lending through the monetary policy, as was the case before the transition was launched. Nevertheless, the idea of the state action in helping the access to finance of the private sector in developing countries is not novel or unconsidered. Yet, the recent empirical analysis and discussion papers are rather in favor of some kind of soft state intervention ('visible hand') in the form of rules and regulation that promote, indirectly, the access to finance of informationally opaque but valuable projects⁸⁵.

The policies should aim to mitigate information asymmetry, but also to correct for evident market failures. The inflowing capital maturity is to the large extent determined by the risk perception, same as the level of calculated risk spread in the price of financing. The country risk is in large part determined by the current account deficit level (higher deficit result in lower rating and higher spread). Another important element of rating is a fiscal deficit and political stability. The last create a vicious cycle of uneven access to finance, expensive finance, foreign investors' perception of high country risk and consequent expensive foreign borrowing and maturity structure of inflowing capital in favor of the short-term over the long-

⁸⁵ De la Torre, et al. 2007

term. The exit from the vicious cycle is in political and institutional stabilization, but also in rebalancing of the economy. Special attention should be directed into tradable sector financing. Further investigation is needed to verify the last interpretation of results and to design policies that target the specific market failures.

Appendix to Chapter 4.

TABLE 4-10. Survey coverage by country and year

	Year of survey					Total obs. by country
	2002	2005	2007	2008	2009	
Albania	170	204	304	0	54	732
Bosnia	182	200	0	0	361	743
Bulgaria	250	300	1,015	0	288	1,853
Croatia	187	236	633	0	104	1,160
Czech Republic	268	343	0	0	250	861
Estonia	170	219	0	0	273	662
FYROM	170	200	0	0	366	736
Hungary	250	610	0	0	291	1,151
Latvia	176	205	0	0	271	652
Lithuania	200	205	0	0	276	681
Moldova	174	350	0	0	363	887
Montenegro	20	17	0	0	116	153
Poland	500	975	0	0	455	1,930
Romania	255	600	0	0	541	1,396
Serbia	230	283	0	0	388	901
Slovakia	170	220	0	0	275	665
Slovenia	188	223	0	0	276	687
Ukraine	463	594	0	851	0	1,908
Total obs. by year	4,023	5,984	1,952	851	4,948	17,758

Source: BEEPS, own calculations

TABLE 4-11. Definitions of dependent variables

Dependent variable name	Definition
Access to finance_1	Question: "Is Access to finance, which includes availability and cost, interest rates, fees and collateral requirements, No Obstacle, a Minor Obstacle, a Moderate Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment?", dummy variable = 1 for Major Obstacle and Very Severe Obstacle, and =0 for other answers.
Access to finance_2	Question: "Which of the following elements of the business environment, if any, currently represents the biggest obstacle faced by this establishments." Dummy variable = 1 for Access to finance, and =0 for all other elements answered: Access to land, Business licensing and permits, Corruption, Courts, Crime, theft and disorder, Customs and trade regulations, Electricity, Inadequately educated workforce, Labor regulations, Political instability, Practices of competitors in the informal sector, Tax administration, Tax rates, Transport.
Have_loan	Dummy =1 if at the time of the survey the establishment have a line of credit or a loan from a financial institution, =0 if not.
No_need_loan	Question: "What was the main reason why this establishment did not apply for any line of credit or loan in /fiscal year preceding the survey/?", Dummy variable =1 for answer "No need for a loan - establishment has sufficient capital"
Interest_rates_not_favorable	Question: "What was the main reason why this establishment did not apply for any line of credit or loan in /fiscal year preceding the survey/?", Dummy variable =1 for answer "Interest rates are not favorable", =0 for all other answers. Variable covers only the subsample of firms with answers to this question different from "No need for a loan -- establishment has sufficient capital".
Not_favourable_loan_terms	Question: "What was the main reason why this establishment did not apply for any line of credit or loan in /fiscal year preceding the survey/?", Dummy variable =1 for answer "Interest rates are not favorable" or " Collateral requirements are too high" or "Size of loan and maturity are insufficient", =0 for all other answers. Variable covers only the subsample of firms with answers to this question different from "No need for a loan -- establishment has sufficient capital".

TABLE 4-12. Definition of independent variables

Variable	Definition
Manufacturing_dummy	Dummy variable equals 1 if the firm operates in the manufacturing industry and equals 0 for services firms.
Large	Dummy variable equals 1 for firms with 100 and more employees and 0 for less than 100.
Small	Dummy variable equals 1 for firms with 19 and less employees.
Sales_exported	% share of total sales that is exported.
Foreign_capital	Percent of the firm owned by foreign individuals, companies or organizations.
State_capital	Percent of the firm owned by Government/State.
Overdue_utilities_taxes	Dummy variable assigned a value 1 if the establishment currently have any payments overdue by more than 90 days for utilities or taxes, zero otherwise.
Ln_old	Log of the age of operations of the firm.
Pressure_domestic_competitors	Dummy assigned 1 if pressure from domestic competitors is affecting the firm's decisions to develop new products or services and markets is qualified as very important or fairly important, zero otherwise.
Pressure_foreign_competitors	Dummy assigned 1 if pressure from foreign competitors is affecting the firm's decisions to develop new products or services and markets is qualified as very important or fairly important, zero otherwise.
Pressure_customers	Dummy assigned 1 if pressure from customers is affecting the firm's decisions to develop new products or services and markets is qualified as very important or fairly important, zero otherwise.
Audited_financial_statements	Dummy assigned 1 if
Quality_certificate	Dummy assigned 1 if the firm has an internationally-recognized quality certification, zero otherwise.
Employees_growth	Growth rate of the number of employees between previous fiscal year and 3 years before the previous fiscal year.
Crisis_dummy	Dummy variable assigned a value 1 for the time of the interview falling in 2008:q4 and in 2009, 0 otherwise.
Ln_GDP_per_capita	Logarithm of the respective country per capita GDP in the year preceding the survey.
Ln_nr_banks	Logarithm of the number of banks in the respective country.
Credit_to_GDP	Credit to private sector, in % of GDP
NPL	Non-performin loans, in % of total loan
Foreign_banks_share	Share of assets held by foreign banks in total banking sector assets, in %.
CA	Current account balance, in % of GDP. Positive for surplus and negative values for deficit.
EBRD_banking_reform_4	Dummy variable assigned 1 for value 4 of EBRD indicator of banking sector reform, zero otherwise.

TABLE 4-13. Variables descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Access to finance_1	17,618	0.216	0.412	0.0	1.0
Access to finance_2	17,618	0.448	0.497	0.0	1.0
Access to finance_3	13,595	0.073	0.260	0.0	1.0
Have_loan	7,761	0.128	0.334	0.0	1.0
No_need_loan	6,829	0.724	0.447	0.0	1.0
Interest_rates_not_favorable	14,850	0.024	0.154	0.0	1.0
Not_favourable_loan_terms	7,000	0.114	0.317	0.0	1.0
Manufacturing_dummy	17,618	0.368	0.482	0.0	1.0
Large	17,618	0.220	0.414	0.0	1.0
Small	17,618	0.484	0.500	0.0	1.0
Sales_exported	17,555	13.222	27.616	0.0	100.0
Foreign_capital	17,151	10.524	28.664	0.0	100.0
State_capital	17,145	6.453	23.353	0.0	100.0
Overdue_utilities_taxes	17,618	0.070	0.255	0.0	1.0
Ln_old	17,605	2.684	0.790	0.0	7.6
Pressure_domestic_competitors	17,529	0.611	0.488	0.0	1.0
Pressure_foreign_competitors	17,401	0.431	0.495	0.0	1.0
Pressure_customers	17,490	0.518	0.500	0.0	1.0
Audited_financial_statements	17,155	0.495	0.500	0.0	1.0
Quality_certificate	17,256	0.214	0.410	0.0	1.0
Employees_growth	16,582	0.117	0.506	-6.2	5.1
Crisis_dummy	17,618	0.260	0.439	0.0	1.0
Ln_GDP_per_capita	16,757	8.222	0.719	6.7	9.7
Ln_nr_banks	16,737	3.566	0.713	1.9	5.2
Credit_to_GDP	16,737	38.940	20.257	5.8	88.3
NPL	15,836	6.525	7.208	0.3	44.1
Foreign_banks_share	16,737	67.072	25.533	12.1	99.0
CAD	16,757	-8.671	7.997	-39.5	10.7
EBRD_banking_reform_4	17,618	0.346	0.476	0.0	1.0

Source: BEEPS, own calculations

TABLE 4-14. Correlation matrix of variables

	Access to finance_1	Access to finance_2	Access to finance_3	Have_loan	No_need_loan	Interest_rates_n ot_favorable	Not_favourable _loan_terms	Manufacturing_ dummy	Large	Small	Sales_exported	Foreign_capital	State_capital	Overdue_utilitie s_taxes	Pressure_domest ic_competitors	Pressure_foreig n_competitors	Pressure_custo mers	Audited_financi al_statements	Quality_certifica te	Employees_gro wth	Crisis_dummy	Ln_GDP_per_ca pita	Ln_nr_banks	Credit_to_GDP	NPL	Foreign_banks_ share	EBRD_banking_ reform_4	EBRD_banking_ reform_1_2		
Access to finance_1	1																													
Access to finance_2	0.5834*	1																												
Access to finance_3	0.2256*	0.2140*	1																											
Have_loan	0.0480*	0.1058*	0.0807*	1																										
No_need_loan	-0.3137*	-0.3213*	-0.1840*	0.0296*	1																									
Interest_rates_not_favorable	0.0882*	0.0802*	0.1233*	0.0910*		1																								
Not_favourable_loan_terms	0.1691*	0.1848*	0.0622*	-0.0752*	-0.5878*		1																							
Rejected_loan	0.2621*	0.2637*	0.1371*	-0.0850*	-0.7250*		0.8115*																							
Manufacturing_dummy	0.0499*	0.0622*	0.0616*	0.0279*	-0.0750*	0.0082	0.0534*	1																						
Large	-0.0405*	-0.0317*	0.0121	0.1621*	0.0693*	0.0225*	-0.0700*	0.1169*	1																					
Small	0.0351*	0.0184*	-0.0231*	-0.1955*	-0.0758*	-0.0290*	0.0650*	-0.1626*	-0.5135*	1																				
Sales_exported	-0.0192*	-0.0133	0.0252*	0.0535*	0.0503*	0.0105	-0.0318*	0.2630*	0.2449*	-0.2409*	1																			
Foreign_capital	-0.0741*	-0.0859*	-0.0403*	-0.0384*	0.1132*	-0.0226*	-0.0740*	0.0262*	0.1753*	-0.1560*	0.2438*	1																		
State_capital	0.0022	-0.0203*	-0.0386*	0.0047	0.0071	-0.0221*	-0.0593*	-0.0645*	0.1975*	-0.1775*	-0.0076	-0.0836*	1																	
Overdue_utilities_taxes	0.0836*	0.0879*	0.0191*	0.0267*	-0.0876*	0.0646*	0.0013	0.0053	0.0438*	-0.0422*	0.0064	-0.0297*	0.0999*	1																
Ln_old	0.0016	-0.0043	-0.0198*	0.0896*	-0.0056	-0.0153	-0.0335*	0.0567*	0.2596*	-0.2214*	0.0517*	-0.0540*	0.2771*	0.0741*	1															
Pressure_domestic_competitors	0.0639*	0.0862*	-0.0578*	0.0201	-0.0214	0.0133	0.0355*	-0.0876*	-0.0439*	0.0462*	-0.1594*	-0.0454*	-0.0428*	0.0408*	0.0354*	1														
Pressure_foreign_competitors	0.0695*	0.0883*	-0.0385*	0.0390*	-0.0186	0.0123	0.017	0.0066	0.0212*	-0.0161*	-0.0088	0.0335*	-0.0356*	0.0264*	0.0468*	0.5341*	1													
Pressure_customers	0.0486*	0.0583*	-0.0541*	0.0221	-0.0246*	0.0088	0.0324*	-0.0491*	-0.0154*	0.0327*	-0.0918*	-0.015	-0.0101	0.0400*	0.0352*	0.5295*	0.5739*	1												
Audited_financial_statements	-0.0436*	-0.0586*	0.0057	0.1400*	0.0911*	0.0299*	-0.0631*	0.0404*	0.3223*	-0.3409*	0.1484*	0.1782*	0.1133*	0.0386*	0.1413*	0.0164*	0.0587*	0.0243*	1											
Quality_certificate	-0.0230*	-0.0173*	0.0533*	0.1018*	0.0692*	0.0122	-0.0734*	0.1500*	0.2816*	-0.2987*	0.1734*	0.1183*	-0.0018	-0.0092	0.0872*	-0.0514*	0.0234*	-0.0325*	0.2123*	1										
Employees_growth	-0.0441*	-0.0166*	0.0042	0.0922*	0.0580*	0.0003	-0.0129	-0.0349*	-0.0086	-0.0654*	0.0015	0.0443*	-0.0983*	-0.0628*	-0.2031*	-0.0188*	-0.0169*	-0.0183*	-0.0121	0.0152	1									
Crisis_dummy	-0.0032	0.0157*	0.1516*	0.1098*	-0.0135	0.1453*	-0.0141	-0.0404*	0.0741*	-0.1064*	0.0304*	0.0011	-0.1370*	-0.0558*	0.0976*	0.0976*	0.0831*	0.0479*	0.1861*	0.0377*	0.0377*	1								
Ln_GDP_per_capita	-0.0535*	-0.0693*	0.0576*	0.1355*	0.0807*	0.0189*	-0.1296*	0.0227*	0.0409*	-0.0319*	0.0771*	0.0001	-0.1057*	-0.0330*	0.0300*	0.0545*	0.0758*	0.0563*	0.0426*	0.1341*	-0.0446*	0.3867*	1							
Ln_nr_banks	0.1186*	0.1218*	-0.0342*	-0.1157*	-0.0949*	-0.0117	0.1253*	0.1151*	0.0176*	-0.006	-0.0697*	-0.0119	0.0356*	-0.0194*	0.0582*	0.0568*	0.012	0.0509*	-0.1210*	-0.0559*	-0.0488*	-0.1987*	-0.3346*	1						
Credit_to_GDP	-0.0262*	-0.0380*	0.1379*	0.0324*	-0.0395*	0.0728*	0.0079	0.1096*	0.0504*	-0.0871*	0.0766*	-0.0210*	-0.1741*	-0.0921*	-0.0821*	-0.1425*	-0.0750*	-0.1034*	0.0047	0.1392*	0.0045	0.4382*	0.6282*	-0.0533*	1					
NPL	0.0395*	0.0357*	-0.0651*	0.0970*	0.0194	-0.0503*	0.0019	-0.0534*	-0.0345*	0.0912*	-0.0206*	-0.006	0.0795*	0.0501*	0.1264*	0.1275*	0.1014*	0.0901*	-0.0590*	-0.0898*	-0.0493*	-0.2275*	-0.0646*	0.0470*	-0.3531*	1				
Foreign_banks_share	-0.0255*	-0.0307*	0.0918*	0.0635*	0.0392*	0.0423*	-0.0858*	-0.0091	-0.0033	-0.0404*	0.0386*	-0.0202*	-0.1075*	-0.0480*	-0.0734*	-0.0973*	-0.0279*	-0.0791*	0.0656*	0.0867*	0.0058	0.3000*	0.4225*	-0.5753*	0.2660*	-0.0794*	1			
CAD	0.0191*	0.0065	-0.0984*	0.0285*	0.0298*	-0.0587*	0.0064	-0.0557*	-0.0134	0.0618*	-0.0434*	0.0139	0.1333*	0.0379*	0.1215*	0.1950*	0.0920*	0.1545*	-0.0212*	-0.1045*	-0.0411*	-0.3011*	-0.2274*	0.5024*	-0.4667*	0.2061*	-0.5376*	1		
EBRD_banking_reform_4	-0.0840*	-0.0971*	0.0236*	0.0011	0.0569*	-0.0015	-0.0938*	0.0481*	0.0197*	-0.0407*	0.0607*	0.0175*	-0.0915*	-0.0833*	-0.0371*	-0.1312*	-0.0754*	-0.0951*	0.0884*	0.0880*	-0.0284*	0.1762*	-0.2381*	0.5812*	-0.3613*	0.4160*	-0.3645*	1		
EBRD_banking_reform_1_2	0.0001	0.0133	-0.0928*		0.0157	-0.0536*	0.0320*	-0.0512*	-0.0044	0.0337*	-0.0469*	0.0344*	0.1372*	0.0468*	0.0378*	0.0412*	0.0013	0.0354*	0.0158*	-0.0929*	0.0329*	-0.2481*	-0.6077*	0.3294*	-0.4512*	0.0221*	-0.5559*	0.3707*	-0.3174*	1

Source: BEEPS, own calculations

TABLE 4-15. Probit model estimation results for country dummies, marginal effects

	Dependent variable: Access_to_finance_1	Dependent variable: Access_to_finance_2
	TABLE 4-3, Model (1)	TABLE 4-4, Model (1)
Bosnia	0.030 (0.026)	-0.010 (0.032)
Bulgaria	0.066 (0.023)***	0.015 (0.027)
Croatia	0.034 (0.024)	0.110 (0.038)***
Czech Republic	0.026 (0.025)	0.055 (0.045)
Estonia	-0.116 (0.017)***	-0.041 (0.027)
FYROM	0.017 (0.026)	0.099 (0.047)**
Hungary	0.027 (0.024)	-0.092 (0.016)***
Latvia	-0.059 (0.022)***	-0.017 (0.033)
Lithuania	-0.047 (0.023)**	-0.036 (0.029)
Moldova	0.094 (0.028)***	0.076 (0.044)**
Montenegro	-0.093 (0.033)***	0.016 (0.042)
Poland	0.135 (0.025)***	-0.042 (0.026)
Romania	0.079 (0.025)***	0.029 (0.037)
Serbia	0.124 (0.029)***	0.027 (0.037)
Slovakia	-0.018 (0.025)	0.012 (0.038)
Slovenia	-0.070 (0.020)***	0.062 (0.044)
Ukraine	0.150 (0.027)***	-0.004 (0.028)
Observations	15,306	6,255
Prob>chi2	0.0000	0.0000
pseudo R2	0.05	0.04

* p<0.1; ** p<0.05; *** p<0.01

Note: the omitted country is Albania

General Conclusion

“Learning from the crisis appears to be our only hope. In good times, it is not an appropriate time for scrutiny and reflection, let alone for a substantial change of direction in the original spirit of the word repentance. The truth appears in a crisis – frequently in its unpleasant nakedness (the emperor wears no clothes!), but in all its vehemency,” T. Sedlacek (2011, p. 322)

The events of the past few years compel us to reexamine many of our long-held ideas and practices in both monetary and regulatory policy (Yellen, 2009, p. 7). Apart from this conceptual perspective that has been evolving in developed markets since the crisis experience, implying a more holistic approach in policies that affect the financial sector⁸⁶, the implementation of market principles and policies to financial sectors in new emerging markets represented a challenge throughout transition in post-communist countries of Eastern Europe. The challenge relied on inherited grounds marked by a different economic and political system. The crisis has brought a fresh perspective and new problems for this region – its further macroeconomic and financial sector development and stability. Though these economies still depend a lot on ‘core Europe’ market and financing, it is clear that future sources of growth and future economic policies may not be imported but well founded in understanding local advantages as well as local problems.

I have aimed in this thesis to understand these local specifics of financial intermediation and related macroeconomic impacts. The choice of investigated problems, the research approach and interpretation of results are closely connected with the practical experience during the preparation of the thesis. The fact that I spent a part of that time in Serbia as a researcher in one think tank and, later on, in a systemically relevant large foreign bank, enriched my specific insights which I will present here in general conclusion chapter. First, we once again summarize the main future macroeconomic challenges in Emerging Europe that are directly linked to financial intermediation in these countries. In the following subsection, we present the overall conclusion derived from the specific outcomes of separate empirical researches in this thesis. Further on, we extract some more general conclusions that may be traced in the research and experience from the thesis but that do not belong strictly to the main line defined

⁸⁶ Such as macroprudential policy (Clement , 2010; de la Torre and Ize, 2009)

by the primary goal of the thesis, i.e., financial intermediation. We finish this chapter with lessons for future economic policies that should be more flexible, more holistic and more tailor-made to local circumstances than before the crisis. We also try to extract specific recommendations as well as guiding principles that should be built into these policies where the financial market is concerned.

Main macroeconomic challenges in Emerging Europe

Internationalization of financial market that gained momentum since the 1990s was an inseparable part of the wider globalization process enabled by the wave of deregulation and liberalization of economic flows. The financial globalization in Europe was somewhat different than in other parts of the world. That distinction was reflected largely in the direction of financial and capital flows. The capital was flowing ‘downhill’ from rich core to poorer periphery. The main driving force was to take advantage from higher marginal returns on investment in new untapped markets, consistently with the neoclassical proposition that capital goes where the marginal return on investment is higher, but opposite to the worldwide pattern where capital was going ‘uphill’ (Lucas puzzle), probably in a quest for safety and protection. In line with this last view, one of the credible hypothesis that explains the direction of flows within Europe relied on the fact that new emerging market economies were on the path of political convergence, including institutional alignment and integration into the European Union. The last was, according to this argumentation, anticipated in availability of funds (reflecting loosened risk perception) that were abundantly placed to the region of transition Europe. On the other side, financial sector reform in line with market principles was one of the crucial pillars of the overall transition of Central and Eastern European countries. The reform resulted in the liberalization of financial markets and the entry of foreign banks which channeled the lion’s share of capital inflows into this region. It brought many positive outcomes such as convergence in average income and a rise in living standards. The convergence reflected in faster growth in per capita income in countries with a lower initial basis. Although the crisis seems to have not reversed but only stopped this process, none of these economies attained the EU-15⁸⁷ average in per capita income.

With the last crisis, many fundamental imbalances that submerged in a course of the previous period of financial integration propagated crisis effects and represented an additional obstacle for recovery from recession. The region is largely financially dependent on the developed core

⁸⁷ “The EU-15” refers to the 15 Member States of the European Union prior to its enlargement in 2004.

countries of Western Europe. Financing became much more expensive and less available with growing risk aversion since the crisis. Deleveraging of locally present foreign banks that dominate local financial sectors has been continuous since then. Banks experience difficult times in terms of high level of non-performing loans and often insufficient capitalization and there is no perspective of an end to the resulting credit crunch. Local policies are of limited scope for maneuver. Fiscal deficit is at unsustainably high levels pushing up public debt. Monetary policy has apparently no success in revival of investments and consumption despite relatively low inflation. It became obvious that the growth model the countries of Emerging Europe pursued until the crisis was unsustainable as it was based on financial leveraging of a private sector that was channeled to imports and created large imbalances in foreign trade (current account) and the external competitiveness of local economies.

Unlike the uncontested benefits of globalization in other areas such as free trade, the consciousness on the risks of financial globalization to macroeconomic and financial stability existed even before the last crisis. The reasons behind it were linked to fundamental differences between the financial sector and the “real” economy. It was advocated that though free capital markets can allocate capital efficiently, large interconnected financial institutions can also take risks that impose huge losses in the form of negative externalities on the rest of the economy in a way that large manufacturing firms cannot. The Asian crisis of 1997 brought a major change in perspective in the area of short-term capital flows. The risks here were recognized to be greater, the benefits lower, the circumstances in which countries should engage in full liberalization more restrictive than was the case before that crisis with special attention to short-term capital flows (Stiglitz, 2000). However, financial market imperfections in combination with deregulation and liberalization including the lack of right incentives within the behavior of institutions in the financial market apparently reproduced in the region of Emerging Europe and the ongoing crisis only unveiled them. Although there is still no systemic bank crisis but rather several cases of bankruptcies of financial institutions, this list of risks materialized in weak and vulnerable real economy. The idea of the empirical research herein was to investigate micro level evidences of these risks.

Microeconomic challenges within the financial sector with macroeconomic and stability implications – results from the empirical analysis

This thesis encompasses three studies of distinct dimensions of financial intermediation in transition economies in Europe. Common to these studies is that they treat micro level failures

of financial intermediation that were manifested as macroeconomic imbalances or weaknesses of macroeconomic policies. These vulnerabilities became particularly obvious with the ongoing global crisis and are relevant from the perspective of future economic prospects of this region.

The first study examined the outcome of the competition on a liberalized lending market that experienced credit boom – the phase that characterized financial intermediation in all transition economies. In the example of Serbia, we arrive at the following main findings. First, through an on-site survey that is designed and conducted in order to cover lending market conditions, paying attention to all methodological specifics to data quality, we surveyed the representative sample of 19 banks. The survey registered that the level of lending interest rates was high in general and extremely dispersed across market segments and banks. The same survey registered the increasing presence of competition and its impact on lending interest rates while the competitive pressures were differently felt within different banks. Similarly, it is evident that different banks have different price and composition of funding.

The empirical estimation of determinants of bank interest margins using generalized least square estimation on panel dataset covering overall banking sector of Serbia from 2000 to 2005, display evidence that foreign banks are charging relatively lower interest margins after controlling for difference in administrative cost, funding cost and bank capitalization. This finding is contradictory to the world scale evidence provided by Claessens, et al. (2001) that foreign banks have lower margins than domestic banks in developed countries but the opposite holds in developing countries. In the case of Serbia, this may be explained by the lower administrative costs of foreign banks and their focus on more competitive market segments. The overall presence of foreign banks, however, does not have an impact on bank interest margins in line with results of the similar estimation of Latin America provided by Soledad Martinez and Mody (2004).

Another result shows that larger banks are able to charge higher interest margins and in that action probably exert certain monopolistic power toward clients. Further estimation of the determinants of bank asset quality measured by risk reserves to total interest bearing asset reveals that the riskiness of domestic banks increases with the increased presence of foreign banks in the market. The previous findings indicate that the competition in the liberalized credit market between new entering foreign banks and existing domestic banks may result in a

'flight to captivity'⁸⁸ of less transparent borrowers to local banks while more transparent and larger borrowers go to foreign banks where they can find more attractive price of borrowing. Foreign banks have cost advantage as they have access to cheaper foreign refinancing while local banks finance themselves from local deposits and by borrowing from foreign banks on the interbank market. Local banks, unlike foreign one, have informational advantage as they know better the market in the period following the liberalization. This pattern of competition results in risk concentration in one market segment. That segment is characterized by less competition. The interest rates on this segment are relatively higher as clients (more opaque and therefore perceived as more risky) have less negotiation power being rationed by foreign banks. At the same time it is possible that some of the potential borrowers that are smaller and less transparent but effectively have sound businesses, stay out of the market as they are faced with interest rates on riskier market segment that include certain monopolistic spread (markup pricing).

The second study, investigates the role of bank lending in the transmission of monetary policy under the inflation targeting framework that was introduced within a set of transition reforms. Bank lending represented the main driver of monetary expansion and at the same time the main concern for demand driven inflation pressures. We analyzed again the case of Serbia and used the well established methodology by Kashyap and Stein (2000) including the general method of moment estimation on the database with individual bank panel data from quarterly financial statements for the period from June 2006 to September 2012. The estimation result shows that banks' lending do not respond to changes in monetary policy instrument and that behind the last phenomenon may stand both an inelastic demand for loans as well as an inelastic supply. This finding suggests that both the interest rate channel (passing through loan demand reaction on monetary policy instrument – interest rate) and the bank lending channel (passing through supply of loans adjustment to referent interest rate) of monetary policy transmission were ineffective in Serbia in the observed period.

Though some of similar studies using the same methodological base in one or more transition economies in different time periods find some evidence in support of bank lending channels in several transition countries (such as Matousek and Sarantis, 2009), the major message from the overview of this literature is rather its inability to provide clear answers on the existence of bank lending channels as presented in Chapter 3, section 3.3.2. Even from the perspective of the overall transmission of monetary policy including all available channels, the empirical

⁸⁸ Dell'Ariccia and Marquez , 2004

literature on transition countries suffers from the same lack of comprehensive uniform evidence ((Ehrmann, et al., 2007, provide an overview). The evidence on bank lending channels is not clearer either in the countries of the EU-15. For example, Ehrmann, et al. (2002) find some evidence for France, Italy and Germany, Hernando (2001) finds no evidence for Spain, and Farihna (2001) finds some evidence for Portugal.

I further tried to include my entire researcher's experience from ten years of close monitoring of the banking sector and monetary developments in Serbia and the region in the interpretation of results. The above presented findings explain the empirical estimation of the lack of impact of monetary policy instrument to bank lending and is in some way expected as the economy is highly 'euroized' – 70% of all loans are denominated in euro currency implying that local currency interest rate is relevant for only a smaller part of financial intermediation. Moreover, the main source of bank refinancing and increasing bank capitalization was from the foreign headquarters of new entrant banks.

Local interest rate is naturally of less importance. As in the period of rapid credit expansion, before the crisis, interest rate was apparently ineffective in reining credit supply; local monetary policy authorities used mandatory reserve requirements as prudential measure. That instrument proved to have no particular effect on halting loans as credit expansion partly dislocated to direct cross-border lending to local companies. High mandatory reserve requirements and strict rules for loan loss reserves neither helped as monetary measure since inflation stabilization occurred only with stabilizing exchange rate. The exchange rate channel apparently played the most important role in transmission to prices as apart from import prices, the heritage of weak local currency and hyperinflation from 1990s reflected in the usage of foreign currency to unofficially denominate a large part of transactions. In this context, the inflation targeting framework despite explicit determination to use interest rate as a main instrument practically implied the use of local reference rate to indirectly manage exchange rate and ultimately impact prices. That created a vicious circle of monetary policy aiming to keep stable prices in an environment of open financial flows (most of them of a short-term) – a situation known as the 'unholy trinity'. That is, the impossible trinity of having in the same time an open capital account for foreign financial inflows (and outflows), sovereign monetary policy, and a stable exchange rate.

It was intended to be resolved by allowing exchange rate flexibility within the framework of inflation targeting. However, as exchange rate pass through is a dominant inflationary factor,

this trilemma is hard to solve. The high interest rate differential between Euribor and local rate (on local currency) resulted in carry trade inflows in local currency. The last would induce local currency appreciation and therefore price stabilization. Any exogenous risk to local currency depreciation would decrease carry trade yields and represent a risk for outflows from local currency and its sudden depreciation. Consequently that would represent a risk for inflation acceleration and force local monetary policy to increase its restrictiveness, i.e. to raise the reference rate. This volatility of exchange rate is creating the volatility of interest rate and the shift of its primary focus – from real flows. This means a direct longer term impact on output (investment and savings) to financial flows and an indirect short-term impact on the exchange rate.

Some of these challenges are registered in the literature before the crisis (Stone, et al., 2009) as after the crisis (Svensson, 2009; Ostry, et al., 2012) A more general conclusion of this analysis is that in the context of a shallow market and open financial market for foreign flows, local monetary policy becomes the hostage of short-term speculative capital. Thus monetary policy based on market instruments, i.e. interest rate, is less effective in a small open economy as market instruments do not lead to expected effects to real flows. Even prudential instruments that aim at halting excessive credit growth (unlike reference rate movements) possibly did impact the lending interest rates by increasing regulatory cost in the form of risk reserves. However, that did not necessarily result in a reduction in credit growth as some of flows were displaced to direct cross border lending. At the same time, locally intermediated credit became more expensive and kept growing in certain market segments where demand was inelastic to price (households and local less transparent enterprises). The former problems were probably less emphasized in transition economies that achieved more solid institutions and political stability (those above the ‘great divide’) than it was in the examined case of Serbia. Examining the Serbian case allowed me, however, to capture these adverse manifestations of implementing liberalization and market-based policies on weak institutional capacity in circumstances of low political stability – the common environment in many emerging countries.

The third empirical study in this thesis, analyzed the determinants of financial constraints in 18 transition countries in Europe on dataset from enterprise level survey provided by EBRD in four turns from 2002 to 2008. All these countries had in common the fact that prior to the crisis they had based their growth model on financial integration (EBRD, 2009). Examining in depth the financing obstacle to business may bring some genuine answers on financial

development and its effects on the growth of the real sector. The main result of the empirical estimation using probit methodology was that a higher probability of financial constraint exists with manufacturing enterprises in contrast to other industries. Besides an increased probability of facing access to finance as very severe business obstacle, the estimation also reveals that manufacturing firms have more need for loans and that those that do not use bank loans are more prone to state high interest rates and non-favorable non-price loan terms as reasons for not using external financing. This finding inspired me to formulate a more general hypothesis on the role of the financial sector in the macroeconomic effects of the applied development model in transition economies in the period before the crisis. Namely, two decades of uneven access to finance by manufacturing businesses (producing tradable goods) resulted in structural imbalances in the real sector that reflected in trade deficit, i.e. underdeveloped tradable sector and overdeveloped non-tradables (construction, real-estate, trade).

The underlying mechanism behind this conclusion may be like the famous “lemons market problem” (Akerlof, 1970). This outcome is analogous to the second-hand car market where an owner of above average quality car is not willing to participate in the market where price is fixed according to the average quality (due to lack of information on the demand side on the specific quality of each car). In the loan market where the offered interest rate by banks correspond to perception of average risk (including country risk spread of junk rated sovereign), certain add-ons for prudential regulation measures and sometimes also from monopolistic pricing systematically leaves ‘good risks’ out of the demand for loans and out of the lending market. Systematically underfinanced, they refrain from investment and get underrepresented with time, while on aggregate level deficit in foreign trade deepens. The last explanation assumes that finance drives growth (Schumpeter, 1911; Levine, 2004). Another effect may amplify this structural imbalance. Following from the conclusions of the study of monetary policy, real appreciation of local currency resulting from the specific setting of monetary policy, may cause ‘Dutch disease’- a like effect during post-liberalization foreign financial and capital inflows driven real currency appreciation. Its effects may have emphasized the relative underdevelopment of the tradable sector (manufacturing industry). Namely, it is cheaper to import than to produce locally while the export is less competitive on strong local currency resulting from important foreign financial inflows to liberalized emerging markets during transition (Egert, 2013).

The main general conclusion arising from these specific empirical researches is that imperfections immanent to the financial market per se, reflected also within specific reforms during the transition of countries in Central and Eastern Europe and had impact on the macro-level economic and financial vulnerabilities. The way that the financial and monetary system is transformed result in consequences for financial stability, monetary policy effectiveness, and current account imbalance. All these consequences amplified with the last crisis while the fact that financial markets of Emerging Europe became previously much more integrated acted in support of crisis propagation to the region.

Some general side-messages

There are also a few more general observations resulting from the analyses presented in this thesis that open directions for further research. They concern the extent to which or whether the simple replicating of market institutions from developed market to new establishing markets is a good choice. Young markets are characterized by high information asymmetry and low level of credibility among economic agents including often low level of credibility in governments. Simple copying of institutions (laws, institutional design, processes) from the developed market without much concern for the inherited local norms from the past may result in the weak implementation of institutions and structural imbalances. There might be no effect to impose market policy instruments if the market is still not operational. In the case of monetary policy, the last is quite illustrative from the case examined in this thesis. Imposing interest rate as the main monetary policy instrument and hesitating to instead apply administrative measures (it had a pejorative connotation before the crisis while nowadays these kind of measures are considered under macroprudential policy), may lead to many distortions such as the described monetary policy ineffectiveness.

The specific research of the financial sector also points to the general observation that the lack of ex ante knowledge may stand behind some negative consequences of transition reforms and policies. It could have been however expected to have local lack of knowledge about market economy while introducing market economy for the first time. Nonetheless, even knowledge and experience from developed markets that was advised to transition countries was not always appropriate as new processes generated within transition had no precedent and resulted in own sui generis rules and phenomena. The knowledge of local economic agents – firms and citizens on the institutions of market economy may reflect in reactions that are not in line with the model hypothesis. For example, the lack of citizens' understanding of financial market

institutions (credit, interest rate, etc.), may result in low demand elasticity on price of loan but also in imprudent borrowing that further transmits to a high rate of default, as we could see from the empirical research presented in this thesis.

Another general observation that emanates from the research conducted and presented in this thesis concerns the inseparable link – no matter direction the causality goes – between financial flows on one side and real flows and political (and institutional) environment, on the other side. Internationalization of finance and financial development that exceeds the development of real sector may result in bubbles and reversals that manifested with the crisis shock to economies. On the other hand, financial integration between core Europe and Emerging Europe has apparently attained levels far beyond their institutional harmonization and political integration before the crisis. We saw that unrealistic optimism and risk perception reflected in lowered risk margins for debt flowing to the countries of Emerging Europe from core Europe before the crisis and the sudden significant rise in risk spread after the crisis reflected a reappraisal of risk and an increase in risk aversion. We may expect that in the future, the attained level of financial integration, i.e. significant foreign investors presence in the region, may serve as a levy for further progress in convergence in institutions and overall political integration.

We also may notice that the political risks represent an enemy to real sector development and if they are below a certain threshold they prevent positive and amplify negative outcomes from financial market development to real economy. The last was possible the case of Serbia. The financial markets react to higher political and macroeconomic risk including loose institutions and low information transparency on economic agents by investing with relatively short maturity through charging higher country risk spreads, i.e. higher expected returns. As a consequence they aggravate the vulnerability of the local economy. Short-term financial flows are harmful to development as they increase volatility and exposure to contagions and change in market sentiments. Country spread linked to country risk ranking leads to the general increase of the financing cost of an economy irrespective of the specific risk that may in reality bear below the country risk spread.

Lessons learned: messages for policy makers and financial market participants

What can be done in future to prevent the negative outcomes of financial intermediation to real sector vulnerabilities in emerging markets remains a big challenge for future policies. It seems that, since the crisis, in the age-old discussion of the relative roles of markets and of the

state, the pendulum has swung, at least a bit, toward the state. The views on the need for regulation and on the limits of regulation are being revised in a sense that they are both stronger than was thought earlier. In what way should these policies be designed? The solution might lay in a return to the basic principles behind the existence of financial institutions. It relies on solving the agency problem of information asymmetry by collecting information, monitoring risk and taking good collateral. It also includes right incentives that shape the behavior of financial institutions to favor long-term development over short-term profit (despite long-term loss).

Where would we search for main future messages for policymakers? From the local country perspective, the financial globalization brings its proper risks for a recipient country. The main message from this study would be that, it would be illusory to fight against globalization (once experiencing its risks), but knowing its principles and nature may help turn it into benefits and avoid its pitfalls. The last should include strengthening of the institutions and a gradual approach to liberalization once sound supervision and incentives are set. In the approach to liberalization, distinction should be made between short-term debt and portfolio flow and long-term investments in favor of the latter ones. In the future, policies should take care of local development, which the financial market through its mechanism apparently does not automatically produce. It should include monitoring of the interest rate level and the prevention of abnormally high rates presuming dangerous risk taking by banks. Obstacles to access to finance should be detected and resolved. General knowledge on the financing of businesses should be reinforced. Information asymmetry mitigation should be one of guiding principles of the local policy designer. Apparent mechanisms in international finance were due to information asymmetry. All risks in one country have as input price the sovereign spread to which other elements of spread are added and where due to risk aversion investing is focused on the shorter end may be mitigated by government policy designed to share the risk or reduce information asymmetry. These policies should aim at easing access to finance to production sectors where initial investments are higher and returns are lower but steadier in long run.

On the global level, i.e. from the perspective of foreign investors to emerging markets and their regulators, setting the right incentives inside financial markets and institutions should be the priority. Here also, the revival of basic principles of banking may help. Mutual credibility is also an investment and is something that is being built for a long time. In the short run one may earn exceptional yields, but in the mid- and long-term, the financial sector may not create

value higher than the real sector. And the real sector has its limitations. Although emerging countries represent a green field for higher marginal returns on investment, these returns are limited by natural factors. In further reference to the lemons market (Akerlof, 1970), if a foreign investor (bank) offers financing to a good project with the loan interest rate that includes (1) the risk of the sovereign in which the project operates, i.e. one emerging country, (2) local regulatory requirements, and (3) markup price, then the investor may find himself faced with the problem that the project having a longer term perspective and high initial investment in development and fixed assets, reasonable yield, and low risk of default is simply out of the lending market as the general rate level is beyond the capacity to repay it. At the same time, those projects that remain on the demand side are probably not the ones that will repay the loans.

To put this financial sector related conclusion as a paradigm of the broader market transformation of post socialist economies related pitfalls, we may refer here to an effective reflection by Kolodko (2010, p. 5) on the meaning behind a widespread expression ‘emerging markets’: “From this neoliberal point of view, ‘emerging markets’ are instrumentally treated as one more opportunity to do good business, without necessarily taking into consideration the social costs to the places where business is done. But from the point of view of the countries and economies interested in ‘emerging’, the purpose is basically different: it has the appearance of a market economy system, effective and competitive on the world’s scale, which would be able to fulfill satisfactorily the needs of their own societies. That, briefly, is the fundamental difference between the neoliberal approach to postsocialist systemic transformation and the one represented by social market economy. The first approach concentrates on emerging opportunities to do business. One should not be surprised with this but it is necessary to understand it and react properly. The other approach concentrates on creating and developing a new type of social bond, based on new market management principles. Hence, it is not just ‘markets’ that emerge, but a market economy based society. And that is something quite different...”

Financial system is a component of the economy that may create a difference in a way that right setting of financial intermediation framework based on market principles may help avoid ‘emerging market’ outcome that is rather short lived and vulnerable and promote a market economy based society as a sustainable long term outcome.

After several years working in Serbia as an observer and even as a participant in the ongoing vibrant transformation of the financial sector – first as a researcher in a influential think tank that advocated for better reforms, and lately as analyst in one of the largest foreign banks where we observed the financial market from its epicenter – I tried to bring to this thesis my impressions that both inspired and colored my findings. The main message that sublimates the list of specific findings detailed herein is that although the political choice is made in favor of market principles as the ones that provide the most productive allocation of resources, in order to fulfill that theoretical proposition to the best outcome, the right setting of financial architecture is a necessary precondition.

This financial architecture should be adapted to the specific market – to its heritage in terms of (1) its past and well-entrenched norms in terms of business and financing, (2) its real economy long-term development goals, and (3) its local knowledge of finance. Banking is the long perspective business. It should accompany the development of the real sector and promote it in order to assure its own prosperity. All countries are prone to banking crises no matter how advanced. Emerging markets tend to have more of the other types of crises, e.g. sovereign default and currency crisis (Reinhart and Rogoff, 2009). With this in mind, Serbia, as well as other transition economies in Europe may claim that their banking sector were quite resistant to the global crisis. Unlike the US, or the UK, they did not close so many banks. In Serbia for example, there are two state-owned banks that have gone bankrupt since the crisis began. An additional two are under strict supervision and face severe undercapitalization.

There are however serious threats even to the rest of the banking system that is still well capitalized and sound despite share in NPL of 20%. The main threat is in the risks to real sector sustainable recovery. And some of the risks are produced by the same financial sector, precisely by its architecture and inherent rules. These rules may have been set to serve the best purpose, but as we have shown in this study, the outcome may be different than the best. The risks may tend to concentrate in certain small local banks despite the envisaged benefits from the competition that was provided by the foreign bank entry. Even though foreign banks are better efficient (as evidenced in works of Bonin, et al., 2004; Weill, 2003; Fries and Taci, 2004), and able to offer the lower price of financing to the rest of the economy, the fact that economic agents are not familiar with external lending (even interest rate as its price), foreign exchange risks, etc., may put banks in a position to charge markup prices.

Moreover, when instead of collecting information and evaluating the risk of each borrower, the general input price for foreign bank financing in Emerging markets is calculated by relying on international rating agency information, translated into sovereign ratings and corresponding country risk spreads, it may lead to severe distortions in the structure of local economy. It may also signal that the perspective of banks is not long-term as they choose external information rather than to themselves perform their main economic function and *raison d'être*. Charging to all local borrowers the risk perceived for the sovereign (of junk rating such as in countries of SEE actually) means treating all persons (even the prime clients in terms of credibility) a priori as junk clients and all business, even the most stable and sustainable ones, as junk businesses. That short-term orientation is partly resulting from the political instability, but in large extent they are built in the incentives within the financial institutions. Political instability is, as we have shown, inseparable from income convergence and financial integration no matter what is the causality direction.

Some reconciliation of perspective (in favor of long- over short-term) and goals between banks, regulators and public is necessary and only on these sound grounds should the business be left to market forces. It is pointless that the monetary and regulatory authority which should be able to see big picture and prevent system vulnerabilities puts all its efforts in implementing policy framework (e.g. inflation targeting) that has no impact on the targeted variable. In terms of the prudential policy, where it was more tailor made in the case of Serbia, and relied to the larger extent on administrative restrictions than on market transmission, results are, we may observe, far better as the system is relatively stable despite several shocks and weak economic recovery. The price is however high as high requirements in terms of capital and risk reserves are translated into the high cost of financing to the economy.

The future of banking both in developed as in less developed countries will need more creativity, more flexibility and a more holistic approach. It will need more matching between science and practice. The globalized financial institutions will need more understanding and adaptation to local needs and economic specifics to avoid that in the quest for higher returns they distort local economies in which they place, and finally, to distort their own long-term vitality.

I hope that my study has, at least a bit, contributed in that direction. As nicely metaphorically expressed by Sedlacek (2011, p. 321), "There is a song that says that rules and laws are

created by lawyers and poets. Poets (in the wider meaning of the term) give rules meaning and spirit; lawyers give them form and letter. Similarly, we may say that a great economist can be either an outstanding mathematician or an excellent philosopher. It appears to me that we have given lawyers and mathematicians too large a role at the expense of poets and philosophers. We have exchanged too much wisdom for exactness, too much humanity for mathematization. It brings to mind an extremely detailed ivory tower, but one that has its foundations built on sand. It goes without saying that one parable speaks of how a wise builder pays more attention to his foundation than to the baroque decorations on the tip-tops of his building's towers. When the rain comes, the cathedral will not fall like a house made of sugar."

References

- Abiad A, Leigh D, Mody A, (2009), “Financial integration, capital mobility, and income convergence”, *Economic Policy*, Vol. 24(4), pp. 241-305
- Akerlof G. A, (1970), “The Market for 'Lemons': Quality Uncertainty and the Market Mechanism”, *The Quarterly Journal of Economics*, MIT Press, Vol. 84(3), pp 488-500
- Allen L, (1988), “The Determinants of Bank Interest Margins: A Note,” *Journal of Financial and Quantitative Analysis*, Vol. 23(02), pp. 231-235
- Amato J.D. and Gerlach S, (2002), “Inflation targeting in emerging market and transition economies: Lessons after a decade”, *European Economic Review*, Vol. 46(4-5), pp.781–790
- Angeloni I. and Ehrmann M, (2004), “Monetary transmission in the Euro area: early evidence”, *Economic Policy*, CEPR & CES & MSH, Vol. 18(37), pp. 469-501
- Arellano M. and Bond S, (1991), “Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations”, *Review of Economic Studies*, Vol. 58(2), pp. 277-97.
- Arellano M, and Bover O, (1995), “Another look at the instrumental variable estimation of error-components models”, *Journal of Econometrics*, Vol. 68(1), pp. 29-51.
- Arellano M. and Bond S, (1998), “Dynamic Panel data estimation using DPD98 for Gauss: A guide for users”, *Mimeo*, Institute for Fiscal Studies
- Arestis P. and Demetriades P.O, (1997), “Finance and Growth: Institutional Considerations, Financial Policies and Causality”, *Keele Department of Economics Discussion Papers*, Keele University, No. 97/02
- Arestis P. and Demetriades, P.O, (1997), “Financial Development and Economic Growth: Assessing the Evidence”, *Economic Journal*, Vol. 107(442), pp. 783–99.

- Ashcraft A, (2006), “New Evidence on the Lending Channel,” *Journal of Money, Credit and Banking*, Vol. 38(3), pp 751-775
- Atanasijević J. and Čupić V, (2010), “Financial integration and access to finance in transition economies: A sectoral approach”, *Ekonomika preduzeća*, Vol. 58(1-2), pp. 50-58
- Atanasijević J. and Božović M, (2013), “Exchange rate as a determinant of corporate defaults in a euroized economy: evidence from micro-level data”, *Mimeo*
- Bagehot W, (1873), *Lombard Street: A Description of the Money Market*, King, London
- Balázs É, (2013), “Dutch Disease in the Post-Soviet Countries of Central and South-West Asia: How Contagious is it?”, *EconomiX Working Papers*, University of Paris West - Nanterre la Défense, No. 2013-10
- Bancel F. and Perrotin T, (1999), “Le coût du capital dans les pays émergents”, *Revue d'analyse financière*, No.119, pp. 76 - 88.
- Banian, K. Kemme D, Sarsyan G, (2008), “Inflation targeting in Armenia: monetary policy in transition”, *Comparative Economic Studies Journal*, Vol. 50(3), pp. 421-437
- Bank for International Settlements, (2008), *Annual Report 2008*, BIS, Basel
- Barisitz S, (2003), “On the Catching-Up Route – The Development of Banking in Serbia and Montenegro since 2000’’, *Focus on Transition*, Oesterreichische Nationalbank, Vol. 1, pp. 189-216
- Barro R.J. and Sala-i-Martin X, (1992), “Convergence”, *Journal of Political Economy*, No.100, pp. 223-251
- Barth J, Caprio G, Levine R, (2005), *Rethinking bank regulation*, Cambridge University Press, Cambridge
- Beck T, Demirgüç-Kunt A, Levine R, (2000), “A New Database on the Structure and Development of the Financial Sector”, *The World Economic Review*, No.14, pp. 597-605

- Beck T, Demirgüç-Kunt A, Maksimović V, (2004), “*Bank Competition and Access to Finance: International Evidence*”, *Journal of Money, Credit and Banking*, Vol. 36(3), pp. 627-48
- Beck T, Demirgüç-Kunt A, Levine R, (2005), “Bank Concentration and Fragility: Impact and Mechanics”, *NBER Working Paper*, No. 11500
- Beck T, Demirgüç-Kunt A, (2006), “Small and medium-size enterprises: Access to finance as a growth constraint”, *Journal of Banking and Finance*, Vol. 30(11), pp. 2931-2943
- Benkovskis K, (2008), “Is there a bank lending channel of monetary policy in Latvia? Evidence from Bank Level Data”, *Working papers*, Latvijas Banka, No. 1/2008
- Berg A, Karam P, Laxton D, (2006), “Practical model-based monetary policy analysis – a how-to guide”, *IMF Working paper series*, No. 06/81.
- Berger A. and DeYoung R, (1997), “Problem loans and cost efficiency in commercial banks”, *Journal of Banking and Finance*, Vol. 21(6), pp. 849-870
- Berger A. and De Young R, (2001), “The effects of geographic expansion on bank efficiency,” *Finance and Economics Discussion Series*, No. 2001-03
- Berglof E. and Bolton P, (2001), “The Great Divide and Beyond: Financial Architecture in Transition”, *William Davidson Institute Working Paper*, No. 414
- Berglof E, Korniyenko Y, Plekhanov A, Zettelmeyer J, (2009), “Understanding the crisis in emerging Europe”, *EBRD Working Paper*, No.109
- Berk J.M, (1998), “Monetary Transmission: What do we know and how can we use it”, *Quarterly Review*, Banca Nazionale del Lavoro, Vol. 51, pp. 145-170
- Bernanke B.S, (1983), “Nonmonetary Effects of the Financial Crisis in Propagation of the Great Depression“, *American Economic Review*, Vol. 73(3), pp. 257-76
- Bernanke B.S. and Blinder A.S, (1988), “Credit, Money and Aggregate Demand”, *American Economic Review*, Vol. 78(2), pp. 435-39

- Bernanke B.S. and Blinder A.S, (1992), “The Federal Funds Rate and the Channels of Monetary Transmission”, *American Economic Review*, Vol. 82(4), pp. 901-22
- Bernanke B.S. and Gertler M, (1995), “Inside the black box: The credit channel of monetary policy transmission”, *Journal of economic perspectives*, Vol. 9 (4), pp. 27–48.
- Besanko D. and Thakor A, (1992), ’’Banking deregulation: Allocational consequences of relaxing entry barriers’’, *Journal of banking and science*, Vol. 16(5), pp 909-932
- Bhagwati J, (1998), “The Capital Myth. The Difference between Trade in Widgets and Dollars”, *Foreign Affairs*, Vol. 7(3), pp. 7–12
- Birdsall N. and Fukuyama F, (2011), “The Post-Washington Consensus: Development after the Crisis - Working Paper 244“, *Working Papers*, Center for Global Development, No. 244
- Bitans M, (2004), “Pass-Trough of Exchange rates to Domestic Prices in East European Countries and the Role of Economic Environment”, *Bank of Latvia Working Paper*, No. 218.
- Blinder A. and Stiglitz J.E, (1983), “Money, Credit Constraints and Economic Activity’’, *American Economic Review*, Vol. 73(2), pp. 297-302
- Blundell R. and S. Bond, (1998), “Initial conditions and moment restrictions in dynamic panel data models”, *Journal of Econometrics*, Vol. 87(1), pp. 115-43.
- Bond S, (2002), “Dynamic panel data models: A guide to micro data methods and practice’’, *Working Paper*, Institute for Fiscal Studies, No. 09/02
- Bonin, J. Hasan I, Wachtel, P. (2004). “Privatization Matters: Bank Efficiency in Transition Countries’’, *BOFIT Discussion Paper*, Bank of Finland, No.8
- Boot A, Greenbaum S, Thakor A, (1993), “Reputation and Discretion in Financial Contracting,” *American Economic Review*, Vol. 83(5), pp. 1165-83

- Brezigar-Masten, A, Coricelli F, Masten I, (2008), “Non-linear Growth Effects of Financial Development: Does Financial Integration Matter”, *Journal of International Money and Finance*, Vol. 27(2), pp. 295-313
- Brunner K. and Allan H, (1988), “Money and Credit in the Monetary Transmission Process”, *American Economic Review*, Vol. 78(2), pp. 446-51
- Calvo G.A. and Coricelli F, (1996), “Monetary policy and interenterprise arrears in post-communist economies: Theory and evidence,” *Journal of Policy Reform*, Vol. 1(1), pp. 3-24.
- Chatelain J.B, Generale A, Hernando I, Von Kalckreuth U, Vermeulen P, (2001), “Firm investment and monetary policy transmission in the Euro Area”, *Discussion Paper Series I: Economic Studies*, Deutsche Bundesbank, No. 20
- Chmielewski T, (2003), “Interest rate pass-through in the Polish banking sector and Bank-specific financial disturbances”, *MPRA Paper*, No. 5133
- Claessens S, (1996), “Banking reform in transition countries”, *Policy Research Working Paper Series*, The World Bank, No. 1642
- Claessens S, Demirguc-Kunt A, Huizinga H, (2001), “How Does Foreign Entry Affect Domestic Banking Markets?”, *Policy Research Working Paper Series*, The World Bank, No. 1918
- Claessens S. and Laeven, L, (2003), “What Drives Bank Competition? Some International Evidence”, *Policy Research Working Paper Series*, The World Bank, No. 3113
- Claeys S. and Vennet Vander R, (2003), “Determinants of Bank Interest Margins in Central and Eastern Europe. Convergence to the West?”, *Ghent University Working Paper* No.2003/203

- Clarke G, Cull R, D'Amato L, Molinari A, (1999), "The effect of foreign entry on Argentina's domestic banking sector", *Policy Research Working Paper Series*, The World Bank, No. 2158
- Clarke G, Cull R, Martinez-Peria M, Sanchez S, (2001), "Foreign Bank Entry: Experience, Implications for Developing Countries, and Agenda for Further Research", *Policy Research Working Paper Series*, The World Bank, No.2698
- Clarke G, Cull R, Martinez Peria M, (2006), "Foreign bank participation and access to credit across firms in developing countries," *Journal of Comparative Economics*, Vol. 34(4), pp. 774-795
- Clement P, (2010), "The term "macroprudential": origins and evolution", *BIS Quarterly Review*, Bank for International Settlements, Issue March
- Corbet J. and Mayer C, (1992), "Financial reforms in Eastern Europe: Progress with the wrong model", *Oxford Review of Economic Policy*, Vol. 7(4), pp. 5-75
- Coricelli F, Egert B, MacDonald R, (2006a), "Monetary Transmission Mechanism in Central and Eastern Europe: Gliding on a Wind of Change", *William Davidson Institute Working Paper*, No. 850
- Coricelli F, Mucci F, Revoltella D, (2006b): "Household Credit in the New Europe : Lending Boom or Sustainable Growth?", *CEPR Discussion Papers*, No. 5520
- Coricelli F, Jazbec B, Masten I, (2008), "Sources and Obstacles for Growth in Transition Economies: the Role of Credit", *Festschrift in Honor of G. Calvo*, MIT Press, No.13
- Coricelli F, Driffield N, Sarmistha P, Roland I, (2010), "Microeconomic implications of credit booms: evidence from emerging Europe", *Working Paper*, EBRD, No. 119
- Creel J. and Levasseur S, (2005), "Monetary policy transmission mechanisms in the CEECs: How important are the differences with the euro area?", *Documents de Travail de l'OFCE*, Observatoire Français des Conjonctures Economiques, No. 2005-02

- Crespo-Cuaresma J, Egert B, Reininger T, (2004), “Interest rate pass-through in new EU Member States: The case of the Czech Republic, Hungary and Poland”, *William Davidson Institute Working Paper*, No. 671.
- Cull R, Soledad Martinez Peria, M, (2010), “Foreign bank participation in developing countries: what do we know about the drivers and consequences of this phenomenon?”, *Policy Research Working Paper Series*, The World Bank, No. 5398
- Darvas Z, (2006), “Monetary Transmission in the New EU Member States: Evidence from Time-Varying Coefficient Vector Autoregression”, *Focus on European Economic Integration*, Oesterreichische Nationalbank, Issue 1, pp. 140-157
- De Haas R. and Peeters M, (2004), “The dynamic adjustment towards target capital structures of firms in transition economies”, *The Economics of Transition*, EBRD, Vol. 14(1), pp. 133-169
- De Haas R. and Van Lelyveld I, (2004), “Foreign Bank Penetration and Private Sector Credit in Central and Eastern Europe”, *Journal of Emerging Market Finance*, Vol. 3(2), pp. 125-151
- De Haas, R. and Van Lelyveld I, (2010), “Internal Capital Markets and Lending by Multinational Bank Subsidiaries”, *Journal of Financial Intermediation*, Vol. 19(1), pp.1-25
- De Haas R. and Knobloch S, (2011), “In the wake of the crisis: dealing with distressed debt across the transition region”, *EBRD Working paper*, No. 112
- De Haas R, Korniyenko Y, Loukoianova E, Pivovarsky A, (2012), “Foreign Banks and the Vienna Initiative: Turning Sinners into Saints?”, *Money and Finance Research group Working Papers*, University Politecnica Marche, No. 62

- De la Torre, Gozzi A.J.C, Schmukler S, (2007), “Innovative Experiences in Access to Finance: Market Friendly Roles for the Visible Hand?”, *Policy Research Working Paper*, The World Bank, No. 4326
- De Melo M. and Denizer C, (1997), “Monetary policy during transition: an overview”, *Policy Research Working Paper Series*, The World Bank, No. 1706
- De Souza M.V, (2006), “Estimating the existence of the bank lending channel in the Russian federation”, *Bank and credit*, Vol. 9(2006), pp. 3-13
- Dell’Ariccia G. and Marquez R, (2004), “Information and Bank Credit Allocation”, *Journal of Financial Economics*, Vol. 72(1), pp. 185-214
- Demirguc-Kunt A. and Huizinga H, (1998), “Determinants of Commercial Bank Interest Margins and Profitability, Some International Evidence”, *Policy Research Working Paper*, IMF, No. 1900
- Detragiache E, Gupta P, Tressel T, (2006), “Foreign Banks in Poor Countries: Theory and Evidence”, *IMF Working paper series*, No. 06/18
- Dimitrijević (Atanasijević) J, (2005), “Interest Rates in Serbia”, *Quarterly monitor of economic trends and policies in Serbia*, CEVES, No. 2
- Dimitrijević (Atanasijević) J, (2006), “Non Performing Loans in Serbia – What is the Right Measure?”, *Quarterly monitor of economic trends and policies in Serbia*, CEVES, No. 7
- Dimitrijević (Atanasijević) J, (2007), “Monetary Policy – Transmission Channels to Prices: a Year of Inflation Targeting”, *Quarterly monitor of economic trends and policies in Serbia*, No. 10
- Dimitrijević (Atanasijević) J. and Najman B, (2008), “Inside the credit boom: competition, segmentation and information: the evidence from the Serbian credit market”, *Comparative Economics Studies*, Vol. 50(3), pp. 217-252

- Dixit A. and Stiglitz J, (1977), “Monopolistic Competition and Optimum Product Diversity”, *American Economic Review*, Vol. 67(3), pp. 297-308
- Drakos K, (2003), “Assessing the success of reform in transition banking 10 years later: an interest margins analysis”, *Journal of Policy Modelling*, Vol. 25(3), pp. 309-317
- Duenwald C. et al, (2005), “Too Much of a Good Thing? Credit Booms in Transition Economies: The Cases of Bulgaria, Romania, and Ukraine”, *IMF Working paper*, No. 05/128
- EBRD, (2006), *Transition report 2006*, EBRD, London
- EBRD, (2009), *Transition report 2009*, EBRD, London
- EBRD, (2010), *Transition report 2010*, EBRD, London
- EBRD, (2010), *BEEPS 2008-2009: A Report on Methodology and Observations*, EBRD, London
- Egert B, MacDonald R, (2008), “Monetary transmission mechanism in Central and Eastern Europe: surveying the surveyable”, *OECD Economic Department Working Papers*, No. 654
- Ehrmann M, Gambacorta G, Martinez-Pages J, Sevestre P, Worms A, (2002), “Financial systems and the role of banks in monetary policy transmission in the euro area”, *Note d'études et de recherche*, Banque de France, No.93.
- Ehrmann et al, (2003), “The Effects of Monetary Policy in the Euro Area”, *Oxford Review of Economic Policy*, Vol. 19(1), pp. 58-72
- Eller M, Frömmel M, Srzentić N, (2010), “Private Sector Credit in CESEE: Long-Run Relationships and Short-Run Dynamics“, *Focus on European Economic Integration*, Oesterreichische Nationalbank, Issue 2, pp. 50–78
- Fanelli J.M. and Keifman S, (2002), “Finance and Changing Patterns in Developing Countries”, *Journal of Finance and Accounting*, Vol. 15(4), pp. 143-171

- Farinha L. and Robalo Marques C, (2001), “The bank lending channel of monetary policy: identification and estimation using Portuguese micro bank data“, *Working Paper Series*, European Central Bank, No. 0102
- Favara G, (2003), “An Empirical Assessment of the Relationship Between Finance and Growth”, *IMF Working Paper Series*, No. 03/123
- Fazzari S, Hubbard G, Petersen B.C, (1988), “Financing Constraints and Corporate Investment”, *NBER Working Paper*, No. 2387
- Feldstein M, Horioka C, (1980), “Domestic Savings and International Capital Flows”, *The Economic Journal*, Vol. 90(358), pp.314-329
- Fendel R, Lis E, Rülke J.C, (2008), “Does the financial market believe in the Phillips Curve? Evidence from the G7 countries,” *Center for European, Governance and Economic Development Research Discussion Papers*, University of Goettingen, No. 73
- Fischer S, (1998), “Capital Account Liberalization and the Role of the IMF”, in “Should the IMF Pursue Capital-Account Convertibility?”, *Essays in International Finance*, Princeton University, Vol. 207, pp. 1–10.
- Fisher I, (1933): “The Debt-Deflation Theory of the Great Depression,” *Econometrica*, No. 1, pp. 337–357.
- Frankel J, Parsley D, Wei S, (2005), “Slow pass-through around the world: a new import for developing countries?“, *NBER working paper*, No. 11199
- Freixas X, and Rochet J.C. (1999), *Microeconomics of banking*, The MIT Press, Cambridge
- Friedman M, Schwartz A. J, (1963), *A Monetary History of the United States, 1867-1960*, NBER Books
- Friedrich C, Schnabel I, Zettelmeyer J, (2010), “Financial integration and growth – is emerging Europe different?”, *EBRD Working paper*, No. 123

- Fries S. and Taci A, (2002), "Banking reform and development in transition economies", *EBRD Working Paper*, No. 71
- Fries S, Neven D, Seabright P, (2004), "Competition, Ownership and Bank Performance in Transition", mimeo, EBRD
- Fries S. and Taci A, (2004), "Cost efficiency of banks in transition: Evidence from 289 banks in 15 post-communist countries", *EBRD Working Paper*, No. 86
- Galati G. and Moessner R, (2010), "Macroprudential policy - a literature review", *DNB Working Papers*, Netherlands Central Bank, No. 267
- Gertler M, (1988), "Financial Structure and Aggregate Economic Activity: An Overview", *Journal of Money, Credit and Banking*, Vol. 20(3), pp. 559-588
- Gertler M. and Gilchrist S, (1994), "Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms", *The Quarterly Journal of Economics*, Vol. 109(2), pp. 309-40
- Gianetti M. and Ongena S, "Lending by Example": Direct and Indirect Effects of Foreign Banks in Emerging Markets", *CEPR Discussion Papers*, No. 6958
- Goldsmith R.W, (1969), *Financial Structure and Development*, Yale University Press, New Haven
- Golodniuk I, (2005), "Financial Systems and Financial Reforms in CIS Countries", *CASE Network Studies and Analyses*, CASE-Center for Social and Economic Research, No. 0306
- Goodhart C. and Schoenmaker D, (1993), "Institutional Separation between Supervisory and Monetary Agencies", *LSE Financial Markets Group Special Paper*, No. 52
- Gorodnichenko Y. and Schnitzer M, (2010), "Financial constraints and innovation: Why poor countries don't catch up", *NBER Working Paper*, No. 15792

- Gourinchas P.O. and Jeanne O, (2007), “Capital flows to developing countries: the allocation puzzle”, *NBER Working paper*, No. 13602
- Granger, C.W.J. (1988), “Causality, Cointegration, and Control,” *Journal of Economic Dynamics and Control*, Vol. 12(2-3), pp. 551-559.
- Greenwald B. and Stiglitz J, (1987), “Keynesian, New Keynesian and New Classical Economics”, *Oxford Economic Papers*, Vol. 39(1), pp. 119-133
- Gurley J.G. and Shaw E.S. (1955), “Financial Aspects of Economic Development”, *American Economic Review*, 45(4), 515–38.
- Hansen B, (2000), “Sample Splitting and Threshold Estimation”, *Econometrica*, Vol. 68, pp. 575-603
- Hansen L.P, (1982), “Large sample properties of generalized method of moments estimators”, *Econometrica*, Vol. 50 (4), pp. 1029-1054
- Hanson S, Kashyap K, Stein J, (2011), “A Macroprudential Approach to Financial Regulation”, *Journal of Economic Perspectives*, Vol. 25(1), pp. 3-28
- Hashi I. and Toci V, (2010), “Financing constraints, credit rationing and financing obstacles: evidence from firm-level data in South-eastern Europe”, *Economic and business review*, Vol. 12(1), pp. 29-60
- Havrylchyk O. and Jurzyk E, (2005), “Does the bank lending channel work in transition economy? A case of Poland”, *Mimeo*, European University Viadrina
- Hayward P. and Westphal A, (2006), “The Banking System in Republic of Serbia: Selected Issues”, *IMF Country Report*, No. 06/382
- Hellmann T, Murdock K.C, Stiglitz J, (2000), “Liberalization, Moral Hazard in Banking, and Prudential Regulation: Are Capital Requirements Enough?“, *American Economic Review*, Vol. 90(1), pp. 147-165

- Hericourt J, (2006), “Monetary policy transmission in the CEEC’s: a comprehensive analysis”, *Economic and Business Review*, Vol. 8(1), pp.37-81
- Hernando I. and Pages J. M, (2001), “Is There a Bank Lending Channel of Monetary Policy in Spain“, *Working Papers*, Banco de Espana, No. 0117
- Herrmann S. and Mihaljek D, (2010), “The determinants of cross-border bank flows to emerging markets – new empirical evidence on the spread of financial crises”, *Discussion Paper Series 1: Economic Studies*, Deutsche Bundesbank, No. 17
- Ho T. and Saunders A, (1981), “The Determinants of Bank Interest Margins: Theory and Empirical Evidence”, *Journal of Financial and Quantitative Analysis*, Vol. 16(4), pp.581-600
- Holden P. and Prokopenko V, (2001), “Financial Development and Poverty Alleviation: Issues and Policy Implications for Developing and Transition Countries”, *IMF Working paper series*, No. 01/160
- Horvath C, Kreko J, Naszodi A, (2006), “Is there a bank lending channel in Hungary? Evidence from bank panel data”, *MNB Working paper*, Hungarian National Bank, No.7
- IMF, (2000), *World Economic Outlook 2000*, Washington DC
- IMF, (2002), *Federal Republic of Yugoslavia: Selected Issues and Statistical Appendix*, IMF, Washington D.C
- IMF, (2003), *Compilation Guide on Financial Soundness Indicators*, IMF, Washington D.C.
- IMF, (2006), *Republic of Serbia: 2006 Article IV Consultation and Post-Program Monitoring Discussions – Staff Report; Staff Supplement; Public Information Notice on the Executive Board Discussion; and Statement by the Executive Director for the Republic of Serbia*, IMF, Washington DC

- Jimborean R, (2009), “The Role of Banks in the Monetary Policy Transmission in the New EU Member States”, *Economic Systems*, Vol. 33(4)
- Jonas J. and Mishkin F, (2003), “Inflation targeting in transition countries: Experience and prospects”, *NBER Working paper*, No. 9667
- Juks R, (2004), “The importance of the bank lending channel in Estonia: evidence from micro-economic data”, *Bank of Estonia Working Papers*, Bank of Estonia, No. 2004-06
- Kashyap A. and Stein J, (1993), “Monetary Policy and Bank Lending”, *NBER Working Paper*, No. 4317
- Kashyap A. and Stein J, (1995), “The Impact of Monetary Policy on Bank Balance Sheets”, *NBER Working Paper*, No. 4821
- Kashyap A. and Stein J, (1997), “What do a Million Banks Have to Say About the Transmission of Monetary Policy?”, *NBER Working Paper*, No. 6056
- Kashyap A. and Stein J, (2000), “What do a Million Observations on Banks Say about the Transmission of Monetary Policy”, *American Economic Review*, Vol. 90(3), pp.407-428
- Keeley M.C, (1990), “Deposit Insurance, Risk, and Market Power in Banking“ *American Economic Review*, Vol. 80(5), pp. 1183-1200
- Keynes J.M, (1930), *Treatise on Money*, Macmillan and co, London
- Kim M, et al, (2005), “What Determines Banks’ Market Power? Akerlof versus Herfindahl” *Norges Bank Working Paper*, No. 2005/8
- King R.G. and Levine R, (1993a), “Finance and Growth: Schumpeter Might Be Right”, *Quarterly Journal of Economics*, Vol. 108(3), pp. 717–37.
- King R.G. and Levine R, (1993b), ‘Finance, Entrepreneurship, and Growth: Theory and Evidence’, *Journal of Monetary Economics*, Vol. 32(3), pp. 513–42.

- Kishan R. and Opiela T, (2000). “Bank size, bank capital, and the banks lending channel”, *Journal of Money, Credit and Banking*, Vol. 32(1), pp. 121–141.
- Klein M, (1986), “A theory of the banking firm,” *Journal of Money, Credit and Banking*, Vol. 3, pp. 205-218
- Klos B. and Wrobel E, (2001), “ The monetary transmission mechanism and the structural modelling of inflation at the National Bank of Poland’’, *BIS Papers*, Bank for International Settlements, Vol. 8, pp. 232-251
- Köhler M, Hommel J, Grote M, (2006), “The Role of Banks in the Transmission of Monetary Policy in the Baltics’’, *Discussion Paper*, Center for European Economic Research, No. 06-005
- Kolodko G, (2010), “The Great Transformation 1989-2029, Could It Have Been Better? Will It Be Better?”, *Working Paper Series*, UNU-WIDER, No. 2010/40
- Kornai J, (1979), “Resource-Constrained versus Demand-Constrained Systems’’, *Econometrica*, Vol. 47(4), pp. 801-19
- Kornai J, (1986), “The Soft Budget Constraint“, *Kyklos*, Wiley Blackwell, Vol. 39(1), pp. 3-30
- Kose A, Prasad M. E, Rogoff K, Wei S. J, (2006), “Financial Globalization: A Reappraisal’’, *NBER Working paper*, No. 12484
- Kraft E, (2004), “Foreign Banks in Croatia: Reasons for Entry, Performance and Impacts’’, *Journal of Emerging Market Finance*, Vol. 3(2), pp. 153-174
- Kraft E. and Jankov, Lj. (2005), “Does Speed Kill? Lending Booms and their Consequences in Croatia’’, *Journal of Banking and Finance*, No. 29, pp.105-121
- La Porta R, Lopez-de-Silanes F, Shleifer A, Vishny R.W, (1998), “Law and Finance“, *Journal of Political Economy*, University of Chicago Press, Vol. 106(6), pp. 1113-1155

- Lane P. and Milesi-Ferretti G, (2007), “The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970-2004”, *Journal of International Economics*, Vol. 73(2), pp. 223-250
- Lang M. and Krznar I, (2004), ” Transmission Mechanism of Monetary Policy in Croatia”, *Mimeo*, Croatian National Bank
- Law on Banks and Other Financial Organizations (2002), *Official Gazette*, No. 36/2002
- Law on Payment Operations (2002), *Official Gazette*, No. 3/2002
- Law on the National Bank of Serbia, (2003), *Official Gazette*, No. 72/2003
- Leiderman L, Maino R, Parrado E, (2006), “Inflation Targeting in Dollarized Economies“, *IMF Working Papers*, No. 06/157
- Levine R, (1997), “Financial development and Economic Growth: Views and Agenda”, *Journal of Economic Literature*, Vol. 35(2), pp. 688-726
- Levine R, (2003), “Denying Foreign Bank Entry: Implications for Bank Interest Margins”, *Working paper*, Central bank of Chile, No. 222
- Levine R, (2004), “Finance and Growth: Theory and Evidence”, *NBER Working Paper*, No. W10766.
- Lucas R, (1972), “Expectations and the Neutrality of the Money”, *Journal of Economic Theory*, Vol. 4(2), pp. 103-124
- Lucas R, (1988), “On the Mechanics of Economic Development”, *Journal of Monetary Economics*, Vol. 22(1), pp. 3–42
- Lucas R, (1990), “Why doesn’t capital flow from rich to poor countries?”, *American Economic Review*, Vol.80(2), pp. 92-96
- Mamatzakis E, Staikouras C, Koutsomanoli-Fillipaki N, (2005), “Competition and Concentration in the Banking Sector of the South Eastern European Region”, *Emerging Market Review*, Vol.6(2), pp. 192-209

- Matousek R. and Sarantis N, (2009), “The bank lending channel and monetary transmission in Central and Eastern European countries”, *Journal of Comparative Economics*, Vol. 37(2), pp. 321-334
- McKinnon R.I, (1973), *Money and Capital in Economic Development*, Brookings Institution, Washington DC
- McKinnon R.I, (1988), “Financial Liberalization in Retrospect: Interest Rate Policies in LDCs”, in G. Ranis and T.P. Schultz (eds), *The State of Development Economics*, Basil Blackwell, Oxford
- Mian A, (2006), “Distance Constraints: The Limits of Foreign Lending in Poor Economies”, *Journal of Finance*, Vol. 61(3), pp. 1465-1505
- Miller M.H, (1998), “Financial Markets and Economic Growth”, *Journal of Applied Corporate Finance*, Vol. 11(1), pp. 8–14
- Miron J.A, Romer C.D, Weil D.N, (1994), “*Historical Perspectives on the Monetary Transmission Mechanism*”, NBER Chapters in Monetary Policy, pp.263-306
- Mishkin F, (2001), “The Transmission Mechanism and the Role of Asset Prices in Monetary Policy”, *NBER Working Paper*, No. 8617
- Mishkin F, (2002), “Does inflation targeting matter? Commentary”, *Review*, Federal Reserve Bank of St. Louis, Issue July, pp. 149-154
- Mladenović Z. and Petrović P. (2005), “Ekonometrijsko modeliranje inflacije u Srbiji”, *FREN research*, www.fren.org.rs
- Mladenović, Z. and Petrović, P. (2009) “Exchange rate pass-through across different inflation regimes: Evidence from a small open developing economy”, *FREN Working Paper*, FREN
- Modigliani F. and Miller M.H, (1958), “The Cost of Capital, Corporation Finance and the Theory of Investment”, *American Economic Review*, Vol. 48(2), pp. 261–97.

- Monti M, (1972), “Deposit, credit and interest rate determination under alternative bank objectives” in: *Mathematical Methods in Investment Finance*, edited by Szego G.P. and Shell K, North-Holland, Amsterdam
- Mottu E, (2007), “Serbia: Monetary policy and forecasting analysis model”, *Mimeo*, National bank of Serbia
- National bank of Serbia, (2004) “Rules on the chart of accounts and content of accounts within the chart for banks and other financial organisations”, *Official Gazette*, No. 133/2003 and 4/2004
- National bank of Serbia, (2004 and 2005), “Decision on Criteria for the Classification of Balance Sheet and Off-balance Sheet Items According to the Level of Collectability and Special Provisions of Banks and Other Financial Organisations”, *Official Gazette*, No. 37/2004, 86/2004 and 51/2005
- National Bank of Serbia, (2006), *The Memorandum of the National Bank of Serbia on Principles of a New Monetary Policy Framework, Aiming at Low Inflation Objectives*, Belgrade
- National bank of Serbia, (2008) “Rules on forms and content of individual items in financial statement forms to be completed by banks and other financial organizations”, *Official Gazette*, No. 74/2008
- National bank of Serbia, “Banking system report”, various issues
- National bank of Serbia, “Statistical Bulletin”, various issues
- OECD, (1993), *Trends and policies in privatization*, OECD, Paris
- OECD, (2011), *Slovenia: Review of the financial system*, Organization for economic co-operation and development (OECD), Paris

- Orlowski L, (1998), “Monetary policy targeting in Central Europe’s transition economies: The case for direct inflation targeting”, in Market Dabrowski (ed.), *Disinflation in Transition Economies*, Central University Press, Budapest
- Ostry J.D, Ghosh A.R, Chamon M, (2012), “Two Targets, Two Instruments: Monetary and Exchange Rate Policies in Emerging Market Economies”, *IMF Staff Discussion Notes*, No. 12/01
- Pagano M, (1993), “Financial Markets and Growth: An Overview”, *European Economic Review*, Vol. 37(2–3), pp. 613–22
- Panzar J, Rosse J, (1987), “Testing for Monopoly Equilibrium”, *Journal of Industrial Economics*, Vol. 35(4), pp. 443-456
- Patrick H, (1966), “Financial Development and Economic Growth in Underdeveloped Countries”, *Economic Development and Cultural Change*, Vol. 14(2), pp. 174–89
- Peek J. and Rosengreen E, (1995), “Is bank lending important for the transmission of monetary policy? An overview”, *New England Economic Review*, Federal Reserve Bank of Boston, Issue November, pp. 3-11
- Peek J. and Rosengren E, (2000), “Implication of the Globalization of the Banking Sector: The Latin American Experience”, *New England Economic Review*, Federal Reserve Bank of Boston, Issue September, pp. 45-62
- Petersen M. and Rajan R, (1996), “Trade Credit: Theories and Evidence”, *NBER Working Paper*, No. 5602
- Pomerlano M, (1998), “The East Asia crisis and corporate finances: The untold micro story”, *Policy Research Working Paper Series*, The World Bank, No. 1990
- Pritchett L, (1997), “Divergence, Big Time“, *Journal of Economic Perspectives*, Vol. 11(3), pp. 3-17

- Pruteanu A, (2004), “The Role of Banks in the Czech Monetary Policy Transmission Mechanism“, *Working Papers*, Czech National Bank, No. 2004/03
- Pruteanu-Podpiera A, (2007), “The role of banks in the Czech monetary policy transmission mechanism”, *Economics of Transition*, Vol. 15(2), pp.393–428.
- Puhr C. and Schwaiger M, Sigmund M, (2009), “Direct Cross-Border Lending by Austrian Banks to Eastern Europe”, *Financial Stability Report*, Oesterreichische Nationalbank, Issue 17, pp. 102-122
- Rajan R. and Zingales L, (1998), “Debt, Folklore, And Cross-Country Differences In Financial Structure”, *Journal of Applied Corporate Finance*, Vol. 10(4), pp. 102-107
- Reinhart C. and Rogoff K, (2009), “This Time It’s Different: Eight Centuries of Financial Folly-Preface”, *MPRA Paper*, No. 17451
- Robinson J, (1952), “The generalization of the General Theory”, in *The rate of interest, and other essays*, Macmillan, London, pp.67-142
- Rodrik D, (2012), “Do we need to rethink growth policies”, in “*In the Wake of the Crisis, Leading Economists Reassess Economic Policy*”, edited by Olivier Blanchard, David Romer, Michael Spence and Joseph Stiglitz, MIT Press, Cambridge Massachusetts
- Roodman D, (2009), “How to do xtabond2: An introduction to difference and system GMM in Stata”, *Stata Journal*, Vol. 9(1), pp. 86-136.
- Rossi S, Schwaiger M, Winkler G, (2005), “Managerial Behavior and Cost/Profit Efficiency in the Banking Sectors of Central and Eastern European Countries”, *Osterreichische Nationalbank Working Paper*, No. 96
- Rousseau P.L. and Wachtel P, (2001), “Inflation, Financial Development and Growth”, in T. Negishi, R. Ramachandran and K. Mino (eds), *Economic Theory, Dynamics and Markets: Essays in Honor of Ryuzo Sato*, Kluwer, Boston, pp. 309–24.

- Rousseau P. and Wachtel P, (2005), “Economic Growth and Financial Depth: Is the Relationship Extinct Already?”, *Discussion Paper*, World Institute for Development Economic Research, No. 2005
- Santomero A, (1996), “The regulatory and public policy agenda for effective intermediation in post socialist economies”, *The Wharton Financial Institutions Center*, Working Paper Series, No.96-34
- Schiantarelli F, (1995), “Financial Constraints and Investment: A Critical Review of Methodological Issues and International Evidence”, *Boston College Working Papers in Economics*, No. 293
- Schmitz B, (2004), “What Role do Banks play in Monetary Policy Transmission in EU New Member Countries?”, *Mimeo*, Hungarian national bank
- Schoors K, (2000), “A Note on Building a Database on Russian Banks: Fieldwork Against the Odds”, *Post-Communist Economies*, Vol. 12(2), pp. 241-249
- Schoors K, (2001), “The credit squeeze during Russia's early transition: A bank-based view”, *The Economics of Transition*, EBRD, Vol. 9(1), pp. 205-228
- Schumpeter, J. (1911), *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and Business Cycle*, Harvard University Press, Cambridge
- Sedlacek T, (2011), *Economics of good and evil, The quest for economic meaning from Gilgamesh to Wall street*, Oxford University Press, Oxford
- Sen A, (1999), *Developments as Freedom*, Oxford University Press, Oxford
- Sevestre P, (1997), “On the use of banks balance sheet data in loan market studies: a note”, *Working Papers*, Banque de France, No. 49
- Sguard et al., (1996), “Credit Crisis and the Role of Banks During Transition: a Five-Country Comparison”, *CEPII Working Paper*, No. 96-08

- Shaw E.S, (1973), *Financial Deepening in Economic Development*, Oxford University Press, New York
- Shin H.S, (2011), “Macroprudential policies beyond Basel III”, *BIS Papers chapters*, in: Bank for International Settlements (ed.), *Macroprudential regulation and policy*, Vol. 60, pp. 5-15
- Soledad Martinez Peria M, Mody A, (2004), “How Foreign Participation and Market Concentration Impact Bank Spreads: Evidence from Latin America”, *Journal of Money, Credit and Banking*, Vol. 36(3), pp. 511-537
- Stein J.C, (1995), “An Adverse Selection Model of Bank Asset and Liability Management with Implications for the Transmission of Monetary Policy“, *NBER Working Papers*, No. 5217
- Stiglitz, J. and Weiss A, (1981), “Credit Rationing in Markets with Imperfect Information”, *American Economic Review*, Vol. 71(3), pp. 393-410
- Stiglitz J, (2000), “Capital Market Liberalization, Economic Growth, and Instability”, *World Development*, Vol. 28(6), pp. 1075-1086
- Stiglitz J, (2002), “New perspectives on public finance: recent achievements and future challenges,” *Journal of Public Economics*, Vol. 86(3), pp. 341-360
- Stiglitz J, (2010), “Regulation and Failure”, in “*New Perspectives on Regulation*”, edited by David Moss and John Cisternino, The Tobin Project, Cambridge Massachusetts, pp. 11-23
- Stiglitz J. (2012), “Macroeconomics, Monetary Policy and the Crisis”, in “*In the Wake of the Crisis, Leading Economists Reassess Economic Policy*”, edited by Olivier Blanchard, David Romer, Michael Spence and Joseph Stiglitz, MIT Press, Cambridge Massachusetts

- Sturm J.E. and Williams B, (2004), “Foreign bank entry, deregulation and bank efficiency: Lessons from the Australian experience“, *Journal of Banking & Finance*, Vol. 28(7), pp. 1775-1779
- Summers L, (2000), “International Financial Crises: Causes, Prevention, and Cures”, *American Economic Review*, Vol. 90(2)
- Svensson L, (2000), “Open-economy inflation targeting” *Journal of International Economics*, Vol. 50(1), pp. 155–183.
- Svensson L, (2009), “Flexible inflation targeting – lessons from the financial crisis”, *Mimeo*, Netherlands Central Bank
- ‘The gated globe’, special report World economy, *The Economist*, October 12, 2013, p.3
- The World Bank and IMF, (2005), *Financial Sector Assessment: a handbook*, The World Bank/IMF joint publication, Washington DC
- The World Bank, (2005), *BEEPS-at-a-Glance, Serbia and Montenegro*, Washington DC
- The World Bank, (2008), *Finance for All? Policies and Pitfalls in Expanding Access*, The World Bank, Washington DC
- Udell G.F. and Wachtel P, (1995), “Financial system design for the formerly planned economies: Defining the issues, Financial Markets, Institutions and Instruments”, *New York University Working Papers*, Vol. 4(2), pp. 1-59
- Uvalić M, (2010), *Serbia’s transition. Towards a better future*. Palgrave MacMillan, Basingstoke
- Uvalić M, (2013), “Why has Serbia not been a frontrunner?” Chapter 29 of: *Handbook of the economics and political economy of transition* (P. Hare and G. Turley, eds.), pp. 365-375. Routledge International Handbooks, London and New York
- Vernimmen P, (2006), *Finance d’Entreprises*, Dalloz-Sirey, Paris

- Vittas D, (1991), “Measuring Commercial Bank Efficiency, Use and misuse of bank operating ratios”, *IMF Working paper series*, No. 806
- Vives X, (2001), “Competition in the Changing World of Banking”, *Oxford Review of Economic Policy*, Vol. 17(4), pp.535-547
- Vučković M, (1969), “The recent development of the money and banking system of Yugoslavia”, *Journal of Political Economy*, University of Chicago, Vol. 71, p. 363
- Wachtel P, (2001), “Growth and Finance: What Do We Know and How Do We Know It?”, *International Finance*, Wiley Blackwell, Vol 4(3), pp. 335-362
- Weill L, (2003), “Banking efficiency in transition economies”, *The Economics of Transition*, EBRD, Vol. 11(3), pp. 569-592
- Williams J, (2004), “Determining management behaviour in European Banking”, *Journal of Banking and Finance*, No. 28, pp. 2427-2460.
- Williamson J, (1989), “The Case for Roughly Stabilizing the Real Value of the Dollar”, *The American Economic Review*, Vol. 79(2), pp. 41-45
- Windmeijer F, (2005), “ A finite sample correction for the variance of linear efficient two-step GMM estimators”, *Journal of Econometrics*, Vol. 126(1), pp. 25-51
- Winkler A, (2009), “Southeastern Europe: Financial Deepening, Foreign Banks and Sudden Stops in Capital Flows”, in *Focus on European Economic Integration*, Oesterreichische Nationalbank, Vol. 1, pp. 84-97
- Wong K.P, (1997), “On the Determinants of Bank Interest Margins under Credit and Interest Rate Risk”, *Journal of Banking and Finance*, Vol. 21(2), pp. 251-271
- Wrobel E. and Pawlowska M, (2002), “Monetary transmission in Poland: Some evidence on interest rate and credit channels”, *Materials and Studies*, National bank of Poland, No.24

Yellen J, (2009), “Linkages between monetary and regulatory policy: lessons from the crisis”,

FRBSF Economic Letter, Federal Reserve Bank of San Francisco, Issue November

Zarruck E.R, (1989), “Bank Spread with Uncertain Deposit Level and Risk Aversion”,

Journal of Banking and Finance, Vol. 13(6), pp. 797-810