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Giang Phung

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ESCP Europe

Ecole Doctorale de Management Panthéon-Sorbonne
ED 559

ESSAYS ON BANKS
IN THE EMERGING AND TRANSITION ECONOMY OF VIETNAM

THESE

En vue de l'obtention du
DOCTORAT ÈS SCIENCES DE GESTION

Par

Giang PHUNG

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Dành tặng gia đình thân yêu của tôi

A ma très chère famille

To my dear family

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Essais sur les banques dans l'économie émergente et en transition du Vietnam
RESUME GENERAL (en français)

Un marché financier stable et efficace est essentiel pour une croissance économique durable, tant dans les pays émergents comme le Vietnam que sur les marchés plus développés. La crise financière mondiale de 2008 a mis en évidence l'échec de la réglementation bancaire traditionnelle et contraint les pays en voie de développement à renforcer non seulement les réglementations existantes, mais également à rechercher de nouveaux moyens de stabiliser les banques. En particulier, il est devenu évident que les réglementations prudentielles classiques peuvent être plus efficaces si elles sont complétées, par exemple, par une bonne gouvernance d'entreprise, une discipline de marché et des procédures efficaces pour le traitement des banques en faillite par le régulateur.

Dans cette thèse, nous essayons d'identifier l'efficacité de ces différentes dimensions de la réglementation bancaire pour le cas particulièrement intéressant du Vietnam. Après la décision de réforme du gouvernement (« doi moi ») en 1986, le pays a réussi à privatiser progressivement différents secteurs de l'économie, notamment la banque et la finance, ce qui a permis une économie plus prospère et de meilleures conditions de vie. Cependant, en regardant de plus près ce processus, il est possible d'identifier certains problèmes dans le secteur financier qui risquent de ralentir la croissance économique. Si le Vietnam veut continuer à croître et à rattraper les économies plus développées, il est essentiel de comprendre les causes profondes de ces problèmes et de les résoudre avec une meilleure réglementation financière. Nous pensons que nos résultats seront un pas dans cette direction.

Nous pensons également que nos résultats sont transférables à d'autres pays émergents et en transition. Plus généralement, le Vietnam peut également être utilisé comme laboratoire pour mieux comprendre les mécanismes économiques existant dans les pays développés.

Le premier article de cette thèse analyse l'impact des « partenaires stratégiques », qui sont des banques étrangères détenant un nombre stratégique d'actions dans des banques vietnamiennes. Dans notre étude, nous intégrons les facteurs de gouvernance pour mieux

comprendre le rôle des partenaires stratégiques dans l'amélioration de la performance des banques vietnamiennes. En particulier, la participation étrangère et la gestion étrangère sont souvent supposées améliorer l'efficacité des banques des marchés émergents. L'étude contribue à la littérature existante sur la gestion des banques par des étrangers en faisant la distinction entre la propriété des investisseurs stratégiques et non stratégiques et entre la dépendance ou non des gestionnaires étrangers à l'égard du partenaire stratégique. Les preuves montrent que seule la présence de dirigeants étrangers indépendants a un impact positif sur les banques, impliquant des conflits entre les actionnaires locaux et le partenaire stratégique qui entravent un transfert de technologie efficace.

Le deuxième article porte sur l'érosion de la discipline des déposants au Vietnam, d'abord lors de la tourmente bancaire provoquée par la crise financière mondiale de 2007-2008, pendant laquelle l'inflation a atteint 23,12%, puis lors de la crise de dette en 2011. Au cours de ces deux périodes, nous avons observé l'intervention de la Banque d'Etat du Vietnam sous la forme de plans de sauvetage implicites. Ils ont assuré qu'aucune banque n'échouerait, indépendamment de sa situation financière. Nos tests montrent que la discipline des déposants vis-à-vis des banques s'est beaucoup affaiblie après ces deux épisodes. Les déposants se préoccupent alors uniquement des taux d'intérêt des dépôts et accordent beaucoup moins d'attention au risque des banques. En conséquence, les banques qui doivent payer des intérêts élevés pour attirer des dépôts auront tendance à prendre des projets plus risqués afin de couvrir leurs coûts de capital, ce qui entraînera une part plus importante de prêts non productifs dans leurs bilans.

Enfin, nous menons une étude sur la manière dont les fusions bancaires au Vietnam ont été utilisées comme un outil de restructuration du système bancaire. Même si depuis 2007, il existe une loi explicite sur la faillite pour les établissements de crédit, aucune faillite n'a jamais eu lieu. Au lieu de cela, la Banque d'Etat du Vietnam oblige généralement la banque en détresse à fusionner avec une institution plus forte. Nous analysons l'effet de ces fusions sur les banques acquéreuses et constatons qu'elles sont moins bien loties en termes de rentabilité et de liquidité, comme en témoigne les valeurs inférieures de la rentabilité des actifs, du

rendement des capitaux propres ou du rendement récurrent, les ratios de coûts sur revenus et les ratios de prêts sur dépôts plus élevés. Il convient de noter que la détérioration de la situation financière de ces banques acquéreuses est observée non seulement juste après l'acquisition, en raison du fardeau des banques en détresse, mais que cet effet persiste pendant une période de cinq à six ans après l'acquisition. Cette constatation montre que les fusions au Vietnam ne constituent pas une méthode efficace pour sauver les banques défaillantes et pourraient en réalité affaiblir l'ensemble du système financier.

Les sections suivantes de la thèse sont organisées comme suit. Le chapitre 1 présente une revue de la littérature sur les systèmes financiers dans les pays en transition ainsi que sur le cadre institutionnel du système bancaire vietnamien. Les chapitres 2, 3 et 4 correspondent aux trois articles empiriques présentés ci-dessus. Le chapitre 5 conclut la thèse.

Essays on banks in the emerging and transition economy of Vietnam

GENERAL ABSTRACT (in English)

A stable and efficient financial market is essential for sustainable economic growth, both in emerging countries like Vietnam as well as in more developed markets. The global financial crisis in 2008 has highlighted the failure of traditional banking regulations and forced developing countries not only to reinforce existing regulations but also to search for new ways of stabilizing banks. In particular, it became evident that classical prudential regulations can be more efficient if it is complemented for example by good corporate governance, market discipline and efficient procedures for the handling of failed banks by the regulator.

In this thesis, we try to identify the efficiency of these different dimensions of bank regulations for the particularly interesting case of Vietnam. After the government's decision of reform ("doi moi") in 1986, the country has succeeded in the gradual privatization of different economic sectors, including banking and finance, leading to a more prosperous economy and better living conditions. However, when looking closer at this process, it is possible to identify a number of problems in the financial sector that threaten to slow down economic growth. If Vietnam is to keep growing and catch up with more developed economies, it is essential to understand the root causes of these problems and address them with better financial regulations. We believe that our results will be a step in this direction.

We also think that many of our insights should be transferrable to other emerging and transition countries. More generally, Vietnam can also be used as a laboratory to better understand the economic mechanisms that exist in developed countries.

The first paper of this thesis analyzes the impact of "strategic partners", which are foreign banks holding a strategic amount of shares in Vietnamese banks. In our study, we integrate the governance factors to better understand the role of strategic partners in improving the performance of Vietnamese banks. In particular, foreign ownership and foreign

management are often assumed to improve the efficiency of emerging market banks. The study adds to the existing literature on foreign bank management by distinguishing between strategic and non-strategic investors' ownership and between the dependence or not of foreign managers on the strategic partner. Evidence shows that only the presence of independent foreign executives has a positive impact on banks, implying conflicts between local shareholders and the strategic partner which hamper efficient technology transfer.

The second article focuses on the erosion of depositor discipline in Vietnam, first during the banking turmoil caused by the global financial crisis 2007-2008, when inflation reached 23.12%, and then during the country's bad debt crisis in 2011. In these two periods, we observed the State Bank of Vietnam's intervention in the form of implicit bail-outs. They ensured that no bank would fail, independently of its financial situation. Our tests show that depositor discipline over banks became much weaker after these two episodes. Depositors then only care about deposit interest rates and pay much less attention to how risky the banks are. As a consequence, banks who have to pay high interests to attract deposits will be prone to taking riskier projects in order to cover their costs of capital, which in turn will lead to a higher portion of non-performing loans on their balance sheets.

Finally, we carry out a study of the way bank mergers in Vietnam have been used as a tool to restructure the banking system. Even though since 2007, there has been an explicit bankruptcy law for credit institutions, no bankruptcy has ever occurred. Instead, the State Bank of Vietnam typically forces the weak bank to merge with a stronger institution. We analyze the effect of these mergers on the acquiring banks and observe that they are worse off in terms of profitability and liquidity, evidenced by lower Return on Average Assets (ROAA), Return on Average Equity (ROAE) or Recurring Earning Power, higher Cost to Income Ratios, and higher Net Loans to Deposit ratios. It is worth noting that these banks are worse off not just after the acquisition due to the burden of the weak acquired banks, but that this effect persists for a period of 5-6 years after the acquisition. This finding illustrates that mergers in Vietnam are not an effective method to save failing banks and might actually weaken the entire financial system.

The following sections of the thesis are organized as follows. Chapter 1 presents a literature review on financial systems in transition economies as well as some institutional background for Vietnam's banking system. Chapters 2, 3, and 4 correspond to the three empirical articles presented above. Chapter 5 concludes the thesis.

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CHAPTER 1: INTRODUCTION

1.1. The role of banking systems in Emerging market economies and Transition economies

1.1.1. Emerging market economies – Transition economies

Vietnam is at the same time an emerging country and a transition economy. While the definitions of these two concepts differ, most of the transition economies are also emerging market economies. The common objective of these economies, as in the case of Vietnam, is to become a developed, open market economy.

A transition economy is characterized by a transitional phase of changing from central planning to free markets. Since the collapse of communism in the late 1980s, countries of the former Soviet Union and its satellite states in Europe, together with some Asian countries (Cambodia, China, Laos, and Vietnam) sought to embrace market capitalism and abandon central planning, meaning they are in the process of transforming from a closed economy to an open market economy. Most of these transition economies have to face with severe short-term difficulties and longer-term constraints on development, including rising unemployment, inflation, lack of entrepreneurship and skills, corruption, inadequate infrastructure and legal system, and increasing inequality. Rising unemployment resulted from the effort of cutting cost, improving efficiency in newly established private firms and reduction in the size of the state bureaucracy.

An emerging market economy (EME) was first defined as an economy with low to middle per capita income in 1981 by the economist Antoine W. Van Agtmael of the International Finance Corporation (IFC) - a sister organization of the World Bank and member of the World Bank Group. The World Bank classifies economies into low-income, lower-middle income, upper-middle income and high-income economies based on their GNI (Gross National Income) per capita, calculated using the World Bank's "Atlas" method¹.

¹ The thresholds of these groups have changed over time. The World Bank clarifies that their use of this classification system does not imply a judgment with regard to the development status of any country or territory. In addition, for the World Bank, the term "country", used interchangeably with "economy", does not

Currently, the World Bank does not have an explicit list of emerging markets. The Emerging Markets Database (EMDB) developed by IFC (International Finance Corporation) was sold to S&P (Standard & Poor's) in 2000. However, it is worth noting that there is no single definition or classification of countries in the emerging markets group. Besides S&P, many other international organizations have their own definition and list of emerging markets², including the International Monetary Fund (IMF), the Financial Times Stock Exchange (FTSE), the Morgan Stanley Capital International (MSCI) Indexes, the Emerging Market Bond Index Global (EMBI Global) by J.P. Morgan, Dow Jones, and Russell Investment, among others. The 2018 Morgan Stanley Capital International (MSCI) Market Classification Framework considers the following three criteria in classifying countries as developed, emerging or frontier: economic development, size and liquidity, and market accessibility. Developed markets have a high level of market efficiency and strict standards in accounting and securities regulations, such as the United States, Western Europe, and Japan. An emerging market is an economy that has some characteristics of a developed market, has begun to open up its markets and "emerge" onto the global scene, but does not satisfy standards to be termed a developed market. Emerging markets typically have a physical financial infrastructure including banks, a stock exchange, and a unified currency. The term "frontier market" is used for developing countries with smaller, riskier, less liquid capital markets, or more limited market accessibility than "emerging". In 2018, Vietnam is considered an emerging market based on the criteria of IMF, EM bond index or BRICS + Next Eleven but it is still a "frontier" market according to the definition of MSCI, FTSE, Dow Jones, or S&P. Although the term "emerging market" is loosely defined, countries that fall

signify political independence but makes reference to any territory for which authorities report separate social or economic statistics.

² The lists of emerging countries vary from one organization to another. A list of emerging market economies generally includes several African countries, some Eastern European countries, a number of countries of Latin America, some countries in the Middle East, Russia and some Asian countries. The four largest emerging economies by either nominal or PPP-adjusted GDP are Brazil, Russia, India and China (the BRIC countries), of which China and India are considered the largest emerging markets.

into this category share common characteristics of developments and reforms, disregard of their size³.

Since emerging markets start at a lower level of economic performance, there is room for development and EMEs are usually fast-growing economies. Under the reform process, an EME has the high chance of receiving aid and guidance from large donor countries and/or world organizations such as the World Bank and the International Monetary Fund, in exchange of their commitment to further open their markets to facilitate global trade exchange and competition. Similarly, transforming the centrally planned economies to an open market in transition economies requires substantial reforms. Essential ingredients necessary for a successful transition include the process of liberalization, macroeconomic stabilization, restructuring, and privatization, as well as legal and institutional reforms, during which the creation of a viable financial sector is imperative. In the following sections, we present a literature review on financial systems and economic growth in general and the importance of the banking systems in transition economies and emerging markets in particular.

1.1.2. Financial systems and economic growth

Research has long attributed a decisive role to the banking sector in mobilizing savings, evaluating projects, monitoring managers' risk-taking, and facilitating transactions for a country's economic development. The link between finance and growth has first been established by Schumpeter (1911). Joseph Schumpeter argued that the services provided by financial intermediaries are essential for technological innovation and economic growth. More recently King and Levine (1993) present cross-country analysis using data on 80 countries over the 1960-1989 period, showing evidence consistent with Schumpeter's view that the financial system can promote economic growth. Various measures of the level of financial development demonstrate strong associations with real per capita GDP growth, the rate of

³ We can find China, which is now the world's second-biggest economy by GDP (current US\$), alongside much smaller economies like Hungary in the list of emerging markets. Both countries belong to this category because both have taken up economic development and reform programs that will lead them to stronger economic performance while building transparency and efficiency in the capital market as well as overall accountability within the system.

physical capital accumulation, and physical capital employment efficiency improvement. More importantly, the predetermined component of financial development is robustly correlated with future rates of economic growth, physical capital accumulation, and economic efficiency improvements. These empirical findings have refuted the skepticism over the role of financial development in economic growth, even among the most influential economists up to that time, who allege that financial development simply followed economic growth (Robinson, 1952), or believe that the relationship between financial and economic development was “over-stressed” (Lucas, 1988). Using a large sample of countries over the 1980s, Rajan and Zingales (1998) confirm that by reducing the costs of external finance to firms, financial development facilitates economic growth.

The size and structure of financial markets vary considerably by country. Factors that are considered the most important are the level of economic development and the legal tradition to which the country belongs. La Porta et al. (1998) show that countries with a *common law* tradition provide better protection of investors and minority shareholders in particular than do the countries of civil law tradition.

Beck and Levine (2002) find that stock markets positively influence economic growth. Nevertheless, the scale and complexity of financial institutions as well as financial markets in developed economies are not consistent with low-income economies because of the gap in the financial infrastructure. In the near future, the stock markets may not become the main source of financing in developing countries. In reality, during the early stages of development, small and medium enterprises cannot rely on the stock market to raise capital but need to borrow from banks.

1.1.3. Banking systems in emerging and transition economies

In developing countries, one of the most important issues is setting the financial sector to allocate funds to different industries in the economy in an efficient manner. As above-mentioned, direct finance, such as stock markets cannot be an effective channel of financing

in emerging countries and indirect finance (mainly banks) still play a crucial role in allocating funds in these economies. The literature has studied several aspects of banking systems in emerging and transition economies, nevertheless, many questions are left for further research.

Setting an objective and making plans for the reform require benchmarks and developed countries appear to have exemplary models for transition economies. Jaffee and Levonian (2001) assume that the banking systems in the developed economies have reached an efficient equilibrium and use two-stage regression tests to obtain benchmarks for the efficient structure of the banking systems in 23 transition economies. They first determine the most important causes of the observed structure of banking systems in developed economies and then apply the regressions estimated in the first stage to the transition economies in Central and Eastern Europe. According to this study, benchmarks that should be taken into account in order to measure the convergence of a transition economy's banking system to that of the developed economies are total bank assets, the number of banks, bank branches, and the number of employees.

In order to reach the same efficiency level in the financial system as in the developed economies, transition economies need to undertake substantial reforms. According to Hawkins and Mihaljek (2001), reforms in the banking sector in the transition economies are driven by deregulation, privatization of public banks, opening to foreign competition, technological change, and changes in the behavior of firms and banking crises. Note, however, that during this reform process, banking instability may even be desirable for improving banking efficiency (Gorton and Winton, 1998), especially due to the small size of the banking system in transition economies. The authors argue that stability can simply be obtained by, for example, outlawing private banking altogether, but evidence suggests that this results in inefficient banking systems. Furthermore, if subsidizing SOEs' inefficient loans may make them safer to established banks and hence assure them higher stability, it will require instability elsewhere in the system, such as the creation of small new banks with high failure rates that provide credit to new, risky firms.

Banking performance and profitability are also questions of high interest to researchers. While investigating the determinants of bank profitability, Djalilov and Piesse (2016) conclude that the banking sector of early transition countries of Central and Eastern Europe (CEE) is more competitive than in the late transition countries of the former USSR. More specifically, in late transition countries, they find a negative influence of government spending and monetary freedom on bank profitability. Moreover, better profitability observed in better-capitalized banks in early transition countries implies that these banking sectors are more robust. In emerging Asian countries, Phan et al. (2016) have found positive effects of market concentration, bank size, and gross domestic product growth on banking efficiency, whereas competition and liquidity risk are negatively related to efficiency. In contrast with this study, Chan et al. (2015) conclude that higher bank concentration reduces the efficiency level of commercial banks in ASEAN 5⁴, consistent with concentration-fragility theory. The authors also find that better institutional framework – greater foreign ownership, political stability, and regulatory quality – plays a significant mediating role to improve bank efficiency level even in a highly concentrated banking market. The effect of banking system reform on Chinese listed firms' financial decisions appears positive: Tsai et al. (2014) find that the reform increased the efficiency of resource allocation, mitigating politically-oriented investment problem for state-controlled listed companies thanks to foreign participation in the management of Chinese banks. The authors also observe reduced financial constraints in non-state-controlled listed companies thanks to increased access to bank loans. Du et al. (2016) carry out a comparative study of shadow banking activities of non-financial firms in China and transition economies in Central and Eastern Europe (CEE), in which firms borrow in order to lend, hence decrease the efficiency of capital employed in production and distort the resources allocation in the economy. The authors find that a better development of the financial market and legal system, as well as better growth prospects, deter firms from engaging in re-lending business. Chen and Zhu (2018) also provide updated evidence of a

⁴ ASEAN-5 comprises the founding member states of ASEAN (Association of Southeast Asian Nations): Indonesia, Malaysia, the Philippines, Singapore and Thailand.

positive association between the foreign presence and banking competition in emerging markets. In particular, their analysis suggests that such a linkage is more conspicuous after the 2008-2009 global financial crisis than before and more pronounced in Latin American and Eastern and Central European emerging markets than in Asia. Furthermore, a lower level of regulatory restrictions in banking sectors has a moderation effect on the positive “foreign penetration - competition” nexus.

In this thesis, we contribute to the literature by examining the governance and regulatory characteristics of the banking system in Vietnam’s economy, which is at the same time an emerging and a transition economy. More specifically, our research analyzes 1) how an emerging country can best benefit from the expertise of foreigners in improving banking performance, 2) the role of depositor discipline and 3) the efficiency of acquisition as a tool of restructuring the banking system. In the following section, we will start by providing some background information on the Vietnamese banking system reform.

1.2. Institutional features of the Vietnamese banking system

1.2.1. Vietnamese banking system reform

In most transition economies, the creation of a capitalist banking system was marked with the attempt of forming a "two-tiered" system (Claessens, 1998). The national bank from the prior communist era was remodeled as the central bank and a number of commercial banks, often specialized by sector.

Vietnam followed similar steps of transformation. The two parts of the country were reunified in 1975 after decades of wars. In 1976, as a part of its postwar reorganization, the country established the State Bank of Vietnam to replace the former National Bank of Vietnam. Vietnam's economy was then supported by a "one bank" system with a head office in Hanoi, a division in Ho Chi Minh City, and numerous provincial branches nationwide. The state banking system was essentially operating as a budgetary tool of a command economy, keeping track of the financial transactions that resulted from planned allocations, having no

activities following market principles. Banks in Vietnam acted as accounting agencies for the planning process and payment agents among state entities rather than as financial intermediaries of a market-oriented economy, similar to other pre-transition planned economies (Bonin and Wachtel, 2003).

The model for this structure can be traced back to the most powerful command economy under the rule of the Communist Party - the Union of Soviet Socialist Republics (USSR), established in 1922, five years after the revolution that overthrew the Russian czar. Initially, as an underdeveloped economy, the Soviet Union could adopt Western technology while forcibly mobilizing resources with an intense focus on industrialization and modernization at the expense of personal consumption. The low departing point together with the implementation of such technologies granted the Soviet Union a period of rapid growth between 1928 and 1970, during which the estimated average annual growth rate in the gross national product (GNP) regularly exceeded 5 percent. However, once the gap between the country and the West narrowed, its ability to imitate development models and its productivity effects diminished. Consequently, the command economy began to stagnate in the 1970s (see Ofer, 1987). The Soviet Union failed to incentivize further technological innovation (Bergson, 1987) and to cope with the growing complexity of the economy beyond its coordination and planning capacity (Schroeder, 1985). Various piecemeal reforms allowing for more decentralized market and openness to foreign trade only undermined the economy's core institutions, and finally resulted in the Soviet Union collapse in late 1991. Weitzman (1970) and Easterly and Fischer (1995) attribute sharply diminishing returns to capital in the Soviet Union to a low elasticity of capital-labor substitution, suggesting that this difficulty was related to the planned economic system.

The Soviet Union's declining economic power in the 1970s gradually reduced its political influence over other communist countries. Deprived of subsidies from the leading communist country, together with an urging need of recovering its postwar economy, Vietnam eventually voted for radical reform. The year of the "doi moi" (reform) 1986 marked an important revolution in the economy: Vietnam transformed the way the economy operated

from the command mechanism with central planning and subsidizing to the market mechanism. Accordingly, the banking system of Vietnam was revolutionized and shifted to serve increasingly important market participants – the people, and enterprises. This is a truly fundamental change that forms the basis for the development of a modern market economy.

The start of the liberalization of the banking system was the Decree 53/HDBT issued in March 1988. In May 1990, the State Council then passed two ordinances that officially transformed the banking system in Vietnam into a two-tier system. Since then, the State Bank of Vietnam focuses on the tasks of a central bank, whereas commercial activities have been delegated to four state-owned banks⁵, of which two were created in 1988⁶ and two were reorganized from existing banks⁷.

Alongside these state-owned commercial banks, since 1991, private Vietnamese joint-stock banks have been gradually founded and come into operation. This decision of introducing private banks to the economy was a rational one since Claessens (1998) shows evidence of institutional development of banks in twenty-five transition countries suggesting that more rapid progress can be made with the entry of new banks as opposed to the rehabilitation of existing state-owned banks. Nevertheless, poor troubled-bank intervention, preferential treatment, and limited entry still impede the progress of the banking system, leaving a cadre of weak banks in existence. A later study by Saez (2001) also confirms that the new entry approach may work more favorably to reduce non-performing assets in China

⁵ The fifth state-owned bank, Mekong Housing Bank (MHB), was established much later in 1997. In contrast with the other four state-owned banks with nation-wide networks which are referred to as “Big Four”, MHB is small and most active in the Mekong Delta area. Due to internal management frauds, the bank’s equity had been decreasing constantly since 2007. In 2015, the bank was merged with BIDV, another state-owned bank. Also in this year, the State Bank of Vietnam took over three failed private banks, turning them into state-owned banks (GP Bank, CB Bank, Ocean Bank).

⁶ (i) Agribank was established in 1988 under the name of Agricultural Development Bank of Vietnam, changed into Vietnam Bank for Agriculture in 1990 and finally Vietnam Bank for Agriculture and Rural Development since 1996 (Annual Report 2017, Agribank). (ii) Vietinbank was established under the name of Vietnam Industrial and Commercial Bank in 1988. In 2009, the bank was listed and became Vietnam Joint Stock Commercial Bank for Industry and Trade.

⁷ (i) BIDV, formerly Vietnam Construction Bank established in 1957, was renamed into Vietnam Bank for Investment and Construction in 1981, then Bank for Investment and Development of Vietnam in 1990. In 2012, the bank was equitized and transformed into Joint Stock Commercial Bank for Investment and Development of Vietnam. (ii) Vietcombank, formerly Foreign Trade Bank established in 1962, was officially transformed to a multi-functional state-owned commercial bank. The bank was renamed to Bank for Foreign Trade of Vietnam in 1996. In 2008, the bank was listed on the stock exchange and changed its name to Vietnam Foreign Trade Joint Stock Bank.

and India. In Vietnam, the benefits of the restructuring of the banking system and market reforms initiated by "Doi Moi" since 1986 were proved by the success of considerable decline in inflation in 1988 (nearly 500 percent) to 36 percent in 1990, and it has continued to decline through 1994⁸.

The renovation of banking activities has contributed positively to the reform process and economic development of Vietnam. First, it plays an important role in repelling and curbing inflation, gradually stabilizing the currency exchange rate, contributing to the improvement of the macro-economy and business environment. Second, the renovation promotes investment, developing production, trading, and import-export activities. Under the market-oriented mechanism, banks mobilize domestic capital for development investment and lend mainly based on the feasibility and effectiveness of each project, each sector of the industry. Banking credit has contributed positively to sustaining high economic growth for years in a row with the domestic credit provided by financial sector accounting for more than 100% of GDP since 2009⁹. The use of bank capital for this purpose is expected to be increasingly professional, transparent and effective. Furthermore, the project appraisal, the lending decision and the close monitoring after lending are believed to promote sustainable development by focusing on customers' secure and efficient use of loans, as well as their compliance with international commitments and regulations on environmental protection. In the literature, Thoa and Uyen (2017) examine the effect of banking system reform and find a U-shape relation between investment and cash flow. They also find evidence that the presence of foreign banks in Vietnam mitigates the underinvestment problem of private listed firms thanks to better accessibility to bank loans, even though overinvestment of state-controlled firms is not reduced. The efficiency of the Vietnamese banking system from 1999 to 2009 has been analyzed by Stewart et al. (1996). The results reveal the determinants of bank efficiency such as bank size, non-state ownership, and moderate branch networks.

⁸ CPI Report, Vietnam's General Statistics Office

⁹ Source: the World Bank data

Besides traditional credit activities, banking services have also developed in terms of quality and types, facilitating production and business. Although Vietnam is still a cash-based society, by the end of 2014 there were about 16000 automated teller machines (ATMs) installed and more than 172000 POS/EDC (point of sales/ electronic data capture). These are in line with the Government's undertakings of promoting non-cash based payment; various new, advanced payment services and means continued being developed and diversified with many safe and convenient products. There were also around 60 commercial banks providing Internet Banking service and around 30 commercial banks providing Mobile Banking service for individuals and enterprises with a high increase of transactions. E-wallet payments are increasingly accepted, with 37 commercial banks providing the service. 80 million cards in circulation, various payment services were integrated and safety of bank cards payment was improved¹⁰.

Similar to other transition economies, the transformation of Vietnamese financial markets has not been without setbacks. Caprio and Klingebiel (1995) document banking crises since the late 1970s, reporting crises in transition countries like Bulgaria, Estonia, Hungary, Latvia, where problems range from extremely high nonperforming loans (exceeding 60 percent of assets), insolvent banks accounting up to 47 percent of the deposits in the banking system, to the takeover by the central bank of the largest private commercial bank. Gorton and Winton (1998) estimate that Vietnam's non-performing assets in 1994 – mid-1995 accounted for between 15 percent and 40 percent. Furthermore, although private banks often outnumber state-owned commercial banks, the state-owned banks often make most of the loans, most of which are directed to large, unprofitable SOEs or former SOEs at the expense of new private-sector firms, thus emphasize the problem of non-performing loans. It is worth noting that bad loans may result in negative net worth, making state-owned banks difficult to privatize.

¹⁰ Annual Report 2014 – The State Bank of Vietnam

Vietnam was also affected by the 1997's East Asia financial crisis, though to a limited extent given that the Vietnamese economy was still mainly based on the state. Vietnam did not have much experience in macro-level management to deal with inflation and exchange rate problems in the context of an open market economy. It took several years (from 1997 to 2001) for the economy to be re-enforced.

In the post-2007 period, Vietnam's economy has witnessed great fluctuation. After joining the WTO in 2007 which coincided with the global financial crisis 2007-2008, Vietnam faced high inflation due to foreign capital inflows but was unable to react timely in order to govern the foreign currency flows into the economy. Two-digit inflations, which peaked at 22.97% in 2008, lasted until 2012 and led to turmoil and risk of crisis in the economy. The banking system has experienced a period of "explosion" or over-extension, ignoring basic safety principles¹¹. The economy has paid a huge price because of the weaknesses and losses caused by the banking system. Given that the Transparency International ranked Vietnam 117/180 on the Corruption Index 2018 and scored 33 for the perceived level of its public sector corruption on a scale of 0 (highly corrupt) to 100 (very clean), the Vietnamese banking system is not an exception. In a study about firms' bank pools decision relying on a rich data set from Vietnamese firms, Lobez et al. (2018) detect two corrupt banks, by their definition are those whose CEO was sentenced to a death penalty following the court's decision on evidence of his or her fraud. The authors confirm that firms and banks match, in terms of their levels of integrity, which intensifies the collateral consequences of corruption in both banks and firms. In order to restore the financial stability and to strengthen confidence in the future of the banking system, the State Bank of Vietnam has implemented different restructuring measures, including corruption investigation and

¹¹ The number of local commercial banks in Vietnam peaked at 42 in 2008, conditions for establishing new banks were subsequently considered unduly lax. 2007's commercial banks' credits outstanding increased by 53.89% as compared to 2006, much higher than the previous year-on-year increase of 25.44%. (Source: Annual Report 2007, 2008 – The State Bank of Vietnam). Anecdotes show that in order to meet credit growth objectives set by managers, bankers obliged themselves to fake supporting documents for customers' credit profiles, which undoubtedly led to the bad debt crisis a few years later.

prosecutions, as well as failed banks takeovers. For all the banks, bad debt is strictly controlled¹².

1.2.2. Vietnamese financial markets

Along with the innovation of the economy, Vietnamese financial markets have made remarkable progress. As of 31 December 2014, money markets participants include the 5 state-owned banks, the Social Policy Bank, the Development Bank, 33 commercial joint stock banks, 4 joint venture banks, 47 foreign bank branches, the Cooperative Bank of Vietnam¹³, 1145 local people's credit funds, some insurance and reinsurance companies, investment funds¹⁴. However, not all of them participate in the interbank market, the Treasury bill auction market and the open market operations carried out by the central bank. Only joint stock commercial banks, joint venture banks, foreign bank branches, and some insurance companies are members of these more restricted markets.

The state's interventions in the money market consist substantially of monetary policy measures and the central bank's operations. In order to gradually align with international practice, from June 2002, the State Bank of Vietnam switched to the implementation of a base rate mechanism¹⁵. The State Bank announces a base interest rate every month together with refinancing interest rates and rediscount interest rates. They also report the swap rate, the open market interest rate and the interest rate of the Treasury bill auctions. All of these interest rates will influence the market interest rate, the deposit interest rate and the lending interest rate of the credit institutions.

In addition, the reserve requirements also have an impact on interest rates. When the State Bank moves the reserve requirements ratio upwards, it will increase the input cost of the credit institutions. As a consequence, either the credit institutions maintain the deposit interest

¹² The Government issued the Decision No. 254/QĐ-TTg dated 01/3/2012, ratifying the "Scheme on restructuring the system of credit institutions - period 2011-2015", focusing on restructuring and handling bad debt.

¹³ Formerly Central credit fund, transformed to Cooperative Bank of Vietnam in 2013.

¹⁴ Annual Report 2014 – The State Bank of Vietnam

¹⁵ Annual Report 2002 – The State Bank of Vietnam

rates and raise the lending interest rate, or they increase both deposit rates and lending interest rates at the same time. In contrast, the impact of foreign exchange interventions on banks' interest rates is not as explicit. In the future, the growth of credit institutions and the alignment of the State Bank of Vietnam's monetary policy and interventions with international practices are expected to enable commercial banks to be more active in their funding and lending activities. In particular, they are expected to participate and to compete more actively in the money markets.

In Vietnam, the deposit market is the market with the strongest and most active competition among financial intermediaries in attracting idle money in the population. Vietnamese credit institutions have introduced different forms of funding strategies. They compete for customers by offering personal accounts, card accounts and other savings products such as certificates of deposits. They also compete to attract demand deposits from organizations like the State Treasury, the Vietnamese Social Insurance, life insurers, post and telecommunications, and electricity companies. In addition, savings deposits are a traditional form of raising funds used primarily by credit institutions and postal savings service companies and local people's credit funds¹⁶. To attract customers, commercial banks innovate and propose various offers: one-point deposit – multiple-point withdrawal deposit certificates¹⁷, accumulated savings, savings associated with life insurance, progressive deposit interest rates, and flexible-term savings. Banks also issue certificates of deposits, bills, bonds, mainly to mobilize capital with a term of 6 months or more at attractive interest rates. The implementation of a wide variety of products and services by financial intermediaries reflects intense competition in the deposit market. However, the State Bank of Vietnam expects banks to further attract all cash in the population into the banking system. Collecting this idle cash is

¹⁶ People's Credit Funds are credit unions operating under the model of cooperatives in communes or wards, the smallest administrative units in Vietnam. This is an effective channel of capital mobilization in rural areas where people are not used to banks. People's Credit Funds are established with the capital contribution of members in the communes or wards and can borrow from the Central People's Credit Fund and from other credit institutions. People's Credit Funds lend to their members and other poor households within their geographical operating area. Vietnam Association of People's Credit Fund (VAPCF) was established in October 2005.

¹⁷ Please note that this was not always possible in Vietnam.

expected to further contribute to the development of the money market because it increases demand deposits and hence the available capital for credit institutions.

1.2.3. The Vietnamese stock market

In addition to the banking system, transition economies need to strengthen their stock markets during their development in accordance with the strict standards in the more developed countries, preparing an appropriate financial infrastructure that will help boost the businesses in the long run. After 6 years of preparation, the stock market in Vietnam was born in 1997 and trading began in 2000¹⁸. Despite strong fluctuations, the stock market has increasingly been operating in compliance with international standards. Although the market volume is still limited and the scale is small, the market has progressively matured and become an important source of long-term capital for the economy.

There are currently two distinct stock exchanges. The larger one is the Ho Chi Minh City Securities Trading Center (HoSTC) located in Ho Chi Minh City. It was founded according to Decision 127/1998/QĐ-TTg, and trading officially commenced on July 28, 2000. It also has an administrative function and is formally an administrative agency of the State Securities Commission, along with the Hanoi Securities Trading Center. On August 8, 2007, HoSTC was renamed and upgraded to the Ho Chi Minh Stock Exchange (HOSE). The second stock exchange of Vietnam, the Hanoi Securities Trading Center (HaSTC) located in Hanoi, was founded under the same Decision, and officially launched trading activities on March 8, 2005. On January 2, 2009, Hanoi Securities Trading Center was transformed to Hanoi Stock Exchange (HNX).

At the end of 2009, the combined market capitalization of both Ho Chi Minh City Securities Trading Center and Hanoi Securities Trading Center was only 27 billion dollars,

¹⁸ The time difference between the establishment and the opening reflects the difficulty in setting up the stock market of Vietnam. The State Securities Committee was officially founded on the 20th, July 1997, right at the time of the outburst of the Asian financial crisis originated in Thailand. Some senior leaders of the Communist Party and the Government worried that Vietnam would not be able to manage once the stock market opened as in the capitalist countries. Only until 3 years later, Ho Chi Minh City Stock Exchange Center officially opened with 2 stocks namely REE and SAM.

equivalent to 38% the GDP of Vietnam, and three times as much as that of 2008¹⁹. Recent figures show a constant development in the scale of the stock market in Vietnam. As of December 2017, Hanoi Stock Exchange had 384 listed companies; the total market capitalization reached 9.6 billion dollars²⁰. The Ho Chi Minh Stock Exchange (HOSE) had nearly 387 listings, including stocks, fund certificates and bonds with the total market capitalization of 113 billion dollars. The combined market capitalization of the two stock exchanges reached 150 billion dollars, equivalent to 74.6% of the GDP of Vietnam²¹.

In Vietnam, there is no separation between commercial and investment banking. Vietnamese commercial banks play an active role in the development of the stock market, almost all of the nearly 50 active securities trading companies belong to commercial banks, proposing services like brokerage, investment advisory, stock custody, and securities lending. Banks also represent a big fraction of the market capitalization, accounting for 22.7 billion dollars as of December 2018. In total, 13 banks were listed on the stock market as of 30th June 2018²², of which 10 on HOSE (Ho Chi Minh Stock Exchange) and 3 on HNX (Hanoi Stock Exchange).

In the following chapters, we propose an empirical analysis which aims at assessing the results of recent reforms in the banking system in Vietnam, including the strategic partnership program, implicit bailouts during the financial crisis and depositor discipline, and forced mergers post-crisis as a measure of restructuring failed banks.

¹⁹ State Securities Commission of Vietnam, 2009 Report

²⁰ Hanoi Stock Exchange's annual report 2017

²¹ Ho Chi Minh Stock Exchange's annual report 2017

²² The 13 listed commercial stock banks in Vietnam are: Vietcombank, BIDV, VietinBank, Eximbank, MBBank, Sacombank, VPBank, HDBank, TPBank, TechcomBank on the Ho Chi Minh Stock Exchange; ACB, SHB, NCB on the Hanoi Stock Exchange. Source: HOSE and HNX.

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CHAPTER 2

Can Foreigners Improve the Profitability of Emerging Market Banks? Evidence from the Vietnamese Strategic Partner Program

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Abstract

Foreign ownership and foreign management are often assumed to improve the efficiency of emerging market banks. Our paper examines this relationship for the Vietnamese strategic partner program, where foreign banks have been allowed to take minority stakes in local banks. We add to the existing literature on foreign bank management by distinguishing between ownership by strategic and non-strategic investors and between foreign management sent by the strategic partner and independent foreign executives. We show that only the presence of independent foreign executives or managers who are no longer employed by strategic partners has a positive impact on banks. We interpret these results as the consequence of conflicts between local shareholders and the strategic partner, which prevent efficiency in enhancing technology transfer.

2.1. Introduction

Transforming a socialist style centralized banking system into a competitive, efficient and stable financial market is a major challenge for all transition countries. The disastrous experiments of many eastern European countries with financial sector reform (Bonin and Wachtel, 1999, Bárta and Singer, 2006) have demonstrated that the key to a successful transition is to increase the efficiency of local banks without disrupting the human capital and knowledge embedded in the existing structures.

Vietnam has tried to achieve these goals with a policy of “strategic partnerships” where large international banks are allowed to acquire minority stakes in important local banks. Officially starting in 2007 with investments in 7 banks representing roughly 17% of Vietnam’s banking assets, the program successively expanded to 13 banks in 2013, covering around 40% of the country’s banking assets. The law allowed a single foreign owner to own a stake of up to 20% in a bank; total non-Vietnamese ownership is limited to 30% (Decree No. 69/2007/ND-CP).¹

This policy is hotly debated in Vietnam. Foreign banks argue that in order to make their investments in domestic banks profitable, they would either need a controlling stake or at least receive the right to operate the bank, which under the 20% ownership is not possible (Talkvietnam, 2012). The Vietnamese Government is reluctant to cede majority control of banks but is forced to make concessions to attract capital and strengthen a banking system that is overwhelmed by bad loans.

Our paper assesses the success of the strategic partnership policy in improving the profitability of Vietnamese banks. We find that the policy has not reached its goal in a direct manner; the only visible success was that the program strongly attracted foreign capital to the banking system, especially during the stock market boom in 2007-2008. Nevertheless, neither foreign ownership, nor the mandatory representation of foreign shareholders on the supervisory board seems to have had a positive effect on the fundamental profitability of banks, measured by the Net Interest Margin (NIM), Return on Assets (ROA), or Return on Equity (ROE).

This does not imply, however, that foreign management is not capable of contributing to the performance of Vietnamese banks. Whereas non-Vietnamese supervisory board members have no impact, we can show that the presence of foreigners on the executive board improves performance. This seems to indicate that it is indeed hands-on involvement with the day to day management that boosts performance.

Interestingly, however, this is only true for foreigners who have no current relationship with strategic investors. Management board members sent by strategic investors have no or negative impact, whereas the presence of foreign management independent of the strategic partner as well as that of strategic partners' former employees significantly increases bank performance. Apparently, only the active managerial participation of foreign bankers chosen by the banks themselves has a positive impact on performance.

We think that the most likely explanation for this observation is that power struggles between the minority and majority shareholders prevent foreign managers sent by the strategic investor from becoming effective. Foreign strategic partners might also be reluctant to engage in technology transfer if they anticipate the partnership to be short-lived. Indeed, several partnerships have now been dissolved.² In other strategic partnerships, the cooperation seems to have broken down despite the fact that the foreign partner still owns shares.³

2.2. Literature review

Our paper adds to the growing literature on financial systems in transition countries in Eastern Europe and Asia. In particular, we complement the study of Berger, Hasan and Zhou (2009) and Hasan and Xie (2013) on the similar Chinese strategic partner program. They observe that minority foreign ownership is associated with significantly improved efficiency, and conjecture that foreigners “*take positions on the board and in the management of Chinese banks*” and “*leverage these positions to improve the corporate culture and management of these banks*”.

Similar evidence on the positive effect of foreign minority investment and board participation in the context of other formerly nationalized banking sectors is also given by Choi and Hasan (2005) for Korea, by Gulamhussen and Guerreiro (2009) for Portugal, and by Oxelheim and Randøy (2003) for non-bank corporations in Scandinavia.

Evidence on the positive importance of foreign influence on banks also comes from the large literature following the cross-country study by Demirgüç-Kunt and Huizinga (1999), demonstrating that foreign-owned or majority-controlled banks perform better than their local counterparts. In a study of Argentina and Mexico, Goldberg et al. (2000) have found that foreign-owned banks both performed better and were less risky than their domestic counterparts. Bonin et al. (2005a) also make this observation for east European transition countries. Note, however, that with 20% ownership, the Vietnamese banks with a strategic partnership in our sample cannot be considered to be foreign controlled.

We can partially replicate these results for Vietnam. In particular, the presence of non-strategic investors seems to have a beneficial effect on ROA and ROE. Yet, this is not true for strategic partners. Neither ownership by strategic partners per se, nor the presence of these strategic partners on boards leads to better performance. If anything, it rather seems to deteriorate performance.

There are a number of possible reasons for this difference between the effect of foreign ownership in China and in Vietnam. One of those might be timing. The Chinese strategic partner program had preceded the Vietnamese program for several years and by 2009 a number of Chinese partnerships had already been dissolved.⁴ When foreign banks started to invest in Vietnam in 2007, some disappointment with these programs may have already set in; therefore local banks might have been less open and foreign investors might have been less inclined to engage in technology transfer.

Another reason for the divergence in results might be the difference in magnitude between the Chinese and Vietnamese economies as well as the difference in the size of their banks. Whereas a successful investment in a Chinese bank was a strategic priority for western

banks, an investment in a Vietnamese bank might have been perceived as being less important. Consequently, foreign banks might have been less prone to get actively involved in the costly transfer of technology and know-how.

In addition to our principal result, we are able to confirm or contradict, for Vietnam, a number of additional relationships that have been identified for other countries. For example, there is a large amount of literature on the efficiency of state-owned banks. Micco et al. (2007) show that state ownership decreases bank profitability in developing economies while Bonin et al. (2005b) and Heffernan and Fu (2008) confirm this observation for Eastern European and Chinese state-owned banks. It should be emphasized, however, that there is no mechanical relationship between state ownership and financial profitability. In Africa (Figueira et al., 2006), bank performance seems to be relatively unaffected by state ownership. We observe that in Vietnam, state-owned banks even seem to be more profitable than privately owned banks in terms of net interest margin, probably because they benefit from a number of advantages, in particular, privileged access to cheap refinancing from the central bank.

There is also a strand of literature arguing that listing in the stock market will improve the efficiency of banks in emerging markets. For instance, Luo (2003) finds that in China, publicly listed banks have better asset quality. A stock market listing can also improve capital ratios (Xue, 2007 and Peng, 2008) as well as increase efficiency (Victor et al., 2007). However, these results are not unchallenged; for example, Heffernan and Fu (2008) do not find increased profitability for listed banks in China. As Lin and Zhang (2009) indicate, some banks might perform better only before being listed but not subsequently, because large capital injection was received to move off NPLs prior to listing but tailed off post listing. Our results show that listed Vietnamese banks have significantly better net interest margin, as well as return on asset or return on equity.

The next section will give a short overview of banking sector reform in Vietnam along with a detailed description of the “strategic partnership program” and its objectives. We then explain in Section 4 the construction of the dataset and provide summary statistics for the key

variables used in our study. Section 5 presents our principal results, discusses political implications and robustness, and Section 6 concludes.

2.3. Some Institutional Background

2.3.1. From a mono-bank system to a two-tier system: the transition of Vietnam's banking sector

After its reorganization in 1976, the State Bank of Vietnam (formerly the National Bank of Vietnam) became the central bank of the country. As recently as 1988, Vietnam's economy was supported by a "one bank" system with a head office in Hanoi, a division in Ho Chi Minh City, and numerous provincial branches nationwide. The state banking system was essentially operating as a budgetary tool.

The year of "doi moi" (reform) 1986 marked an important change in the economy as well as in the banking system of Vietnam, which was then officially transformed into a two-tier system.⁵ The State Bank of Vietnam focuses on the tasks of a central bank, whereas commercial activities have been delegated to five state-owned banks.⁶ In addition to these state-owned commercial banks, since 1991, private Vietnamese joint-stock banks have been gradually founded and come into operation.

Commercial banks today are diversified in terms of ownership and business focus. As of 31 December 2015, 9 banks were listed on either HOSE (Ho Chi Minh City Securities Trading Center) or HaSTC (Hanoi Securities Trading Center).

2.3.2. The Vietnamese strategic partner program

Before the official start in 2007 of the strategic partnership program launched by the Government Decree 69/2007, five banks had already welcomed foreign shareholders with ownership ranging from 5% to 30%.⁷

Until the beginning of 2014, foreign shareholders were allowed to own up to 30% and the ownership stake of a strategic partner and its related parties was allowed to reach up to 15%

of a Vietnamese bank. In special cases with the Prime Minister's approval, this could be increased to 20%. The new regulation in Government Decree No.01/2014/ND/CP on foreign investors' purchase of shares of Vietnamese credit institutions (effective from 02/20/2014) removes the Prime Minister's approval condition for up to 20% ownership of a single partner, without raising the total foreign shares. Exceptions may, however, be considered on a case by case basis for weak banks, so that with the Prime Minister's approval, foreign ownership is expected to reach up to 100%.

The motivation for these partnerships is twofold: they allow Vietnamese banks to increase their capital (which was especially true during 2007 when the stock market boomed in Vietnam) but also to exploit the global brands of the foreign partners and to learn from international practices through knowledge transfer projects. For the foreign partners, they provide an opportunity to probe the market potential and export their expertise. Yet, as our paper demonstrates, after 7 years of implementation, the real benefits of this kind of collaboration have not yet been proved. Nevertheless, during the period 2007-2009, the banking system witnessed a strong wave of strategic partnerships.

We compile a list of local banks that have participated in this program, detailing the starting date and ending date (if any) of the partnership, and indicating whether foreign partner banks have a separate direct subsidiary in Vietnam (See Table S1 in the annex). Since Vietnam joined the WTO in 2007, foreign banks have also been allowed to establish 100 percent foreign-owned banks in Vietnam. Today, six foreign banks are active in Vietnam (See Table S2 in the annex), of which one was established in 2008, four in 2009 and the most recent in 2016. Interestingly, some foreign banks are present in Vietnam through a strategic partnership as well as with their own subsidiaries (See Table S1 in the annex), which has predictably led to conflicts of interest (Vietnam Investment Review, 2013).

2.4. The data

2.4.1. Indicators of bank performance

Measuring bank performance is difficult because information about returns is meaningless without controlling for risk. A large number of papers have assessed bank efficiency using frontier analysis (See Berger and Humphrey, 1997 for a survey of the early literature) and several papers have applied this tool to the Vietnamese banking sector (Dang-Thanh (2012), Sun and Chang (2011), Vu and Turnell (2010), Phan and Daly (2013), Dinh (2013), and Hùng (2007)), however, with sometimes counter-intuitive results. For example, Dang-Thanh (2012) shows that the efficiency of Vietnamese banks measured with a frontier analysis approach has decreased over time, whereas Vu and Turnell (2010) obtain the opposite result. We, therefore, follow the approach of Demirgüç-Kunt and Huizinga (1999) and rely on simpler accounting measures of bank performance. In particular, we focus on the Net interest margin (NIM), the Return on Equity (ROE) and Return on Assets (ROA).

We define Net Interest Margin (NIM) as the difference between the bank's interest income and interest expenses divided by the amount of their interest-earning assets (see Bitner and Goddard, 1992). Return on Assets (ROA) is determined as a company's net income divided by its average assets (Crosson et al., 2008).

ROE, defined as net profit divided by book equity, is used by most bank managers and financial analysts in developed countries a key performance indicator. By focusing on the return for shareholders, this measure aggregates rents earned on the asset side as well as rents earned from the liability side of the bank balance sheet and in particular deposits. Unfortunately, ROE has major flaws as a performance indicator (Admati et al., 2013). Specifically, it is very sensitive to variations in bank risk-taking, especially leverage, and therefore often not closely correlated with shareholder value creation (Moussu and Petit-Romec, 2014).

In the context of an emerging market, the flaws of ROE have been evident for a long time, notably because the level of book equity is highly dependent on accounting choices regarding non-performing loans. Vietnamese bank managers and financial analysts do not

consider it a reliable indicator of bank performance (KPMG, 2013).⁸ The measure most looked at in Vietnam is the NIM. As this measure excludes non-interest income which can be substantial for some banks, it is often complemented by ROA.

2.4.2. Foreign ownership and management

Vietnamese companies have a two-tiered board structure and use a slightly unusual terminology to describe these boards. The term “board of management” is used in Vietnam to refer to what in Europe would be called “executive board”. The equivalent structure in the US would be the “executive committee”, “operating committee” or “executive council”. This board is headed by the CEO.

The term “board of directors” is used in Vietnam to refer to the “supervisory board” (European terminology) which in US terms would correspond to a board of non-executive directors. This board is presided by a chairman who usually differs from the CEO. It is worth noting that in Vietnamese banks, there is a third board named “supervisory board” comprised of independent supervisors, whose role is to help the board of directors in controlling the board of management’s activities.

Shareholders are entitled to be represented on the “board of directors” and therefore, the percentage of foreign board members is basically a rounded value of the percentage of foreign ownership. This is not true for the fraction of foreigners on the board of management, which is only weakly correlated with the percentage of foreign equity ownership.

For this study, we have collected information about foreign ownership and the presence of foreign members on boards from banks’ annual reports. Foreign ownership is characterized by strategic partner's ownership share (FPshare) and other foreign investors' ownership share (Fshare), both in percentage. We then distinguish between the presence of foreign managers on the Board of Management (BOM) that have been sent by the strategic partner (BOMFP), foreign bankers who used to work for partners but do not any more work for the strategic partner (BOMFxP), and those without any relationship with partners (BOMFnP). Similarly for the Board

of Directors (BOD), we construct dummy variables indicating the presence of foreigners: Foreign board members employed by the strategic partner (BODFP) or having previously worked for the strategic partner (BODFxP), foreign board members not related to any investors (BODFnP), and representatives of foreign investors other than strategic partners on the board of directors (BODFI). Since none of the banks' foreign managers or directors is present during the entire period of our study, these dummy variables do not conflict with the bank fixed effects.

2.4.3. Control variables

In addition to our main variables, we include several control variables which imply banks' characteristics in our regressions: bank size (measured by the natural logarithm of total assets) and leverage (measured by bank's total assets divided by bank's book equity). In order to control for the effect of the 2008 crisis, we indexed total assets to inflation, which was very high in Vietnam, especially under the crisis, reaching 22.14% in 2008 (source of inflation index: World Bank). Details about these two control variables are further specified in the following part of Data and summary statistics.

2.4.4. Data and summary statistics

The data for this study were hand-collected from the banks' annual reports. The State Bank of Vietnam requires banks to publish financial reports in local generally accepted accounting practices (Vietnamese Accounting Standards – VAS); hence, all the data used for analysis come from audited and standardized financial statements. We cover the period from 2000 to 2014 and include all Vietnamese commercial banks in our sample.

During the period of our study, the number of Vietnamese commercial banks ranged from 34 to 42 banks; the fluctuation is explained by the creation of new banks and mergers. Among this population of banks, some small banks did not disclose their financial information for certain years. In 2011 and 2012, our data covers respectively 91.8% and 95.6% of total Vietnamese commercial banks' assets, which were respectively 4,232 trillion VND and 4,361

trillion VND (approximately 190 - 200 billion dollars). For the earlier years, we have more missing data and therefore a slightly lower coverage. Over the whole period, Vietnamese commercial banks stably accounted for 85% - 89% of the total assets of the whole credit institution system in Vietnam. For more details, see Table S3 in the annex.

Table 1: Variables and data

Variables	Definition
<i>Performance Indicators</i>	
NIM	Net Interest Margin
ROE	Return on Equity
ROA	Return on Asset
<i>Participation in boards</i>	
BODFP	Dummy - foreign directors assigned by strategic partner on the board of directors
BODFI	Dummy - foreign directors assigned by investors on the board of directors
BODFxP	Dummy - foreign directors who used to work for strategic partners on the board of directors
BODFnP	Dummy - foreign directors who have no relationship with partner/investor on the board of directors
BOMFP	Dummy - foreign managers assigned by partner on the board of management
BOMFxP	Dummy - foreign managers who used to work for strategic partner on the board of management
BOMFnP	Dummy - foreign managers who have no relationship with strategic partner/ investors on the board of management
<i>Ownership</i>	
FPshare	Strategic partner's ownership share (%)
FIshare	Other foreign investors' ownership share (%)
listed	Dummy - 1 if the bank is listed; 0 otherwise
state	Dummy - 1 if the bank is state-owned; 0 otherwise
<i>Control variables</i>	
logasset	Natural logarithm of Total assets
leverage	Bank's Total asset / Bank's book equity
<i>Sources of data:</i> World Bank, State Bank of Vietnam, Vietnamese banks' annual reports	

We classify the different types of banks included in our study and their evolution in terms of market shares by total assets (see Table S4 in the annex). In particular, Table S4 illustrates the impressive progress of privatization in Vietnam over the last years. In 2012, the five state-controlled banks own slightly less than half of the total Vietnamese commercial banking assets, down from 75% six years earlier and 88% in 2001. Table 1 provides an overview of the variables used in the empirical analysis.

Tables 2a and 2b provide summary statistics. The summary statistics for continuous variables are detailed in Table 2b Overall profitability is highly variable with interest margins ranging from -0.82% to 21%; ROE ranging from -82% to 43%; and ROA ranging from -5.51% to 5.95%. Given that the maximum foreign ownership in Vietnamese banks is restricted by law at 30%, strategic partner's ownership share (FPshare) and other foreign investors' ownership share (FIshare) account for 3.59% and 1.16% on average, with the maximum values of 27.59% and 24%, respectively. The low mean values compared to the maximum values can be explained by the low number of observations of banks with a foreign strategic partner (85 observations over a total of 418 observations, see Table S6 in the annex for dummy variable BODFP - Banks with foreign directors assigned by strategic partner on the board of directors). Similarly, there are only 21 observations of banks with foreign directors assigned by other investors on the board of directors – BODFI, signifying a low value of other investors' ownership in Vietnamese banks.

Our set of control variables relates to bank characteristics. Bank size, measured by the natural log of the bank's total assets (logasset), ranges from 8.43 to 19.36, with an average value of 16.22 (total assets are in VND billion). The leverage variable (total assets/equity) is characterized by a range between 1 and 92.95. High leverage (92.95) means that equity equals between 1 and 2 % of total assets; which does not meet the State Bank of Vietnam's requirement that banks maintain a minimum capital adequacy ratio (CAR) of 9%. However, in reality, not all Vietnamese banks are able to maintain this ratio, especially under the effects of recent crises (Global Financial Crisis 2008 and then Vietnam's bad debt crisis 2011). In order to recover the banking system, the State Bank of Vietnam launched the restructuring program of credit

institutions for the period 2011-2015, during which several banks have been acquired. According to the regulations of this program, weak banks are allowed time for self-restructuring before being forced to merge with another bank, which explains why some banks in our sample have very high leverage.

Table 2a: Summary Statistics - Continuous variables

Continuous variables						
Variable	n	Mean	S.D.	Min	Median	Max
NIM (%)	414	3.16	1.73	-0.82	2.86	21.24
ROA (%)	402	1.05	0.83	-5.51	0.97	5.95
ROE (%)	402	9.50	7.96	-82.00	9.19	43.20
FPshare (%)	418	3.59	7.04	0.00	0.00	27.59
Fishare (%)	418	1.16	3.65	0.00	0.00	24.00
logasset	418	16.22	1.65	8.43	16.13	19.36
leverage	418	11.06	7.13	1.00	10.04	92.95

Notes: Variables are defined in Table 1.

The summary statistics for dummy variables are detailed in Table 2b. On the board of directors, 20% of the observations have foreign directors appointed by the partner, 5% appointed by other investors, whereas boards with foreign directors independent of the partner and other investors account for 4%, and only 1% include those who used to work for the partner. On the board of management, 9% of the observation have foreign managers sent by the partner, 6% include those independent of the partner and 1% board foreign managers who used to work for the partner.

Regarding the ownership status, only 15% of our observations are state-owned banks and 13% are listed banks. The majority is therefore privately owned non-listed banks. However, as illustrated in Table S3, despite the increasing privatization in the banking system, Vietnamese

state-owned banks still account for a major share of the market. In 2001, the five state-owned banks accounted for 78% of the total assets of the credit institutions system in Vietnam. In 2012, the market share by total assets reduced to 43% for these state-owned banks.

Table 2b: Summary Statistics - Dummy variables

Dummy variables		
Variable	n	Frequency
BOMFP	418	0.09
BOMFxP	418	0.01
BOMFnP	418	0.06
BODFP	418	0.20
BODFI	418	0.05
BODFxP	418	0.01
BODFnP	418	0.04
listed	418	0.13
state	418	0.15

Notes: Variables are defined in Table 1.

We also provide the correlation matrix (See Table S5 in the annex). Table S6 (in the annex) gives the overall evolution for the different types of foreign managers and directors over the study period.

2.5. Empirical analysis and discussion

2.5.1. The empirical strategy

We are running regressions of our different performance metrics ROE, ROA and NIM on the dummy variables representing the different types of management and control variables, i.e. we want to estimate the equation:

$$\begin{aligned}
Performance_{i,t} = & \alpha + \beta_1 BOMFP_{i,t} + \beta_2 BOMFxp_{i,t} + \beta_3 BOMFnP_{i,t} \\
& + \beta_4 BODFP_{i,t} + \beta_5 BODI_{i,t} + \beta_6 BODFxp_{i,t} + \beta_7 BODFnP_{i,t} \\
& + \sum_j \gamma_{j,i,t} Controls_{i,t} + \sum_{t=2001}^{2014} \delta_t Year_t + \varepsilon_{i,t}
\end{aligned} \tag{Eq. (1)}$$

The coefficients of interest are the β_j , $j=1,\dots,7$ that characterize the effect of different types of foreign board members on bank performance. Our primary estimation method for Eq. (1) is a panel ‘Fixed-Effect’ estimation with the entity (bank) and year fixed effects. Fixed effects for individual banks allow us to control for time-invariant features, such as the general quality of the individual banks, and should, therefore, reduce the concern that our results are generated by selection bias.

However, this estimation method has certain limits in our context. In particular, time-invariant variables like the effect of state ownership cannot be estimated with a fixed effect regression. A fixed effect regression also leads to a high loss of degrees of freedom. Therefore, we also provide a random effect regression.

Given the relatively small size of the country and the fact that the transition to a market based financial sector has only started in the 90s, we do not have as many observations as for example studies on the Chinese banking sector. This somehow constrains our empirical approach. Specifically, to maintain statistical significance, we are forced to restrict the number of bank control variables to size (measured by the natural logarithm of total assets) and leverage (measured by the bank’s total assets divided by its book equity). Regarding additional control variables, we have added the bank’s listing status as a dummy variable. We indexed total assets to inflation, which was very high in Vietnam, especially under the crisis, reaching 22.14% in 2008 (source of inflation index: World Bank). Other sources of bank heterogeneity should be absorbed by the bank fixed effects.

2.5.2. The empirical results

This section presents the regression results. Table 3 reports our main regressions of Net Interest Margin (NIM), Return on Assets (ROA), and Return on Equity (ROE) on the independent variables, using a fixed effects model with bank and year fixed effects and heteroscedasticity-consistent standard errors (White, 1980) and a random effect model with time dummies. For every regression, we present two specifications: one using the percentage of foreign ownership and the other using the presence of foreigners on the board of directors. Both variables are strongly correlated, given that ownership usually implies a representation on the board of directors.

Our most significant and interestingly result is that in all specifications, foreign members on board of management that are not affiliated with a strategic partner (BOMFnP) have a significant positive effect on NIM, whereas the presence of managers sent by the strategic partner shows no effect. The results are less clear cut for the other performance indicators, but in the more efficient random effect specification, the former variable (BOMFnP) still shows a positive association with ROA and ROE. Board of director membership has generally no impact on performance. Interestingly, the presence of other foreign investors on board of directors is associated with positive effects on ROA, ROE but negative for NIM. It seems that foreign investors' representatives on board of directors push local banks better for what they want - higher ROE – while they do not pay much attention to NIM, the preferred measure of bank performance by locals. The focus on performance indicators may not be so prevalent for strategic partners since local banks' performance (in all aspects) is not necessarily their priority; learning about the local market seems to be their preference. If controlled for the presence of foreign management, ownership by strategic investors has negative impacts on ROA and ROE, but ownership by non-strategic investors is positively associated with these performance measures.

The effects of our control variables are also worthwhile pointing out. In particular, listed banks show significantly better performance across all the measures. In order to be listed on the stock exchanges, banks in Vietnam have to meet stricter regulatory conditions than others.

Table 3: Regression Results

	Dependent variables											
	Fixed effect model						Random effect model					
	ROA	ROE	NIM	ROA	ROE	NIM	ROA	ROE	NIM	ROA	ROE	NIM
Participation in boards												
BOMFP	0.277 <i>(1.69)*</i>	2.009 <i>(0.92)</i>	0.442 <i>(1.52)</i>	0.202 <i>(1.51)</i>	0.981 <i>(0.54)</i>	0.348 <i>(1.16)</i>	0.282 <i>(2.04)**</i>	1.440 <i>(0.72)</i>	0.449 <i>(1.15)</i>	0.194 <i>(1.65)*</i>	0.109 <i>(0.08)</i>	0.321 <i>(0.88)</i>
BOMFxFP	0.199 <i>(0.92)</i>	0.376 <i>(0.14)</i>	0.156 <i>(0.48)</i>	-0.133 <i>(0.72)</i>	-3.928 <i>(1.85)*</i>	0.287 <i>(0.94)</i>	0.225 <i>(1.45)</i>	2.907 <i>(1.19)</i>	0.201 <i>(0.68)</i>	-0.096 <i>(0.36)</i>	-1.370 <i>(0.39)</i>	0.344 <i>(1.30)</i>
BOMFnP	0.193 <i>(0.94)</i>	2.104 <i>(1.37)</i>	1.202 <i>(3.47)***</i>	0.298 <i>(1.81)*</i>	3.559 <i>(2.13)**</i>	1.282 <i>(3.76)***</i>	0.248 <i>(2.29)**</i>	4.184 <i>(2.44)**</i>	1.315 <i>(3.39)***</i>	0.317 <i>(2.05)**</i>	4.371 <i>(1.75)*</i>	1.330 <i>(2.78)***</i>
BODFP	-0.287 <i>(1.86)*</i>	-3.135 <i>(1.61)</i>	-0.006 <i>(0.03)</i>				-0.290 <i>(2.02)**</i>	-3.276 <i>(1.67)*</i>	0.058 <i>(0.18)</i>			
BODFI	0.245 <i>(1.99)**</i>	4.102 <i>(2.40)**</i>	-0.840 <i>(2.62)***</i>				0.271 <i>(2.19)**</i>	6.157 <i>(3.75)***</i>	-0.630 <i>(1.47)</i>			
BODFxFP	-0.501 <i>(2.08)**</i>	-5.915 <i>(1.35)</i>	0.265 <i>(0.78)</i>				-0.507 <i>(3.70)***</i>	-4.976 <i>(2.59)***</i>	0.291 <i>(1.28)</i>			
BODFnP	0.153 <i>(0.88)</i>	2.550 <i>(1.37)</i>	-0.257 <i>(0.79)</i>				0.098 <i>(0.63)</i>	0.881 <i>(0.29)</i>	-0.319 <i>(0.95)</i>			
Ownership												
FPshare				-0.012 <i>(1.98)**</i>	-0.118 <i>(1.69)*</i>	0.001 <i>(0.06)</i>				-0.012 <i>(1.66)*</i>	-0.098 <i>(1.62)</i>	0.006 <i>(0.24)</i>
FIshare				0.015 <i>(1.66)*</i>	0.227 <i>(1.83)*</i>	-0.001 <i>(0.04)</i>				0.015 <i>(1.63)</i>	0.241 <i>(1.78)*</i>	0.010 <i>(0.36)</i>
listed	0.334 <i>(3.39)***</i>	3.857 <i>(3.91)***</i>	0.727 <i>(3.44)***</i>	0.311 <i>(3.07)***</i>	3.609 <i>(3.42)***</i>	0.609 <i>(2.83)***</i>	0.312 <i>(2.80)***</i>	4.136 <i>(2.62)***</i>	0.845 <i>(3.41)***</i>	0.282 <i>(2.33)**</i>	3.884 <i>(2.36)**</i>	0.693 <i>(2.86)***</i>
state							-0.146 <i>(0.63)</i>	-4.117 <i>(2.66)***</i>	2.480 <i>(3.00)***</i>	-0.103 <i>(0.43)</i>	-3.224 <i>(2.08)**</i>	2.521 <i>(3.06)***</i>
Control variables												
logasset	0.018 <i>(0.26)</i>	1.182 <i>(2.56)**</i>	-1.047 <i>(3.35)***</i>	0.015 <i>(0.21)</i>	1.127 <i>(2.41)**</i>	-1.043 <i>(3.34)***</i>	-0.001 <i>(0.01)</i>	1.852 <i>(3.55)***</i>	-0.926 <i>(3.47)***</i>	-0.007 <i>(0.06)</i>	1.646 <i>(3.33)***</i>	-0.936 <i>(3.49)***</i>
leverage	-0.028 <i>(2.21)**</i>	0.215 <i>(1.55)</i>	-0.021 <i>(1.09)</i>	-0.028 <i>(2.20)**</i>	0.213 <i>(1.51)</i>	-0.020 <i>(1.06)</i>	-0.031 <i>(2.21)**</i>	0.153 <i>(1.41)</i>	-0.020 <i>(0.94)</i>	-0.031 <i>(2.19)**</i>	0.170 <i>(1.59)</i>	-0.019 <i>(0.92)</i>
Fixed Effect (FE)												
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Adjusted R ²	0.4156	0.3334	0.5539	0.4128	0.3257	0.5504						
Overall R ²							0.2517	0.3140	0.3191	0.2442	0.2954	0.3206
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						
Prob > chi2							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N	402	402	414	402	402	414	402	402	414	402	402	414

Notes: Variables are defined in Table 1.

Estimations were performed using Robust Fixed-effects Least Squares Dummy Variable Model and Random-effect Least Squares Dummy Variable Model.

The numbers in italic are t-statistics for fixed effect model and z-statistics for random effect model. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level.

The listed banks who fail to maintain these conditions will be considered for delisting. Such requirements, together with the transparency that stock exchanges offer, play the role of a guarantee for banks' stakeholders. The result of our study shows that market discipline can have a positive influence on banks that complements regulatory monitoring.

We also observe a positive impact of size (logasset) on ROE, but a negative impact on NIM. The likely reason is the variation in average leverage that is not picked up by our "end-of-year" controls for book leverage. Given our definition of NIM, higher leverage will lead to higher interest costs and therefore to a lower NIM. At the same time, higher leverage will increase ROE. This explanation is also consistent with the fact that higher leverage is often associated with lower ROA.

State ownership in the random effects regression has the opposite effect to that of size: State-owned banks have higher interest margins as they are able to borrow at subsidized rates, however, they have low ROE and ROA as their portfolio is comprised mostly of inefficient state-owned clients, resulting in low non-interest income.

There are several ways to interpret the results of our study. The first result is a negative one: foreign minority ownership of the strategic partners makes no improvement to performance. This is an important insight because it implies that the strategic partnership program has not achieved its principal objective.

Obviously, we would also like to be able to make a positive statement and claim that putting a foreigner on the management board is associated with higher performance, at least if this is a decision made by the bank itself. Here results are to some extent less explicit; but still, indicate that the presence of foreigners that are not affiliated with a strategic partner has a positive impact on performance. Admittedly, our study is not sufficient to prove causality here. In the following section, we will discuss this issue in more detail.

2.5.3. Discussion

Governance studies are always plagued by endogeneity problems and our study is no exception. We do not have an appropriate instrumental variable to address this problem; however, we want to argue that, when carefully interpreted, our results can nevertheless be used to derive policy implications.

There are two obvious problems that could influence the empirical results presented in the previous section. First, it is possible that foreign investors choose the better performing local banks or those for which they anticipate a better future performance when deciding about their strategic partnerships. We would then get a relationship not because of causality but because of a selection effect. However, the ability of foreign banks to select their strategic partners has actually been quite limited, as the State Bank of Vietnam only allowed foreign investors to select from a small number of potential strategic partners – the conditions for a Vietnamese bank to enter into a partnership are strictly defined in Decree No. 69/2007/ND-CP and then Decree No. 01/2014/ND-CP. Our finding that none of NIM, ROE or ROA is influenced by strategic partners' ownership (or the closely correlated BODFP) confirms this.

The second and potentially more severe concern is that only more reform-minded and innovative banks will seek to bring foreigners on its management board. It is therefore not obvious whether it is really the presence of the foreigners which makes a difference or whether these banks would have performed better, even without foreign management. Indeed, it is possible that causality runs both ways. Better banks are more likely to ask foreign bankers to join the management board, but the presence of foreigners probably still makes a difference, if only because it reduces agency conflicts and wealth extraction by different interest groups. Reform-minded CEOs might use the presence of foreign members on the management board with the exact intention of reducing these types of behavior.

This interpretation is supported by anecdotal evidence which shows that non-affiliated foreigners are typically employed by banks that are perceived to be innovative and efficient, whereas many of the banks participating in the strategic partnership program use the foreign

partner solely as financial investors, but otherwise viewed them as competitors for the control of the bank and therefore refused to cooperate in any way. This contrasts with the strategy of other banks that directly recruit foreigners as executives and try to make the best of this human capital investment.

A possible explanation for the failure of cooperation is conflicts of interest. When corruption is still a phenomenon in Vietnamese banks, from the local bank's point of view, active cooperation with an "honest" partner is not compatible (Lobez et al., 2018). In addition, there are several reasons for which a strategically acting foreign partner might not wish to boost with certainty the profitability of a local partner. The problem is most obvious for foreign banks that do not only hold strategic participation in a local bank but also have a separate independent direct presence in Vietnam (See Table S1 in the annex). In this case, it would clearly not be in the interest of the foreign banks to help to build a strong competitor to its own fully owned subsidiary. It is the concern of local banks that managers appointed by partners under their partnership program do not work for the best interests of local banks, or alternatively, that the partners have no incentive to send their best staff to local banks for fear of conflict of interest. In fact, it is likely that the foreign strategic partner views his minority stake rather as a source of information and possibly as a way to identify and recruit management talent for its independent subsidiary.

Even in the case where the foreign partner intends to deepen and extend his partnership with the local bank, it might not be in his interest to boost the performance of the local partner. A more profitable and therefore more powerful local partner may be more difficult to fully absorb than a weak bank in case the regulatory limitations on foreign ownership are removed. In addition, increasing its ownership stake in a profitable bank will be more expensive than buying the capital of a fledgling bank. Therefore, banks with an eye on fully taking over the local bank might prefer to wait with the technology transfer until the integration is complete.

2.6. Robustness checks

We have experimented with a range of alternative specifications and run regressions on sub-periods. Our basic insight remains stable: in almost none of the regressions, the presence of foreign strategic partners on the management board or the board of directors has a positive effect; meanwhile, in all specifications, the effect of foreigners not affiliated with strategic partners on the management board has a positive effect.

We first deal with multicollinearity between explanatory variables. According to Tabachnick and Fidell (1996), the independent variables with a bivariate correlation more than 0.70 should not be included in multiple regression analysis. Therefore, in our main empirical tests, we don't include variables that have a pairwise correlation higher than 0.70 (see Table S5 in the annex for the correlation matrix). Specifically, "FPshare" - the strategic partners ownership's share in percentage and BODFP - the dummy variable that indicates whether a local bank has foreign directors assigned by strategic partner on the board of directors have a bivariate correlation of 0.91; "FIshare" - the other investors' ownership share in percentage and BODFI - the dummy variable that indicates whether a local bank has foreign directors assigned by other investors on the board of directors have a bivariate correlation of 0.742. We do not include these pairs of variables in the same regressions but use them alternatively in different models.

In our first robustness check, we further remove one of the two variables that are highly correlated in the same regressions, though the correlation is lower than 0.70 (BOMFP and BODFP: 0.626, BOMFP and FPshare: 0.629; see Table 4 for fixed-effect models and Table 5 for random-effect models).

In this robustness check where we apply stricter conditions to ensure that multicollinearity is excluded, the results are consistent with our main tests. Foreign managers sent by the strategic partner are not associated with any performance improvement; whereas in most of the test settings, independent foreign managers are associated with improvement in performance, especially in Net Interest Margin (NIM), the most favored performance indicator.

Table 4: Robustness check - Multicollinearity

	Dependent variables											
	Fixed effect model - Robustness test - Multicollinearity											
	ROA	ROE	NIM	ROA	ROE	NIM	ROA	ROE	NIM	ROA	ROE	NIM
<i>Participation in boards</i>												
BOMFP				0.088 (0.109)	0.084 (1.320)	0.357 (0.230)				0.062 (0.110)	-0.343 (1.368)	0.359 (0.230)
BOMFxFP	0.026 (0.186)	-0.882 (2.242)	-0.112 (0.283)	-0.217 (0.179)	-4.612** (1.989)	0.294 (0.285)	-0.239 (0.177)	-4.441** (1.994)	0.108 (0.266)	-0.232 (0.182)	-4.863** (2.033)	0.295 (0.282)
BOMFnP	0.246 (0.211)	2.485* (1.492)	1.262*** (0.353)	0.228 (0.165)	2.680* (1.617)	1.288*** (0.340)	0.338** (0.171)	3.755** (1.644)	1.342*** (0.345)	0.260 (0.170)	3.200* (1.692)	1.285*** (0.340)
BODFP	-0.170 (0.117)	-2.288* (1.291)	0.179 (0.209)									
BODFI	0.248** (0.124)	4.123** (1.699)	-0.807*** (0.308)									
BODFxFP	-0.395* (0.233)	-5.147 (4.330)	0.440 (0.316)									
BODFnP	0.199 (0.175)	2.890 (1.906)	-0.158 (0.327)									
<i>Ownership</i>												
FPshare							-0.007 (0.005)	-0.092* (0.048)	0.010 (0.015)			
Flshare							0.017* (0.009)	0.240** (0.121)	0.005 (0.021)	0.013 (0.010)	0.210 (0.131)	-0.001 (0.021)
listed	0.361*** (0.101)	4.049*** (0.994)	0.770*** (0.215)	0.366*** (0.100)	4.436*** (1.052)	0.606*** (0.200)	0.326*** (0.100)	3.685*** (1.048)	0.636*** (0.218)	0.320*** (0.102)	3.699*** (1.078)	0.609*** (0.216)
state	0.013 (0.072)	1.149** (0.467)	-1.055*** (0.311)	0.012 (0.072)	1.110** (0.471)	-1.042*** (0.308)	0.011 (0.072)	1.107** (0.472)	-1.050*** (0.309)	0.011 (0.072)	1.090** (0.470)	-1.042*** (0.309)
<i>Control variables</i>												
logasset	0.013 (0.072)	1.149** (0.467)	-1.055*** (0.311)	0.012 (0.072)	1.110** (0.471)	-1.042*** (0.308)	0.011 (0.072)	1.107** (0.472)	-1.050*** (0.309)	0.011 (0.072)	1.090** (0.470)	-1.042*** (0.309)
leverage	-0.029** (0.013)	0.209 (0.143)	-0.022 (0.020)	-0.028** (0.013)	0.217 (0.137)	-0.020 (0.019)	-0.029** (0.013)	0.211 (0.142)	-0.021 (0.019)	-0.028** (0.013)	0.218 (0.137)	-0.020 (0.019)
<i>Fixed Effect (FE)</i>												
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Adjusted R²</i>	0.4132	0.3330	0.5528	0.4118	0.3234	0.5529	0.4124	0.3272	0.5502	0.4111	0.3244	0.5517
<i>Prob > F</i>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<i>N</i>	402	402	414	402	402	414	402	402	414	402	402	414

Notes: Variables are defined in Table 1. In this robustness check, we do not include variables that are highly correlated (pairwise correlation > 0.6). Therefore, BODFP and BOMFP (r=0.626), BOMFP and FPshare (r=0.629), BODFI and Flshare (r=0.742) are not included in the same regression.

Estimations were performed using Robust Fixed-effects Least Squares Dummy Variable Model.

Robust standard errors in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level.

Table 5: Robustness check - Multicollinearity

	Dependent variables											
	Random effect model - Robustness test - Multicollinearity											
	ROA	ROE	NIM	ROA	ROE	NIM	ROA	ROE	NIM	ROA	ROE	NIM
Participation in boards												
BOMFP				0.081 (0.090)	-0.445 (1.222)	0.415 (0.291)				0.054 (0.083)	-1.077 (1.413)	0.386 (0.293)
BOMFxp	0.053 (0.133)	2.132 (1.822)	-0.065 (0.225)	-0.186 (0.244)	-2.515 (3.190)	0.414* (0.221)	-0.193 (0.276)	-1.429 (3.465)	0.181 (0.181)	-0.202 (0.249)	-2.507 (3.265)	0.394* (0.222)
BOMFnP	0.291** (0.113)	4.274** (1.740)	1.373*** (0.423)	0.254* (0.144)	3.682 (2.327)	1.323*** (0.441)	0.352** (0.162)	4.386* (2.487)	1.384*** (0.491)	0.277* (0.148)	4.015* (2.393)	1.351*** (0.468)
BODFP	-0.172 (0.112)	-2.686* (1.489)	0.246 (0.289)									
BODFI	0.268* (0.145)	6.107*** (1.686)	-0.602 (0.384)									
BODFxp	-0.399*** (0.150)	-4.417** (1.861)	0.466** (0.214)									
BODFnP	0.157 (0.169)	1.336 (3.012)	-0.214 (0.321)									
Ownership												
FPshare							-0.007 (0.006)	-0.095 (0.062)	0.014 (0.020)			
FIshare							0.017* (0.010)	0.242* (0.130)	0.015 (0.029)	0.012 (0.009)	0.214 (0.137)	0.011 (0.027)
listed	0.339*** (0.118)	4.250*** (1.630)	0.889*** (0.257)	0.334*** (0.121)	4.956*** (1.604)	0.740*** (0.226)	0.295** (0.123)	3.893** (1.653)	0.718*** (0.244)	0.286** (0.124)	3.941** (1.666)	0.692*** (0.241)
state	-0.112 (0.238)	-3.954** (1.543)	2.527*** (0.819)	-0.082 (0.234)	-3.241** (1.588)	2.473*** (0.794)	-0.076 (0.243)	-3.210** (1.532)	2.556*** (0.813)	-0.064 (0.244)	-2.830* (1.558)	2.500*** (0.807)
Control variables												
logasset	-0.004 (0.107)	1.842*** (0.524)	-0.930*** (0.262)	-0.012 (0.107)	1.625*** (0.471)	-0.923*** (0.260)	-0.011 (0.108)	1.644*** (0.491)	-0.940*** (0.262)	-0.016 (0.109)	1.543*** (0.472)	-0.930*** (0.264)
leverage	-0.032** (0.014)	0.146 (0.113)	-0.022 (0.022)	-0.031** (0.014)	0.182* (0.104)	-0.020 (0.021)	-0.032** (0.015)	0.170 (0.107)	-0.020 (0.022)	-0.031** (0.014)	0.174* (0.105)	-0.019 (0.021)
Fixed Effect (FE)												
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	No	No	No	No	No	No	No	No	No	No	No	No
Overall R ²	0.2469	0.3127	0.3167	0.2398	0.2861	0.3195	0.2427	0.2955	0.3200	0.2405	0.2917	0.3203
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N	402	402	414	402	402	414	402	402	414	402	402	414

Notes: Variables are defined in Table 1. In this robustness check, we do not include variables that are highly correlated (pairwise correlation > 0.6). Therefore, BODFP and BOMFP (r=0.626), BOMFP and FPshare (r=0.629), BODFI and FIshare (r=0.742) are not included in the same regression.

Estimations were performed using Robust Random-effects Least Squares Dummy Variable Model.

Robust standard errors in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level.

With a low level of significance, strategic partners' minority ownership or the presence of their directors on the local bank's board is associated with a lower ROE. Interestingly, other investors in local banks are associated with better ROA and ROE but not NIM. More specifically, other investors' presence on board of directors is significantly linked with much higher ROE, which confirms our hypothesis that these "pure investors" only care about the short-term return of their investment and not the long-term health of the local banks.

Another concern about our empirical results is that they are driven by a few big banks. We have generated a sub-sample where the first three banks that entered in a strategic partnership are dropped. They all began the strategic partnership in 2005, before the official start of this program in 2007, and their partners all had a separate direct subsidiary in Vietnam which competed directly with local banks (see Table S1 in the annex for these banks' name and partnership details). By removing these banks, we reduce 40 observations from the initial sample; none of the remaining banks has a director who used to work for their partners (see Table 6 for fixed-effect models and Table 7 for random-effect models).

It is worth noting that the empirical results using this sub-sample shows improvement in NIM associated with the presence of foreign managers appointed by the strategic partners. However, the positive effect is always half as much compared with that linked with the presence of independent foreign managers. This result corroborates further our judgement about the conflict of interest: foreign partners who have a separate subsidiary in the local market are not willing to improve the performance of their direct competitors, and those who do not have their own established subsidiary do contribute to the local bank's performance improvement but only to a limited extent. Other results are similar to those of the main empirical tests: strategic partners' minority ownership or alternatively, their presence on the board of directors, is correlated with worse ROA and ROE. The presence of other investors' on board of directors is associated with much higher ROE and higher ROA, but also worse NIM. This outcome is coherent with the finding in the main tests.

Table 6: Robustness check – Sub-sample

	Dependent variables											
	Fixed effect model - Robustness test - Sub-sample											
	ROA	ROE	NIM	ROA	ROE	NIM	ROA	ROE	NIM	ROA	ROE	NIM
Participation in boards												
BOMFP				0.151 (0.129)	0.785 (1.365)	0.612** (0.281)				0.097 (0.133)	0.250 (1.519)	0.644** (0.295)
BOMFxFP	0.145 (0.217)	0.428 (1.737)	-0.097 (0.327)	0.094 (0.223)	-0.712 (1.579)	0.191 (0.273)	0.115 (0.198)	-0.216 (1.426)	-0.060 (0.296)	0.082 (0.223)	-0.837 (1.604)	0.198 (0.273)
BOMFnP	0.179 (0.246)	0.726 (1.511)	1.283*** (0.378)	0.088 (0.200)	-0.437 (1.495)	1.268*** (0.378)	0.277 (0.213)	1.319 (1.647)	1.317*** (0.403)	0.152 (0.208)	0.191 (1.689)	1.232*** (0.376)
BODFP	-0.179 (0.148)	-2.711* (1.594)	0.348 (0.249)									
BODFI	0.299** (0.125)	4.540*** (1.745)	-0.921** (0.365)									
BODFxFP	-	-	-									
BODFnP	0.020 (0.209)	-0.531 (2.175)	-0.430 (0.388)									
Ownership												
FPshare							-0.012** (0.006)	-0.149*** (0.055)	0.024 (0.018)			
Flshare							0.034*** (0.012)	0.320** (0.158)	0.004 (0.035)	0.019 (0.013)	0.190 (0.180)	-0.009 (0.034)
listed	0.443*** (0.116)	5.300*** (1.163)	0.900*** (0.246)	0.424*** (0.114)	5.191*** (1.197)	0.682*** (0.234)	0.366*** (0.117)	4.560*** (1.152)	0.758*** (0.247)	0.376*** (0.117)	4.721*** (1.176)	0.708*** (0.245)
state	0.004 (0.074)	0.926* (0.473)	-1.059*** (0.321)	0.005 (0.075)	0.929* (0.478)	-1.049*** (0.320)	0.000 (0.074)	0.884* (0.477)	-1.049*** (0.318)	0.004 (0.075)	0.924* (0.477)	-1.049*** (0.320)
Control variables												
logasset	0.004 (0.074)	0.926* (0.473)	-1.059*** (0.321)	0.005 (0.075)	0.929* (0.478)	-1.049*** (0.320)	0.000 (0.074)	0.884* (0.477)	-1.049*** (0.318)	0.004 (0.075)	0.924* (0.477)	-1.049*** (0.320)
leverage	-0.028** (0.014)	0.224 (0.149)	-0.018 (0.020)	-0.026** (0.013)	0.233* (0.141)	-0.014 (0.018)	-0.027** (0.013)	0.231 (0.146)	-0.016 (0.019)	-0.026** (0.013)	0.237* (0.141)	-0.014 (0.018)
Fixed Effect (FE)												
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Adjusted R²</i>	0.3995	0.2583	0.5578	0.4002	0.2498	0.5571	0.4024	0.2550	0.5537	0.3995	0.2489	0.5558
<i>Prob > F</i>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<i>N</i>	363	363	374	363	363	374	363	363	374	363	363	374

Notes: Variables are defined in Table 1.

Estimations were performed using Robust Fixed-effects Least Squares Dummy Variable Model.

Robust standard errors in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level.

Table 7: Robustness check – Sub-sample

	Dependent variables											
	Random effect model - Robustness test - Sub-sample											
	ROA	ROE	NIM	ROA	ROE	NIM	ROA	ROE	NIM	ROA	ROE	NIM
Participation in boards												
BOMFP				0.125 (0.085)	-0.997 (1.114)	0.646** (0.322)				0.083 (0.078)	-1.184 (1.109)	0.670** (0.338)
BOMFxp	0.197 (0.156)	4.834** (2.265)	0.089 (0.286)	0.114 (0.118)	1.460 (1.323)	0.376** (0.156)	0.164 (0.114)	2.886** (1.392)	0.121 (0.232)	0.104 (0.119)	1.362 (1.328)	0.394** (0.159)
BOMFnP	0.226* (0.115)	3.123** (1.488)	1.410*** (0.472)	0.127 (0.113)	1.719 (1.546)	1.310** (0.516)	0.277* (0.154)	2.285 (1.859)	1.370** (0.598)	0.162 (0.115)	1.762 (1.554)	1.290** (0.542)
BODFP	-0.194 (0.139)	-3.349** (1.694)	0.346 (0.338)									
BODFI	0.285 (0.177)	3.722* (1.956)	-0.818** (0.383)									
BODFxp	-	-	-									
BODFnP	-0.041 (0.182)	-2.801 (2.510)	-0.483 (0.437)									
Ownership												
FPshare							-0.012** (0.006)	-0.143*** (0.054)	0.023 (0.023)			
Flshare							0.029* (0.015)	0.167 (0.140)	0.005 (0.049)	0.015 (0.016)	0.080 (0.135)	-0.007 (0.041)
listed	0.391*** (0.146)	4.818** (2.173)	0.886*** (0.322)	0.355** (0.142)	4.730** (2.042)	0.667** (0.276)	0.311** (0.145)	4.223** (2.060)	0.742** (0.300)	0.320** (0.144)	4.538** (2.088)	0.681** (0.297)
state	-0.073 (0.271)	-3.334* (1.727)	2.667*** (0.852)	-0.040 (0.271)	-2.240 (1.732)	2.616*** (0.835)	-0.044 (0.274)	-2.517 (1.773)	2.659*** (0.836)	-0.037 (0.275)	-2.176 (1.771)	2.595*** (0.835)
Control variables												
logasset	-0.022 (0.115)	1.673*** (0.553)	-0.963*** (0.265)	-0.029 (0.117)	1.399*** (0.500)	-0.966*** (0.268)	-0.028 (0.116)	1.431*** (0.517)	-0.966*** (0.265)	-0.031 (0.118)	1.365*** (0.508)	-0.959*** (0.268)
leverage	-0.031** (0.015)	0.133 (0.129)	-0.018 (0.023)	-0.030** (0.015)	0.158 (0.122)	-0.014 (0.021)	-0.030** (0.015)	0.163 (0.120)	-0.016 (0.022)	-0.029** (0.015)	0.162 (0.121)	-0.014 (0.021)
Fixed Effect (FE)												
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	No	No	No	No	No	No	No	No	No	No	No	No
Overall R ²	0.2360	0.2483	0.3403	0.2265	0.2214	0.3418	0.2314	0.2293	0.3355	0.2254	0.2212	0.3424
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N	363	363	374	363	363	374	363	363	374	363	363	374

Notes: Variables are defined in Table 1.

Estimations were performed using Robust Random-effects Least Squares Dummy Variable Model.

Robust standard errors in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level.

2.7. Conclusion

The paper uses the Vietnamese strategic partnership program to complement existing literature on foreign ownership and management of banks in emerging markets. In particular, we bring additional insights about the channels through which foreigners can generate performance enhancing reforms by distinguishing between foreign management working for a strategic investor and non-affiliated foreign management. Furthermore, we differentiate between foreign management on the board of directors and the executive board.

We show that there is no mechanical relationship between foreign ownership or management and performance. Neither minority ownership by strategic investors, nor the presence of foreign management on the board of directors guarantees improvements in a local bank. Yet, what seems to work is the active involvement of foreign management that is not affiliated with a strategic investor.

These results have implications for the design of the Vietnamese “strategic partnership” program as well as for constructing reform policies for banks in emerging markets in general. Specifically, our results show that if strategic partners do not fully control the local bank, they will only have limited incentives to engage in a true transfer of technology and know-how. It is likely that this problem can be avoided by giving the strategic partner full control, although we cannot test this hypothesis with our data.

However, we can show that foreign control is not the only way to make local banks more competitive. There is also an alternative way for improving the performance of local banks: They can directly recruit foreign professionals without having to cede control to a strategic partner with uncertain objectives. This seems to be an efficient way for banks in emerging markets to obtain western know-how and technology.

Notes

1. In January 2014, the Vietnamese Government issued Decree No. 01/2014/ND-CP stipulating foreign investors' share purchase from Vietnamese credit institutions, adding only minor changes to the previous version (see more details in part 3.2 - The Vietnamese strategic partner program).

2. For instance, ANZ divested from its local partner Sacombank in early 2012. Similarly, the Singapore-based Oversea-Chinese Banking Corporation (OCBC) ended its partnership with VPBank by selling its stake in 2013.

3. In April 2014, HSBC's representatives withdrew from Techcombank's Board of Directors at the end of their technical assistance contract, without being replaced and without renewing the contract.

4. For example, in 2009, "Bank of America ("BoA") sold part and Royal Bank of Scotland ("RBS") sold all of their stakes in China Construction Bank ("CCB") and Bank of China ("BOC")" (Moody's: Impact of foreign investors' sale of China banks stakes. Global Credit Research - 01 Apr 2009: https://www.moody's.com/research/Moodys-Impact-of-foreign-investors-sale-of-China-banks-stakes--PR_176345).

5. In March 1988, the issuance of Decree 53/HDBT directed the banking system towards more business orientation. In May 1990 the State Council then passed two ordinances that officially transformed the banking system in Vietnam into a two-tier system: the Ordinance on the State Bank of Vietnam and the Ordinance on banks, credit cooperatives and finance companies.

6. The Bank for Foreign Trade (Vietcombank) handles over 80 percent of all trade transactions, including foreign exchange. The Bank for Investment and Development of Vietnam (BIDV) focuses on the financing of infrastructure. The Vietnam Bank for Industry and Trade (VietInBank – formerly Industrial and Commercial Bank, abbreviated Incombank) focuses on financing industry and trade. The Bank for Agricultural Development (Agribank) maintains the largest network in the country, corresponding to the needs of an agriculture-dominated economy. The smallest one is the Housing Bank of Mekong Delta. Vietcombank,

BIDV, VietInBank, and Agribank are often referred to as the “Big Four” state-owned banks due to their size in total assets and branches network.

7. Saigon Thuong Tin Commercial Bank (Sacombank) initiated the trend in 2001, receiving a financial contribution from the financial group Dragon Financial Holding (UK) equal to 10% of the charter capital.

8. KPMG, (2013), Vietnam banking survey

<http://www.kpmg.com/VN/en/IssuesAndInsights/ArticlesPublications/Documents/Advisory/Vietnam%20Banking%20Survey%202013%20-%20EN.pdf>

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Annex

Table S1: List of foreign strategic partners in Vietnamese banks

Strategic partner bank	Local bank	Start of the Partnership	End of the Partnership*	Separate direct subsidiary
Standard Chartered Bank	Asia Commercial Joint Stock Bank (ACB)	Jun-05		Yes
ANZ	Saigon Thuong Tin Commercial Joint Stock Bank (Sacombank)	Aug-05	Jan-12	Yes
HSBC	Viet Nam Technological and Commercial Joint Stock Bank (Techcombank)	Dec-05		Yes
OCBC Bank	Vietnam Prosperous Bank (VP Bank)	Mar-06	Nov-13	
Deutsche Bank AG	Hanoi Building Commercial Joint Stock Bank (Habubank)	Apr-07	Aug-12	
BNP Paribas	Orient Commercial Joint Stock Bank (OCB)	Oct-07		
Sumitomo Mitsui Banking Corporation	Vietnam Com. Joint Stock Bank of Export & Import (Eximbank)	Jul-08		
Société Générale	Sotheast Asia Commercial Joint Stock Bank (SeABank)	Aug-08		
Maybank	An Binh Commercial Joint Stock Bank (ABB)	Sep-08		
SBI Holdings Inc	TienPhong Commercial Joint Stock Bank (TPbank)	Aug-09		
Commonwealth Bank of Australia	Vietnam International Commercial Joint Stock Bank (VIB)	Sep-10		
Fullerton Financials Hdgs Pte., Ltd.	Mekong Development Joint Stoct Commercial Bank (MDB)	Dec-10	Aug-15	
Mizuho Corporate Bank	Joint Stock Commercial Bank for Foreign Trade of Vietnam (Vietcombank)	Sep-11		
Bank of Tokyo-Mitsubishi UFJ	Vietnam Bank for Industry and Trade (VietInBank)	Dec-12		

* if blank, the partnership is still in place as of 31 December 2015.

Source: Vietnamese banks' annual reports

Table S2: List of foreign banks in Vietnam

No	Bank Name	No of License	Date of License	Chartered capital* (VND bil)	Address
1	Hongkong – Shanghai Bank Vietnam Limited -HSBC	235/GP-NHNN	08/09/2008	7528	235 Dong Khoi, Ben Nghe Ward, Distric 1, HCMC
2	Standard Chartered Bank (Vietnam) Limited-SCBVL	236/GP-NHNN	08/09/2008	3080	Rooms No. 1810-1815 Kengnam Building, Lot E6, Cau Giay, Me Tri, Tu Liem, Ha Noi
3	ANZ Bank (Vietnam) Limited - ANZVL	268/GP-NHNN	09/10/2008	3000	Suncity Building, 13 Hai Ba Trung, Hanoi
4	Shinhan Bank Vietnam Limited - SHBVN	341/GP-NHNN	29/12/2008	4547	Ground, 2,3 Floors, Empress Building, No. 138-142 Hai Ba Trung, Đa Kao ward, district 1, Ho Chi Minh
5	Hong Leong Bank Vietnam Limited - HLBVN	342/GP-NHNN	29/12/2008	3000	Ground Floor, Centec Building, 72-74 Nguyen Thi Minh Khai, Ward 6, District 3, HCMC
6	Public Bank (Vietnam) Limited - PBVN	38/GP-NHNN	01/04/2016	3000	7th Floor, Prime Centre Building, 53 Quang Trung street, Nguyen Du ward, Hai Ba Trung District, Hanoi, Vietnam.

* As of 31 December 2015, except for Public Bank Vietnam Limited

Source: State Bank of Vietnam

Table S3: Credit institutions by types in Vietnam

#	Category	2004	2006	2007	2008	2010	2011	2012	2013	2014	Total Assets (%)			Total Assets (bil VND)
											2001	2004	2012	12/31/2012
1	State-owned commercial banks	5	5	5	5	5	5	5	5	5	78%	75%	43%	2 201 660
2	Policies banks	1	1	1	1	1	1	1	1	1				
3	Development banks	0	0	1	1	1	1	1	1	1				
4	Joint-stock commercial banks	36	34	34	40	37	35	34	33	33	11%	14%	42%	2 159 363
5	Joint-venture banks	4	5	5	5	5	5	4	4	4				
6	Foreign banks' branches	28	31	41	39	48	50	49	53	47				
7	100% foreign-owned capital banks	0	0	0	5	5	5	5	5	5	8%	8%	11%	555 414
8	Financial companies	5	6	9	17	17	18	18	17	17				
9	Financial leasing companies	9	11	12	13	13	12	12	12	11	3%	3%	3%	154 857
10	Central people's credit funds	1	1	1	1	1	1	1	1	1				
11	Local people's credit funds	905	926	996	1016	1057	1095	1032	1144	1145	0%	0%	0%	14 485
12	Small-sized financial organization	N/A	N/A	N/A	N/A	1	1	2	2	3				
13	Foreign credit institutions representative offices	N/A	N/A	N/A	55	48	50	N/A	N/A	N/A				
	Total	994	1020	1105	1198	1239	1279	1164	1278	1273	100%	100%	100%	5 085 779

Table S4: Vietnamese Banks by Types

<i>Number of observations by year</i>	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
	12	12	14	16	20	20	35	36	40	41	41	38	36	32	25	418
<i>Observations by ownership</i>																
1. State-owned commercial banks																
Big Four banks w/ foreign minority	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	5
Big Four banks w/o foreign minority	2	2	2	3	2	3	4	4	4	4	4	4	3	2	2	45
Non Big-Four state-owned bank	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	12
2. Joint-stock commercial banks (JCBs)																
JCBs w/ foreign minority	0	1	0	0	1	2	4	7	10	11	12	13	11	10	8	90
JCBs w/o foreign minority	9	9	12	12	16	14	26	24	25	25	24	20	20	17	13	266

*See note 4 for the list of "Big Four" banks

Table S5: Correlation matrix

	NIM	ROA	ROE	BOMFP	BOMFxp	BOMFnP	BODFP	BODFI	BODFxp	BODFnP	FPshare	Fshare	listed	state	logasset	leverage
NIM	1.0000 414															
ROA	0.3742* 0.0000 402	1.0000 402														
ROE	0.0515 0.3029 402	0.5513* 0.0000 402	1.0000 402													
BOMFP	0.0489 0.3212 414	0.0038 0.9387 402	0.0050 0.9202 402	1.0000 418												
BOMFxp	0.0377 0.4446 414	-0.0114 0.8195 402	-0.0325 0.5161 402	-0.0382 0.4365 418	1.0000 418											
BOMFnP	0.0785 0.1106 414	-0.0128 0.7976 402	0.0341 0.4949 402	0.2439* 0.0000 418	0.2296* 0.0000 418	1.0000 418										
BODFP	-0.0545 0.2688 414	-0.0592 0.2363 402	-0.0149 0.7664 402	0.6259* 0.0000 418	0.1889* 0.0001 418	0.2330* 0.0000 418	1.0000 418									
BODFI	-0.0496 0.3143 414	-0.0043 0.9310 402	0.1984* 0.0001 402	0.1559* 0.0014 418	-0.0278 0.5715 418	-0.0568 0.2469 418	0.2375* 0.0000 418	1.0000 418								
BODFxp	0.0274 0.5788 414	-0.0594 0.2346 402	0.0092 0.8540 402	0.1183* 0.0155 418	0.5417* 0.0000 418	0.2566* 0.0000 418	0.1631* 0.0008 418	0.1762* 0.0003 418	1.0000 418							
BODFnP	-0.0439 0.3730 414	-0.0082 0.8697 402	0.0657 0.1890 402	0.3864* 0.0000 418	-0.0233 0.6350 418	0.4500* 0.0000 418	0.2540* 0.0000 418	-0.0444 0.3655 418	-0.0212 0.6652 418	1.0000 418						
FPshare	-0.0298 0.5451 414	-0.0328 0.5125 402	0.0175 0.7264 402	0.6285* 0.0000 418	0.2317* 0.0000 418	0.3341* 0.0000 418	0.9098* 0.0000 418	0.1972* 0.0000 418	0.2256* 0.0000 418	0.2760* 0.0000 418	1.0000 418					
Fshare	-0.0484 0.3261 414	0.0409 0.4131 402	0.2230* 0.0000 402	0.3393* 0.0000 418	-0.0383 0.4344 418	-0.0550 0.2623 418	0.4146* 0.0000 418	0.7416* 0.0000 418	0.1349* 0.0057 418	0.2194* 0.0000 418	0.3445* 0.0000 418	1.0000 418				
listed	-0.0191 0.6982 414	-0.0006 0.9901 402	0.1880* 0.0002 402	0.3000* 0.0000 418	-0.0465 0.3431 418	-0.0951 0.0521 418	0.2839* 0.0000 418	0.3359* 0.0000 418	0.0888 0.0696 418	0.1558* 0.0014 418	0.2481* 0.0000 418	0.5422* 0.0000 418	1.0000 418			
state	-0.0277 0.5736 414	-0.1902* 0.0001 402	0.1241* 0.0128 402	-0.0149 0.7613 418	-0.0504 0.3043 418	-0.1030* 0.0353 418	-0.1272* 0.0092 418	0.0273 0.5782 418	-0.0459 0.3490 418	-0.0805 0.1002 418	-0.1322* 0.0068 418	-0.0353 0.4714 418	0.1001* 0.0407 418	1.0000 418		
logasset	-0.3539* 0.0000 414	-0.2340* 0.0000 402	0.2449* 0.0000 402	0.2225* 0.0000 418	0.0532 0.2778 418	0.1463* 0.0027 418	0.2585* 0.0000 418	0.1429* 0.0034 418	0.1229* 0.0119 418	0.1727* 0.0004 418	0.2722* 0.0000 418	0.2293* 0.0000 418	0.3835* 0.0000 418	0.5176* 0.0000 418	1.0000 418	
leverage	-0.2752* 0.0000 414	-0.3441* 0.0000 402	0.3063* 0.0000 402	-0.0460 0.3484 418	-0.0316 0.5197 418	0.0122 0.8036 418	-0.0164 0.7375 418	0.1249* 0.0106 418	0.0583 0.2345 418	0.0109 0.8249 418	-0.0265 0.5895 418	0.0924 0.0592 418	0.0870 0.0756 418	0.4797* 0.0000 418	0.5193* 0.0000 418	1.0000 418

* indicates statistical significance at the 5 % level

Among the variables, only BODFP and FPshare show significantly high correlation at 0.9098, and BODFI and Fshare at 0.7416, which is understandable as members on a board of directors represent the financial participation of investors in the local banks. We do not use these two pairs of variables in the same model, but separately: we test the effect of direct foreign ownership in one model and the presence of foreign partners/ investors in the other.

Table S6: Presence of foreign bankers on boards

<i>Variables</i>	<i>Number of observations by year</i>	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
		1	1	1	1	3	2	5	5	16	20	23	27	31	32	26	194
<i>Observations by presence on boards (yes/ no)</i>																	
BOMFP	Banks with foreign managers assigned by the partner on the board of management	0	0	0	0	0	0	0	0	4	5	4	5	8	7	5	38
BOMFxP	Banks with foreign managers who used to work for the strategic partner on the board of management	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	6
BOMFnP	Banks with foreign managers who have no relationship with the strategic partner/ investors on the board of management	0	0	0	0	0	0	0	0	1	2	3	4	5	5	4	24
BODFP	Banks with foreign directors assigned by the strategic partner on the board of directors	0	1	0	0	1	1	4	4	9	10	12	11	11	12	9	85
BODFI	Banks with foreign directors assigned by other investors on the board of directors	1	0	1	1	2	1	1	1	1	1	1	2	2	3	3	21
BODFxP	Banks with foreign directors who used to work for the strategic partner on the board of directors	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	5
BODFnP	Banks with foreign directors who have no relationship with the partner/ investors on the board of directors	0	0	0	0	0	0	0	0	1	1	2	3	2	3	3	15

Table S7: Data availability

Bank names	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
An Binh Commercial Joint Stock Bank-ABBANK						1	1	1	1	1	1	1	1	1	1	10
Asia Commercial Joint-stock Bank-Ngan Hang A Chau		1		1	1		1	1	1	1	1	1	1	1	1	12
Bao Viet Commercial Joint Stock Bank										1	1	1	1	1		5
Dai A Commercial Joint Stock Bank							1	1	1	1	1	1	1			7
DongA Commercial Joint Stock Bank-Ngân Hàng Đông A	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
First Joint Stock Commercial Bank-De Nhat Commercial Joint-Stock Bank								1	1	1	1					4
Global Petro Commercial Joint Stock Bank							1		1	1	1					4
Hanoi Building Commercial Joint Stock Bank - Habubank	1	1		1	1		1	1	1	1	1	1				10
Ho Chi Minh City Development Joint Stock Commercial Bank			1		1	1	1	1	1	1	1	1	1	1	1	12
Joint Stock Commercial Bank for Foreign Trade of Vietnam- VIETCOMBANK				1	1	1	1	1	1	1	1	1	1	1	1	12
Joint Stock Commercial Bank for Investment and Development of Vietnam	1	1				1	1	1	1	1	1	1	1	1	1	12
Kien Long Commercial Joint Stock Bank							1	1	1	1	1	1	1	1	1	9
Lien Viet Post Joint Stock Commercial Bank									1	1	1	1	1	1	1	7
Mekong Development Joint Stock Commercial Bank							1	1	1	1	1	1	1	1		8
Mekong Housing Bank-MHB	1			1	1	1	1	1	1	1	1	1	1	1		12
Military Commercial Joint Stock Bank				1	1	1	1	1	1	1	1	1	1	1	1	11
Nam A Commercial Joint Stock Bank			1	1	1	1	1	1	1	1	1	1	1	1	1	12
National Citizen Commercial Joint Stock Bank							1	1	1	1	1	1	1	1	1	9
North Asia Bank - Ngan hang Thuong mai Co Phan Bac A-BAC A Bank									1			1	1			3
Ocean Commercial Joint Stock Bank							1	1	1	1	1	1	1	1		8
Orient Commercial Joint Stock Bank-Ngan Hang Thuong Mai Co Phan Phuong Dong	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15
Petrolimex Group Commercial Joint Stock Bank (The)-PG Bank			1	1	1		1	1	1	1	1	1	1	1	1	12
Saigon - Hanoi Commercial Joint Stock Bank							1	1	1	1	1	1	1	1	1	9
Saigon Bank for Industry and Trade	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15
Saigon Commercial Bank-Saigonbank					1	1	1	1	1	1	1	1	1	1	1	11
Saigon Thuong Tin Commercial Joint-Stock Bank-SACOMBANK-Ngan Hang Saigon Thuong Tin	1	1			1	1	1	1	1	1	1	1	1	1	1	13
Southeast Asia Commercial Joint Stock Bank-SEA Bank					1	1	1	1	1	1	1	1	1	1	1	11
Southern Bank-Phuong Nam Commercial Joint Stock Bank	1	1	1		1		1	1	1	1	1	1	1	1		12
Tien Phong Commercial Joint Stock Bank									1	1	1	1	1	1	1	7
Trust Bank - NHTMCP Dai Tin - NHTMCP Xay dung VN								1	1	1	1	1				5
Viet Capital Commercial Joint Stock Bank							1	1	1	1	1	1	1	1	1	9
Viet Nam Thuong tin Joint Stock Commercial Bank-VIETBANK										1	1					2
Vietnam Asia Commercial Joint-Stock Bank					1	1	1	1	1	1	1	1	1			10
Vietnam Bank for Agriculture and Rural Development - Agribank-Ngan Hang Nong Nghiep va Phat Trien Nong Thon Viet Nam			1	1	1		1	1	1	1	1	1	1	1	1	12
Vietnam Export Import Commercial Joint Stock Bank	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15
VietNam International Commercial Joint Stock Bank - VIB		1	1			1	1	1	1	1	1	1	1	1	1	12
Vietnam Joint-Stock Commercial Bank for Industry and Trade	1	1	1	1		1	1	1	1	1	1	1	1	1	1	14
Vietnam Maritime Commercial Stock Bank-Ngan Hang Hang Hai				1	1	1	1	1	1	1	1	1	1	1	1	12
Vietnam Prosperity Joint Stock Commercial Bank-VP Bank	1		1	1	1	1	1	1	1	1	1	1	1	1	1	14
Vietnam Technological and Commercial Joint-Stock Bank - Techcombank	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15
Vietnam Tin Nghia Commercial Joint Stock Bank							1	1	1	1						5
WesternBank							1	1	1	1	1	1	1			7
Total observations	12	12	14	16	20	20	35	36	40	41	41	38	36	32	25	418

CHAPTER 3

Making depositors greedy and careless: Government safety nets and the degradation of depositor discipline

Abstract

In emerging countries, deposits play an important role in banks' total funding; hence depositor discipline may significantly impact banking performance and the stability of the financial system. This paper investigates the reaction of bank depositors to interest rates as well as signs of banks' risk, before and after the recent banking crisis in Vietnam. Before the crisis, the level of deposit financing in banks depended on the interest rates offered, but also on measures of the banks' risk-taking. After the crisis, the second relationship wanes: Bank customers still react actively to interest rates but substantially less to risk, presumably because they have learned that their deposits are safe, whatever risk the bank is taking.

3.1. Introduction

Similar to what happened in developed countries, governments in emerging countries intervened during the crisis in the banking system by raising deposit insurance coverage or bailing out and taking over troubled financial institutions. The objective of these measures is to stabilize the financial system in the short term and avoid major economic damage, by reducing panic among banks' clients and preventing bank runs. However, in the long term, this type of drastic regulatory intervention may harm financial stability as it might erode market discipline and in particular depositor discipline.

In this study, I use Vietnam as a laboratory to examine depositor discipline in an emerging country. Vietnam is particularly well suited for this purpose. As a transition country, Vietnamese depositors had no previous experience with bank bailouts and crises; I can thus analyze how bailouts affect the behavior of clients without any preconceptions about possible implicit government guarantees. Unlike in most developed countries, Vietnamese banks raise a major fraction of their funding through deposits and as a consequence Vietnam has intensely competitive deposit markets with very reactive depositors.

I will demonstrate that before the crisis, depositors monitored bank risk and hence banks were disciplined by depositor behavior, government bailouts and the official introduction of deposit insurance during the financial crisis in Vietnam have reduced this channel of market discipline. In a nutshell, before the bailouts, depositors strongly preferred safe banks; afterward, they mostly care about interest rates. More precisely, I find that Vietnamese depositors are always very sensitive to price: before as well as after the crisis, depositors choose banks offering higher interest rate to place their money. However, before the crisis, they also cared about the bank's leverage. Banks with higher equity over total assets ratio were able to attract a higher level of funding from deposits than banks with low equity levels. This monitoring of banks' risk by depositors significantly decreased after the bailouts: after the crisis, the relationship between leverage and deposit financing is much weaker. Another indicator of bank risk covering both returns and leverage, Z-score, is also investigated. However, the calculation of Z-score that

requires 3-year or 5-year rolling windows leads to a significant decrease in the number of usable observations. There are signs of depositor monitoring effect before the crisis as well as diminishing depositor discipline post-crisis, though the deterioration effect shows no clear significance, presumably due to the noise associated with the Z-score calculation method. Other tests with various bank risk indicators, such as non-performing loans ratios, or loan loss provision over net interest revenue reveal no clear relationship with depositor discipline, probably due to the low number of observations and the low reliability of the accounting information regarding these ratios.

The results suggest that, as a consequence of the government's intervention in the banking system and more specifically as a consequence of bailing out troubled banks, depositors have learned that the safety of their deposits is independent of the risk that the bank is taking.

This study demonstrates that depositor discipline exists, but also casts some doubt about the usefulness of depositor discipline as a tool to stabilize banks. In particular, even if depositor discipline exists, the effect seems not to be strong enough to incite banks to limit risk-taking. In a financial crisis, some banks will fail despite depositor discipline and consequently government bailouts of failing banks will erode depositor discipline. These findings raise questions about whether stabilizing financial systems through depositors is a promising strategy.

The rest of the paper is organized as follows. Section II reviews the prior literature on market discipline by different types of debt – subordinated debt and deposits as well as the way bailouts impact on depositor discipline. Section III presents the State Bank of Vietnam's prevention measures against the effects of the global financial crisis on the banking system. I then introduce in Section IV the construction of the dataset and methodology. Section V presents the main empirical findings and discusses their economic significance. Section VI conducts robustness tests and Section VII concludes.

3.2. Literature review

3.2.1. Depositor discipline

As financial intermediaries, banks play a key economic role in providing financial liquidity. Banks fulfill this role by borrowing “short” (taking demandable or short-term deposits) and lending “long” by reinvesting those funds in long-term, illiquid loans (Diamond and Rajan, 2001). This process results in asset-liability mismatches and hence creates an inherently unstable balance sheet. Banks operate on the principle of fractional reserves where on any given day depositors will withdraw only a small fraction of deposits. However, this assumption does not always hold: When banks lend, they take on credit risk. If depositors think that the bank has taken excessive risk, they will withdraw their deposits. In the extreme, this can result in a bank run where depositors simultaneously request to withdraw more than the total amount of cash on the bank’s balance sheet or the total amount of short-term cash that a bank can raise from other sources. In this case, the bank will not have enough liquidity to honor all depositors’ demands and fail.

In theory, this mechanism creates an incentive for banks to not take excessive risk and thus contributes to the general banking system stability. Diamond and Rajan (2000) stipulate that the optimal bank capital structure trades off effects on the probability of financial distress and liquidity creation. Calomiris and Kahn (1991) believe that demandable deposits give depositors an option to force liquidation, which in turn gives bank management incentive to act in depositors' interest. In general, depositors will monitor the banks and penalize excessive risk-taking by withdrawing deposits or requiring a higher risk premium as confirmed by Martinez Peria and Schmukler (2001). Accordingly, depositor discipline will tend to lower the probability of individual bank failures as well as the incidence of banking crises; thereby it will lead to a healthier banking sector. As a consequence, this “depositor discipline” effect could be one possible market mechanism that contributes to a more efficient and stable banking system. Huybens et al. (2005) find evidence from Mexico proving that in a context of limited deposit insurance, depositors punished banks for risky behavior and provided stability to the system.

There exist a number of studies on depositor discipline in the US banking system. Park and Peristiani (1998) find evidence for depositor discipline, confirming that bank risk and the deposit rate are positively related and that riskier banks have a lower amount of uninsured deposits. Maechler and McDill (2006) also inspect deposits at US banks and demonstrate that depositor discipline may effectively constrain managers' risk-taking by raising the cost of debt following the implementation of risky strategies. Using a branch level data set on deposit rates, Jacewitz and Pogach (2018) find significant pricing advantages at the largest banks over their smaller bank counterparts on comparable deposits, consistent with a too-big-to-fail subsidy captured by the former through lower risk premiums on uninsured deposits. In Europe, Birchler and Maechler (2001) find considerable evidence of depositor discipline for Swiss banks – depositors are sensitive to bank fundamentals, to differences across bank groups, and to institutional changes to the Swiss depositor protection system. For an international sample of banks, Bertay et al. (2013) find that systemically large banks are subject to greater market discipline. Kozłowski, Ł. (2016) examines market discipline mechanisms at Polish cooperative banks and observes that depositors are sensitive to risk-taking by cooperative banks. Furthermore, the author confirms improvement in a bank's transparency thanks to its internet activity, as well as a stronger market discipline over more internet-active banks since online banking systems stimulate deposit mobility.

My paper adds to the growing literature on depositor discipline in developing countries. Empirical research on depositor discipline can be found for Latin American countries, for example, Calomiris and Powell (2001) show that in Argentina, both large deposit withdrawals and high interest rates are associated with banks' higher risk, on both sides of the balance sheet, i.e. asset risk and leverage. In India, Ghosh and Das (2006) find that depositors 'punish' banks for risky behavior, either by placing a lower amount or requiring deposit rate changes. Ungan, Caner, and Özyildirim (2008) study large Russian banks between 2000 and 2005 and find that healthier banks in terms of capital and liquidity significantly increase their deposits. Hou, Gao, and Wang (2016) investigate depositor

discipline in China, an emerging economy under financial repression and implicit government guarantee. The results suggest that, in general, deposit growth ratios are negatively associated with bank risk measures. Moreover, market disciplines work more significantly and are strengthened with the development of internet finance in large banks, in contrast to what can be found in non-state-owned banks. However, Omet and Fayyumi (2004) report the non-existence of depositor discipline in Jordan. Oliveira et al. (2014) find an absence of discipline on too-big-to-fail banks in Brazil.

3.2.2. Impact of crises and bail-outs on depositor discipline

Intuitively, deposit insurance and bailouts will tend to weaken depositors' incentives to monitor banks. This effect has been demonstrated in a range of studies: Demirgüç-Kunt and Huizinga (2004) find cross-country evidence suggesting that explicit deposit insurance lowers interest expenses and undermines market discipline on bank risk-taking. Furthermore, in almost all countries, policymakers extend an implicit financial safety net to banks in the hope of making systemic banking failure less probable and to limit the turmoil engendered when they occur. Flannery (1998) goes beyond the statement that depositors are concerned about the solvency of banks and shows empirical evidence that they also care about the solvency of the deposit insurer as well as the readiness of the government to support a bank. In the same line of thought, depositors appear to count on implicit government guarantee as well: it is what the government does and not what it says that matters. In an international survey, Demirgüç-Kunt, Karacaovali, and Laeven (2005) point out that several countries have implemented measures to compensate uninsured depositors, notwithstanding the absence of explicit coverage. In a more updated version of the comprehensive study on deposit insurance worldwide, Demirgüç-Kunt, Kane, and Laeven (2014) document that coverage increased during a crisis and remained above pre-crisis levels, questioning the eligibility of deposit insurance and putting into light the concerns about implicit coverage and moral hazard going forward. In Russia, the introduction of deposit insurance diminishes remarkably the sensitivity

of households to bank capitalization (Karas, Pyle, and Schoors, 2013). In a novel bank run experiment where the level of deposit insurance depends on the number of depositors running on the bank and thus is uncertain, Peia and Vranceanu (2018) demonstrate that partial deposit insurance schemes might be detrimental to bank stability, especially under noisy information about the size of the insurance fund.

The recent global financial crisis in 2008 provides a unique experiment to investigate depositors discipline in a special context. In a study on Central European countries banks, Hasan et al. (2013) do not find evidence of an overall wake-up call among depositors during the crisis. Berger and Turk-Ariss (2015) document significant depositors discipline prior to the crisis in both the US and EU, with the magnitude depending on size and listed status; nevertheless, depositor discipline mostly decreased during the crisis, except for the small US banks. However, evidence of the opposite effect can be found in the investigation of the impact of bank failures on the disciplining behavior of depositors in local US banking markets during the recent financial crisis (Lamers, 2015). The author reports increased depositor discipline despite the existence of possible distortions such as deposit insurance schemes and bailouts and confirms a stronger and long-lasting sensitivity of depositors to bank risk in markets that have witnessed failures. More recently, Acharya et al. (2016) have questioned the pertinence of market discipline as a tool in bank supervision following the crisis.

My study for Vietnam corroborates that depositor discipline deteriorates following the increased deposit insurance coverage and bailouts of weak banks. Depositors feel no more need to monitor bank risk and prefer basing their choice of banks on the interest rates they offer, knowing that their money is safe anyway.

Along with my principal result, I am able to reassert or rebut, for Vietnam, a number of additional relationships that have been identified in the literature. For example, Barrell, Davis, Fic, and Karim (2011) find a direct relationship between bank size and risk-taking, confirming the existence of implicit too big to fail insurance. According to Hori, Murata, and Ito (2009), depositors in Japan are sensitive to banks' health and more responsive to bank risk at larger

institutions than those at smaller institutions. Semenova (2007) find varying depositor discipline in different groups of banks (state, private, and foreign) in Russia. In particular, the author finds virtually no discipline on foreign banks, while depositors use a quantity-based discipline mechanism for the two other groups, i.e. they are more sensitive to bank total assets of the state and private domestic banks. In addition, private domestic banks are also disciplined by price and maturity shifts.

I observe that in Vietnam, bigger banks have a smaller portion of customer deposits in their total funding, possibly due to their ability to call on other sources of funding. An alternative explanation for this observation could be that there is stronger depositor discipline for these institutions since they depend more on uninsured deposits. At the same time, state-owned banks and 100% foreign-owned banks seem to be more trust-worthy to retail depositors, probably owing to the stronger implicit guarantee for the former and international reputation for the latter. Note that no clear evidence of depositor discipline can be found in joint-venture banks.

3.3. The financial crisis, bank bailouts and deposit insurance in Vietnam

3.3.1. Deposit market competition and deposit rate ceilings

In Vietnam, small banks with limited capital and low liquidity have often been the first to offer attractive interest rates, sometimes extremely high ones, exceeding the State Bank of Vietnam's regulatory cap on deposit rates. To do so, these banks exploit loopholes, such as deposit bonuses and gifts for customers which enable banks to offer effective rates that exceed the deposit rate ceilings, initiating a competitive "interest rate" price war. Once the price war starts, bigger banks need to follow suit for fear of losing deposits to those who offer higher interest rates. The record for interest rate levels has been set in 2008, the year of the global financial crisis, which followed a boom in the stock exchanges and real estate market in Vietnam in 2007: Smaller banks have been able to offer effective deposit rates as high as 22%, exceeding

the cap of lending rate at 21%²³. With this strategy, banks seem to be able to temporarily meet their immediate objective, which is to improve their liquidity and to quench their thirst for cash.

The fear is that these high deposit interest rates cannot be covered by the lending interest rates which are capped by the regulator. In addition, driven by short-term profit maximization, some banks neglect liquidity management, not paying due attention to portfolio structure, taking risks with a high ratio of medium and long-term lending using short-term deposits. High deposit rates will, therefore, create huge credit risk. With loan interest rates exceeding 18% excluding fees and with increasing raw materials expenses and high inflation, borrowing enterprises will have difficulties to make a profit to ensure loan reimbursement. Hence, a price war in interest rates might be one of the reasons for high non-performing loans levels in many Vietnamese banks. Furthermore, facing high interest rates, many organizations and individuals will not dare to borrow capital for production, business or investment in projects, leading to the risk of economic decline. This is why the State Bank of Vietnam wants to effectively curb the interest rates price wars with a deposit cap rate.

3.3.2. The impact of the 2008 financial crisis on Vietnam

Originated in the United States, the global financial crisis 2008 quickly spread over many other countries in the world, with larger effects on the emerging economies than the advanced economies (Chen et al., 2016). Vietnam recognized the negative impact on its economy but initially considered its financial system to be sufficiently stable. Hence, in the first two quarters of 2008, the State Bank of Vietnam (SBV) implemented contractionary monetary policies, aiming at curbing inflation and stabilizing the macro-economy. Only in the last two quarters of this year, the central bank gradually shifted to an expansionary policy, using different measures to stimulate business and production as well as to prevent an economic decline. These policies

²³ The State Bank of Vietnam specifies the deposit rate ceilings in dedicated circulars at the beginning of 2008 and since March 2011. When no specific deposit rate ceiling is mentioned in the circulars, it is stipulated that deposit rates are not allowed to surpass lending rates, which is economically logical to banks and to avoid unhealthy competition. See Graph 2 for the evolution of deposit rate ceilings in Vietnam during the period 2000-2015.

demonstrated the flexibility of the SBV but they created abrupt, sudden, and unpredictable changes in interest rates and other prices which confused enterprises and reduced their investment and general activity²⁴.

Although not officially announced as support packages, many measures were aimed at aiding banks, including daily open market operations and multiple reductions of reserve requirement ratios²⁵. The purpose was to ensure banks' liquidity, stabilizing the money market, especially at the moments of changes in the reserve requirement ratio or the announcement of regulated interest rates. Up to the fourth quarter of 2008, the SBV had conducted refinancing with short-term capital for commercial banks that experienced temporary difficulties of liquidity, especially for small-size commercial banks.²⁶ Actually, these measures did not solve the problem; they just deferred it and may have even been at the root of the bad debts crisis that broke out in Vietnam a few years later²⁷. The bottom line is that Vietnamese, who had never experienced banking crises and bailouts, then started to assume that the government would be willing to use all available means to save its banks for fear of a systemic failure of the entire banking system.

There are undoubtedly good reasons for which the State Bank of Vietnam enacted all these supporting measures during the financial turbulence. The fear of capital outflows is the main motive. A larger amount of capital outflows means a larger savings-investment gap, causing a greater dependence on external indebtedness to finance national development objectives and might result in a currency crisis. In the same line of thought, the authorities have demonstrated consistent protection towards depositors in banking distress, pursuing either

²⁴ In particular, during 2008, the central bank changed their base rate 8 times, beginning at 8.25% in January, climaxed at 14% since June to October, then declined again to reach 8.5% at the end of the year. See Graph 1 for more details on the State Bank of Vietnam's regulatory interest rates.

²⁵ For example, even under the period of a tight monetary policy, the central bank enacted bids for short termed securities (7, 14, 21, 28 days) through daily open market operations (OMO), where volume was defined based on payment requirement and monetary market evolution. During the last months of 2008, in order to support banks to supply capital to the economy, the SBV decided to reduce the reserve requirement ratios, consecutively from 11% to 10%, and 6% for local currency deposits, and from 11% to 9% and 7% for foreign currency deposits.

²⁶ Source: Annual Report – State Bank of Vietnam, 2008

²⁷ Window dressing cannot hide the real situation of banks forever: in September 2012, SBV reported a prudent bad debts ratio at 17.21% of total outstanding loans; the real figure could be much higher.

explicit deposit insurance or more importantly, implicit guarantees. Up to 2012, deposit insurance policies were jointly stipulated in different legal documents of the Vietnamese Government and related ministries and departments. After the issuance of Law on Deposit Insurance in 2012 effective since 01 January 2013, deposit insurance policies confirmed their importance in Vietnam. The deposit insurance cap was set at 30 million VND (approximately 2200 USD) in 1999, raised to 50 million VND (approximately 3200 USD) in 2005 and recently 75 million VND (approximately 3300 USD) since 05 August 2017.²⁸

The implicit deposit insurance has been mostly implemented through government takeovers of troubled banks (See Chapter 4 of this dissertation). In principle, Vietnam has the necessary legal and administrative infrastructure to liquidate failed banks in an orderly fashion. However, experts in the field consider that Vietnam still needs at least two years of preparation before any bankruptcy declaration in the financial system is economically viable.

Indeed, bankruptcy in the Vietnamese banking system was defined by laws on credit institutions dated December 12, 1997 (No. 07/1997/QH10, expired) and dated June 16, 2010 (No. 47/2010/QH12), but has never occurred. The latter law has been recently amended and supplemented by the law No. 17/2017/QH14 dated November 20, 2017, and effective from January 15, 2018. Among its amendments and supplements, the latest law better clarifies and calls more attention to bankruptcy applied to troubled banks under “special control”, i.e. banks under the direct control of the State Bank of Vietnam. This movement shows the lawmakers’ belief that the Vietnamese banking industry has matured over the past time and their determination to allow banks to be declared bankrupt. Note, however, that according to this law, the financial institution would be allowed to file for bankruptcy as a last resort only if it cannot overcome other restructuring plans including (a) a recovery plan; (b) a plan of merger, acquisition or a total capital transfer of the bank to other investors; (c) a dissolution plan; or (d) a compulsory transfer plan.

²⁸ Approximate USD values are calculated using the exchange rates of the years in question (exchange rates are from Vietcombank – Joint Stock Commercial Bank for Foreign Trade of Vietnam).

In practice, the Vietnamese government has not applied these laws regardless of the bank size with the fear that any failure in the system could expand to a larger scale. The temporary result is that no bankruptcy occurs; bank clients' money is safe from bank runs; however, whether these actions can fundamentally lead to more efficient and stable banks or rather create moral hazard and postpone the bad scenario is still an open question.

3.4. Data and summary statistics

3.4.1. Construction of the data set

To examine whether depositor discipline has deteriorated, this paper tests for its presence prior to the crisis in Vietnam and compare with the following period. In particular, I examine the effects of bank risk on the *funding by deposits ratio* - a proxy for depositor discipline as it captures how much funding the banks' depositors are willing to supply. The measures of risk employed are the *bank Z-score* and the bank leverage in terms of the *equity total asset ratio*, which are used alternatively in different regressions.

The bank Z-score is an indicator that combines the capitalization and returns; hence it reflects reasonably the bank business risk, which is inversely related to the probability of bank insolvency. It is estimated as the return on assets plus the capital-asset ratio divided by the standard deviation of asset returns. It indicates the number of standard deviations that a bank's ROA has to drop below its expected value before equity is depleted. A higher value of Z-score, therefore, characterizes greater banking stability and a lower value indicates instability (Laeven and Levine, 2009). I consult the study of Bouvatier et al. (2018) for different methods of calculating the bank Z-score. According to the authors, in the overall preferred multivariate-model approach, the best Z-score to use is the ROA-based Z-score using current values of the

capital-asset ratio.²⁹ In this study, the Z-score is calculated with moving average ROA over 3-year windows and current values of the capital-asset ratio.³⁰

Bank leverage, measured by the ratio of total assets over equity, is a simpler indicator for bank risk without consideration of returns. Higher leverage may signify that banks expand their total assets exceedingly; the capital buffer may be too thin to cope with hazardous events, such as non-performing loans. It may, however, indicate that banks have not been able to collect deposits and grow their credit portfolio, thus diminish their profitability. Nevertheless, because of its simplicity, it is more intuitive and easier for depositors to compare banks and play their monitoring role accordingly. In this study, the *equity to total asset ratio*, i.e the inverse ratio of bank leverage is used.

A *deposit pricing index* is also investigated to study the sensitivity of depositors to interest rates, calculated as the bank's average interest expense rate relative to the deposit cap rate regulated by the State Bank of Vietnam. The deposit rate is of course partially endogenous, but the fact that it is positively related to the deposit funding ratio demonstrates that higher depositor pricing is used as a way to increase a bank's deposit funding ratio rather than as a way to hold back outflowing deposits. Therefore, even though a higher deposit rate could be a consequence of depositor discipline, in this study, deposit pricing can still be used as an explanatory variable.

I then introduce a dummy variable which distinguishes years after the crisis (after 2008) and before the crisis (2008 backward), as well as the interaction between this dummy variable and banks' Z-score or leverage, to compare the effect between the pre and post-crisis period. Control variables are also examined, such as the effect of *bank size* on depositor discipline, the

²⁹ Bouvatier et al. (2018) also recommend a novel regulatory capital Z-score as having the superior performance compared to other return-based Z-scores owing to its independence from earnings – the data available in this study is not adequate for such a calculation.

³⁰ Other methods considered include the ROA-based Z-score with the moving average of the capital-asset ratio, the ROE-based Z-score using 3 and 5 year windows, all give inferior results compared with the chosen 3 moving moments ROA-based Z-score using current values of the capital-asset ratio. ROE-based Z-scores are calculated as $(1 + ROE) / sd(ROE)$.

impact of macro monetary management tool – the central bank’s *discount rates*. Finally, *GDP growth rates* are used as a control variable for different years’ economic environment impact.

Table 1 below provides the definition of the variables used in the empirical analysis.

Table 1: Variables definition

Variables	Definition
<i>Depositor discipline</i>	
Customer Deposits/ Total Funding	Customer Deposits/ Total Funding excluding Derivatives
<i>Bank’s indicators</i>	
Deposit pricing	Deposit pricing is an index calculated as the bank’s average interest expense rate relative to the deposit cap rate regulated by the State Bank of Vietnam.
Z-score	The bank Z-score compares a bank's buffers (capitalization and returns) with the volatility of those returns. In this study, it is estimated as the 3-year moving average of return on assets plus the current capital-asset ratio divided by the standard deviation of asset returns.
Equity/Total Assets	Equity over Total Assets ratio
<i>Interactions</i>	
Deposit pricing x After Crisis	Interaction variable between Deposit pricing and After crisis dummy
Z-score x After Crisis	Interaction variable between bank Z-score and After crisis dummy
Equity/Total Asset x After Crisis	Interaction variable between Equity over Total Assets ratio and after crisis dummy
<i>Control variables</i>	
After Crisis	After crisis - Dummy variable for the post-crisis period (after 2008)
Bank size	Natural logarithm of Total assets
GDP growth rate	Annual growth rate of Gross domestic product
Discount rate	The discount rate applied when the State Bank of Vietnam (SBV) lends cash in exchange of commercial bills and other short-term securities (treasury bills, deposit certificates) for credit institutions. ³¹
<i>Sources of data: BankScope, State Bank of Vietnam, World Bank and author’s calculation from these sources</i>	

Vietnamese banks’ financial data for this study was collected from the BankScope database provided by Bureau van Dijk and Fitch Ratings for over 40 commercial banks during

³¹ Prior to the maturity of such papers, if banks are in need of capital, they can pledge these securities to the SBV at the discount rates previously announced by the SBV to get capital for their activities. Consequently, the SBV's discount rate serves as the "floor" interest rate on the market: banks have borrowed money from the SBV to provide credit to customers, therefore, they have to lend at higher interest rates to be profitable.

the period 2000-2014. Information on interest rates policies is from the State Bank of Vietnam's annual reports. Vietnam's macroeconomic data including inflation and GDP growth is originated from the World Bank's reports. The State Bank of Vietnam requires banks to publish financial reports in local generally accepted accounting practices (local GAAPs - Vietnamese Accounting Standards – VAS). When banks have foreign investors, they also produce IFRS financial reports. Since most of the banks follow local GAAPs and few banks have IFRS reports, the treatment drops observations that are not local GAAPs standardized to obtain data consistency. In order to ensure the quality of the data used for analysis, only data from reports that meet audit statement qualification “audited” or “unqualified” is retained. As control of outliers, 7 observations of which the Equity/Total Assets ratio is greater than 80 percent are removed from the sample. Exceptionally high Equity/Total Assets ratio indicates that the banks have just entered the market and thus have not been active in taking deposits. The study covers the period from 2000 to 2014 which yields a sample of 434 bank-year observations. Due to the calculation involving moving moments of ROA, there are 286 usable observations of Z-scores.

3.4.2. Descriptive statistics

Table 2 provides an overview of the data. The dependent variable “*Customer Deposits/ Total Funding*” was highly variable, ranging from 15.63% to 100%, with most of the banks having a high customer deposit/ total funding ratio, resulting in high mean value at 69.59%.

It is notable that the index of relative *deposit pricing* comparing banks' interest rates to the deposit cap also has a wide range of values, indicating highly asymmetric competition in the deposit market among banks. In particular, the deposit pricing ratios, calculated as the bank's average interest expense rate divided by the regulated deposit cap rate, ranged from a low end of 12.64% to a high end of 147.48%. Please note that this ratio can be higher than 100% since the calculation is based on banks' yearly average interest expense rates and yearly time-weighted average deposit cap rates. Within a year, due to the macro management requirement, the State Bank of Vietnam may change the deposit cap rates several times – this was the case in 2008 and

during the period 2011-2014. Therefore, banks who were able to mobilize customers funding when the cap rate was higher but failed to do so when the cap rate decreased showed deposit pricing index higher or even much higher than 100% for the years in question. We can also observe that after the crisis, the competition on the deposit market becomes fiercer, at least for some banks, since the maximum deposit pricing before the crisis is only 78.16, compared to 147.48 post-crisis.

Table 2: Summary Statistics - Continuous variables

Continuous variables								
Variable	n	Mean	S.D.	Min	.25	Median	.75	Max
Customer Deposits/ Total Funding	434	69.59	17.67	15.63	56.93	71.48	81.74	100
Deposit pricing	428	56.16	25.25	12.64	36.78	54.3	72.14	147.48
Z-score	304	63.08	96.22	1.32	21.79	37.59	61.86	948.59
Equity/Total Assets	434	13.39	9.68	0.3	7.44	10.33	15.6	67.83
Bank size	434	13.85	1.47	10.35	12.69	13.73	14.84	17.06
GDP growth rate	434	6.25	0.74	5.25	5.42	6.24	6.9	7.55
Discount rate	434	6.27	2.59	3	4.5	5.48	9.51	11.77
Pre-crisis	n	Mean	S.D.	Min	.25	Median	.75	Max
Customer Deposits/ Total Funding	199	71.85	19.93	15.63	58.14	76.41	86.06	100
Deposit pricing	195	40.88	14.51	13.98	30.91	40	50.43	78.16
Z-score	115	73.09	113.96	2.26	21.03	38.56	65.52	724
Equity/Total Assets	199	13.22	9.91	0.3	7.07	10.72	15.42	67.8
Bank size	199	13.16	1.44	10.35	12.12	12.87	14.01	16.73
GDP growth rate	199	6.8	0.63	5.66	6.32	6.98	7.13	7.55
Discount rate	199	5.04	1.96	3	4.05	4.5	4.8	9.51
Post-crisis	n	Mean	S.D.	Min	.25	Median	.75	Max
Customer Deposits/ Total Funding	235	67.69	15.29	20.49	55.32	68.83	78.23	99.68
Deposit pricing	233	68.95	25.24	12.64	56.05	68.43	82.16	147.48
Z-score	189	56.99	83.35	1.32	21.98	36.34	60.98	948.59
Equity/Total Assets	235	13.53	9.49	2.96	7.83	10.22	16.39	67.83
Bank size	235	14.43	1.22	11.38	13.59	14.36	15.35	17.06
GDP growth rate	235	5.78	0.46	5.25	5.4	5.42	6.24	6.42
Discount rate	235	7.31	2.6	4.6	5.48	6.16	9.8	11.77

Notes: Variables are defined in Table 1.

Sources of data: BankScope, State Bank of Vietnam, World Bank and author's calculation from these sources

In this sample, the lowest bank Z-score is 1.32 and the highest reaches 948.59. The gap widens among banks post-crisis as well, since the range of Z-score for banks pre-crisis is from 2.26 to 724. During the analyzed period, commercial banks in Vietnam had Equity/Total Assets ratios averaging 13.39%, which varied highly from 0.30% to 67.83%. On average, Equity/Total Assets ratios seem to slightly worsen post-crisis with an average value of 9.49 compared to 9.91 pre-crisis. These two indicators reflect the great difference in risk-taking among banks.

Bank sizes differed significantly, where the natural logs of total assets (in millions VND, inflation-indexed to the base year 2000) varied from 10.35 to 17.06 and the mean value was 13.85. Total assets of banks in Vietnam grow after the crisis compared to the previous period. The GDP growth rates in Vietnam were quite stable, ranging from 5.25% to 7.55%. According to the macro situation, the State Bank of Vietnam's discount rates fluctuated as well, ranging from 3% to 11.77% and averaging 6.25%.

In the sample, the post-crisis observations account for 54% of the overall sample, therefore the compositions of the sample pre and post-crisis are mostly the same.

3.5. Empirical analysis

3.5.1. The empirical strategy

The empirical analysis of this paper is based on the regressions of the measure of depositor discipline - "Customer deposit/ Total funding" ratio - on different banks' risk indicators and control variables to estimate the following equation:

$$\begin{aligned}
 & (Customer\ deposit/Total\ funding)_{i,t} \\
 & = \alpha + \beta_j(Risk_j)_{i,t} + \gamma(Risk_{jx\ After\ Crisis})_{i,t} + \sum_t \delta_{i,t} Controls_{i,t} + \varepsilon_{i,t}
 \end{aligned}$$

Eq. (1)

The coefficients of interest are the β_j , $j=1, 2, 3$ that characterize the effect on depositor discipline of different banks' indicators, including Deposit pricing, Z-score, Equity/Total Assets

and the interaction between Z-score or capital-asset ratio and After Crisis dummy. Bank control is Bank size and macro-level controls in the model are GDP growth rate and the State Bank of Vietnam's discount rate. The primary estimation method for Eq. (1) is a panel 'Fixed-Effect' estimation with the entity (bank) fixed effects. Entity fixed effects method allow us to control for time-invariant characteristics, for instance, the general quality of the individual banks, and should thus diminish the concern that the results are generated by selection bias.

Vietnam's transition to a market based financial sector has only started in the 90s and the country's size is relatively small. As a consequence, this paper's sample does not have as many observations as for example studies on the Chinese banking sector. This results somehow in a constraint for the chosen empirical approach; to preserve statistical significance, the bank control variable is limited to size (measured by the natural logarithm of total assets). Other macro-level control variables are GDP growth rates and the central bank discount window lending rate. Total assets are inflation indexed to smooth out the effect of high inflations in Vietnam, especially under the crisis (reaching 22.14% in 2008, the source of inflation index: World Bank). The bank fixed effects in the regressions should absorb other sources of bank heterogeneity.

3.5.2. Results

This section presents the regression results. Table 3 reports the main regressions of Customer Deposits/ Total Funding on the independent variables, using a model with bank fixed effects and a model with robust heteroscedasticity-consistent standard errors (White, 1980). For the fixed-effects regressions, explanatory variables include bank's indicators (Deposit pricing, Z-score, Equity/ Total Assets), the interaction variable between the Z-score or the Equity/ Total Assets ratio and the After Crisis dummy, and control variables (the After Crisis dummy variable, the Bank size, the GDP growth rate, and the State Bank's Discount rate). Table 3 presents the regression results with the Equity/ Total Assets ratio as an explanatory variable. Table 4 shows the results with the Z-score in the regressions.

Table 3: The impact of the 2008 financial crisis on depositor discipline - capital-assets ratio

	Customer Deposits/ Total Funding							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank's indicators								
Deposit pricing	0.276*** (0.092)	0.333*** (0.074)	0.218** (0.091)	0.296*** (0.073)	0.354*** (0.052)	0.353*** (0.050)	0.339*** (0.053)	0.339*** (0.052)
Deposit pricing x After Crisis	0.095 (0.085)	0.020 (0.052)	0.147* (0.088)	0.044 (0.054)				
Equity/Total Assets	0.555*** (0.153)	0.584*** (0.148)	0.474*** (0.159)	0.513*** (0.152)	0.576*** (0.154)	0.581*** (0.148)	0.504*** (0.161)	0.504*** (0.154)
Equity/Total Asset x After Crisis	-0.401** (0.195)	-0.501*** (0.161)	-0.389* (0.206)	-0.528*** (0.172)	-0.440** (0.194)	-0.465*** (0.123)	-0.449** (0.206)	-0.450*** (0.130)
Control variables								
After Crisis	-6.228 (5.588)		-8.610 (5.811)		-0.686 (3.499)		-0.029 (3.693)	
Bank size	-7.099*** (1.354)	-7.602*** (1.291)	-8.090*** (1.349)	-8.811*** (1.263)	-7.383*** (1.365)	-7.485*** (1.209)	-8.572*** (1.349)	-8.576*** (1.192)
GDP growth rate	-6.164*** (1.165)	-5.830*** (1.151)	-4.453*** (1.145)	-3.952*** (1.120)	-6.006*** (1.166)	-5.930*** (1.129)	-4.140*** (1.156)	-4.137*** (1.091)
Discount rate	-1.523*** (0.250)	-1.546*** (0.249)			-1.560*** (0.247)	-1.558*** (0.246)		
Observations	428	428	428	428	428	428	428	428
Adjusted R-squared	0.514	0.514	0.478	0.477	0.514	0.515	0.475	0.477
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Depositors Discipline: Customer Deposits/ Total Funding excluding Derivatives.

Bank's indicators: *Deposit pricing*, calculated as the bank's average interest expense rate over the deposit cap rate regulated by the State Bank of Vietnam; *Equity/Total Asset* is the bank's capital-asset ratio; *Equity/Total Asset x After Crisis* is the interaction variable between Equity over Total Assets ratio and After crisis dummy.

Control variables: *After Crisis* is the dummy variable for the post-crisis period (after 2008); *Bank size* is the natural logarithm of Total assets; *GDP growth rate* is the annual growth rate of Vietnam's Gross domestic product; *Discount rate* is the interest rate applied when the State Bank of Vietnam (SBV) redeems commercial bills and other short-term valuable papers (treasury bills, deposit certificates) for credit institutions. Prior to the maturity of such papers, if banks are in need of capital, they can pledge these valuable papers to the SBV at the discount rates previously announced by the SBV to get capital for their activities. Apparently, the SBV's discount rate serves as the "floor" interest rate on the market: banks have borrowed money from the SBV to provide credit to customers, therefore, they have to lend at higher interest rates to be profitable.

Sources of data: BankScope, State Bank of Vietnam, World Bank and author's calculation from these sources.

Estimations were performed using Robust Fixed-effects Least Squares Dummy Variable Model.

The numbers in italic are t-statistics for fixed effect model. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level.

In Table 3, the most significant and interesting result is the opposite sign of the coefficients for the Equity/ Total Assets ratio and the interaction term with the "After Crisis" dummy on Customer Deposit/ Total Funding throughout all regressions. The size of the coefficient on the interaction term is almost the size of the coefficient on the direct effect. This means that the sensitivity of deposit funding with respect to leverage has been mostly offset after the crisis. I interpret this as evidence that depositors did monitor banks' risk and cared about banks' leverage before the crisis; however, after the crisis, this disciplining effect has been offset by the influence of the government's safety net. Deposit pricing always shows a significant positive relationship with the dependent variable. This strongly suggests a highly competitive deposit market in Vietnam. The coefficients of the interaction term between the Deposit pricing

variable and the After crisis dummy are always positive but not highly significant, indicating that no clear intensification in deposit market competition is found.

Table 4: The impact of the 2008 financial crisis on depositor discipline – Z-score

	Customer Deposits/ Total Funding							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank's indicators								
Deposit pricing	0.172 (0.106)	0.343*** (0.078)	0.107 (0.106)	0.309*** (0.077)	0.342*** (0.057)	0.320*** (0.054)	0.325*** (0.059)	0.304*** (0.057)
Deposit pricing x After Crisis	0.205** (0.100)	-0.022 (0.043)	0.265*** (0.102)	-0.005 (0.042)				
Z-score	0.018** (0.007)	0.020*** (0.007)	0.021*** (0.007)	0.024*** (0.007)	0.017** (0.007)	0.021*** (0.007)	0.019*** (0.007)	0.024*** (0.007)
Z-score x After Crisis	-0.012 (0.010)	-0.017 (0.011)	-0.012 (0.010)	-0.018 (0.012)	-0.010 (0.010)	-0.019* (0.012)	-0.010 (0.010)	-0.019 (0.012)
Control variables								
After Crisis			-15.105*** (5.507)		-18.068*** (5.713)		-4.685** (2.260)	
Bank size	-8.594*** (1.680)	-9.863*** (1.566)	-9.375*** (1.693)	-10.977*** (1.564)	-8.991*** (1.656)	-10.081*** (1.473)	-9.962*** (1.664)	-11.026*** (1.486)
GDP growth rate	-6.535*** (1.294)	-5.653*** (1.301)	-5.126*** (1.282)	-3.943*** (1.276)	-6.339*** (1.275)	-5.466*** (1.307)	-4.751*** (1.262)	-3.901*** (1.279)
Discount rate	-1.384*** (0.269)	-1.477*** (0.267)			-1.471*** (0.264)	-1.467*** (0.265)		
Observations	286	286	286	286	286	286	286	286
Adjusted R-squared	0.592	0.580	0.554	0.537	0.585	0.582	0.542	0.538
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Depositors Discipline: *Customer Deposits/ Total Funding* excluding Derivatives.

Bank's indicators: *Deposit pricing*, calculated as the bank's average interest expense rate over the deposit cap rate regulated by the State Bank of Vietnam; *Z-score* compares a bank's buffers (capitalization and returns) with the volatility of those returns and is estimated as the 3-year moving average return on assets plus the current capital-asset ratio divided by the standard deviation of asset return; *Z-score x After Crisis* is the interaction variable between Z-score and After crisis dummy.

Control variables: *After Crisis* is the dummy variable for the post-crisis period (after 2008); *Bank size* is the natural logarithm of Total assets; *GDP growth rate* is the annual growth rate of Vietnam's Gross domestic product; *Discount rate* is the interest rate applied when the State Bank of Vietnam (SBV) redeems commercial bills and other short-term valuable papers (treasury bills, deposit certificates) for credit institutions. Prior to the maturity of such papers, if banks are in need of capital, they can pledge these valuable papers to the SBV at the discount rates previously announced by the SBV to get capital for their activities. Apparently, the SBV's discount rate serves as the "floor" interest rate on the market: banks have borrowed money from the SBV to provide credit to customers, therefore, they have to lend at higher interest rates to be profitable.

Sources of data: BankScope, State Bank of Vietnam, World Bank and author's calculation from these sources.

Estimations were performed using Robust Fixed-effects Least Squares Dummy Variable Model.

The numbers in italic are t-statistics for fixed effect model. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level.

Table 4 presents the regression results where the Z-score is used as an indicator of bank risk. The results show a significant and positive association between Z-score and deposit funding in banks: banks with better Z-scores, i.e. sounder banks, have higher deposit funding ratios in total funding. Nevertheless, unlike the capital-asset ratios, the interaction term between the Z-score and the After crisis dummy has negative coefficients but not highly significant.³² It can be

³² Regressions with Z-scores calculated with other methods have been carried out, such as the ROA-based Z-score with moving mean of the capital-asset ratio, ROE-based Z-score using 3 and 5-year windows, all give

concluded that depositor discipline effectively exists with respect to the bank Z-score. However, the deterioration effect post-crisis seems to be less clear, presumably attributable to the calculation of Z-scores which involves the moving moments of 3-year windows. As a consequence, the change between the pre-crisis and post-crisis periods is less distinguishable.

Similar to the regressions with capital-assets ratio, Deposit pricing always shows a significant positive relationship with the dependent variable. The coefficients of its interaction term with the After crisis dummy are always positive and significant in some regressions, which may suggest a subtle sign of a request to increase deposit rates post-crisis.

Table 5: The impact of the 2008 financial crisis on depositor discipline

	Customer Deposits/ Total Funding							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank's indicators								
Z-score					0.018**	0.019***	0.021***	0.022***
					(0.007)	(0.007)	(0.007)	(0.007)
Z-score x After Crisis					0.004	0.002	0.004	0.002
					(0.010)	(0.011)	(0.010)	(0.011)
Equity/Total Assets	0.525***	0.503***	0.459***	0.433***				
	(0.151)	(0.149)	(0.157)	(0.155)				
Equity/Total Asset x After Crisis	-0.347*	-0.225*	-0.356*	-0.220*				
	(0.189)	(0.120)	(0.202)	(0.125)				
Control variables								
After Crisis	3.145		3.514		-0.921		-0.995	
	(3.486)		(3.696)		(2.371)		(2.419)	
Bank size	-4.576***	-4.046***	-5.778***	-5.192***	-6.400***	-6.661***	-7.421***	-7.704***
	(1.363)	(1.159)	(1.330)	(1.127)	(1.638)	(1.359)	(1.629)	(1.349)
GDP growth rate	-7.822***	-8.238***	-6.058***	-6.515***	-8.594***	-8.382***	-7.014***	-6.785***
	(1.226)	(1.165)	(1.175)	(1.083)	(1.309)	(1.267)	(1.251)	(1.201)
Discount rate	-1.425***	-1.431***			-1.364***	-1.365***		
	(0.276)	(0.277)			(0.299)	(0.298)		
Observations	434	434	434	434	286	286	286	286
Adjusted R-squared	0.432	0.432	0.400	0.400	0.519	0.521	0.482	0.484
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Depositors Discipline: Customer Deposits/ Total Funding excluding Derivatives.

Bank's indicators: Z-score compares a bank's buffers (capitalization and returns) with the volatility of those returns and is estimated as the 3-year moving average return on assets plus the current capital-asset ratio divided by the standard deviation of asset return; Z-score x After Crisis is the interaction variable between Z-score and After crisis dummy. Equity/Total Asset is the bank's capital-asset ratio; Equity/Total Asset x After Crisis is the interaction variable between Equity over Total Assets ratio and After crisis dummy.

Control variables: After Crisis is the dummy variable for the post-crisis period (after 2008). Bank size is the natural logarithm of Total assets; GDP growth rate is the annual growth rate of Vietnam's Gross domestic product; Discount rate is the interest rate applied when the State Bank of Vietnam (SBV) redeems commercial bills and other short-term valuable papers (treasury bills, deposit certificates) for credit institutions. Prior to the maturity of such papers, if banks are in need of capital, they can pledge these valuable papers to the SBV at the discount rates previously announced by the SBV to get capital for their activities. Apparently, the SBV's discount rate serves as the "floor" interest rate on the market: banks have borrowed money from the SBV to provide credit to customers, therefore, they have to lend at higher interest rates to be profitable.

Sources of data: BankScope, State Bank of Vietnam, World Bank and author's calculation from these sources.

Estimations were performed using Robust Fixed-effects Least Squares Dummy Variable Model.

The numbers in italic are t-statistics for fixed effect model. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level.

lower significance compared with the chosen Z-score using 3-year windows average ROA values and current values of the capital-asset ratio.

To verify the change in the importance of risk factors over the deposit funding ratio, regressions without the deposit pricing variable are performed. Table 5 illustrates the results of these regressions. The depositor discipline over the capital-asset ratio and the bank Z-score remains significant. The monitoring effect over capital-assets ratio declines after the bailouts of the government, though the significance is lower compared to the main test. No clear deterioration or amelioration post-crisis is observed for depositor discipline over the bank Z-score, again, probably due to the noise added to this ratio when using average values in its calculation.

Among the control variables, the “After Crisis” dummy reflects the change in time and is significantly correlated with some of the variables. Therefore, regressions without this dummy variable are included to discern the impact of time alone and the impact of other variables. In particular, the After crisis dummy has a significant and high correlation with the deposit pricing variable ($r=0.55$), implying a more competitive deposit market post-crisis. The After crisis dummy has a very low and non-significant correlation with the bank risk indicators considered in this study (with the capital-asset ratio: $r = 0.016$, with the Z-score: $r = -0.081$). In Table 5 where regressions without the deposit pricing variable are displayed, the After crisis dummy shows no clear relationship with the dependent variable customer deposit funding ratio.

Bank size has a negative impact on the dependent variable, demonstrating the deposit discipline over a higher proportion of uninsured deposits in bigger banks. GDP growth rates are negatively associated with the Customer Deposit/ Total Funding Ratio. As GDP growth is an indicator of the economy’s overall health, this implies that in good years, money circulates in other channels of investment instead of staying in saving accounts. The State Bank’s discount rates also manifest a highly significant negative association with the Customer Deposit/ Total Funding Ratio. A discount rate is actually a monetary tool allowing banks to borrow from the State Bank by discounting their commercial bills and other short-term securities (treasury bills, certificates of deposit). Higher discount rates reveal the State Bank’s willing to tighten the

money supply; which consequently reduces the volume of placements in banks, especially given the deposit cap rates which limit an appropriate compensation for accepting higher bank risk.

3.6. Robustness checks

I have experimented with a range of alternative specifications. The empirical results prove to be robust across a broad range of specifications. The basic insight remains stable: in all of the regressions, the interaction of the Equity/ Total Assets ratio or the Z-score with the after crisis dummy variable has a significant and negative effect.

In my robustness checks, I use sub-samples, removing wholly foreign-owned banks or state-owned banks. Only 6% of my observations belong to 100% foreign-owned banks, this is due to the fact that before Vietnam's entry to the World Trade Organization in 2007, restriction on foreign ownership in banking was the norm. State-owned banks account for 12% of the observations. Wholly foreign-owned banks, which are only allowed to enter the Vietnamese market under strict conditions, are normally considered to be safer because they are "guaranteed" by their strong international standing. In general, foreign banks follow more strict regulatory requirements, and may, therefore, have better risk indicators, including capital-assets ratio or Z-score. Finally, state-owned banks are banks where the State holds more than 50% of the stake, implying a government's implicit insurance for these banks.

The first robustness check (See Table 6a and Table 6b) uses a sub-sample without foreign banks. In Table 6a, consistent with the main results, we can observe strongly significant coefficients with opposite signs on the Equity/ Total Assets ratio and its interaction with After Crisis dummy on Customer Deposit/ Total Funding. The monitoring effect on capital-assets ratios is almost offset after depositors learned about the government's bailouts during the crisis.

Table 6a: Robustness test – Sub-sample without foreign banks – capital-assets ratio

	Customer Deposits/ Total Funding							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank's indicators								
Deposit pricing	0.285*** (0.091)	0.343*** (0.075)	0.227** (0.090)	0.307*** (0.074)	0.361*** (0.053)	0.358*** (0.051)	0.346*** (0.053)	0.345*** (0.052)
Deposit pricing x After Crisis	0.092 (0.085)	0.016 (0.052)	0.145* (0.087)	0.039 (0.054)				
Equity/Total Assets	0.571*** (0.153)	0.600*** (0.148)	0.495*** (0.159)	0.534*** (0.153)	0.592*** (0.155)	0.598*** (0.148)	0.524*** (0.161)	0.527*** (0.154)
Equity/Total Asset x After Crisis	-0.363* (0.197)	-0.465*** (0.161)	-0.335 (0.207)	-0.480*** (0.171)	-0.400** (0.195)	-0.437*** (0.122)	-0.394* (0.207)	-0.411*** (0.129)
Control variables								
After Crisis	-6.339 (5.624)		-8.939 (5.832)		-0.990 (3.528)		-0.453 (3.714)	
Bank size	-7.143*** (1.354)	-7.654*** (1.296)	-8.130*** (1.348)	-8.879*** (1.266)	-7.416*** (1.368)	-7.563*** (1.214)	-8.608*** (1.351)	-8.674*** (1.194)
GDP growth rate	-5.987*** (1.199)	-5.649*** (1.190)	-4.099*** (1.165)	-3.573*** (1.142)	-5.835*** (1.201)	-5.726*** (1.167)	-3.780*** (1.178)	-3.731*** (1.113)
Discount rate	-1.574*** (0.265)	-1.601*** (0.264)			-1.614*** (0.262)	-1.611*** (0.261)		
Observations	403	403	403	403	403	403	403	403
Adjusted R-squared	0.519	0.519	0.483	0.482	0.519	0.520	0.481	0.482
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Depositors Discipline: *Customer Deposits/ Total Funding* excluding Derivatives.

Bank's indicators: *Deposit pricing*, calculated as the bank's average interest expense rate over the deposit cap rate regulated by the State Bank of Vietnam; *Equity/Total Asset* is the bank's capital-asset ratio; *Equity/Total Asset x After Crisis* is the interaction variable between Equity over Total Assets ratio and After crisis dummy.

Control variables: *After Crisis* is the dummy variable for the post-crisis period (after 2008); *Bank size* is the natural logarithm of Total assets; *GDP growth rate* is the annual growth rate of Vietnam's Gross domestic product; *Discount rate* is the interest rate applied when the State Bank of Vietnam (SBV) redeems commercial bills and other short-term valuable papers (treasury bills, deposit certificates) for credit institutions. Prior to the maturity of such papers, if banks are in need of capital, they can pledge these valuable papers to the SBV at the discount rates previously announced by the SBV to get capital for their activities. Apparently, the SBV's discount rate serves as the "floor" interest rate on the market: banks have borrowed money from the SBV to provide credit to customers, therefore, they have to lend at higher interest rates to be profitable.

Sources of data: BankScope, State Bank of Vietnam, World Bank and author's calculation from these sources.

Estimations were performed using Robust Fixed-effects Least Squares Dummy Variable Model.

The numbers in italic are t-statistics for fixed effect model. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level.

In Table 6b, for the regressions with Z-score, the coefficients are positive and significant, showing evidence of depositor discipline over this bank risk indicator. Nonetheless, the negative impact of Z-score post-crisis on deposit funding ratio is not significant, similar to the result found in the main tests. In both tables, depositors' favor for high interest rates is remarkable: Deposit pricing has a positive association with the dependent variable. Other control variables like GDP growth rate and Discount rate show a highly significant negative relationship with the Deposit Funding Ratio.

Table 6b: Robustness test – Sub-sample without foreign banks – Z-score

	Customer Deposits/ Total Funding							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank's indicators								
Deposit pricing	0.083 <i>(0.127)</i>	0.352*** <i>(0.082)</i>	0.011 <i>(0.131)</i>	0.322*** <i>(0.082)</i>	0.355*** <i>(0.059)</i>	0.333*** <i>(0.056)</i>	0.340*** <i>(0.061)</i>	0.318*** <i>(0.059)</i>
Deposit pricing x After Crisis	0.326*** <i>(0.121)</i>	-0.018 <i>(0.046)</i>	0.396*** <i>(0.126)</i>	-0.004 <i>(0.045)</i>				
Z-score	0.019*** <i>(0.007)</i>	0.023*** <i>(0.008)</i>	0.023*** <i>(0.007)</i>	0.027*** <i>(0.007)</i>	0.019** <i>(0.008)</i>	0.024*** <i>(0.008)</i>	0.023*** <i>(0.007)</i>	0.027*** <i>(0.007)</i>
Z-score x After Crisis	-0.013 <i>(0.010)</i>	-0.017 <i>(0.011)</i>	-0.014 <i>(0.010)</i>	-0.019 <i>(0.012)</i>	-0.011 <i>(0.011)</i>	-0.019 <i>(0.012)</i>	-0.012 <i>(0.011)</i>	-0.019 <i>(0.012)</i>
Control variables								
After Crisis		-22.957*** <i>(6.760)</i>		-26.756*** <i>(7.179)</i>		-5.035** <i>(2.462)</i>		-4.974* <i>(2.602)</i>
Bank size	-7.173*** <i>(1.777)</i>	-9.224*** <i>(1.652)</i>	-7.896*** <i>(1.802)</i>	-10.380*** <i>(1.659)</i>	-8.136*** <i>(1.743)</i>	-9.423*** <i>(1.533)</i>	-9.149*** <i>(1.762)</i>	-10.419*** <i>(1.554)</i>
GDP growth rate	-5.063*** <i>(1.350)</i>	-4.206*** <i>(1.365)</i>	-3.910*** <i>(1.393)</i>	-2.798** <i>(1.374)</i>	-4.837*** <i>(1.336)</i>	-4.069*** <i>(1.368)</i>	-3.528** <i>(1.364)</i>	-2.772** <i>(1.364)</i>
Discount rate	-1.416*** <i>(0.260)</i>	-1.522*** <i>(0.258)</i>			-1.518*** <i>(0.256)</i>	-1.516*** <i>(0.257)</i>		
Observations	256	256	256	256	256	256	256	256
Adjusted R-squared	0.588	0.566	0.537	0.506	0.572	0.568	0.513	0.509
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Depositors Discipline: *Customer Deposits/ Total Funding* excluding Derivatives.

Bank's indicators: *Deposit pricing*, calculated as the bank's average interest expense rate over the deposit cap rate regulated by the State Bank of Vietnam; *Z-score* compares a bank's buffers (capitalization and returns) with the volatility of those returns and is estimated as the 3-year moving average return on assets plus the current capital-asset ratio divided by the standard deviation of asset return; *Z-score x After Crisis* is the interaction variable between *Z-score* and *After crisis* dummy.

Control variables: *After Crisis* is the dummy variable for the post-crisis period (after 2008); *Bank size* is the natural logarithm of Total assets; *GDP growth rate* is the annual growth rate of Vietnam's Gross domestic product; *Discount rate* is the interest rate applied when the State Bank of Vietnam (SBV) redeems commercial bills and other short-term valuable papers (treasury bills, deposit certificates) for credit institutions. Prior to the maturity of such papers, if banks are in need of capital, they can pledge these valuable papers to the SBV at the discount rates previously announced by the SBV to get capital for their activities. Apparently, the SBV's discount rate serves as the "floor" interest rate on the market: banks have borrowed money from the SBV to provide credit to customers, therefore, they have to lend at higher interest rates to be profitable.

Sources of data: *BankScope*, *State Bank of Vietnam*, *World Bank* and author's calculation from these sources.

Estimations were performed using Robust Fixed-effects Least Squares Dummy Variable Model.

The numbers in italic are t-statistics for fixed effect model. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level.

The second robustness check uses a sub-sample of the data by removing the 100% state-owned banks using the same fixed effects regressions (See Table 7a and 7b). In this test set, the main results hold true as well. Depositor discipline exists for risk indicators, the capital-asset ratio, and the bank Z-score. The deterioration effect on deposit discipline over the capital-asset ratio is highly significant post-crisis. The coefficients of the interaction variable *Equity/ Total Assets x After Crisis* dummy roughly offset those of *Equity/ Total Assets* ratio at either 5% or 1%. Bank size is correlated with lower deposits in total funding. Similar to the main tests, the negative association between the bank Z-score and the customer deposit funding ratio post-crisis is not clearly significant. Deposit pricing also has a positive association with the dependent

variable in all regressions. GDP growth rate and Discount rate have a highly significant negative relationship with the dependent variable.

Table 7a: Robustness test - Sub-sample without state-owned banks – capital-assets ratio

	Customer Deposits/ Total Funding							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank's indicators								
Deposit pricing	0.329*** (0.099)	0.321*** (0.078)	0.275*** (0.098)	0.282*** (0.076)	0.356*** (0.055)	0.360*** (0.055)	0.341*** (0.056)	0.347*** (0.056)
Deposit pricing x After Crisis	0.033 (0.093)	0.042 (0.057)	0.080 (0.096)	0.071 (0.059)				
Equity/Total Assets	0.538*** (0.170)	0.533*** (0.161)	0.453** (0.175)	0.458*** (0.166)	0.548*** (0.168)	0.525*** (0.163)	0.477*** (0.174)	0.442*** (0.170)
Equity/Total Asset x After Crisis	-0.570** (0.230)	-0.554*** (0.169)	-0.575** (0.244)	-0.589*** (0.180)	-0.590*** (0.222)	-0.480*** (0.126)	-0.626*** (0.237)	-0.465*** (0.134)
Control variables								
After Crisis	0.893 (7.232)		-0.815 (7.542)		2.983 (4.393)		4.342 (4.603)	
Bank size	-8.015*** (1.548)	-7.930*** (1.370)	-9.138*** (1.536)	-9.217*** (1.332)	-8.151*** (1.537)	-7.653*** (1.262)	-9.497*** (1.507)	-8.790*** (1.240)
GDP growth rate	-6.894*** (1.294)	-6.938*** (1.267)	-5.172*** (1.264)	-5.130*** (1.232)	-6.834*** (1.293)	-7.131*** (1.241)	-4.992*** (1.268)	-5.397*** (1.206)
Discount rate	-1.569*** (0.283)	-1.567*** (0.283)			-1.580*** (0.282)	-1.597*** (0.279)		
Observations	375	375	375	375	375	375	375	375
Adjusted R-squared	0.505	0.506	0.469	0.471	0.506	0.507	0.470	0.469
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Depositors Discipline: *Customer Deposits/ Total Funding* excluding Derivatives.

Bank's indicators: *Deposit pricing*, calculated as the bank's average interest expense rate over the deposit cap rate regulated by the State Bank of Vietnam; *Equity/Total Asset* is the bank's capital-asset ratio; *Equity/Total Asset x After Crisis* is the interaction variable between Equity over Total Assets ratio and After crisis dummy.

Control variables: *After Crisis* is the dummy variable for the post-crisis period (after 2008); *Bank size* is the natural logarithm of Total assets; *GDP growth rate* is the annual growth rate of Vietnam's Gross domestic product; *Discount rate* is the interest rate applied when the State Bank of Vietnam (SBV) redeems commercial bills and other short-term valuable papers (treasury bills, deposit certificates) for credit institutions. Prior to the maturity of such papers, if banks are in need of capital, they can pledge these valuable papers to the SBV at the discount rates previously announced by the SBV to get capital for their activities. Apparently, the SBV's discount rate serves as the "floor" interest rate on the market: banks have borrowed money from the SBV to provide credit to customers, therefore, they have to lend at higher interest rates to be profitable.

Sources of data: *BankScope*, *State Bank of Vietnam*, *World Bank* and author's calculation from these sources.

Estimations were performed using Robust Fixed-effects Least Squares Dummy Variable Model.

The numbers in italic are t-statistics for fixed effect model. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level.

Table 7b: Robustness test - Sub-sample without state-owned banks – Z-score

	Customer Deposits/ Total Funding							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank's indicators								
Deposit pricing	0.079 (0.128)	0.356*** (0.082)	0.011 (0.131)	0.325*** (0.082)	0.357*** (0.059)	0.334*** (0.056)	0.342*** (0.061)	0.320*** (0.059)
Deposit pricing x After Crisis	0.333*** (0.121)	-0.021 (0.046)	0.399*** (0.126)	-0.004 (0.045)				
Z-score	0.019*** (0.007)	0.023*** (0.008)	0.023*** (0.007)	0.027*** (0.007)	0.019** (0.008)	0.024*** (0.008)	0.023*** (0.007)	0.028*** (0.007)
Z-score x After Crisis	-0.014 (0.010)	-0.018 (0.011)	-0.015 (0.010)	-0.019 (0.012)	-0.012 (0.011)	-0.020* (0.012)	-0.012 (0.011)	-0.019 (0.012)
Control variables								
After Crisis			-23.660*** (6.781)		-27.052*** (7.196)		-5.333** (2.458)	
Bank size							-5.061* (2.606)	
Bank size	-7.167*** (1.784)	-9.276*** (1.659)	-7.985*** (1.803)	-10.496*** (1.658)	-8.143*** (1.751)	-9.508*** (1.538)	-9.250*** (1.762)	-10.539*** (1.554)
GDP growth rate	-5.413*** (1.398)	-4.491*** (1.413)	-4.122*** (1.430)	-2.940** (1.407)	-5.175*** (1.382)	-4.323*** (1.411)	-3.709*** (1.399)	-2.910** (1.395)
Discount rate	-1.418*** (0.285)	-1.527*** (0.284)			-1.528*** (0.281)	-1.518*** (0.282)		
Observations	238	238	238	238	238	238	238	238
Adjusted R-squared	0.582	0.557	0.535	0.502	0.564	0.559	0.509	0.505
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Depositors Discipline: *Customer Deposits/ Total Funding* excluding Derivatives.

Bank's indicators: *Deposit pricing*, calculated as the bank's average interest expense rate over the deposit cap rate regulated by the State Bank of Vietnam; *Z-score* compares a bank's buffers (capitalization and returns) with the volatility of those returns and is estimated as the 3-year moving average return on assets plus the current capital-asset ratio divided by the standard deviation of asset return; *Z-score x After Crisis* is the interaction variable between *Z-score* and *After crisis* dummy.

Control variables: *After Crisis* is the dummy variable for the post-crisis period (after 2008); *Bank size* is the natural logarithm of Total assets; *GDP growth rate* is the annual growth rate of Vietnam's Gross domestic product; *Discount rate* is the interest rate applied when the State Bank of Vietnam (SBV) redeems commercial bills and other short-term valuable papers (treasury bills, deposit certificates) for credit institutions. Prior to the maturity of such papers, if banks are in need of capital, they can pledge these valuable papers to the SBV at the discount rates previously announced by the SBV to get capital for their activities. Apparently, the SBV's discount rate serves as the "floor" interest rate on the market: banks have borrowed money from the SBV to provide credit to customers, therefore, they have to lend at higher interest rates to be profitable.

Sources of data: BankScope, State Bank of Vietnam, World Bank and author's calculation from these sources.

Estimations were performed using Robust Fixed-effects Least Squares Dummy Variable Model.

The numbers in italic are t-statistics for fixed effect model. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level.

3.7. Conclusion

The paper studies Vietnamese banks before and after the global financial crisis to complement existing literature on depositor discipline in emerging markets. In particular, I bring additional understanding about the ways depositors monitor banks and their reaction to the government intervention post-crisis.

This paper shows evidence of significant depositor discipline: clients require compensation for their risk when depositing money by demanding higher deposit pricing, and banks that have a better capital-asset ratio or a higher Z-score, or more financially sound banks, enjoy a higher ratio of customer deposits in their total funding. However, after the

crisis, the monitoring effect on the bank's capital-asset ratio decreases. Besides, even though there was no significant evidence of depositor discipline degradation over bank Z-score, the coefficients of this risk indicator post-crisis are negative, implying a weaker monitoring effect over the bank Z-score to a certain extent. In combining with the effect of deposit rates, it is observable that depositors still care about the deposit pricing but substantially less about a bank's risk, believing that their money is safe in any case with the government's implicit insurance. This has led to a fear among the financial experts that without a proper monitoring mechanism, people would believe that deposits are a totally safe investment; in this case, banks would more and more aggressively compete for new deposits and in turn, lend money to riskier projects to compensate for these expenses. Additional tests are carried out, which demonstrate that higher customer deposit funding ratios are significantly associated with some inferior indicators of asset quality post-crisis, such as Loan Loss Reserves / Impaired Loans, Reserves for Impaired Loans/ Impaired Loans, and Impaired Loans / Equity. The degradation can also be found with some profitability indicators post-crisis, for example, Net Interest Revenue / Average Assets, which illustrates that the higher amount of customer deposit has not been efficiently invested to earn accordingly higher net interest revenues. Furthermore, a similar relationship is found with Recurring Earning Power, which emphasizes the bank's lower general profitability and not just interest-related operations.

The paper demonstrates the problems associated with excessive deposit insurance. Admittedly, it does not propose a solution. Letting depositors lose their money would solve the moral hazard issue and implement strong depositor discipline. However, this solution is probably not viable because it is likely to create additional problems, such as capital outflow or at least decreased the confidence of the depositors in the banking system. An important possible objection to this suggestion is that it is very costly or even impossible for depositors, especially the small ones, to effectively monitor banks. Given the small insured amount of deposit in Vietnam (approximately 3300 USD since 05 August 2017), removing the deposit

insurance will affect more than 80% of the depositors³³, mostly smaller ones. In this case, the herding behavior in financial markets will lead to negative outcomes, bank runs are likely to occur.

Depositor discipline hence seems to be a theoretically possible channel to stabilize banks; nevertheless, it is unlikely to be a viable solution in most countries. Partial deposit insurance such as the system that existed in the UK before 2009 does not seem to be working either³⁴. A suggestion to policymakers who want to design adequate measures that offset moral hazard and contribute to financial stability is to further investigate the reaction of depositors to other depositors' decision. Kiss et al. (2012) show evidence that observability of previous actions on the emergence of bank runs might be considered as a partial substitute of deposit insurance. It is worth studying the component of depositors based on their deposit size and demographic characteristics because each group has different sensitivity to risk. Carrying out lab experiments and experimental study that take into account these factors in depositor discipline would be fruitful areas for future research.

³³ The State Bank of Vietnam

³⁴ In 2007, the English bank Northern Rock suffered massive withdrawals within days despite that deposit insurance covered 100% of the first £2,000 and 90% of the first £35,000 at that time.

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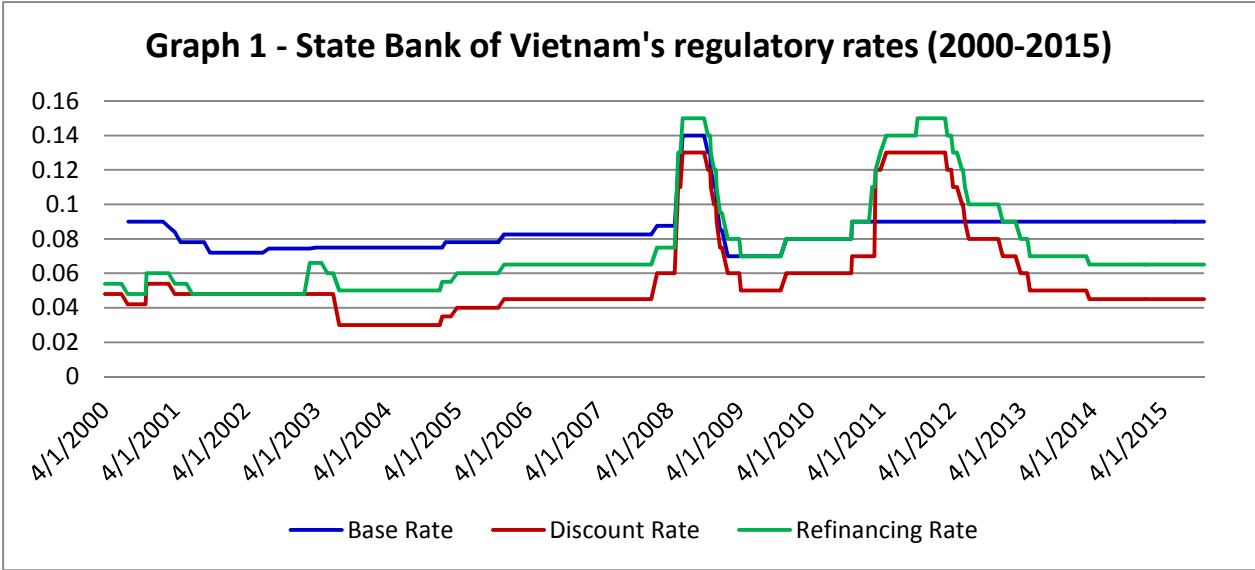
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Appendices



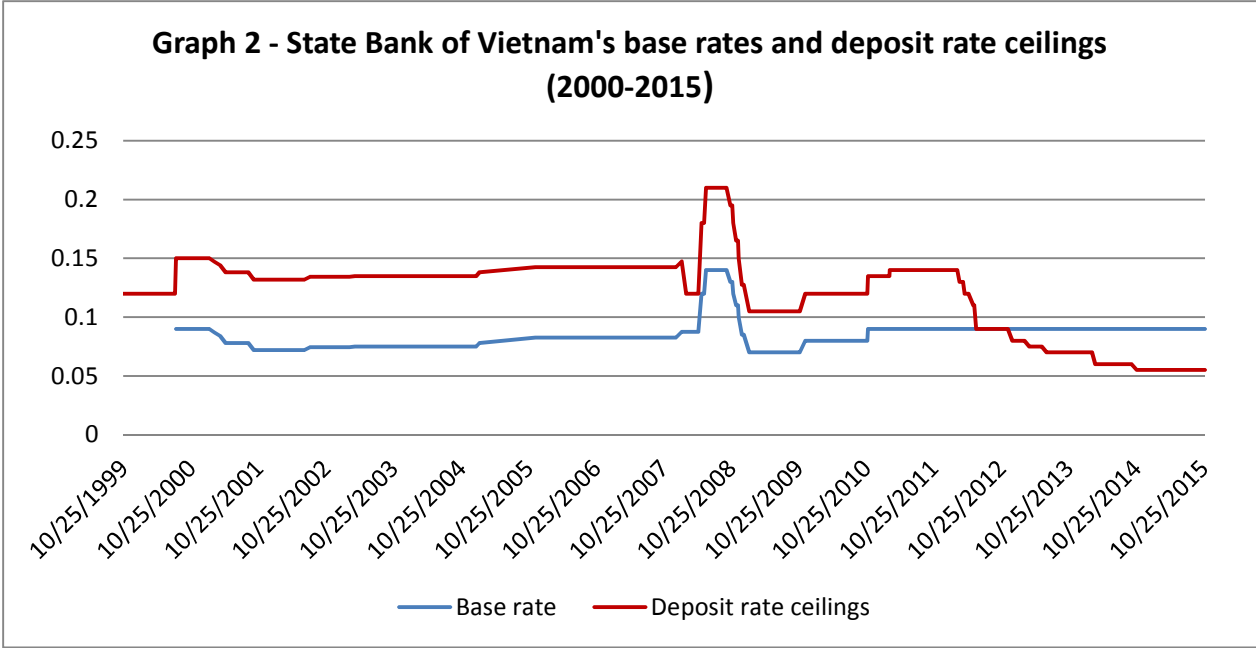
Base rate is a tool to implement the monetary policy of the State Bank of Vietnam (SBV) in the short term. According to the Law on the State Bank of Vietnam, the basic interest rate is applicable only to Vietnam dong (VND) and announced by the SBV, shall serve as a basis for credit institutions to set business interest rates. Base rates are determined on the basis of the interbank market interest rates, open market interest rates of the central bank, interest rates for deposits mobilized by credit institutions and the trend of supply-demand for credit. Under the Civil Code, credit institutions are not allowed to lend at interest rates that are more than one-and-a-half times the base rate. Although mentioned in the Law on the State Bank of Vietnam which came into effect on October 1, 1998, the base rate was only first announced in May 2000.

Monetary policy instruments of foreign central banks are similar to those of the State Bank of Vietnam, which are the Fed Funds Rate of the United States, the London Interbank Offered Rate (LIBOR) of the United Kingdom, Tokyo Inter-Bank Offered Rate (TIBOR) of Japan, Euro Interbank Offered Rate of the European Union. These interest rates are sometimes translated into Vietnamese as the base rates.

Discount rate is the interest rate applied when the State Bank of Vietnam (SBV) redeems commercial bills and other short-term securities (treasury bills, deposit certificates) for credit institutions. Discount rates depend on the security: banks who are securities holders pledge them to the SBV to obtain a loan with a value less than the face value of the security (the difference is the discount rate). The banks can either collect the reimbursement when these securities mature, or they can pledge these securities to the SBV at the discount rates previously announced by the SBV to get capital for their business activities.

Apparently, the SBV's discount rate acts as the "floor" interest rate on the market. The reason is simple: credit institutions have borrowed money from the SBV to provide credit to customers, therefore they have to lend at interest rates higher than the SBV's interest rates to be profitable. The SBV's redeeming of securities is similar to the increase of money supply in the market. However, the high discount rate will limit the access to capital of credit institutions and vice versa. Raising the discount rate is considered one of the central banks' tools to tighten currency and curb inflation.

Refinancing rate: Basically, the discount rates and refinancing rates are similar in practice, except for the subjects. The refinancing rate can be applied to a greater variety of securities and therefore is often higher than the discount rate due to higher risk. The mechanism of impact of the refinancing rate is the same as the discount rate. When the SBV sets goals of fighting inflation and stabilizing the exchange rates, refinancing rate will increase. By definition, refinancing rate is the interest rate applied when the SBV refinances credit institutions in the following forms: i) re-lending by credit profiles, ii) discounting and rediscounting of commercial papers and other short-term securities, iii) Repurchase Operations (Repo): secured lending by the pledge of commercial papers and other short-term securities.



The deposit rate ceiling is the highest interest rate a financial institution can pay depositors. In Vietnam, the State Bank sets deposit interest rates whereby financial institutions will not be allowed to raise interest rates beyond this ceiling. If a financial institution breaks the rules, it will be fined.

CHAPTER 4

Difficult to Digest: Takeovers of Distressed Banks

Abstract

Government induced or voluntary takeovers are frequently used as an indirect way to bail out distressed banks. In this paper, we analyze the effect of takeovers on the performance of the acquiring banks in Vietnam for the period 2000-2017. We demonstrate that these takeovers substantially weaken the profitability and liquidity of the merged banks and that this negative effect persists over a prolonged period of time. After the takeover, the acquiring bank is more financially constrained and less able to carry out its economic functions as a financial intermediary. These results do not only demonstrate that shareholders should be wary of acquisitions but also suggest that the strategy of stabilizing a financial system through bank mergers may have detrimental indirect long-term consequences on financial systems.

"No, we would not do something like Bear Stearns again - in fact, I don't think our Board would let me take the call."

Jamie Dimon in his 2015 letter to shareholders

4.1. Introduction

Takeovers of distressed banks are frequently used to stabilize a financial system without explicitly bailing out a bank. These takeovers are usually government-induced as the above quote by Jamie Dimon suggests (the phone call he is referring to in the quote above came from the government). Sometimes, however, these takeovers are also voluntary as acquirers see these transactions as a cheap way to increase their market share. Our study of banking takeovers in Vietnam for the period 2000-2017 shows evidence of substantially weakened profitability and liquidity of the acquiring banks, furthermore, this negative effect persists over a prolonged period of time. As a consequence, the efficiency of financial intermediation and the allocation of capital will be reduced. These negative long term consequences may at least partially offset the positive effect of avoiding a financial shock after a bank failure.

The paper focusses on the takeovers of Vietnamese banks after the 2008 crisis. Almost all of these takeovers involved banks that were known to have followed risky strategies and had suffered from the repercussions of the 2008 financial crisis in Vietnam. Using a difference in difference approach, we demonstrate that these takeovers had a strong detrimental effect on the profitability and liquidity of the acquiring bank. Simple indicators of profitability such as return on assets, return on equity, cost income ratio or recurring earning power strongly deteriorate after the merger. This effect remains visible even years after the merger. In addition, acquiring banks show higher Net Loans / Deposit & Short-term Funding ratios, reflecting lower liquidity. Overall, there seem to be no positive consequences that would counterbalance these additional costs, so governments seem to use threats rather than incentives to coerce the acquirers to bail out the failed banks.

The rest of the paper is organized as follows. Section II reviews the prior literature on acquiring banks' performance post-merger. Section III describes the different phases of the crisis in Vietnam and the related bank takeovers. We then introduce in Section IV the construction of the dataset and methodology. Section V presents the main empirical findings and discusses their economic significance. Section VI conducts robustness tests and Section VII concludes.

4.2. Literature review

4.2.1. General empirical literature on M&A mostly in developed countries

Merger and Acquisition (M&A) are major strategic decisions with important consequences not only for shareholders but for all stakeholders, including employees, commercial partners, government regulators, investment bankers, lawyers, and lobbyists. It is therefore not surprising that there exists an extensive empirical literature on M&A. A recent "survey of the surveys" by Mulherin et al. (2017) selected 120 articles focusing on empirical work about M&A from several leading finance journals. The authors report that whereas the early literature focused on the creation of wealth by M&A the research topics and results have changed over time in accordance with the evolution of M&A activity, the globalization trend, and the availability of new databases. Our study contributes to the literature on M&A in a particular sector in a specific context: the banking industry in emerging markets post-crisis.

4.2.2. Wealth creation effect and efficiency in the banking sector M&A

Recent literature continues to study banking M&A from different angles, notably the wealth creation effect for which the results diverge. In a review of the post-2000 financial institution mergers and acquisition literature covering over 150 studies, DeYoung et al. (2009) highlight the main findings: North American bank mergers tend to improve efficiency but the stockholder wealth creation effect is non-conclusive. In contrast, European bank mergers witness both efficiency gains and stockholder value enhancement. On the other hand, Bercher

(2009) advocates the anticipated components of bidder returns by examining the banking industry mergers around the passage of a deregulatory act (Riegle Neal Act of 1994), claiming that focusing only on narrow event windows underestimates gains to bidders. He also observes positive bidder returns, thus confirms that mergers are motivated by synergy rather than disciplinary motives. Al-Khasawneh and Essaddam (2012) show that acquirers' cumulative abnormal returns (CARs) are positively associated with their technical efficiency and geographic diversification. They also find a negative relationship between targets' CARs and both their size and revenue efficiency. The positive and significant value creation for the shareholders of the targets, as opposed to almost no value creation found for the shareholders of acquirers, is again observed by Asimakopoulos and Athanasoglou (2013) in an event study for a sample of European banks spanning a period of 15 years. In addition, shareholders of acquirers prefer listed, smaller and less profitable banks having higher non-interest related income, but are concerned when the target is weakly liquid, inefficiency with heightened credit risk. Finally, the quality of investment banks and shareholder wealth in bank mergers have been examined in an empirical study by Chuang (2014), who suggests that overall, financial advisors seem to add value for bidding firms but not target firms.

Within the scope of our study, the impact on stock prices is less obvious as most of the acquiring banks are not listed and informal information regarding the merger often leaked out in form of rumors well before the official announcement day. In addition, news about possible mergers which finally did not occur further contributes to the noise in prices on the stock market.

Besides the investigation of mergers' wealth creation effects, researchers also examine the efficiency improvement post-merger. Egger and Hahn (2010) provide evidence in favor of cost-performance gains in horizontal mergers among Austrian banks, and smaller banks are more likely to enjoy this effect earlier than larger banks involved in mergers. Erel (2011) looks at US commercial banks and finds that, on average, mergers decrease loan spreads, confirming efficiency gains over increased market power. In contrast, the result of our study

shows that acquirers are negatively impacted by the takeovers: they suffer from worse profitability and liquidity, as well as poorer cost management post-merger.

4.2.3. The global financial crisis and M&A in the banking sector as a method of restructuring

The financial crisis in 2007-2008 has substantially affected M&A transactions in the global banking sector. The difference between pre-crisis mergers (2004-2007) and crisis mergers (2007-2010) among US commercial banks was empirically studied by Dunn et al. (2015), suggesting that crisis period mergers gains outweigh presumably high capital reallocation costs. The authors demonstrate that overall merger announcement value creation during the financial crisis is positively associated with targets' assets and capitals quality, but negatively associated with targets' efficiency. In contrast with previous long literature showing that abnormal returns around the announcement date are negative for acquirers and positive for targets, Beltratti and Paladino (2013) find that abnormal returns for EU bank acquirers during the credit crisis (2007-2010) are zero on average at the announcements but positive after completion. They conjecture that acquisitions implemented during a financial crisis may have created more value for acquirers, as involved acquirers were sufficiently strong to take advantage of forced sales from weaker competitors under a global liquidity shortage. However, due to substantial uncertainty, investors postpone repricing of stocks to completion of the transaction.

Mergers and acquisition transactions may be triggered by different motives: Authors have distinguished between the market power, merger wave, pre-emptive merger, synergy, and financial distress hypothesis. By examining 600 intra-industry public banks' M&A transactions in North America and Europe in the period from 1990 to 2008, Hankir et al. (2011) assert that the market power hypothesis predominates over four other frequently proposed M&A motives. However, it is observed that the failure of a bank is often resolved through mergers and takeovers by incumbent banks – in which case financial distress

hypothesis outstrips. Perotti and Suarez (2002) argue that promoting the takeover of failed banks by solvent institutions can reinforce stability by offering surviving incumbents larger rents under greater market concentration when their competitors fail. Caiazza et al. (2012) find support for the ‘acquire to restructure’ hypothesis, which posits that targets are typically less efficient banks that are acquired for restructuring, with the intention of enhancing profitability. Under this motive of mergers, Acharya and Yorulmazer (2007) develop a theoretical framework that involves granting liquidity to surviving banks in the purchase of failed banks, arguing that this liquidity provision policy gives banks incentives to differentiate, rather than to herd and is a substitute to the bailout policy from an ex-post standpoint. The mergers in the banking sector in Vietnam seem to belong to this category, where the government expects mergers to be an effective measure to recover weak banks.

Nevertheless, Weiß et al. (2014) are concerned by the “concentration-fragility” hypothesis, showing evidence for a significant increase contribution to systemic risk following mergers in the banking system, from both the merged banks as well as their competitors. Similarly, Gomez (2015) proves that incumbent takeovers may also undermine financial stability by creating a systemically important financial institution (SIFI) if they have high discount rates. In fact, the “too big to fail” guarantee is supposed to provide the bank with incentives to take excessive risk, thereby, sows the seed of future systemic failures and the benefits of failed-bank takeovers turn into costs for bank supervisors. Vallascas and Hagendorff (2011) convey a critical view of the risk-reduction potential of M&A among European banks, recommending policymakers to consider the costs and benefits of bank consolidation carefully. Behr and Heid (2011) exploit a sample of bank mergers in nine EU economies between 1997 and 2007 and find that merger premiums are paid to obtain safety-net subsidies, suggesting moral hazard in banking systems. However, Montes (2014) finds an only small impact on competition in the mortgage market of the consolidation of the Spanish banking sector resulting from the financial crisis of 2008. Our study does not investigate the systemic risk and hence cannot judge the situation in Vietnam, however, the deterioration in

banking profitability and liquidity will consequently result in detrimental repercussion on the Vietnamese banking system as a whole.

4.2.4. M&A in the banking sector in developing countries

As data in the developing countries becomes more accessible, researchers are able to verify the economic relationships related to mergers that were observed in developed countries. Goddard et al. (2012) use sample of 132 events in Asia and Latin America between 1998 and 2009 and find that on average, M&A creates shareholder value for target firms without causing any loss to the acquiring firm. The same research identifies that acquirer shareholders benefit from the acquisition of underperforming targets and from government-instigated M&A transactions. The Vietnamese government may be inspired by similar experience when deciding to launch the forced mergers and acquisition program as a way to recover weak banks in the financial system. Yet, our results show that this goal is not achieved – indeed, acquirers suffer poorer performance and liquidity post-merger. Du and Sim (2016) corroborate the hypothesis that target banks are mainly the ones to benefit from efficiency improvements in a study of six Asian emerging countries bank M&A. In our study, the data that we can gather does not allow us to examine this hypothesis since target banks in Vietnamese mergers literally disappear, they are totally merged with the acquirers and only one name remains.

Under the oligopolistic nature of South African banking industry, Wanke et al. (2017) find that the drivers of virtual efficiency in M& A are bank type and origin, suggesting criteria to be taken into account to identify suitable targets. We have some doubt about whether the Vietnamese acquirers can have the choice of targets as their South African counterparts and thus do not carry out a similar examination.

Rahman et al. (2018) report an overall negative market response towards the M&A in the banking sector of Pakistan. By studying all the M&A deals of Asian listed banks, Shirasu (2018) empirically examines the long-term changes in banking management strategies for the

acquirer banks. The author finds that M&A contribute to increasing new loans and enhancing capital adequacy, but banks fail to make profits because of the non-performing loans. In our study which includes all M&A deals in Vietnam of both listed and non-listed banks, on the contrary, we observe no improvement in loan growth or capital quality. However, we report a similar effect of worsening profitability and efficiency of merged banks, which is supposedly attributable to the burden of the non-performing loans.

4.3. Forced and voluntary mergers of distressed banks in Vietnam

During the global financial crisis in 2008, although the Vietnamese government did not officially acknowledge that the country was facing a financial crisis, the turmoil in world markets had important consequences for Vietnam. Numerous emergency loans from the State Bank of Vietnam, especially for providing short-term liquidity, have helped its commercial banks avoid instantaneous failures, however, these measures were more likely to postpone than really solve the problem. Partially as a consequence, the bad debts crisis was declared in 2011 and touched almost every bank, though the real figures were not revealed immediately. In September 2012, the State Bank of Vietnam disclosed a ratio of 17.21% of bad debts over total outstanding loans - the real figure might have been substantially higher. In order to deal with this situation, the government issued Decision No. 254/QĐ-TTg on the first of March, 2012, approving the restructuring of the credit institutions system in the period 2011 – 2015. The primary objective was to achieve healthy financial conditions and to improve the capability, safety, and the efficiency of Vietnamese credit institutions.

Among various solutions pointed out in this law, voluntary mergers are strongly encouraged on the principle of ensuring the depositors' interests, the legal economic rights and obligations of relevant parties. In order to ensure the safety and stability of the system, credit institutions facing high risks shall be subject to special measures, i.e. forced merger or similar actions. In detail, the regulations distinguish (i) healthy credit institutions to (ii) those in a temporary shortage of liquidity, and (iii) substandard credit institutions. The first group is

invited to participate in the restructuring of the two others by lending to the weak credit institutions and acquiring substandard credit institutions. On the other hand, the second group is encouraged to merge among themselves and to merge with the healthy banks. Finally, for the weakest group, after employing methods to ensure their solvency and putting them under special supervision if necessary, specific steps with regard to merger requirement are stipulated. In particular, those banks shall be merged, consolidated, acquired on a voluntary basis, in default of which the State Bank of Vietnam shall take measures to compel the merger, consolidation, or acquisition. The State bank of Vietnam shall compel substandard credit institutions to transfer their capital; major and controlling shareholders shall have to transfer their shares. The State Bank of Vietnam shall directly repurchase the charter capital or shares of the weak credit institutions to initially consolidate and fortify them before merging with other credit institutions or selling to qualified investors. Foreign credit institutions are allowed to repurchase or merge weak banks, the foreign shareholding limit at restructured weak joint-stock commercial banks will be considered for a raise.

As a result of this law, there were 11 mergers in the Vietnamese banking system during 2011-2015. These deals fall into three main categories: 1) voluntary mergers among healthy banks, 2) voluntary acquisitions of a bank in difficulties by a healthy bank, 3) forced takeovers of distressed banks by the State Bank of Vietnam. There has been no case where a foreign bank played the principal role of rescuing the failed banks, either as an investor buying controlling shares or as an acquirer. The full list of these deals can be found in Annex 1.

Given the context of the overwhelming level of non-performing loans together with low transparency in the Vietnamese banking system, acquirers may not have had the best information for evaluating their targets before a takeover. While each bank is dealing with a large amount of non-performing loans, mergers will add bad debt, accompanied by a series of other issues post-merger. Once the deal is concluded, it turns out that recovering overdue debts, handling bad debts transferred from acquired banks become one of the main missions of acquirers³⁵. Non-

³⁵ For example, at Saigon - Hanoi Commercial Joint Stock Bank (SHB), the merger of Hanoi Building Commercial Joint Stock Bank (Habubank) has made its NPL rate constantly high due to bad debts from

performing loans also negatively affect banks because they absorb capital, increase operational costs and hence decrease profitability, necessitate management time and attention, thus divert focus from the bank's core activities; and they may even sabotage the sustainability of the bank. The difficulties that acquirers will have to face appear foreseeable. Nonetheless, the merger deals on voluntary basis indicate that there are expected advantages from the standpoint of the acquirers, for example, a quick increase in market share and customer network that requires years to develop otherwise. The remaining question is whether the advantages outrank the drawbacks in these mergers and acquisition.

4.4. Data and summary statistics

4.4.1. Construction of the data set

In our investigation of mergers and acquisitions of Vietnamese banks, we use a difference-in-difference method, comparing acquiring banks with other banks and with themselves pre-acquisition. We consider a set of *operation/ profitability ratios* including *Return on Average Assets (ROAA)*, *Return on Average Equity (ROAE)*, *Recurring Earning Power*, and *Cost to Income Ratio*. Regarding the banks' *liquidity*, indicators like *Net Loans / Total Assets*, *Net Loans / Deposit and Short-term Funding*, or *Net Loans / Total Deposit and Borrowing* are taken into account.

In our difference-in-difference design, the treatment group contains acquiring banks, and the control group includes other banks. We first construct an *Acquiring* dummy variable, which takes the value one for acquiring banks both before and after the merger. In order to discern the impact caused by mergers to acquirers, we use the interaction *Acquiring bank x Post-merger*. Furthermore, we create the interaction *Acquiring bank x Year n Post-merger* that indicates time (in years) since acquisition for those acquiring banks to inspect the recovery effect on banking performance, where *Year 1 Post-merger* dummy indicates the year when the targets' financial

Habubank (at the time of the merger, Habubank's bad debt ratio was approximately 15%). SHB's key task has been to recover overdue debt, dealing with bad debts transferred from Habubank, especially those of failed state-owned corporations such as Vinashin (Vietnam Shipbuilding Industry Group, now Shipbuilding Industry Corporation abbreviated SBIC).

figures are consolidated to the acquirers' statements, *Year 2 Post-merger* dummy is the year that follows and so on. Finally, we examine a set of control variables, taking into account the *bank size, bank ownership, and GDP growth rates*.

Table 1 below provides the definition of the variables used in the empirical analysis.

Table 1: Variables and data

Variables	Definition
Operation/ Profitability	
Return on Average Assets (ROAA)	After tax profits as a percentage of Total Assets, shows how a bank can convert its asset into net earnings.
Return on Average Equity (ROAE)	Net earnings per dollar equity capital. The higher ratio is an indicator of higher managerial performance.
Recurring Earning Power	After tax profits adding back provisions for bad debts as a percentage of Total Assets. Effectively this is a return on assets performance measurement without deducting provisions.
Cost to Income Ratio	Measures the overheads or costs of running the bank (majorly salaries) as percentage of income generated before provisions.
Liquidity	
Net Loans / Total Assets	Indicates what percentage of the assets of the bank is tied up in loans. The higher this ratio the less liquid the bank will be.
Net Loans / Deposit and Short-term Funding	Indicates the percentage of the bank's loans compared to its deposit and short-term funding. The higher this ratio the less liquid the bank will be.
Net Loans / Total Deposit and Borrowing	Indicates the percentage of the bank's loans compared to its total deposit and borrowing. The higher this ratio the less liquid the bank will be.
Acquiring	
Acquiring	Dummy - 1 for the acquiring banks
Acquiring bank x Post-merger	Interaction - 1 for the acquiring banks post-merger
Acquiring bank x Year 1 Post-merger	Interaction - 1 for the first year of acquiring banks since the merger
Acquiring bank x Year 2 Post-merger	Interaction - 1 for the second year of acquiring banks since the merger
Acquiring bank x Year 3 Post-merger	Interaction - 1 for the third year of acquiring banks since the merger
Acquiring bank x Year 4 Post-merger	Interaction - 1 for the fourth year of acquiring banks since the merger
Acquiring bank x Year 5 Post-merger	Interaction - 1 for the fifth year of acquiring banks since the merger
Acquiring bank x Year 6 Post-merger	Interaction - 1 for the sixth year of acquiring banks since the merger
Ownership	
100% foreign-owned	Dummy - 1 if the bank is 100% foreign-owned; 0 otherwise
Joint-venture	Dummy - 1 if the bank is a joint-venture*; 0 otherwise
State-owned	Dummy - 1 if the bank is state-owned**; 0 otherwise
Control variables	
Bank size	Natural logarithm of Total assets
GDP growth rate	Annual growth rate of Gross domestic product
* Joint-venture banks are all established by Vietnamese government/ central bank and a foreign counterpart, prone to fulfill their mission of financing bilateral trade and investment activities	
** State-owned banks are banks where the State holds more than 50% stake	
<i>Sources of data: BankScope, Orbis Bank Focus, State Bank of Vietnam, World Bank and author's calculation from these sources</i>	

We collected Vietnamese commercial banks' financial data from BankScope for over 40 commercial banks during the period 2000-2015. The sample is then merged with data from Orbis Bank Focus to cover up to 2017. The information regarding merger years is hand-collected from the acquirers' financial statements. Vietnam's macroeconomic data, GDP growth, is from the World Bank's reports.

All commercial banks in Vietnam are required to publish financial reports in local generally accepted accounting practices (local GAAPs - Vietnamese Accounting Standards – VAS). A few banks having foreign investors also produce IFRS financial reports. We keep only local GAAPs standardized observations during our data treatment and eliminate the observations from the reports that did not meet audit statement qualification (the “qualified” reports). Finally, duplicates are deleted if any. Our sample covers the period from 2000 to 2017 and includes 579 observations.

4.4.2. Descriptive statistics

We provide an overview of the data in the tables below. Table 2a gives the summary statistics for the continuous variables of the whole sample, whereas Table 2b provides a comparison of these variables statistics for acquirers before and after the mergers. Table 2c indicates the number of acquirers' observations by time since mergers and Table 2d reveals the number of observations by bank ownership.

For the whole sample (Table 2a), the profitability measures diverge substantially among banks. Specifically, Return on Average Assets (ROAA) ratio stretches from as low as -25.08% to as high as 7.94% and has a mean value of 0.93%. The mean value of Return on Average Equity (ROAE) is 9.11%, whereas it peaked at 44.25% and troughed at -97.79%. Recurring Earning Power varies from -19.24% to 8.68% and averages 1.83%. On the operation side, cost efficiency differs widely from banks to banks as well, whereby Cost to Income Ratio varies between 18.82% and 234.76% and the average is 52.5%.

Table 2a: Summary Statistics - Continuous variables

Continuous variables						
Variable	n	Mean	S.D.	Min	Median	Max
Operation/ Profitability						
Return on Average Assets (ROAA)	574	0.93	1.72	-25.08	0.99	7.94
Return on Average Equity (ROAE)	570	9.11	9.33	-97.79	8.68	44.25
Recurring Earning Power	574	1.83	1.62	-19.24	1.85	8.68
Cost To Income Ratio	569	52.5	20.38	18.82	48.27	234.76
Liquidity						
Net Loans / Total Assets	576	52.57	15.09	3.67	53.53	93.56
Net Loans / Deposit and Short-term Funding	576	67.24	27.05	10.85	64.65	291.69
Net Loans / Total Deposit and Borrowing	471	64.47	24.6	10.85	63.25	291.69
Control variables						
Bank size	579	16.07	1.62	8.35	16.02	19.56
GDP growth rate	579	6.29	0.68	5.25	6.24	7.55

Notes: Variables are defined in Table 1.

In Vietnam, liquidity regulation is still under development as the deadline for the implementation of Basel II is on January 1, 2020, and thus has not been the norm. On average, Vietnamese banks have 52.57% of their Total Assets tied up in Net Loans; nevertheless, this ratio can be as low as 3.67% or as high as 93.56%, indicating that some banks have just entered the market and some banks may engage in a highly risky credit policy or suggesting a high amount of reserves for impaired loans. Compared with Deposits, Net Loans in Vietnamese banks account for 64.47% - 67.24%. Similarly, the ratios for some banks reach up to 292%, suggesting their low liquidity.

By comparing the acquirers before and after the mergers (Table 2b), we observe a lower average value of ROA after the mergers (0.16% versus 0.88%); nevertheless, the standard deviation is lower, too (2.21% versus 3.43%). The average value of ROE also reduced almost by half, from 12.79% to 7.00%, whereas the standard deviation decreased only marginally, from 6.43% to 6.25%. Similarly, there is a reduction in Recurring Earning Power, both for its average values (from 1.83% to 0.79%) and its standard deviation (from 2.84% to 1.90%). In contrast, the cost related indicator Cost to Income Ratio becomes higher post-merger (62.66% compared with 45.46% pre-merger), accompanied by a higher standard deviation (14.54% versus 12.39% previously). Regarding the liquidity, the ratios of Total Assets or Deposits tied up in Net Loans decreased slightly, pivoting the range of 50% - 60%; their standard deviations also decreased,

down from 16.52% - 21.20% to 13.52% - 15.72%. Their bank size grew over time and is more homogenous after mergers.

Table 2b: Summary Statistics – Acquirers before and after the mergers

Continuous Variables	Acquirers before mergers						Acquirers after mergers					
	n	Mean	S.D.	Min	Median	Max	n	Mean	S.D.	Min	Median	Max
<i>Operation/ Profitability</i>												
Return on Average Assets (ROAA)	66	0.88	3.43	-25.08	1.08	7.94	36	0.16	2.21	-12.40	0.42	2.15
Return on Average Equity (ROAE)	65	12.79	6.43	0.00	13.64	29.02	35	7.00	6.25	0.33	6.34	22.00
Recurring Earning Power	66	1.83	2.84	-19.24	2.12	8.16	36	0.79	1.90	-9.62	1.02	2.55
Cost To Income Ratio	65	45.46	12.39	25.17	45.26	98.86	35	62.66	14.54	41.67	60.01	96.26
<i>Liquidity</i>												
Net Loans / Total Assets	67	52.37	16.52	22.00	56.83	82.91	36	51.46	13.52	18.95	54.21	71.16
Net Loans / Deposit & Short-term Funding	67	64.35	21.20	21.99	69.18	126.18	36	58.32	15.72	10.85	60.74	82.25
Net Loans / Total Deposit and Borrowing	64	60.08	18.68	21.99	64.88	97.40	35	57.76	14.10	10.85	59.23	77.53
<i>Control variables</i>												
Bank size	67	16.51	1.46	13.46	16.54	18.97	36	17.62	0.84	14.99	17.53	19.56
GDP growth rate	67	6.34	0.75	5.25	6.32	7.55	36	6.23	0.53	5.25	6.21	6.81
<i>Notes: Variables are defined in Table 1.</i>												

In our sample, 17.79% of the observations belong to the acquiring banks (both before and after the mergers). The post-merger acquiring banks observations account for 6.04%. The detailed distribution of observations by time since mergers (from year 1 which is the year of the merger to year 6) is shown in Table 2c below.

Table 2c: Number of acquirers' observations by time since mergers

Acquiring status	Number of acquirers' observations by time since mergers		Frequency
Total observations	579	100.00%	579
Acquirers	103	17.79%	103
Acquirers - Year 1 since mergers	8	1.38%	8
Acquirers - Year 2 since mergers	8	1.38%	8
Acquirers - Year 3 since mergers	7	1.21%	7
Acquirers - Year 4 since mergers	5	0.86%	5
Acquirers - Year 5 since mergers	4	0.69%	4
Acquirers - Year 6 since mergers	3	0.52%	3

Due to the fact that before Vietnam's entry to the World Trade Organization in 2007, restrictions on foreign ownership in banking were the norm and even after this event, foreign banks are still prudent when entering this emerging market, only 7.77% of our observations belong to 100% foreign-owned banks. Joint-venture banks account for 11.74% of the observations and 12.78% are state-owned banks. Table 2d below presents the frequency of observations by ownership.

Table 2d: Number of observations by ownership

<i>Ownership</i>	Number of observations by ownership	Frequency
Total observations	579	100.00%
100% foreign-owned bank	45	7.77%
Joint-venture bank	68	11.74%
State-owned bank	74	12.78%

4.5. Empirical analysis

4.5.1. The empirical strategy

We run regressions of Profitability and Liquidity ratios on banks' acquiring status dummies or interactions, ownership, and control variables. Put differently, we intend to estimate the equations:

$$Profitability_{i,t} = \alpha + \beta_j(Acquiring_j)_{i,t} + \sum_k \gamma_{k,i,t} Controls_{i,t} + \varepsilon_{i,t} \quad \text{Eq. (1)}$$

$$Liquidity_{i,t} = \alpha + \beta_j(Acquiring_j)_{i,t} + \sum_k \gamma_{k,i,t} Controls_{i,t} + \varepsilon_{i,t} \quad \text{Eq. (2)}$$

Our primary estimation method is a random effect regression with ownership independent variables. With this approach, the effects of time-invariant variables like bank types (state ownership, joint-venture or foreign ownership) can be estimated in combination with acquisition-related dummy variables.

4.5.2. Baseline results

Table 3a and table 3b report our baseline results. Table 3a shows the impact of takeovers on banking performance by using the interaction of acquiring banks and the post-merger dummies, whereas Table 3b reveals this impact provided time length since the merger. Columns (1) to (7) document the regression results for the full sample and columns (8) to (14) for the sample without the State Bank of Vietnam's takeovers, which are for many considered a restructuring with the State's intervention rather than a merger. The estimates from regressions on Operation/ Profitability indicators are displayed in columns (1) to (4) and (8) to (11) respectively for these two different samples. Columns (5) to (7) and then (12) to (14) disclose the estimates for Liquidity indicators.

Operation/ Profitability

Overall, acquiring banks post-merger are significantly associated with worse performance in terms of Operation/ Profitability. Interestingly, before the mergers, the Return on Average Equity (ROAE) in acquiring banks is 3.14% higher than other banks with high statistical significance. However, the mergers have a detrimental effect on this ratio, producing a negative impact of -7.91%, which signifies that post-merger acquirers are worse than other banks in this aspect. The Return on Average Assets (ROAA) for these banks is 1.4% lower than pre-merger, whereas the Recurring Earning Power suffers a 1.52% decrease; all effects are significant at 1% level. While this negative effect is insignificant on ROAE and just slightly significant on ROAA in the year of the acquisition, it becomes highly significant and more and more important from the second year onward. On the other hand, the effect on Recurring Earning Power is strong and highly significant since the year of the merger (-1.73%) and remains consistently significant though less distinguished from year 2 to year 6 (ranging between -1.13% and -1.53%). Regarding operational efficiency, cost-related ratios are also inferior in acquiring banks post-merger. In particular, Cost to Income Ratio indicates 21.82 points higher at 1% significance level. When we separate the effects by years since mergers, Cost to Income ratio in acquiring banks post-merger is persistently and significantly higher (18.64 to 23.23 points) than the pre-merger period.

Table 3a: Takeovers and banking performance

	<i>Full sample - 2000 - 2017</i>							<i>Sample without SBV's takeovers - 2000 - 2017</i>						
	<i>Operation/ Profitability</i>				<i>Liquidity</i>			<i>Operation/ Profitability</i>				<i>Liquidity</i>		
	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
Acquiring														
Acquiring	-0.387 (0.817)	3.143** (1.372)	-3.598 (3.590)	-0.361 (0.726)	-4.342 (4.444)	-4.990 (6.301)	-6.318 (5.597)	0.380 (0.361)	3.582*** (1.378)	-4.511 (3.823)	0.302 (0.364)	-2.536 (4.375)	-1.617 (5.674)	-3.611 (5.192)
Acquiring x Post-merger	-1.396*** (0.396)	-7.911*** (1.986)	21.819*** (3.106)	-1.519*** (0.393)	4.488 (3.383)	8.056* (4.627)	10.089** (4.271)	-1.170*** (0.345)	-8.088*** (1.981)	21.927*** (3.122)	-1.351*** (0.378)	4.907 (3.417)	8.776* (4.645)	11.333*** (4.151)
Ownership														
100% foreign-owned	0.432 (0.285)	-0.023 (1.953)	5.921 (7.519)	0.428 (0.389)	-11.062** (5.328)	-10.292* (6.158)	-6.558 (4.737)	0.398 (0.283)	-0.086 (1.969)	5.636 (7.538)	0.382 (0.389)	-11.468** (5.330)	-11.051* (6.180)	-7.206 (4.763)
Joint-venture	-0.162 (0.416)	-1.210 (1.706)	-0.344 (7.186)	0.062 (0.550)	-1.967 (4.272)	2.437 (7.274)	10.773 (10.254)	-0.233 (0.409)	-1.296 (1.726)	-0.614 (7.207)	-0.016 (0.550)	-2.352 (4.305)	1.534 (7.343)	9.759 (10.230)
State-owned	-0.700** (0.322)	-4.075 (3.211)	6.771 (5.194)	-0.229 (0.326)	16.410*** (5.690)	30.528*** (8.354)	24.898*** (8.112)	-0.761*** (0.258)	-4.130 (3.214)	6.601 (5.180)	-0.317 (0.284)	15.575*** (5.565)	29.503*** (8.119)	24.111*** (7.972)
Control variables														
Bank size	0.145* (0.087)	1.535*** (0.412)	-3.255** (1.307)	0.129 (0.099)	-1.822* (1.043)	-8.593*** (2.167)	-7.552*** (1.923)	0.098 (0.078)	1.503*** (0.419)	-3.235** (1.335)	0.094 (0.100)	-1.806* (1.046)	-8.766*** (2.162)	-7.747*** (1.939)
GDP growth rate	0.197** (0.080)	1.796** (0.763)	-5.965*** (1.018)	0.189** (0.082)	0.416 (1.055)	-3.021 (2.041)	-1.255 (1.498)	0.160** (0.077)	1.755** (0.771)	-5.917*** (1.019)	0.165** (0.081)	0.469 (1.069)	-3.026 (2.055)	-1.247 (1.517)
N	574	570	569	574	576	576	471	563	561	560	563	565	565	463
R-squared	0.0362	0.112	0.130	0.0479	0.110	0.171	0.168	0.0567	0.112	0.131	0.0568	0.115	0.179	0.175
Prob > chi2	0.0022	0.0000	0.0000	0.0002	0.0232	0.0001	0.0050	0.0000	0.0000	0.0000	0.0000	0.0237	0.0002	0.0055

This table presents the results of robust random-effects least squares model for the impact of mergers on banking performance.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Operation/ Profitability Indicators: *Return on Average Assets (ROAA):* After-tax profits as a percentage of Total Assets, shows how a bank can convert its asset into net earnings. *Return on Average Equity (ROAE):* Net earnings per dollar equity capital. The higher ratio is an indicator of higher managerial performance. *Recurring Earning Power:* After-tax profits adding back provisions for bad debts as a percentage of Total Assets. Effectively this is a return on assets performance measurement without deducting provisions. *Cost to Income Ratio:* Measures the overheads or costs of running the bank (majorly salaries) as percentage of income generated before provisions.

Liquidity Indicators: *Net Loans / Total Assets:* Indicates what percentage of the assets of the bank is tied up in loans. The higher this ratio the less liquid the bank will be. *Net Loans / Deposit and Short-term Funding:* Indicates the percentage of the bank's loans compared to its deposit and short-term funding. The higher this ratio the less liquid the bank will be. *Net Loans / Total Deposit and Borrowing:* Indicates the percentage of the bank's loans compared to its total deposit and borrowing. The higher this ratio the less liquid the bank will be.

Acquiring dummies: *Acquiring:* Dummy - 1 for the acquiring banks. *Acquiring bank x Post-merger:* Interaction - 1 for the acquiring banks post-merger

Ownership: *100% foreign-owned:* Dummy - 1 if the bank is 100% foreign-owned; 0 otherwise. *Joint-venture:* Dummy - 1 if the bank is a joint-venture; 0 otherwise. Joint-venture banks are all established by the Vietnamese government/ central bank and a foreign counterpart, prone to fulfill their mission of financing bilateral trade and investment activities. *State-owned:* Dummy - 1 if the bank is state-owned**; 0 otherwise. State-owned banks are banks where the State holds more than 50% stake.

Control variables: *Bank size:* Natural logarithm of Total Assets. *GDP growth rate:* Annual growth rate of Gross domestic product.

Table 3b: Takeovers and banking performance – prolonged effects

	Full sample - 2000 - 2017							Sample without SBV's takeovers - 2000 - 2017						
	Operation/ Profitability				Liquidity			Operation/ Profitability				Liquidity		
	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
Acquiring														
Acquiring	-0.304 (0.692)	3.139** (1.344)	-3.041 (3.362)	-0.362 (0.697)	-3.966 (4.293)	-4.345 (6.154)	-5.843 (5.477)	0.352 (0.324)	3.571*** (1.346)	-3.874 (3.579)	0.260 (0.330)	-2.166 (4.151)	-1.109 (5.431)	-3.056 (4.933)
Acquiring x Year 1 post-merger	-1.688* (0.981)	-4.981 (3.425)	18.643*** (3.439)	-1.728*** (0.652)	-3.083 (3.109)	-2.884 (5.198)	1.654 (5.620)	-0.694*** (0.260)	-5.138 (3.403)	18.737*** (3.427)	-1.056*** (0.170)	1.049 (3.013)	6.982** (4.227)	(2.921)
Acquiring x Year 2 post-merger	-0.736** (0.304)	-8.192*** (2.062)	20.996*** (5.416)	-1.132*** (0.324)	-0.214 (2.741)	1.197 (4.109)	3.974 (3.592)	-0.988*** (0.230)	-8.372*** (2.049)	21.082*** (5.409)	-1.193*** (0.332)	-0.510 (2.805)	0.484 (4.175)	3.671 (3.666)
Acquiring x Year 3 post-merger	-0.941*** (0.317)	-8.947*** (1.800)	19.287*** (4.468)	-1.236*** (0.351)	4.127 (3.474)	8.078 (5.150)	9.297** (4.738)	-1.201*** (0.287)	-9.110*** (1.804)	19.346*** (4.435)	-1.286*** (0.374)	3.783 (3.551)	7.351 (5.259)	8.951* (4.880)
Acquiring x Year 4 post-merger	-1.087*** (0.378)	-10.158*** (1.825)	22.518*** (3.493)	-1.372*** (0.437)	6.672 (4.707)	10.779 (6.754)	12.215** (6.119)	-1.401*** (0.360)	-10.339*** (1.845)	22.575*** (3.504)	-1.437*** (0.471)	6.237 (4.797)	9.837 (6.909)	11.675* (3.320)
Acquiring x Year 5 post-merger	-1.108*** (0.428)	-8.769*** (3.063)	21.515*** (4.226)	-1.382*** (0.526)	13.507*** (5.052)	20.502*** (6.760)	20.883*** (6.016)	-1.374*** (0.487)	-8.916*** (3.097)	21.590*** (4.278)	-1.409** (0.566)	13.204*** (5.092)	19.931*** (6.805)	20.634*** (6.126)
Acquiring x Year 6 post-merger	-1.192*** (0.301)	-8.142*** (3.099)	23.232*** (8.962)	-1.527*** (0.405)	17.143*** (6.287)	27.364*** (8.928)	24.876*** (7.367)	-1.482*** (0.333)	-8.290*** (3.062)	23.311*** (8.971)	-1.557*** (0.440)	16.814*** (6.332)	26.753*** (8.990)	24.554*** (7.465)
Ownership														
100% foreign-owned	0.473 (0.290)	-0.023 (1.962)	5.949 (7.556)	0.452 (0.390)	-11.146** (5.356)	-10.388* (6.198)	-6.646 (4.764)	0.397 (0.284)	-0.087 (1.977)	5.664 (7.575)	0.380 (0.391)	-11.524** (5.364)	-11.125* (6.210)	-7.280 (4.784)
Joint-venture	-0.088 (0.401)	-1.197 (1.707)	-0.237 (7.239)	0.093 (0.537)	-2.047 (4.327)	2.388 (7.350)	10.630 (10.296)	-0.237 (0.412)	-1.290 (1.730)	-0.494 (7.265)	-0.024 (0.554)	-2.406 (4.354)	1.463 (7.390)	9.744 (10.272)
State-owned	-0.693** (0.275)	-4.127 (3.191)	6.503 (5.246)	-0.212 (0.311)	16.743*** (5.776)	30.980*** (8.469)	25.430*** (8.301)	-0.765*** (0.259)	-4.172 (3.200)	6.311 (5.239)	-0.307 (0.286)	15.903*** (5.657)	29.946*** (8.260)	24.464*** (8.122)
Control variables														
Bank size	0.149* (0.090)	1.549*** (0.415)	-3.162** (1.334)	0.128 (0.098)	-1.910* (1.049)	-8.716*** (2.159)	-7.695*** (1.947)	0.097 (0.080)	1.512*** (0.422)	-3.137** (1.366)	0.089 (0.102)	-1.882* (1.065)	-8.869*** (2.182)	-7.826*** (1.973)
GDP growth rate	0.196** (0.085)	1.813** (0.773)	-5.901*** (1.053)	0.189** (0.085)	0.189 (1.043)	-3.348 (2.058)	-1.606 (1.504)	0.166** (0.078)	1.767** (0.782)	-5.850*** (1.055)	0.165** (0.083)	0.232 (1.058)	-3.353 (2.070)	-1.552 (1.523)
N	574	570	569	574	576	576	471	563	561	560	563	565	565	463
R-squared	0.0431	0.115	0.128	0.0514	0.119	0.177	0.172	0.0577	0.115	0.129	0.0565	0.121	0.183	0.178
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

This table presents the results of robust random-effects least squares model for the prolonged impact of mergers on banking performance.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Operation/ Profitability Indicators: *Return on Average Assets (ROAA):* After-tax profits as a percentage of Total Assets, shows how a bank can convert its asset into net earnings. *Return on Average Equity (ROAE):* Net earnings per dollar equity capital. The higher ratio is an indicator of higher managerial performance. *Recurring Earning Power:* After-tax profits adding back provisions for bad debts as a percentage of Total Assets. Effectively this is a return on assets performance measurement without deducting provisions. *Cost to Income Ratio:* Measures the overheads or costs of running the bank (majorly salaries) as percentage of income generated before provisions.

Liquidity Indicators: *Net Loans / Total Assets:* Indicates what percentage of the assets of the bank is tied up in loans. The higher this ratio the less liquid the bank will be. *Net Loans / Deposit and Short-term Funding:* Indicates the percentage of the bank's loans compared to its deposit and short-term funding. The higher this ratio the less liquid the bank will be. *Net Loans / Total Deposit and Borrowing:* Indicates the percentage of the bank's loans compared to its total deposit and borrowing. The higher this ratio the less liquid the bank will be.

Acquiring dummies: *Acquiring:* Dummy - 1 for the acquiring banks. *Acquiring bank x Year n Post-merger (n = 1 to 6):* Interaction - 1 for the nth year of acquiring banks since the merger

Ownership: *100% foreign-owned:* Dummy - 1 if the bank is 100% foreign-owned; 0 otherwise. *Joint-venture:* Dummy - 1 if the bank is a joint-venture; 0 otherwise. Joint-venture banks are all established by the Vietnamese government/ central bank and a foreign counterpart, prone to fulfill their mission of financing bilateral trade and investment activities. *State-owned:* Dummy - 1 if the bank is state-owned**; 0 otherwise. State-owned banks are banks where the State holds more than 50% stake.

Control variables: *Bank size:* Natural logarithm of Total Assets. *GDP growth rate:* Annual growth rate of Gross domestic product.

We can see that acquiring banks struggle in their restructuring post-merger in order to cut costs; nevertheless, this is not as easy as expected. The first factor to take into account is the additional cost related to the re-organization of the merged entity. This phenomenon is similar to significantly lower cost efficiency after merger events that Montgomery et al. (2014) observe in Japan banking consolidation after its own banking crisis in the late 1990s. However, unlike their Japanese counterparts, merged banks in Vietnam are unable to maintain their “bottom line”, presumably due to the absence of increased market power. Furthermore, given the high NPL ratios in both acquiring and acquired banks in Vietnam, the pressure to deal with these bad debts weighs even more on the cost increase and drags profitability. To sum up, acquiring banks post-merger seem to perform more poorly, bearing both less satisfactory profitability and more inefficient cost management.

In comparison, regressions using the sample without the SBV’s takeovers indicate similar results even though the magnitude may be different. It is worth noting that prior to the mergers the private acquirers enjoyed 3.58% higher in ROAE compared to their counterparts. The negative impacts on ROAA and Recurring Earning Power in acquirers post-merger are lower (-1.17% and -1.35%, respectively) but slightly higher for ROAE (-8.09%). This is probably explained by a better effort of private acquirers to keep profits from worsening and possibly due to their higher ROAE pre-merger. Cost to Income Ratio displays a similar increase of 21.93 points. The negative impacts on ROA and Recurring Earning Power in the first year post-merger are much lower compared to the general sample, which can be explained by the mechanical effect of “adding” the distressed merged banks to the healthier acquirers. Nevertheless, from the second year onward, the damaging effects are similar or even worse, showing the strong repercussion on the private acquirers. Over the years, Cost to Income Ratio increases almost as much in comparison with the banks taken over by the SBV. A marginal difference can be explained by additional costs suffered by the private acquirers due to either an absence or a less visible presence of the government’s implicit guarantee.

Liquidity

The random effects regression results indicate in general below par Liquidity indicators for acquiring banks post-merger, which is significant for Net Loans / Total Deposit & Borrowing ratio and slightly significant for Net Loans / Deposit & Short-term Funding Ratio. Specifically, after the mergers, acquirers display an increase in Net Loans / Total Deposit & Borrowing (10.09%) and in Net Loans / Deposit & Short-term Funding (8.06%), confirming their inferior liquidity compared to their counterparts. Indeed, this adverse effect on liquidity statistically emerges in year 3 and year 4 post-merger (9.3% and 12.22% increases in Net Loans / Total Deposit & Borrowing ratio) and becomes stronger and more significant in year 5 and year 6 (20.88% and 24.88%, respectively). The statistically significant increases in Net Loans / Deposit & Short-term Funding materialize in year 5 and year 6 post-merger (20.50% and 27.36%). Even if no significance is found for the change in Net Loans / Total Assets in acquirers post-merger in general, the distinction by year reveals that this ratio becomes significantly worse in acquiring banks in year 5 and year 6 post-merger, reaching 13.51% and 17.14% higher compared to pre-merger period.

Analyzed separately, the increase in these ratios may also be considered as the bank's move to expand its profit-generating assets; yet, when we put them side by side with the deteriorated profitability, the lower liquidity is actually perturbing. Generally, it seems that acquiring banks are not only less performing but also face lower liquidity post-merger, which entitles higher risk and may, in turn, translate into future worse performance. After removing the SBV's takeovers from the sample, we observe that private acquirers post-merger display lower liquidity in comparison with the general sample. Deposit & Short-term Funding and Total Deposit & Borrowing are respectively tied up more in Net Loans by 8.78% and 11.33% than pre-merger period. Almost identical to the full sample, all the three liquidity ratios Net Loans / Total Assets, Net Loans / Deposit & Short-term Funding and Net Loans / Total Deposit & Borrowing become significantly higher in year 5 and year 6 post-merger with a slightly reduced magnitude. Whether this is an implication of higher risk taken by private acquirers or evidence of lower reserves for impaired loans that must be deducted from gross loans to calculate net loans, it

seems that private acquirers have more difficulties in recovering their pre-merger profitability. However, this may also be attributable to the fact that their pre-merger profitability is substantially higher compared with the control group, whereas the profitability of the banks taken over by the SBV is lower. The same explanation applies to the more inflated Cost to Income Ratio associated with the private acquirers post-merger.

Ownership – Control Variables

Besides the main inspection of acquiring status and bank profitability and liquidity, we investigate the impact of bank ownership on bank performance. Bank ownership, in general, has no significant impacts on either profitability or cost efficiency, except for state ownership. We find that state-owned banks are significantly associated with lower ROAA (roughly 0.7%), conforming to the usual perception that state ownership entails less efficient use of assets. Regarding the liquidity, wholly foreign-owned banks are associated with a better Net Loans / Total Assets ratio, 11% lower than private local banks at 5% significance level and a 10% lower Net Loans / Deposit & Short-term Funding. This may be explained by the Basel's regulatory requirements on liquidity that foreign banks follow more strictly than other local banks because they adhere to the same set of internal regulations established by the holding banks in their home countries. On the other hand, state ownership is significantly associated with more assets or deposits tied-up in loans and state-owned banks are thus less liquid. In combination with the above-mentioned lower ROAA, higher profit-generating assets ratios imply that state-owned banks seem to be less efficient in their performance.

Other controls in our regressions include bank size or GDP growth rate. Bank size has a positive impact on performance, in particular, the ROAA, though the effect is minimal (0.15% change for each 1% increase in total assets) and only at 10% significance. The positive impact is higher and strongly significant for ROAE, 1% change in total assets would entail a 1.5% increase in ROAE at 5% significance. Each percent change in total assets is also associated with a 3.2% lower in Cost to Income Ratio. No significant impact is found for Recurring Earning Power. This means that bigger banks manage costs more efficiently or enjoy the economy of scale, which

contributes to their better ROAA. The positive impact of bank size on ROAE is not only more significant but also stronger than on ROAA, which may partly be due to higher leverages in bigger banks. Bigger banks also maintain lower Net Loans ratios compared to Total Assets, Deposit & Short-term Funding and Total Deposit & Borrowing, thus ensure better liquidity. This higher liquidity can be attributable to the diversity of products range in big banks, which allows them to depend less on loans. Lastly, the GDP growth rate control variable displays significant association with operation/ profitability indicators, but not with the liquidity indicators. Better GDP growth rates are positively correlated with ROAA and Recurring Earning Power (both are 0.2% higher for each percent increase in GDP growth rate), or ROAE (1.8% higher). Interestingly, they are negatively correlated with the Cost to Income Ratio, each percent increase in GDP growth rates imply a 6% decrease in this cost ratio. The positive macroeconomic index reveals auspicious conditions for banks in both boosting their profitability and managing costs more efficiently. Favorable economic conditions allow banks to lend more easily and more performing enterprises mean both higher interest income and lower risk of bad debts.

4.6. Robustness

For our robustness check, we carry out a range of different regression, including those with fixed effects, a sub-sample keeping only observations since 2007 and finally a special setting where we build artificially merged entities pre-merger by consolidating the financial statements of the banks involved in a merger.

In the first set of robustness tests, we implement *fixed-effect estimations* with the entity (bank) fixed effects using the same variables as in the main regressions. Entity fixed effects method helps diminish the concern that our results are generated by selection bias by allowing us to control for time-invariant characteristics, such as the general quality of the individual banks. Tables 4a and 4b present the results of our fixed-effect robustness tests.

Table 4a: Fixed effects - Takeovers and banking performance

	Full sample - 2000 - 2017							Sample without SBV's takeovers - 2000 - 2017						
	Operation/ Profitability				Liquidity			Operation/ Profitability				Liquidity		
	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
<i>Acquiring</i>														
Acquiring x Post-merger	-1.538*** (0.429)	-7.422*** (1.310)	21.143*** (2.849)	-1.584*** (0.375)	5.171** (2.560)	8.693** (3.450)	10.792*** (3.088)	-1.259*** (0.261)	-7.390*** (1.311)	21.131*** (2.861)	-1.358*** (0.266)	5.927** (2.583)	10.301*** (3.349)	12.545*** (2.868)
<i>Control variables</i>														
Bank size	0.144** (0.061)	1.193*** (0.303)	-3.147*** (1.026)	0.124* (0.067)	-2.083** (1.018)	-8.800*** (1.458)	-7.755*** (1.244)	0.116** (0.055)	1.171*** (0.308)	-3.138*** (1.044)	0.099 (0.065)	-2.036** (1.034)	-8.872*** (1.489)	-7.833*** (1.264)
GDP growth rate	0.202*** (0.073)	1.504** (0.639)	-5.906*** (0.919)	0.189*** (0.070)	0.211 (0.794)	-3.121** (1.388)	-1.292 (1.259)	0.174*** (0.062)	1.474** (0.646)	-5.858*** (0.923)	0.168*** (0.063)	0.274 (0.799)	-3.083** (1.399)	-1.229 (1.266)
N	574	570	569	574	576	576	471	563	561	560	563	565	565	463
Adjusted R-squared	0.260	0.250	0.352	0.335	0.466	0.370	0.422	0.190	0.251	0.354	0.305	0.456	0.358	0.413
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0491	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0342	0.0000	0.0000

This table presents the results of robust fixed-effects least squares model for the impact of mergers on banking performance.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Operation/ Profitability Indicators: *Return on Average Assets (ROAA):* After-tax profits as a percentage of Total Assets, shows how a bank can convert its asset into net earnings. *Return on Average Equity (ROAE):* Net earnings per dollar equity capital. The higher ratio is an indicator of higher managerial performance. *Recurring Earning Power:* After-tax profits adding back provisions for bad debts as a percentage of Total Assets. Effectively this is a return on assets performance measurement without deducting provisions. *Cost to Income Ratio:* Measures the overheads or costs of running the bank (majorly salaries) as percentage of income generated before provisions.

Liquidity Indicators: *Net Loans / Total Assets:* Indicates what percentage of the assets of the bank is tied up in loans. The higher this ratio the less liquid the bank will be. *Net Loans / Deposit and Short-term Funding:* Indicates the percentage of the bank's loans compared to its deposit and short-term funding. The higher this ratio the less liquid the bank will be. *Net Loans / Total Deposit and Borrowing:* Indicates the percentage of the bank's loans compared to its total deposit and borrowing. The higher this ratio the less liquid the bank will be.

Acquiring dummies: *Acquiring bank x Post-merger:* Interaction - 1 for the acquiring banks post-merger

Ownership: *100% foreign-owned:* Dummy - 1 if the bank is 100% foreign-owned; 0 otherwise. *Joint-venture:* Dummy - 1 if the bank is a joint-venture; 0 otherwise. Joint-venture banks are all established by the Vietnamese government/ central bank and a foreign counterpart, prone to fulfill their mission of financing bilateral trade and investment activities. *State-owned:* Dummy - 1 if the bank is state-owned; 0 otherwise. State-owned banks are banks where the State holds more than 50% stake.

Control variables: *Bank size:* Natural logarithm of Total Assets. *GDP growth rate:* Annual growth rate of Gross domestic product.

Table 4b: Fixed effects - Takeovers and banking performance – prolonged effects

	Full sample - 2000 - 2017							Sample without SBV's takeovers - 2000 - 2017						
	Operation/ Profitability				Liquidity			Operation/ Profitability				Liquidity		
	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
Acquiring														
Acquiring x Year 1 post-merger	-1.451 (0.922)	-4.848 (3.006)	18.736*** (3.464)	-1.619** (0.722)	-2.357 (3.036)	-1.346 (4.388)	2.871 (4.420)	-0.743*** (0.279)	-4.830 (3.001)	18.735*** (3.469)	-1.069*** (0.219)	-1.036 (3.149)	1.692 (3.978)	6.993** (3.263)
Acquiring x Year 2 post-merger	-1.119*** (0.272)	-7.699*** (1.769)	19.632*** (5.339)	-1.251*** (0.333)	0.330 (2.542)	1.484 (3.608)	4.346 (3.074)	-1.020*** (0.241)	-7.685*** (1.768)	19.639*** (5.339)	-1.169*** (0.317)	0.412 (2.559)	1.869 (3.619)	4.774 (3.068)
Acquiring x Year 3 post-merger	-1.382*** (0.312)	-8.316*** (1.412)	17.706*** (3.646)	-1.364*** (0.343)	4.749 (2.997)	8.156** (3.924)	9.544*** (3.651)	-1.264*** (0.286)	-8.282*** (1.412)	17.686*** (3.652)	-1.267*** (0.330)	4.787 (3.022)	8.528** (3.953)	9.929*** (3.676)
Acquiring x Year 4 post-merger	-1.620*** (0.416)	-9.135*** (1.605)	20.293*** (4.117)	-1.518*** (0.455)	7.847* (4.142)	11.830** (5.348)	13.191*** (4.898)	-1.481*** (0.389)	-9.093*** (1.604)	20.266*** (4.128)	-1.404*** (0.441)	7.883* (4.163)	12.253** (5.385)	13.603*** (4.922)
Acquiring x Year 5 post-merger	-1.647*** (0.541)	-8.247*** (3.104)	21.611*** (5.012)	-1.560*** (0.551)	14.162*** (4.888)	20.886*** (5.851)	21.404*** (5.179)	-1.498*** (0.517)	-8.197*** (3.104)	21.575*** (5.019)	-1.438*** (0.537)	14.176*** (4.920)	21.313*** (5.905)	21.807*** (5.202)
Acquiring x Year 6 post-merger	-1.800*** (0.467)	-7.567*** (2.267)	23.502*** (8.423)	-1.730*** (0.489)	17.968*** (6.102)	28.127*** (7.693)	25.485*** (6.547)	-1.636*** (0.443)	-7.508*** (2.263)	23.454*** (8.424)	-1.596*** (0.475)	17.973*** (6.129)	28.573*** (7.734)	25.871*** (6.556)
Control variables														
Bank size	0.139** (0.062)	1.192*** (0.305)	-3.037*** (1.051)	0.116* (0.068)	-2.205** (1.043)	-8.972*** (1.486)	-7.908*** (1.274)	0.115** (0.057)	1.170*** (0.310)	-3.025*** (1.070)	0.094 (0.067)	-2.122** (1.056)	-8.988*** (1.516)	-7.914*** (1.298)
GDP growth rate	0.203*** (0.077)	1.505** (0.650)	-5.838*** (0.951)	0.185** (0.074)	-0.048 (0.818)	-3.489** (1.422)	-1.653 (1.307)	0.180*** (0.064)	1.474** (0.658)	-5.789*** (0.956)	0.168** (0.066)	0.022 (0.823)	-3.433** (1.435)	-1.555 (1.316)
N	574	570	569	574	576	576	471	563	561	560	563	565	565	463
Adjusted R-squared	0.250	0.244	0.342	0.325	0.470	0.370	0.419	0.181	0.245	0.344	0.294	0.459	0.357	0.409
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0002	0.0000	0.0000	0.0003	0.0010	0.0000	0.0000	0.0002	0.0000	0.0000	0.0001	0.0020	0.0000	0.0000

This table presents the results of robust fixed-effects least squares model for the prolonged impact of mergers on banking performance.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Operation/ Profitability Indicators: *Return on Average Assets (ROAA):* After-tax profits as a percentage of Total Assets, shows how a bank can convert its asset into net earnings. *Return on Average Equity (ROAE):* Net earnings per dollar equity capital. The higher ratio is an indicator of higher managerial performance. *Recurring Earning Power:* After-tax profits adding back provisions for bad debts as a percentage of Total Assets. Effectively this is a return on assets performance measurement without deducting provisions. *Cost to Income Ratio:* Measures the overheads or costs of running the bank (majorly salaries) as percentage of income generated before provisions.

Liquidity Indicators: *Net Loans / Total Assets:* Indicates what percentage of the assets of the bank is tied up in loans. The higher this ratio the less liquid the bank will be. *Net Loans / Deposit and Short-term Funding:* Indicates the percentage of the bank's loans compared to its deposit and short-term funding. The higher this ratio the less liquid the bank will be. *Net Loans / Total Deposit and Borrowing:* Indicates the percentage of the bank's loans compared to its total deposit and borrowing. The higher this ratio the less liquid the bank will be.

Acquiring dummies: *Acquiring bank x Year n Post-merger (n= 1 to 6):* Interaction - 1 for the nth year of acquiring banks since the merger

Ownership: *100% foreign-owned:* Dummy - 1 if the bank is 100% foreign-owned; 0 otherwise. *Joint-venture:* Dummy - 1 if the bank is a joint-venture; 0 otherwise. Joint-venture banks are all established by the Vietnamese government/ central bank and a foreign counterpart, prone to fulfill their mission of financing bilateral trade and investment activities. *State-owned:* Dummy - 1 if the bank is state-owned**; 0 otherwise. State-owned banks are banks where the State holds more than 50% stake.

Control variables: *Bank size:* Natural logarithm of Total Assets. *GDP growth rate:* Annual growth rate of Gross domestic product.

Consistent with the baseline results, acquiring banks post-merger are strongly associated with lower profitability (ROAA, ROAE, and Recurring Earning Power) as well as higher Cost to Income Ratio at a high significance level. Similarly, the Net Loans ratios display strongly significant and higher coefficients in acquiring banks post-merger, reflecting acquiring banks' inferior liquidity after the mergers. In our fixed-effects robustness test setting, bank ownership cannot be included because this characteristic does not change over time. Otherwise, bank size and GDP growth rate control variables confirm their significant positive correlation with bank performance, associated with higher profitability and lower cost ratios. In addition, bank size is negatively associated with Net Loans ratios at high significance levels, which mean that they manage better their loans related liquidity. Another interpretation is that bigger banks have the advantage of scale and can better manage their liquidity accordingly. In the same manner, the GDP growth rate, a macroeconomic index, is associated with better managed (lower) Net Loans ratios. A possible explanation is that favorable economic conditions allow banks to enhance total assets and deposits base, diversify their products/ service and to rely less on loans.

Secondly, we employ a *sub-sample* in our regressions where *observations since 2007* are retained. This sub-sample allows us to investigate the impact of mergers on acquiring banks in a more homogeneous macroeconomic environment, since 2007 initiated the participation of Vietnam in WTO, marking a major change as the business environment becomes more open in general. We obtain 422 observations for this sub-sample. Tables 5a and 5b display the results of our random-effects robustness tests for this sub-sample. When comparing with the full sample, acquiring banks pre-merger since 2007 are characterized by significantly higher ROAE than the control group (a difference of 4.5% versus 3.1% in the full sample), but when we removed the takeovers by the SBV, this ratio is slightly lower (a difference of 3.4% versus 3.6% in the full sample). This is probably due to the substantially higher leverage in acquiring banks pre-merger, especially in banks which are taken over by the SBV later on. The worsening effects on profitability, cost management, and liquidity are also more remarkable, especially on the liquidity ratios. The reason might be the better cost to income ratio and better liquidity of acquiring banks pre-mergers since 2007, though this preferable difference is not statistically significant.

Table 5a: Sub-sample - Takeovers and banking performance

	Sub-sample - 2007 - 2017							Sub-sample without SBV's takeovers - 2007 - 2017						
	Operation/ Profitability				Liquidity			Operation/ Profitability				Liquidity		
	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
Acquiring														
Acquiring	-0.613 (1.094)	4.527*** (1.514)	-5.422 (3.993)	-0.540 (0.934)	-7.915* (4.108)	-6.332 (7.542)	-7.894 (7.071)	0.443 (0.460)	3.354*** (1.208)	-5.467 (4.409)	0.334 (0.451)	-6.837 (4.366)	-2.810 (7.360)	-4.671 (7.068)
Acquiring x Post-merger	-1.453*** (0.443)	-8.206*** (1.618)	22.514*** (4.002)	-1.481*** (0.435)	6.960** (2.729)	12.416** (5.818)	14.345** (5.678)	-1.229*** (0.424)	-8.515*** (1.641)	22.448*** (4.011)	-1.281*** (0.433)	7.947*** (2.676)	13.948** (5.791)	16.450*** (5.593)
Ownership														
100% foreign-owned	0.607 (0.383)	0.905 (1.878)	4.970 (7.770)	0.526 (0.444)	-9.920* (5.209)	-14.001* (7.167)	-9.652 (5.982)	0.422 (0.331)	1.200 (1.778)	4.679 (7.800)	0.358 (0.429)	-10.636** (5.224)	-15.313** (7.208)	-11.128* (6.093)
Joint-venture	0.267 (0.721)	0.313 (2.040)	-0.294 (8.732)	0.393 (0.764)	6.431 (4.525)	5.856 (9.617)	16.682 (11.030)	-0.209 (0.578)	1.073 (1.900)	-0.660 (8.717)	-0.002 (0.671)	5.345 (4.535)	3.718 (9.491)	13.605 (10.487)
State-owned	-0.871 (0.615)	-1.094 (2.249)	7.196 (9.124)	-0.295 (0.616)	14.823*** (5.654)	38.858*** (13.869)	34.522** (13.890)	-0.590 (0.538)	-1.731 (2.134)	7.042 (9.250)	-0.076 (0.630)	14.764*** (5.561)	38.889*** (13.712)	35.173** (13.912)
Control variables														
Bank size	0.349 (0.336)	1.911*** (0.601)	-3.506 (3.439)	0.220 (0.295)	-0.432 (1.613)	-12.553*** (4.849)	-11.301** (5.021)	0.108 (0.253)	2.334*** (0.495)	-3.547 (3.525)	0.020 (0.257)	-0.757 (1.568)	-13.308*** (4.717)	-12.379** (4.920)
GDP growth rate	0.008 (0.097)	1.300*** (0.479)	-3.838*** (1.361)	0.107 (0.080)	-0.869 (0.982)	-0.119 (2.087)	0.842 (2.218)	0.057 (0.079)	1.099** (0.475)	-3.652*** (1.390)	0.150** (0.063)	-0.686 (0.990)	0.317 (2.114)	1.403 (2.243)
N	421	421	418	421	421	421	348	412	412	411	412	412	412	341
R-squared	0.0497	0.195	0.122	0.0570	0.175	0.196	0.214	0.0673	0.220	0.121	0.0487	0.173	0.206	0.226
Prob > chi2	0.0166	0.0000	0.0000	0.0001	0.0000	0.0000	0.0041	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0090

This table presents the results of robust random-effects least squares model for the impact of mergers on banking performance.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Operation/ Profitability Indicators: *Return on Average Assets (ROAA):* After-tax profits as a percentage of Total Assets, shows how a bank can convert its asset into net earnings. *Return on Average Equity (ROAE):* Net earnings per dollar equity capital. The higher ratio is an indicator of higher managerial performance. *Recurring Earning Power:* After-tax profits adding back provisions for bad debts as a percentage of Total Assets. Effectively this is a return on assets performance measurement without deducting provisions. *Cost to Income Ratio:* Measures the overheads or costs of running the bank (majorly salaries) as percentage of income generated before provisions.

Liquidity Indicators: *Net Loans / Total Assets:* Indicates what percentage of the assets of the bank is tied up in loans. The higher this ratio the less liquid the bank will be. *Net Loans / Deposit and Short-term Funding:* Indicates the percentage of the bank's loans compared to its deposit and short-term funding. The higher this ratio the less liquid the bank will be. *Net Loans / Total Deposit and Borrowing:* Indicates the percentage of the bank's loans compared to its total deposit and borrowing. The higher this ratio the less liquid the bank will be.

Acquiring dummies: *Acquiring:* Dummy - 1 for the acquiring banks. *Acquiring bank x Post-merger:* Interaction - 1 for the acquiring banks post-merger

Ownership: *100% foreign-owned:* Dummy - 1 if the bank is 100% foreign-owned; 0 otherwise. *Joint-venture:* Dummy - 1 if the bank is a joint-venture; 0 otherwise. Joint-venture banks are all established by the Vietnamese government/ central bank and a foreign counterpart, prone to fulfill their mission of financing bilateral trade and investment activities. *State-owned:* Dummy - 1 if the bank is state-owned**; 0 otherwise. State-owned banks are banks where the State holds more than 50% stake.

Control variables: *Bank size:* Natural logarithm of Total Assets. *GDP growth rate:* Annual growth rate of Gross domestic product.

Table 5b: Sub-sample - Takeovers and banking performance – prolonged effects

	Sub-sample - 2007 - 2017							Sub-sample without SBV's takeovers - 2007 - 2017						
	Operation/ Profitability				Liquidity			Operation/ Profitability				Liquidity		
	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
Acquiring														
Acquiring	-0.532 (0.970)	4.433*** (1.445)	-4.701 (3.799)	-0.553 (0.895)	-7.263* (3.887)	-5.485 (7.265)	-7.141 (6.885)	0.401 (0.414)	3.318*** (1.136)	-4.683 (4.202)	0.286 (0.416)	-6.143 (4.054)	-1.885 (6.983)	-3.695 (6.728)
Acquiring x Year 1 post-merger	-1.559** (0.734)	-4.653 (2.886)	19.124*** (3.991)	-1.581*** (0.525)	-0.541 (3.157)	-0.421 (6.390)	4.250 (6.880)	-0.757*** (0.271)	-5.551* (3.135)	19.097*** (3.995)	-0.985*** (0.188)	1.442 (3.004)	4.964 (5.029)	10.940** (4.399)
Acquiring x Year 2 post-merger	-0.836** (0.339)	-9.137*** (1.758)	21.816*** (6.075)	-1.113*** (0.365)	2.060 (2.272)	5.801 (4.615)	8.105* (4.466)	-1.067*** (0.287)	-8.913*** (1.744)	21.783*** (6.076)	-1.115*** (0.371)	2.164 (2.299)	5.547 (4.653)	8.393* (4.566)
Acquiring x Year 3 post-merger	-0.964** (0.386)	-9.661*** (1.506)	19.260*** (4.784)	-1.206*** (0.372)	6.488** (3.217)	11.848* (6.138)	12.852** (5.803)	-1.226*** (0.356)	-9.380*** (1.442)	19.133*** (4.718)	-1.209*** (0.412)	6.547** (3.276)	11.489* (6.252)	12.986** (5.997)
Acquiring x Year 4 post-merger	-1.123** (0.450)	-10.954*** (1.551)	23.141*** (4.231)	-1.366*** (0.473)	9.655** (4.054)	16.201** (7.677)	17.438** (7.241)	-1.421*** (0.451)	-10.652*** (1.442)	22.987*** (4.212)	-1.352** (0.534)	9.696** (4.122)	15.710** (7.870)	17.534** (7.529)
Acquiring x Year 5 post-merger	-1.175** (0.482)	-9.581*** (2.836)	22.262*** (4.891)	-1.395** (0.558)	16.440*** (3.781)	26.444*** (7.684)	26.657*** (7.281)	-1.389** (0.576)	-9.414*** (2.808)	22.165*** (4.919)	-1.316** (0.635)	16.605*** (3.802)	26.411*** (7.775)	27.163*** (5.527)
Acquiring x Year 6 post-merger	-1.291*** (0.345)	-8.880*** (2.632)	22.948** (9.818)	-1.546*** (0.440)	19.173*** (4.856)	32.282*** (9.691)	30.075*** (8.278)	-1.500*** (0.459)	-8.722*** (2.575)	22.826** (9.818)	-1.443*** (0.524)	19.349*** (4.861)	32.317*** (9.730)	30.601*** (8.421)
Ownership														
100% foreign-owned	0.654* (0.371)	1.027 (1.860)	5.120 (7.833)	0.566 (0.445)	-10.091* (5.255)	-14.073* (7.197)	-9.747 (6.010)	0.419 (0.335)	1.211 (1.787)	4.825 (7.864)	0.348 (0.434)	-10.733** (5.271)	-15.406** (7.268)	-11.239* (6.163)
Joint-venture	0.226 (0.699)	0.571 (2.000)	0.087 (8.829)	0.420 (0.754)	5.962 (4.511)	5.704 (9.518)	16.351 (10.961)	-0.212 (0.586)	1.101 (1.912)	-0.282 (8.816)	-0.021 (0.679)	5.074 (4.560)	3.452 (9.550)	13.275 (10.539)
State-owned	-0.847* (0.483)	-1.458 (2.208)	6.682 (9.364)	-0.317 (0.570)	15.604*** (5.779)	39.420*** (13.975)	35.093** (14.056)	-0.590 (0.555)	-1.803 (2.139)	6.509 (9.492)	-0.052 (0.651)	15.299*** (5.706)	39.524*** (13.957)	35.734** (14.194)
Control variables														
Bank size	0.351 (0.284)	2.086*** (0.580)	-3.278 (3.547)	0.241 (0.278)	-0.716 (1.562)	-12.683*** (4.746)	-11.463** (4.952)	0.106 (0.262)	2.355*** (0.503)	-3.319 (3.636)	0.008 (0.267)	-0.929 (1.564)	-13.487*** (4.736)	-12.565** (4.981)
GDP growth rate	-0.019 (0.107)	1.283*** (0.475)	-3.738*** (1.374)	0.092 (0.086)	-1.123 (1.006)	-0.528 (2.127)	0.424 (2.260)	0.061 (0.079)	1.093** (0.466)	-3.547** (1.402)	0.150** (0.064)	-0.962 (1.012)	-0.084 (2.152)	1.026 (2.287)
N	421	421	418	421	421	421	348	412	412	411	412	412	412	341
R-squared	0.0584	0.207	0.119	0.0628	0.186	0.204	0.219	0.0681	0.226	0.118	0.0465	0.181	0.210	0.228
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

This table presents the results of robust random-effects least squares model for the prolonged impact of mergers on banking performance.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Operation/ Profitability Indicators: *Return on Average Assets (ROAA):* After-tax profits as a percentage of Total Assets, shows how a bank can convert its asset into net earnings. *Return on Average Equity (ROAE):* Net earnings per dollar equity capital. The higher ratio is an indicator of higher managerial performance. *Recurring Earning Power:* After-tax profits adding back provisions for bad debts as a percentage of Total Assets. Effectively this is a return on assets performance measurement without deducting provisions. *Cost to Income Ratio:* Measures the overheads or costs of running the bank (majorly salaries) as percentage of income generated before provisions.

Liquidity Indicators: *Net Loans / Total Assets:* Indicates what percentage of the assets of the bank is tied up in loans. The higher this ratio the less liquid the bank will be. *Net Loans / Deposit and Short-term Funding:* Indicates the percentage of the bank's loans compared to its deposit and short-term funding. The higher this ratio the less liquid the bank will be. *Net Loans / Total Deposit and Borrowing:* Indicates the percentage of the bank's loans compared to its total deposit and borrowing. The higher this ratio the less liquid the bank will be.

Acquiring dummies: *Acquiring:* Dummy - 1 for the acquiring banks. *Acquiring bank x Year n Post-merger (n = 1 to 6):* Interaction - 1 for the nth year of acquiring banks since the merger

Ownership: *100% foreign-owned:* Dummy - 1 if the bank is 100% foreign-owned; 0 otherwise. *Joint-venture:* Dummy - 1 if the bank is a joint-venture; 0 otherwise. Joint-venture banks are all established by the Vietnamese government/ central bank and a foreign counterpart, prone to fulfill their mission of financing bilateral trade and investment activities. *State-owned:* Dummy - 1 if the bank is state-owned**; 0 otherwise. State-owned banks are banks where the State holds more than 50% stake.

Control variables: *Bank size:* Natural logarithm of Total Assets. *GDP growth rate:* Annual growth rate of Gross domestic product.

Last but not least, in order to discard the concern about the mechanical effect of mergers, which posits that the profitability of a merged bank drops in comparison with the acquirers pre-merger because it is merely the mechanical addition of the acquiring bank and the failing bank, we rebuild the sample by constructing *artificially merged entities pre-merger*. These artificially merged entities were first created by adding up the financial figures from the balance sheets and income statements of the banks involved in a merger. Their financial ratios were then recalculated accordingly. After the calculation of artificially merged banks pre-merger, our sample comprises 515 observations.

In comparison with the normal full sample, regressions using this mechanically built sample show no significant difference in all the indicators studied for acquiring banks compared to the control group (acquiring banks in the normal sample possess higher ROAE pre-merger). Nevertheless, all the coefficients for the Acquiring dummy retain the same signs but smaller than those in the full normal sample regressions. It means acquiring banks pre-merger seem to have better financial ratios than the control group (though not statistically significant), yet to a smaller extent compared to the main regressions. Additionally, the deteriorating effects of the mergers on these banks, demonstrated by the coefficients of the interaction Acquiring x Post-merger, are also less remarkable. The statistical significance remains strong for all profitability and cost management ratios, but seems to disappear for the liquidity ratios and can only be observed again in the regressions where we distinguish the effects by year post-merger (year 5 and year 6 reveal high significance for the poorer liquidity in acquirers). Presumably, the attenuation in the magnitude is due to the fact that acquired banks' poor performance was partially absorbed using the artificially merged banks pre-merger. In conclusion, we can confirm that all the deterioration impacts of the mergers with distressed banks remain.

Table 6a: Sample with artificial pre-merger acquirers - Takeovers and banking performance

	Artificial pre-merger acquirers - sample - 2000 - 2017							Artificial pre-merger acquirers - sample without SBV's takeovers - 2000 - 2017						
	Operation/ Profitability				Liquidity			Operation/ Profitability				Liquidity		
	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
Acquiring														
Acquiring	-0.346 (0.869)	1.916 (1.447)	-2.969 (3.784)	-0.276 (0.754)	-2.867 (4.609)	-3.400 (6.788)	-5.114 (6.086)	0.418 (0.458)	2.367 (1.501)	-3.760 (4.113)	0.392 (0.429)	-0.915 (4.525)	0.217 (6.199)	-2.229 (5.730)
Acquiring x Post-merger	-1.341*** (0.415)	-6.889*** (1.752)	20.905*** (3.297)	-1.559*** (0.406)	1.114 (3.320)	5.042 (4.637)	6.912 (4.309)	-1.163*** (0.404)	-7.144*** (1.719)	21.068*** (3.305)	-1.447*** (0.422)	1.322 (3.434)	5.687 (4.773)	8.144* (4.318)
Ownership														
100% foreign-owned	0.543* (0.284)	0.076 (1.964)	4.298 (7.543)	0.565 (0.383)	-10.917** (5.278)	-9.586 (6.195)	-7.028 (4.977)	0.493* (0.285)	0.016 (1.981)	3.912 (7.561)	0.512 (0.385)	-11.355** (5.284)	-10.371* (6.209)	-7.700 (5.003)
Joint-venture	-0.005 (0.397)	-0.998 (1.713)	-3.003 (6.923)	0.293 (0.515)	-0.928 (4.226)	3.655 (7.120)	10.727 (10.230)	-0.087 (0.383)	-1.084 (1.742)	-3.399 (6.939)	0.205 (0.508)	-1.318 (4.268)	2.707 (7.184)	9.687 (10.198)
State-owned	-0.692* (0.360)	-4.306 (3.986)	6.912 (5.858)	-0.257 (0.350)	16.729*** (6.044)	33.873*** (9.047)	27.498*** (7.681)	-0.744** (0.304)	-4.303 (3.985)	6.664 (5.864)	-0.322 (0.300)	15.744*** (5.964)	32.732*** (8.912)	26.635*** (7.534)
Control variables														
Bank size	0.184* (0.096)	1.652*** (0.446)	-4.033*** (1.338)	0.203** (0.097)	-1.004 (1.082)	-8.012*** (2.336)	-7.183*** (2.007)	0.129 (0.081)	1.615*** (0.454)	-4.033*** (1.367)	0.163* (0.094)	-0.968 (1.086)	-8.192*** (2.343)	-7.385*** (2.028)
GDP growth rate	0.217** (0.092)	1.893** (0.847)	-6.108*** (1.151)	0.202** (0.093)	0.840 (1.176)	-2.588 (2.054)	-0.839 (1.448)	0.176** (0.088)	1.837** (0.859)	-6.049*** (1.155)	0.174* (0.090)	0.887 (1.196)	-2.608 (2.061)	-0.846 (1.472)
N	510	506	505	510	512	512	413	499	497	496	499	501	501	405
R-squared	0.0410	0.0952	0.129	0.0617	0.109	0.171	0.174	0.0548	0.0943	0.130	0.0650	0.113	0.179	0.182
Prob > chi2	0.0019	0.0000	0.0000	0.0002	0.0555	0.0005	0.0057	0.0000	0.0000	0.0000	0.0000	0.0567	0.0007	0.0078

This table presents the results of robust random-effects least squares model for the impact of mergers on banking performance.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Operation/ Profitability Indicators: *Return on Average Assets (ROAA):* After-tax profits as a percentage of Total Assets, shows how a bank can convert its asset into net earnings. *Return on Average Equity (ROAE):* Net earnings per dollar equity capital. The higher ratio is an indicator of higher managerial performance. *Recurring Earning Power:* After-tax profits adding back provisions for bad debts as a percentage of Total Assets. Effectively this is a return on assets performance measurement without deducting provisions. *Cost to Income Ratio:* Measures the overheads or costs of running the bank (majorly salaries) as percentage of income generated before provisions.

Liquidity Indicators: *Net Loans / Total Assets:* Indicates what percentage of the assets of the bank is tied up in loans. The higher this ratio the less liquid the bank will be. *Net Loans / Deposit and Short-term Funding:* Indicates the percentage of the bank's loans compared to its deposit and short-term funding. The higher this ratio the less liquid the bank will be. *Net Loans / Total Deposit and Borrowing:* Indicates the percentage of the bank's loans compared to its total deposit and borrowing. The higher this ratio the less liquid the bank will be.

Acquiring dummies: *Acquiring:* Dummy - 1 for the acquiring banks. *Acquiring bank x Post-merger:* Interaction - 1 for the acquiring banks post-merger

Ownership: *100% foreign-owned:* Dummy - 1 if the bank is 100% foreign-owned; 0 otherwise. *Joint-venture:* Dummy - 1 if the bank is a joint-venture; 0 otherwise. Joint-venture banks are all established by the Vietnamese government/ central bank and a foreign counterpart, prone to fulfill their mission of financing bilateral trade and investment activities. *State-owned:* Dummy - 1 if the bank is state-owned**; 0 otherwise. State-owned banks are banks where the State holds more than 50% stake.

Control variables: *Bank size:* Natural logarithm of Total Assets. *GDP growth rate:* Annual growth rate of Gross domestic product.

Table 6b: Sample with artificial pre-merger acquirers - Takeovers and banking performance – prolonged effects

	Artificial pre-merger acquirers - sample - 2000 - 2017							Artificial pre-merger acquirers - sample without SBV's takeovers - 2000 - 2017						
	Operation/ Profitability				Liquidity			Operation/ Profitability				Liquidity		
	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing	Return on Average Assets (ROAA)	Return on Average Equity (ROAE)	Cost to Income Ratio	Recurring Earning Power	Net Loans / Total Assets	Net Loans / Deposit & Short-term Funding	Net Loans / Total Deposit & Borrowing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
Acquiring														
Acquiring	-0.428 (0.792)	1.875 (1.409)	-2.101 (3.291)	-0.352 (0.738)	-2.283 (4.440)	-2.516 (6.711)	-4.293 (5.961)	0.371 (0.401)	2.297 (1.455)	-2.795 (3.537)	0.326 (0.364)	-0.221 (4.169)	1.219 (5.831)	-1.210 (5.334)
Acquiring x Year 1 post-merger	-1.561* (0.929)	-3.737 (3.143)	17.079*** (3.833)	-1.759*** (0.638)	-6.013** (2.627)	-5.391 (4.699)	-1.380 (5.157)	-0.679** (0.276)	-3.985 (3.083)	17.219*** (3.813)	-1.113*** (0.186)	-4.987* (2.690)	-2.310 (4.175)	3.333 (3.104)
Acquiring x Year 2 post-merger	-0.304 (0.647)	-6.971*** (1.746)	19.713*** (4.879)	-1.032*** (0.363)	-3.463 (2.723)	-1.781 (4.421)	0.704 (3.679)	-0.979*** (0.271)	-7.238*** (1.705)	19.865*** (4.830)	-1.271*** (0.312)	-3.995 (2.766)	-2.709 (4.461)	0.378 (3.771)
Acquiring x Year 3 post-merger	-0.487 (0.635)	-7.852*** (1.599)	17.960*** (4.445)	-1.130*** (0.408)	0.603 (3.216)	4.618 (5.055)	5.582 (4.466)	-1.185*** (0.332)	-8.105*** (1.572)	18.088*** (4.367)	-1.358*** (0.381)	0.012 (3.257)	3.662 (5.103)	5.227 (4.612)
Acquiring x Year 4 post-merger	-0.639 (0.638)	-9.404*** (1.712)	21.742*** (3.869)	-1.294*** (0.485)	2.903 (4.214)	7.579 (6.452)	8.751 (5.601)	-1.382*** (0.393)	-9.660*** (1.726)	21.861*** (3.864)	-1.531*** (0.489)	2.223 (4.255)	6.473 (6.528)	8.164 (5.794)
Acquiring x Year 5 post-merger	-0.594 (0.660)	-8.089*** (2.983)	20.538*** (4.626)	-1.284** (0.546)	9.450* (4.862)	16.945** (6.711)	17.183*** (5.624)	-1.346*** (0.507)	-8.315*** (3.015)	20.650*** (4.667)	-1.486** (0.580)	8.899* (4.861)	16.196** (6.708)	16.891*** (5.727)
Acquiring x Year 6 post-merger	-0.656 (0.601)	-7.453** (3.018)	22.218** (9.688)	-1.401*** (0.487)	13.081** (5.807)	23.794*** (8.428)	21.220*** (6.601)	-1.435*** (0.354)	-7.682*** (2.966)	22.329** (9.696)	-1.611*** (0.484)	12.487** (5.813)	22.988*** (8.414)	20.848*** (6.679)
Ownership														
100% foreign-owned	0.544* (0.299)	0.076 (1.972)	4.366 (7.584)	0.568 (0.393)	-10.987** (5.313)	-9.644 (6.222)	-7.104 (5.003)	0.493* (0.286)	0.016 (1.989)	3.987 (7.604)	0.510 (0.386)	-11.401** (5.322)	-10.440* (6.240)	-7.774 (5.032)
Joint-venture	0.056 (0.379)	-0.975 (1.709)	-2.866 (6.973)	0.314 (0.490)	-1.023 (4.289)	3.575 (7.180)	10.616 (10.265)	-0.092 (0.386)	-1.052 (1.731)	-3.265 (6.987)	0.196 (0.513)	-1.371 (4.322)	2.622 (7.232)	9.693 (10.249)
State-owned	-0.814** (0.323)	-4.448 (3.984)	6.725 (5.877)	-0.286 (0.321)	17.373*** (6.197)	34.807*** (9.280)	28.452*** (7.916)	-0.755** (0.306)	-4.462 (3.988)	6.452 (5.885)	-0.317 (0.304)	16.374*** (6.087)	33.607*** (9.101)	27.305*** (7.709)
Control variables														
Bank size	0.189* (0.099)	1.681*** (0.449)	-3.940*** (1.369)	0.209** (0.097)	-1.126 (1.090)	-8.187*** (2.334)	-7.356*** (2.027)	0.129 (0.083)	1.653*** (0.456)	-3.941*** (1.397)	0.158 (0.097)	-1.064 (1.104)	-8.318*** (2.369)	-7.475*** (2.057)
GDP growth rate	0.234** (0.104)	1.934** (0.863)	-6.064*** (1.192)	0.214** (0.096)	0.565 (1.159)	-2.992 (2.061)	-1.275 (1.437)	0.182** (0.091)	1.885** (0.876)	-6.008*** (1.196)	0.174* (0.093)	0.604 (1.180)	-3.005 (2.075)	-1.228 (1.462)
N	510	506	505	510	512	512	413	499	497	496	499	501	501	405
R-squared	0.0507	0.0989	0.128	0.0673	0.118	0.177	0.179	0.0560	0.0981	0.128	0.0648	0.119	0.183	0.185
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

This table presents the results of robust random-effects least squares model for the prolonged impact of mergers on banking performance.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Operation/ Profitability Indicators: *Return on Average Assets (ROAA):* After-tax profits as a percentage of Total Assets, shows how a bank can convert its asset into net earnings. *Return on Average Equity (ROAE):* Net earnings per dollar equity capital. The higher ratio is an indicator of higher managerial performance. *Recurring Earning Power:* After-tax profits adding back provisions for bad debts as a percentage of Total Assets. Effectively this is a return on assets performance measurement without deducting provisions. *Cost to Income Ratio:* Measures the overheads or costs of running the bank (majorly salaries) as percentage of income generated before provisions.

Liquidity Indicators: *Net Loans / Total Assets:* Indicates what percentage of the assets of the bank is tied up in loans. The higher this ratio the less liquid the bank will be. *Net Loans / Deposit and Short-term Funding:* Indicates the percentage of the bank's loans compared to its total deposit and borrowing. The higher this ratio the less liquid the bank will be.

Acquiring dummies: *Acquiring:* Dummy - 1 for the acquiring banks. *Acquiring bank x Year n Post-merger (n= 1 to 6):* Interaction - 1 for the nth year of acquiring banks since the merger

Ownership: *100% foreign-owned:* Dummy - 1 if the bank is 100% foreign-owned; 0 otherwise. *Joint-venture:* Dummy - 1 if the bank is a joint-venture; 0 otherwise. Joint-venture banks are all established by the Vietnamese government/ central bank and a foreign counterpart, prone to fulfill their mission of financing bilateral trade and investment activities. *State-owned:* Dummy - 1 if the bank is state-owned**; 0 otherwise. State-owned banks are banks where the State holds more than 50% stake.

Control variables: *Bank size:* Natural logarithm of Total Assets. *GDP growth rate:* Annual growth rate of Gross domestic product.

It is worth noting that besides the dependent variables used in the main regressions and the robustness regressions, we have run many regressions using multiple Asset Quality, Capital Quality, Operation/ Profitability, and Liquidity ratios, none of which is significant (see Appendix – not destined for publication). We can, therefore, say that no positive outcome can be found to make up for the negative consequences of merger-acquisition on banking performance that we have discovered in our analysis.

4.7. Conclusion

Our paper inspects the impact of mergers and acquisition on banking performance in Vietnamese banks to complement existing literature on banking M&A efficiency in emerging markets. In particular, we observe financial constraints post-merger in banks that acquired another failed bank. Additionally, we measure the impact over time and remark prolonged negative financial consequences for acquirers.

We find a significant association between the fact that a bank has acquired a weak competitor and lower profitability (ROAA, ROAE, and Recurring Earning Power) as well as worse cost management (higher Cost to Income Ratio). In principle, these undesirable repercussions on performance can be expected to disappear in the years following the mergers; however, we demonstrate that this was not the case. A similar pattern can be observed for liquidity ratios, including Net Loans / Total Assets, Net Loans / Deposit & Short-term Funding, Net Loans / Total Deposit & Borrowing. This indicates that acquiring banks perform worse than what they would have been able to attain through organic growth. They suffer from the detrimental influence of the weak acquired banks and the heavy charge of post-merger reorganization. This has called into question the real utility of mergers and acquisition to banks in particular and to the financial system in general, which challenge the government's strategy of using takeovers as a method of implicit bailouts. Moreover, the higher cost ratios in acquiring banks imply that internal management has not succeeded in transmitting efficient decisions through the mergers and acquisitions process.

This M&A program during the period 2011-2015 coincided with the burst out of non-performing loans in the banking system and the disentangling phase of its aftermaths, which remains relevant for the time being, therefore it is required to have a proper legal framework on recovering non-performing loans as well as debts sales and purchases. In particular, the authority should facilitate and support banks in the execution of the court's decisions on the handling of collateral assets. In addition, the securitization of debts and better legal transparency would allow effective debts related transactions on the securities market; thereby increase their liquidity and help accelerate the process of dealing with bad debt. The government may also design comprehensive policies about technology upgrading and further promote the application of Basel II in Vietnamese banks in order to have a minimum capital requirement and risk management in conformity with higher international standards. Credit growth cannot be the utmost criteria in evaluating a bank's health and sustainable development prospect, it is more recommended to give priority to credit quality and appropriate credit risk management.

Finally, we propose thorough consideration for a measure involving foreign banks as acquirers of weak local banks. Even though this has already been mentioned in the guidelines for restructuring the credit institutions system for the period 2011 – 2015 and repeated in the same guidelines for the period 2016-2020, it has never been implemented. In our previous research on the impact of foreign presence on boards on Vietnamese banks' performance (Phung and Troege, 2018), foreign minority ownership seems to be inefficient in improving local banks' profitability due to conflicts of interests; meanwhile wholly foreign-owned banks appear to be healthier in all the aspects studied. Letting foreign banks buy the most troubled local banks while entitling them full control over the acquired entities might, therefore, be an advisable strategy to restructure these banks, especially after various unsuccessful efforts of the government and given the limited capacity of other possible local acquirers. Nevertheless, the concern regarding cross-border mergers and acquisitions is that cultural differences and regulatory barriers may create high transaction costs and integration difficulties may reduce the value of internalization. Indeed, Steigner and Sutton (2011) show that greater cultural distance in cross-border takeovers has a

positive influence on the long-run performance of bidders with high intangibles, implying significant internalization benefits from the technological know-how. Policymakers should, however, take into account the acquirer shareholders' aversion to information asymmetries in cross-border mergers that Asimakopoulos and Athanasoglou (2013) emphasize. Specifically, foreign bidders should be supported with more transparency in cultural differences and adaptation, legal or accounting factors in order to facilitate the success of growth potential and cost reduction expected from a cross-border deal. It is worth emphasizing the role of "regulatory arbitrage" (Karolyi and Taboada, 2015), in which acquirers come primarily from countries with a stronger, more restrictive regulatory environment than that of their target - these acquisitions are also associated with more positive announcement effects. Additionally, according to Gulamhussen et al. (2016), the size of the acquiring country, the depth of its the financial market and presence of customers from acquiring countries in target countries positively impact both the probability and value of cross-border M&As; at the same time the geographic, psychic, and time zone distances between acquirer and target countries have negative impacts. All these elements should be carefully studied while designing a consolidation program involving foreign bidders.

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Annex: List of banking M&A deals in Vietnam

No.	Merged date	Acquirer	Target	Merged name
1	29/07/2011	LienViet Commercial Joint Stock Bank	Vietnam Postal Savings Service Company (VPSC)	Lien Viet Post Joint Stock Commercial Bank
2	26/12/2011	Saigon Joint Stock Commercial Bank (SCB)	First Joint Stock Commercial Bank (Ficombank)	Saigon Joint Stock Commercial Bank (SCB)
			VietNam Tin Nghia Commercial Joint Stock Bank (TinNghiaBank)	
3	28/08/2012	Saigon – Hanoi Commercial Joint Stock Bank (SHB)	Hanoi Building Commercial Bank (Habubank)	Saigon – Hanoi Commercial Joint Stock Bank (SHB)
4	30/09/2013	PetroVietnam Finance Corporation (PVFC)	Western Commercial Joint Stock Bank	Vietnam Public Joint Stock Commercial Bank (PVcomBank)
5	20/12/2013	Ho Chi Minh City Development Joint Stock Commercial Bank (HD Bank)	Dai A Commercial Joint Stock Bank	Ho Chi Minh City Development Joint Stock Commercial Bank (HD Bank)
6	01/04/2015	Vietnam Maritime Commercial Stock Bank (MSB)	MDB (Mekong Development Bank)	Vietnam Maritime Commercial Stock Bank (MSB)
7	02/02/2015	The State Bank of Vietnam	Vietnam Construction Bank (VNCB) *	Vietnam Construction Bank (VNCB), One Member Limited Liability Bank
8	25/04/2015	The State Bank of Vietnam	Ocean Commercial Joint Stock Bank *	Ocean Commercial One Member Limited Liability Bank (Ocean Bank)
9	25/05/2015	Joint Stock Commercial Bank for Investment and Development of Vietnam (BIDV)	Mekong Housing Bank (MHB)	Joint Stock Commercial Bank for Investment and Development of Vietnam (BIDV)
10	07/07/2015	The State Bank of Vietnam	Global Petro Commercial Joint Stock Bank (GP Bank) *	Global Petro Sole Member Limited Commercial Bank (GP Bank)
11	01/10/2015	Saigon Thuong Tin Commercial Joint-Stock Bank (Sacombank)	Phuong Nam Commercial Joint Stock Bank (Southern Bank)	Saigon Thuong Tin Commercial Joint-Stock Bank (Sacombank)

** These banks were bought by the State Bank of Vietnam at 0 VND, i.e. all the shareholders lost their rights in the banks and then changed from commercial banks to one-member limited liability banks.*

Appendices

(not destined for publication)

The appendices show the regressions where the influence of acquiring related variables is not statistically significant.

Robust Random-effects Least Squares Model - Takeovers and banking performance									
	<i>Assets Quality</i>					<i>Capital Ratios</i>			
	Loan Loss Reserves / Gross Loans	Loan Loss Provision / Net Interest Revenue	Loan Loss Reserve / Impaired Loans	Impaired Loans / Gross Loans	Impaired Loans / Equity	Equity / Total Assets	Equity / Net Loans	Equity / Customers & Short Term Funding	Equity / Liabilities
Acquiring									
Acquiring	0.658 (0.690)	1.351 (4.936)	7.332 (17.506)	-0.502 (0.758)	-0.722 (4.337)	-2.917 (2.810)	-4.620 (8.892)	-2.317 (4.356)	-2.237 (4.147)
Acquiring x Post-merger	2.354 (1.722)	1.840 (6.179)	-23.595 (19.458)	-2.574 (3.202)	4.292 (6.998)	0.340 (4.686)	-8.751 (22.502)	14.958 (10.846)	14.399 (10.513)
Ownership									
100% foreign-owned	0.125 (0.291)	-8.121** (3.300)	71.589 (47.684)	0.870 (1.422)	-4.578*** (1.380)	9.197 (7.039)	43.657 (34.219)	22.037 (21.086)	22.155 (20.547)
Joint-venture	0.902 (0.812)	12.856 (11.924)	30.364 (24.341)	13.679 (13.296)	1.366 (7.385)	2.361 (3.493)	1.222 (12.506)	-0.065 (13.884)	0.192 (13.326)
State-owned	2.192** (0.945)	21.135** (9.652)	-10.287 (18.098)	-4.263 (5.440)	35.105*** (10.865)	5.873 (3.888)	13.226 (15.981)	27.940* (16.496)	26.438* (15.890)
Control variables									
Bank size	-0.535* (0.301)	-2.809 (3.266)	9.026* (5.133)	2.377 (2.331)	1.176 (1.214)	-5.326*** (1.684)	-13.326* (7.057)	-16.932** (7.044)	-15.961** (6.815)
GDP growth rate	-0.445*** (0.098)	1.501 (2.501)	23.498*** (8.806)	0.577 (1.052)	2.547 (3.221)	-2.693*** (0.483)	-6.587** (2.809)	-7.901*** (2.355)	-7.366*** (2.342)
N	537	538	381	385	387	579	575	575	575
R-squared	0.0592	0.0387	0.0612	0.0407	0.171	0.428	0.202	0.263	0.261
Prob > chi2	0.0000	0.0000	0.0536	0.2690	0.0000	0.0000	0.0000	0.0004	0.0010

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Robust Random-effects Least Squares Model - Takeovers and banking performance

	<i>Assets Quality</i>					<i>Capital Ratios</i>			
	Loan Loss Reserves / Gross Loans	Loan Loss Provision / Net Interest Revenue	Loan Loss Reserve / Impaired Loans	Impaired Loans / Gross Loans	Impaired Loans / Equity	Equity / Total Assets	Equity / Net Loans	Equity / Customers & Short Term Funding	Equity / Liabilities
Acquiring									
Acquiring	0.304 (0.448)	1.294 (4.922)	3.035 (15.466)	-0.532 (0.800)	-1.028 (4.422)	-3.003 (2.908)	-5.764 (9.221)	-2.215 (4.604)	-2.147 (4.385)
Acquiring x Year 1 post-merger	5.696 (4.894)	-8.113 (11.742)	-43.531** (17.482)	0.169 (2.246)	13.119 (10.378)	-6.180 (9.901)	-38.455 (51.207)	5.213 (10.699)	5.099 (10.313)
Acquiring x Year 2 post-merger	0.359 (0.335)	-0.110 (6.031)	-33.093** (16.078)	-1.214 (2.292)	8.063 (10.020)	2.731 (2.760)	5.274 (10.425)	12.922 (8.745)	12.583 (8.420)
Acquiring x Year 3 post-merger	0.404 (0.372)	7.260 (7.775)	-22.053 (21.348)	-3.427 (3.359)	0.449 (8.968)	3.363 (3.225)	5.753 (12.941)	17.673 (11.389)	17.016 (11.001)
Acquiring x Year 4 post-merger	0.461 (0.348)	6.501 (8.027)	13.043 (33.250)	-4.880 (4.064)	-2.422 (5.775)	2.862 (3.734)	2.828 (15.258)	18.945 (13.294)	18.303 (12.878)
Acquiring x Year 5 post-merger	0.593 (0.384)	4.364 (7.536)	0.900 (20.382)	-5.235 (4.399)	-0.825 (5.348)	3.826 (4.191)	3.316 (17.552)	22.981 (14.997)	22.050 (14.583)
Acquiring x Year 6 post-merger	0.781* (0.460)	15.715 (11.482)	15.449 (27.924)	-6.030 (5.076)	0.113 (6.733)	3.235 (4.614)	0.833 (19.603)	24.357 (16.798)	22.994 (16.263)
Ownership									
100% foreign-owned	0.159 (0.235)	-8.202** (3.343)	72.624 (48.530)	0.895 (1.482)	-4.618*** (1.390)	9.261 (7.047)	43.522 (34.146)	22.011 (21.200)	22.133 (20.659)
Joint-venture	0.970 (0.910)	12.686 (11.941)	29.476 (26.241)	13.869 (13.492)	1.888 (7.851)	2.299 (3.461)	0.726 (12.366)	-0.209 (13.946)	0.055 (13.386)
State-owned	1.876** (0.788)	21.626** (9.818)	-4.694 (17.822)	-4.659 (5.612)	35.353*** (11.439)	6.281 (3.880)	14.693 (16.067)	28.304* (16.796)	26.781* (16.181)
Control variables									
Bank size	-0.396 (0.251)	-2.969 (3.270)	7.338 (5.311)	2.509 (2.389)	1.271 (1.247)	-5.442*** (1.651)	-13.778** (6.958)	-17.033** (7.126)	-16.057** (6.896)
GDP growth rate	-0.375*** (0.111)	1.289 (2.529)	22.176** (9.173)	0.726 (1.116)	2.920 (3.236)	-2.809*** (0.488)	-6.957** (2.876)	-8.062*** (2.451)	-7.517*** (2.438)
N	537	538	381	385	387	579	575	575	575
R-squared	0.0995	0.0406	0.0685	0.0409	0.174	0.437	0.214	0.265	0.262
Prob > chi2	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0014	0.0016

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Robust Random-effects Least Squares Model - Takeovers and banking performance

	<i>Operation/ Profitability</i>					<i>Liquidity</i>		
	Net Interest Margin	Net Interest Revenue / Average Assets	Other Operating Income / Average Assets	Non-Interest Expense / Average Assets	Non Operating Items & Taxes / Average Assets	Interbank Ratio	Liquid Assets / Deposits & Short-term Funding	Liquid Assets / Total Deposits & Borrowings
Acquiring								
Acquiring	-0.548 (0.655)	-0.514 (0.557)	0.336* (0.182)	0.305 (0.378)	0.034 (0.045)	36.292 (25.946)	2.331 (3.981)	0.654 (3.821)
Acquiring x Post-merger	-0.501 (0.499)	-0.560 (0.399)	0.051 (0.480)	0.931 (0.582)	0.112 (0.070)	-46.512* (27.538)	-1.863 (6.642)	-6.015* (3.577)
Ownership								
100% foreign-owned	0.292 (0.377)	0.569* (0.339)	0.596 (0.373)	0.667 (0.549)	-0.184 (0.123)	161.495** (44.390)	26.943*** (8.293)	14.225*** (4.546)
Joint-venture	-0.556 (0.483)	-0.229 (0.363)	1.072 (0.816)	0.983 (1.122)	-0.068 (0.085)	89.920* (46.229)	12.358 (9.311)	23.912* (12.879)
State-owned	0.877 (0.675)	0.760 (0.516)	0.773 (0.739)	2.304** (1.082)	0.115 (0.085)	20.061 (33.428)	18.217 (11.425)	8.188 (6.310)
Control variables								
Bank size	-0.420 (0.263)	-0.310 (0.192)	-0.352 (0.287)	-0.786** (0.380)	0.018 (0.027)	-10.906 (8.899)	-10.956*** (4.124)	-5.682*** (1.349)
GDP growth rate	-0.312** (0.132)	-0.242** (0.119)	-0.252 (0.260)	-0.756** (0.380)	-0.070*** (0.019)	-12.963 (10.000)	2.739 (2.108)	3.448*** (1.257)
N	574	574	572	574	515	528	575	471
R-squared	0.115	0.119	0.0727	0.152	0.110	0.129	0.275	0.274
Prob > chi2	0.0027	0.0006	0.1080	0.2080	0.0000	0.0001	0.0000	0.0000

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Robust Random-effects Least Squares Model - Takeovers and banking performance

	<i>Operation/ Profitability</i>					<i>Liquidity</i>		
	Net Interest Margin	Net Interest Revenue / Average Assets	Other Operating Income / Average Assets	Non-Interest Expense / Average Assets	Non Operating Items & Taxes / Average Assets	Interbank Ratio	Liquid Assets / Deposits & Short-term Funding	Liquid Assets / Total Deposits & Borrowings
Acquiring								
Acquiring	-0.528 (0.654)	-0.502 (0.556)	0.342* (0.189)	0.335 (0.383)	0.036 (0.046)	35.928 (25.971)	2.279 (3.991)	0.482 (3.832)
Acquiring x Year 1 post-merger	-0.853 (0.710)	-0.877 (0.559)	-0.229 (0.461)	0.557 (0.358)	0.137* (0.073)	-1.087 (51.621)	-2.279 (6.037)	-6.519* (3.807)
Acquiring x Year 2 post-merger	-0.714 (0.454)	-0.727** (0.358)	0.162 (0.402)	0.353 (0.418)	0.030 (0.155)	-62.717** (30.109)	-0.708 (5.943)	-3.566 (4.554)
Acquiring x Year 3 post-merger	-0.330 (0.596)	-0.429 (0.505)	0.160 (0.508)	0.997 (0.724)	0.156*** (0.059)	-62.816*** (26.627)	-0.782 (6.536)	-4.809 (3.651)
Acquiring x Year 4 post-merger	0.101 (0.759)	-0.054 (0.651)	-0.047 (0.571)	1.346 (0.858)	0.182** (0.071)	-52.827** (26.392)	-2.537 (8.185)	-6.923* (4.024)
Acquiring x Year 5 post-merger	0.009 (0.842)	-0.038 (0.735)	0.129 (0.685)	1.454 (0.977)	0.040 (0.076)	-70.054*** (26.401)	-2.533 (10.035)	-8.152 (5.100)
Acquiring x Year 6 post-merger	-0.354 (0.720)	-0.405 (0.577)	0.365 (0.784)	1.523 (1.038)	0.134 (0.130)	-51.590* (26.822)	0.661 (10.245)	-6.284 (5.859)
Ownership								
100% foreign-owned	0.308 (0.372)	0.582* (0.334)	0.595 (0.377)	0.663 (0.554)	-0.184 (0.123)	161.576** (44.527)	26.890*** (8.398)	14.197*** (4.563)
Joint-venture	-0.558 (0.480)	-0.233 (0.360)	1.077 (0.822)	0.988 (1.128)	-0.067 (0.086)	90.404* (46.374)	12.066 (9.357)	23.849* (12.947)
State-owned	0.912 (0.668)	0.799 (0.513)	0.790 (0.755)	2.331** (1.101)	0.115 (0.086)	19.200 (33.626)	18.521 (11.686)	8.290 (6.348)
Control variables								
Bank size	-0.429* (0.258)	-0.321* (0.189)	-0.358 (0.292)	-0.792** (0.386)	0.018 (0.028)	-10.585 (8.952)	-11.106*** (4.219)	-5.734*** (1.352)
GDP growth rate	-0.330** (0.131)	-0.259** (0.118)	-0.257 (0.267)	-0.773** (0.389)	-0.070*** (0.019)	-12.792 (10.241)	2.682 (2.195)	3.456*** (1.286)
N	574	574	572	574	515	528	575	471
R-squared	0.120	0.125	0.0733	0.152	0.111	0.131	0.275	0.274
Prob > chi2	0.0009	0.0002	0.0000	0.0017	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Robust Fixed-effects Least Squares Model - Takeovers and banking performance									
	<i>Assets Quality</i>					<i>Capital Ratios</i>			
	Loan Loss Reserves / Gross Loans	Loan Loss Provision / Net Interest Revenue	Loan Loss Reserve / Impaired Loans	Impaired Loans / Gross Loans	Impaired Loans / Equity	Equity / Total Assets	Equity / Net Loans	Equity / Customers & Short Term Funding	Equity / Liabilities
Acquiring									
Acquiring x Post-merger	2.687* (1.573)	13.439* (7.296)	-29.065** (13.298)	-3.423* (1.808)	5.666 (6.214)	-0.323 (3.728)	-11.707 (20.257)	14.033 (10.568)	13.518 (10.414)
Control variables									
Bank size	-0.572*** (0.209)	-10.359*** (3.563)	13.437*** (4.727)	3.040** (1.273)	0.481 (1.824)	-5.162*** (0.862)	-12.813* (6.922)	-16.614** (6.739)	-15.651** (6.671)
GDP growth rate	-0.468*** (0.123)	-2.979 (2.642)	23.758*** (8.050)	0.882 (0.641)	3.319 (3.606)	-2.539*** (0.465)	-6.067** (2.959)	-7.512*** (2.792)	-7.012** (2.743)
N	537	538	381	385	387	579	575	575	575
Adjusted R-squared	0.256	0.085	0.138	0.532	0.239	0.647	0.435	0.409	0.407
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0004	0.0353	0.0037	0.0794	0.4780	0.0000	0.0449	0.0041	0.0073

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Robust Fixed-effects Least Squares Model - Takeovers and banking performance									
	<i>Assets Quality</i>					<i>Capital Ratios</i>			
	Loan Loss Reserves / Gross Loans	Loan Loss Provision / Net Interest Revenue	Loan Loss Reserve / Impaired Loans	Impaired Loans / Gross Loans	Impaired Loans / Equity	Equity / Total Assets	Equity / Net Loans	Equity / Customers & Short Term Funding	Equity / Liabilities
Acquiring									
Acquiring x Year 1 post-merger	5.189 (3.692)	1.436 (10.601)	-44.557*** (15.927)	-0.356 (1.515)	13.514 (9.988)	-5.958 (8.289)	-37.570 (43.022)	5.688 (9.679)	5.521 (9.432)
Acquiring x Year 2 post-merger	1.211** (0.603)	7.165 (6.555)	-34.523** (13.780)	-1.731 (1.370)	8.679 (9.099)	1.919 (2.154)	2.205 (10.558)	12.077 (8.194)	11.798 (8.060)
Acquiring x Year 3 post-merger	1.363** (0.642)	20.035*** (7.260)	-25.654 (18.246)	-4.266** (1.925)	0.046 (8.483)	2.339 (2.361)	2.077 (12.978)	16.515 (10.873)	15.949 (10.696)
Acquiring x Year 4 post-merger	1.556** (0.715)	22.476** (8.714)	6.934 (30.368)	-5.942** (2.389)	-3.580 (7.355)	1.658 (2.752)	-1.732 (15.413)	17.855 (12.845)	17.309 (12.663)
Acquiring x Year 5 post-merger	1.852** (0.748)	19.238** (8.622)	-5.816 (18.067)	-6.412*** (2.471)	-2.013 (6.559)	2.762 (3.116)	-0.549 (17.560)	21.786 (14.527)	20.911 (14.367)
Acquiring x Year 6 post-merger	2.072** (0.819)	34.223** (13.926)	5.612 (25.776)	-7.362** (2.936)	-2.555 (8.666)	1.962 (3.518)	-3.838 (19.623)	22.640 (16.130)	21.323 (15.875)
Control variables									
Bank size	-0.522*** (0.187)	-10.709*** (3.598)	11.783** (4.785)	3.151** (1.291)	0.916 (1.841)	-5.234*** (0.851)	-13.210* (6.902)	-16.724** (6.795)	-15.755** (6.727)
GDP growth rate	-0.436*** (0.134)	-3.423 (2.702)	22.146*** (8.298)	1.033 (0.668)	3.814 (3.690)	-2.607*** (0.483)	-6.353** (3.083)	-7.681*** (2.886)	-7.168** (2.836)
N	537	538	381	385	387	579	575	575	575
Adjusted R-squared	0.265	0.078	0.128	0.531	0.231	0.647	0.435	0.404	0.402
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0161	0.0601	0.0000	0.0209	0.8250	0.0000	0.0385	0.0447	0.0730

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Robust Fixed-effects Least Squares Model - Takeovers and banking performance									
	<i>Operation/ Profitability</i>						<i>Liquidity</i>		
	Net Interest Margin	Net Interest Revenue / Average Assets	Other Operating Income / Average Assets	Non-Interest Expense / Average Assets	Pre-Tax Operating Income / Average Assets	Non Operating Items & Taxes / Average Assets	Interbank Ratio	Liquid Assets / Deposits & Short-term Funding	Liquid Assets / Total Deposits & Borrowings
Acquiring									
Acquiring x Post-merger	-0.534 (0.417)	-0.594* (0.341)	0.101 (0.280)	1.108*** (0.392)	-1.069* (0.544)	0.111 (0.072)	2.518 (26.626)	0.359 (7.354)	-5.230** (2.479)
Control variables									
Bank size	-0.415** (0.183)	-0.302** (0.138)	-0.401*** (0.137)	-0.822*** (0.209)	-0.623** (0.295)	0.018 (0.019)	-34.221*** (9.568)	-12.297*** (4.664)	-6.164*** (1.002)
GDP growth rate	- (0.110)	-0.230** (0.092)	-0.282** (0.127)	-0.776*** (0.196)	0.248** (0.115)	-0.070*** (0.016)	-23.535** (9.364)	2.201 (2.087)	3.237*** (1.160)
N	574	574	572	574	198	515	528	575	471
Adjusted R-squared	0.387	0.390	0.324	0.342	0.316	0.310	0.261	0.374	0.529
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0002	0.0001	0.0015	0.0007	0.0414	0.0000	0.0030	0.0000	0.0000

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Robust Fixed-effects Least Squares Model - Takeovers and banking performance									
	<i>Operation/ Profitability</i>						<i>Liquidity</i>		
	Net Interest Margin	Net Interest Revenue / Average Assets	Other Operating Income / Average Assets	Non-Interest Expense / Average Assets	Pre-Tax Operating Income / Average Assets	Non Operating Items & Taxes / Average Assets	Interbank Ratio	Liquid Assets / Deposits & Short-term Funding	Liquid Assets / Total Deposits & Borrowings
Acquiring									
Acquiring x Year 1 post-merger	-0.779 (0.643)	-0.823 (0.521)	-0.158 (0.366)	0.572 (0.522)	-0.691 (0.543)	0.137* (0.077)	26.106 (44.808)	-1.015 (6.345)	-6.029* (3.563)
Acquiring x Year 2 post-merger	-0.721** (0.356)	-0.737** (0.292)	0.157 (0.282)	0.534* (0.283)	-1.076* (0.595)	0.031 (0.150)	-27.130 (29.933)	0.892 (6.284)	-3.059 (3.819)
Acquiring x Year 3 post-merger	-0.346 (0.484)	-0.449 (0.415)	0.172 (0.300)	1.216*** (0.469)	-1.503** (0.609)	0.156*** (0.054)	-16.615 (26.792)	1.651 (7.375)	-3.985 (2.921)
Acquiring x Year 4 post-merger	0.117 (0.661)	-0.051 (0.572)	-0.029 (0.333)	1.647*** (0.545)	-1.968** (0.856)	0.179*** (0.061)	11.122 (27.549)	0.397 (9.402)	-5.967* (3.526)
Acquiring x Year 5 post-merger	-0.133 (0.743)	-0.166 (0.657)	0.230 (0.384)	1.687*** (0.629)	-1.604* (0.873)	0.038 (0.070)	-2.172 (28.468)	0.351 (11.312)	-7.117 (4.855)
Acquiring x Year 6 post-merger	-0.517 (0.631)	-0.552 (0.522)	0.478 (0.458)	1.781*** (0.654)	-1.551* (0.868)	0.130 (0.113)	28.411 (28.441)	3.355 (11.733)	-5.241 (5.512)
Control variables									
Bank size	-0.426** (0.184)	-0.312** (0.139)	-0.403*** (0.139)	-0.829*** (0.211)	-0.530* (0.283)	0.018 (0.019)	-34.181*** (9.629)	-12.332*** (4.706)	-6.177*** (1.013)
GDP growth rate	- (0.112)	-0.243** (0.094)	-0.285** (0.131)	-0.794*** (0.202)	0.271** (0.120)	-0.070*** (0.017)	-23.945** (9.664)	2.169 (2.154)	3.253*** (1.191)
N	574	574	572	574	198	515	528	575	471
Adjusted R-squared	0.383	0.386	0.318	0.337	0.311	0.305	0.255	0.368	0.523
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prob > F	0.0008	0.0006	0.0065	0.0183	0.1360	0.0000	0.0186	0.0000	0.0000

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

CHAPTER 5: GENERAL CONCLUSION

In this part, I will draw the main conclusions of my research concerning the transition process of the Vietnamese banking system. I will also propose policy recommendations that will help emerging countries to build an efficient and stable financial system.

5.1. Summary of results

Overall, the evolution of the Vietnamese banking system can probably be considered a success. Since 2011, the Vietnamese banking sector has had remarkable development, progressed further in international integration, particularly when a series of free trade agreements (FTAs) was signed. In addition to being a member of the World Trade Organization (WTO), Vietnam's joining the ASEAN Economic Community (AEC) and most recently its participation in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)³⁶ have opened numerous opportunities for its banks. The country's total credit grew more than five times in seven years since 2001, reached nearly 50 billion dollars in 2007³⁷. Between 2001 and 2012, the total assets of private commercial banks increased from 11% to 42% (Appendix 2, Chapter 2). State-owned banks, while remaining dominant, are becoming more and more privatized, 3 out of 4 have been listed. In total, there are currently 13 listed commercial joint stock banks (chapter 1).

Despite numerous successes in the reform process, it is inevitable that Vietnam has encountered some difficulties. As Meltzer (2012) has it said, capitalism doesn't work without

³⁶ Initially, the Trans-Pacific Strategic Economic Partnership (TPP) agreement was signed in February 2016, with 12 participating countries including Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, USA, and Vietnam. After the withdrawal of the United States in January 2017, the remaining 11 members (representing 13.4% of the global gross domestic product or \$13.5 trillion) were still trying to restore the TPP agreement. On 11 November 2017, 11 countries have agreed to rename TPP into the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). The formal signing ceremony was held on 8 March 2018 in Santiago, Chile. The agreement came into effect and began the first round of tariff reductions on 30 December 2018. The CPTPP holds most of the content of the TPP, but in the 8,000 pages of the original agreement, there are 20 clauses suspended, mostly related to intellectual property. For the financial services sector in the CPTPP, although it requires the provision of many opportunities for market access and cross-border investment, it ensures that the CPTPP countries have the capacity to control the market and financial institutions as well as to implement emergency measures in case of crisis.

³⁷ Annual Report 2007 – The State Bank of Vietnam

failure, since the market evolution brings about innovations with both breakthrough improvements in the productivity and unforeseeable corollary. In emerging markets and transition countries, even though the economic model is not totally capitalist, making the market more and more open necessarily entails some undesirable effects. In spite of constant impressive growth rates, according to the World Economic Forum (WEF) assessment in the Globe Competitiveness Report published annually, the financial market of Vietnam has always been ranked low. WEF's 2018 report shows that access to credit and the soundness of Vietnam's financial market development are low. In particular, the soundness of Vietnam banks ranked 113 over 140 countries, financial stability ranked No. 93. According to the same report, non-performing loans stood at only 2.3% of loan portfolio value, ranked No. 39, but the restructured debts that potentially become bad debts again remain high. This dissertation focuses on several lines of examination of the outstanding issues during the transforming process: (i) foreigners' impact on the banking performance; (ii) depositor discipline given the government's implicit bailouts; and (iii) mergers as a form of restructuring weak banks post-crisis.

We started with the question of whether the strategic partnership program that involves a strong foreign bank in a business relationship with a local bank was genuinely effective. In particular, this relationship is characterized by minor ownership of an internationally established foreign bank in a local bank (maximum 20% of shares). The findings are interesting. As opposed to the usual perception of superior performance associated with foreigners in emerging markets, we first find that the intended goal of the strategic partnership program was not met. Local banks participating in a strategic partnership with a foreign bank do not perform better. More specifically, neither the presence of the foreign executives nor the participation of foreign managers sent by the strategic partner has a positive impact on the local bank performance. Furthermore, evidence shows that only the presence of independent foreign executives or managers is associated with an improvement in banking performance.

Given the increasingly open market to non-domestic participants, foreign banks can now enter the Vietnamese banking market under their own names. Thus, these results can be seen as inefficiency in technology transfer caused by the conflicts of interest between local shareholders and the strategic partner. Our findings have potential policy implications for the ongoing regulatory reform. The evidence points out that strategic partnership is inefficient, whereas banks in emerging markets can benefit from foreign talent resources by directly employing them. This will also address a major challenge facing the banking system in emerging markets and transition economies - the limited quality of human resources (professionalism, foreign language skills) and the retention of talents, avoiding the shift of limited high-quality human resources to more developed countries. By employing experienced foreign experts instead of relying on ineffective partnership with foreign investors who seek profits above all, local banks can take advantage of available global human capital. When local banks have their own selection of high-quality foreign managers, they can exploit their expertise both in daily operations and in training new skills in compliance with international standards, thereby increasing the overall quality of these banks' human capital.

Along with the banking system reforms, policymakers are concerned about the reaction of banking clients, which are considered an important part of "market discipline". We then examined the effects of the government's implicit bailouts on depositor discipline, especially under the shock of the global financial crisis 2008. The study provides consistent evidence of depositors' sensitivity to interest rates, both before and after the crisis. Depositors also preferred safer banks, evidenced by a higher ratio of customer deposits in their total funding. However, after the crisis, depositors are substantially less responsive to a bank's risk. The results prove that depositor discipline has deteriorated after observing the government's implicit insurance; depositors assume that their money is always safe regardless of the risk the bank is taking.

The conclusion illustrates the problems associated with excessive deposit insurance and depositor discipline. Why proposing no viable solution to these problems, we suggest that future research involves further categorization of depositors' reaction to previous actions on bank runs emergence. Since each category may have different risk sensitivities and make different decisions facing a possible bank run, investigation by depositor categories, either under lab experiments or empirical study, may help design adequate measures that offset moral hazard and enhance the financial stability.

The last essay aims to provide an empirical examination of the banking restructuring by forced mergers. We observe financial constraints post-merger in acquiring banks, in particular, lower profitability, higher cost ratios, as well as inferior liquidity ratios. Furthermore, we remark prolonged negative financial consequences for acquirers. In terms of policy conclusions, our findings suggest that acquiring banks did not perform well post-mergers; hence it is doubtful if mergers of distressed banks provide potential benefits to the banking sector.

Nevertheless, the need to restructure the banking system remains relevant; we propose alternatives such as legal and financial facilities to handle bad debt problems. For example, the securitization of debts together with legal transparency will allow effective debts related transactions, providing liquidity and accelerating the process of dealing with bad debt. Besides, evidence has shown that local acquirers were not fully capable of restructuring another failed bank in addition to recovering themselves from the bad debts crisis. For the weakest banks that are still under restructuring requirement, increasing foreign ownership limits so that foreign banks can participate actively in redressing their financial and operational situation might be an advisable strategy. Moreover, these weakest banks are at the same time the smallest banks in the system; therefore, if the ownership is transferred to foreign investors, the proportion of local ownership over the whole banking system should remain dominant. The policymakers would certainly expect to carefully examine conditions for a successful cross-border merger, which involve cultural differences and regulatory barriers. Finally, for the long-term benefits of the banking system, the trade-off between growth and risk management should

be deliberately taken into account. Upgrading technology and integrating higher risk management standards are compulsory if banks plan for sustainable development.

5.2. Closing thoughts

Overall, this thesis has highlighted the key points in the non-performance of certain Vietnamese government's reforming policies: the strategic partnership program, the impact of implicit insurance on depositor discipline, and stabilizing the financial market by mergers of distressed banks. For the sake of future financial stability and sustainable growth in emerging markets, further studies on problems during the banking reform process should be conducted. I would like to end this dissertation with some thoughts related closely to my studies that I have not had occasion to treat within this thesis: stabilization of banking stock prices and the impact of banking fraud prosecutes on banking performance.

As stock markets in emerging countries are still small and lack a well-regulated legal framework, it is possible that individuals, companies manipulate to stabilize stock prices to seek rents. I would explore in more depth an intriguing pattern in the stock prices of Vietnamese banks: On many occasions, prices seem to stabilize, sometimes for several months and often around a round number. This occurs during episodes of low but non zero trading volumes and is often triggered by the arrival of negative news. Obviously, this behavior will harm the development of the stock markets. Comerton-Forde and Putniņš (2011) find evidence that closing price manipulation has a significantly detrimental effect on price accuracy, thus distorting market efficiency. Khwaja and Mian (2005) suggest that manipulation rents can account for almost half of total broker earnings the stock market of Pakistan. These large rents impede market reforms and as a consequence, emerging equity markets often remain marginal with few outside investors and little raised capital.

For the case of Vietnam, I interpret the price pattern around a seemingly targeted level with low but non-zero volume and that happens following bad news related to the banks as evidence of price stabilization by the controlling owners of these banks. It is unlikely that this

stabilization is originated from the authority. Turnovsky (1979) shows evidence that authority intervention based on past information will never succeed in improving the performance of an efficient futures market. In my study, a first effort will be to describe and quantify this behavior. In a second step, I will compare the occurrence of these episodes for banks and non-banks and finally explore in more depth the reasons for which in some banks prices are stabilized. Possible reasons can be size and risk management culture of the firms in question. Imisiker and Tas (2013) find evidence from the Istanbul Stock Exchange showing that small firms, firms with less free float rate and a higher leverage ratio are more prone to stock price manipulation. However, why this phenomenon occurs to banks only and not to non-bank enterprises is an interesting question for which I will try to find the reasons.

Another remarkable difference in Vietnam compared to developed countries is the severe sanctions against banking frauds, where numerous senior managers have been prosecuted. My research will aim to discover if the arrests of banking senior managers have positive effects on the financial markets in the context of failures of the preventive function of the regulatory system. I believe that in particular, this study can bring interesting results for the developed economies. Notably, in the global financial crisis, numerous systemic fraud scandals have led to far fewer lawsuits in the US and Europe than previous crises, such as the Savings and Loans crisis.

Bank fraud research finds that the main causes are weak organizational structure and political connections in countries where corruption prevails. Bougen and Young (2000) have shown that bank fraud is the origin of organizational failures as well as regulatory failures. Moreover, regulators mistakenly take into account the circumstances of the past failure in order to derive future political prescriptions. Cheng and Ma (2009) find that the main problem of bank fraud and corruption in China is the gigantic canvas of government officials, insiders of banks and criminal enterprises fraud. The rigor of Chinese law does not automatically make the fight against bank fraud more effective. Law enforcement and sanctions are not predictable and consistently applied to discourage fraud.

Serious consequences of frauds are not only in the value of the defrauded goods but also in the deterioration of the banking reputation and the confidence of the customers in the security of the banking system and the financial market. I will use legal documents to determine the level of sanction of fraudulent practices and cross these data with media sources to establish a relationship between the level of fraud and the repressive action of the public authorities. A detailed study of financial documents will allow analyzing the impact of fraudulent practices and sanctions on the financial health of banks.

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