EMPIRICAL ANALYSIS ON CAPITAL MARKET AND LISTED FIRMS IN VIETNAM

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(Degree)
博士（経済学）

(Date of Degree)
2015-03-25

(Date of Publication)
2017-03-25

(Resource Type)
doctoral thesis

(Report Number)
甲第6281号

(URL)
https://hdl.handle.net/20.500.14094/D1006281

December 22nd, 2014

EMPIRICAL ANALYSIS ON CAPITAL MARKET AND LISTED FIRMS IN VIETNAM

ベトナムにおける資本市場と上場企業の実証分析

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Acknowledgements

I wish to express my sincere gratitude to my Supervisor Professor Seiichi Fujita for his support, guidance and encouragement throughout the course of my studies. I highly appreciate his profound knowledge, experience and his comments regarding this dissertation. I am also deeply grateful to Professor Nobuaki Matsunaga for his support during my research and for his helpful comments on progress reports and logic of this dissertation. I was happy to be a part of his seminar group which helped me build up ideas of research and is socially enjoyable. I really benefited from his seminar. I am also thankful to Professor Koji Kawabata, a member of my dissertation committee for his helpful comments on econometric models.

I wish to thank Professor Nobuyuki Isagawa of Graduate School of Business Administrations- Kobe University and Professor Fumiharu Mieno of Center for Southeast Asian Studies- Kyoto University for their supports and helpful comments during my Master Course at Graduate School of International Cooperation Studies- Kobe University. My special thanks go to former Professor Robert D. Eldridge of Graduate School of International Public Policy – Osaka University who was the first person receive and accept me to be a student in Japan. I would like to thank him for his kindness, support and encouragement when I was a research student at Osaka University. My thanks also go to Pham Thi Thu Trang- PhD student at seminar of Professor Nobuaki Matsunaga for her comments and encouragements during my dissertation writing process.

I express my indebtedness to my parents and my sister for their trust, understanding and continuous spiritual supports for me. When I have no confidence in myself, they always believe and encourage me so much. They are strong motivation for me to accomplish this work.

Abbreviations

ADB	Asian Development Bank
Agribank	Vietnam Bank for Agriculture and Rural Development
BIDV	Joint Stock Commercial Bank for Investment and Development of Vietnam
FBBs	Foreign Bank Branches
FBs	Foreign Owned Banks
HNX	Hanoi Stock Trading Center
HOSE	Ho Chi Minh Stock Trading Center
IMF	International Monetary Fund
JSCBs	Joint Stock Commercial Banks
JVBs	Joint Venture Banks
NPLs	Non-Performing Loans
SBV	State Bank of Vietnam
SMEs	Small and Medium Enterprises
SOCBs	State Owned Commercial Banks
SOEs	State Owned Enterprises
VAMC	Vietnam Asset Management Company
Vietcombank	Joint Stock Commercial Bank for Foreign Trade of Vietnam
Vietinbank	Joint Stock Commercial Bank for Industry and Trade of Vietnam
WB	World Bank
WTO	World Trade Organization
IPO	Initial Public Offering

Summary

This dissertation explores the effects of capital market including credit market and stock market on listed firm performance and firm's behaviors in Vietnam using panel data analysis method. It consists of the following six chapters.

The first chapter gives introduction about the development and problems of Vietnam stock market and banking sector which are two main capital resources of listed firms. The second chapter investigates the impact of stock market liquidity on firm performance, the impact channel of liquidity on firm value and the role of foreign ownership in enhancing firm value. We apply random effect model and use financial statement data of 200 listed firms in Hanoi Stock Exchange (HNX) and Ho Chi Minh Stock Exchange (HOSE) during 2007-2011 to reveal research questions. We add three liquidity measures: Amihud illiquidity rate, total firm trading volumes and total market trading volumes at one lagged year; and other firm specific variables to evaluate the relationship between firm value and stock market liquidity. Amihud illiquidity rate is the key variable and constructed as the ratio of change in stock prices to total trading value. Higher illiquidity rate means lower liquidity of firm. The empirical results show that liquidity increase firm performance by reducing business risk. In addition, firms with over 30 percent of foreign ownership rate have higher liquidity, thus enhance firm value than those have lower 30 percent foreign ownership. We also find the different effects of firm business risk on firm value when taking lagged times at 1 year and 4 years. This suggests information asymmetry resulting from ineffectiveness of stock market. Thus, it comes to conclusion that market openness might benefit firm and improve stock market efficiency.

The third chapter focuses on analyzing the benefits of Vietnam stock market openness to listed firms. The research aims to reveal three questions: 1) Do market openness enhances firm value, investment and decrease cost of capital? ii) In which channels do firms benefit from market openness? iii) What characteristics appear to help firms benefit more from market openness and what is the role of financial market regulation in support to market openness? We apply foreign portfolio investment capital inflows as stock market openness proxy to respond the research questions. Other firm-specific variables such as leverage, profitability and dividend are added in the model as control variables. The percentage of stock market capitalization and credit market depth to GDP are used to proxy financial market development. The research applies dynamic panel data model with GMM estimation and uses data of 210 listed firms in HNX and HOSE during 2009-2013 periods. The advantage of GMM estimation is to solve endogeneity problem between

dependent and explanatory variables. The results indicate that market openness contributes to decrease cost of capital and enhance firm value in short and long-term. It also reveals the impact channel of market openness through increasing stock returns of firm and decreasing returns volatility. Moreover, it emphasizes the importance of market regulation and investor's protection in absorbing more foreign capital inflows.

The fourth chapter studies the corporate responses to banking sector crisis occurred since 2010 in Vietnam. The research applies fixed effect model and uses data of 202 listed firms in both HNX and HOSE during 2009-2012 periods. This chapter reveals that firms tend to decrease investment, increase cash reserves for hedging and use trade credit measured by accounts payable to total debt ratio as substitution capital resource during crisis. However, bank relationship firms do not increase trade credit as they are ensured by stable capital resources from bank. We also find that firms change its capital structures by decreasing bank loans and increasing equity debt issuance in response to credit supply shock of commercial banks. Though, the coefficients are small.

The last chapter reviews banking sector reforms and introduces banking reform index of Vietnam. The context of bad loans crisis of banking system has motivated stronger reform in banking sector since 2012. In March 2012, State Bank of Vietnam responded to bank crisis by announcing restructuring of credit institutions in the 2011-2015 period that focused on action in 2014 by setting standards for net capital requirements, restructuring financial institutions' operations and management, promoting the merging and integration of financial institutions.

In attempt to provide quantitative assessment on bank sector reforms in Vietnam, we apply financial reform index constructed by Abiad, Detragiache and Tressel (2007). The index tracks seven dimensions of financial reforms over 60 countries over the period 1973-2002: i) the credit controls, reserve requirement dimensions and aggregate credit ceilings that account for the restrictiveness of reserve requirements, the existence of mandatory credit allocations set by SBV, quantitative restrictions on bank credit and the existence of subsidized credit schemes; ii) the interest rate controls dimension measures the extent to which deposit and lending rate are market determined or are restricted by ceiling rates issued by SBV; iii) banking sector entry barriers dimension tracks entry restrictions in entry of foreign banks and other financial sectors into domestic market; iv) the bank privatization dimension measures the extent to which bank assets are controlled by private owners rather than government; v) the banking sector supervision dimensions consider the adoption of the Basel capital regulation and a number of characteristics of bank supervisory system; vi) the financial account transactions dimension measures restrictions in both capital inflow and outflow and the unification of exchange rate system; vii) the securities market

dimension tracks reforms that foster the development of government and corporate bond markets as well as equity market. Because available dataset only covers the period 1973-2005, we supplement data from 2009 to 2013 by coding each dimension based on the method of Abiad et al. In each dimension, a higher score indicates a higher degree of domestic financial reform. We ranged each dimension score between 0 and 1. Total financial reforms index is average of seven dimensions.

Financial reform index increased from 0.36 point in 2001 to 0.45 point in 2003 after the Vietnam-Unites States Bilateral Trade Agreement has been signed in 2001. Reform index was constant at 0.45 point during 2004-2007 and dropped to 0.40 point in 2008 due to impacts from stock market bubble burst and high inflation rate. The index recovered to 0.55 point in 2009 as a result from reconstruction in stock market and foundation of Banking Supervisory Agency under the management of SBV. In addition, reform index is expected to positively related to corporate borrowings. In 2014, Vietnam banking reform index was at 0.50.

Chapter 6 gives policy implication towards stock market openness and banking sector reforms by enlarging the market entry to foreign banks and enhancing state owned commercial banks' equitization process to improve effectiveness of capital market and mitigate firm's vulnerability.

Keywords: stock market liquidity, stock market openness, firm performance, cost of capital, banking sector crisis, trade credit, cash holdings, capital structure, banking reform index

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Chapter 1: Introduction

1.1. Background

1.1.1. Capital Supply Side

Due to the corporate bond market still being underdeveloped, Vietnamese listed firms have chosen to raise capital from two main capital markets. One is short-term and long-term borrowing loans from the banking sector and the other is issuance of equity capital from the stock market. Thus, the research focuses on revealing the development as well as current problems of the Vietnamese banking sector and stock market.

Capital market plays a crucial role in economic growth. A well-functioning and stable capital market contributes to enhancing efficient allocation of capital resources and provides for investors best investment opportunities that suit their preferences of risks and returns. The development of the capital market has strategic importance in economic development in Vietnam as it not only supplements corporate capital resources to sustain momentum of economic growth but also provides diverse financial resources and solutions to facilitate the needed structural reforms of the financial system and state owned enterprises (SOEs).

Since the launch of the economic reform policy *Doi Moi* in 1986, Vietnam's economy has been transforming from a centrally planned economy into a market-based economy and implementing the market openness gradually. In association with economic transformation, capital market has achieved some initial development with foreign banks' entry into the domestic financial market and formation of joint stock commercial banks (JSCBs) during 1990s. However, the capital market structure was unbalanced in that it mainly was dependent on credit from banking sector and the majority of credit resources came from four biggest state owned commercial banks (SOCBs). Banking sector credit has expanded rapidly since 2000. The total credit of the banking sector accounted for 59 percent of GDP in 2004 and increased significantly by 123 percent in 2009 after Vietnam joined the WTO in 2007. SOCBs have dominated market shares of banking sector and allocated approximately 60 percent of total banking sector supplied credit in 2009 and 69 percent in 2010. In addition, 45 percent of SOCBs' total loans were channeled to SOEs in 2000 and it dropped by 34 percent in 2004 (WB's Vietnam capital market report, 2006; WB's data).

Besides the problems of hot credit growth, concentration and ineffective credit allocation of SOCBs, Vietnam's banking system also has faced other problems related to uncertainties in law and

contract enforcement and the lack of human and institutional capacity. As a result, public confidence in the banking system remains weak and contains hidden risks. Since the end of 2010, the banking system has experienced a serious system crisis resulting from the large number of bad loans of inefficiently operated SOEs. In addition, commercial banks whose credit was lent to real-estate firms or to other firms to finance investment projects into the stock market had the highest number of bad loans due to the collapse of bubble prices in stock market in 2008 and the frozen real-estates market since 2006. The non-performing loans rate (NPLs) of total banking system reached 3.4 percent in 2011 and 4.67 percent in 2013 (KPMG's Vietnamese banking system report, 2013). Credit growth decrease started in March 2011 as the result of State Bank of Vietnam (SBV)'s monetary tightening policy by raising policy rate by 14.5 percent. SBV also implemented other policies including limiting lending to non-manufacturing sectors such as real-estate, capping deposit rates at 14 percent to control high inflation rates and high credit growth in 2011. In response to SBV's policy, the yield curve became inverted which reflected a decline in banking system liquidity. In step with the decline in liquidity, the 1-month interbank lending rate rose to 30-40 percent in October 2011 while the overnight rate was as least 7 percent at the end of June 2012 (Kadomae, 2012). Deposit rate cap policy also negatively influenced on domestic banks capital, thus raised average lending rate by 18 percent in 2011 and 17.8 percent in 2012.

Vietnam's economy remained unstable with an average inflation rate of about 18 percent in 2011. In attempt to cope with this economic turmoil, the Vietnamese government announced socio-economic development plan Resolution No.01/NQ-CP in January 2012 with the following targets: i) keeping inflation below 10 percent, ii) shrinking the budget deficit to 4.8 percent of GDP and shrinking the trade deficit to 12 percent of total exports, iii) raising the amount investment equivalent to one-third of GDP, iv) raising economic growth from 6 to 6.5 percent. SBV responded to the government's request by issuing the following banking sector reform plans in March 2012 with the main targets including enhancing SOCBs' equitization, limiting NPLs rate of SOCBs to 3 percent based on Vietnam's accounting standard, improving risk management ability and recapitalizing bank adequate capital to meet Basel II by 2015. The implementation schedule was divided into four phrases and will be completed in 2015 in which 2014 was emphasized as an action year[1].

Looking back at the 1990s when the First Law on Companies and Private Enterprises was passed and SOEs were first equitized, Vietnam's capital market actually became more diversified

[1] See "On the restructuring of credit institutions in the 2011-2015 period" at luatvn.net/Filedownload/122142/132319/en_254_qd_ttg.doc

with the formation of the Ho Chi Minh Stock Trading Center (HOSE) in July 2000. There were only 21 listed firms with total market capitalization equivalents to 110.67 million U.S. dollars by December 2001 and 173.73 million U.S. dollars by June 2003 (ADB's Vietnam capital road map, 2003). After Hanoi Stock Trading Center (HNX) was established in 2005 and Law on Securities as well as Law on Enterprise became effective in 2006, securities exchange transactions in Vietnam stock market became more active. By December 2014, the total number of listed firms in both stock exchange markets were 672 firms (307 in HOSE and 365 in HNX) and total market capitalization by the end of 2013 was approximately 46 billion U.S. dollars accounting for 32 percent of GDP (HOSE and HNX's data; StoxPlus's media news).

Table 1-1: Summary of Vietnam stock market during 2005-2012 period

	2005	2006	2007	2008	2009	2010	2011	2012
No. listed firms HOSE	28	86	123	155	203	279	309	314
No. listed firms HNX	13	101	128	184	259	356	385	398
Capitalization HOSE (bil.USD)	46.4 mil	9.8	22.7	9.7	26.7	30.3	21.7	31.5
Capitalization HNX (bil.USD)	Na	4.5	8.1	2.9	6.7	7.3	4.2	4.1
VN index	307.5	633.05	927.02	313.62	494.77	484.66	351.55	399.71
HNX index	91.03	242.84	323.55	105.12	168.17	114.24	58.74	55

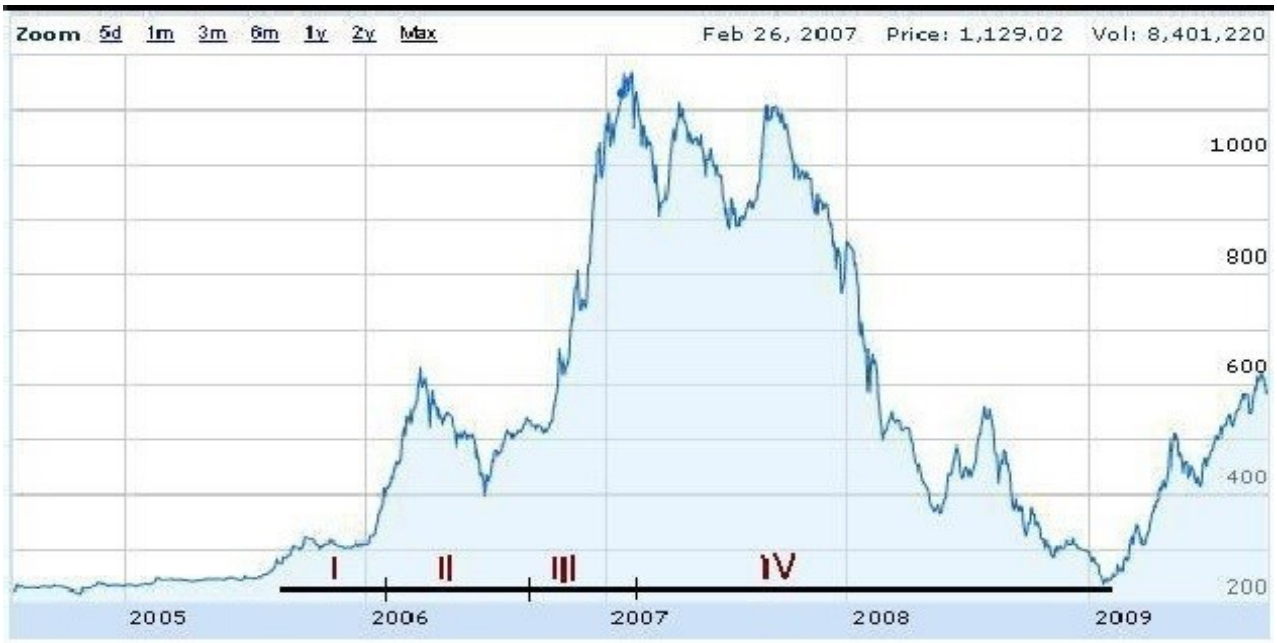
Source: summarized by author based on data of Stoxplus[2]

The movement of the VN-index was very volatile during 2006-2008 and this time was also the forming, developing and exploding of the biggest boom of the stock market. The stock market boom started forming in 2006 due to a series of government's decisions issuances such as Decision 528 for approving the list of SOEs being on the way of listing and doing transactions on the stock market; Decision 189 for establishing independent Securities Depository and Decision 238 for raising the percentage of ownership of foreign investment up to 49 percent. As a result, the number of listed firms increased and the number of investor rose as well. According to the State Securities Commission, about 90 percent of investors were individuals. The VN-index climbed from 300 points at the beginning of 2006 to 600 points in April 2006. As the psychological speculation completely dominated domestic investors and attracted them to follow optimistic assessments, the VN-index reached its record peak at 1.170 points in March 2007 that marked the boom period of stock market. After that, the VN-index fluctuated during 2007-2008 and fell to 235.18 points in February 2009. Two reasons of bubble crash were considered that the financial crisis and economic turmoil in the U.S and other European countries affected investors' psychology and more

[2] Exchange rate was calculated based on data of Vietcombank on December 31st of each year

importantly from the domestic inflation control policy of government resulting in a large flow of money into the stock market. The government instructed banks to stop lending to people and companies to speculate on shares and to stop selling shares that they had received as collateral that strongly affected investors' psychology.

Figure 1-1: VN-index from 2006 to 2009



Source: Sacombank securities company

1.1.2. Capital Demand Side

The number of listed firms in Vietnam stock market is 672 firms (307 in HOSE and 365 in HNX) by December 2014. As in table 1-2, market capitalization of listed firms to GDP increased by year except 2008 and 2011. Banking sector with only 9 listed banks in both HOSE and HNX has largest market capitalization approximately 11 billion U.S. dollars by 2014. The second and third market capitalizations belong to consumer goods and financials sector at 10.5 and 10 billion U.S. dollars. Although ranked No.1 on market capitalization, banking sector has lowest ROA ratio while ROA ratio of consumer goods sector is highest. Among 11 sectors, health care sector has highest foreign ownership rate at 33 percent. Oils & Gas, technology and consumer goods also attract foreign investors more than other those.

According to reports at Workshop about macroeconomic challenges, difficulty in liquidity of the economy and solutions for enterprises at Hanoi in 2012, due to decline in domestic demands on goods and services as well as tightening monetary policy of government in 2011, listed firms'

performance became worse and asset liquidity decreased considerably. In the first Quarter of 2012, 57.6 percent of listed firms had total debt to asset ratio over 0.5 while 70 percent of listed firms had weak capacity to cover interest expenses. This situation resulted to 35.2 percent of listed firms belonging to "distress zone" that was headed to bankruptcy based on Z-score bankruptcy index. Moreover, the number of listed firms had the ratio of inventories to working capital over 1 accounting for 44.7 percent at the end of 2011. These numbers reflected financial difficulties of listed firms in particular and firms in general in Vietnam in the context of economic downturn and unstable capital market.

Table 1-2: Market capitalization of total listed firms (% GDP)

Year	Market capitalization of total listed firms (% GDP)
2005	0.9%
2006	14.90%
2007	27.50%
2008	10.60%
2009	23.10%
2010	17.60%
2011	13.50%
2012	21.10%
2013	31%
2014	32%

Source: WB, financial news media

Table 1-3: Sector summary in Vietnam stock market by December 2014

Industry	Market capitalization	ROA	ROE	Foreign holdings
Banks	$10,944,709,738	0.90%	10.20%	17.10%
Basic Materials	$3,753,464,419	7.80%	15.20%	12.90%
Consumer goods	$10,544,147,940	13.20%	19%	26.10%
Consumer services	$790,730,337	7.10%	11.50%	6%
Financials	$10,092,462,547	4.70%	15.70%	16.90%
Health Care	$815,028,090	14%	21.40%	33%
Industrials	$4,738,483,146	6.50%	10.10%	10.20%
Oil & Gas	$1,509,363,296	9.30%	21.90%	29.70%
Technology	$1,455,430,712	9.70%	26.20%	28.70%
Telecommunications	$3,183,521	1.60%	3.10%	---
Utilities	$7,689,466,292	19.30%	29.30%	6.20%

Source: stoxplus.com[3]

1.2. Research framework

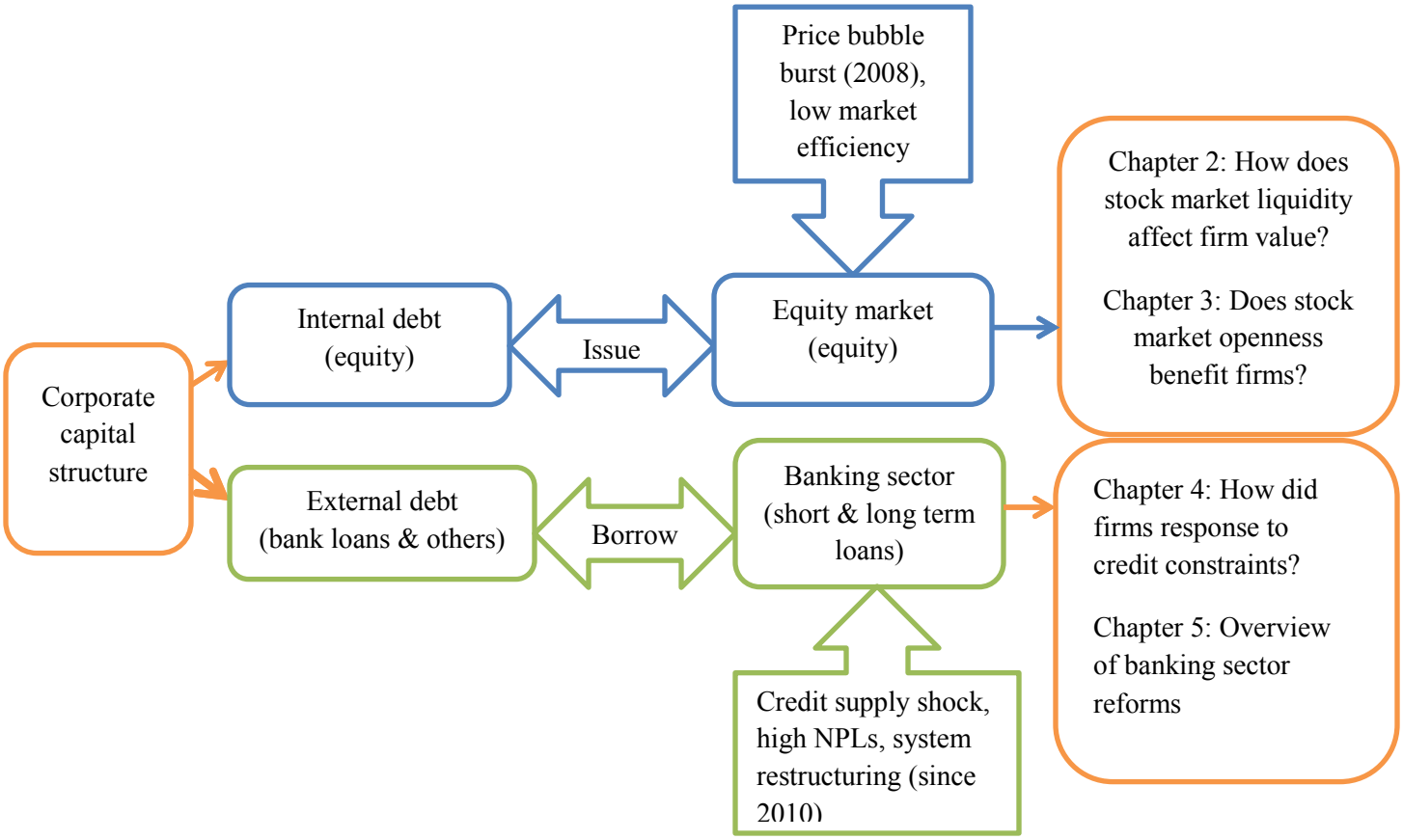


Figure 1-2: Research framework and research objectives

According to balance sheets of financial statements, corporations raise fund from two sources: internal debt including equity capital and external debt including short term debt (borrowings, trade credit and others) and long term debt (borrowings, tax liabilities and others). Thus, the stable development of equity market and banking sector as the capital supply side is crucial meaning to corporate operations. If two markets are abnormal, they will affect directly cost of capital of firms. Our research is conducted in the context that both markets exposed the weakness in the system: stock market experienced price bubble in 2007, market crash in 2008 then "bear market" during

[3] Market capitalization is calculated in U.S. dollars based on exchange rate at December 19th 2014 of Vietcombank

2009-2012 periods; banking sector has experienced bad loans crisis since the end of 2010 and now is on the process of system restructuring.

Since problems of capital market and banking sector exposed in short 5 years, how did ineffective capital market affect firms? And how did firms respond to credit crisis? The research focuses on revealing these questions and proposing solutions from market perspectives. It is composed of 4 chapters that evaluate: ① the impact of stock market and foreign ownership on firm value in chapter 2; ② the benefits of stock market openness to firm value, firm investment and cost of capital in chapter 3 ③ responses of corporations to credit constraints during banking crisis period in chapter 4 and ④ review Vietnam banking sector reforms process as solution for banking crisis in chapter 5.

We apply panel data analysis method and use the annual financial statement data of 200~210 non-financial and non-real estate listed firms in both HOSE and HNX from January 2007 to December 2013[4] to clarify research objectives above. The data collection process is random. Stock trading data and banking sector data are downloaded from websites of securities trading companies and domestic commercial banks. Macroeconomic data and financial indexes are collected from data set of WB, IMF and other financial institutions.

1.3. Research contribution

Our study has five distinct features that differentiate it from existing studies. First, while most relevant research on Vietnam focuses on analysis at macroeconomic-level data, our dissertation pays attention to firm-level analysis and provides empirical evidence on impacts of the imperfect capital market on firm as well as solutions to reduce the ineffectiveness of market. Second, to our knowledge, we are the first to study the causal effect of Vietnam banking sector crisis on domestic corporate investment, provision behaviors as well as decision on funding resources using firm-level data. The reason is that although banking crisis occurred since the end of 2010, relevant works on its effect were not as much as expected due to limitation of obtainable data. Moreover, due to banking sector reforms as the effective solution for the banking system crisis are now in the process of implementation, it is difficult to assess accurately and completely crisis's effect. Third, our dissertation is the first to provide empirical evidence on the benefits of stock market openness to listed firms with the newest market and firm-level data in Vietnam. Recent relevant research that was conducted by Vo Xuan Vinh (2010) with Vietnamese firm-level data during 2007-2009 periods only shown which firm characteristics foreign investors have preference to invest in the stock

[4] See Appendix 2 for statistic descriptions of sample data

market. The other relevant research of Linh Nguyen and Nhung Le (2013) focused on the impact of foreign portfolio flows on Vietnamese stock market volatility during 2005-2011 periods but not listed firms. Fourth, we collect and construct some proxies to measure directly liquidity as well as openness to foreign investors for individual firms. This makes our evaluation more accurate than applying general financial market indexes. Fifth, while previous works focus only credit market or stock market, our research combines analysis of the effects of both external debt issuance market (banking sector) and internal equity issuance market (stock market) on corporate value and corporate behaviors.

Chapter 2: Stock market liquidity and firm performance

2.1. Introduction

It is well known that emerging financial markets are not liquid as those of advanced economies. The lack of liquidity is regarded as a key factor for high volatility in asset prices in stock market and a significant obstacle to stock market development. Many policies to enhance market liquidity including raising foreign ownership rate for institutional investors, strengthening market intermediaries and completing legal and regulatory framework have been implemented in emerging market. The stock market with abundant liquidity contributes to create more capital resources for economic activities and corporate operations.

There are strong theoretical reasons to suspect that liquidity positively affects firm value. Because the tradability of stock which commands both cash flow and control rights plays important role in the governance, capital resource and performance of firms. Amihud (2002) shows that market liquidity positively affects stock excess returns, especially in small firm stocks. Fang et al. (2009) investigate the causal effect of liquidity shocks on firm performance and demonstrate that firms with higher stock liquidity have better performance. Wang et al. (2009) analyze the effects of firm-specific characteristics on stock returns and find that firms with higher risk, lower liquidity and higher returns volatility have significant lower returns on stocks.

In comparison with other South East Asian economies such as Singapore, Thailand and Malaysia, Vietnam is considered as a later-developing country in the process of transition from a state-controlled economy to a market-based economy. The establishment of HOSE in 2000 was expected to become an efficient capital raising channel for firms. After 6 years of stagnation, the stock market experienced bubble growth in 2007. The bubble burst in 2008 leading to a considerable drop in VN-index from 927 points to 313 points. This reflected the inefficiency of stock market in managing and supervising trading activities as well as the lack of information transparency. The worldwide financial recession resulting from the collapse of Lethman-Brothers investment bank in the United States made the stock market's performance worse in 2008. As the number of listed firms has been increasing significantly by year, the stock market downturn is considered to affect negatively firm value. In addition, in last haft of 2009 and 2010, Vietnam faced the bankruptcy of large SOEs and bad debt of banking system that influenced strongly on economic

performance. The existence and operation of firms in economy downturn context became more difficult.

The aims of this chapter are: i) to investigate the effect of liquidity on firm performance, ii) to understand how liquidity affects firm performance; iii) to examine the role of foreign ownership rate in enhancing market liquidity as well as firm value. This chapter is constructed as following: 2.2 introduces Amidud's liquidity index and prior studies on firm value and stock market liquidity, 2.3 describes data and variables construction, 2.4 reports empirical results and 2.5 gives some remarking conclusions.

2.2. Literatures review

This section introduces some typical liquidity measures and gives literatures review on the relationship between stock liquidity and firm value.

Measurement of stock market liquidity varies in prior researches depending on market evaluation objectives such as market depth, breadth, tightness, immediacy or resiliency. Liquidity measures can be classified into four categories: 1) transaction cost measures that capture the cost of trading financial assets in a secondary market and the disparity in bid and ask prices is applied to measure transaction cost; 2) volume-based measures that evaluate the depth and the breadth of market; 3) price-based measures that capture movements toward equilibrium prices to evaluate the resiliency of the market; and 4) market-impact measures that evaluate the difference in price movements due to degree of liquidity from other factors in order to measure both resiliency and speed of price discovery (Sarr and Lybek, 2002).

Amihud (2002) introduces illiquidity rate as calculated by the ratio of change in stock prices to total trading volumes. A high illiquidity rate indicates low liquidity of a firm in stock market. Amihud demonstrates that a firm with a high illiquidity rate has low stock returns and illiquidity's effect is stronger in small firm stocks. The findings in the research of Fang et al. (2009) show that stocks with high liquidity have better performance as measured by market to book ratio. The reason is that liquidity increases the information of the market prices and of performance-sensitive managerial compensation. Wang et al. (2009) prove that stocks with higher liquidity have higher stock returns in stock market crashes. The linkage of liquidity and firm value is that liquidity positively affects stock returns, thus raises firm market value because it minimizes the change in trading prices and maximizes trading volumes. Vinh (2010) applies volume-based liquidity measures to investigate the impact of liquidity on stock returns in Vietnam stock market from 2006 to 2010. The results supported to prior researches about the positive impact of liquidity on stock

returns.

Instead of using intraday bid-ask spread to measure market liquidity as in many previous researches, we apply Amihud illiquidity rate in consideration of obtainable data and proxy calculation. Because it is impossible to calculate intraday bid-ask spread without professional calculation software. In addition, the advantage of Amihud illiquidity rate index is that it combines both transaction cost- measures and volumes-based measures.

2.3. Data and variables construction

2.3.1. Data

The research uses data of 200 non-financial and non-real estate listed firms in the HOSE and HNX from January 2007 to December 2011. We obtain annual financial statement data from websites of Ban Viet Securities Company and daily stock prices data from the websites of FPT Securities Company. All samples are divided into 5 main industry groups based on Vietnamese Standard Industrial Classification 2007 (VSIC 2007) issued by the General Statistics of Vietnam.

Table 2-1: Industrial classification

Industry	Number of firms
Manufacturing	109
Service	58
Construction	7
Information and communication	18
Mining and quarrying	8
Total	200

Note: The service industry is composed of 5 service supply-based industries. They are retail- wholesale- trade, accommodation and food service, administrative and support service, transportation and storage, utility (divided based on VSIC 2007)

2.3.2. Variables construction

Three liquidity measures are applied in this paper: annual average illiquidity rate of each stock, total trading volumes of each stock in one trading year and total trading volumes of stock market in one lagged trading year. Illiquidity rate is calculated following Amihud's method which is defined as the ratio of change in stock prices to market turnover in absolute value. The formula is as below:

$$ILLIQ_{iy} = 1/\ D_{iy} \times \sum_{t=1}^{D_{iy}} |R_{iyd}|\ /\ VOL_{iyd}$$

where $|R_{iyd}|$ is returns of stock i in day d of year y in absolute value. VOL_{iyd} is respective daily trading volumes in *Dongs*. D_{iy} is number of trading days of stock i in year y. Illiquidity rate implies that a firm with less stock prices fluctuation to total trading volumes has higher market liquidity. To construct Amihud illiquidity rate, firstly we calculate daily illiquidity rate of each stock in one trading year in absolute value. Then we exclude zero trading volume day from the sample. Lastly, we took the average value of the daily illiquidity rate in one trading year of each stock. As shown in table 2-2, average illiquidity rate ranges from 2.99E-07 to 15.87 with a mean value of 0.15 that implies a large disparity in liquidity of stocks.

In studying the association between firm performance and stock liquidity, a proxy for Tobin's Q based on Kaplan and Zingales (1997) is used as key measure for firm market performance. Proxy for Q has been used as a measure for firm performance in enormous number of studies. Q is defined as the ratio of market capitalization to book asset value of firm measured at one fiscal year. Market capitalization is computed by multiplying trading price of a stock at the end of trading year to total number of issued outstanding shares in one trading year. The book asset value is computed as total assets minus total debts in one fiscal year. Following Fang et al. (2009), we also include OIOA to measure firm asset performance. OIOA is the ratio of earnings before interest, taxes, depreciation and amortization (EBITDA) to book value of asset measured at a firm' fiscal year end. Q-ratio ranges from 0.11 to 16.96 with a mean value of 1.59 and OIOA ranges from -0.42 to 8.31 with a mean value of 0.36.

The control variables of this study included firm-specific characteristics variables such as leverage rate, firm size, number of employees and operating income risk. Leverage rate is used as control variable in most previous researches to evaluate the financial health of company. High leverage rate implies default risk, thus is supposed to negatively affect firm performance. Firm size and number of employees are included to examine scale-effect on firm performance. And it is supposed to positively affect firm performance. As one of determinants of firm performance, operating income risk is added as explanatory variable. It is defined as the standard deviation of quarterly earnings before interest and taxes (EBIT) divided by quarterly book value of assets and measured at least 3 quarters prior to the end of fiscal year.

Volatility is applied as a measurement for information asymmetry in stock market. It is calculated as standard deviation of daily returns of one stock in one trading year. High returns volatility indicates strong asymmetric information, thus it is expected to diminish firm value. Ownership rate is included to consider corporate governance effect on firm performance, especially

the role of foreign ownership in enhancing firm value. Ownership rate is defined as the percentage of foreign owned shares and state owned shares to total shares. Foreign ownership rate has mean value of 10.67 while state ownership rate has higher mean value of 28.66. Industry dummy variables and year dummy variables are added to consider industry effect and year effect on firm performance. We add only manufacturing and service industry into model as sample of other industries is small. 2008 year represented for stock market crash year and 2010 year represented for banking system crisis year, thus are expected to negatively affect firm performance.

Table 2-2: Variables definition and summary statistics

Variables	Definition
LEV	Ratio of total debt to total asset measured at the end of fiscal year
lnEMP	Number of employees of firm in logarithm
lnSIZE	Total assets minus total debts measured at the end of fiscal year
FOR	Percentage of foreign shareholders
GOV	Percentage of government shareholders
RISK	Standard deviation of the ratio of quarterly earnings before interest and taxes (EBIT) to quarterly book asset value
MANU	Manufacturing industry dummy variable
SER	Service industry dummy variable
Year2008	Year dummy variable
Year2010	Year dummy variable
AVEILL	Average illiquidity rate measured in one trading year. AVEILL is defined as the ratio of change in daily stock prices to total daily trading volumes of each stock at absolute value
lnFIRMVOL	Total trading volumes in logarithm of each stock in one trading year
lnMARKET_1	Total trading volumes in logarithm of stock market in one trading year
Volatility	Standard deviation of daily stock returns of each stock in one trading year
Q-ratio	Ratio of market value to book asset value at the end of fiscal year. Market value is computed as trading price at the end of trading year multiply total issued outstanding shares in one trading year. Book asset value is computed as total asset minus total debt at the end of fiscal year.
OIOA	Ratio of earnings before interest, taxes, depreciation and amortization (EBITDA) to book asset value at the end of fiscal year

Variable	Obs	Mean	Std. Dev.	Min	Max
LEV	992	0.45	0.22	0.01	0.92
lnSIZE	1000	26.02	1.38	20.28	30.29
lnEMP	1000	6.23	1.22	3.22	9.43
FOR	1000	10.67	14.15	0.00	49.00
GOV	1000	28.66	23.06	0.00	82.95
RISK	866	0.11	1.16	0.001	28.03
VOLATILITY	862	3.36	1.24	-3.20	19.48
MANU	1000	0.55	0.50	0.00	1.00
SER	1000	0.30	0.46	0.00	1.00
YEAR2008	1000	0.20	0.40	0.00	1.00
YEAR2010	1000	0.20	0.40	0.00	1.00
AVEILL	873	0.15	0.78	2.99E-07	15.87
lnFIRMVOL	884	39.54	3.21	21.71	48.42
lnMARKETVOL_1	999	33.11	0.44	32.61	33.70
QRATIO	918	1.59	1.55	0.11	16.96
OIOA	1000	0.36	0.40	-0.42	8.31

2.3.3. Methodology

The research applies random effect model[5] to assess whether stock liquidity improves, diminishes or does not affect firm performance. *QRATIO* and *OIOA* are regressed on liquidity variable and several firm-specific characteristics variables. All regression models are run with robustness to correct heteroskedasticity. The based specification model is defined as below:

$$Performance_{it}=\beta_0+\beta_1 AVEILL_{it}+\beta_2 lnFIRMVOL_{it}+\beta_3 lnMARKETVOL_{t-1}+\sum_{j=1}^{j=J}\gamma_i\, Control_{itj}+\varepsilon_{it}$$

where *Qratio* and *OIOA* are dependent variables and measured for firm performance of firm *i* in year *t*. Measures of stock market liquidity composes average illiquidity rate *AVEILL* of firm *i* in one trading year *t*, total trading volumes *lnFIRMVOL* of firm *i* in one trading year *t* and total stock market trading volumes $lnMARKETVOL_{t-1}$ in one lagged trading year *t*. $Control_{itj}$ is set of control variables. It includes firm size *lnSIZE*, number of employees *lnEMP*, leverage rate *LEV*, percentage of state ownership *GOV*, percentage of foreign ownership *FOR*, operating income *RISK*, stock returns *VOLATILITY* of firm *i* in year *t*, industry dummy variables *MANU* and *SER* to control for industry effect and year dummy variable *Year2008* and *Year2010* to control for year effect of stock

[5] We applied Breusch-Pagan test to determine between OLS and random effect model. Null hypothesis of no random panel effect was rejected because p-value is smaller than significant level 0.05. Thus, random effect model is more appropriate

market crash and banking system crisis, respectively. ε_{it} is error term.[6]

2.4. Empirical results

2.4.1. Liquidity and firm value

Table 2-3 presents random effects model estimates. Model (1) and (2) are regressed on firm performance *QRATIO*. Manufacturing and service dummy variables are included in model (1) to investigate the impact of industry on firm performance. Year dummy variables are included in model (2) to investigate the effect of stock market crash in 2008 and banking system crisis in 2010 on firm performance. Model (3) and model (4) are regressed on firm performance *OIOA*. Industry dummy variables are added in model (3) and year dummy variables are added in model (4).

Under the control of firm-specific characteristics variables, regression results of model (1) indicate positive impact of liquidity on firm value. Higher illiquidity rate decreases firm value about 15 percent while a rise in firm trading volumes increases firm market value approximately 0.001 units. Contrast to firm trading volumes effect, an increase in stock market trading volumes in one lagged year decreases firm value about 0.01 units. It is explained as speculators raised market liquidity with short selling strategies that lead to the losses for firm due to stock market crash in 2008 (Goldstein and Guembel, 2008). The negative effect of stock market crashes in 2008 on firm value in model (2) makes explanation more obvious. Banking system crisis in the late of 2010 does not decrease firm value as expected. It might benefit from demand stimulation policy of government implemented in 2009 that lead to slight recovery of stock market in 2009 and first half of 2010. HNX launched online transaction system since February 2010 with selected companies while HOSE applied a matching order market pricing system that allowed investors to buy or sell stocks at the best price currently available since July 2010. The operation of new transaction systems contributed to boost market trading volumes that might increase firm performance.

In model (1), firms with higher foreign ownership rate enhance firm market value about 3.3 percent in comparison with domestic firms. It is because foreign director boards tend to be proactive to information disclosure, thus increase investor confidence to firm (Lars and Trond, 2002). Firms with high state-ownership rate increase slightly firm market value about 0.7 percent. The difference in coefficients implies a fall in investor's confidence due to bankruptcy of large SOEs in 2009. Operating income volatility enhances firm market value due to overvaluation of investors resulting from information asymmetry. Model (2) reports similar results on negative effect of illiquidity rate

[6] Correlation matrix of variables is reported in table 1-1 of Appendix 1

on firm value.

Table 2-3: Effects of liquidity, ownership rate, information asymmetry on firm value

	Panel A: Random effects regression model			
Dependent variable	QRATIO (1)	QRATIO (2)	OIOA (3)	OIOA (4)
AVEILL	-0.152	-0.210	-0.007	-0.006
	(0.042)***	(0.055)***	-0.006	-0.006
lnFIRMVOL	0.088	0.058	0.0003	0.008
	(0.037)**	(0.039)	(0.003)	(0.004)*
lnMARKETVOL_1	-0.907	-1.294	0.026	0.075
	(0.087)***	(0.131)***	(0.013)**	(0.022)***
lnSIZE	-0.27	-0.273	-0.058	-0.068
	(0.093)***	(0.098)***	(0.022)***	(0.023)***
lnEMP	0.046	0.055	0.085	0.085
	(0.046)	(0.049)	(0.025)***	(0.024)***
LEV	0.061	-0.019	0.505	0.504
	(0.326)	(0.336)	(0.057)***	(0.058)***
GOV	0.007	0.008	0.002	0.003
	(0.003)***	(0.003)***	(0.0007)***	(0.0007)***
FOR	0.033	0.032	0.001	0.001
	(0.006)***	(0.006)***	(0.001)	(0.001)
RISK	0.028	0.022	-0.004	-0.003
	(0.007)***	(0.009)**	(0.002)***	(0.002)**
VOLATILITY	-0.005	0.020	-0.0004	-0.001
	(0.044)	(0.042)	(0.003)	(0.003)
MANU	-0.224		-0.056	
	(0.197)		(0.073)	
SER	-0.014		-0.048	
	(0.214)		(0.071)	
Year2008		-0.845		0.011
		(0.074)***		-0.012
Year2010		0.338		-0.059
		(0.094)***		(0.017)***
Cons	34.405	48.327	0.191	-1.508
	(2.994)***	(4.155)***	(0.489)	(0.689)**
R-squared	0.2	0.26	0.37	0.37
Observations	854	854	854	854

Note: Table 2-3 shows random effects model with *Qratio* and *OIOA* as dependent variable. Definitions of variables are in table 2-2. Standard errors are displayed in parentheses and adjusted for heteroskedasticity. (***), (**), (*) indicate significance at 1 percent, 5 percent and 10 percent two-tailed level respectively.

A negative sign of firm size on firm market value implies that small firms have higher performance than large firms. It is explained as a fall in investor's confidence to large SOEs resulting to undervaluation of stocks of large firms. Stock returns volatility does not mitigate firm value as expected. In addition, industry dummy variables are statistically insignificant.

To gain further insight into impact of liquidity on firm performance, we add *OIOA* measuring for firm performance as dependent variable. The regression results are shown in model (3) and (4) in table 2-3. Firm illiquidity rate and trading volumes do not significantly affect *OIOA* in model (3) while only firm trading volumes raise firm performance slightly in model (4). In contrast, stock market trading volumes increase firm performance about 0.0003 units in model (3) and 0.001 units in model (4). The results are statistically significant though the coefficients are small.

The coefficient of state ownership rate is positive and significant at 1 percent level in model (3) and (4) while foreign ownership rate does not play a role in enhancing firm performance as the coefficient of *FOR* is not significant. The higher income risk decreases firm performance about 0.04 percent. The coefficient of *RISK* is significant at 1 percent level. The difference in sign of coefficient *RISK* between model (1) and model (3) implies information asymmetry.

Some coefficients of control variables in model (3) and (4) are significant. The coefficient of leverage rate *LEV* is positive and significant at 1 percent. This suggests that higher leverage is correlated with higher firm performance which is consistent with the findings of Bhandari (1988) that higher leverage ratio induces higher expected returns on stocks. Larger firms have lower performance while firms with more employees tend to have higher performance. The coefficients are statistically significant at 1 percent. The results are similar to model (4) when including year dummy variables.

In summary, we find that firms with higher liquidity have better firm market value. Stock market trading volumes affect negatively firm market value and positively firm asset value at one lagged year. A raise in foreign ownership rate increases firm market value *QRATIO* but does not increase firm asset value *OIOA*. Stock returns volatility representing for information asymmetry does not explain the change in firm performance.

2.4.2. Reverse causality of liquidity and firm performance

An alternative explanation of for regression results is that high Qratio firms tend to be good quality company and sought by institutional investors. Liquidity is high because institutional investors trade these stocks resulting in reserve causality. In addition, an unobservable correlated with both stock market liquidity and firm performance may be present and could make coefficient estimates biased. For example, high quality managers may tend to manage companies with more liquid stocks. High quality managers would also result in high firm performance. In this case, manager quality is unobservable and correlated with both liquidity and firm performance. Thus, stock liquidity will be positively correlated with firm performance, however better firm performance is not due to liquidity.

We apply two-stage least squares to control endogeneity. One benefit of this method is that the unobservable does not have to be constant across time. We use one lag of illiquidity rate *AVEILL_1* as exogenous variables to solve possible reserve causality that are correlated with liquidity but uncorrelated with error terms. The use of illiquidity rate in one lagged year as exogenous variable helps mitigate concerns that an unobservable is correlated with stock market liquidity and firm performance in year *t*. Coefficient estimates of first stage and second stage least squared regression are shown in table 2-4.

At first stage squared equation, *AVEILL_1* is used as exogenous variable. Market trading volumes and risk are significant at 1 percent level. At second-stage regression model, *AVEILL_1* is used as instruments. The results are similar to the results estimated in the GLS results. The coefficient on illiquidity is negative and statistically significant at 1 percent level in the model with *QRATIO* as dependent variable. Similarly, the coefficient of illiquidity rate in the model using *OIOA* as dependent variable is not significant. In the other word, liquidity only affects in firm market value and do not affect in firm asset value measured. We also applied instrumental variable *lnFIRMVOL_1* to test the endogeneity of firm trading volumes and firm market value. Unexpected, the results are not significant in two-stage least squared regression, thus we do not report the results in the paper. In conclusion, the results are robust when using two-stage least squared.

Table 2-4: Reverse causality control

Panel B: Two stage least squares			
	First-stage	*Second-stage*	
Dependent variable	AVEILL (1)	QRATIO (2)	OIOA (3)
FIT_AVEILL		-0.299	0.014
		(0.110)***	(0.027)
AVEILL_1	-0.037		
	(0.033)		
lnFIRMVOL	0.010	0.083	-0.003
	(0.008)	(0.013)***	(0.004)
lnMARKETVOL_1	-0.347	-0.403	0.021
	(0.081)***	(0.067)***	(0.018)
lnSIZE	-0.084	-0.138	-0.066
	(0.058)	(0.048)***	(0.015)***
lnEMP	-0.049	-0.021	0.093
	(0.030)	(0.053)	(0.017)***
LEV	-0.095	0.486	0.555
	(0.157)	(0.193)**	(0.059)***
GOV	0.0005	0.006	0.003
	(0.0009)	(0.002)***	(0.0007)***
FOR	0.006	0.027	0.002
	(0.005)	(0.004)***	(0.001)
RISK	0.153	0.065	-0.009
	(0.006)***	(0.033)**	(0.009)
VOLATILITY	-0.006	0.026	-0.004
	(0.036)	(0.023)	(0.006)
MANU	0.013	-0.032	-0.044
	(0.056)	(0.134)	(0.046)
SER	0.146	0.043	-0.040
	(0.122)	(0.153)	(0.052)
Cons	13.754	14.300	0.612
	(3.666)***	(2.378)***	(0.636)
R-squared	0.12	0.10	0.38
Observations	680	680	680

Instrumented: AVEILL

Instruments: lnFIRMVOL lnMARKETVOL_1 lnSIZE lnAGE LEV GOV FOR RISK VOLATILITY MANU SER AVEILL_1

Note: Table 2-4 shows random effects model with *Qratio* and *OIOA* as dependent variable. Definitions of variables are in table 2-2. Standard errors are displayed in parentheses and adjusted for heteroskedasticity. (***), (**), (*) indicate significance at 1 percent, 5 percent and 10 percent two-tailed level respectively.

2.4.3. How did liquidity influence firm performance?

In this section, we run several tests to investigate the mechanism through which liquidity affects firm performance. As Fang et al (2009) presented in their research, liquidity may improve firm performance by: making prices more informative to stakeholders (Khanna and Sonti, 2004), permitting more effective contracting on stock price regarding management compensation contracts (Holmstrom and Tirole, 1993), allowing non-blockholders to intervene and become blockholders by buying shares (Maug, 1998), inducing an overvaluation on firm value of irrational investors (Baker and Stein, 2004).

2.4.3.1. Stock prices positive feedback hypothesis

We follow the hypothesis about price positive feedback of Khanna and Sonti (2004) to examine impact channel of liquidity on firm value. It is supposed that high business risk induces low liquidity of stock due to under-reaction of investors, thus decreases firm value. We will test this hypothesis by considering the relationship of income volatility and liquidity. Prior researches such as Zhang (2006) and Berkman, Dimitrov, Jain (2009) also use income volatility as proxy of business risk. First, we construct *RISK* variable as standard deviation of quarterly operating incomes of firm *i* in one year. Nextly, *RISK* is divided into 3 levels from high to low risk levels in which 30 percent of firms belongs to top risk, 30 percent belongs to medium risk and 30 percent belongs to bottom risk. Lastly, *RISK* variable is replaced with dummy variable *D_RISK_H* where *D_RISK_H* equals 1 if stock is in the top of 30 percent risk and equals 0 if stock is in the medium and bottom of risk. And interaction of illiquidity rate *AVEILL* and dummy high risk *D_RISK_H* is added in regression model. Similarly, we also make interaction of firm trading volumes *lnFIRMVOL* and dummy high risk *D_RISK_H*.

Table 2-5: Testing for positive feedback hypothesis

Panel C: Random effects regression model				
Dependent variable	QRATIO (1)	QRATIO (2)	OIOA (3)	OIOA (4)
AVEILL	-0.135		-0.006	
	(0.039)***		(0.006)	
AVEILL x D_RISK_H	-0.125		-0.014	
	(0.056)**		(0.011)	
lnFIRMVOL		0.085		0.0002
		(0.037)**		(0.003)
lnFIRMVOL x D_RISK_H		0.002		0.004
		(0.003)		(0.001)***
lnMARKETVOL_1	-1.039	-0.874	0.025	0.026
	(0.073)***	(0.086)***	(0.013)**	(0.013)**
lnSIZE	-0.149	-0.264	-0.056	-0.056
	(0.061)**	(0.091)***	(0.020)**	(0.022)***
lnEMP	0.037	0.058	0.084	0.084
	(0.046)	(0.047)	(0.025)***	(0.025)***
LEV	0.043	0.061	0.510	0.499
	(0.314)	(0.325)	(0.058)***	(0.056)***
GOV	0.007	0.007	0.002	0.003
	(0.003)***	(0.003)***	(0.0007)***	(0.0008)***
FOR	0.029	0.032	0.001	0.001
	(0.006)***	(0.006)***	(0.0010)	(0.0010)
RISK	0.050	0.0001	-0.001	-0.007
	(0.011)***	(0.004)	(0.003)	(0.001)***
VOLATILITY	0.007	-0.010	-0.0004	-0.0007
	(0.043)	(0.043)	(0.003)	(0.003)
MANU	-0.285	-0.223	-0.056	-0.057
	(0.204)	(0.199)	(0.073)	(0.074)
SER	-0.108	-0.030	-0.049	-0.049
	(0.226)	(0.212)	(0.071)	(0.071)
Cons	39.229	33.221	0.199	0.156
	(2.944)***	(2.949)***	(0.517)	(0.477)
R-squared	0.19	0.20	0.37	0.37
Observations	855	859	855	859

Note: Table 2-5 shows random effects model with *Qratio* and *OIOA* as dependent variables. Definitions of variables are in table 2-2. *D_RISK_H* is dummy variable that equals one if firm belongs to 30 percent of top high *RISK* and 0 otherwise. Standard errors are displayed in parentheses and adjusted for heteroskedasticity. (***), (**), (*) indicate significance at 1 percent, 5 percent and 10 percent two-tailed level respectively.

The interaction of illiquidity rate *AVEILL* and dummy high risk *D_RISK_H* is added in model (1) and (3). The estimated results in model (1) with dependent variable *QRATIO* support to positive feedback hypothesis that firms with higher business risk have lower liquidity inducing a decrease about 12 percent in firm performance. The coefficient of interaction variable in model (3) with dependent variable *OIOA* is not significant. In contrast, the coefficient of *lnFIRMVOLxD_RISK_H* in model (4) with dependent variable *OIOA* is significant and indicates that higher business risk increase stock trading volumes leading to a slight rise in firm performance. The result reflects overreaction of investors to stocks due to information asymmetry. We do not examine pay-for-performance sensitivity hypothesis and block-holder intervention hypothesis due to lack of data.

2.4.4. Foreign ownership rate and firm performance

In this section, we test the hypothesis that market openness expressed by the rate of foreign owned shares may improve firm performance through reducing illiquidity rate. Oxelheim et al. (2002) indicate that firms have significantly higher performance if they have outside board members. Black et al. (2006) conduct the research on Korean corporations and conclude that corporate governance is an important factor in explaining market value of public firms. The research also indicates that firms with better governance have higher market value.

As supported by prior works, we make up a high foreign ownership rate dummy variable *D_FOR_30* that equals one if firms have over 30 percent foreign ownership rate and equals zero if firms have less than 30 percent foreign owner ship rate. We choose 30 percent to measure high foreign ownership rate as foreign ownership rate cannot exceed over 49 percent following investment laws number 59/2005/QH12. The interaction of illiquidity rate *AVEILL* and dummy variable *D_FOR_30* implies that firms with high foreign ownership rate have lower illiquidity rate leading an increase in firm performance. The results are shown in table 2-6. In model (1) with dependent variable *QRATIO*, firm with over 30 percent foreign ownership rate has higher liquidity and increases firm market value about 12 percent. The estimated coefficient is statistically significant at 5 percent level. We do not find the evidence of foreign boarding in raising operating incomes *OIOA* in model (2). We add interaction of firm trading volumes and foreign ownership rate *lnFIRMVOL x D_FOR_30* in the model but the results are not significant, thus are not reported in the table 2-6.

Table 2-6: Foreign shareholders and firm performance

Panel D: Foreign shareholders and firm performance		
Dependent variable	QRATIO (1)	OIOA (2)
AVEILL	-0.202	-0.014
	(0.055)***	(0.008)
AVEILL x D_FOR_30	0.119	0.013
	(0.057)**	(0.008)
lnMARKETVOL_1	-1.047	0.024
	(0.073)***	(0.013)*
lnSIZE	-0.150	-0.056
	(0.060)**	(0.021)***
lnEMP	0.036	0.084
	(0.046)	(0.025)***
LEV	0.062	0.507
	(0.312)	(0.057)***
GOV	0.007	0.002
	(0.003)***	(0.0007)***
FOR	0.029	0.001
	(0.006)***	(0.001)
RISK	0.040	-0.003
	(0.010)***	(0.002)
VOLATILITY	0.009	-0.0002
	(0.043)	(0.003)
MANU	-0.283	-0.056
	(0.204)	(0.073)
SER	-0.108	-0.050
	(0.226)	(0.071)
Cons	39.544	0.229
	(3.001)***	(0.523)
R-squared	0.19	0.37
Observations	855	855

Note: Table 2-6 shows random effects model with *Qratio* and *OIOA* as dependent variable. Definitions of variables are in table 2-2. *D_FOR_30* is a dummy variable that equals 1 if firm has over 30 percent of foreign ownership rate and 0 otherwise. Standard errors are displayed in parentheses and adjusted for heteroskedasticity. (***), (**), (*) indicate significance at 1 percent, 5 percent and 10 percent two-tailed level respectively.

In conclusion, firms have high foreign ownership rate may be evaluated as good governance and well managed firms. Thus, stocks of these firms may be overvalued leading a high stock returns

and high trading volumes. Consequently, high liquidity rate raise firm market value measured by Q ratio.

2.4.5. Lag-effects and firm performance

Based on the positive signs of *RISK* on firm performance measured by Qratio in table 2-3, we assume that there exists overreaction of investors to stocks when the market is less informative. To test this assumption, we construct *RISK_1* and *RISK_4* that measured incomes volatility at one and four lagged years then regress on firm performance measured by Qratio. As shown in table 2-7, the effects of operating incomes volatility *RISK* on Q-ratio is positive at 1 lagged year but negative at 4 lagged years. The coefficients are significant at 1 and 10 percent. We interpret the opposite results as resulting from information asymmetry in stock market. When the information of listed firms is not reflected accurately in the stock market, investors tend to overreact to stocks in short run, thus increase its market value. But in long run overreaction tends to be reduced and stock prices will be adjusted following the decreasing expectation of investors.

Table 2-7: Lag-effects on firm performance

Panel E: Lag-effects on firm performance		
	RISK 1-Lagged Year	RISK 4-Lagged Years
Dependent variable	QRATIO (1)	QRATIO (2)
AVEILL	-0.145	-0.136
	(0.042)***	(0.035)***
lnFIRMVOL	0.08	0.092
	(0.034)**	(0.037)**
lnMARKETVOL_1	-0.945	-0.83
	(0.083)***	(0.086)***
lnSIZE	-0.248	-0.293
	(0.091)**	(0.092)***
lnEMP	0.044	0.063
	-0.047	-0.049
LEV	0.031	-0.066
	-0.315	-0.339
GOV	0.008	0.007
	(0.002)***	(0.003)**
FOR	0.033	0.032
	(0.006)***	(0.006)***
RISK_1	0.032	
	(0.017)*	
RISK_4		-0.052
		(0.006)***
VOLATILITY	0.003	0.004
	-0.043	-0.051
MANU	-0.233	-0.254
	(-0.201)	(-0.218)
SER	-0.041	-0.036
	(-0.217)	(-0.238)
Cons	35.403	32.26
	(2.882)***	(3.132)***
R-squared	0.22	0.2
Observations	818	768

Note: Table 2-7 shows random effects model with *Qratio* and *OIOA* as dependent variable. Definitions of variables are in table 2-2. Standard errors are displayed in parentheses and adjusted for heteroskedasticity. (***), (**), (*) indicate significance at 1 percent, 5 percent and 10 percent two-tailed level respectively.

2.4.6. Robustness tests

We apply OLS and fixed effect model to test robustness of the models. As shown in table 2-8, the effects of liquidity on firm value in model (1) when running OLS regression are not different from those of random effect model. Firm with lower liquidity affected negatively firm value about 12 percent. We also check robustness with fixed effect model but most of dummy variables omitted and overall R-squared value is very low. Through, the effects of liquidity on firm value are not different from random effect model. The results in model (3) and (4) also support for the choice of random effect model in our research.

Table 2-8: Robustness tests with OLS and fixed effect model

	Panel F: OLS regression		Panel G: Fixed effect	
Dependent variable	QRATIO (1)	OIOA (2)	QRATIO (3)	OIOA (4)
AVEILL	-0.121	0.003	-0.18	-0.003
	(0.075)*	-0.007	(0.035)***	-0.006
lnFIRMVOL	0.04	0.004	0.16	0.014
	(0.021)*	(0.002)*	(0.047)***	(0.008)*
lnMARKETVOL_1	-1.4	0.08	-0.393	0.125
	(0.122)***	(0.027)***	(0.157)**	(0.048)***
lnSIZE	-0.147	-0.054	-2.049	-0.137
	(0.058)**	(0.010)***	(0.227)***	(0.079)*
lnEMP	0.052	0.067	-----	-----
	-0.042	(0.013)***		
LEV	-0.362	0.674	-1.034	0.222
	-0.053	(0.049)***	(0.509)**	-0.156
GOV	0.008	0.003	-----	-----
	(0.002)***	(0.0004)***		
FOR	0.029	0.002	-----	-----
	(0.004)***	(0.0005)***		
RISK	0.021	0.001	0.011	-0.004
	-0.015	-0.003	-0.009	(0.002)**
VOLATILITY	0.036	-0.003	0.01	-0.001
	-0.045	-0.006	-0.046	-0.003
MANU	-0.289	-0.047	----	-----
	(0.175)*	-0.04		
SER	-0.121	-0.06	----	-----
	-0.182	-0.038		
Year2008	-0.865	0.008	-1.111	-0.003
	(0.102)***	-0.022	(0.095)***	-0.019
Year2010	0.377	-0.049	-0.089	-0.088
	(0.090)***	(0.028)*	-0.123	(0.029)***
Cons	49.49	-1.801	62.355	-0.844
	(4.140)***	(0.909)**	(5.804)***	-1.179
R-square	0.28	0.38	0.01	0.06
Observations	813	815	813	815
Number of groups			200	200

Note: Table 2-8 shows OLS and fixed effect models with *Qratio* and *OIOA* as dependent variable. Definitions of variables are in table 2-2. Standard errors are displayed in parentheses and adjusted for heteroskedasticity. (***), (**), (*) indicate significance at 1 percent, 5 percent and 10 percent two-tailed level respectively.

2.5. Conclusion

We conduct some empirical tests to evaluate the impact of stock market liquidity on firm value. We find that firm liquidity increases firm performance by reducing capital cost while excess market trading volumes decrease firm performance in one lagged year. It is explained as stock market crash in 2008 induced a decrease in market liquidity and affected negatively stock returns. In addition, lag-effects of incomes volatility imply inefficiency of market when stocks' information was not accurately reflected in the stock market leading mispricing of stocks.

We find that firms with over 30 percent foreign ownership rate have higher liquidity and better performance than other firms. It benefits from foreign participation in stock market that contributed to improving market liquidity and management ability of domestic firms. As corporate governance became more efficient, it improved quality of corporate information provided to investors, thus enhanced investor's confidence to firm and contribute to a raise in stock returns. Based on these findings, we suggest stock market openness as the solution to improve market efficiency.

Chapter 3: Do firms benefit from foreign portfolio investment capital inflows? An analysis of listed firms in Vietnam stock market during 2009-2013 using dynamic panel data model with GMM estimation

3.1. Introduction

Recent researches have studied the effect of financial market openness in economic performance. They argue that capital account liberalization enhance market efficiency by increasing liquidity, analyst and auditing quality and mitigating agency problems, cost of capital. While opposite views concentrate on the risk of capital inflows volatility and the spread of currency crises due to weak investor protection (Lemmon and Lins, 2003) and small absorptive capacity of developing countries (Prassad et al., 2003), thus suggest the market openness process should be implemented slowly. Edison et al. (2004) review the prior empirical evidences and demonstrate that the debates may be resulting from different measures of capital account liberalization in different literatures. Controversial results also reflect the difficulty in identifying and quantifying the capital account with wide set of countries data. Quinn and Toyoda (2008) support the view and prove that measurement error, different time periods use and collinearity among independent variables account for conflicting results.

Previous researches have studied the benefits from financial market openness based on a large number of panel data set of both developed market and developing market. Most of developing countries are big emerging markets such as India, Brazil, China and Korea. Some smaller markets are Chile, Peru, Turkey, Thailand and Malaysia. One of disadvantages of researches on small markets is limitation of data. In addition, Prassad et al. (2003) emphasize the risk of capital inflows management ability of governance and institutions in developing countries.

Based on financial market open index issued by Chinn and Ito (2002), among Southeast Asia countries, Malaysia, Thailand, Indonesia and Philippines are ranked next to Singapore with not completely full openness degree. The early research of Ghazali et al. (2008) was conducted with data set of Indonesia, Korea, Malaysia, Philippines, Singapore and Thailand and concluded that stock market development influenced the real sector in all countries except Indonesia and only

Malaysian stock market development show the gain from market openness. For all other countries, the effects are mixed and vary depended on openness measures.

3.1.1. Why financial market openness matters in Vietnam

Vietnam financial market is considered to be less developing than Thailand and Malaysia in Southeast Asia region. It is similar to Thailand in the early development period, Vietnam government has implemented financial market openness gradually with limitation of foreign ownership rate under 49 percent of legal capital of non-financial firms, under 15 percent of legal capital of credit institutions and under 30 percent of legal capital of commercial banks by the end of 2013 (according to Decree No.69/2007/ND-CP and No.55/2009/QD-TTG of the Premier and official document No.1266/UBCK-PTTT of the State Securities Commission). The bad loans crisis of domestic commercial banks since the end of 2010 has pushed government under higher pressure of financial system reform for more efficiency and higher management ability. Decree No. 01/2014/ND-CP of Premier was issued in January 2014 as a solution for financial system reform by enlarging foreign owned room by 20 percent of legal capital of credit institutions. In an attempt to mobilize the market, stronger market openness policy is considered as to enlarge more owned room for foreign investors in non-financial sector till 60 percent. Nevertheless controversy on the risk of volatility of short term capital flows to equity market and the loss of autonomy of domestic financial institutions, openness to financial market is evaluated as necessary policy to enhance market efficiency.

If it is supposed that financial market openness induce economic growth and financial development, one may be concerned about whether domestic firms can benefit from market openness. This becomes our research motivation and the paper will focus on three related questions:

i) Do foreign portfolio investment inflows as a measure for financial liberalization enhance non-financial firm performance, investment and decrease cost of capital?

ii) What are channels in which firms benefit from foreign investment capital?

iii) What are characteristics that appear to help firm absorb more foreign capital inflows and what is the role of financial market regulation in enhancing capital inflows?

While most of previous studies focused on examining the impact of financial integration on economic growth and financial market development, we examine the impact of stock market openness at firm data level. Thus, it is expected that our research will contribute to supplemental case study of emerging market. It also needs to emphasize that evaluation on financial integration

cost is not our objectives in this paper because in our opinion, total value of foreign portfolio capital inflows to Vietnamese financial market is small at present.

The paper outline is as follow: section 3.2 reviews financial market openness measures and the relationship between market openness and economic growth as well as firm performance. Section 3.3 describes data, variables construction and methodology. Section 3.4 presents empirical results and section 3.5 concludes.

3.2. Reviews of financial market openness measure, financial integration and economic growth

3.2.1. Financial market openness measures

Firstly, we review financial openness measures to get more profound understanding about the variety of measures. Financial market openness measures have been divided into 2 categories: de jure (legal measure) and de facto (volume based measure). Here we summarize some main market openness indicators based on de jure and de facto measures.

① De jure measures:

The IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) issued firstly in 1950 was the primary source for de jure measure. According to Quinn et al. (2011), AREAER is adjusted by times and from 1967 to 1996 AREAER includes a table of "summary features of exchange and trade systems in member countries" which shows the ability of restrictions on resident's payment various current and capital account categories exist. AREAER table indicators are converted into binary 0 if not open and 1 if open and named as IMF_BINARY indicator. But this measure is limited on market information due to their binary nature: some countries that are not fully open, those that are partly open and those that are completely closed. Thus, Voth (2003) criticizes this measure as bias estimate. The further limitation is that IMF_BINARY report restrictions on only residents and the table indicator was published only until 1996.

Other three important measures based on IMF_BINARY indicator are introduced respectively by Quinn (1992, 1997, 2007 and 2008), Chinn and Ito (2002, 2006 and 2008) and Edison et al. (2004). Three indicators are as below. Quinn constructs indicators on capital account (CAPITAL) and financial current account (FIN_CURRENT) regulations based on AREAER table. The indicators cover six categories: payment for imports, receipts from exports, payment for invisibles,

receipts from invisibles, capital flows by residents and by non-resident. Then four categories are converted into scores ranging from 0 to 8 reflecting openness level for FIN_CURRENT. Other two categories are ranged from 0 to 4 reflecting openness level for CAPITAL. The advantage of Quinn's indicators is that it captures the intensity of enforcement of controls on both capital account and financial current account. Quinn's indicators can be obtained from 1950-1997 for 21 OECD countries and five years 1958, 1973, 1982 and 1988 for 43 non-OECD countries.

Edison et al. (2004) construct SHARE index that reflect the proportion of years in which countries had liberalized capital account. For example, if the AREAER judge capital market open for 5 year over 10 year period, then SHARE indicator would be 0.5. But the problem of this measure is that it does not reflect level of capital intensity of the market.

Chinn and Ito initially introduced KAOPEN index in 2006 to measure a country's degree of capital account openness. KAOPEN index is constructed based on the binary dummy variables that codified from AREAER table and includes four categories on the restrictions on external accounts: current account transactions restriction, capital account transactions restriction, export proceeds surrender requirements and presence of multiple exchange rates plus SHARE index over 5 years. Higher scores indicate greater openness. KAOPEN index covers wide cross-section of 182 countries since 1970 and now is updated to 2011. It reflects the level of capital intensity and economic globalization data is publicly available.

② De facto measures:

De jure based indicators do not reflect the extent of capital flows response to capital control policy, so de jure measures do not show degree of financial integration. De factor that measure a country's integration into global markets was constructed as resolving those disadvantages. We introduce two measures that influence our work.

Lane and Milesi-Ferretti (2003) have constructed two quantity based financial integration measures. One is calculated as the percentage of external assets plus liabilities to GDP. The other measure is built based on portfolio equity and FDI assets that is the ratio of portfolio equity assets (and liabilities) plus foreign direct investment assets (and liabilities) to GDP. These measures cover a wide range of data of both developed markets and emerging countries from 1970 to 2011. Unfortunately, it is impossible to obtain portfolio and FDI data for Vietnam stock market.

Edison and Warnock (2003) have developed hybrid based measure FORU, which shows the restrictions on foreign ownership of domestic equities. Hybrid means a measure that is based on quantity calculation but also reflect the legal restrictions. FORU index is built based on the data of

International Financial Corporation about emerging markets and calculated as monthly share of domestic equities available for foreign purchase divided total market capitalization. Calculation for FORU index requires each stocks with at least 50 million dollars market capitalization and at least 20 million dollars annual trading values. This condition became disadvantage to calculate market openness index for small scale market such as Vietnam[7].

Quinn (2011) criticizes that quantity and hybrid based measures are not to be consistent due to the volatility of portfolio and FDI assets across countries and times. Moreover, access to banking data may be restricted by some countries. Despite the inconsistency of the measures, de facto measures are seen to provide information about the intensity of capitals and be appropriate measure for markets on the process of opening.

As a reference from Lane and Milesi Ferretti's researches, this work constructs proxy for stock market openness based on volumes of foreign portfolio investment capital inflows of each stock and total stock market to total trading volumes in one year. The details of measure construction will be described in part 3.3.

3.2.2. Financial integration and economic growth

Theoretical linkage between banking system development and economic growth has been focused early in the research of Robinson since 1952. King and Levine (1993a) conduct empirical research and conclude that financial intermediations can be a good predictor for long run economic growth, capital accumulation and productivity improvements. An extending model to prove the contribution of both stock market and banking development to long run economic growth was conducted by Levine and Zervos in 1998. It reveals that market liquidity and development of banking are positively related to economic growth, capital accumulation and productivity growth. Based on prior results, Levine proved the relation of financial liberalization and economic growth in 2001. The empirical proof indicates that international portfolio investment flows tend to enhance stock market liquidity. In turn, an improvement in liquidity boosts economic growth by increase productivity growth.

Bekaert, Harvey and Lundblad (2005) investigate the data of 95 countries from 1980 to 1997 with pooled OLS and generalized method of moments (GMM) estimation and show that equity market liberalization improves annual GDP growth about 1 percent significantly. They also argue macroeconomic reforms, financial reforms and legal reforms that be coincided with liberalization

[7] Foreign portfolio investment capital inflows to GDP was approximately about 1.8 percent in 2009; 2 percent in 2010; 1 percent in 2011 and 2012; and 1.2 percent in 2013

process contribute mainly to economic growth. In addition, countries with better legal system, good institutions, favorable conditions for foreign investment and investor protection will benefit more from growth effect. Bekaert et al. (2011) reconfirm that openness impact on factor productivity growth is more important than the effect on capital growth. This explains why the growth effects of liberalization is permanent but not temporary.

Henry (2000) examines data of 12 emerging markets that have implemented official dates of stock market liberalization and shows that the country's aggregate cost of capital fall when it opens stock market to foreign investors inducing risk sharing between domestic and foreign agents. Stock market openness also increases equity price index while holding expected future cash flow constant. In 2004, Chari and Henry reexamined prior results at firm level data by investigating 429 firms of 11 liberalized emerging markets and concluded that systematic risk of firm reduce about 3.4 percent point since market opened. Furthermore, Henry (2000) also provides the evidence of stock market liberalization increases private investment in 9 among 11 emerging countries after mean of 3 years of stock markets liberalization.

Ferreira and Laux (2009) investigate the importance of portfolio investment flows level and volatilities as determinants of subsequent economic growth in cross 50 countries data by using pooled OLS and time series estimations. They find that open to portfolio flows contribute significantly to growth, which is the evidence of benefits of openness. In addition, the effect of portfolio inflows for less developed countries is especially strong. Moreover, the volatility of portfolio flows is related weakly growth and does not depress growth systematically.

Beside the historical focus on financial integration and macroeconomic growth, there are expanding relevant literatures at firm data level. In general, these works have focused on evaluating the influence of financial liberalization on equity prices of firms, cost of capital, investment activities and financial constraints condition. We give some summaries as below.

Harris et al. (1992) study the impact of financial liberalization on capital structure and investment decisions of 218 Indonesian manufacturing firms by using GMM panel estimation. The results show liberalization benefits firms by domestic credit reallocation that relax financial constraints and enhance investment activities. Moreover, firms could access to cheaper credit from foreign banks leading to higher leverage rate that in turns, give a rise in equity returns.

Bae et al. (2006) investigate the association of information environment and degree of openness to foreign equity investment. They find that market opening to foreign portfolio investors does not lower the cost of capital but also alters the domestic information environment for

disclosure, using and analyzing that information. However it also indicates the risks of information overload and noise trading once further opening to foreigners.

Patro and Wald (2005) find a change in returns and exposure during liberalization using large of data firms set in 18 emerging markets. They show that firms' stock returns increase during market liberalization but a majority of firms have lower mean returns and dividend yields after liberalization. Additionally, cost of capital declines after liberalization and decrease more for the firm with lower foreign exchange exposure.

Milton (2006) uses the panel data of 1141 firms from 28 countries to study how stock market liberalization benefits firms. He finds that firms is open to foreign investors have higher growth, greater investment, profitability, efficiency and lower leverage.

Shin and Park (2008) study the consequent impact of stock market opening to cost of capital of 411 nonfinancial firms data in Korean stock exchange market during 1994-2004 by applying three models including fixed effect panel data, dynamic panel data with GMM estimation and panel VAR. They find that firms open larger to foreign investors have lower cost of capital measured by dividend yield when market is fully opened.

Although prior researches have predicted improvements of firm growth, investment and decrease in cost of capital resulting from financial liberalization policies, there is a lack of empirical studies on initially liberalizing small financial markets that are strongly intervened by government. Moreover, since small markets are seen as not functional market, empirical results may be different to previous studies even when using the same liberalization measures. Thus, our study is considered to provide additional empirical results in different economic context to other prior ones.

3.3. Data, variables construction and methodology

3.3.1. Stock market openness proxy

We use size of foreign portfolio investment capital inflows as proxy for openness of Vietnam stock market. Foreign portfolio investment inflows are trading value purchased by foreign investors in local money in one year. In addition, it composes of trading value of each firm and total trading value in stock market. Due to lack of data of foreign bond liabilities, foreign portfolio investment inflows comprise only stock investment capital of foreign investors. Different to prior literatures which using ratio of foreign portfolio capital to GDP, we measure size of foreign capital inflows as the proportion to total market trading value and total firm trading value. The reason is that proportion of foreign portfolio inflows to GDP of Vietnam is still small at present. Thus, in this

paper financial market openness is measured by two proxies: ① the ratio of total market foreign portfolio investment inflows to total stock market trading value and ② the ratio of foreign portfolio investment inflows to total trading value of each stock in one trading year.

Based on the prior literatures of Henry (2000), Mitton (2006) and Shin and Park (2008), we assume that market openness affect positively firm performance, investment and negatively affect cost of capital.

3.3.2. Dependent and explanatory variables

Q ratio is applied to measure firm performance. It is calculated as the ratio of market value to book asset value of firm at the end of year. Investment is the ratio of capital expenditure to total assets at the end of year. Cost of capital is calculated as sum of weighted average value of cost of debt and cost of equity (WACC)[8]. It is expected that market openness enhance Q ratio and investment while diminish cost of capital of each stock.

We add some control explanatory variables into models such as leverage ratio, profitability, dividend payout ratio to examine the impact of firm characteristics on firm value, investment and cost of capital. Variables construction and assumption about effects on dependent variables are presented as below

Leverage ratio is measured by total liabilities to total assets at the end of year. It is assumed that leverage ratio positively affects Q ratio and investment based on higher risk higher returns theory and increases cost of capital. Profitability is measured by earnings before interest and taxes (EBIT) in logarithm at the end of year. Profitability is expected to be positively related to firm performance, firm investment and negatively related to cost of capital.

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[8] WACC was constructed based on formula: WACC = $r_D(1 - T_c)$ * D / (D+E) + r_E * E / (D+E) where: r_D = Cost of debt (interest expense), r_E = Cost of equity (CAPM model), (1 - T_c) = Corporate tax rate, D = Market value of debt, E = Market value of equity. WACC's calculation step: **Step 1)** Cost of debt calculation: ① Calculate tax rate (tax expenses/ profit before tax ratio) ② calculate average tax rate over past 3 years ③ calculate (1 - T_c) ④ calculate interest expense rate (interest expense/ debt) ⑤ calculate average interest expense rate over 3 past year ⑥ calculate cost of debt based on $r_D(1 - T_c)$ * D / (D+E). **Step 2)** Cost of equity calculation: ① Calculate $r_E = r_f + \beta (r_M - r_f)$ where β is beta of each stock in each year, r_f is risk free rate (10 year Vietnam government bond yield), r_M is expected market returns based on the data of Damodaran, 2013 ② calculate r_E * E / (D+E). **Step 3)** WACC calculation by summing cost of debt in step 1 and cost of equity in step 2

Dividend payout ratio is calculated as the ratio of dividend to earnings after taxes at the end of year. Free cash flow hypothesis (Jensen, 1986) assumes that higher dividend payout ratio induces higher stock prices because it reduces potential abuses or conflicts of interest of managers and shareholders. Thus, relation between dividend payout ratio and firm value is assumed to be positive. In contrast, higher payout ratio resulting to a decline in free cash flow is considered to decrease investment. Grullon, Michaly and Swaminathan (2002) find that firm with higher dividend payout ratio diminishes cost of capital as the result of a decline in discount rate in the market. Based on prior literatures, we assume that dividend payout ratio is negatively related to investment and cost of capital and positively related to firm value.

We add other three variables to measure efficiency and depth of financial market. They are volatility, stock market capitalization to GDP ratio and credit to GDP ratio. Volatility is used to measure the market efficiency. It is the percentage of standard deviation of daily stock market returns in one year. Volatility is expected to diminish firm value, investment and increase cost of capital. Following Kunt and Levine (2007), we apply two variables to measure financial market depth. One is the ratio of stock market capitalization to GDP as a measure for stock market depth, the other is the ratio of credit provided by domestic banks to GDP as a measure for credit market depth. Financial market depth is considered to enhance firm value, investment and decrease cost of capital because it is well functional operation market.

Table 3-1 presents definition and summary statistics of variables and table 3-2 summarizes the signs of hypothesis[9]. As shown in table 3-1, Q ratio has minimum value at -0.75 which is value of Viglacera Corporation of manufacturing industry in 2013. Nam Vang Corporation of service industry also has negative Q-ratio at -0.18. Q-ratio is negative because total liabilities exceed total asset. Vinamilk Group of manufacturing industry had maximum Q-ratio at 5.84 in 2013. Vincom Group of service industry achieved high Q ratio over 5 point in 2009 and 2013. Maximum value of cost of capital was 25.26 point and belonged to Song Da Industry and Trade Corporation in 2010. Other 5 firms had high cost of capital over 20 point in 2010.

[9] Correlation matrix of variables is reported in table 1-2 of Appendix 1

Table 3-1: Variables description and statistics

Variable	Description
Q ratio	Ratio of market value to book asset value in one fiscal year
Investment	Ratio of capital expenditure to total asset in one fiscal year
Cost of capital	Weighted average of cost of debt and cost of equity in one fiscal year (WACC)
TFP	Ratio of total foreign purchase value to total stock market trading value in one year
FP	Ratio of total foreign purchase value to total trading value of each stock in one year
Leverage	Ratio of total liabilities to total asset in one fiscal year
Profitability	Earnings before interest and taxes in logarithm in one fiscal year
Dividend	Ratio of dividend payment to profit after taxes in one fiscal year
Volatility	Percentage of standard deviation of stock market returns in one trading year
Stock market depth	Percentage of stock market capitalization to GDP
Credit market depth	Percentage credit provided by domestic banks to GDP

Variable	Obs	Mean	Std. Dev.	Min	Max
Qratio	1044	1.05	0.76	-0.75	5.84
Investment	1023	0.06	0.08	1.03E-06	0.61
Cost of capital	1049	9.20	3.58	0.19	25.26
TFP	1050	13.83	3.69	7.86	18.12
FP	1039	8.16	14.59	0.00	98.09
Leverage	1050	0.47	0.23	0.003	1.24
Profitability	998	24.57	1.69	16.34	30.05
Dividend	842	1.48	20.89	-144.34	528.45
Volatility	1050	39.60	26.80	18.58	87.31
Stock market depth	1050	20.64	5.80	13.50	31.00
Credit market depth	1050	115.32	12.47	102.60	135.80

Maximum value of debt to asset ratio is 1.24 resulting from excessive proportion of total debts over total assets. And this is ratio of Nam Vang Corporation of service industry in 2013. Phuong Nam Corporation had highest dividend payout ratio at 528.45 in 2011. It is because dividend payout policy of Phuong Nam Corporation remained high despite low profitability. Volatility of stock market returns was highest at 87 percent in 2009 due to stock market crash in 2008 and lowest at 18 percent in 2013. Volatility decreased by 21 percent in 2010 but increased by 51 percent in 2011 due to effect of banking crisis. Stock market capitalization to GDP was highest in 2013 and lowest at 13 percent in 2011. Credit market depth proxy was highest at 135 percent in 2010 before banking crisis and lowest at 102 percent in 2013.

Table 3-2: Summary of hypothesis

	Q ratio	Investment	Cost of capital
TFP	+	+	-
FP	+	+	-
Leverage	+	+	+
Profitability	+	+	-
Dividend	+	-	-
Volatility	-	-	+
Stock market depth	+	+	-
Credit market depth	+	+	-

3.3.3. Data and methodology

This paper uses annual financial statement data of 210 non-financial and non-real estate listed firms in HNX and HOSE from January 2009 to December 2013. Data of daily trading value and foreign portfolio purchase value of each stock are obtained from website of Ban Viet Securities Corporate, FPT Securities Corporate and other financial websites to calculate market openness proxy. Annual data of stock market capitalization, credit provided by domestic banks and GDP from 2009 to 2013 are obtained from data of World Bank, IMF and StoxPlus Financial Corporation. In addition, we based on cross-countries equity risk premiums data of Damodaran (2013) to calculate equity risk premium for Vietnam stock market as one part of cost of capital construction[10].

We apply dynamic panel data model with GMM estimation suggested by Arellano-Bond (1991), Arellano-Bover (1995) and Blundell and Bond (1998) to examine the hypothesis. Advantage of GMM estimation is to solve problems of ① endogeneity that caused by causality relation between dependent variable and explanatory variables, dependence of dependent variable on past realizations, not strictly exogenous explanatory variables resulting to correlation of explanatory variables with past and current error terms; ② fixed unobserved firm specific-effects on error terms; ③ autocorrelation due to the presence of lagged dependent variable resulting from causality relation; ④ panel data with short time dimension ($T=5$) but large firm dimensions ($N=210$). The model is as below:

[10] According to Damodaran, A. (2013) "Equity risk premiums (ERP): determinants, estimators and implications", equity risk premiums of Vietnam stock market is about 7.9

$$Dependent_{it} = \beta_1 Dependent_{it-1} + \beta_2 FP_{i,t} + \beta_3 TFP_t + \beta_4 Market_t + \sum_{j=1}^{j=J} \gamma_i Control_{itj} + \delta_j + \epsilon_{i,t}$$

where $Dependent_{it}$ are Q-ratio, investment and cost of capital of firm i during the period t. $Dependent_{it-1}$ are dependent variables of firm i in one lagged year. $FP_{i,t}$ denotes foreign portfolio investment capital inflows rate of firm i in time t. TFP_t denotes total foreign portfolio investment capital inflows rate of stock market in time t. $Control_{itj}$ is a vector of firm-characteristics of firm i during the period t as control variables. $Market_t$ is a vector of financial market development in time t. δ_j is unobserved fixed firm-effects on error term, $\epsilon_{i,t}$ is error terms.

3.4. Empirical result analysis

3.4.1. Benefit from foreign investment capital portfolio inflows

Table 3-3 presents regression results of the impact of foreign portfolio investment inflows on firm performance, firm investment and cost of capital. One may concern about the past realization on dependent variables, thus we add one lagged Q ratio_1, Investment_1 and Cost of capital_1 into models to test reverse causality. *TFP* and *FP* measuring for stock market openness are taken at 1 and 4 lagged years to consider short-term and long-term effect. All firm-specific control variables such as debt/asset, profitability and dividend are regressed at one lagged year. GMM estimations are endogenous variable dependent variables and *FP* variable in all models at 1 lagged year respectively.

We find evidence that support to our hypothesis in model (1). In short run, foreign portfolio investment capital inflows of each stock enhances firm value slightly about 1.2 percent in one lagged year and total market foreign portfolio capital inflows increase firm value about 2.8 percent at 10 percent statistical significant. In addition, in long run foreign portfolio capital inflows continuously enhance firm value about 4.9 percent. High leverage rate diminishes firm value considerably in short and long run that indicates risk of default in the context of economic downturn. Profitability also decreases market value of firm in short run suggesting financial constraints of firm during credit crunch. In inefficient market, stock prices volatility increases firm value 0.7 percent in short-term and 1.2 percent in long-term at 1 percent statistically significant. We find that financial depth contributes to enhance firm market value in short and long term.

Amihud and Medelson (1986), Amihud (1997), Stulz (1999a) and Henry (2000a) demonstrate that market liberalization increase market liquidity and risk sharing by diversified financial products, in turn encourage firm investment and reduce cost of capital because of a decrease in market risk

premium. Consistent with these views, model (5) and (6) show a sharp decline in cost of capital about 31.9 percent in short run and 38.5 percent in long run at 5 percent statistical significance as market foreign portfolio capital inflows increase. Profitability increases cost of capital considerably in short and long term suggesting high profit-firms issue a large of equities and debts but inefficient capital market and banking system crisis induces cost of capital. One lagged leverage rate decreases cost of capital that implies adjustment of capital structure by decreasing loans borrowing or equity issuance. Stock market development contributes to diminish cost of capital considerably in short run about 12.1 percent and 41.3 percent in long run at 1 percent statistically significant. While in long run credit depth may induce incentives for firm to borrow more, thus increase cost of capital about 10.2 percent.

We examine the impact of foreign portfolio investment capital inflows on firm value, investment and cost of capital. The evidences are consistent with assumption and prior researches in short and long run for firm value and cost of capital. However, we do not find the evidence of effect of stock market openness on corporate investment.

3.4.2. Effect channels of market openness on firm value, investment and cost of capital

In this part, we shed a light at channels through which foreign equity portfolio capital may be linked to investment and cost of capital. Levine and Zervos (1998a) argue that stock market liberalization increase market liquidity and risk sharing. Henry (2000a) demonstrates the mechanism in which stock market liberalization contributes to private investment boom through increase of stock prices. The author supplemented the evidence in 2003 on benefits of liberalization to capital stock growth, output growth, investment boom and decrease of cost of capital. Based on prior empirical works, we assume that market openness measured by foreign portfolio capital inflows contribute to firm value and cost of capital by improving stock prices and increasing risk sharing. To reveal this assumption, we add 2 interaction variables: interaction of foreign portfolio investment capital inflows and average returns in one year of each stock; interaction of foreign portfolio investment capital inflows and return volatility of each stock in one year.

The results are reported in table 3-4. A rise in foreign capital inflows improve liquidity of stock inducing an increase in stock prices, thus enhance firm value approximately 10 percent at 10 percent statistical significance. Although coefficient is not high, we show the evidence that liberalization enhance value of firm via increase in liquidity.

Table 3-3: Foreign portfolio investment inflows and firm performance, investment and cost of capital

	(1)	(2)	(3)	(4)	(5)	(6)
	△Q-ratio	△Q-ratio	△Investment	△Investment	△Cost of capital	△Cost of capital
△Dependent variable_1	0.087	-0.047	-0.672	-0.693	-0.719	-0.729
	(0.79)	(-0.31)	(-3.58)***	(-4.21)***	(-2.78)***	(-4.67)***
△FP_1	0.012		0.0006		-0.006	
	(1.88)*		(0.93)		(-0.25)	
△TFP_1	0.028		0.001		-0.319	
	(1.91)*		(0.41)		(-2.01)**	
△FP_4		0.049		0.001		-0.092
		(1.84)*		(0.63)		(-0.85)
△TFP_4		-0.011		-0.0003		-0.385
		(-0.21)		(-0.09)		(-1.78)*
△Leverage_1	-3.939	-3.905	0.179	0.129	-10.411	-12.146
	(-2.46)**	(-2.21)**	(1.15)	(0.82)	(-1.32)	(-2.05)**
△Profitability_1	-0.067	-0.074	-0.0002	0.003	1.027	1.122
	(-1.83)*	(-1.37)	(-0.05)	(0.88)	(1.89)*	(3.47)***
△Dividend_1	-0.120	-0.206	-0.022	-0.024	0.176	0.140
	(-1.6)	(-1.12)	(-0.92)	(-1.02)	(0.85)	(0.73)
△Volatility	0.007	0.012	-0.0002	-0.0002	-0.018	-0.078
	(3.2)***	(2.4)**	(-0.95)	(-0.38)	(-1.2)	(-5.33)***
△Stock market depth	0.045	0.064	0.0005	0.001	-0.121	-0.413
	(5.31)***	(2.07)**	(0.24)	(0.39)	(-3.62)***	(-3.59)***
△Credit market depth	0.026	0.026	0.0003	-0.0003	0.027	0.102
	(7.82)***	(3.15)***	(0.35)	(-0.4)	(0.47)	(4.96)***
No. of observations	807	795	786	779	805	801
No. of groups	208	207	208	207	208	208
AR(2) p-value	33.4	41.7	15	11.9	39.9	77
Sagan test	4.25	2.22	1.61	1.72	8.17	8.03
(p-value)	93.6	99.4	99.6	99.5	51.7	53.2

Note: All regressions are estimated using two-step dynamic panel data GMM estimation with robust standard errors. Variable descriptions are in table 3-1. One lagged dependent variables are added into models to examine causality effect. GMM estimation with dependent variables and FP variable are at 1 lagged times. Instruments variables of model (1) and (2) are*: return_1, CAPM_1 and volatility_1*; Instruments variables of model (3) and (4) are: *Q-ratio_1, (EBIT/ asset)_1*; Instruments variables of model (5) and (6) are: *beta, return*. AR (2) tests for autocorrelation in two steps and Sagan test is for null hypothesis of valid over-identifying restrictions. Figures in parentheses are t-statistics. ***, **, * are statistically at 1 percent, 5 percent and 10 percent respectively

Evidences of increase in risk sharing after market liberalization are presented in many empirical works (Levine and Zervos, 1998a, b; Chari and Henri, 2004). Amihud et als (1997) find that increased liquidity reduces market risk premium which decreases cost of capital and raises firm value. Todea and Plesoianu (2009) show positive relation of foreign portfolio investment and degree of information efficiency of Central and Eastern European stock markets. Here, we apply return volatility measured as the change in daily stock returns of each stock in one year to examine the informational efficiency of stock market. We also make the interaction of return volatility variable and foreign portfolio investment inflows variable to investigate the impact of liberalization on cost of capital via decrease in return volatility. The result of model (2) shows market liberalization reduces cost of capital about 19.4 percent by improving information efficiency in stock market. Coefficient is statistically significant at 5 percent.

This part provides the evidence of channels in which foreign investment capital affects firm value and cost of capital. Increase in stock prices via liquidity is considered to lead a rise in firm value while liberalization contributes to improve information efficiency, thus reduces cost of capital significantly.

Table 3-4: Effect channels on firm value, investment and cost of capital

	(1)	(2)
	△Q ratio	△Cost of capital
△Dependent variable_1	0.363	-1.486
	(1.81)*	(-2.99)***
△FP* return	0.099	
	(1.95)*	
△FP* returnvol		-0.194
		(-2.0)**
△TFP_1	0.006	-1.084
	(0.22)	(-2.49)**
△Leverage_1	-3.903	-30.950
	(-1.76)*	(-3.0)***
△Profitability_1	0.002	3.541
	(0.04)	(2.56)**
△Dividend_1	-0.066	0.387
	(-0.83)	(1.16)
△Volatility	0.010	0.013
	(3.53)***	(0.48)
△Stock market depth	0.015	-0.069
	(0.71)	(-0.77)
△Credit market depth	0.015	-0.267
	(2.51)**	(-1.57)
No. of observations	805	814
No. of groups	208	208
AR(2) p-value	71.2	29.2
Sagan test	1.49	0.4
(p-value)	47.5	81.8

Note: All regressions are estimated using two-step dynamic panel data GMM estimation with robust standard errors. Variable descriptions are in table 3-1. One lagged dependent variables are added into models to examine causality problem. *FP*return* is the interaction of total foreign purchase to total trading value of each stock and average return of each stock in one year. *FP*returnvol* is interaction of total foreign purchase to total trading value of each stock and percentage of change in daily stock return of each stock in one year. GMM estimation with dependent variables in model (1) and (2) are at 1 lagged year. Instruments variables of model (1) are *capm_1, lnEBIT_1, returnvol_1*; Instruments of variables of model (2) are *beta, state ownership rate, stock market depth*. AR tests are for autocorrelation in two steps and Sagan test is for null hypothesis of valid over-identifying restrictions. Figures in parentheses are t-statistics. ***, **, * are statistically at 1 percent, 5 percent and 10 percent respectively

3.4.3. Firm characteristics, financial market regulation and foreign portfolio investment inflows

In this part, we account for what firm characteristics appear to absorb more foreign portfolio investment capital than the others in stock market. We conduct dummy variable *underSTATE30* measuring for state ownership rate that equals 1 if firm has under 30 percent of state ownership rate and 0 otherwise; dummy variable *overFO30* measuring for foreign ownership rate that equals 1 if firm has over 30 percent foreign ownership rate and 0 otherwise. Two dummy variables measuring for size of market capitalization are *MIDCAP* and *SMALLCAP*. *MIDCAP* equals 1 if firm belongs to market capitalization range over 2 billion dollars but under 10 billion dollars and 0 otherwise. *SMALLCAP* equals 1 if firm belongs to market capitalization over 300 million dollars and below 2 billion dollars[11]. *MANU* and *SERVICE* are industry dummy variables that equal 1 if firm belongs to manufacturing industry or service industry and 0 otherwise. We make interaction of dummy variables and foreign portfolio investment capital to examine the absorptive capacity of ownership rate, size and industry to foreign capital inflows in firm value, investment and cost of capital.

As shown in model (1) in table 3-5, manufacturing sector absorb less foreign capital inflows than other industries, thus decreases firm value 29.6 percent. It may come from the reason that performance of manufacturing sector is not good during credit crunch period. In contrast, if firm has small-scaled market capitalization and belongs to services industry, it is likely to absorb more foreign investment capital to finance its investment project approximately 17.7 percent and 6.2 percent. It is due to stocks of small firms are high returns high risks, which attract foreign investors more than big stocks. Model (3) supports to this view. Small firm absorbs more foreign capital but as riskier than big firms, thus increases cost of capital about at 1 percent statistically significant. We also find the evidence that firm has foreign ownership over 30 percent seems to have lower cost of capital.

Prasad et al. (2003) emphasize the role of quality of macroeconomic policies and domestic governance in diminishing the vulnerability of developing market to the risk factors associated with financial globalization. They demonstrate the lack of transparency has been shown to be associated with more herding behavior by foreign investors and high corruption may affect the composition of a country's capital inflows, thereby making it more vulnerable to the risks of speculation and contagion effects. Bakaert, Harvey and Lundblad (2005) support to these views when reveal the reason why benefits from liberalization are different from countries. They conclude that countries

[11] We ranked MIDCAP and SMALLCAP based on the market capitalization definition of Investopedia. LARGE CAP is not included due to small scale of market capitalization of sample

have better legal systems, institutions and investor protection will generate more growth effects. Following references, we apply three financial market development indexes are strength of auditing and reporting standards, protection of minority shareholders' interests, regulation and supervision of securities exchanges to investigate how financial market development contributes to firm value, investment and cost of capital. Data of indexes are obtained from the Global Competitiveness Report during 2009-2014 periods of World Economic Forum. Strength of auditing and reporting standards is defined as strength of auditing and reporting standards and ranged from 1-7 (best) scale in which median value of Vietnam in 5 years is 3.6. Protection of minority shareholders' interests is defined as strength of protection of minority shareholders by legal system and ranged from 1-7 (best) scale in which median value of Vietnam in 5 years is 4.1. Regulation and supervision of securities exchanges are described as effectiveness of regulation and supervisions of securities exchanges market and ranged from 1-7 scale (best) in which median value of Vietnam in 5 years is 3.6. We construct 3 interaction terms of audit, protection, regulation and foreign portfolio capital inflows of each stock to examine the influence of financial market development on foreign investment capital flows.

The results are shown in table 3-6 that the role of regulation and supervision in securities exchange are extremely important. Market regulations contribute in absorbing more foreign capital inflows that increase firm value at 5 percent statistically significant. The evidences are consistent with prior researches on important role of market regulation in reducing risk to volatility and market vulnerability. In contrast, enhancement of information disclosure due to high auditing standards is likely to absorb less portfolio capital and diminish firm value. We interpret these results as auditing standard enhancement helps investors to select the best performance firm based on financial statement. If firm is considered to be in financially constrained, investment decisions of investors will become more prudent and bad performance firm tends to be undervalued. Protection for minority shareholder' interests encourage foreign investors to invest more, thus increase firm value.

Table 3-5: Firm characteristics, industry and foreign portfolio investment inflows

	(1)	(2)	(3)
	△Q-ratio	△Investment	△Cost of capital
△Dependent variable_1	0.261	-1.501	-0.441
	(0.72)	(-2.65)***	(-1.42)
△FP*underSTATE30	0.233	0.039	2.172
	(1.56)	(0.96)	(1.49)
△FP*overFO30	-0.084	-0.058	-1.590
	(-0.44)	(-1.44)	(-1.76)*
△FP*MIDCAP	0.479	-0.726	-2.368
	(0.78)	(-1.45)	(-0.25)
△FP*SMALLCAP	0.251	0.177	2.739
	(1.18)	(1.89)*	(2.8)***
△FP*MANU	-0.296	0.002	0.037
	(-2.09)**	(0.04)	(0.05)
△FP*SERVICE	0.272	0.062	-1.105
	(0.86)	(3.78)***	(-1.23)
△Volatility	0.018	0.0008	-0.031
	(4.61)***	(0.95)	(-2.04)**
△Stock market depth	-0.057	-0.012	-0.135
	(-0.86)	(-1.78)*	(-0.86)
△Credit market depth	0.016	0.001	0.119
	(1.49)	(0.60)	(4.5)***
No.of observations	1029	985	1034
No.of groups	210	210	210
AR(2) p-value	61	23.7	72.2
Sagan test	7.04	2.3	16.48
(p-value)	13.4	80.7	0.01

Note: All regressions are estimated using two-step dynamic panel data model GMM estimation with robust standard errors. *underSTATE30* is dummy variable and equals 1 if state ownership rate is below 30 percent and 0 otherwise. *OverFO30* is dummy equals 1 if foreign ownership rate is over 30 percent and 0 otherwise. *MIDCAP* is dummy variable and equals 1 if firm market capitalization is about 2 ～10 billion USD and 0 otherwise. *SMALLCAP* is dummy variable and equals 1 if firm market capitalization is about 300 million ～ 2 billion USD and 0 otherwise. *MANU* is industry dummy variable and equals 1 if firm belongs to manufacture industry and 0 otherwise. *SERVICE* is industry dummy variable equals 1 if firm belongs to manufacture and 0 otherwise. Other variable descriptions are presented in table 3-1. Instruments variables of model (1) are *return, beta*. Instruments variables of model (2) are *Qratio_1, stock market depth, credit market depth*. Instruments variables of model (3) are *beta, stock market depth, credit market depth*. AR (2)

tests for autocorrelation in two steps and Sagan test is for null hypothesis of valid over-identifying restrictions. Figures in parentheses are t-statistics. ***, **, * are statistically at 1 percent, 5 percent and 10 percent respectively.

Table 3-6: Financial market development and foreign portfolio investment inflows

	(1)	(2)	(3)
	△Q-ratio	△Investment	△Cost of capital
△Dependent variable_1	-1.181	-0.700	0.184
	(-1.09)	(-2.25)**	(1.15)
△ [FP* audit]_1	-1.713	-0.022	0.841
	(-2.51)**	(-0.25)	(0.78)
△ [FP* protect]_1	0.814	0.008	-0.265
	(1.81)*	(0.2)	(-0.54)
△ [FP*regulation]_1	0.893	0.015	-0.754
	(2.24)**	(0.31)	(-1.04)
△Volatility	-0.021	-0.0004	-0.092
	(-1.15)	(-0.33)	(-6.55)***
△Stock market depth	0.385	0.0003	-0.053
	(1.99)**	(0.02)	(-0.38)
△Credit market depth	-0.054	0.001	0.155
	(-1.38)	(0.15)	(4.28)***
Number of observations	981	979	1025
Number of groups	210	210	210
AR(2) p-value	52	44	97.7
Sagan test	1.85	8.63	54.96
(p-value)	39.7	0.01	0.00

Note: All regressions are estimated using two-step dynamic panel data GMM estimation with robust standard errors. *Audit* is strength of auditing and reporting standards index; *protection* is strength of protection of minority shareholders' interest index; *regulation* is regulation and supervision of securities exchanges index. Other variable descriptions are presented in table 3-1. Instruments variable of model (1) is *lnEBIT_1*. Instruments variable of model (2) is *return_1*. Instruments variables of model (3) are *beta_1, stock market depth, credit market depth*. AR (2) tests for autocorrelation in two steps and Sagan test is for null hypothesis of valid over-identifying restrictions. Figures in parentheses are t-statistics. ***, **, * are statistically at 1 percent, 5 percent and 10 percent respectively.

3.4.4. Robustness tests

One may concern that higher level of foreign portfolio investment inflows causes volatility and harm firm value or increase cost of capital. We create two dummy variables *FB50* that equals 1

if firm has ratio of foreign capital inflows to total trading value over 50 percent and 0 otherwise; and *FB70* that equals 1 if firm has ratio of foreign capital inflows to total trading value over 70 percent and 0 otherwise. Then we construct two interactions of foreign portfolio investment capital and *FB50* at 1 lagged year and foreign portfolio investment capital and *FB70* at 4 lagged years to test impact of higher foreign capital inflows on firm value and cost of capital. As the results shown in table 3-7 and 3-8, we do not find evidences that increase in foreign capital inflows may mitigate firm value and increase cost of capital in short run. Model (3) in table 3-8 provides the evidence that firms with capital inflows even over 50 percent have lower cost of capital about 62 percent in long run at 1 percent statistically significant.

Table 3-7: Robustness tests in one lagged year

	(1)	(2)	(3)	(4)
	△Q-ratio	△Q-ratio	△Cost of capital	△Cost of capital
△Dependent variable_1	0.090	0.146	-0.657	-0.596
	(0.72)	(1.12)	(-2.74)***	(-2.77)***
△ [FP* FP50]_1	0.009		0.003	
	(1.17)		(0.12)	
△ [FP* FP70]_1		0.015		0.037
		(1.49)		(0.95)
△TFP_1	0.026	0.036	-0.286	-0.262
	(1.61)	(2.28)**	(-1.93)*	(-2.03)**
△Leverage_1	-4.305	-4.517	-9.409	-9.351
	(-2.81)***	(-3.2)***	(-1.24)	(-1.32)
△Profitability_1	-0.052	-0.062	0.913	0.800
	(-1.31)	(-1.73)*	(1.82)*	(1.76)*
△Dividend_1	-0.139	-0.114	0.160	0.166
	(-1.67)*	(-1.57)	(0.76)	(0.67)
△Volatility	0.007	0.007	-0.022	-0.022
	(3.05)***	(3.61)***	(-1.65)*	(-2.07)**
△Stock market depth	0.050	0.046	-0.118	-0.114
	(6.14)***	(5.7)***	(-3.45)***	(-3.08)***
△Credit market depth	0.025	0.026	0.040	0.055
	(6.77)***	(7.55)***	(0.73)	(1.08)
No. of observations	807	807	805	805
No. of groups	208	208	208	208
AR(2) p-value	32.5	32.6	51.8	72.5
Sagan test	4.73	6.09	8.14	7.51
(p-value)	90.8	80.8	52	58.4

Note: All regressions are estimated using two-step dynamic panel data GMM estimation with robust standard errors. *FP50* is foreign purchase to total trading value ratio dummy variable that equals 1 if the ratio is over 50 percent and 0 otherwise. *FP70* is foreign purchase to total trading value ratio dummy variable that equals 1 if the ratio is over 70 percent and 0 otherwise. *[FP*FB50]_1* is the interaction of foreign purchase to trading value ratio and FB50 dummy variable at 1 lagged year. *[FP*FB70]_1* is the interaction of foreign purchase to trading value ratio and FB70 dummy variable at 1 lagged year. Applied instruments variables are the same to table 3-3. AR (2) tests for autocorrelation in two steps and Sagan test is for null hypothesis of valid over-identifying restrictions. Figures in parentheses are t-statistics. ***, **, * are statistically at 1 percent 5 percent and 10 percent respectively

Table 3-8: Robustness tests in four lagged years

	(1)	(2)	(3)	(4)
	△Q-ratio	△Q-ratio	△Cost of capital	△Cost of capital
△Dependent variable_1	-0.018	0.014	-0.730	-0.682
	(-0.15)	(0.11)	(-4.5)***	(-4.45)***
△ [FP* FP50]_4	0.049		-0.620	
	(1.16)		(-2.14)**	
△ [FP* FP70]_4		0.028		-0.268
		(0.67)		(-0.92)
△TFP_4	-0.0004	0.059	-0.024	-0.370
	(-0.01)	(1.5)	(-0.12)	(-1.62)
△Leverage_1	-4.492	-4.033	-15.495	-10.101
	(-2.84)***	(-2.37)**	(-4.2)***	(-1.69)*
△Profitability_1	-0.031	-0.068	0.908	0.934
	(-0.53)	(-1.33)	(2.82)***	(2.94)***
△Dividend_1	-0.166	-0.189	0.274	0.081
	(-1.16)	(-1.38)	(0.93)	(0.27)
△Volatility	0.009	0.014	-0.061	-0.075
	(1.74)*	(3.04)***	(-3.99)***	(-3.04)***
△Stock market depth	0.057	0.088	-0.265	-0.369
	(1.7)*	(3.45)***	(-2.35)**	(-2.66)***
△Credit market depth	0.022	0.015	0.085	0.117
	(3.03)***	(2.28)**	(2.62)***	(4.88)***
No. of observations	795	795	801	801
No. of groups	207	207	208	208
AR(2) p-value	40.8	31.1	65.1	95.2
Sagan test	2.68	3.56	2.26	3.48
(p-value)	98.8	96.5	98.7	94.2

Note: All regressions are estimated using two-step dynamic panel data GMM estimation with robust standard errors. *FP50* is foreign purchase to total trading value ratio dummy variable that equals 1 if the ratio is over 50 percent and 0 otherwise. *FP70* is foreign purchase to total trading value ratio dummy variable that equals 1 if the ratio is over 70 percent and 0 otherwise. *[FP*FB50]_4* is the interaction of foreign purchase to trading value ratio and FB50 dummy variable at 4 lagged years. *[FP*FB70]_4* is the interaction of foreign purchase to trading value ratio and FB70 dummy variable at 4 lagged years. Applied instruments variables are the same to table 3-3. AR (2) tests for autocorrelation in two steps and Sagan test is for null hypothesis of valid over-identifying restrictions. Figures in parentheses are t-statistics. ***, **, * are statistically at 1 percent 5 percent and 10 percent respectively

3.5. Conclusion

We conduct empirical analysis to investigate the benefits of stock market openness to listed firms in Vietnam stock market during 2009-2013 periods. We measure market openness index as the ratio of total foreign purchase value to total trading value of stock market; and the ratio of foreign purchase value to trading value of each stock. The results show that in short and long run market openness increase market value and decrease cost of capital of firm. We also find that market openness increases average stock return of firm, thus benefits its value by enhancing stock market liquidity. Furthermore, a raise in foreign portfolio capital inflows contributes to promoting information disclosure, and diminishing returns volatility that help to decrease cost of fund raising in stock market. The impact channel of market openness on firm is consistent with previous works in both developed and developing countries.

We find the evidence that small firms and service sector are likely to absorb more foreign portfolio capital than manufacturing sector and mid-cap firms. Moreover, firms with high foreign ownership rate tend to attract foreign investors more as they are considered to be well-operated and good governance than those have less foreign ownership rate. The study reveals the importance of financial market regulations and protection of shareholder's interests in absorbing foreign portfolio capital flows. The results support the views on complement investment climate in emerging market.

The contribution of the research is to support to gradual financial market openness policy based on empirical evidences. We argue that market openness will dedicate to improve the efficiency of market as low liquidity and weak transparency of information.

Chapter 4: Corporate responses to credit constraints during Vietnam banking crisis periods

4.1. Introduction

Vietnam's banking system has been exposed to default risk since the end of 2010. This has resulted from weak risk management ability and loosening of lending standards due to cross ownership in commercial banking system for a long time. According to State news media, the total number of bad loans in banking system has reached 13 billion U.S. dollars, equivalent to 11 percent of GDP (the precise bad loans number varies in reported documents). In an attempt to deal with the bad loans problem, the government has enhanced the process of banking system reform and formed a Vietnam asset management company (VAMC) with capital of about 4.8 billion U.S. dollars to buy the bad loans from commercial banks. VAMC will issue zero coupon bonds in charge of a bank's bad debt and the bonds will have a maturity of 5 years and lenders can use them as collateral to get refinancing funds from the central bank (Bloomberg, Wall Street Journal).

Lending interest rate issued by commercial banks for private sectors increased to 18 percent in 2011 which made firms have difficulty in fund raising. Firms faced particular disadvantages in the credit market and decline in domestic aggregate demands due to the economic downturn. According to a report on macroeconomic challenges, difficulty in liquidity of the economy and solution for enterprises at Hanoi in 2012, listed firms are likely to be bankruptcy, measured by Z-scores, accounted for 48 percent at Q1-2012. The report also shows that about 60~70 percent of listed firms faced difficulties in short-term liquidity as inventories were 44.7 percent in 2011. External capital ratio still accounted for about 0.52 of capital structure in Q1-2012 that implied the fact that firms are likely to be vulnerable to credit shock.

This economic context motivated us to investigate the response of firms to credit supply shocks and the impact of credit shock on corporate capital structure. The study aims to shed light on the following questions: i) Do credit constraints decrease performance of bank-dependent firms during crisis period? ii) How did investment, cash holdings and trade credit behaviors of firms change in response to the credit crunch? iii) Do credit supply constraints lead to a change in corporate capital structure that encouraged firms to issue more equity capital than borrow from banks?

The contribution of the study is provides evidence of effects of credit supply shocks on listed firm performance after bank crisis occurred at the end of 2010 in Vietnam. The research is expected

to contribute a case study about financial constraints and firm behavior in emerging market. It indicates the importance of substitution capital resources to mitigate the vulnerability for firms during crisis period.

Chapter 4 is organized as follows. Part 4.2 gives brief literatures review, part 4.3 gives an overview of Vietnam banking system and banking crisis. Descriptions of data, variables construction and statistics are presented in part 4.4. Part 4.5 analyzes empirical results and part 4.6 concludes the study.

4.2. Literature reviews

This section summarizes main literatures related to impact of credit market crisis on firm performance. We present other literatures on firm behaviors and credit crisis in part 4.5 when analyzing empirical results.

Lemmon and Roberts (2011) applied probit model and OLS model to examine the effect of credit supply shocks due to the collapse of Drexel Burnham Lambert, Inc. occurred in 1990 on United States non-financial corporate's financing and investment behavior during 1986-1993 period. The results shown that the contraction in the credit supply alter financing and investment behaviors of below-investment-grade firms. Net debt issuances decreased haft in comparison with pre-shock period. Due to substitution to alternative financial resources such as bank debt, equity, trade credit are limited, net investment also declined one by one with the decline in net debt issuances. The contribution of the research is that capital supply shocks to firms' behavior are not limited to small, bank-dependent firms but also to speculative grade firm's behaviors which are significantly financially healthier than unrated firms.

Chava and Purnanandam (2011) conducted a research with fixed effect regression model to investigate capital supply shocks of United States banking system during Russian crisis of fall in 1998 on 2.665 bank-dependent firms and 304 rated firms. They concluded that firms that primarily relied on bank loans suffered larger losses during crisis period and experienced a higher decline in capital expenditure and profitability consequently. When classifying banks into affected and unaffected groups, they found that affected banks group is more vulnerable than those to credit supply shocks. The key contribution of their research is to exploit a shock that resulted from different country to domestic firms and provide the evidence that shocks can propagate from one country to other countries as financial markets become integrated through banking channel.

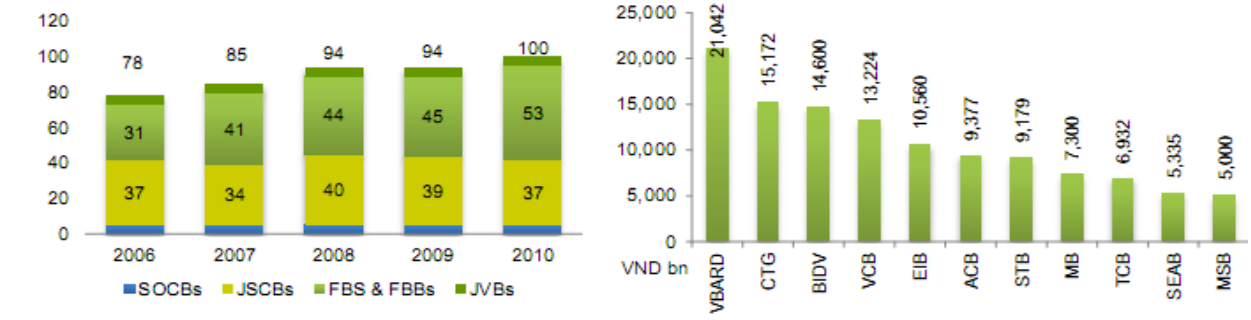
Calomiris et al. (2012) examined three "crisis shocks": the collapse of global trade, the contraction of credit supply and selling pressure on firm' equity occurred during 2007-2008 crisis period for emerging countries and developing countries. The research used a large number of corporate data included 11.677 firms operating in 44 countries during crisis period and 16.434 firms in 44 countries during placebo period. It also constructed six variables that measure for firm's sensitivity to three shocks and applied OLS model with country and industry dummies. By comparing two periods, the research pointed out that variables capturing sensitivity decrease stock returns of firms in the period of crisis do not affect valuation of firm on placebo period. In addition, credit shocks affected more significantly developed countries than developing countries in the period of March 2008 (Bear Stearns collapse) and the summer and fall of 2008 (Lehman Brother's collapse); and the liquidity shock was more serious and variable in developed countries than in emerging markets. The contribution of study is to provide a new approach from firm-specific sensitivities to shocks which arise as result of unexpected crisis event, but did not focus on reason and consequences of the crisis.

4.3. Overview of Vietnam banking system and banking crisis

We based on the data of banking sector report of Vietcombank Securities Company in 2011 and KPMG in 2013 to give some description statistics about Vietnamese banking system during 2006-2012 periods. We do not aim to present the detailed banking system reform strategy in this part.

By the end of 2010, Vietnamese banking sector comprises 101 banks and foreign bank branches including 5 SOCBs, 37 JSCBs, 53 foreign owned banks (FBs) and foreign bank branches (FBBs) and 5 joint venture banks (JVBs). Most of domestic banks are small and medium scale banks when only 26.2 percent of banks have charter capital about 240 million USD dollars or above. Four largest banks Agribank, Vietinbank, Vietcombank and BIDV are SOCBs and their traditional customers are SOEs which exposed high NPLs than other enterprises. According to SBV, 60 percent of NPLs in 2010 was from SOEs.

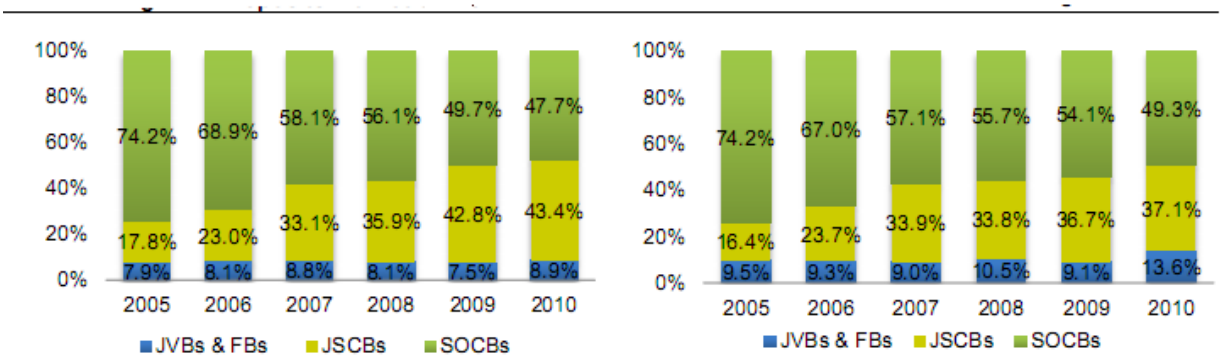
Figure 4-1: Number of banks during 2006-2010 **Figure 4-2: Charter capital of 11 largest banks**



Source: SBV, Vietcombank Securities Company

SOCBs dominate the deposit market share and credit market share during 2005-2010 but the proportion decreased by times while JSCBs have gradually grabbed market shares from SOCBs by increasing the lending accounts for SMEs. By 2010, credit market shares of JSCBS accounted for 37.1 percent of total market while market shares of SOCBs decreased by 49.3 percent in comparison with 2009. In addition, deposit market shares of SOCBs and JSCBs are the same in 2010 that imply a gradual decrease in monopoly of SOCBs. JVBs and FBs developed retail banking in domestic market and market shares of FBs and JVBs also increased by times slightly.

Figure 4-3: Deposits market share **Figure 4-4: Credit market share**



Source: Vietcombank Securities Company

As shown in figure 4-5 and figure 4-6, credit growth and deposits growth were continuously high over 20 percent from 2000 to 2010. Average credit growth was 31.55 percent and average deposit growth was 28.91 percent for long ten years and reached the peach at 53.89 percent and 47.64 percent respectively in 2007. Hot credit growth in 2007 was due to by a large number of loans for individuals and firms to invest in real estate and stock market. Since stock market crashed in

2008 and real estate market was frozen at the end of 2008, loans could not be repaid resulting to high NPLs of domestic banks

Figure 4-5: Credit growth 2000-2010

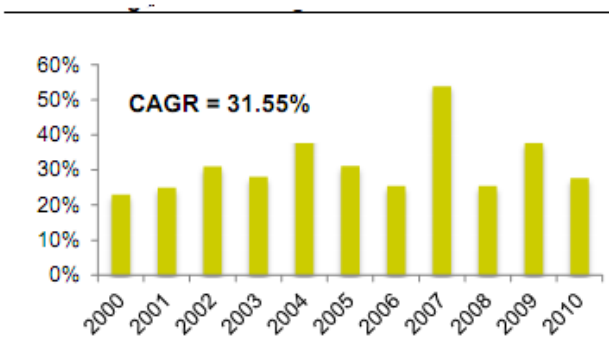
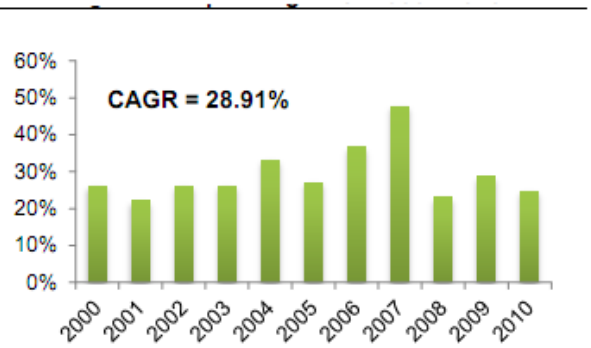


Figure 4-6: Deposit growth 2000-2010

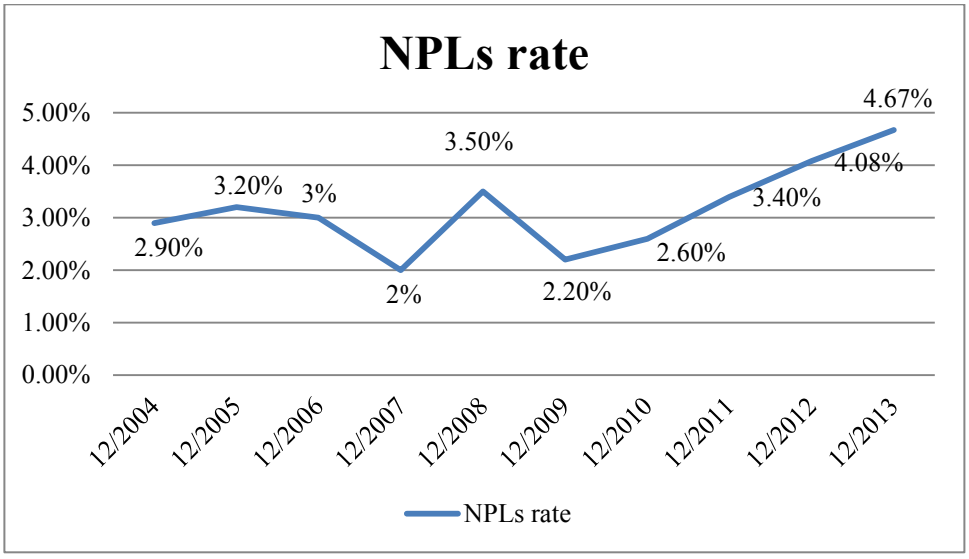


Source: Vietcombank Securities Company

KPMG conducted a banking system survey in 2013 with 33 domestic banks. Figure 4-7 shows NPLs rate of 33 domestic banks during 2004-2013. NPLs rate across banking sector increased since 2009 and was 4.67 percent in April 2013. SBV implemented many policies to deal with bad loans problem by establishing VAMC to repurchase NPLs from commercial banks and completing the function of Credit Information Centre in 2013. SBV also implemented tightening monetary policy to control inflation rate and credit growth. Consequently, credit growth decreased significantly to 12 percent as lending rates increased by 20 percent in 2011.

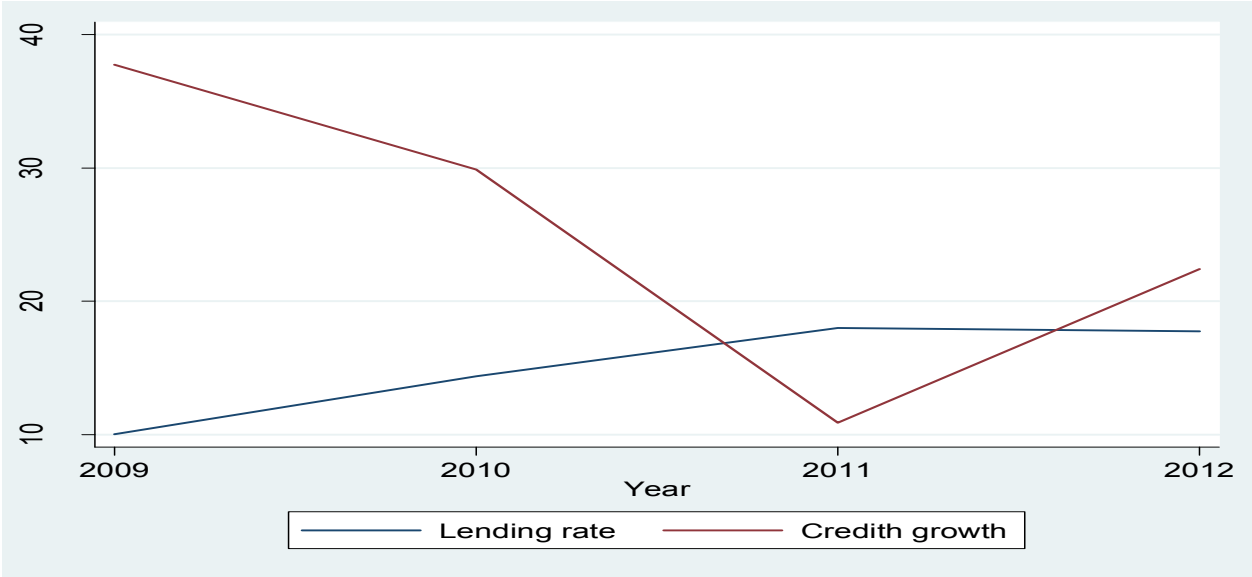
The effects of banking system crisis were reflected by significant decreases in both aggregate loans growth and deposit growth of SOCBs and JSCBs. As shown in figure 4-9, loans growth of 27 JSCBs decreased from 41 percent in 2010 to 17 percent in 2011 while deposit growth decreased from 41 percent in 2010 to 18 percent in 2011. The situation was similar to SOCBs. Loans growth decreased from 25 percent in 2010 to 12 percent in 2011 while deposit growth dropped from 24 percent 2010 to 9 percent in 2011. Credit growth of SOCBs and JSCBs was stagnant during 2012-2013 while deposit growth recovered and increased by 29 percent in 2012 for JSCBs and 19 percent in 2013 for SOCBs. Decrease in deposit growth in 2011 was due to imposition of deposit rate ceilings by 14 percent to control inflation rate. Since 2012, deposit growth rates increased because SBV had adjusted deposit ceiling rate in short and long term.

Figure 4-7: Non performing loans rate of banking system during 2004-2013



Source: KPMG's Vietnamese banking system report in 2013

Figure 4-8: Lending interest rate of commercial banks and credit growth rate in Vietnam during 2009-2012

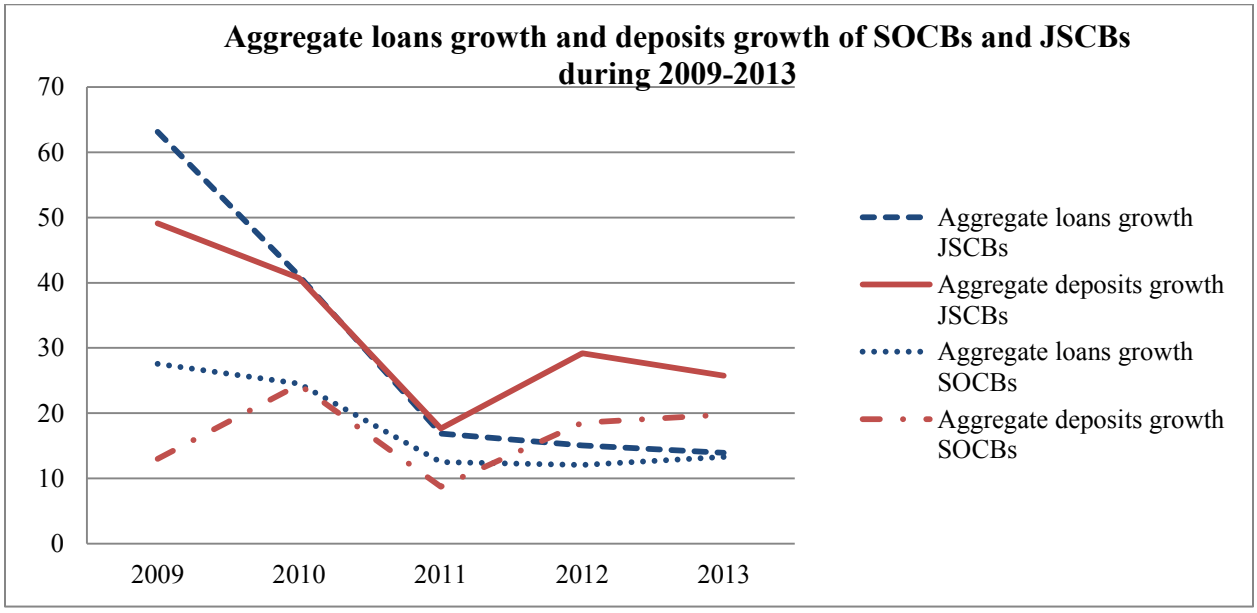


Source: calculated by author based on data of IMF and StoxPlus Company

Decrease in deposit growth affected bank capital ratio that calculated as the ratio of bank equity capital plus retained earnings to total assets. Bank capital implies availability to finance bank operation as well as lending capacity. Bank capital ratio of JSCBs decreased more than SOCBs due to economic scales. It decreased from 16 percent in 2008 to 12.5 percent in 2009 and maintained a

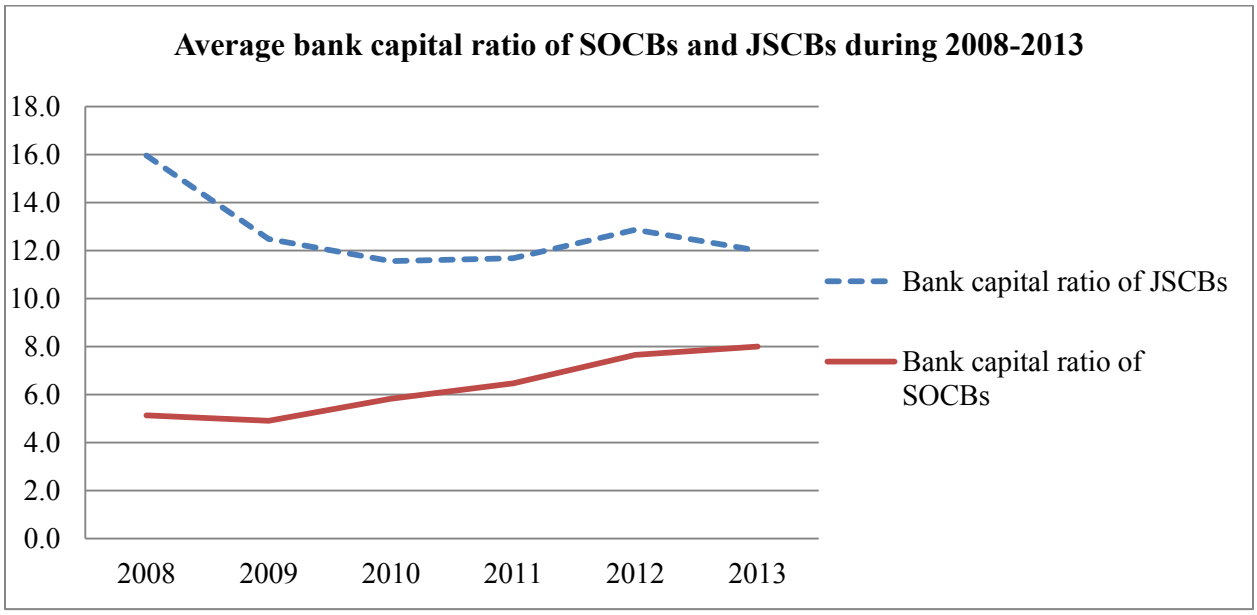
low growth rate at 11~12 percent during 2010-2013. Contrast to JSCBs, capital ratio of SOCBs decreased only in 2009 and increased slightly during 2010-2013.

Figure 4-9: Aggregate loans growth and deposits growth of SOCBs and JSCBs during 2009-2013



Source: calculated by author based on financial statement data of 5 SOCBs and 27 JSCBs

Figure 4-10: Average bank capital ratio of SOCBs and JSCBs during 2008-2013



Source: calculated by author based on financial statement data of 5 SOCBs and 27 JSCBs

4.4. Data, variables construction and methodology

4.4.1. Data

The study used random sample of 202 non-financial and non- real estates listed firms in HNX and HOSE from January 2009 to December 2012. Financial statements of listed firms are annual data and stock prices are daily data. All data could be obtained from database of FPT Securities and Ban Viet Securities Company. Monthly lending interest rate data of domestic commercial banks from January 2009 to December 2012 are obtained from banking sector report of StoxPlus Company in September 2013. Table 4-1 summarizes number of firms classified into 5 main industries: manufacturing, service, construction, information and communication (IC), mining and quarrying. We classified industry based on Vietnam Standard Industrial Classification 2007 (VSIC 2007) issued by General Statistics of Vietnam. When classifying industry, we considered the main business operating at the time of sample collection and from which firms gain main revenues because a lot of firms operate multiple businesses.

Table 4-1: Industrial classification

Industry	Number of firms
Manufacturing	114
Service	58
Construction	6
Information and communication	17
Mining and quarrying	7
Total	202

Note: Service industry composes of 5 supply service based industries. They are retail- wholesale- trade, accommodation and food service, administrative and support service, transportation and storage, utility (classified by author based on standard of VSIC 2007)

4.4.2. Variables construction and methodology

We perform fixed effect regression with panel data on 202 firm observations from 2009 to 2012 period to study research objectives. Industry and firm-fixed effects are included into model. Firm-fixed effect implies each firm's own characteristics such as geographic location, number of employees, scale etc. The estimated model is as below:

$$Y_{it} = \propto_i + \beta_1 AFTER2010 + +\beta_2 Supply\ side_t + \sum_{j=1}^{j=J} \gamma_i\ Demand\ side_{itj} + \epsilon_{it}$$

where Y_{it} is a measure of firm i's performance, investment, cash-holdings and trade credit at time t; $\propto_i$ is firm and industry fixed effect; $Demand\ side_{itj}$ denotes a vector of firm time-specific control variables. It composes of illiquidity rate, sales growth, dividends payout, Z-score, bank dependence and good coverage; $Supply\ side_t$ denotes credit supply side variables in time t and composes of average monthly lending interest rate of commercial banks and credit growth rate; $AFTER2010$ is dummy variable that denotes the year after credit crunch occurred and ϵ_{it} is error terms.

We considered firm-specific variables that might affect firm value as following reasons. Illiquidity of stocks can decrease firm market value and evidence was revealed in chapter 2. Thus, we add illiquidity rate into model to examine the effect of liquidity on enhancing firm performance. Chava et al. (2011) added sales growth into the model as a measure for firm's growth opportunity. High sales growth ensures financial health for firm during crisis period and is assumed to positively affect firm performance.

Following prior researches, we applied Z-score [12]as a measure for firm financial distress. Z-score was firstly introduced by professor Altman of New York University in 1968 and applied widely to predict probability of bankruptcy for firm in two year. Z-score is calculated based on information from corporate financial statements and stock market data and is sum of 5 categories of firms that are liquidity, profitability, leverage, solvency and activity. Firms with Z-score over 2.99 are considered in "safe zones"; with Z-score below 2.99 and over 1.81 are in "grey zones"; and below 1.81 are considered to be in financial distress condition and are likely to declare bankruptcy. We apply Altman Z-score to proxy corporate default risk in regression model. Z-score is a dummy variable and takes value 1 if firm has Z-score below 1.81 and value 0 if otherwise. A negative sign of coefficient of Z-score dummy variable to firm value is expected. Table 4-2 shows an increase of number of distress firms by year especially after bank crisis occurred.

[12] See Altman I. E. (1968) "Financial ratios, discriminant analysis and the prediction of corporate bankruptcy" and Altman I. E. (2000) "Predicting financial distress of companies: revisiting the Z-score and Zeta models" for more detailed score construction

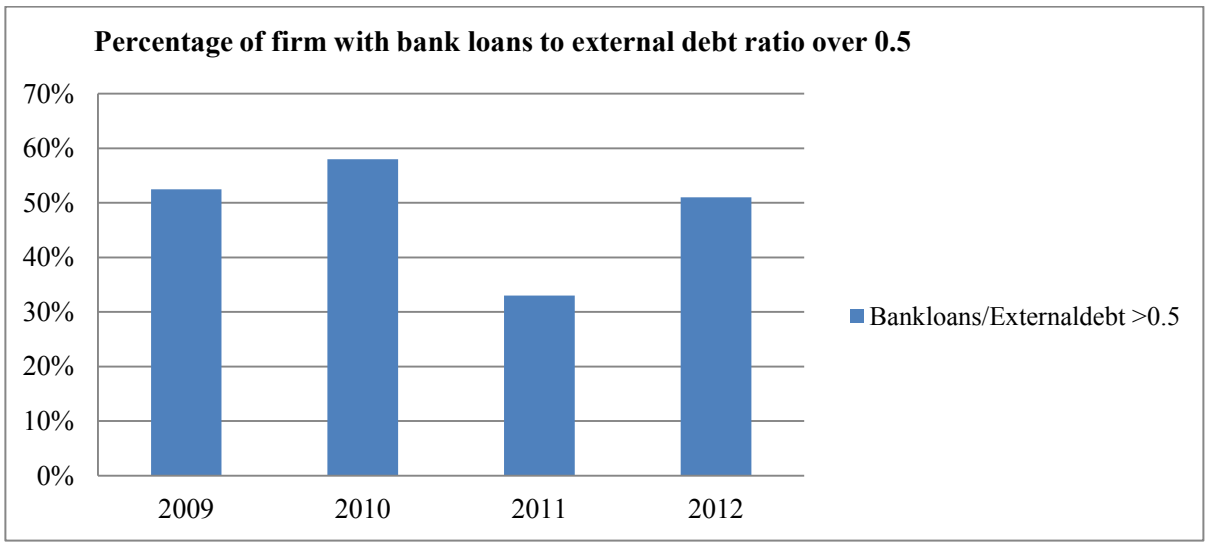
Table 4-2: Summary of Z-score of firms during 2009-2012

Year	Distress zone Z-score <1.81	Grey zone 1.81< Z-score <2.99	Safe zone Z-score > 2.99	Total firms
2009	42	59	101	202
2010	48	58	96	202
2011	69	54	79	202
2012	66	56	80	202

Source: calculated by author

In developed financial markets, a large number of reliable long-term credit rating information for firms could be obtained from database of famous rating companies. And a large of relevant researches used credit rating as a bank dependence proxy for firm (Chava and Purnanandam, 2011). Unfortunately, trust credit rating database are unavailable in Vietnam, thus it motivated us to choose bank loans to external debt ratio as a proxy for bank dependence of firms. Firm with bank loans to external debt ratio equals or over 0.5 is considered to be strong bank-dependence and is assumed to be vulnerable during credit constraints period. Figure 4-11 shows the percentage of bank dependence- firms during 2009-2012 that dropped significantly to 33 percent in 2011. Despites access to credit market is narrow, corporate external debt was dependent on bank loans as percentage of firms with bank loans to external debt over 50 percent increased by 51 percent in 2012. Based on previous works, we assume that bank loan-dependence may affect negatively firm performance due to a rise in cost of capital.

Figure 4-11: Percentage of bank dependent firms during 2009-2012



Source: calculated by author

We add several firm-specific variables into models as explanatory variables including dividend payouts ratio and good coverage dummy variable following Calomiris et al. (2012) to measure firm's sensitivity to credit supply shocks. Dividend payouts tend to decline if firm is in financial distress. Thus, high dividend payouts ratio that reflected stable financial condition of firm is expected to enhance firm market value. Good coverage dummy variable is calculated as the ratio of earnings before interest and taxes divided by interest expenses. It measures the ability of firms to meet their obligations. Firm has interest coverage ratio above 1 will be far from financial distress and have ability to pay debts while those are not. Thus, good coverage is expected to affect positively firm value in the model. Definition of variables is presented in table 4-3[13].

Table 4-3: Variables definition and summary statistics

Name of variable	Definition
Illiquidity rate	Average illiquidity rate measured in one trading year. AVEILL is defined as the ratio of the change in daily stock prices to total daily trading volumes of each stock at absolute value
Sales growth	Ratio of total sales of present year minus total sales of previous year divided to total sales of previous year
Profitability	Ratio of earnings before interest and taxes (EBIT) to total assets at one fiscal year end
Dividend	Ratio of dividend payouts scaled by profit after taxes measured at one fiscal year end
Cash flow	Ratio of EBIT plus depreciation minus taxes divided by total assets at beginning year
Z-score<1.81	A dummy variable indicating bankruptcy proxy. It takes value 1 if Z-score is smaller 1.81 and 0 otherwise.
Bankdep	A dummy variable indicating bank loans dependence of firm. It is defined as ratio of bank loans divided by total debts at one fiscal year end. It takes value 1 if ratio is over 0.5 and 0 otherwise
Good coverage	A dummy variable indicating ability of firm to meet their debt obligations. It is defined as ratio of earnings before interest and taxes divided by interest expenses and takes value 1 if ratio is above 1 and value 0 otherwise
After2010	A dummy variable indicating year of bank crisis. It takes value 1 if year is after 2010 and 0 if otherwise
Lending rate spread	Difference of average monthly lending interest rate issued by commercial banks at present year and average monthly lending interest rate at previous Year

[13] Correlation matrix of variables is reported in table 1-3 of Appendix 1

Credit growth	Growth rate of credit supply in one year
Q ratio	Ratio of market asset value divided by book asset value at one fiscal year end
Investment	Ratio of capital expenditure divided by one lagged total assets at one fiscal year end
Cash reserves	Ratio of cashes equivalent divided by total assets at one fiscal year end
Accounts receivable	Ratio of total amount of accounts receivable divided by total assets at one fiscal year
Accounts payable	Ratio of total amount of accounts payable divided by total debts at one fiscal year end

Variable	Obs	Mean	Std. Dev.	Min	Max
Q ratio	802	1.07	0.77	0.02	5.16
Investment	790	0.07	0.08	1.04E-06	0.61
Cash reserves	808	0.12	0.13	0.0002	0.94
Accounts receivable	808	0.16	0.13	0.00003	0.71
Accounts payable	803	0.22	0.18	0.0001	0.95
Illiquidity rate	791	0.18	0.82	1.20E-06	15.87
Sales growth	808	0.05	3.67	-103.14	7.26
Dividend	659	1.72	23.6	-144.34	528.45
Profitability	808	0.11	0.09	-0.49	0.64
Cash flow	808	0.17	0.13	-0.16	1.13
Z-score<1.81	808	0.28	0.45	0.00	1.00
Good coverage	808	0.93	0.26	0.00	1.00
Bankdep	808	0.49	0.50	0.00	1.00
After2010	808	0.50	0.50	0.00	1.00
Lending rate spread	808	-0.37	5.40	-9.22	4.36
Credit growth	808	25.23	9.90	10.90	37.74

4.5. Corporate responses to credit constraints

4.5.1. Credit constraints and firm performance

Regression results of effect of credit supply shocks on firm performance for all time samples are presented in table 4-4. Model (1) and (2) are regressed under the control of firm fixed effect and industry fixed effect respectively. We do not find evidence of the impacts of bank dependence on firm performance in all models. Firm with high bankruptcy risk decreases firm performance about 22 percent under firm fixed effect at 1 percent statistically significant. Banking crisis dummy variable *after2010* diminishes firm value significantly under firm and industry fixed effects

respectively. The results are consistent with our hypothesis on effect of credit crunch on firm performance.

Illiquidity rate diminishes firm value about 2.7 percent under firm-fixed effect. Sale growth increases slightly firm value 0.3 percent under firm fixed effect while an increase in profitability enhances firm value about 0.03 under industry fixed effects. Lending interest spread decreases firm value about 2.5 percent and 1.8 percent under firm and industry-fixed effect respectively as firms were vulnerable to interest rate fluctuations.

Table 4-4: Impact of credit constraints on firm performance

	All period	
Dependent variable	Q ratio (1)	Q ratio (2)
Illiquidity rate	-0.027	0.040
	(-1.91)*	(0.69)
Sales growth	0.003	0.009
	(2.00)**	(1.30)
Profitability_1	-0.362	2.774
	(-0.84)	(33.37)***
Dividend_1	-0.0001	-0.0005
	(-0.25)	(-1.56)
Zscore < 1.81	-0.224	-0.192
	(-2.79)***	(-1.76)
Good coverage	0.156	-0.073
	(1.97)*	(-0.67)
Bankdep	0.091	-0.014
	(1.19)	(-0.13)
After2010	-0.494	-0.414
	(-6.49)***	(-3.57)**
Bankdep*after2010	-0.056	-0.064
	(-0.70)	(-0.70)
Lending rate spread	-0.025	-0.018
	(-5.83)***	(-8.55)***
Credit growth	-0.0004	0.006
	(-0.13)	(1.22)
Constant	1.273	0.949
	(7.81)***	(3.19)**
Firm fixed effect	Yes	No
Industry fixed effect	No	Yes
Observations	646	646
Number of groups	199	5
Overall R-squared	0.19	0.34

Note: This table shows panel data fixed effect regressions with *Qratio* as dependent variable. We include firm fixed effect in model (1) and industry fixed effect in model (2). Definition of explanatory variables is presented in table 4-3. T-values are displayed in parentheses right below. Standard errors are adjusted for heteroskedasticity. (***), (**), (*) indicates significance at 1 percent, 5 percent and 10 percent two-tailed level.

Next we test the impact of bank dependence on firm value before and after banking system crisis. We divide sample in 2009-2010 pre-crisis period and 2011-2012 post-crisis period then regress *bankdep* on *Q ratio*. Table 4-5 shows negative impact of *bankdep* on *Q ratio* in model (4) under the control of industry-fixed effect. Bank dependence – firms have lower firm value about 9.2 percent after banking crisis. The coefficient is statistically significant at 10 percent. The result supports for our hypothesis that bank dependent firms are likely to be more vulnerable than other firms to credit constraints.

Table 4-5: Impact of credit constraints on firm performance during pre-crisis and post-crisis period

	Pre-crisis (2009-2010)		Post-crisis (2011-2012)	
	Q ratio (1)	Q ratio (2)	Q ratio (3)	Q ratio (4)
Illiquidity rate	-0.054	0.047	-0.311	-0.230
	(-3.20)***	(0.96)	(-2.05)**	(-6.78)***
Sales growth	0.007	0.008	-0.112	0.214
	(2.69)***	(1.75)	(-2.40)**	(0.84)
Profitability_1	-1.442	2.133	0.530	3.382
	(-3.34)***	(23.7)***	(0.71)	(14.65)***
Dividend_1	-0.003	-0.003	-0.0002	-0.0006
	(-12.33)***	(-4.61)***	(-0.92)	(-1.55)
Bankdep	0.033	0.004	-0.032	-0.092
	(0.39)	(0.03)	(-0.47)	(-2.77)**
Z-score < 1.81	-0.220	-0.365	-0.180	-0.010
	(-2.03)**	(-3.67)**	(-2.62)***	(-0.07)
Good coverage	-0.258	-0.064	-0.012	-0.070
	(-3.89)***	(-0.51)	(-0.21)	(-0.90)
Lending rate spread	-0.025	-0.020	-----	-----
	(-7.6)***	(-8.26)***		
Credit growth	-----	-----	0.007	0.015
			(3.30)***	(2.14)*
Constant	1.835	1.219	0.726	0.218
	(14.80)***	(5.78)***	(5.77)***	(0.94)
Firm fixed effect	Yes	No	Yes	No
Industry fixed effect	No	Yes	No	Yes
Observations	311	311	335	335
Number of groups	193	5	184	5
Overall R-squared	0.04	0.16	0.14	0.34

Note: This table shows panel data fixed effect regressions with *Qratio* as dependent variable. We run model (1) and model (3) with firm fixed effects and model (2) and model (4) with industry fixed effects. Definition of explanatory variables is presented in table 4-3. T-values are displayed in parentheses right below. Standard errors are adjusted for heteroskedasticity. (***), (**), (*) indicates significance at 1 percent, 5 percent and 10 percent two-tailed level.

4.5.2. Corporate investment during credit constraints period

Many researches have shown the evidence on real effects of financial crisis to corporate investment through bank-lending channel. Duchin, Ozbas and Sensoy (2010) study the effect of the 2007-2008 financial crisis on corporate investment using quarterly data of non-financial United States 3.668 firms during 2001-2009 periods. They find that corporate investment decline significantly following the onset of crisis under the control of firm and time fixed effects. The research also shows the decline is greatest for firms that have low cash reverses or high short-term debt, are financially constraints and belongs to industries dependent on external finance. Akbar, Rehman and Ormrod (2012) adopt a fixed effect model and use the sample of 4973 United Kingdom firms to examine how shocks to the supply of credit during the financial crisis 2007-2008 affect the financing and investment policy of private companies. The result highlight that credit contraction has negatively affected firm performance and firm investment and firms tend to hold cast reserves to hedge themselves from negative effect of credit shock. Kahle and Stulz (2013) conduct the empirical analysis about effects of recent financial crisis in corporate capital expenditures and borrowing using OLS regression and quarterly data of U.S non-financial firms during 1983-2010 periods. They find that during financial crisis, corporate borrowing and capital expenditures fall significantly. However, bank-dependent firms do not decrease in debt issuance and capital expenditures much more than the other firms even during crisis because they have other insured financial resources to fund their investment projects such as issuing equity or public debt, selling assets or obtain more from trade credit.

Based on previous researches, we assume that corporate investment decrease during credit constraints. We add some firm specific variables as determinant on corporate capital expenditures including financial ability (profitability and cash flow) and risk (dummy Z-score and illiquidity rate)

Table 4-6: Corporate investment during credit constraints periods

	All period	
Dependent variable	Investment (1)	Investment (2)
Profitability_1	0.074	0.037
	(1.43)	(0.73)
Cash flow_1	0.047	0.121
	(1.22)	(3.15)**
Illiquidity rate	-0.005	-0.008
	(-1.76)*	(-7.18)***
Z-score<1.81	0.016	0.018
	(1.74)*	(3.92)**
After2010	-0.019	-0.025
	(-2.34)**	(-4.67)***
Bankdep*after2010	-0.020	-0.010
	(-1.71)*	(-0.74)
Constant	0.043	0.042
	(3.65)***	(6.84)***
Firm fixed effect	Yes	No
Industry fixed effect	No	Yes
Time fixed effect	Yes	Yes
Observations	773	773
Number of groups	202	5
Overall R-squared	0.07	0.09

Note: This table shows panel data fixed effect regressions with *capital expenditure to one-lagged total assets ratio* as dependent variable. We include firm fixed effect and time fixed effect in model (1), industry fixed effect and time fixed effect in model (2). Definition of explanatory variables is presented in table 4-3. T-values are displayed in parentheses right below. Standard errors are adjusted for heteroskedasticity. (***), (**), (*) indicates significance at 1 percent, 5 percent and 10 percent two-tailed level.

We construct the interaction of bank dependence variable and after 2010 dummy variable and include into the model to test the change in corporate investment to credit constraints. *Profitability* and *cash flow* are computed in one lagged year to examine time effect on investment. Table 4-6 reports the results. Credit shock decreases corporate capital expenditures approximately 2 percent and 2.5 percent while investment of bank dependent firms declines slightly 2 percent under the controlling of firm fixed effect. The sensitivity of cash flow- investment (positive relationship) is argued as a measure for firm financial constraints (Fazzari et al., 1988) and is proved in the model when cash flows enhance firm investment under industry fixed effects.

4.5.3. Corporate cash holdings during credit constraints period

Recent empirical researches have expressed a great attention in investigating the determinants of corporate cash holdings. Opler et al. (1999) conducted times series and cross section tests to examine determinants of cash holdings of publicly traded United States firms from 1971 to 1994. They find that firms with strong growth opportunities and high business risk and smaller size hold more cashes than other firms to ensure they will be able to keep investing when cash flow is too low and when outside funds are expensive. In addition, the incentives for cashes accumulation behavior are explained to avoid firm's inflow funds deficit and reduce finance losses. The research of Ozkan et al (2003) with a sample of UK firms during 1984-1999 periods suggest that ownership and growth opportunities exert positive impacts while leverage and bank debt exert negative impacts on cash holdings. Ferrari (2004) complements prior research with EMU countries sample from the 1987-2000 and concludes that cash holdings are positively affected by investment opportunity and cash flows and are negatively affected by asset liquidity, bank debt, size and capital market development. McVanel and Perevalov (2008) reveal the role of financial constraints and firm characteristics in increasing cash holdings of Canadian firms during 1980-2006. Their findings emphasize small size, high cash inflow, low level of cash substitutes and high expenditure on research and development are correlated with the high cash holdings.

The other research of Alvarez et al (2010) focuses on investigating cash holdings decision of Chilean firms during 1996-2009 periods. The results are mostly similar to prior researches which show that leverage, banking debt, liquid assets and size reduce cash holdings while sales volatility increases cash holdings.

We add *after2010* and the interaction of *after2010* and *bankdep* dummy variables to study the impact of credit constraints on cash holdings and relationship of bank dependent firms and cash holdings behavior of firms. Following the previous researches, other determinants of cash holdings are also examined. Table 4-7 presents the empirical results. Since bank crisis occurred, corporate cash holdings increase in 2011 and 2012 about 4.3 percent under the control of industry fixed effects. The positive effect is consistent with hypothesis that firms increase cash reserves for provisions (Denis and Sibilkov, 2010). Cash reserves help firms to maintain stable liquidity and reduce the risk of bankruptcy during financial crisis. In contrast, firms with exclusive relationship with banks tend to decrease cash holdings about 6.6 percent even during credit crisis since their projects are fully financed by banks. Our results support to researches of Ozkan et al. and Ferrari (2004).

Table 4-7: Corporate cash holdings during credit constraints period

	All period	
Dependent variable	Cash reserves (1)	Cash reserves (2)
Sales growth	0.001	0.0004
	(2.77)***	(4.83)***
Profitability_1	0.161	0.466
	(2.09)**	(8.76)***
Investment_1	-0.011	-0.004
	(-2.91)***	(-0.92)
Dividend_1	0.00001	-0.0001
	(0.13)	(-2.15)*
Z-score < 1.81	-0.035	-0.046
	(-2.96)***	(-4.11)**
After2010	0.019	0.043
	(1.31)	(3.76)**
Bankdep*after2010	-0.022	-0.066
	(-1.48)	(-5.04)***
Constant	0.112	0.072
	(9.30)***	(8.58)***
Firm fixed effect	Yes	No
Industry fixed effect	No	Yes
Time fixed effect	Yes	Yes
Observations	647	647
Number of groups	198	5
Overall R-squared	0.17	0.20

Note: This table shows panel data fixed effect regressions with *cash equivalents to total assets ratio* as dependent variable. We include firm fixed effect and time fixed effect in model (1), industry fixed effect and time fixed effect in model (2). Definition of explanatory variables is presented in table 4-3. T-values are displayed in parentheses right below. Standard errors are adjusted for heteroskedasticity. (***), (**), (*) indicates significance at 1 percent, 5 percent and 10 percent two-tailed level.

The effects of profitability and bankruptcy risk in cash reserves of firms are obvious. Higher profitable firms have higher cash reserves. Bankruptcy risk firms have lower cash reserves than the others. High sales growth increases cash reserves of corporate while investment expenditure decreases cash ratio slightly.

Our results are consistent with prior researches and indicate that firms hold more cashes during credit crisis as hedging instrument for future projects and undertake present investments. In

addition, bank dependent-firms decrease cashes holdings as the demands on capital are met from external funds during crisis period.

4.5.4. Corporate trade credit during credit constraints period

4.5.4.1. Accounts receivable and accounts payable

In this section, we investigate corporate behavior to trade credit as measured by accounts receivable to total assets in response to credit constraints. Yang (2011) investigate firm's trade credit (measured by accounts receivable and payable) and bank credit behavior around the time of the recent subprime financial crises using U.S manufacturing sector data during 2005-2009 period. The research indicates a substitute/complementary effect between bank credit and accounts payable/receivable. Bank credit decreases immediately after the breakout of the crisis while receivable increases immediately after the breakout and then drops down in the post-breakout period. Accounts payable, however steadily increases during the breakout and post-breakout period. Moreover, financially constrained firms are likely to cut their credit supply to customers and increase their using of credit from suppliers. Garcia-Appendini and Garrica (2013) study corporate trade credit using United States data during 2007-2008 financial crisis periods and find that firms with large levels of pre-crisis liquidity extended more trade credit during crisis. They also indicate that financially constrained firms received more trade credit that support to the result of Yang (2011). Valverde et al. (2013) provide the evidence using data of Spanish SMEs that credit constrained firms use trade credit but not loans as substitution financial source for investment during financial crisis while unconstrained firms use more bank loans than trade credit.

Table 4-8 shows that accounts receivable of listed firms increase by 1.8 percent during 2011-2012 periods that suggest profitability losses of trading partners. Especially, bank dependent firms decrease account receivables from 1.4 percent to 3.2 percent during crisis periods to keep cashes-balance stable and use as liquidity provisions. The results are consistent with prior studies of developed economic countries.

Table 4-8: Corporate trade credit during credit constraints period

	All period	
Dependent variable	Accounts receivable (1)	Accounts receivable (2)
Sales growth	-0.001	-0.0002
	(-8.19)***	(-1.00)
Profitability_1	0.031	-0.033
	(0.37)	(-0.20)
Cashflow_1	-0.072	-0.134
	(-1.27)	(-0.82)
Z-score < 1.81	-0.017	-0.041
	(-2.06)**	(-1.87)
After2010	0.018	0.034
	(2.00)**	(1.91)
Bankdep*after2010	-0.014	-0.032
	(-1.70)*	(-2.96)**
Constant	0.167	0.186
	(25.80)***	(27.47)***
Firm fixed effect	Yes	No
Industry fixed effect	No	Yes
Time fixed effect	Yes	Yes
Observations	807	807
Number of groups	202	5
R-squared	0.03	0.04

Note: This table shows panel data fixed effect regressions with *accounts receivable to total assets ratio* as dependent variable. We include firm fixed effect and time fixed effect in model (1), industry fixed effect and time fixed effect in model (2). Definition of explanatory variables is presented in table 4-3. T-values are displayed in parentheses right below. Standard errors are adjusted for heteroskedasticity. (***), (**), (*) indicates significance at 1 percent, 5 percent and 10 percent two-tailed level.

We examine capital resource substitution from bank loans to trade credit during crisis measured by accounts payable to total debt ratio. As shown in table 4-9, since credit shock occurred, firms increase trade credit as substitution fund resource by 2.3 percent and 8.3 percent. In contrast, bank relationship firms do not use other substitution fund as they have insured capital resources from banks, thus decrease trade credit by 2.7 percent and 13.5 percent during crisis periods.

Table 4-9: Trade credit as substitution capital resources

	All period	
Dependent variable	Accounts payable (1)	Accounts payable (2)
Sales growth	-0.001	-0.0004
	(-4.32)***	(-1.61)
Profitability_1	0.051	-0.111
	(0.58)	(-0.81)
Cashflow_1	0.030	0.007
	(0.48)	(0.10)
Z-score < 1.81	-0.025	-0.084
	(-1.80)*	(-4.98)***
After2010	0.023	0.083
	(1.75)*	(3.41)**
Bankdep*after2010	-0.027	-0.135
	(-2.08)**	(-9.32)***
Constant	0.211	0.243
	(21.78)***	(34.60)***
Firm fixed effect	Yes	No
Industry fixed effect	No	Yes
Time fixed effect	Yes	Yes
Observations	802	802
Number of groups	202	5
Overall R-squared	0.08	0.14

Note: This table shows panel data fixed effect regressions with *accounts payable to total debt ratio* as dependent variable. We include firm fixed effect and time fixed effect in model (1), industry fixed effect and time fixed effect in model (2). Definition of explanatory variables is presented in table 4-3. T-values are displayed in parentheses right below. Standard errors are adjusted for heteroskedasticity. (***), (**), (*) indicates significance at 1 percent, 5 percent and 10 percent two-tailed level.

4.5.5. Bank loans supply and corporate capital structure

In this part, we study how the change in bank loans supply impacts on increasing or decreasing in bank loans ratio and equity debt ratio of corporation. Leary (2009) indicates that leverage ratios of bank-dependent firms fluctuated to the change in the expansion or contraction of bank loans supply during 1966 credit crunch period. The research also reveals the changes in corporate capital choice are associated with constrained access to bank debt market. While small firms are rely more on equity financing, large firms tend to substitute from private to public debt

under credit tightening period. Becker and Ivashina (2014) show the evidence about the substitution from loans to bonds of United States corporates at the time of bank credit supply contraction. The capital substitution was especially strong under tight lending standards, depressed aggregate lending, poor bank performance and tight monetary policy.

As credit market crisis occurred since the end of 2010 in Vietnam, SOCBs' loans supply growth rate dropped from 24.5 percent in 2010 to 12.4 percent in 2011 and 12 percent in 2012 while loans supply growth rate of JSCBs decreased more considerably from 41 percent in 2010 to 16.8 percent in 2011 and 15 percent in 2012. The shock of credit supply side made firms to choose between issuing bank debt or equity debt to minimum cost of capital. Thus, we use annual aggregate bank loans growth rate of 5 SOCBs and 27 by total 34 JSCBs[14] to proxy credit shocks of supply side as suggested in the research of Shen et al. (2014) .

Gertler and Gilchrist (1994), Oliner and Rudebusch (1996) use firm size to proxy for access to public debt market. The results show that size is highly correlated with public debt market access. Faulkender and Peterson (2006) reveal that the variables measuring ability of firm to increase its leverage are related to corporate capital structure. They use the presence of credit rating and firm size (as instrumental variables) to proxy for access to bond market and conclude that firm has credit rating may obtain more capital or cheaper capital, in addition firm is large enough to issue bond may have more leverage about 6.6 percent. Leary (2009) argues that large firms, which are more relatively transparent and less informationally opaque, are able to access to private debt market and equity, leading to a lower impact from loans supply shocks. Li, Yue and Zhao (2009) demonstrate that state owned firms are positively associated with leverage and firm's access to long-term debt in China. Following prior researches, we add two dummy variables *size* and *staterate30* to proxy access to credit market. *Size* stands for large and medium sized firm that equals 1 if firm has total assets higher or equal mean value and 0 otherwise. Staterate30 stands for state ownership rate of firm that equals 1 if firm has state owned rate over 30 percent and 0 otherwise. It is expected that *size* and *staterate30* are positively associated with bank loans growth rate.

Financial constrained and unconstrained dummy variable are added to the model to consider financial distress impact on corporate capital structure. Financial constraints proxy is one of the most controversial problems in corporate finance. Fazzari et al. (1988) firstly introduced

[14] We exclude Ban Viet Capital Bank and Bao Viet Bank due to lack of data in 2008; Bac A Bank due to lack of data in 2008, 2009 and 2010; Global Petro Commercial Joint-Stock Bank due to lack of data in 2012; Vietnam Construction Bank due to lack of data in 2012; Viet Bank and PVCom Bank due to lack of data of all periods.

investment-cash flow sensitivity as a measure of financial constraints of firm. In addition, implicit in their argument is the assumption that low dividends are useful indicator of financial constraints. Kaplan and Zingales (1997) reinvestigate the Fazzari et al.'s sample and conclude that firms with highest investment-cash flow sensitivities do not belong to constrained firms but belong to least financially constrained group. They also indicate that neither cash flow sensitivities nor low dividends are useful indicators of financial constraints. Lamont, Polk and Saa-Requejo (2001) create actual KZ index using the original sample of Kaplan and Zingales (1997) with accounting variables: cash flow, Q ratio, debt, dividends and cash holdings, each scaled by total assets. The KZ index loads positively on Q ratio and leverage and negatively on cash flow, dividends and cash. KZ index has been the most popular measure of financial constraints[15].

Whited and Wu (2006) create another financial constraints index that obtained from a structural model. WW index comprises following variables: cash flow to assets (negative loading), a dummy capturing whether firm pays a dividend (negative loading), industrial sales growth (positive). Hadlock and Pierce (2010) exploit the approach of Kapan and Zingales (1997) again and show the doubt on the reliability of KZ index because they find that only two of five components of KZ index are related to constraints in their sample. Thus, Hadlock and Pierce develop their own HP index that based on size, size-squared and age of firm. Besides two variables firm size and age, they also emphasize the importance of other two variables that offer additional explanatory power for predicting constraints are cash flow and leverage.

Due to controversy on financial constraints measures, we select KZ index as measure for financial constraints because as to our opinion, KZ index has been applied in many researches and is composed of determinants of firm performance and financial health of firm.

Other firm-level control variables are chosen based on researches of Frank and Goyal (2004) and Leary (2009) about determinants of corporate's capital structure. They suggest the most reliable factors explaining for leverage rate are median industry leverage, market to book assets ratio, tangibility, profits, log of assets, dividend rate and expected inflation rate. Thus, we add Q-ratio, dividend payout ratio, stock return, sales growth and cash flow into model to examine the role of firm characteristics in determining corporate capital resources.

Table 4-10 shows a slight decrease in corporate bank loans borrowing response to credit supply shock. Medium and large scaled firms have more advantage in accessing to credit market

[15] See Lamont et al. (2001) Financial constraints and stock returns. *The Review of Financial Study*, Vol. 14, No. 2, pp.529-554 for more details of KZ index construction.

and increase loans borrowing rate from 6 to 12 percent. As opposed to size, SOEs find difficulty in access to credit market. This may due to bad performance of some large SOEs in 2009 such as Vinashin and Vinalines that impacted on confidence of loans supply side. We also find that firms with good financial health tend to borrow less than those are not while financial distress firms tend to rely on bank loans resources approximately 9 percent. The reason is obvious because raising capital from other resources such as equity issuance or trade credit increasing is not favorable for firm with high risk of bankruptcy. Thus, there are limited choices of capital for financial distress firms.

Table 4-10: Bank loans supply shock and corporate borrowings

	All period	
Dependent variable:	Corporate borrowing (1)	Corporate borrowing (2)
Loan growth	-0.001	-0.002
	(-1.30)	(-3.50)**
Size	0.066	0.126
	(1.66)*	(12.86)***
Size*Loan growth	-0.001	-0.002
	(-1.27)	(-3.11)**
Staterate30	------	-0.067
		(-4.06)**
Staterate30*Loan growth	0.001	0.0006
	(1.64)	(1.30)
Constraints	-0.031	0.088
	(-1.26)	(13.21)***
Constraints*Loan growth	0.002	0.004
	(2.35)**	(11.85)***
Unconstraints	-0.059	-0.195
	(-2.60)***	(-5.19)***
Unconstraints* Loan growth	0.0004	0.002
	(0.38)	(1.53)
Qratio_1	-0.003	-0.008
	(-0.38)	(-7.63)***
Dividend_1	0.0002	0.00002
	(1.38)	(0.11)
Return_1	-0.005	0.058
	(-0.31)	(1.84)
Sales growth	-0.0002	0.002
	(-0.64)	(9.36)***

Cash flow	0.003	-0.111
	(0.08)	(-2.01)
Constant	0.269	0.314
	(10.70)***	(14.27)***
Firm fixed effect	Yes	No
Industry fixed effect	No	Yes
Time fixed effect	Yes	Yes
Observations	567	567
Number of groups	186	5
Overall R-squared	0.21	0.40

Note: This table shows panel data fixed effect regressions with corporate borrowing measured by *total bank loans to total asset ratio* as dependent variable. Loans growth is annual aggregate loans growth rate of 5 SOCBs and 27 JSCBs. *Size* is dummy variable that measures for firm access to credit market and equals 1 if firm has total assets value greater than or equal to mean value and 0 otherwise. *Staterate30* is dummy variable that measures for firm access to credit market and equals 1 if firm has state ownership rate over 30 percent and 0 otherwise. *Constraints* is constructed based on Kaplan and Zingales index that equals 1 if firm is in upper two deciles and 0 otherwise. *Unconstraints* is measured based on Kaplan and Zingales index that equals 1 if firm is in lower two deciles and 0 otherwise. *Return* is average daily returns of each stock in one trading year that is measured at 1 lagged year. Definition of other firm-level control variables is in table 4-3. Year dummy variables are added into all models but are not reported. Standard errors are clustered at firm level. (***), (**), (*) indicates significance at 1 percent, 5 percent and 10 percent two-tailed level.

Table 4-11 presents a slight increase in equity debt issuance of corporate during credit constraints. Signs of the other explanatory variables are opposite to those on table 11. Good performance firm tend to choose equity debt issuance than borrow from banks, thus increase equity debt ratio from 8 percent to 30 percent. Financial constrained firms adjust capital structure with less equity debt ratio from approximately 6 percent to 15 percent. It is obvious that financial condition of corporate influence strongly on Vietnamese corporate capital structure.

Table 4-11: Bank loans supply shock and equity debt issuance

	All period	
Dependent variable:	Equity debt issuance (1)	Equity debt issuance (2)
Loan growth	0.001	0.002
	(1.67)*	(2.56)*
Size	-0.132	-0.081
	(-4.11)***	(-6.34)***
Size*Loan growth	0.001	0.002
	(1.72)*	(3.05)**
Staterate30	------	0.012
		(1.15)
Staterate30*Loan growth	-0.001	-0.0004
	(-2.13)**	(-2.00)
Constraints	-0.058	-0.154
	(-2.97)***	(-6.50)***
Constraints*Loan growth	-0.0001	-0.003
	(-0.09)	(-3.95)**
Unconstraints	0.087	0.306
	(3.65)***	(13.14)***
Unconstraints*Loan growth	-0.001	-0.003
	(-1.68)*	(-2.10)
Qratio_1	-0.005	0.013
	(-0.77)	(1.96)
Dividend_1	-0.0001	-0.00003
	(-1.31)	(-0.22)
Return_1	0.003	0.007
	(5.62)***	(5.63)***
Sales growth	0.0004	-0.003
	(1.87)*	(-8.69)***
Cash flow	0.018	0.003
	(0.54)	(0.09)
Constant	0.564	0.485
	(26.94)***	(17.66)***
Firm fixed effect	Yes	No
Industry fixed effect	No	Yes
Year dummy	Yes	Yes
Observations	638	638
Number of groups	198	5
Overall R-squared	0.32	0.56

Note: This table shows panel data fixed effect regressions with bank loans borrowing measured by *total bank loans to total asset ratio* as dependent variable. *Loans growth* is annual aggregate loans growth rate of 5 SOCBs and 27 JSCBs. *Size* is dummy variable that measures for firm access to credit market and equals 1 if firm has total assets value greater than or equal to mean value and 0 otherwise. *Staterate30* is dummy variable that measures for firm access to credit market and equals 1 if firm has state ownership rate over 30 percent and 0 otherwise. *Constraints* is constructed based on Kaplan and Zingales index that equals 1 if firm is in upper two deciles and 0 otherwise. *Unconstraints* is measured based on Kaplan and Zingales index that equals 1 if firm is in lower two deciles and 0 otherwise. *Return* is average daily returns of each stock in one trading year that is measured at 1 lagged year. Definition of other firm-level control variables is in table 4-3. Year dummy variables are added into all models but are not reported. Standard errors are clustered at firm level. (***), (**), (*) indicates significance at 1 percent, 5 percent and 10 percent two-tailed level.

4.6. Conclusion

We study the effect of credit supply shock on firm performance in Vietnam since 2010. The credit supply shock affected negatively non-financial firm performance about over 40 percent in general and bank dependent firms have lower firm value about 9 percent during 2011-2012 periods. A significant rise in lending rates of commercial banks in 2011 that narrowed the access to credit market and economic downturn with high inflation rate in 2008 that decreased domestic demands on goods and services are considered as the main causes of the drop of firm value.

Listed firms decreased investment from 2~2.5 percent during credit crunch periods. There are two reasons for this reduction. First, firms did not have enough capital resources for investment projects. Second, corporate demands on investment dropped due to large amounts of inventories in 2012. This means that the cause of investment reduction comes from internal (firm) and external (capital market and customer's demands) reasons. Risk management is one of the most important policies to maintain financial stability during crisis. As a hedging policy, firms increased account receivables from trade credit and especially cash reserves by 4.3 percent to ensure cash-balances and liquidity. It makes a sense if we explain a decrease in investment is inversely proportional to a raise in cash reserves ratio of firm. One may argue about opportunity cost of choice between cash-holdings and investment reduction but from the perspective of turbulent economy during 2009-2012, hedging policy should be considered thoroughly.

Corporate capital structure always has been interesting topic in corporate finance research. In this chapter, capital structure adjustment is closely related to fluctuation of lending rates in credit market. As the results shown, there was adjustment in external capital structure when listed firms increased trade credit loans 2~8 percent as substitution capital resources for bank loans. The role of

trade credit including accounts receivable and accounts payable once was emphasized as cashes provision and substitution resource. We do not find a considerable change in capital structure between choice of bank loans debt and equity debt under the effect of credit supply shock.

When conducting classification of corporate financial condition based on Kaplan and Zingales index to examine the relationship of corporate capital structure choice and financial condition, we find that financially constrained firms rely on bank loans more than those are not in financial constraints. In contrast, unconstrained firms prefer to issue equity debt from 8~30 percent. The real results reflected the more difficulty of constrained firms in fund raising once credit constraints occurred. Moreover, insured financial ability is necessary condition for firms to issue equity.

The results indicate that exclusive bank relationship firms which have bank loans accounting for over 50 percent of external debt did not increase trade credit for substitution capital resources during 2011-2012. This may be explained as exclusive bank relationship ensured stable capital resources for firm even when banks faced bad loans crisis. Thus firm did need to use other external debt resources. The other reason is that high bank levered firms did not build up trust in relationship with the partners, thus could not extend the time of payment in the contract.

Chapter 5: Banking sector reforms in Vietnam and reform index

5.1. Introduction

Financial sector reform has been concerned problem in emerging markets. We have observed banking sector reform and stock market liberalization process in emerging countries such as Korea, India, Brazil and China and in smaller markets such as Taiwan, Mexico, Argentina and Southeast Asians during 1990s. Successful financial reforms were achieved with complete stock market liberalization in Korea, Brazil, India and Malaysia. Stock market liberalization is measured by no limitation to entry of foreigner investors. It is argued that liberalization enhance market capitalization and improve management ability of domestic firm in operation and audit standard. Despite the concerns about shock to macro economy due to hot inflow money and the fear of negative influence in economic due to low capital absorptive capacity of developing economic countries, equity market reform has got considerable achievements both in market scales and regulation aspects over past one decade.

In comparison with equity market, banking sector reform has been implemented slower, especially in countries with heavily bank-dependent economy. Government in developing countries fear that deregulation in banking system may lead to uncontrolled credit expanding of commercial banks inducing high risk of default. Thus, banking sector openness should be implemented gradually in accordance with improvement of banking institution regulation and banking governance efficiency. In the country in which interest rate ceiling is used as a tool of monetary policy, interest rate liberalization seems to be very far objective. Ownership reform in transition economy has attracted a lot of attention of researchers recently. And China as the biggest emerging market is always the most attractive case study. Lin and Zhang (2009) document that Big Four state-owned commercial banks are less profitable, less efficient and have worse asset quality than other types of banks. Jang et al. (2013) complete that performance of private join stock banks and city commercial banks is significantly higher than state owned commercial banks in China. In addition, the privatization of banks has improved performance with respect to inflow and efficiency gains in the short or long run.

Default crisis of Vietnamese commercial banking system has exposed since the end of 2010. Banking crisis is the consequence of high NPLs pouring into real-estates investment and funding state-owned enterprises. In 2012, Vietnam's banking sector has fell deeper into turmoil as a result of

chronic recurring losses and unstable macroeconomic environment. The context of bad loans crisis of banking system has motivated stronger reform in banking sector since 2012. In March 2012, SBV responded to the request of reform by announcing restructuring of credit institutions in the 2011-2015 period that concentrated in action in 2014 by setting standard for net capital requirements, restructuring financial institutions' operations and management, promoting the merging and integration of financial institutions.

As to be motivated from banking reform plans of SBV, in chapter 5 we give some overviews of banking sector reforms in Vietnam since economic reform policy had been implemented in 1986. In attempt to provide quantitative assessment on bank sector reforms in Vietnam, we apply financial reform index constructed by Abiad, Detragiache and Tressel (2007), which tracks policy changes in several areas. Abiad et al.'s method permits us to measure the level of specific reforms such as liberalization of interest rates, elimination of credit allocation control, removal of barriers to foreign banks and improvement of bank regulations. This chapter is constructed as follow: part 5.2 summarizes baking sector reforms in Vietnam, part 5.3 presents financial reform index based on Abiad et al.'s method and part 5.4 gives some conclusion remarks.

5.2. Banking sector reform in Vietnam

SBV was established in 1951 and played the role in issuing money as central bank and financing funds as commercial banks. SBV also owned and controlled directly two banks: Bank for Investment and Development of Vietnam (BIDV) that was founded in 1957 to provide long-term capital to infrastructures and public works; Bank for Foreign Trade of Vietnam (Vietcombank) that was founded in 1963 to finance foreign trade activities, manage foreign exchange and support SOEs. In 1988, Vietnam launched the first major reform of its financial sector by transferring SBV's fiscal management function to State Treasury, transferring SBV's commercial bank function to SOCBs and establishing two more SOCBs that are Vietnam Bank for Agriculture and Rural Development (Agribank) and Vietnam Joint Stock Commercial Bank for Industry and Trade (Vietinbank) to provide financing to their respective economic sectors.

Since 1988, Vietnam's banking system has been transferred from mono-banking system to two-tier banking system where SBV's main functions are restricted to issuing money, controlling inflation and supervising commercial banks while financial intermediation is shifted to commercial banks. But SOCBs' activities are strongly intervened by SBV when both lending rates and deposit rates were set by SBV, priority lending rate is determined for privilege economic sectors. In 1990, government has implemented the first step of banking sector openness by permitting the

establishment of JSCBs and the entry of foreign banks into domestic market through opening branches or establishing joint ventures with domestic banks.

As suggested by Rosengard and Huynh The Du (2012), there are three key dimensions of financial sector reform in Vietnam: financial sector liberalization, financial sector deregulation and financial sector stabilization. Financial sector liberalization is defined as the shift from administration-based to market-based financial systems. This means that interest rates and credit allocation are not dictated by state bank, market prices are used to determine the value of funds and returns on capital is used to allocate these funds. In addition, financial sector liberalization refers market-determined exchange rates and open market accounts. Financial sector deregulation is the movement from a closed to a competitive financial system. It implies a transition from monopoly or oligopoly where legal or administrative barriers limit competition, market entry, expansion and diversification to an open and competitive banking system. Definition of financial sector stabilization relates to improvement of bank regulation and supervision to maintain the future safety and health of banks. It implies the ability to solve bad loans and restoring liquidity and solvency of the banking system after bank crisis.

Vietnam's government has been implementing banking sector reform in three dimensions but the process has been slowly and partially implemented. It has been accelerated just before Vietnam joined WTO in 2007 in which concentrated on promotion of privatization and enhancement of banking regulation and supervision. Intervention of SBV in interest rate, reserves requirement, credit allocation of commercial banks was still strong due to instability of macroeconomic and continually using interest rate as tool of inflation control. We introduce more detailed about reform processing of Vietnam below.

5.2.1. Credit allocation and interest rate controls

Vietnam banking system is dominated by SOCBs that account for over 74 percent of domestic lending market shares in 2002 and over 50 percent in 2010. In 2002, approximately 60 percent of SOCBs' loans portfolio were channeled to SOEs but this number reduced dramatically to 31.4 percent in 2007[16]. This implies inequality in credit allocation to public and private sector in Vietnam for a long time until entry to WTO and SOCBs are facing declining pressure to grant credit to the public sector in the context of increasing banking sector's competition. Moreover, credit was

[16] See IMF (2007) "Vietnam: statistical Appendix", p.23 at http://www.imf.org/external/pubs/ft/scr/2007/cr06423.pdf

allocated with preferential rate to priority sector in specific areas by year such as agricultural infrastructure construction following to government subsidy policy.

Control policy to interest rates of SBV has changed in response to macroeconomic volatility over two decades. In 1995, SBV allowed commercial banks to set deposit rates freely to increase competition in raising capital but maximum loan-deposit rate spread was restricted to 0.35 percent per month. When interest rate competition between banks started increasing, the restriction of 0.35 percent per month eventually removed. SBV adopted new interest rate mechanism was adopted in August 2000 in which domestic currency lending rates were adjusted based on prime rate announced by SBV. The ceilings on foreign lending rates were eliminated in November 2001 and the last restrictions on interest rates were removed in June 2002. Since 2002, commercial banks were fully free to decide all lending and deposit rates. As consequence, total deposit growth in 2004 was up to 33 percent and credit growth was up to 42 percent[17] .

Loans growth and deposit growth increased by 54 percent and 48 percent respectively in 2007 due to high loan outstanding for stock investment. Inflation rate peaked at 12.6 percent in 2007 and soared to 20 percent in 2008. Many reasons were expressed for high inflation rate during 2007-2008 that are a rising in international commodity prices, the loose and not flexible monetary policy, the opening up of Vietnam to the world economy after joining the WTO in late 2006 which abstracted a large of foreign capital inflow caused stock and asset prices to soar (Nguyen et al., 2010). Credit expansion in 2007 was considered to result in inflationary pressure. As a policy to inflation control, SBV immediately set restriction on both credit and deposit rate that were not exclusive over 150 percent of base interest rate announced by SBV in May 2008[18]. Consequently, inflation rate dropped to 7.1 percent in 2009.

However inflation rate soared by 18.7 percent in 2011 as a consequence of high money supply growth, high credit growth and ineffective public investment of government during a long time. Accordance with bad loans crisis since the end of 2010, commercial banks have faced to liquidity and solvency exposures. In order to recover capitalization of banking system, from September 2011 to June 2013, SBV adjusted 8 times ceiling of deposit rate in which decreased from 14 percent to 7 percent for 1- 12 month term deposit; from June 2012 to June 2013, SBV adjusted 5 times loans rate

[17] See Vinacapital, "Vietnamese Banks: a great growth story at inflated prices", Banking sector report, 2006

[18] See at http://www.moj.gov.vn/vbpq/Lists/Vn%20bn%20php%20lut/View_Detail.aspx?ItemID=25074

and set at around 9 percent for 12 month term loans to priority 5 manufacturing sectors[19].

In conclusion, Vietnam's banking sector has had no clear roadmap for interest rate liberalization. Interest rate always has been adjusted in response to inflation rate due to weak management of government in macroeconomics. This caused obstacle for small and medium JSCBs in raising funds. Domestic media reflected a lot of complaints from JSCBs on ceiling deposit rate policy of SBV during 2008-2013.

5.2.2. Reserve requirements

The reserve requirement ratio is the percentage of customer deposits that banks must set aside as reserves to provision for liquidity risk. In Vietnam, required reserves have been utilized as a tool for monetary policy of SBV rather than to finance budget deficits. Despite compulsory reserve requirements rate in commercial banks was determined at high rate as 35 percent in 1992[20], it has never been above 15 percent in practice. Since 2008, Accordance with high ceiling deposit rate policy, SBV has adjusted compulsory required reserves rate at below 10 percent level.

5.2.3. Foreign exchange policy

In Vietnam, both foreign exchange and exchange rate are tightly controlled although the fixed exchange rate regime has been replaced by a pegged float exchange rate regime. Laws in term of exchange rate issued in 2005 expressed hat exchange rate of the Vietnamese currency is created by the demand for and the supply of foreign currencies in the market under the government's regulation[21]. In practice, SBV announces inter-bank exchange rate of the VND against the USD every day. Based on this rate, banks decide their trading rates within a band around the announced rate[22]. In addition, if necessary the government can apply the regulations on the obligation to sell

[19] See at http://thuvienphapluat.vn/archive/Thong-tu-30-2011-TT-NHNN-lai-suat-toi-da-tien-gui-bang-dong-Viet-Nam-vb129697.aspx. Also see at http://thuvienphapluat.vn/archive/Thong-tu-14-2012-TT-NHNN-lai-suat-cho-vay-ngan-han-toi-da-bang-dong-Viet-Nam-vb138783.aspx

[20] See at http://thuvienphapluat.vn/archive/Quyet-dinh-108-QD-NH-Quy-che-du-tru-bat-buoc-doi-voi-to-chuc-tin-dung-vb44376.aspx

[21] See "Ordinance on foreign exchange in 2005, Provision 1, Article 30"

[22] See at http://thuvienphapluat.vn/archive/Quyet-dinh-2554-QD-NHNN-giao-dich-ngoai-te-to-chuc-tin-dung-duoc-phep-hoat-dong-ngoai-hoi-vb16213.aspx

foreign currencies for institution residents.

According to Rosengard and Huynh The Du (2012), reform on of exchange rates was expressed at the official rate announced by SBV, the nominal and effective rate at which commercial banks make transactions and the rate in the free market. During the first reform processing, the gap between official and free market rate was large but it was significantly shortened as the end of 2006. But the rate widened again during the financial crisis due to difference between the nominal and effective exchange rates of commercial banks.

Table 5-1: The spread between Official and Free Market Exchange Rates

Year	1985	1986	1987	1988	1989	1990	1991	2006	2007	2008	
										March	June
Official	15	80	368	3000	3900	5133	9274	16091	16114	15861	16619
Free	115	425	1270	5000	4750	5610	9546	16120	16150	15355	19500
Free/Official	7.67	5.31	3.45	1.67	1.22	1.09	1.03	1.002	1.002	0.968	1.222

Source: SBV, Tien, op.cit.

5.2.4. Capital account liberalization

Capital account liberalization is the slowest component of financial sector reform in Vietnam as the studying from 1997-1998 East Asian financial crisis in Thailand which caused by opening capital account too quickly leading high risk on capital management.

5.2.5. Foreign bank entry barriers

After banking system was transferred from mono-banking system to two-tier banking system 1992, the government began to gradually reduce administrative and legal barriers to entry of foreign banks by permitting a presence of limited foreign banks through joint-venture banks and foreign branches which is restricted on certain types of activities; and diversify ownership rate in banking system by permitting to establish JSCBs. The number of JSCBs increased from 4 in 1991 to 51 in 1997. However, over 70 percent of market shares were occupied by SOCBs and the rest of the market was extremely fragmented and was competed strongly among JSCBs. Small JSCBs merged with bigger JSCBs leading a fall of number of JSCBs to 37 in 2006 and to 33 in June 2013.

Access of foreign banks was initially limited to taking a minority share in joint venture banks and establishing branches and representatives offices until 2004. The amendment of the 1998 Law on Credit Institutions to comply with terms of Vietnam-Unites States Bilateral Trade Agreement set the first step for establishment of wholly foreign owned banks from any country in Vietnam. This

step was eventually required under Vietnam's WTO accession in 2007. In 2006 the government issued a degree that specified the requirements for establishing wholly foreign owned banks and regulated the general operation of foreign bank branches and joint venture banks[23]. The decree required foreign banks applying for wholly foreign owned banking license to have at least USD 20 billion in assets in prior year to application and required a parent bank to own at least 50 percent of the new bank's capital. The decree also expanded license period and branch service transaction include ATMs. Furthermore, Vietnam complied WTO commitment by granting foreign branches equal treatment as same as domestic banks. Thus, by June 2013 there were 5 wholly FBs with 50 branches in big cities and 4 JVBs in Vietnam.

5.2.6. State owned commercial banks privatization

Vietnam government set target to reduce state ownership to 51 percent by 2010. As the first step, government raised the maximum stake that a single strategic foreign investor could hold in a domestic commercial bank from 10 percent to 15 percent of bank's chartered capital. And some special cases, SBV allowed individual foreign investors to increase holdings rate up to 20 percent. Total foreign ownership of a domestic commercial bank was capped at 30 percent but was required hold shares at least 5 years.

Equitization process of SOCBs was launched by the first IPO of Vietcombank in December 2007. Until 2013 except Agribank, other 2 big SOCBs as Vietinbank and BIDV were listed in Stock market exchange market. Besides listed SOCBs and JCSBs, openness to foreign investors to domestic banks was evaluated slowly and cautiously due to fear of loss of autonomy of domestic banking sector.

5.3. Banking system reform index

We apply banking sector reforms index that constructed by Abiad et al. (2008). The index tracks seven dimensions of financial reforms over 60 countries over the period 1973-2002: i) the credit controls, reserve requirement dimensions and aggregate credit ceilings that account for the restrictiveness of reserve requirements, the existence of mandatory credit allocations set by SBV, quantitative restrictions on bank credit and the existence of subsidized credit schemes; ii) the interest rate controls dimension measures the extent to which deposit and lending rate are market determined or are restricted by ceiling rates issued by SBV; iii) banking sector entry barriers dimension tracks entry restrictions in entry of foreign banks and other financial sectors into

[23] See at http://www.moj.gov.vn/vbpq/Lists/Vn%20bn%20php%20lut/View_Detail.aspx?ItemID=13396

domestic market; iv) the bank privatization dimension measures the extent to which bank assets are controlled by private owners rather than government; v) the banking sector supervision dimensions consider the adoption of the Basel capital regulation and a number of characteristics of bank supervisory system; vi) the financial account transactions dimension measures restrictions in both capital inflow and outflow and the unification of exchange rate system; vii) the securities market dimension tracks reforms that foster the development of government and corporate bond markets as well as equity market.

Because available dataset only covers the period 1973-2005, we supplement data from 2009 to 2013 by coding each dimension based on the method of Abiad et al. In each dimension, a higher score indicates a higher degree of domestic financial reform. We ranged each dimension score between 0 and 1. Total financial reforms index is average of seven dimensions.

Table 5-2 presents financial reform index and index decomposition in Vietnam during 2009-2013 periods. Reform index was flattened at 0.55 point in 2009, 2010, 2012 and 2013. The index dropped in 2011 as tightened interest rate policy of SBV to control high inflation rate. Among 7 dimensions, removal entry barriers to foreign banks and international capital account liberalization are implemented very slowly. While progress of SOCBs privatization is in infancy as state ownership rates in 4 biggest banks are still high.

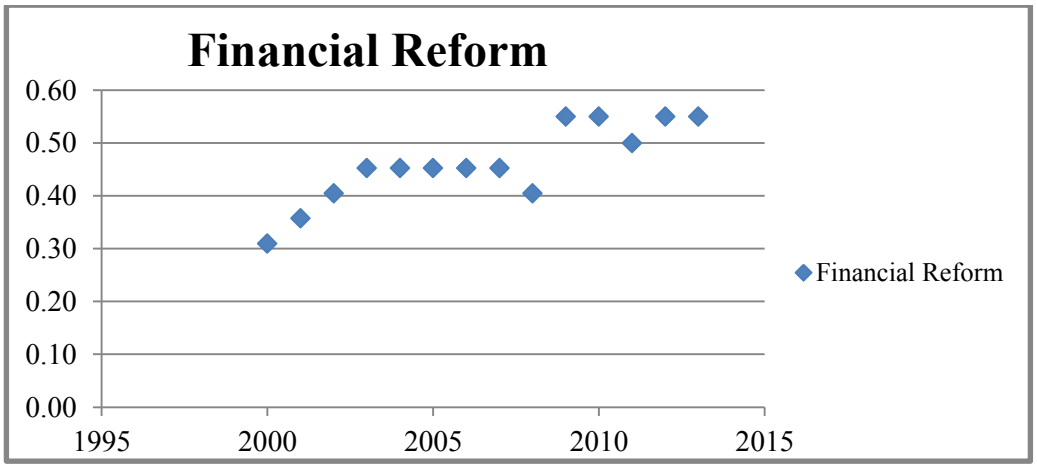
Figure 5-1 shows the change in financial reform index in Vietnam during 2000-2013. Reform index increased from 0.36 point in 2001 to 0.45 point in 2003 after the Vietnam-Unites States Bilateral Trade Agreement has been signed in 2001. Reform index was constant at 0.45 point during 2004-2007 and dropped to 0.40 point in 2008 due to impact from stock market crash and high inflation rate. The index recovered to 0.55 point in 2009 as a result from reconstruction in stock market and foundation of Banking Supervisory Agency under the management of SBV.

Table 5-2: Financial reforms index and index decomposition in Vietnam during 2009-2013

Variable	2009	2010	2011	2012	2013
Reforms	0.55	0.55	0.5	0.55	0.55
Credit allocation	0.5	0.5	0.5	0.5	0.5
Interest control	0.67	0.67	0.33	0.67	0.67
Entry barrier	0.2	0.2	0.2	0.2	0.2
Privatization	0	0	0	0	0
Supervision	0.5	0.5	0.5	0.5	0.5
International capital	0.33	0.33	0.33	0.33	0.33
Securities market	0.6	0.6	0.6	0.6	0.6

Source: calculated by author

Figure 5-1: The change of financial reforms index in Vietnam during 2000-2013



Source: Abiad et al. (2000-2005), author calculation (2006-2013)

5.4. Conclusion

Vietnam banking sector reform has experienced a long path over last two decades. Banking sector reform has been accelerated since banking system crisis occurred at the end of 2010. One of the most important targets of reform plan is to solve bad debts problem of banking system. Bad debts were considered as resulting from governance management (cross shareholdings among commercial banks) and weak risk default management. And banking system reconstruction has a lot of tasks including privatization of SOCBs, merging of small-scaled JSCBs with bad performance and high NPLs. Some financial news media have posted articles related to government's consideration on enlargement of ownership rate for foreign investors in domestic banks by 49 percent to improve efficiency and competitiveness.

Effectiveness of reform can only be evaluated after several years or even longer. It is not easy to conduct a complete reform assessment when reform's plan is now on processing. Thus, our research objectives are not ambitious and limit to reforms index calculation to provide qualitative data for further research.

Chapter 6: Implication

We conduct the research on Vietnam listed firms and capital market to reveal the following questions: i) Do stock market liquidity enhance firm value and the role of foreign ownership to listed firms' value?; ii) Do foreign portfolio capital investment inflows as a proxy for stock market openness benefit firms or not?; iii) How did corporate behavior and capital structure change to response to credit supply shock during crisis periods?

Based on empirical results with robustness checks, we find that firm liquidity enhances firm market value but total stock market liquidity in 1 lagged year decreases firm value. The reasons were that market liquidity dropped dramatically in 2008 after the crash of stock market investment boom and a fall in trading volumes diminished firm value. Market participation of institutional foreign investors blew a fresh air in stock market in 2009 and stimulus stock transactions. Foreign investor's purchases have improved market liquidity as well as confidence of domestic investors for market recovery since 2012. In chapter 2, the role of foreign ownership is affirmed in promoting efficiency of operation and management for corporation.

Banking sector has dominated capital market during 1990s and the first haft of 2000s. Due to the existence of NPLs, the confidence towards banking system as stable short and long term capital providers for firms declined. Since banking crisis occurred, corporations were forced to seek substitution capital resources from trade credit or increase more equity capital issuance. One of distinctive corporate response during crisis periods was holdings more cashes for liquidity provision. One should notice that adjustment of capital structure from external debt (mainly rely on bank loans) to internal debt will be not easy if firms' financial backgrounds are not good enough to create trust to investors. In addition, stock market always is unpredictable and includes hidden risks more than banking sector that might make firms to pay more cost of capital

6.1. Implication for securities market

Our biggest contribution in this research is to provide empirical proof of benefits from stock market openness to firms. Market openness dedicates to enhance firm value and decrease cost of capital. Furthermore, the research also indicates the crucial role of market regulation in absorbing foreign capital inflows stably. This means that the process of gradual stock market liberalization should be accompanied with improvement of market infrastructures, financial intermediaries and legal framework. Strengthening legal and regulatory framework will improve effectiveness of securities market transactions through mitigating information asymmetry. The market openness is

considered to induce more comparativeness for financial intermediaries, thus strengthen operation capacity and efficiency of these institutions. It is proved by decrease in the number of securities companies in 2013. State securities commission of Vietnam classified securities companies into 4 groups in which there are 79 well-operated companies, 8 normally-operated companies, 5 monitoring- companies and 9 strictly monitoring-companies by the end of 2013. And there were 15 securities declaiming to suspend their business activities in 2013.

In an attempt to increase securities market liquidity, the expansion of demands on securities is very important. Besides building up transparent investment environment and integrated transaction system to attract more institutional investor, it should introduce more new financial products such as derivatives and develop more investment stock funds. Listing of the first domestic exchange traded fund in HOSE in October 2014 attracted a lot of investor' attentions and is expected to create more liquidity for securities market.

We provide empirical results about a very slight increase in corporate equity issuance in substitution for bank loans under the effects of credit supply shock during 2011-2012 periods. The results imply the difficulties in issuing equity debt in stock market. Different to borrowing loans from banks in which if a firm meets the evaluation conditions of banks related to financial capacity and investment project, it can receive bank loans, raising capital by issuance equity will be affected by many factors including market fluctuation due to investor's philosophy, macroeconomic condition and the portfolio selections of investors in comparison with other stocks. Due to these reasons, it is necessary to boost corporate bond market as more stable channel of raising corporate capital. Although Vietnamese government made efforts to develop bond market since 2007 as phase II of capital market roadmap but the market scale and number of issuers were still small[24]. One of the most important factors that help to boost corporate bond market is the establishing independent credit rating agencies which would provide investors with quality information on the level of risk of a given security. Furthermore, independent credit rating agency would provide the necessary information for setting investment standards and guidelines. Since November 2014, The Vietnam Ministry of Financial has officially received registration documents for establishment of credit rating agency. Besides development of corporate bond market, the government should facilitate the venture capital fund and mutual fund to enlarge choices of capital resources for firms and make financial market more dynamic.

[24] See appendix 4 for more information on development of Vietnam corporate bond market

6.2. Implication for banking sector reform

Many analysts and researchers have mentioned in the media that there are too much banks in Vietnam relative to the current level of the economy and merging ineffectively-operated small banks is an important content of the banking sector reform plans. In the report of Stoxplus financial company, they noticed that the key problem for consolidating banks is lack of competitive advantage and synergy among them. Almost banks have adopted the same strategy in term of developing a national branch network and offering the same products and services. And banks have been competing with each other using mainly pricing mechanism and simpler procedures rather than product differentiation. They also suggest some solutions for Vietnam banking restructuring based the experiences from developed countries. Because it is difficult to propose solutions to Vietnam banking sector reform if there has no sufficient knowledge on baking system. Thus, in this research we suggest that government should to enhance more significantly the equitization of SOCBs and enlarge gradually domestic market entry for foreign banks to reduce the market concentration of SOCBs as well as improve more comparativeness ability of domestic banks. The second solution is establishing more independent and private credit rating agencies besides the only existence of Credit Information Centre (CIC) belongs to SBV. In our opinion, enhancement of comparativeness by credit market openness and credit information transparency by establishing independent credit rating agency will contribute a lot for efficiency of banking system restructuring process besides small banks merging and acquisition.

6.3. Research limitation

We provide the first analysis at firm level data on impacts of credit supply shock and stock market openness on firm's operations in Vietnam. On the process of conducting research, we found difficulties on data collection and calculation, especially credit market data. Thus, sample size is one of limitation of our research. Moreover, all corporate financial statements are yearly data that makes difficulty in observing corporate quarterly business fluctuation, thus may mitigate the accuracy of evaluation.

We provide a case study of transition economy on the process of implementing financial market reform policies. We understand that our research has the meaning of initial exploration. We

expect that further research about assessment on efficiency of banking sector reform as well as impacts of fluctuation of hot portfolio investment capital inflows on firms' performance and cost of capital will be conducted or discussed more thoroughly.

Appendix 1

Table 1-1: Correlation of variables in chapter 2

	LEV	lnSIZE	lnEMP	FOR	GOV	RISK	MANU
LEV	1						
lnSIZE	-0.09*	1					
lnEMP	0.20*	0.54*	1				
FOR	-0.19*	0.45*	0.35*	1			
GOV	0.07*	-0.08*	-0.05	-0.15*	1		
RISK	0.07*	-0.01	0.07*	-0.02	-0.08*	1	
MANU	-0.05	0.02	0.25*	0.14*	-0.18*	0.05	1
SER	0.01	0.15*	-0.2*	-0.04	0.21*	-0.04	-0.71*
YEAR2008	-0.04	-0.05	0.00	0.00	0.00	-0.02	0.00
YEAR2010	0.01	0.07*	0.00	0.00	0.00	0.01	0.00
AVEILL	-0.02	-0.09*	-0.09*	0.00	0.02	0.22*	-0.03
lnFIRMVOL	-0.01	0.37*	0.21*	0.07*	-0.05	0.02	-0.04
lnMARKETVOL_1	0.02	0.12*	0.00	0.00	0.00	-0.01	0.00
VOLATILITY	-0.02	-0.19*	-0.13*	-0.05	-0.04	-0.01	-0.08*
QRATIO	-0.05	0.02	0.10*	0.21*	0.11*	0.01	-0.05
OIOA	0.43*	-0.15*	0.20*	-0.05	0.14*	0.04	-0.02
SER	1						
YEAR2008	0.00	1					
YEAR2010	0.00	-0.25*	1				
AVEILL	0.05	-0.07*	-0.07*	1			
lnFIRMVOL	0.04	-0.05	0.06	0.00	1		
lnMARKETVOL_1	0.00	-0.16*	0.66*	-0.15*	-0.15*	1	
VOLATILITY	0.04	0.08*	-0.07*	0.04	0.01	-0.11*	1
QRATIO	0.04	-0.17*	-0.13*	0.02	0.15*	-0.36*	0.04
OIOA	-0.08*	0.01	-0.02	-0.02	-0.02	0.01	-0.03
QRATIO	1						
OIOA	0.08*	1					

Note: * is statistically significant at 5 percent

Table 1-2: Correlation of variables in chapter 3

	Q ratio	Investment	WACC	FP	TFP	Leverage	Profitability
Q ratio	1						
Investment	0.12*	1					
WACC	0.24*	-0.10*	1				
FP	0.26*	0.09*	0.02	1			
TFP	-0.39*	-0.09*	-0.09*	0.17*	1		
Leverage	-0.16*	0.12*	-0.52*	-0.11*	0.02	1	
Profitability	0.41*	0.06*	0.08*	0.22*	0.05	0.01	1
Divident	-0.04	-0.02	-0.03	-0.01	0.03	0.03	-0.01
Volatility	0.24*	0.12*	-0.31*	-0.12*	-0.55*	-0.02	-0.05
Marcap/GDP	0.03	-0.10*	-0.04*	0.11*	0.10*	0.03	0.04
Credit/GDP	0.28*	0.11*	0.29*	-0.14*	-0.69*	-0.03	-0.05
Divident	1.00						
Volatility	-0.01	1.00					
Marcap/GDP	-0.03	-0.37*	1.00				
Credit/GDP	-0.01	0.24*	-0.46*	1			

Note: * is statistically significant at 5 percent

Table 1-3: Correlation of variables in chapter 4

	Q ratio	Investment	Cash reserves	Receivable	Payable	ILL rate	Sale growth
Q ratio	1.00						
Investment	0.09*	1.00					
Cash reserves	0.23*	-0.06	1.00				
Receivable	-0.14*	-0.18*	-0.14*	1.00			
Payable	-0.03	-0.06	0.12*	0.29*	1.00		
ILL rate	0.11*	-0.04	-0.01	0.00	-0.02	1.00	
Sale growth	0.05	-0.04	0.03	-0.02	-0.01	0.00	1.00
Dividend	-0.05	-0.03	-0.02	-0.01	0.03	-0.01	-0.03
Profitability	0.51*	0.04	0.43*	-0.08*	-0.01	0.04	0.06
Cash flow	0.51*	0.18*	0.40*	-0.12*	-0.03	0.05	0.08*
Dummy z-score	-0.27*	0.05	-0.29*	-0.10*	-0.22*	-0.03	0.01
Good coverage	0.18*	0.08*	0.15*	0.01	0.03	0.03	0.01
Bankdep	-0.1*	0.12*	-0.29*	-0.06	-0.47*	0.01	-0.04
After2010	-0.41*	-0.08*	0.03	0.02	0.00	-0.12*	0.02
Credit growth	0.42*	0.06	-0.02	-0.02	0.00	0.17*	-0.01
Lending spread	-0.31*	-0.05	0.00	0.02	0.01	-0.23*	-0.02
Dividend	1.00						
Profitability	-0.05	1.00					
Cash flow	-0.05	0.90*	1.00				
Dummy z-score	0.06	-0.44*	-0.38*	1.00			
Good coverage	-0.15*	0.41*	0.34*	-0.30*	1.00		
Bankdep	-0.01	-0.21*	-0.17*	0.23*	-0.10*	1.00	
After2010	0.04	-0.10*	-0.13*	0.12*	-0.21*	0.00	1.00
Credit growth	-0.04	0.06	0.08*	-0.12*	0.14*	-0.01	-0.87*
Lending spread	0.03	-0.04	-0.06	0.07*	-0.05	0.00	0.38*
Credit growth	1.00						
Lending spread	-0.68*	1.00					

Note: * is statistically significant at 5 percent

Appendix 2

Table 2-1: Summary statistics of sample data

	2009	2010	2011	2012	2013
Market cap %					
Micro cap (under $300 million)	93.8	97.1	97.6	96.7	94.8
Small cap ($300 mil~$2 billion)	3.3	2.9	1.9	2.4	4.3
Medium cap ($2~$10 billion)	0.0	0.0	0.5	1.0	1.0
Large cap (over $10 billion)	0.0	0.0	0.0	0.0	0.0
Q ratio %					
Below 0	0.0	0.0	0.0	0.0	1.4
0~1	27.6	44.3	82.9	77.6	66.2
1~3	62.9	53.3	16.2	21.4	31.0
3~5	7.6	2.4	1.0	0.5	1.9
Over 5	0.5	0.0	0.0	0.5	1.0
ROA %					
Loss (< 0%)	1.4	1.4	4.3	10.0	7.6
Low- medium (10 % ~ 30%)	48.1	48.1	46.7	33.3	37.6
Medium- high (30 % ~ 50 %)	5.2	4.3	4.3	2.9	1.4
High (over 50%)	0.5	0.0	0.5	1.4	0.5
Debt/asset (%)					
Low (< 10%)	5.2	3.8	4.3	5.7	4.8
Low- medium (10 % ~ 30%)	22.9	24.3	23.3	21.4	21.0
Medium- high (30 % ~ 50 %)	24.8	24.3	22.9	21.9	23.8
High (over 50%)	47.1	47.6	49.5	51.0	50.5
State owned rate %					
0%	28.1	28.1	28.1	28.1	28.1
10 % ~ 30 %	18.1	18.1	18.1	18.1	18.1
30 % ~ 49%	17.1	17.1	17.1	17.1	17.1
over 49%	30.5	30.5	30.5	30.5	30.5
Foreign owned rate %					
0%	4.8	4.8	4.8	4.8	4.8
10 % ~ 30 %	28.1	28.1	28.1	28.1	28.1
31% ~ 49%	13.3	13.3	13.3	13.3	13.3
Foreign purchase %					
0%	0.5	1.4	4.3	6.7	7.1
Low - medium (10%~30%)	10.0	9.5	11.4	17.6	23.8
Medium - high (30%~50%)	1.9	3.3	6.2	4.3	8.1
High (over 50%)	0	2.9	4.8	1.9	5.7

Appendix 3

Coding rules for the financial liberalization index of Abiad et al. (2010)

This appendix is adapted from Abiad et al. (2010). Financial liberalization index has seven dimensions below. Each dimension has various sub-dimensions. Based on the score for each sub-dimensions, each dimension receives a "raw score". The explanations for each sub-dimension below indicate how to assign the raw score.

After a "raw score" is assigned, it is normalized to a 0-3 scale as below. That is, fully liberalization = 3, partially liberalized = 2, partially repressed = 1, fully repressed = 0.

The final scores are used to compute an aggregate index for each country/year by assigning equal weight to each dimension. For example, if the "raw score" on credit control and reserve requirements totals 4, this is equivalent to the definition of fully liberalized. So the normalization would assign a score of 3 on the scale 0-3 scale.

1. Credit controls and reserve requirements

1) Are reserve requirements restrictive?

- Code as 0 if reserve requirement is more than 20%
- Code as 1 if reserve requirements as reduced to 10 to 20 % or complicated regulation to set reserve requirements are simplified as a step to toward reducing reserve requirements.
- Coded as 2 if reserve requirements are less than 10%

2) Are there minimum amounts of credit that must be channeled to certain sectors?

- Coded as 0 if credit allocations determined by the central bank or mandatory credit allocations to certain sectors exist
- Coded as 1 if mandatory credit allocations to certain sectors are eliminated or do not exist

3) Are there any credits supplied to certain sectors at subsidized rates?

- Codes as 0 when banks have to supply credits at subsidized rates to certain sectors
- Coded as 1 when the mandatory requirements or credit allocation at subsidized rates is eliminated or banks to not have to supply credits at subsidized rates

  These three questions' scores are summed as follows: fully liberalized = 4, largely liberalized = 3, partially repressed = 1 or 2, and fully repressed = 0

4) Are there any aggregate credit ceilings?

- Coded as 0 if ceilings on expansion of bank credit are in place. This includes bank-specific credit ceilings imposed by the central bank.
- Coded as 1 if no restrictions exists on the expansion of bank credit.
  The final sub-index is a weighted average if the sum of the first three categories (with a weigh of 3/4), and of the last category (with a weigh of 1/4)

2. Interest rate liberalization

Deposit rates and lending rates are separated considered, in coding this measure, in order to look at the type of regulations for each set of rates. They are coded as being government set or subject to a binding ceiling or floor (code = 0), fluctuating within a band (code = 1) or freely floating (code = 2). The coding is based on the following description:

- FL = 4 [2, 2] Fully liberalized if both deposit interest rates and lending rates are determined at market rates
- LL = 3 [2, 1] Largely liberalized when either deposit rates or lending rates are freed but the other rates are subject to band or only a part of interest rates are determined at market rates.
- PR = 2/1 [2, 0] [1,1] [1, 0] Partially repressed when either deposit rates or lending rates are freed but the other rates are set by government or subject to ceiling/floor; or both deposit rates and lending rates are subjected to band or partially liberalized; or either deposit rates or lending rates are subject to band or partially liberalized.
- FR = 0 [0, 0] Fully repressed when both deposit rates and lending rates are set by the government or subject to ceiling/floor

3. Banking sector entry

1) To what extent does the government allow foreign banks to enter into domestic market?

This question is coded to examine whether a country allows the entry of foreign banks into a domestic market; whether branching restrictions of foreign banks are eased; to what degree the equity ownership of domestic banks by nonresident is allowed.

- Coded as 0 when no entry of foreign banks is allowed; or tight restrictions on the opening of new foreign banks are in place
- Coded as 1 when foreign bank entry is allowed, but nonresidents must hold less than 50% equity share
- Coded as 2 when the majority of share of equity ownership of domestic banks by nonresidents is allowed; or equal treatment is ensured for both foreign banks and domestic banks; or an unlimited number of branching is allowed for foreign banks

2) Does the government allow the entry of new domestic banks?

- Coded as 0 when the entry of new domestic banks is not allowed or strictly regulated
- Coded as 1 when the entry of new domestic banks or other financial institutions is allowed into the domestic market

3) Are there restrictions on branching? (0/1)

- Coded as 0 when branching restrictions are in place
- Code as 1 when there are no branching restrictions or if restrictions are eased

4) Does the government allow banks to engage in a wide range of activities? (0/1)

- Coded as 0 when the range of activities that banks can take consists of only banking activities
- Coded as 1 when banks are allowed to become universal banks
  There four question' scores are summed as follows: fully liberalized = 4 or 5, largely liberalized = 3, partially repressed = 1 or 2, and fully repressed = 0

4. Bank privatization

- Fully liberalized if no state banks exist or state-owned banks do not consist of any significant portion of banks and/or the percentage of public bank assets is less than 10%
- Largely liberalized if most banks are privately owned and/or the percentage of public bank assets is from 10 to 25%
- Partially repressed if many banks are privately owned but major banks are still-owned and/or the percentage of public bank assets is 25 to 50%
- Fully repressed if major banks are all-state owned banks and/or the percentage of public bank assets is from 50 to 100%

5. Banking sector supervision

1) Has a country adopted a capital adequacy ratio based on the Basel standard? (0/1)

- Coded as 0 if the Basel risk-weighted capital adequacy ratio is not implemented.
- Coded as 1 when Basel CAR is in force.

2) Is the banking supervisory agency independent from executives' influence? (0/1/2)

A banking supervisory agency's independence is ensured when the banking supervisory agency can resolve banks' problems without delays. Delays are often caused by the lack of autonomy of the banking supervisory agency, which is caused by political interference.

- Coded as 0 when the banking supervisory agency does not have an adequate legal framework to promptly intervene in banks' activities; and/or when there is the lack of legal framework for the independence of the supervisory agency such as the appointment and removal of the head of the Ministry of Finance; or when a frequent turnover of the head of the supervisory agency is experienced.
- Coded as 1 when the objective supervisory agency is clearly defined and an adequate legal framework to resolve banking problems is provided but potential problems remain concerning the independence of the banking supervisory agency; or although clear legal objectives and legal independence are observed, the adequate legal framework for resolving problems is not well articulated.
- Coded as 2 when a legal framework for the objectives and the resolution of troubled banks is set up and if the banking supervisory agency is legally independent from the executive branch and actually not interfered with by the executive branch.

3) Does a banking supervisory agency conduct effective supervisions through on-site and off-site examinations? (0/1/2)

Conducting on-site and off-site examinations of banks is an important way to monitor banks' balance sheets.

- Coded as 0 when a country has no legal framework and practices of on-site and off-site examinations is not provided or when no on-site and off-site examinations are conducted
- Coded as 1 when the legal framework of on-site and off-site examinations is set up and banking supervision agency have conducted examinations but in an effective or insufficient manner
- Coded as 2 when the banking supervisory agency conducts effective and sophisticate examinations

4) Does a country's banking supervisory agency cover all financial institutions without exception? (0/1)

If someone kinds of banks are not exclusively supervised by the banking supervisory agency or if offshore intermediaries of banks are exclusively from the supervision, the effectiveness of the banking supervision is serious undermined

- Coded as 1 when all banks are under supervision by supervisory agencies without exception
- Coded as 0 if some kinds of financial institutions are not exclusively supervised by the banking supervisory or are excluded from banking supervisory agency oversights

These questions' scores are summed as follows: highly regulated = 6, largely regulated = 4 or 5, less regulated = 2 or 3, not regulated = 0 or 1.

6. Capital account transactions

1) Is the exchange rate system unified? (0/1)

- Coded as 0 when a special exchange rate regime for either capital or current account transaction exists
- Coded as 1 when the exchange rate system is unified

2) Does a country set restriction on capital inflow? (0/1)

- Coded as 0 when significant restrictions exist in capital flows
- Coded as 1 when banks are allowed to borrow from abroad freely without restrictions and there are no tight restrictions on other capital inflows

3) Does a country set restrictions on capital outflow? (0/1)

- Coded as 0 when restrictions exist on capital outflows
- Coded as 1 when capital outflows are allowed to flow freely or minimum approval restrictions

  By adding these items, fully liberalized is 3, largely liberalized is 2, partially repressed is 1 and fully repressed is 0

7. Securities markets

1) Has a country taken measures to develop securities markets?

- Coded as 0 if a securities market does not exist
- Coded as 1 when a securities market is starting to form with the introduction of auctioning of T-bills or the establishment of a security commission
- Coded as 2 when further measures have been taken to develop securities markets (tax exemptions, introduction of medium and long-term government bonds in order to build the benchmark of a yield curve, policies to develop corporate bond and equity markets)
- Coded as 3 when further policy measures have been taken to develop derivative markets or to broaden the institutional investor base by deregulating portfolio investments and pension funds, or completing the full deregulation of stock exchanges

2) Is a country's equity market open to foreign investors?

- Coded as 0 if no foreign equity ownership is allowed

- Coded as 1 when foreign equity ownership is allowed but there is less than 50% foreign ownership
- Coded as 2 when a majority equity share of foreign ownership is allowed

  By adding these two sub-dimensions, fully liberalized is 4 or 5, largely liberalized is 3, partially repressed is 1 or 2, and fully repressed is 0

Appendix 4

Overview of Vietnam corporate bond market during 1990-2013

We summarize some statistic data about corporate bond market in Vietnam from 1990 to 2013. Because there is no corporate bond data set that declared officially by Vietnam bond market association, we used 152 corporate bond issues data during 1992-2009 obtained from researches of Vuong and Tran (2010)2. Corporate bond data from 2011 to 2013 are obtained from many corporate's press releases, public media sources and summarized by author3. We do not present process and legal procedures of corporate bond issuance, detailed information of issuers in this part.

Until the formation of Ho Chi Minh stock exchange market in 2000, bank credit and informal credit are main external capitals of Vietnam corporates. Corporate bond appeared in 1992-1994 in Vietnam capital market but still had not been familiar financing option until after the stock market booming period 2006-2007 (Vuong and Tran, 2010). Large state-owned corporates were dominated bond issuers in 1990s.

Table 4-1: Statistics of corporate bond issuers

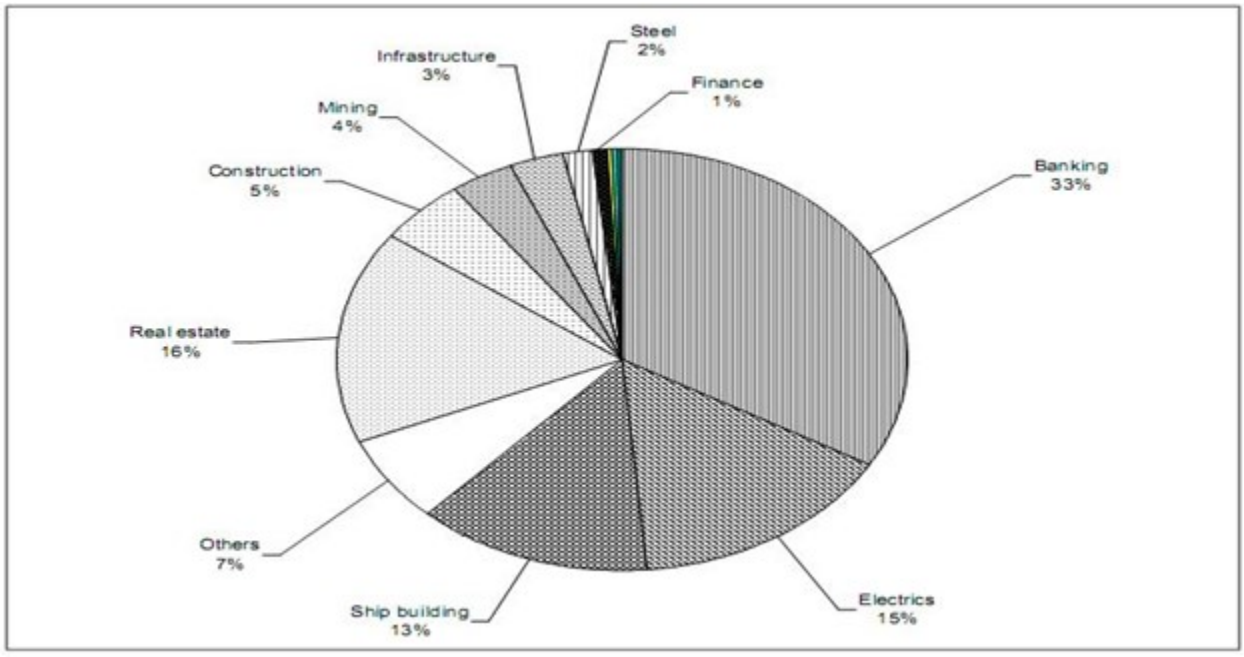
	Total	State-ownership		Listed	
Issuer	63	31	49%	22	35%
Issuance	152	82	54%	46	30%
Successful issuance	113	69	61%	30	27%
value (mil.USD)	4,927.49	3,135.83	64%	1,140.39	23%

Total value of success corporate bond issues has reached USD 4.93 billion, approximately 13 percent of total market capitalization of Vietnam securities market at the end of 2009. Table 9 shows statistics of corporate bond issuers. Number of corporate bond issuers was 63 while listed firms were 457 at the end of 2009. Successful issuances were 113 times over total 153 bond issues. In general, state-owned firms and large firms are main bond issuers and state-owned firms dominated the number of successful bond issuances in comparison with private counterparts. Four biggest bond issuers were Electricity of Vietnam (EVN), Vietnam Shipbuilding (Vinashin), Petro Vietnam (PVN) and Bank for Industries and Development of Vietnam (BIDV).

Figure 4-1 shows the percentage value of corporate bond by industry during 1994-2009. Banking sector was dominated issuers accounting for 31 percent in total value. The motivations for bond issue are asset and liability management and growth in size. In stock prices booming periods 2007-2008, banking industry received about USD 856.39 million from corporate bond sales accounting for 52 percent total bond value of industries. Corporate bond sales of banking sector

were about USD 618.39 million due to capital market downturn at the end of 2008. The value shares of real-estates industry was 16 percent only below banking sector. In 2010, banking and real-estates industries kept dominating corporate bond market.

Figure 4-1: Corporate bond value by industry during 1994-2009



Source: Vuong and Tran, 2010

Table 4-2 shows corporate bond maturity. 5 years maturity was most popular and bonds with longer maturity tended to be successful in primary market. The reason was that large state-owned bond issuers with long maturity had a guarantee from government that affected significantly

Table 4-2: Frequency of corporate bond maturity

Maturity	Frequency	Success Rate
1	7	---
2	19	100%
3	36	69%
4	4	75%
5	40	88%
7	3	100%
10	10	100%
15	2	100%

Source: Vuong and Tran, 2010

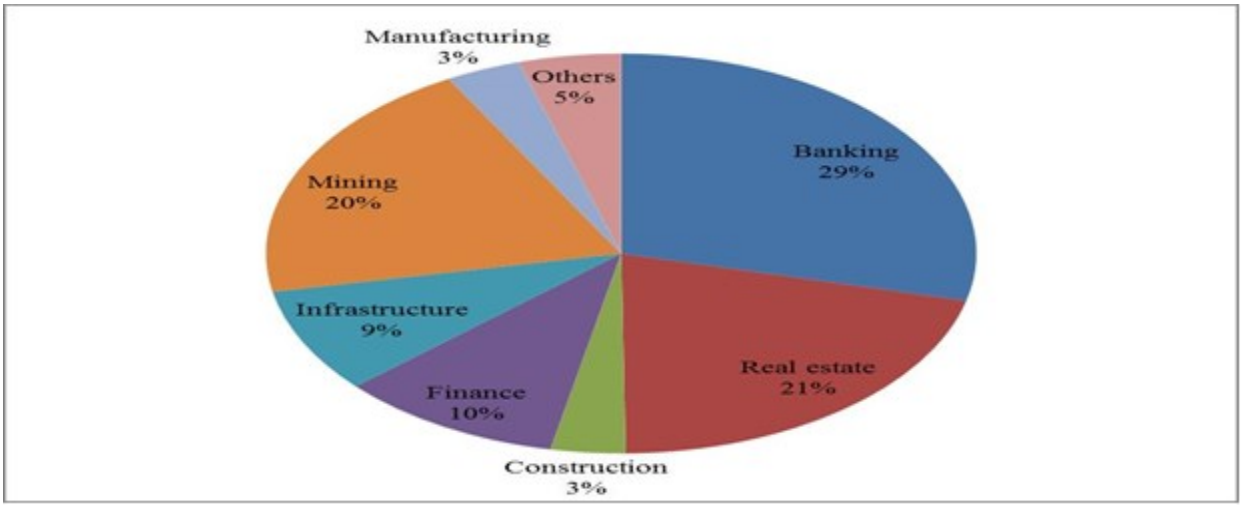
psychology of investors in bond market. Table 4-3 presents the range of coupon rates that bond issuers offered bondholders. 10 percent and 15 percent were most frequent coupon rates. Coupon rates are depended on inflation rate, thus this explained for high interest rates in bond market.

Table 4-3: Frequency of corporate bond interests

Interest rates	Frequency
5%	3
8%	10
10%	42
15%	39
20%	3
More	4

Source: Vuong and Tran, 2010

Figure 4-2: Corporate bond value by industry during 2011-2013



Source: calculated by author based on data collected from media news

Bond issuance value of banking industry was highest accounting for 29 percent after 2010. Bond issuance motivation might to be high needs of funds due to bad loans problem. Real estate and mining were ranked second and third that implicates persistent capital shortage since real estate market has been frozen. Others comprise services, agricultures, transportation and pharmacy and account for 5 percent of total bond issue value. Table 4-4 summarizes bond maturity and interest rates during 2011-2013. One year to 1.5 year and 3 year maturity are most frequent duration. This

indicates short-term capital shortage of firms. Consequently, bond coupon interest rates become higher about 10-15 percent and are kept in float rates due to Vietnam Dong devaluations.

Table 4-4: Frequency of maturity and interest rate during 2011-2013

Maturity	Frequency	Interest rates	Frequency
1 ~ 1.5	11	Below 5 %	3
2	8	5~10 %	9
3	15	10~15 %	9
4 ~ 4.5	2	15~20 %	8
5	10	Over 20 %	3
6	1	Float	9
7	2		
10	1		

Source: calculated by author based on data collected from media news

Appendix 5

Table 5-1: Summary of Vietnam Joint Stock Commercial Bank

Charter of capital > VND 10,000 billions (USD 473 millions)			
Name of banks	**Trading name**	**Location**	**Date of license**
Viet Nam Export Import Commercial Joint Stock Bank	Eximbank	Ho Chi Minh	April 6th, 1992
Sacombank	Sacombank	Ho Chi Minh	December 5th, 1991
Military Commercial Joint Stock Bank	MB Bank	Ha Noi	September 14th, 1994
Sai Gon Commercial Joint Stock Bank	SCB Bank	Ho Chi Minh	December 26th, 2011
(merged by SCB bank, TinNghia Bank,			
Ficombank on Decemver 2011)			
VND 5,000 billions < Charter of capital < VND 10,000 billions			
Asia Commercial Joint Stock Bank	ACB Bank	Ho Chi Minh	April 24th, 1993
Vietnam Public Joint Stock Bank	PVcomBank	Ha Noi	September 16th, 2013
(Merged by Petro Vietnam Financial Corporation and			
Western Rural Commercial Joint Stock Bank on September 2013)			
Saigon-Hanoi Commercial Joint Stock Bank	SH Bank	Ha Noi	November 13th,1993
(Habubank was merged on August 2012)			
Viet Nam Technological and Commercial Joint Stock Bank	Techcombank	Ha Noi	August 6th, 1993
The Maritime Commercial Joint Stock Bank	Maritime Bank	Ha Noi	June 8th, 1991
LienViet Commercial Joint Stock Bank	Lienviet Post Bank	Hau Giang	March 28th, 2008
Tien Phong Commercial Joint Stock Bank	TP Bank	Ha Noi	May 5th, 2008
Southeast Asia Commercial Joint Stock Bank	Seabank	Ha Noi	March 25th, 1994
Vietnam Commercial Joint Stock Bank for Private Enterprise	VP Bank	Ha Noi	August 12th, 1993
Housing Development Commercial Joint Stock Bank	HD Bank	Ho Chi Minh	June 6th, 1992
Dong A Commercial Joint Stock Bank	DongA Bank	Ho Chi Minh	March 27th, 1992
Charter of capital < VND 5,000 billions (USD 237 millions)			
An Binh Commercial Joint Stock Bank	AB Bank	Ho Chi Minh	April 15th, 1993
Vietnam International Commercial Joint Stock Bank	VIB Bank	Ha Noi	January 25th, 1996
Southern Commercial Joint Stock Bank	Southernbank	Ho Chi Minh	March 17th,1993
Ocean Commercial Joint Stock Bank	Oceanbank	Hai Duong	December 30th, 1993
Mekong Development Joint Stock Commercial Bank	MD Bank	An Giang	September 12th, 1992
Great Asia Commercial Joint Stock Bank	DaiA Bank	Dong Nai	September 23th, 1993
Viet A Commercial Joint Stock Bank	VietA Bank	Ho Chi Minh	May 9th,2003
Saigon Bank for Industry and Trade	Saigon Bank	Ho Chi Minh	May 4th, 1993
Nam Viet Commercial Joint Stock Bank	Navibank	Ho Chi Minh	September 18th,1995
Nam A Commercial Joint Stock Bank	NamA Bank	Ho Chi Minh	August 22th, 1992
Bac A Commercial Joint Stock Bank	BacA Bank	Nghe An	September 1st, 1994
Viet Capital Commercial Joint Stock Bank	Vietcapital Bank	Ho Chi Minh	August 22th,1992
Orient Commercial Joint Stock Bank	OCB Bank	Ho Chi Minh	April 13th,1996
Global Petro Commercial Joint Stock Bank	GP Bank	Ha Noi	November 13th, 1993
Kien Long Commercial Joint Stock Bank	Kienlongbank	Kien Giang	September 18th, 1995
Viet Nam Thuong Tin Commercial Joint Stock Bank	Vietbank	Soc Trang	December 15th, 2006
Petrolimex Group Commercial Joint Stock Bank	PG Bank	Ha Noi	November 13th, 1993
Vietnam Construction Joint Stock Bank	Vietnam Constructi	Long An	December 29th, 1993
Bao Viet Joint Stock Commercial Bank	Baovietbank	Ha Noi	December 11th, 2008

Source: summarized by author based on data of SBV

Table 5-2: Statistics of Vietnam Joint Stock Commercial Bank

Charter of capital > VND 10,000 billions (USD 473 millions)							
Name of banks	**Trading name**	**Branches**	**Chartered capital**	**CG 2011**	**DG 2011**	**CG 2012**	**DG 2012**
Viet Nam Export Import Commercial Joint Stock Bank	Eximbank	42	$584,852,071	19.76	-7.74	0.35	31.32
Sacombank	Sacombank	72	$508,402,367	-2.36	-4.14	19.61	43.10
Military Commercial Joint Stock Bank	MB Bank	57	$502,958,580	21.00	36.21	26.14	31.49
Sai Gon Commercial Joint Stock Bank	SCB Bank	47	$500,970,414	99.14	66.94	33.43	35.06
(merged by SCB bank, TinNghia Bank,							
Ficombank on Decemver 2011)							
VND 5,000 billions < Charter of capital < VND 10,000 billions							
Asia Commercial Joint Stock Bank	ACB Bank	81	$443,881,657	17.91	32.99	0.01	-11.94
Vietnam Public Joint Stock Bank	PVcomBank		$426,035,503				
(Merged by Petro Vietnam Financial Corporation and							
Western Rural Commercial Joint Stock Bank on September 2013)							
Saigon-Hanoi Commercial Joint Stock Bank	SH Bank	48	$419,644,970	19.64	35.70	95.25	123.08
(Habubank was merged on August 2012)							
Viet Nam Technological and Commercial Joint Stock Bank	Techcombank	57	$416,000,000	19.88	10.05	7.58	25.74
The Maritime Commercial Joint Stock Bank	Maritime Bank	41	$378,698,225	18.61	28.11	-23.33	-4.35
LienViet Commercial Joint Stock Bank	Lienviet Post Bank	31	$305,798,817	29.73	108.36	80.23	61.11
Tien Phong Commercial Joint Stock Bank	TP Bank	10	$262,721,893				
Southeast Asia Commercial Joint Stock Bank	Seabank	30	$252,544,379	-4.25	38.58	-15.00	-8.46
Vietnam Commercial Joint Stock Bank for Private Enterprise	VP Bank	39	$239,053,254	15.24	22.71	26.45	102.35
Housing Development Commercial Joint Stock Bank	HD Bank	28	$236,686,391	18.07	36.49	52.72	79.48
Dong A Commercial Joint Stock Bank	DongA Bank	46	$236,686,391	14.83	14.79	15.11	40.83
Charter of capital < VND 5,000 billions (USD 237 millions)							
An Binh Commercial Joint Stock Bank	AB Bank	30	$227,076,923	0.19	-13.26	-5.82	42.20
Vietnam International Commercial Joint Stock Bank	VIB Bank	49	$201,183,432	4.23	-1.87	-22.09	-11.52
Southern Commercial Joint Stock Bank	Southernbank	35	$189,349,112	13.02	16.88	23.47	69.86
Ocean Commercial Joint Stock Bank	Oceanbank	21	$189,349,112	8.83	-8.85	36.76	12.05
Mekong Development Joint Stock Commercial Bank	MD Bank	15	$177,514,793	18.22	-80.87	16.66	19.68
Great Asia Commercial Joint Stock Bank	DaiA Bank	12	$146,745,562	19.93	11.67	30.91	67.19
Viet A Commercial Joint Stock Bank	VietA Bank	17	$146,650,888	-12.88	-22.86	11.33	106.96
Saigon Bank for Industry and Trade	Saigon Bank	32	$143,905,325	6.95	-1.53	-2.88	17.05
Nam Viet Commercial Joint Stock Bank	Navibank	20	$142,485,207	19.95	38.25	-0.22	-17.20
Nam A Commercial Joint Stock Bank	NamA Bank	13	$142,011,834	30.97	11.49	-1.38	35.39
Bac A Commercial Joint Stock Bank	BacA Bank	18	$142,011,834				
Viet Capital Commercial Joint Stock Bank	Vietcapital Bank	16	$142,011,834	19.59	64.44	77.66	96.86
Orient Commercial Joint Stock Bank	OCB Bank	25	$142,011,834	19.52	12.73	24.51	55.94
Global Petro Commercial Joint Stock Bank	GP Bank	13	$142,011,834				
Kien Long Commercial Joint Stock Bank	Kienlongbank	23	$142,011,834	19.91	23.35	15.23	30.77
Viet Nam Thuong Tin Commercial Joint Stock Bank	Vietbank	10	$142,011,834				
Petrolimex Group Commercial Joint Stock Bank	PG Bank	16	$142,011,834	11.26	2.06	13.83	12.88
Vietnam Construction Joint Stock Bank	Vietnam Construct	16	$142,011,834				
Bao Viet Joint Stock Commercial Bank	Baovietbank	9	$142,011,834	19.55	-3.58	0.53	-10.88

Note: CG= credit growth, DG = deposit growth

Source: summarized by author based on data of SBV and financial statement of JSCBs

Table 5-3: Statistics of Vietnam State Owned Commercial Bank

Name of banks	Trading name	Location	Date of license
Joint Stock Commercial Bank for Foreign Trade of Vietnam	Vietcombank	Ha Noi	September 21st, 1996
Vietnam Bank for Industry and Trade	Vietinbank	Ha Noi	July 3rd, 2009
Bank for Investment and Development ofVietnam	BIDV	Ha Noi	April 23rd, 2012
Vietnam Bank for Agriculture and Rural Development	Agribank	Ha Noi	January 15th, 1996
Housing Bank of Mekong Delta	MHB Bank	Ho Chi Minh	September 18th, 1997

Trading name	Charter capital	CG 2011	DG 2011	CG 2012	DG 2012
Vietcombank	$1,084,925,094	18.00	-5.94	15.00	13.58
Vietinbank	$1,230,383,895	25.00	1.04	14.00	3.34
BIDV	$1,077,294,007	16.00	-11.84	16.00	4.85
Agribank	$1,364,887,640	1.00	1.76	7.00	2.51
MHB Bank	$143,024,345	0.01	16.29	0.07	3.59

Note: CG= credit growth, DG = deposit growth

Source: summarized by author based on data of SBV and financial statement of SOCBs

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