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# Three essays on capital structure and adjustment speed toward the target leverage of Vietnamese listed firms

Thi Hong An Thai

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## THESE

Pour obtenir le grade de

**DOCTEUR DE LA COMMUNAUTE UNIVERSITE  
GRENOBLE ALPES**

Spécialité : Sciences de gestion

Arrêté ministériel : 25 mai 2016

Présentée par

**Thi Hong An THAI**

Thèse dirigée par Radu BURLACU, Professeur des Universités,  
Université Grenoble Alpes

préparée au sein du Laboratoire CERAG  
à l'École Doctorale EDSG n° 275

## **Trois essais sur la structure du capital et la vitesse d'ajustement vers un ratio «cible» d'endettement des entreprises vietnamiennes**

Thèse soutenue publiquement le **14 Novembre 2019**, devant le jury  
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THREE ESSAYS ON CAPITAL STRUCTURE AND ADJUSTMENT SPEED  
TOWARD THE TARGET LEVERAGE OF VIETNAMESE LISTED FIRMS

by

Thi Hong An Thai

Center for Study and Applied Research in Management (CERAG)

University Grenoble Alpes

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## **Statement of authentication**

I hereby declare that I have written this thesis independently, without assistance from external parties, except where acknowledgement is made.

This work is original, and has not been submitted to any institutions for a degree.

15<sup>th</sup> October, 2019

A handwritten signature in blue ink, appearing to read 'THAI', with a long horizontal flourish extending to the right.

**THAI Thi Hong An**

## Preface

Research papers raised from this thesis were published in three peer-reviewed journals and presented at one international conference.

### Journal

Thai, A. (2017). Ownership and capital structure of Vietnamese listed firms. *International Journal Of Business And Information*, Vol: 12(3), pp: 243-285.

Thai, A. , Hoang, T.M (2019). The impact of large ownership on capital structure of Vietnamese listed firms. *Afro-Asian J. of Finance and Accounting journal*, Vol: 9(1), pp: 80-100.

Thai, A. (2019). Foreign ownership and capital structure of Vietnamese listed firms. *Review of Integrative Business & Economics Research*. Vol: 8 (1), pp: 20-32.

### Conference

Thai, A. (2017). Foreign ownership and capital structure of Vietnamese listed firms, The third international conference on Accounting and Finance (ICOAF 2017), Danang, Vietnam.

### Two other papers are under review:

Thai, A., Radu, B. (2019). The heterogeneity in adjustment speeds toward corporate target leverage: The case of Vietnam

Thai, A., Radu, B. (2019). The adjustment speed toward target leverage over corporate life cycle: The case of Vietnam

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My thanks also go to the staff in the Faculty of Finance, University of Economics, The University of Danang, especially Dr. Dang Tung Lam, for providing me the raw data, and giving me many useful suggestions on methodology used in this thesis. In addition, I would like to express my appreciation to the financial support from the Vietnamese government.

I am so grateful to my parents for loving me unconditionally, and teaching me how to live with honesty. Without the inspiration, drive, and support that they have given me, I might not be the person I am today. Besides, I would also like to thank my beloved sisters for always being by my sides.

Behind me - a mom of two sons, who were only one- and three-years-old when I began my PhD - there is a truly generous husband. He has taken place my role in taking care our children. This appreciation note is for him. Thank you and our lovely sons, so much for supporting me and my dreams. Your love and encouragement are the greatest motivation throughout my PhD journal.

Finally, I would like to thank all of my friends, especially Ms. PHAM Be Loan, Mr. HUYNH Cong Bang, and Mrs. HUYNH Thi My Hanh for sharing my joyful studying time in Grenoble.

## **Abstract**

The first paper stemmed from this thesis seeks to explore the determinants of the capital structure of Vietnamese listed companies, with an emphasis on outside ownership. The empirical results demonstrate that the proportion of state investment has no linear impact on firm leverage. The results, however, reveal an inverted U-shaped relationship. Besides, our empirical results show that the proportions of foreign investment and large holders are negatively associated with short-term, total and market leverage.

The second study aims to explore some new aspects of the issue of adjustment speed toward the target leverage for Vietnamese publicly quoted firms by adopting a partial adjustment model. Through testing the existence of a target leverage and estimating the speed of adjustment, the study tries to find evidence for heterogeneity in adjustment behavior. Indeed, the assumption that the speed of adjustment is the same for all firms is inconsistent with the argument of the tradeoff theory which states that firms readjust their leverage by comparing the costs and benefits of adjustment. For different firms, these elements are different, leading to heterogeneity in speed. Even for a single company, the speed could change over time. To have an in-depth overview of the adjustment mechanism, this study goes inside different sub-samples of firms, i.e., above versus below the target; close versus far from the target; deficit versus surplus firms.

The last essay belonging to the thesis provides, as far as we know, the first evidence of changes of adjustment behaviors over the business life cycle of Vietnam quoted firms from 2005 to 2017. The outcomes show that the adjustment speed toward the target leverage varies significantly across the five phases of life, and reaches the highest level in the stage of introduction. We also find that cash flow pattern is a more reliable proxy of business life cycle stages than firm age and growth rate. Our empirical evidence supports the pecking order theory as the best-fit framework to understand the funding behavior of Vietnam listed firms throughout corporate life.

**JEL classification:** D91 D92 G32

**Keywords:** Ownership structure; State ownership; Foreign ownership; Large ownership; Capital structure; Target leverage; Life cycle; Speed of adjustment; Vietnam.

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## **List of Abbreviations**

ADB	Asian development bank
ASEAN	Association of Southeast Asian Nations
BSC	BIDV securities company
FDI	Foreign direct investment
FE	Fixed effect
GDP	Gross domestic product
GMM	General method of Moments
GNI	Gross national income
GSO	General statistics office of Viet Nam
HOSE	Hochiminh Stock exchange
HSC	Hochiminh city securities corporation
HSX	Hanoi Stock exchange
IMF	International monetary fund
MOF	Vietnam Ministry of Finance
OLS	Ordinary least squares
RE	Random effect
VBMA	Vietnam Bond Market Association
WB	World bank
SBV	The state bank of Vietnam

# CHAPTER 1: Introduction

This chapter introduces an overview of the thesis, including the author's motivation, research context, research questions and contributions. In the section of Vietnam context, the study describes some main characteristics of the economy, especially the equity, corporate bond markets and the banking system, three important channels providing funds for enterprises.

## 1.1. Motivation

Since the introduction of the M&M theory (i.e., the capital structure irrelevance principle) (Modigliani and Miller, 1958), many theoretical and empirical works have been published to explore the logic behind the corporate capital structure. Since the 1980s, these efforts have resulted in the presence of four major theories of capital structure, including the trade-off, pecking order, market timing, agency theories, which are often used to explain capital choices of firms around the world.

The trade-off theory (Baxter, 1967; Kraus and Litzenberger, 1973) argues that a firm will consider the trade-off between costs and benefits of using debt to decide how much levered the firm should be. While the benefits of borrowing come from savings from tax charges, which is often labeled as “debt tax shield”, since interest payments are tax-deductible expense, the costs of debt come from financial distress and bankruptcy. The trade-off framework suggests that when firms are far away from their target, an adjustment process will take place, and the speed with which firms offset deviations between their current leverage and the target depends on the cost of adjusting (Flannery, 2005). After that, firms tend to re-balance their capital structures quickly to stay at the optimal point over time (Leary and Roberts, 2005; Flannery and Rangan, 2006).

According to the pecking order model, which considers informational asymmetries between firms and outside investors, firms favor securities with the lowest sensitivity to information. Consequently, they prefer internal funds to external ones, and debt financing over equity financing. Furthermore, the agency theory explains that disagreements between firm owners (shareholders) and their agents (managers) can negatively impact capital structure decisions. Conflicts arise when the agents are encouraged to act in their own interests which negatively

affect those of the owners, thus, entrenched agents have discretion over their financial choices (Morellec et al., 2010).

Market timing hypothesis (Baker and Wurgler, 2002) argues that the shares are issued when the market highly appreciates firms. That means a good time point to acquire equity is when market-to-book ratio is high, and capital structure depends on the ability of selling "overpriced" shares.

Pecking order and market timing theories imply leverage has no effect on firm value and therefore reject the existence of target leverage as well as the notion of offsetting the distance from the target debt-to-equity ratio.

Although the theories mentioned above cannot explain the corporate capital structure completely, they help to form the basis for modern research on firms' funding choices. Three strands of capital structure studies that attract largest interest are the impact of ownership structure on funding decisions, the adjustment speed towards the target, and the changes of firm financial structure and adjustment behavior over time. Shleifer and Vishny (1986) find that major stockholders can impact the conflicts between the manager and the shareholders as they have strong incentives to monitor managers' activities. However, there are some research gaps, such as the influences of outside ownership on the funding choices of firms in emerging markets. Indeed, most research on this kind of relationship has been undertaken in the cases of developed countries such as the USA and the UK. While the studies for emerging countries are rare, China is the primary case. So far, the impacts of the state, large and foreign shareowners to debt ratios of Vietnam listed firms are not sufficiently explored.

Another main strand of the literature on capital structure is the adjustment speed toward the target. Based on the three main theories, including the tradeoff, pecking order and market timing, the issues of how firms determine their target and readjust their capital structure have been inspired by the first work of Fischer et al. (1989). However, heterogeneity in the adjustment speed is still a field that needs more research. For an emerging market like Vietnam, our study is the first to provide an in-depth analysis on the heterogeneity in adjustment behavior of publicly listed firms. Vietnam, which is a typical emerging market and has specificities such as concentrated-state ownership, slow opening to foreign investors, an under-

developed bond market, and a blooming stock market, offers an interesting empirical ground to test corporate choices of funds.

In addition, our thesis is also designed to test the changes of adjustment speed throughout corporate lifetime. A firm, through its life, conducts its business within the movements of several factors which may involve the inside decision making (e.g., business strategy, funding resources, investment, management...) or outside elements (e.g., competitors, country policies, global financial crisis...). According to each period of time, firms have different objectives, so, will use different resources and methods to achieve their goals. “Through how many stages do firms grow”, and “How can determine which phase a firm is in” are two main questions that need appropriate investigations when considering the business life cycle. With the perception of the life cycle at firm-level, the corporate life can be divided into 3, 4 or 5 phases, and the classification can rely on age, size, growth or cash flows. The classification attribution depends on the purpose of the study or what theories we want to in line with. We use cash-flow pattern approach of Dickinson (2011) to separate 5-stage corporate life as defined by Gort and Klepper (1982). Besides, firm age and growth will be used to ensure the robustness of the findings.

Due to the important influences of the business life cycle on many aspects of the firm, such as performance, investment, dividend policy, the understanding of it is necessary. Indeed, the change of funding behavior across stages of life has attracted the interest of researchers in recent decades. In 1998, Berger and Udell test changes in the financial choices depending on firm size and age for a sample of US small firms. Kim et al. (2012) find evidence of changes in the cost of external finance over firm age. They provide evidence that young firms are treated with low or even negative interest rate from banks as the common way to attract new borrowers. In 2015, Tian & Zhang (2015) explore the impacts of the corporate life cycle on funding choices of Chinese publicly firms, and they find that cash flow positions have a significant influence on debt ratio, stronger than firm age. In 2016, in an examination of Europe listed firms, Castro et al. show that speed fluctuate along three phases of the corporate life (i.e., introduction, growth and maturity). They suggested that firms offset the deviation to the target fastest during introduction stages. Inspired by these above studies, we conduct the first research providing an overview on how Vietnamese public quoted firms adjust their capital structure over their life cycle. Thus, to have an in-depth examination, the study will test the change of both book and market leverage with age, growth rate, and cash flow patterns.

## **1.2. Research questions**

This study observes the case of an emerging market (i.e., Vietnam) to find further evidence which can contribute to the current literature on capital structure decisions through answering the following questions:

1. Does outside ownership structure (including block, foreign and state ownership) affect the funding choices of Vietnamese listed firms?
2. Is there a target leverage? If so, how quickly Vietnamese quoted firms adjust to the target leverage? Is this speed “Homogeneous” for all firms?
3. Does timing issue matter on capital structure decisions? How the adjustment speed toward the target leverage changes over firm life cycle?

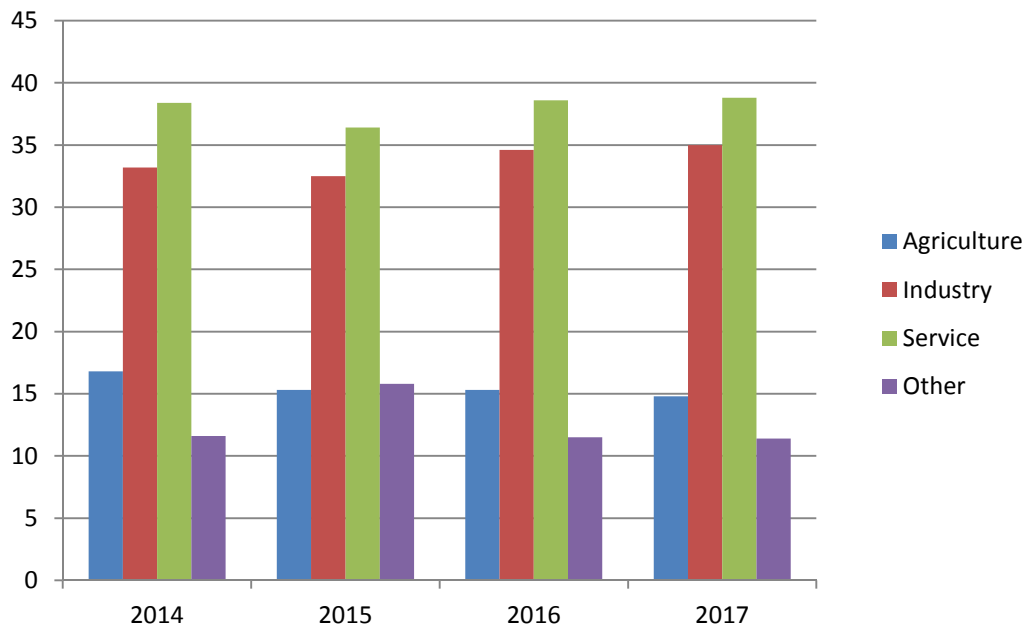
## **1.3. The context of Vietnamese markets**

In order to understand the research topics analyzed by the thesis, it is important to know the evolution and the specificities of the Vietnamese economy. Indeed, it is necessary to consider some main aspects of this market in order to understand what build up our research motivations.

### **1.3.1. Vietnamese economy overview**

Based on the data collected by the IMF and WB, the Vietnamese economy has experienced a stable growth during the decade of 2007-2017. GDP growth was 6.2% in 2016, down from 6.7% in 2015, and hit 6.8% in 2017, which was higher than the rate of 6.3% expected by the IMF. Within the 10-year period, the country has fast undergone the transition from agriculture-based to so-called “industrialisation and modernisation” economy. Looking into GDP share of economic sectors, we can see that the largest component of this economy is services, which contributes more than 35% of the whole gross domestic products’ value. The share of agriculture decreased over time, from around 40% of GDP in 1986, to approximately 14% in 2017.

**Figure 1:** GDP share of major group of economic sectors from 2014 to 2017



*Source: ASEAN Secretariat*

Since 2009, Vietnam was ranked as a lower-middle income country by WB. After that, the GNI level keeps growing and reaches of \$2,060 per capita in 2016. The Vietnamese government has set the long-term goal of becoming an upper-middle income country by 2035. In particular, the short- and medium-term goals are maintaining stable economic growth, together with enhancing the process of industrialization and modernization.

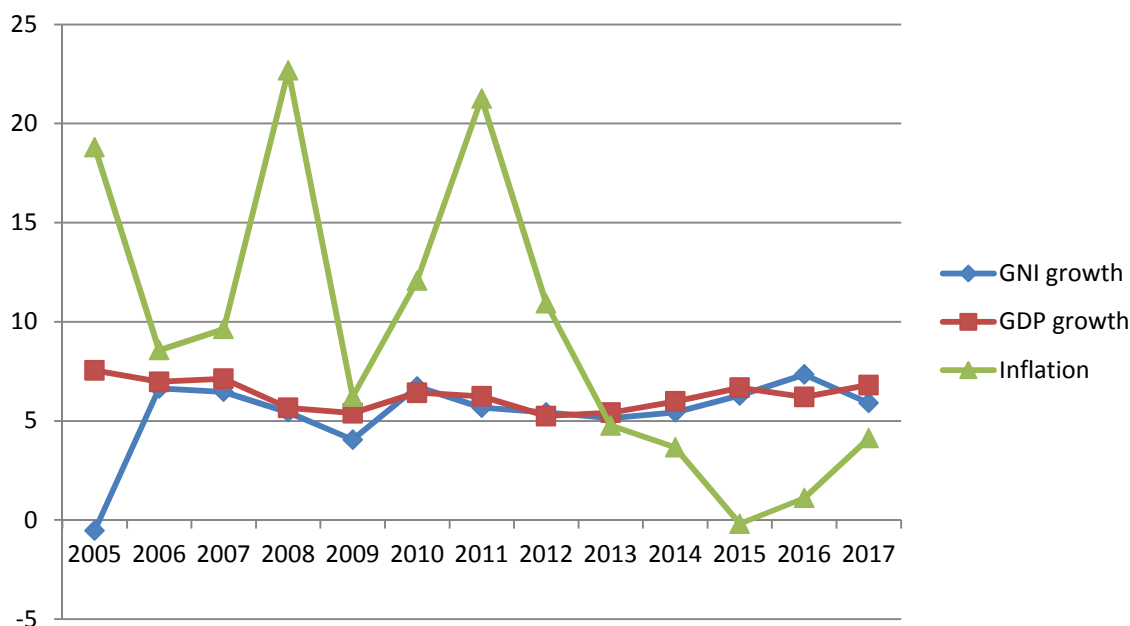
The inflation rate averaged 8.75% for the 2007-2017 period. After reaching an all time high of 22.67% in 2008, it reduced to rates below 5% after 2013. However, the inflation seems to increase again after 5 consecutive years of decrease. The price of some important commodities, including oil and gas, electricity, certain transportation fares, health care services at state-owned hospitals..., is under the strict control of the government<sup>1</sup>. Some other prices are flexible, but required to report regularly so the government can have timely intervention, for example,

---

<sup>1</sup> 2012 Law on prices and Decree 146-November 2016

basic material (e.g., cement, steel, coal...), and basic food (e.g., sugar, rice, milk and nutritional powders for children under six...).

**Figure 2: GNI, GDP, and inflation rate of Vietnam from 2005 to 2017 (annual %)**

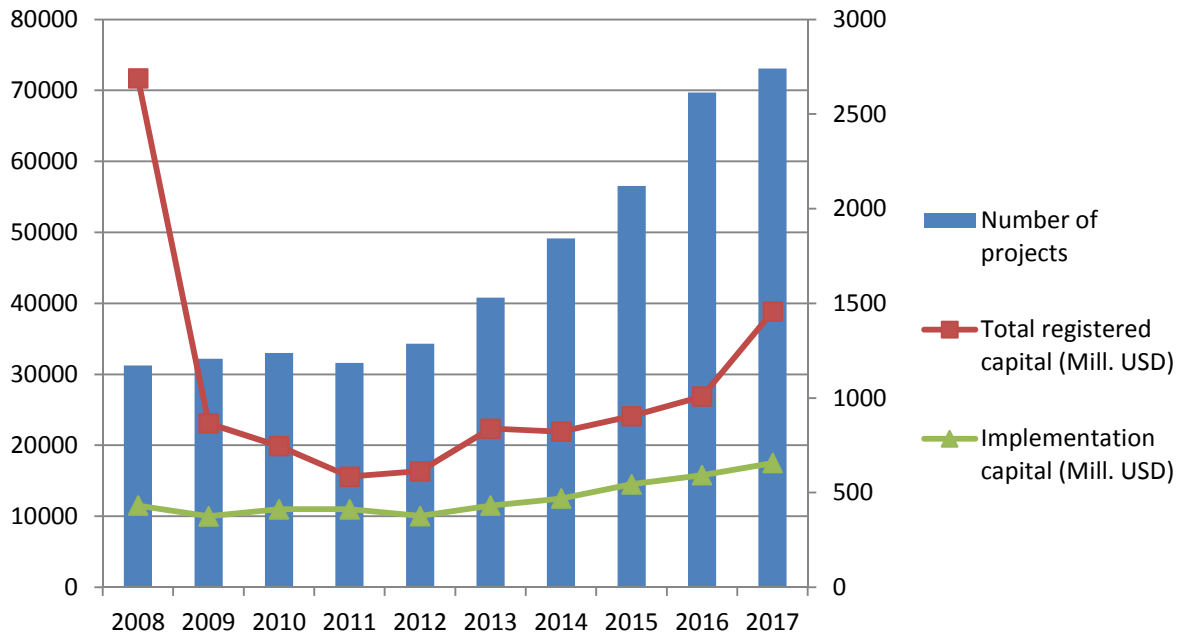


Source: WB

Economic growth has been pushed by the growth in FDI. Net FDI inflows in the period reached the all-time high in 2017 with the value of around \$17.5 billion, and new registered FDI capital grew by 44% compared to 2016. Manufacturing-processing, electricity, and real estate are 3 main industries that attracted the highest flow of foreign investment in 2017 with the value of \$15.87 billion, \$8.37 billion and \$3.05 billion, respectively. The total investments from 3 biggest investors, including Japan, South Korea, and Singapore, reached \$35.6 billion, making up over 70% of the FDI pledged to the country in 2018.



**Figure 3: FDI into Vietnam from 2008 to 2017**



Source: GSO

Through *Doi Moi*, a decade-long government plan to build a market-oriented economy to replace the old centrally planned economy, many state-owned enterprises (SOEs) have been privatized as joint stock companies. Indeed, a number of large SOEs are currently undergoing government divestment and privatization. Under the 2014 Vietnamese Law on Enterprises, an SOE is a corporation that has 100% of its shares owned by the state, either local or central. As a result of privatization, the number of more-than-50%-SOEs declined from around 12,000 in 1991 to 2,486 in 2017. According to the GSO’s report, SOEs contributed approximately 30% to the country’s GDP, although their number only accounted for 0.44% of all on-going firms in 2017. Because of the uncompleted privatization process, however, the proportion of shares in the hands of the state (both local and national) in non-SOEs is still considerable. Fortunately, the private sector has gradually developed and contributed impressively to the development of the economy. It made up 43.22% of GDP in 2015, 42.56% in 2016, and 42.7% in 2017.

**Table 1: Vietnamese firms from 2010 to 2017**

Year	2010	2011	2012	2013	2014	2015	2016	2017
100%-State-owned enterprises	1801	1769	1592	1590	1470	1315	1276	1210
Over-50%-State-owned enterprises	1480	1496	1647	1609	1578	1520	1386	1276
Sole-proprietorship	48007	48913	48159	49203	49222	47741	48409	51542
Partnership	79	179	312	502	507	591	859	881
Limited-liability companies	163978	193281	211069	230640	254952	287786	336884	367273
Joint-stock companies	56767	70043	75022	79449	83551	91592	102243	123440
100%-foreign enterprises	5989	7516	7523	8632	9383	10238	11974	13197
Foreign-domestic joint ventures	1259	1494	1453	1588	1663	1702	2028	2245
Total	279360	324691	346777	373213	402326	442485	505059	561064

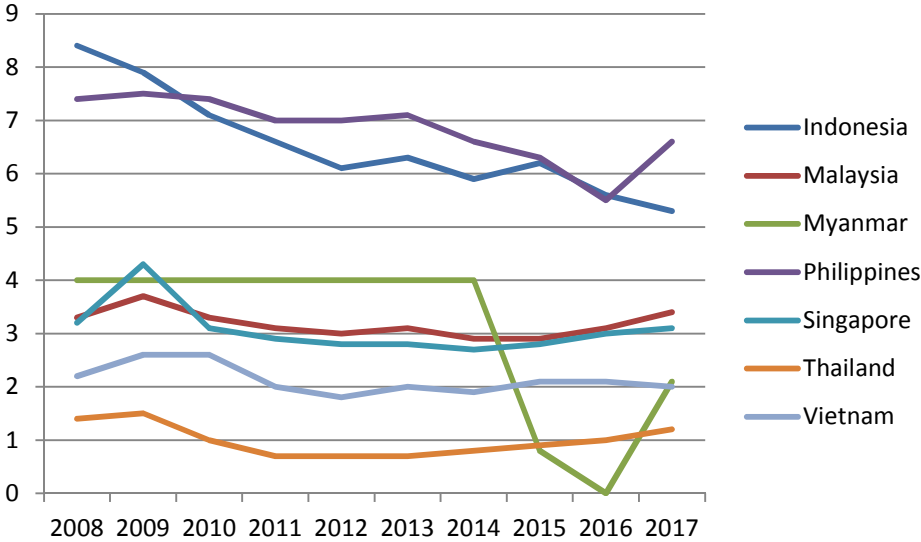
Source: GSO report 2014, 2015, 2016, 2017

The average population in 2017 of the country is estimated at 93.7 million people, which increased by 1.06% compared to 2016; among those, urban population is around 32.8 million people, accounting for 35%, while rural participation is about 60.9 million people, accounting for 65% of the whole number.

In 2017, the share of below-30-year-old employees accounted for 35.2% of the total labor force, while the majority was between 31 and 45 year-old with the rate of 42.7%. Moreover, the rate of un-skilled workers decreased from 34.7% in 2012 to 29.7% in 2007. Among trained employees, the proportion of workers who have university and college degrees accounted for 18.4% and 6.7%, respectively, while workers with intermediate and elementary qualifications taken 10.7% and 8.8% respectively.

The unemployment rate of people who are 15 years old and over in 2017 was 2.0%, which slightly decreased from 2.1% of the previous year. Compared to other countries in ASEAN, this rate is moderate.

**Figure 4:** Unemployment rate of 15-year-old and over population from 2008 to 2017 of Vietnam and other countries who are the members of ASEAN



Source: ASEAN Secretariat

The living standards continue to improve. Human development index (HDI) increased from 0.695 in 2016 to 0.7 in 2017, according to WB report. In terms of the poverty reduction objective, Vietnam has made an impress progress when the share of the population living on less than \$2 a day has been brought down to 9.8% in 2016, which is lower than the Philippines and Cambodia. Life expectancy was 76 years old in 2017, higher than both the Philippines and Indonesia. Gross school enrollment at the secondary level for both sexes was 58% in 2017.

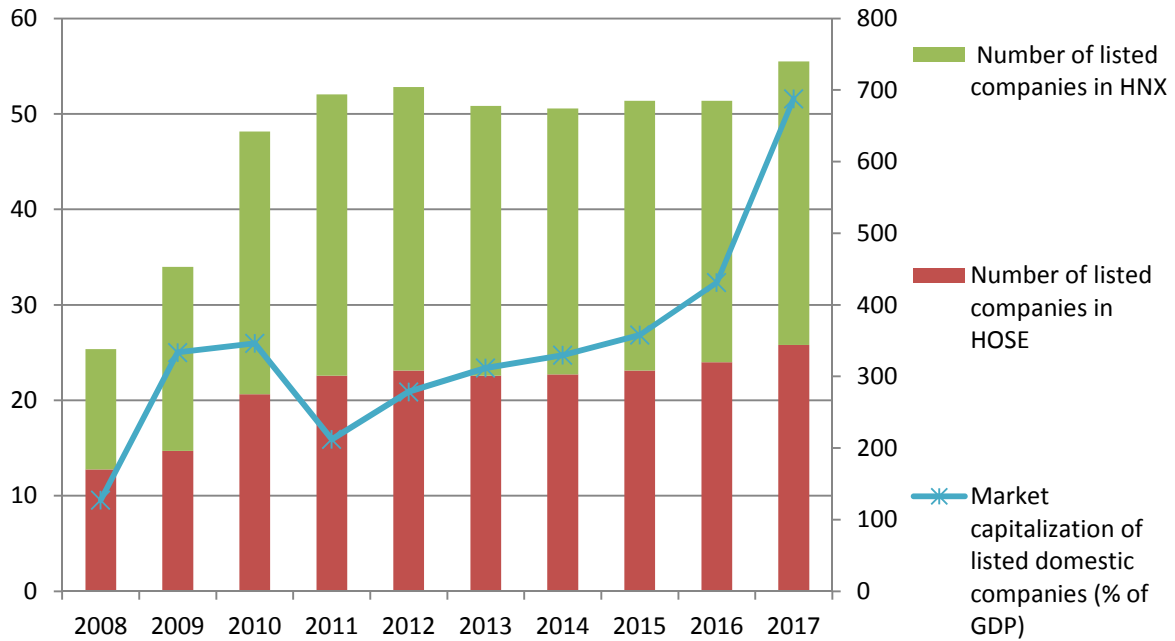
### **1.3.2. Equity market**

Thanks to the “Doi Moi”, the Vietnamese economy is open gradually with the development of the private sector over the long decades dominated by state companies. Although the remaining numbers of SOEs are still considered to be the backbone of the market, private firms have taken advantage of financial incentives and the removal of political barriers to strengthen their business growth. In 2000, the first market, named Ho Chi Minh Stock Exchange (i.e., HOSE or HSX), was established to provide enterprises another official channel to raise funds besides bank loans.

5 years later, the second exchange market, named the Hanoi Securities Trading Center (i.e., HaSTC), was formed, and in 2009, it was transformed and restructured to become the Hanoi Stock Exchange (HNX). Although HNX has performed well, HOSE is still the largest exchange at the moment. With the establishment of these two markets, the size of the stock market has increased considerably, from \$154 million in 2003 to over \$124 billion in 2018. The amount of publicly listed firms increases over time, but still takes a small proportion of all on-going firms.

Apart from HOSE and HSX – the two markets for quoted enterprises - Vietnam also has an Unlisted Public Company Market (UPCoM), which has the objective to encourage unlisted firms to participate in the securities market. A firm who lists in UpcoM may later transfer onto the two main markets.

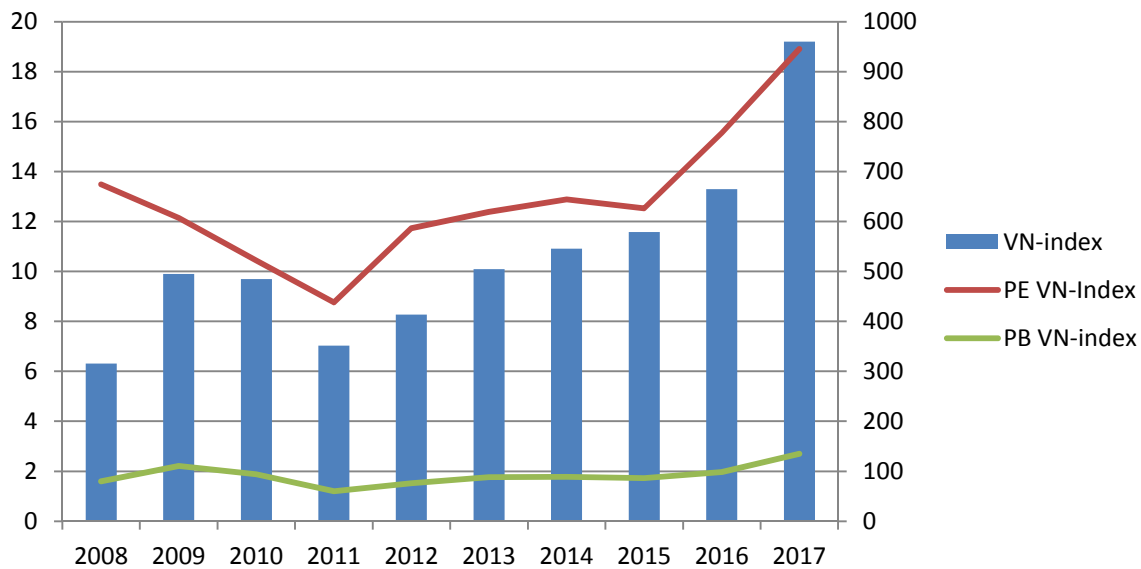
**Figure 5:** Equity market capitalization from 2008 to 2017



*Source: HSX, HOSE, and WB*

Looking at the price-to-earnings (PE), price-to-book (PB), and the value of VN-Index from 2008 to 2017, we can see the development trend of the equity market more clearly. The VN-Index value, which is a capitalization-weighted index comprising all equity listings on HOSE, has grown rapidly from 2011. In 2017, the index was trading around the 960 mark, from a base index value of 100 as of July 28, 2000. Its PE was approximately 19 times in 2017, while PB fluctuated around 2.x.

**Figure 6:** VN-Index and its PB, PE ratios over 2008-2017 period



*Source: BSC report 2018*

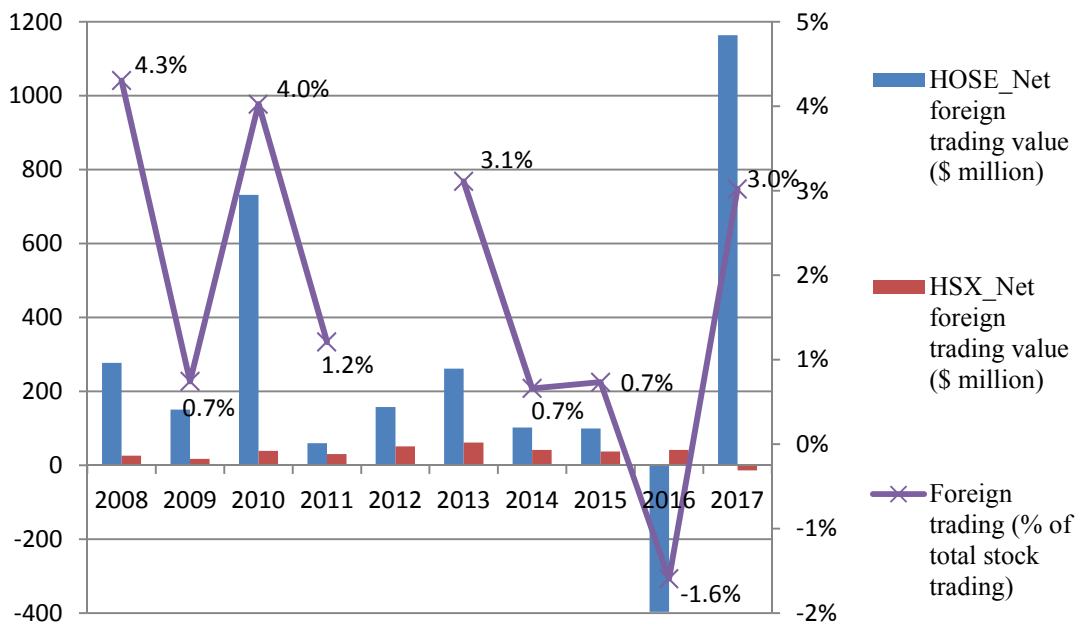
At the end of 2010, Vietnam was ranked 16th in Grant Thornton’s Emerging Markets Opportunity Index 2010. Since 2013, Vietnam has been on Morgan Stanley Capital International’s review list to upgrade from frontier market to emerging market, so the government is desired to keep improving the openness to foreign investors. In fact, foreign investment plays a vital role in providing sufficient funding to develop society, economy, and promoting the advanced technology growth in Vietnam.

Companies do their business in Vietnam based on two main laws: enterprise law 2014 and investment law 2014, which were official implemented and legal updated in 2015. These laws have contributed to eliminate barriers to business investment, create a legal basis for investment environment; increase the transparency and right equality among investors. Thus, they help to enhance the involvement of different types of shareholders into equity markets.

Under Decree 60 signed on 26 June 2015 by the Ministry of finance, Foreign Ownership Limit (FOL) has been loosened so that foreign investors now have the chance to own 100 percent of voting shares though its implementation is uncompleted. At the end of 2016, foreign ownership accounts for 18% of the market (around \$11,700,000,000) while the State holds 33% of stake in

312 companies listing on HOSE. Foreign investors mainly invest in healthcare, technology, consumer goods while key industries like utilities, banks are largely controlled by the government (Stockplus, 2016). According to the World Bank's assessment, in the 2018 Global Business Environment Ranking, Vietnam has increased 14 places from 82 to a position of 68 over 190 observed countries, of which: investor protection level increased 6 levels, from 87 to 81. According to the 2017-2018 Global Competitiveness Report, Vietnam's index increased by 5 grades, from 60 to 55 over 137 countries participating.

**Figure 7:** Foreign trading from 2008 to 2017 in two exchanges



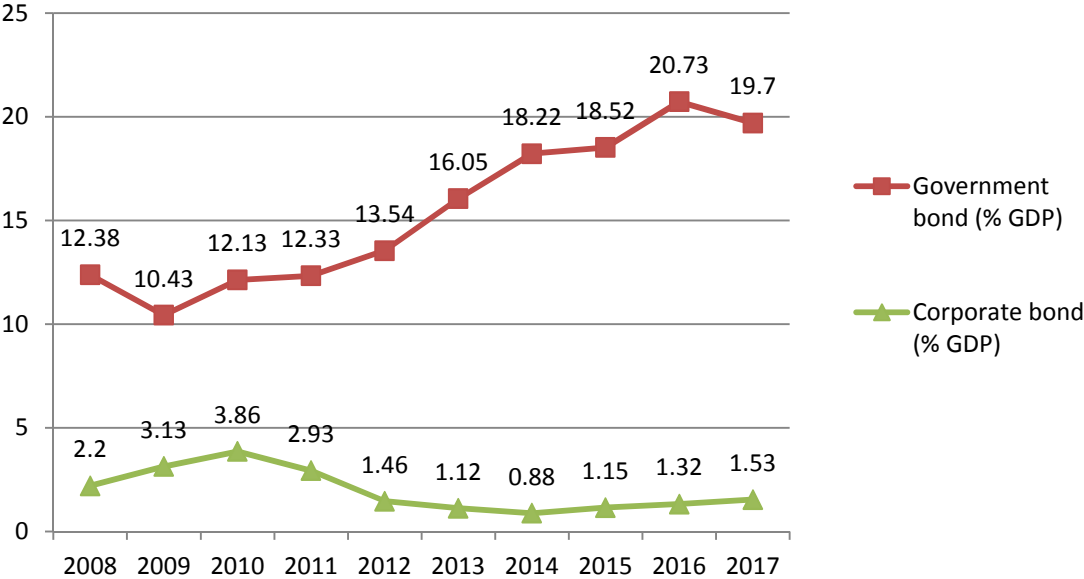
Source: WB and HSC. Note: WB has no data of stock trading of Vietnam in 2012.

### 1.3.3. Corporate bond market

In Vietnam, corporate bonds are registered at the Vietnam security depository, then listed to sell/buy at HOSE or HNX stock exchanges, and transferred electronically on T+1. The minimum par value per bond must be VND100,000 or multiples of VND100,000. In contrast to

the fast growing equity market, the corporate bond market is still underdeveloped, with the size only at 1.53% of GDP in 2017.

**Figure 8:** Vietnam bond market from 2008 to 2017

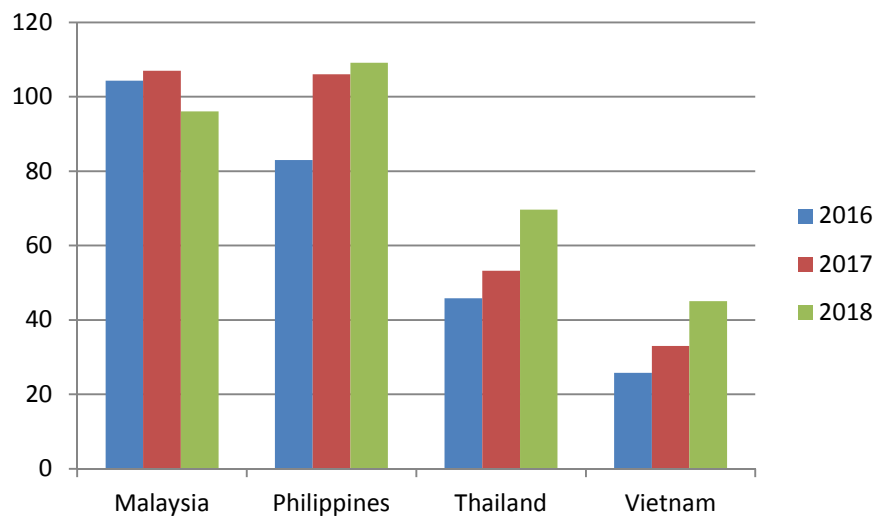


Source: ADB

The size of the Vietnamese corporate bond market is not only much lower than the average of around 20% of Thailand corporate bond market or 15% of Indonesia market, but also very small compared to the size of the Vietnamese equity market and bank credit line, which amount to 51.6% and 130.7% of GDP respectively. Until now, its size remains smallest in the South East Asia region, according to recent reports of the Asia Bond Monitor, a department of ADB, but is predicted to grow exponentially in upcoming years, as some large firms start focus on bonds when the borrowing interest rate from banks has increased over time.



**Figure 9:** Typical issue size of corporate bonds (USD millions) of Vietnam and some other ASEAN countries from 2016 to 2018

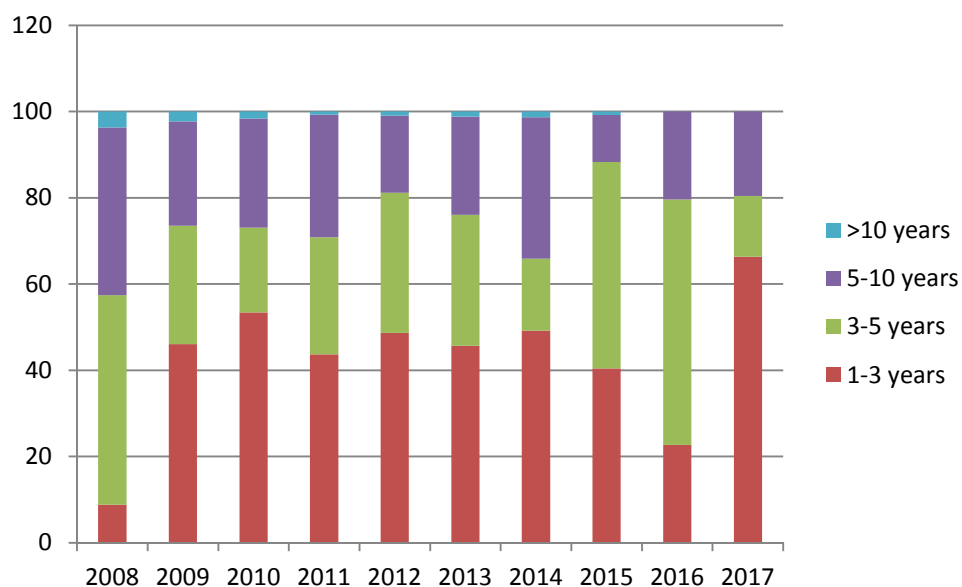


*Source: ADB*

The first reason for the under-development may due to the history of this market. In Vietnam, while the banking system has been developed over 70 years, the corporate bond market was only formed in 2000, and until September 2006, the first issue of corporate bonds by private companies was done, so the market still seems to be in the early stage of its life. In 2017, only a small number of Vietnamese firms, around 59 over 561,064 on-going companies, issue bonds to raise capital. Secondly, the issuance of bonds is not an easy task for all companies regarding to the strict procedures in order to ensure the safety of investors, which firms have to comply with, for example, the obligation to disclose financial information. Borrowing from banks seems to be simpler compared to issuing corporate bonds, especially for small and medium enterprises. The bond channel is thought as saving more chances for large, reputable, audited companies with a broad network of potential investors. Thirdly, the bond market is also not attractive to investors due to undiversified options, leading to unsustainable demand. Moreover, the shortfall of credit rating agencies is also a problem. So far, Vietnamese quoted firms depend on foreign companies which often charge high fees for credit-rating services. Last but not least, Vietnam is truly lacking of a secondary market to increase the liquidity of corporate bonds.

Figure 9 presents the maturity profile of total outstanding corporate bonds over 2008-2017 period. The largest components of bonds had the maturity less than 3 years. At the end of 2018, around 60% of all corporate bonds in the Vietnam were short-term with maturity from 1 to 3 years, while the ratios were 43% in Thailand, 28.5% in the Philippines, and 16% in Malaysia. Among industries, banks' bonds have the longest term, averaging 7.5 years over the 10-year period, followed by infrastructure with an average term of 5 years. Real estate's bonds have maturity around 4 years on average, and are often issued to fund specific projects.

**Figure 10:** The maturity profile of Vietnam corporate bond from 2008 to 2017



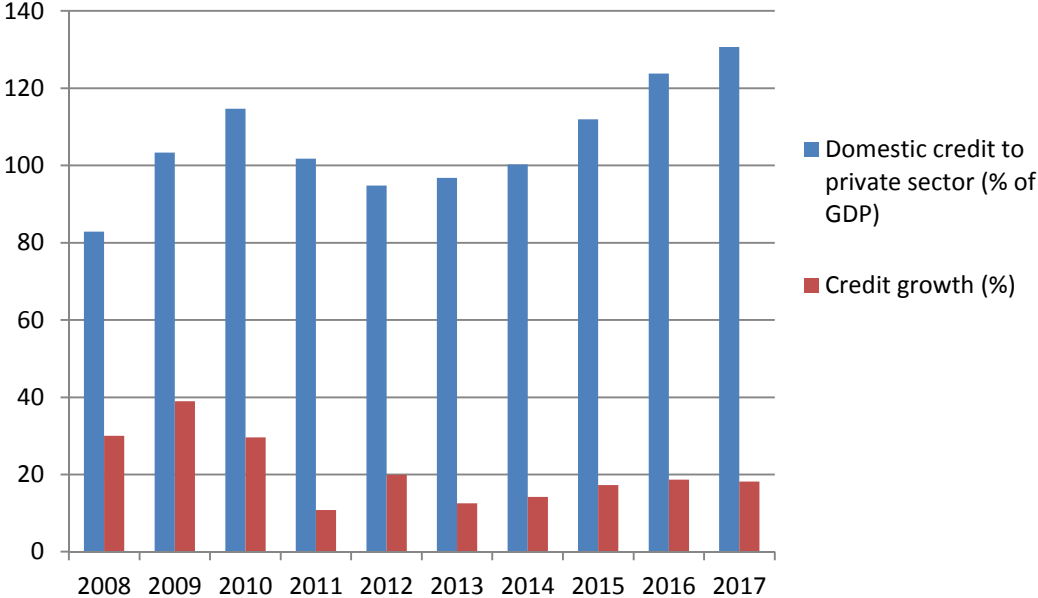
*Source: ADB*

#### 1.3.4. Banking system and credit for firms

In Vietnam, the banking sector has played an important role in providing capital for business since its foundation in 1990. Vietnam, like other emerging markets, has to suffer the problem of information asymmetry, so firms tend to depend on bank credits as the main source of funding. Over the past 28 years, the banking system of this country has undergone many reforms, especially the privatization of state-owned banks, in order to improve the efficiency and

competitiveness. Thanks to that, compared to the equity and bond markets, this industry has more significant and rapid growth. In 2017, there are 4 state-owned and 31 domestic joint-stock commercial, and 9 foreign banks. These banks have the average capital to assets ratio of 7.36%, and provide the domestic credit around 141.85% of GDP.

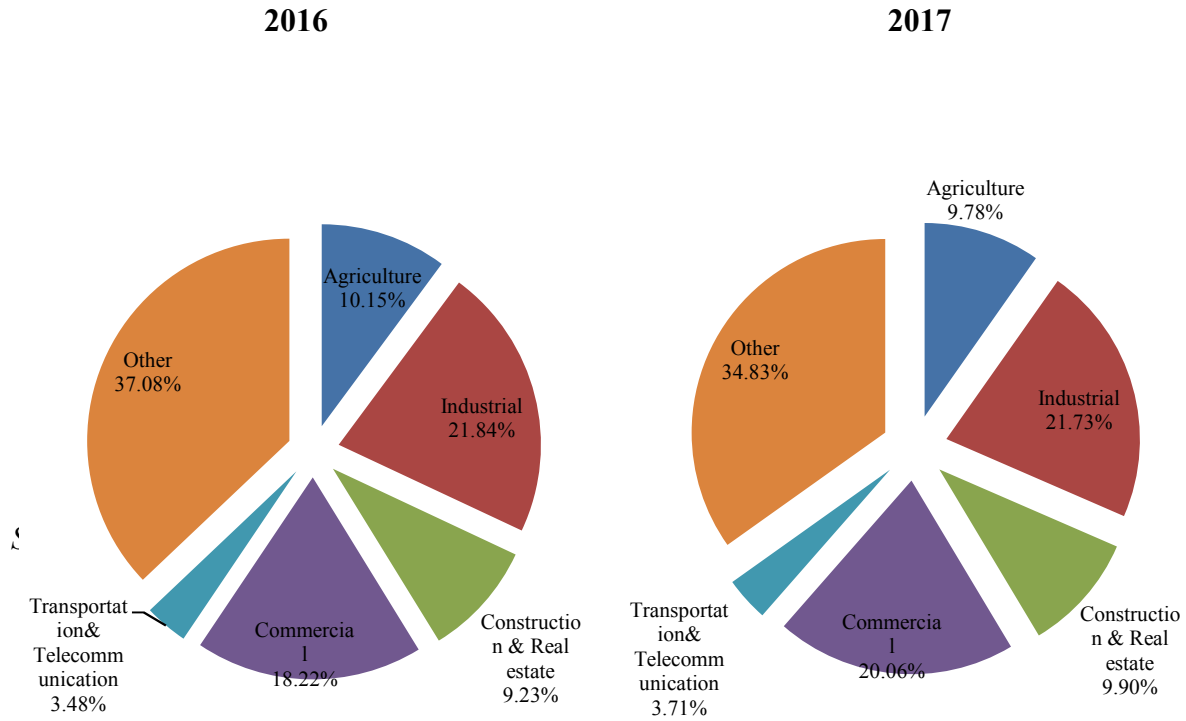
**Figure 11:** Credit for private sector and credit growth from 2008 to 2017



Source: WB, SSI Securities Corporation

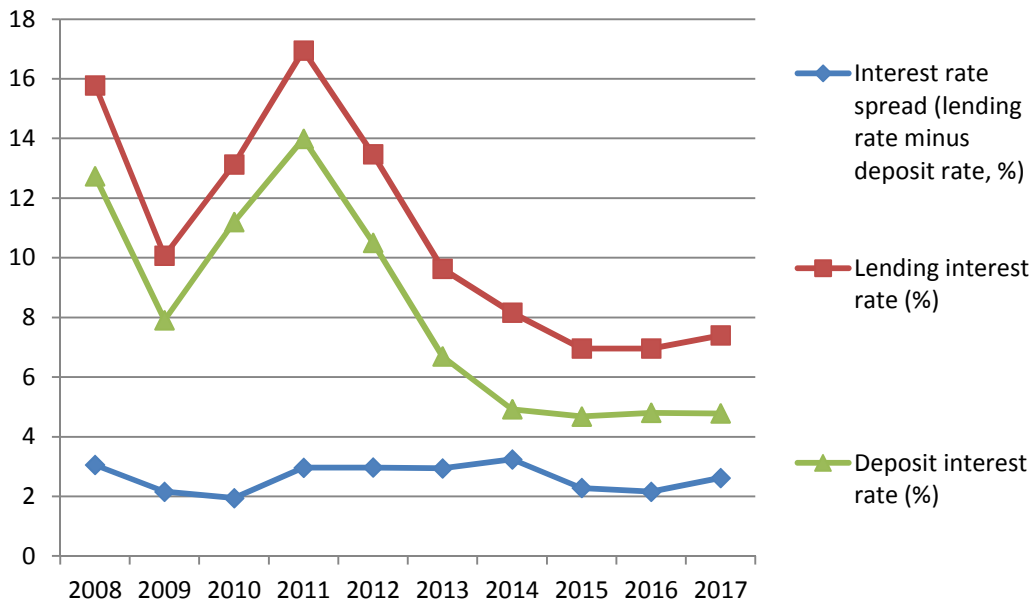
The large amount of bank loans come to industrials and commercials with the proportion of 21.73% and 20.67% respectively. Agriculture is also focused to provide funds with the lowest interest rate. Moreover, since Vietnam is in its process of the infrastructure development, the banks save more chances to construction and real estate companies.

**Figure 12: Domestic credit by sectors in 2016 and 2017**



The high competitiveness of domestic banks, and the involvement of foreign banks with the strength of capital and technology, have contributed significantly to the quality enhancement of Vietnamese banking sectors. Considering to the interest rate, compared to 2016, both average lending and deposit rates increased slightly in 2017, to around 7.7% and 4.5% respectively. The interest rate spread, implying the benefit rate of banks, also has a small improvement in 2017 with the value of 2.2%.

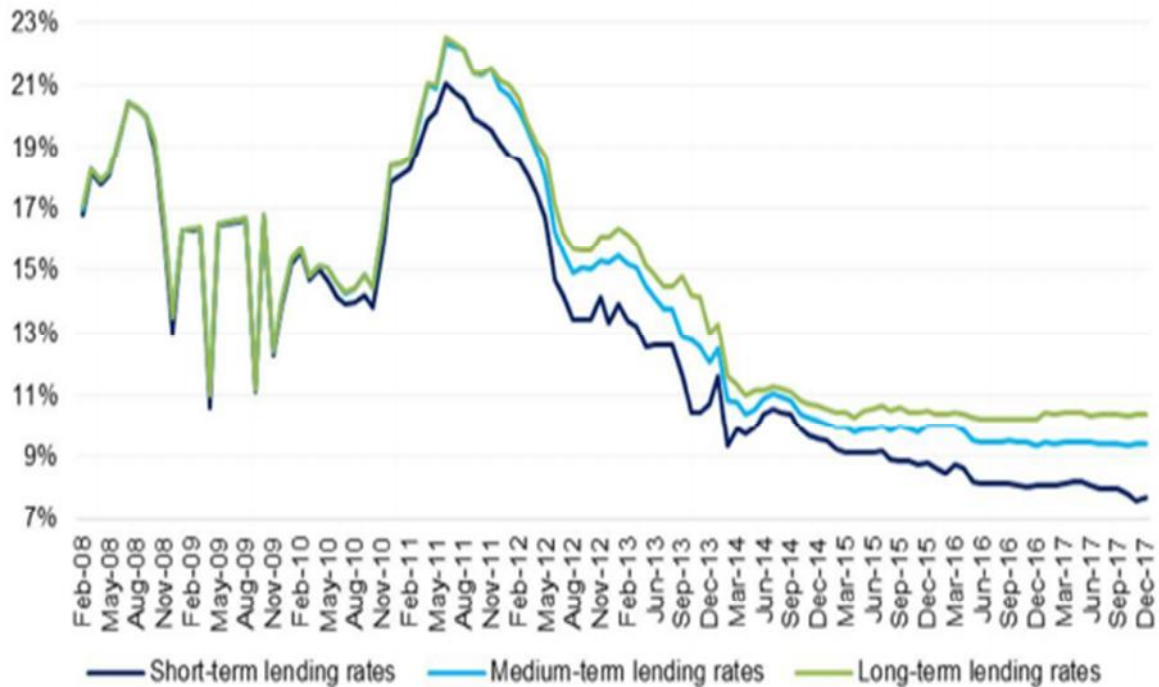
**Figure 13:** Average interest rates from 2008 to 2017



Source: WB

From 2011 to 2017, the overall downward trend can be seen in rates in all terms. However, over the last 3 years, medium-term and long-term lending interest rates were more stable and less volatile than short-term rates. At the end of 2017, long-term lending rate was around 11%, while medium-term rate was lower by 1%. The lowest rate was found in short-term borrowing with the average number smaller than 8% per year. Based on the Article 39/2016/TT-NHNN of the state bank of Vietnam, there are some priority industries, including “agriculture, firms producing goods for export, small- and medium-sized enterprises, enterprises operating in auxiliary industries, and hi-tech enterprises, including startups”, which are able to borrow money from banks with a lower interest rate in comparison to other regular industries.

**Figure 14:** The average lending rate by term from 2008 to 2017



Source: HSC report 2017

Within 3-year period from 2015 to 2017, the average lending rate for the priority areas varied from 6% to 7% per year for short-term and from 9% to 10% for the medium-term and long-term, while the lending rates for regular industries were much higher, from 6.8% to 9.0% for short-term; and 9.3% to 11% for the medium- and long-term in 2017. The basic lending rate for each specific maturity was ruled by the state bank, and need to have the government’s approval. Similarly, the list of priority sectors are also considered regularly.

**Table 2: Lending rates for priority sections documented by the government from 2010 to 2017**

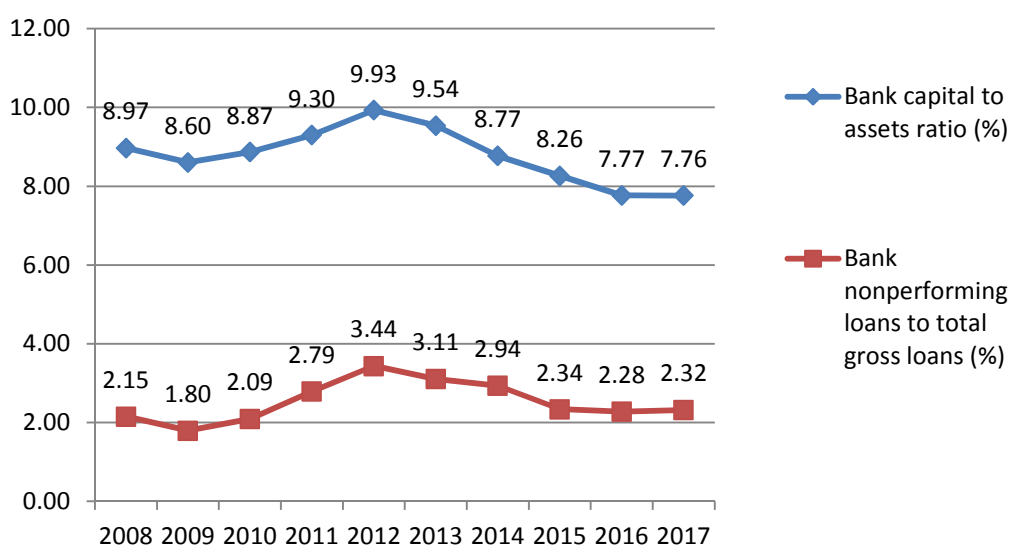
Year	2010		2011		2012		2013		2014		2015		2016		2017	
Term	Short	Medium & long	Short	Medium & long	Short	Medium & long	Short	Medium & long	Short	Medium & long	Short	Medium & long	Short	Medium & long	Short	Medium & long
State_ owned banks																
Priority fields	12.0-13.0	13.0-14.0	14.5-17.0	17.0-18.0	10.0-12.0	14.6-16.0	7.0-9.0	11.0-12.0	7.0	9.0-10.0	6.0-7.0	9.0-10.0	6.0-7.0	9.0-10.0	6.0-6.5	9.0-10.0
Other fields	13.0-14.2	15.0-16.0	17.0-19.0	18.0-19.0	11.0-15.0	14.6-16.5	9.0-10.5	11.5-12.8	7.0-9.0	9.5-11.0	6.8-8.8	9.3-10.5	6.8-8.5	9.3-10.3	6.8-9.0	9.3-11.0
Joint-stock commercial banks																
Priority fields	13.0-14.0	14.0-15.0	17.0-19.0	18.0-20.0	11.0-12.0	15.0-16.5	8.0-9.0	11.0-12.0	7.0	10.0-11.0	7.0	10.0-10.5	7.0	10.0-10.5	6.5	9.5-10.5
Other fields	15.0-16.0	16.0-18.0	18.0-19.0	19.0-20.0	12.0-15.0	16.0-17.5	9.5-11.5	12.0-13.0	8.0-9.0	10.0-11.0	7.8-9.0	10.0-11.0	7.8-9.0	10.0-11.0	7.8-9.0	10.0-11.0

Source: SBV

In terms of ownership structure, SOEs have more advantages in raising capital from banks in comparison to non-SOEs firms (Nguyen and Ramachandran, 2006; Thai, 2017). This was the main reason for the large amount of non-performing loans (NPLs, hereafter) during the 2000s since most of SOEs run their business inefficiently. Aware of the problem with state ownership, beside the privatization of SOEs, the government also enhances the process of reducing state-capital in banks.

To deal with NPLs, from 2015, local banks can transfer a specific ratio of bad debts to a state-owned firm named Asset Management Company. In addition, banks are encouraged to apply Basel II standards, in order to crease the efficiency of bank administration.

**Figure 15:** Capital to assets and nonperforming loan ratios from 2008 to 2017



Source: WB

Other problems of the Vietnamese banking system are cross-ownership, and low equity capital. From 2011, the government has run a project to consolidate weak and small local banks into larger ones by increasing:

- (1) The total of required charter capital from \$45 to \$140 million;
- (2) The minimum rate of capital adequacy from 8% to 9%, and;



(3) The ratio of mandatory reserve funds over the net income from 10% to 25%.

#### **1.4. Contributions**

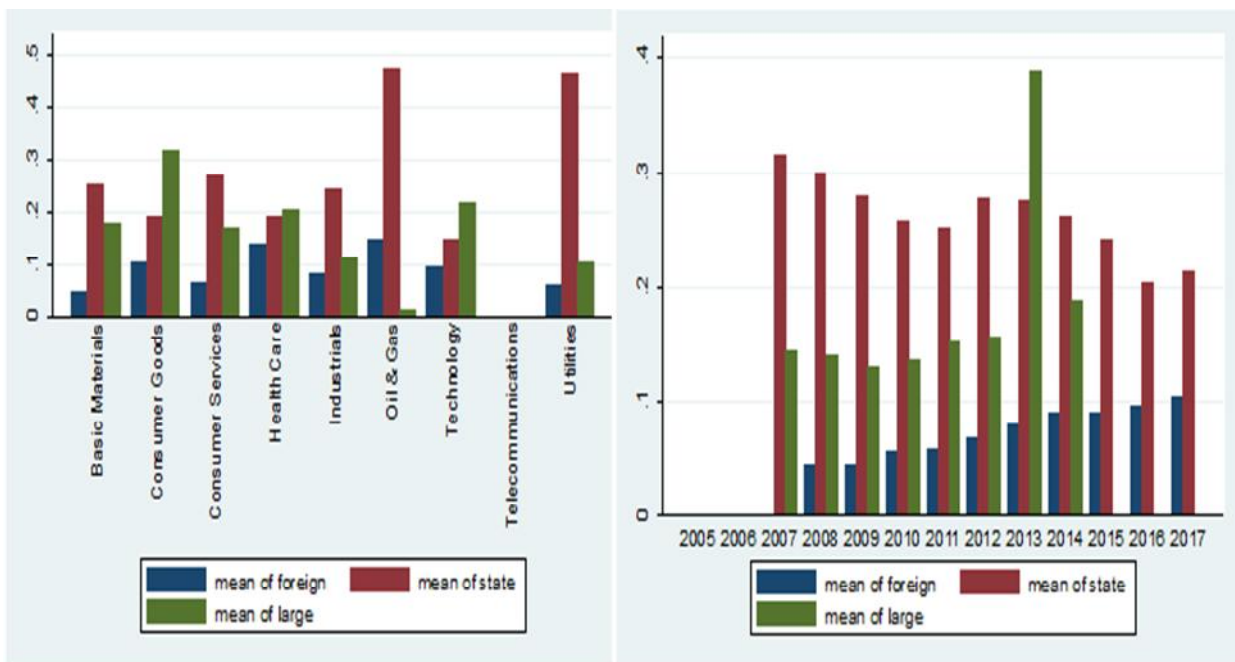
Empirical studies on the capital decisions of Vietnamese companies appear in the mid-2000s, and some of them focus on determinants of funding choices, for example, Nguyen and Ramachandran (2006), Biger et al. (2007), Nguyen et al. (2012), Okuda and Nhung (2012), Le (2015). Nguyen and Ramachandran (2006) examine a set of small- and medium-sized enterprises (SMEs) and find that capital structure relates positively to firm growth, size, and the strength of the relationship between firms and banking system. Their study also shows that ownership has a strong impact on the use of debt because SOEs have more advantages than private firms in borrowing money from banks and other financial institutions. The study, however, finds no significant correlation between profitability and the capital structure of Vietnamese SMEs.

Biger et al. (2007) examine unlisted enterprises, census 2002–2003, and provide evidence that firm size, growth, and managerial ownership has a positive impact on the level of debt, but find an inverse relationship between non-debt tax shield, profitability, tangibility, and leverage. Nguyen et al. (2012) test 116 listed firms for the four-year period, 2007 to 2010, and find that state-owned companies have easier access to financing sources than other types of firms. Okuda and Nhung (2012) suggest that the level of debt correlates positively with managerial ownership ratio and that state-controlled firms have a higher debt level compared, on average, to private firms. Le (2015) observed firms that were listed on the Ho Chi Minh City Stock Exchange (HOSE) for a four-year period, 2008 to 2011, and conclude that foreign ownership has an adverse effect on debt ratios, whereas state ownership is positively and significantly related to debt. They reveal that un-concentrated foreign investment cannot monitor the activities of top managers effectively, similar to cases of other emerging markets. She also tests the relationship between large ownership and capital structure of firms for the first time. Based on a set of 2,797 firm-year observations, the results show that block shareholders do have a clear impact on capital structure measures.

In brief, the majority of the research on the capital structure of Vietnamese firms focuses on SMEs and unlisted enterprises. Some studies have used data from listed companies,

but for only a short period. State ownership is focused to explore, but the popular method is setting a dummy variable (i.e., 1 for state-owned firms and 0 otherwise). Besides, given that Le's (2015) study is the only one to discuss the relationship between blockholders and capital structure of Vietnamese listed firms, there is a need to have more investigation in such a relationship. Indeed, during the period 2007–2017, the volume of shares held by large owners, as Figure 16 shows, is significant, consequently an more in-depth study is necessary. Our paper examines the influence outside ownership, including state, foreign and large ownership, has on the capital structure of listed firms. Using data from all stock markets, we find that the proportion of block investment is negatively associated with short-term, total book and market leverage. Our results are in contrast with the findings of Le (2015).

**Figure 16:** Outside ownership by industry and by year (from 2005 to 2017)



The current study aims, therefore, to contribute to the understanding of capital structure decisions by analyzing a sample of an up-to-date dataset of Vietnamese listed enterprises.

In terms of studies on the target leverage and the movement speed to alleviate the deviation between the current and target position, such work for Vietnamese firms are very rare. The first study examining the existence of target leverage of Vietnam listed firms was by Dereeper, Sébastien and Trinh (2012). Based on a data sample of 300 listed firms from 2005 to 2011, they tested the trade-off against pecking order hypotheses, and found that the latter theory cannot be applied for Vietnamese firms since equity issuance is not related to debt to asset ratio. They also made a comparison between private and state-owned companies to show that there was a big difference in financing decisions between the two subgroups. Specifically, they found while state-controlled firms need one and a half years to offset the deviation between the current debt position and the optimal level, private ones need twice as much time to do the same thing. However, they simply categorized firms as non-state or state-owned by a dummy, so their findings would not sufficiently reflect the current situation, in which the government's privatization project has nearly swept the 100% state-controlled firms out of Vietnam. Indeed, there is no firm with 100% of state ownership in our sample. Three years after the first study by Dereeper, Sébastien and Trinh, of 47 real-estate enterprises throughout the period of 2008-2013, Minh and Dung (2015) use two groups of estimators (static, i.e. Pooled OLS, FE, RE, and dynamic, i.e. GMM) to explore firm funding behavior. They find that the pecking order theory is more suitable for explaining funding behaviors of firms, and adjustment speed was 45.2% per year. They assume that the speed is homogeneous for all firms, so the finding is inconsistent with the argument of the tradeoff theory which states that firms readjust their leverage by comparing the costs and benefits of adjustment. Indeed, for different firms, these elements are different, leading to heterogeneity of speed, and even within one company, the speed could change over time. Besides, their sample of 47 firms is relatively small to ensure the robustness of their findings.

Considering the issue of heterogeneity in adjustment speed, the thesis contributes to the existing literature on funding decisions in some aspects. Most importantly, it is among the first ones which provides an in-depth analysis on the heterogeneity in adjustment behavior of Vietnamese listed firms. The study demonstrates that firms which are below the target often move to the target faster than ones over-leveraged, since they have greater

benefits and lower costs of being at the target point. Secondly, the speed of near-target firms is lower than that of off-target firms, and this finding holds strong for both market and book proxies of debt. When combining directions of the deviation to the distance to the target, the faster speed is found in off-and-below-target firms. Last but not least, our study finds that the financial imbalance has considerable effects on the incentive to approach the target ratio. Specifically, firms with a financial surplus (i.e., cash inflow is larger than cash outflow) tend to move more quickly to the optimal level of debt than ones with a deficit (i.e., cash inflow cannot cover cash outflow). Indeed, companies with deficit may find it costly and even not able to acquire more funds in order to gain the optimal rate of debts. In Vietnam context, we are the first to investigate changes in the adjustment speed with budget constraints. Comparing to the past literature, our observed sample is the most complete, covering 10,789 observations on all exchange markets over a 13-year period, rather than focusing only on the HSX like other papers about the same country, thus providing an overall look of the capital structure of Vietnamese quoted firms.

Within the issue of corporate capital in the context of Vietnam, the thesis provides the first evidence on changes of the adjustment speed towards the target leverage over the business life cycle. The study shows that the faster speed is found for older and high-growth firms. Consistent with Tian & Zhang (2015), and Castro et al.(2016), we found that cash-flow is a more reliable proxy of the corporate stages than the foundation age or growth, and the adjustment speed toward the target leverage varies significantly across the five phases of life. We also find a high-low-high pattern in the changes of adjustment rate. Furthermore, our empirical evidence supports the pecking order as the best-fit framework to understand the funding behavior of Vietnam listed firms over time.

## **1.5. Study structure**

The thesis includes 5 chapters.

### Chapter 1: Introduction

This chapter introduces an overview of the thesis, including the author's motivation, research context, research questions and contributions. In the section of Vietnam context, the study describes some main characteristics of the economy, especially the equity,

corporate bond markets and the banking system, three important channels providing funds for enterprises.

Chapter 2: This is the first essay, which focuses on the impact of outside ownership on the capital structure of quoted firms in Vietnam. From this essay, there are three published papers which discussed three different types of outside ownership, including state, large and foreign investors.

Chapter 3: This is the second essay, which focuses on the heterogeneity in the adjustment speed at which firms move to their target leverage.

Chapter 4: This is the third essay, which focuses on the change of the adjustment speed towards the target leverage over the business life cycle.

Chapter 5: Conclusion

This section finishes the thesis by supplying a quick summary of the thesis's main findings. Then, it identifies the implications, limitations, and proposes some new research directions.

## **CHAPTER 2: OUTSIDE OWNERSHIP AND CAPITAL STRUCTURE OF VIETNAMESE LISTED FIRMS**

**Abstract:** This paper explores the determinants of the capital structure of Vietnamese listed companies, with an emphasis on ownership. The study uses an updated data sample of 261 firms listed on the Ho Chi Minh Stock Exchange (HOSE), spanning more than eight industries during the period 2007-2014. The industries are basic materials, consumer goods, health care, industrials, technology, utilities, and other. A total of 2,177 observations is made, of which 1,077 are state observations. To discover the main factors, several estimators are used, including pooled ordinary least squares (OLS), random effects (REM), fixed effects (FEM), and fixed effects with cluster-robust errors (clustered FEM). The empirical results demonstrate that the proportion of state investment has no linear impact on firm leverage. The results, however, reveal an inverted U-shaped relationship. Besides, our empirical results demonstrate that the proportion of foreign and blockholders investment are linear and negatively associated with short-term, total book and market leverage.

**Keywords:** State ownership, large ownership, foreign ownership, capital structure, Vietnam

### **1. Introduction**

Since the introduction of the M&M theory (Modigliani and Miller, 1958), or the capital structure irrelevance principle, many theoretical and empirical works have been published to explore the logic behind the corporate capital structure. Since the 1980s, these efforts have resulted in the presentation of four major theories, including the trade-off, pecking order, market-timing, and agency. Though the mentioned theories cannot explain the corporate capital structure in emerging markets completely, they help to form the basis for modern research on firms' funding choices.

One strand of capital structure studies that attracts interest is the impact of ownership structure on funding decisions. Shleifer and Vishny (1986) found that major stockholders

could impact the conflicts between the manager and the shareholders as they have strong incentives to monitor managers' activities. Jensen and Meckling (1976) and Myers (1977) stated that a manager's decision to take on a large amount of debt financing leads the firm to pursue better investment opportunities due to re-payment obligations of looming debts. Most research on this kind of relationship has been undertaken in the cases of developed countries such as the USA and the UK.

Vietnam is an emerging market with a strong economic growth rate. In Vietnam, the liberalization process began in 1986 in order to build a market-oriented economy that can replace the old centrally-planned economy. Since then, many state-owned enterprises (SOEs) have been privatized as joint stock companies. Under the Vietnamese Law on Enterprises 2014, an SOE is a corporation that has 100% of its shares owned by the state, either local or central. As a result of privatization, the number of SOEs declined from around 12,000 in 1991 to 2,000 in 2015. According to the Vietnamese Ministry of Planning and Investment (2014), the total value of SOEs accounted for approximately 29% of the country's GDP, although the number of SOEs accounted for only 0.75% of the total number of Vietnamese firms. Because of the uncompleted privatization process, however, the number of shares held by the state (both local and national) in non-SOEs is still considerable.

**Table 1: Vietnamese firms (both listed and unlisted) summarize from 2007 to 2014**

Year	Number (%)		Labor (%)		Capital (%)	
	2007	2014	2007	2014	2007	2014
State-owned enterprises	2,34	0,75	24,38	12,42	44,80	33,38
Sole proprietorship	27,14	12,23	7,10	3,99	2,50	1,58
Partnership	0,04	0,13	0,01	0,03	0,00	0,01
Limited liability companies	52,08	63,37	26,82	31,11	12,98	17,90
Joint stock companies	15,06	20,77	18,38	23,95	21,96	28,24
100% foreign invested enterprises	2,70	2,33	20,17	26,14	11,61	14,60
Foreign-domestic joint ventures	0,63	0,41	3,14	2,36	6,15	4,30
Total	100,00	100,00	100,00	100,00	100,00	100,00

*Source: White paper 2014*

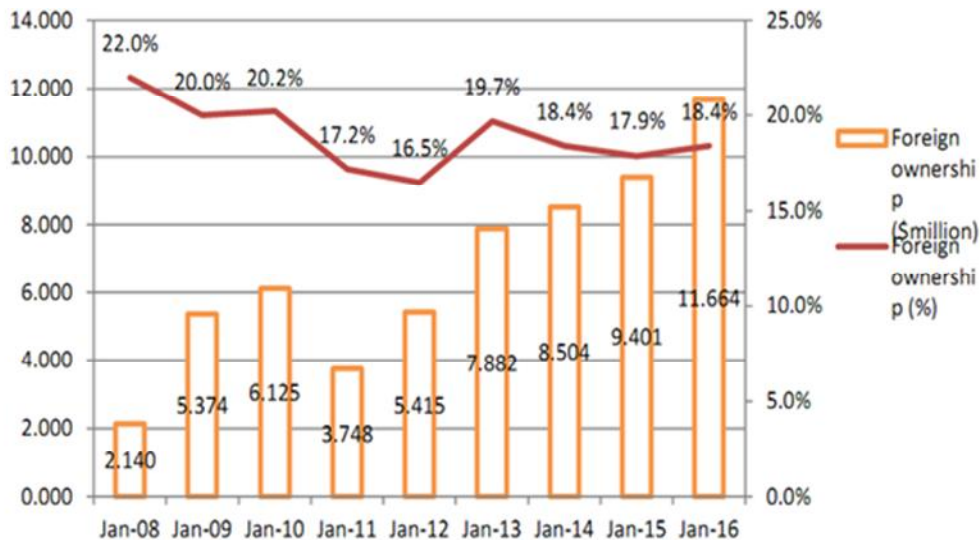
In terms of private firms, their numbers climbed quickly after privatization process and most of them have small and medium size (SMEs). Since Vietnamese bond market is underdeveloped, the banking sector plays an important role in providing capital. According to report of IMF 2015, bank loans acquired by the Vietnamese listed firm are dominated by short-term borrowing.

In 2000, the foundation of Ho Chi Minh Stock Exchange (HOSE) contributed to the increase of the market capitalization from \$154 million in 2003 to over \$124 billion in 2018. At the end of 2010, Vietnam is ranked 16th in the Emerging Markets Opportunity Index 2010 of Grant Thornton. Since 2013, Vietnam has been on the review list to upgrade to the Emerging market from frontier market by Morgan Stanley Capital International.

Hence, the Vietnamese government has been expected to improve the openness to foreign investors. Under Decree 60 signed on 26 June 2015 by the Ministry of finance, Foreign Ownership Limit (FOL) has been loosened so that foreign investors now have the chance to own 100 percent of voting shares. At the end of 2016, foreign ownership accounts for 18% of the market (around \$11,700,000,000) while the State holds 33% of stake in 312 companies listing on HOSE. Foreign investors mainly invest in healthcare, technology, consumer goods while key industries like utilities, banks are largely controlled by the government (Stockplus, 2016).



**Figure 1: Foreign ownership from 2007 to 2015 on HOSE**



*Source: Report of Ministry of Planning and Investment*

Empirical studies of the capital decisions of Vietnamese companies began in the mid-2000s. Nguyen and Ramachandran (2006) examined a set of small- and medium-sized enterprises (SMEs) and found that capital structure positively related to firm growth, size, and how closely connected the SME was to the banks. Their study also showed that ownership had a strong impact on the use of debt because state-owned firms had more advantages than private firms in borrowing money from banks and other financial institutions. The study, however, found no significant correlation between profitability and the capital structure of Vietnamese SMEs.

Biger et al. (2007) examined unlisted enterprises, census 2002–2003, and provided evidence that firm size, growth, and managerial ownership had positive impacts on the level of debt, but found the inverse relationship between non-debt tax shield, profitability, tangibility, and leverage.

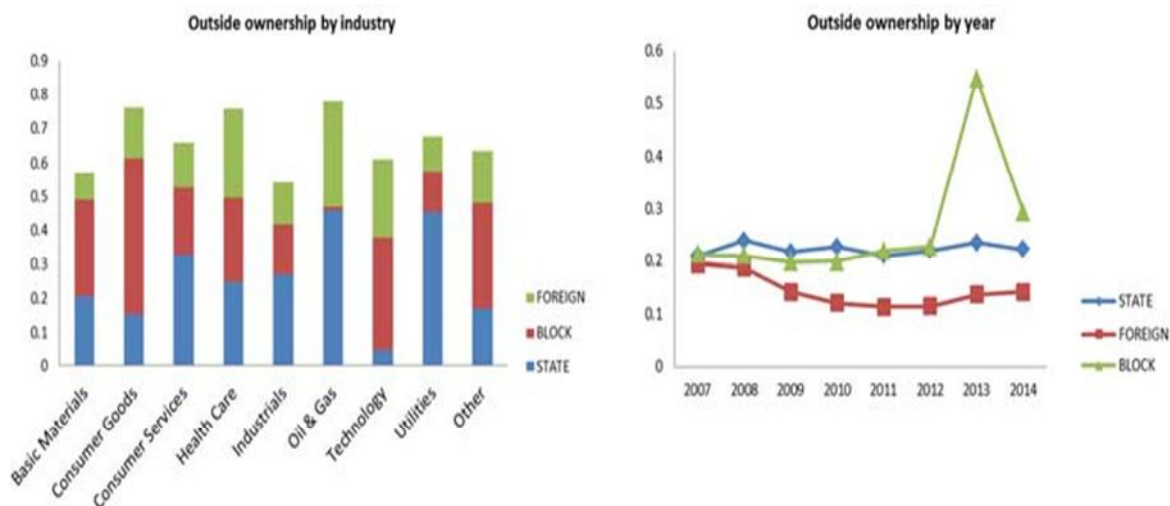
Nguyen et al. (2012) tested 116 listed firms for the four-year period, 2007 to 2010, and found that state-owned companies had easier access to financing sources than did other types of firms.

Okuda and Nhung (2012) suggested that the level of debt correlates positively with managerial ownership ratio and that state-controlled firms have a higher debt level compared, on average, with private firms.

Le (2015) observed firms that were listed on the Ho Chi Minh City Stock Exchange (HOSE) for a four-year period, 2008 to 2011, and concluded that foreign ownership had a negative effect on leverage, whereas state ownership had a significantly positive connection. Her results also show that block shareholders have no clear impact on capital structure measures.

In summary, most of the research on the capital structure of Vietnamese firms has focused on SMEs and unlisted enterprises. Three recent studies (Nguyen et al. 2012; Okuda & Nhung 2010, Le 2015) had different results in terms of the linkage between state ownership and capital structure. Both of these studies cover short-term period, only for 4 years. The current study aims, therefore, to contribute to the understanding of capital structure decisions by analyzing a sample of an up-to-date dataset of Vietnamese listed enterprises.

**Figure 2:** Outside ownership, by industry and by year



Our paper examines the influence outside ownership has on the capital structure of listed firms. Compared to all previous studies in the same markets, our paper uses a more complete data set of listed firms over 8 years. Using data from HOSE, which comprises

over 90% of total market capitalization of all Vietnamese stock exchanges on the last trading day of 2016, we find that the proportion of block and foreign investment is negatively associated with the leverage. The empirical results also demonstrate that the proportion of state investment has no linear impact on firm leverage. The results, however, reveal an inverted U-shaped relationship. We cover all possible leverage measures (both book- and market-based measures, in both short-term and long-term), and use more relevant estimator tools to entrust the empirical findings.

The rest of the paper proceeds as follows. The next section presents the connection between the topic to the theoretical and empirical literature on capital structure. Section 3 describes the data and chosen empirical model. Section 4 describes outcomes and the discussion of results. Section 5 offers concluding remarks.

## **2. Literature review**

This review of the literature discusses related theories and state ownership and capital structure.

### **2.1. Related theories**

This section discusses two related theories: trade-off theory and agency theory.

#### **2.1.1. Trade-off theory**

When increasing the amount of debt used for financing business activities, enterprises can take the following advantages:

- Tax benefits: New debt causes the company to incur interest expense, but these costs are tax-deductible and, hence, add value to the enterprise.
- Financial distress costs: For low levels of debt, the cost of debt is lower than the cost of equity. The probability of bankruptcy is low, so expected financial distress costs are low compared to tax benefits, making debt a relevant financing. But business value does not always increase as the debt ratio increases. Increasing debt can lead to a rise in financial distress or the probability of bankruptcy, which increases the expectation of financial distress costs, which in turn reduces the value of the business.

The idea of financial distress leads to the *trade-off theory* (Kraus & Litzenberger, 1973), whereby the optimal financial structure is one that requires a balance between the benefits

and the cost of debt. Financial distress can be caused by bankruptcy or the risk of bankruptcy. In principle, a business goes bankrupt when the asset value is lower than the debt value. When this happens, the equity value equals zero, and shareholders transfer the right to control the business to creditors, meaning that the debt holders own assets which value is lower than the value of the debt they lent to the firm. The costs associated with bankruptcy can even offset the advantage of using debt, including both direct costs (the legal and administrative costs associated with bankruptcy) and indirect costs (pressure from creditors by limiting debt or raising interest rates, costs of losing current customers and potential customers, the departure of good employees, or the loss of good projects).

*The Trade-off theory* (Kraus & Litzenberger, 1973) takes into account the imperfect conditions of the capital market and posits that firms do have a target leverage and would choose an optimal level of debt by considering both costs and benefits of leverage. The optimal leverage can be seen as an equilibrium point where benefits and costs of using debt balance. Firms will use more debt when the saving from debt tax shields outweigh the costs, which stem mainly from debt overhang and financial distress. Financial distress happens when firms have problems meeting financial obligations on time. This situation can lead to serious problems when firms have to forego beneficial opportunities, lose loyal customers, or are unable to negotiate new contracts.

The static trade-off study suggests that adjustment will occur immediately and completely whenever deviations to the optimal leverage exist in order to maximize firm value since the re-balancing is cost-less. However, the dynamic trade-off model states that costs of adjustment can prevent the firm from correcting its level of debt regularly. Firms will avoid readjusting when the cost of adjustment is higher than the loss caused by a non-preferable level of debt (Fischer et al., 1989). Instead, they allow debt-to-asset ratios to fluctuate around the target leverage.

One hypothesis of the *trade-off theory* states that highly profitable corporations tend to be more leveraged to maximize tax saving. This point suggests a positive correlation between foreign ownership and leverage because foreign investors tend to invest their money in firms with high performance and less default risk.

### 2.1.2. Agency theory

*The agency theory* (Jensen & Meckling, 1976) is built on the concept of agency cost. Within the agency framework, agency cost is the total cost of monitoring expenditures, bonding costs, and residual loss. *Monitoring expenditure* resides in payment for audit and control procedures to ensure that managers will work for firm value. It also relates to expenses to structure firms in a way that can eliminate the unfavorable managerial behavior; for example, introducing outside members to the board of directors. *Bonding cost* is the payment that firms make to a third party that will compensate for financial losses due to dishonest activities by managers. *The residual loss* represents agency costs stemming from conflicts of interest not related to monitoring or bonding. This loss arises because the interests of all parties are difficult to align fully and the cost of ensuring full commitment outweighs the benefit from doing it.

*The agency theory* argues that leverage is affected by agency costs caused by conflicts between the different parties involved with a firm; e.g., managers, stockholders, and debt holders. Even within the same class of shareholders, conflict arises from differences in the way firms distribute their profits. The relationship between the owners and managers of a firm receives the most focus. Conflicts between them stem from problems related to rewards to management, different risk attitudes, and the time horizon of management.

Another agency problem comes from the conflict between debt holders and equity holders. When creditors have the right to first claim on a firm's assets, shareholders are ranked last on the payment list in the case of bankruptcy. Having debt on the balance sheet encourages managers, who act in the interest of existing shareholders, to make poor investments or to invest sub-optimally. This means that they tend to invest in risky projects that are predicted to yield a rate of return which is higher than the interest rate charged by creditors. If these projects generate good earnings that align with stockholders' expectation, they will capture the most. However, if projects fail, creditors will bear the negative outcomes. Aware of this, debtholders will ask higher interest rates, or refuse to lend, which generates cost for using debt.

Another strand of the agency theory that attracts the attention of researchers is so-called "self-interested managerial behavior." Managers are rewarded based on the performance

of their firm; so, they have a tendency to pursue short-term goals. In fact, managers have more information about the firm better than shareholders; so, to maximize their financial benefits, managers can take actions that lead to negative impacts on shareholders. Moreover, risk-averse managers tend to bypass profitable but risky opportunities if they are not under close monitoring. Stockholders can apply various methods to ensure that managers act in accordance with the will of stockholders, such as intervening directly, threatening to fire, or taking over.

Based on this, using debt may be considered as a good way to reduce conflicts between the managers and owners of firms because paying interest will eliminate free cash flows and hence prevent managers from acting in their own interest. That means that debt plays the bonding role in the monitoring mechanism for managers (Jensen, 1986). Introducing external monitoring by issuing debt also encourages managers to work for value maximization of the firm rather than their own personal goals (McColgan, 2001). Besides, using debt leads to increasing bankruptcy cost, especially for low-growth and low-profit firms; hence, managers of firms have incentives to act more efficiently on the value of firms.

This brief discussion suggests that the debt may have, according to the agency theory, both positive and negative impacts on the value of the firm. Besides, it suggests that there is an association between ownership structure and firm leverage because of the link between debt and managerial behaviors.

## **2.2. Outside ownership and capital structure**

Ownership structure is often defined by the allocation of equity among different types of shareholders. Understanding ownership is very important to corporate governance studies because the distribution of equity determines the incentives of managers, which in turn influences firm value.

Jensen and Meckling (1976) argued that ownership structure includes two components: inside and outside. ‘Outside’ describes funds that come from outsiders, including creditors and stockholders, while ‘inside’ describes the capital contribution of managers. Abel Ebel and Okafor (2010) stated that ownership structure comprises managerial ownership, institutional ownership, state ownership, foreign ownership, and

family ownership, which are classified based on the type of owner: managers, institutions, the government, offshore investors, and family, respectively. Based on the volume of stocks held by investors, some studies separate large (or blockholders) from small shareholders (non-blockholders).

When exploring the association between ownership and capital decisions, most studies use the framework provided by the agency theory (Jensen and Meckling, 1976). This hypothesis implies that ownership structure has an impact on capital structure by impacting agency costs which are associated with the conflicts between shareholders and other parties involved with a firm, including managers and creditors. The separations between various holders of equity can also generate costs to firms due to asymmetric information. Depending on level of superior information, different types of investors can have different perceptions about the value of debt or equity financings. However, the matter of ‘which owners have better information?’ is still unanswered, especially in emerging markets.

### **2.2.1. State ownership and capital structure**

The relationship between state ownership and leverage has received increased attention in recent years, especially in developing countries. Zou and Xiao (2006) provide evidence of a positive relationship between the size of state-controlled shares and the amount of debt. The first reason is that state ownership gives firms “guaranteed survival benefits”. They will have more chances to access debt since creditors like to lend to firms with low bankruptcy possibilities. The second reason is that state owners tend to use debt as a method to reduce loss of control and dilution.

Li et al. (2009) agreed with Zou and Xiao (2006), citing the fact that Chinese banks are forced to lend to state-controlled firms under pressure from the government. Similarly, in some countries where corruption is a problem, a close relationship with government enables state firms to borrow under more preferable conditions than private firms.

A study of Russian companies by Pöyry and Maury (2010) show that the higher the fraction of shares held by the state, the greater the number of firms leveraged. Firms of this kind enjoy more favorable borrowing conditions than private firms, including a lower interest rate and more flexible repayment obligations.

Some studies, however, show that firms are less leveraged when the level of state control is high. Dharwadkar et al. (2000) demonstrate that, in transitional markets when state ownership is large, corporate governance and the monitoring system seem to be insufficient; hence, the performance of the firm is doubtful. Because borrowing connected to state-owned firms is dominated by bad debts, creditors do not want to lend their money, and non-state investors prefer issuing equity to making loans.

In Vietnam, investment in listed firms from the local or central government is significant because of the uncompleted privatization process. Nguyen and Ramachandran (2006) analyze 558 SMEs between 1998 and 2001 and concluded that firms with a considerable level of state ownership have advantages when it comes to borrowing money from banks. For one thing, they have a closer relationship with the banking system than do companies since four of the largest banks are also controlled by the central government. Biger et al. (2008) find that the debt ratio is higher for firms that have more shares owned by the state. In Vietnam, this type of firm has advantages not only in accessing natural resources, but in receiving capital because of the guarantee of the government.

In their study of a sample of 299 firms over a four-year period, Okuda and Nhung (2012) find a significant positive link between state-controlled firms and level of debt. The reason is that, under political pressure, banks often give preferable lending treatment to firms with a high level of state control, regardless of the firm's performance. Le (2015) also finds evidence of a positive impact of state ownership on firm leverage. Firms with high state ownership can access credit more easily because of their close relationship with banks. Thus, Hypothesis 1 in the current study is about this linear association.

***Hypothesis 1: State ownership has a positive relationship to the capital structure of Vietnamese listed firms.***

Besides the linear link, some empirical studies have tested the U-shaped connection between ownership structure and debt ratio, but the results are not obvious. After analyzing the data of 112 French listed enterprises, de La Bruslerie and Latrous (2012) discovered that shareholders with low ownership power tend to use more debt to avoid takeover attempts and share dilution. Then, together with the increase in debts, both distress and bankruptcy costs rise, threatening the survival of the firm. Therefore,



whenever ownership is concentrated enough, firms tend to use other funding resources to substitute for debt, causing the debt level to decrease gradually. This means that the link between the two has the shape of an inverted U. For Vietnamese firms, only Le (2015) tested such a relationship, but found no evidence of the non-linear association between capital ratio and four ownership types; i.e., managerial, foreign, state, and large shareholders. In the current study, the connection will be tested using Hypothesis 2.

***Hypothesis 2:** State ownership has a non-linear, inverted U-shaped, relationship to the capital structure of Vietnamese listed firms.*

### **2.2.2. Large ownership and capital structures**

As one of the most interesting aspects of firm ownership, large ownership attracts considerable attention from researchers. Blockholders hold controlling stakes, which is set under the business law of each country, and favourable voting rights on important decisions over those of minority investors. When considering the relationship between block ownership and capital structure, some studies argue that there is a positive connection. The main reason is when the ownership concentration accumulates, blockholders will have a significant controlling role. Indeed, minor shareholders have insufficient voting rights as well as time and interest, or may not have specific knowledge and skills to conduct monitoring activities efficiently in comparison to those of blockholders. Furthermore, large shareholders are likely to be elected to the board of directors (McColgan, 2011). Hence, they favor debt financing over equity financing, especially in developing markets in which the protection mechanism for minority investors is still unfulfilled. In addition, large shareholders strengthen their control in the firm by over-using debt finances and avoiding possible takeover efforts (Harris and Raviv, 1988).

Chidambaran and John (2000) argued that firms with significant block owners reduced agency cost caused by information asymmetry since large shareholders would transfer information from managers to creditors and other equity holders quickly and completely, which helps reducing agency conflicts efficiently, and enables firms to obtain debts more efficiently. In fast-growing firms, when large equity owners are assured about the prospect of success, they avoid using equity to keep hold of their control.

Similarly, Gillan and Starks (2000) find that the presence of blockholders diminishes the free rider problem by overseeing investment activities. This is in line with the active monitoring hypothesis in which owners reduce the manager's interests and thus decrease the agency costs between management and shareholders (Shleifer and Vishny, 1986). Further, Fosberg (2004) finds that a higher concentration of ownership leads to greater monitoring of manager's decisions and higher usage of debt financing.

On the other hand, Jensen and Meckling (1976), Leland and Pyle (1977) and Diamond (1984) state that firms with high controlling ownership tend to reduce their level of debt if the monitoring requirements from creditors increase. Supporting this negative association, Pound (1988) argues that blockholders could cooperate with managers to act against the shareholders' interests, resulting in a negative relationship between blockholders' share and leverage. Moreover, Zeckhauser and Pound (1990) indicated that the presence of blockholders reduced the agency costs of equity and therefore the use of debt financing. Under the control of large blockholders, managers act in the interest of shareholders, thus issuing debt becomes less likely because the presence of large shareholders signals the firm's positive prospect to the market (Zeckhauser and Pound, 1990), and block ownership substitutes debts as a monitoring instrument. Moreover, Driffield et al. (2007) argue that block shareholders in firms with highly concentrated ownership faced increasing un-diversifiable risks, so they reduced debt finances to hedge bankruptcy and distress costs.

Besides discovering the linear link, some empirical studies test the U-shaped connection between ownership and leverage. De La Bruslerie and Latrous (2012) find that shareholders with low level of ownership will use more debt to avoid the risk of takeover and share dilution. Then, due to the increase in the level of debt, both distress and bankruptcy costs rise, threatening firm survival. Consequently, when ownership is concentrated enough, firms will use other funding resources to substitute for debt, making debt level decrease gradually. This means the link between the two has the shape of an inverted U (Thai, 2017).

The Vietnam exchange market has seen rapid development since the foundation of HOSE in 2000. However, similar to other emerging economies, it is not yet mature compared to global standards. Encouraging and promoting the participation of all types of investors

in the local stock market is an effective method to develop the economy (Vo, 2016). Among shareholders, large owners are one of the most important parties that needs to be studied by both firm managers and policy makers. However, only one study to date has examined the relationship between large ownership and capital structure of firms: Le, 2015. Based on a set of 2,797 firm-year observations, this study shows that block shareholders do not have a significant impact on capital structure measures.

Hypothesis 3: Block ownership has a negative relationship with the capital structure of Vietnamese listed firms.

Besides, we also test the U-shaped connection between block ownership and debt ratio by a separate hypothesis. Hypothesis 4: Block ownership has a non-linear relationship with the capital structure of Vietnamese listed firms.

### **2.2.3. Foreign ownership and capital structure**

Together with the wave of offshore investment, cross-country investors are shown to have strong impacts on corporate governance and agency costs in emerging markets. Indeed, on such markets, foreign ownership is considered as the most important part of ownership structure that affects firms' capital decisions (Douma et al., 2006). Theoretically, there are three key arguments for the relationship between foreign capital and funding choices. Firstly, some studies provide evidences of the positive impact of foreign investment on the level of debt. In research conducted in China, Zou and Xiao (2006) show that asymmetric information was a big problem for foreign investors, so using more debt is a good way to improve the monitoring role. Information disadvantages for foreign owners are also found in the studies of Brennan and Cao (1997) and Choe et al. (2005). Furthermore, foreign investors tend to minimize their risks, at both micro and macro levels, by improving firm operation and management through contributing technology and the ability to acquire cheaper sources of debt (Gurunlu and Gursoy, 2010).

However, some studies agree on the negative relationship between debt level and foreign ownership. Gurunlu and Gursoy (2010) believe the main reason for this is a higher equity contribution from foreign investors. Allen et al. (2005) suggest that foreign-owned firms have more available funding sources to substitute debts thanks to their management

skills, wide-network of relationship, superior technology, strong brand name and reputation. Besides, lower corporate tax rates that lead to small benefits from debt tax shield do not encourage them to use more debts (Li et al., 2009). Instead of using debts, increasing foreign ownership is a good way to reduce not only over- investment problems caused by managers, but also the agency cost between managers and stockholders (Huang et al., 2011). Foreign ownership can help to strengthen the monitoring role, and reduce the cost of capital thanks to the existence of a group of external investors, professional analysts and economists closely following the managers' actions.

Last but not least, some studies agree on the fact there is no relationship between foreign investors and funding decision of firms. The reason is offshore owners may only want to diversify their investments so they often focus on short-term efficiency, and therefore the impacts of their existence on capital structures are limited. Especially in unstable and underdeveloped stock markets, institutional foreign investors may not involve with target firms' financing decisions because their participant may take only a very small proportion of their whole portfolio.

In Vietnam, although the connection between ownership and funding choices is still ambiguous, most studies support a positive relationship because of three main reasons. Firstly, similar to China and other emerging countries, information asymmetry are believed to be a big problem that foreign investors have to face (Vo, 2011). When investing in Vietnam, foreign investors not only individuals, but also institutions may suffer several risks, from cultural differences to political changes. As a consequence, they tend to use debt to improve the managerial monitoring role (DN Phung and TPV Le, 2013). Secondly, Vietnamese listed firms which attract a high level of foreign funds often have large size and reputation. They have stable cash flows and a significant amount of valuable assets-in-place, bringing them the bargaining power to borrow more money from banks and other financial institutions with cheaper costs. Thirdly, foreign- owned firms have more advantage in minimizing agency cost which enables them to acquire more debts. However, DN Phung and TPV Le (2013) find evidence of a negative relationship caused by low and non-concentrated offshore funds. In fact, wide-spreading capital reduces its managerial monitoring effects because foreign investors only have the power to correct the behavior of top managers when their investment is large and concentrated

enough.

Hypothesis 5: Foreign ownership has a negative relationship with the capital structure of Vietnamese listed firms.

Hypothesis 6: Foreign ownership has a non-linear relationship with the capital structure of Vietnamese listed firms.

### **2.3. Other determinants of capital structure**

Although the majority of studies on capital structure have analyzed data from developed countries (Hodder and Senbet, 1990; Rajan and Zingales, 1995; Wald, 1999), studies have been conducted in developing countries, mainly testing the predictions of theories (Jung et al., 1996; Booth et al., 2001; Chen, 2004; Biger et al., 2007; Nguyen et al., 2012). Jung et al. (1996) provides empirical support for the agency theory by showing that to pursue growth, management's decision to issue equity was worthwhile for firms with strong investment opportunities because the interests of managers and shareholders coincided. Although the use of debt finance limits the agency costs of managerial discretion, it creates distress costs. Growth opportunities may add value to firms as intangible assets. Pecking order theory predicts a positive relationship between growth and debt ratio because internal funds may not satisfy demands of high growth firms (Köksal and Orman, 2015). However, the trade-off theory predicts that firms become less leveraged during growth periods. Booth et al. (2001) provide evidence supporting a negative correlation between leverage and growth opportunities.

The tangibility of firm assets relates to the costs of financial distresses. The more tangible firm assets are, the lower the loss in firm value when the firm is in financial distress. Also, the more tangible the firm's asset is, the higher is the firm's ability to issue debt and thus avoid revealing information about future profits to external investors; tangibility is positively related to long-term leverage (Köksal and Orman, 2015). On the other hand, faster-growing firms have a higher level of intangible assets, and it is more difficult to use intangible assets as a bank collateral (Köksal and Orman, 2015). It is indeed difficult for firms to negotiate with their debt-providers due to free rider and asymmetric information issues, which are more prevalent for firms with a high level of intangible assets. Consequently, companies may not obtain enough funds and have to

bear greater financial distress costs (Danila and Huang, 2016). Indeed, firms with higher growth lose more value when they are in a situation of distress. Further, firms with a higher proportion of tangible assets tend to be larger in size. Larger firms have more branches and subsidiaries and thus have lower bankruptcy risks. Studies have shown that larger firms have higher leverage (Rajan and Zingales, 1995; Booth et al., 2001; Köksal and Orman, 2015).

Booth et al. (2001) stated that firms could minimize the effects of asymmetric information by turning to external financing only when firms cannot finance their growth by retained earnings. Because firms prefer internal sources of funds, including cash and other liquid assets to debt financing, the availability of funds has effects on the leverage. Results from De Jong et al. (2008) show that liquidity has negative impacts on leverage.

If external financing is deemed necessary, firms first rely on debt-financing and then on convertible bonds. Equity is considered as a the last option because transaction costs. Moreover, under asymmetric information between firms and investors, firms prefer internal funds to external ones. Among outside sources of capital, debt results in smaller effects of information asymmetries. Moreover, the pecking order theory suggests that firms decide to finance their firm depending on firm profitability. Profitable firms often finance their growth by internal funds and keep their debt level stable. Katagiri (2014) pointed out that profitable firms had high tax advantages and low probability to pay financial distress costs. On the other hand, less profitable firms have to depend on debt to finance their growth.

DeAngelo and Masulis (1980) find that non-debt tax shields (NDTS), which includes accounting depreciation, depletion allowances, and investment tax credits, can act as a substitute for debt. Firms with a larger amount of NDTS are expected to have a smaller amount of debt. The explanation is that they reduce total corporate income tax and consequently reduce benefits by using debt. As a consequence, firms with larger non-debt tax shields will be less levered. Another factor which is considered as a reliable variable for growth opportunities of firms is the market-to-book ratio (Frank and Goyal, 2003). The market timing hypothesis suggests that firms have a tendency to issue equity when firm stocks are highly appreciated by investors (high market-to-book ratio), leading to a

reduction of debt ratio. However, in most of the empirical analyses conducted on Vietnamese firm data, the variable denoting the market-to-book ratio is absent.

### **3. Data and methodology**

This section discusses the data used in the current study, presents the research model, discusses the dependent variable (capital structure), key predictor variables, control variables, and presents a summary of the variables together with their correlation.

#### **3.1. Data**

In Vietnam, reliable audited financial data are available only in reports for listed companies; therefore, the current paper focuses on that type of firm to ensure empirical relevance.

The database is from Stoxplus, which is the leading company in Vietnam for providing a comprehensive range of financial and business information, analytical tools, and market research services. The data on firms used in the current study are set under the form of an unbalanced panel, and include data for 261 non-financial firms and more than 312 companies listed on the Ho Chi Minh Stock Exchange (HOSE), comprising more than 90% of the combined market capitalization of HOSE and Hanoi Stock Exchange (HNX) in the last trading day of 2016. A total of 2,177 observations is obtained (Table 1), spanning eight industries; i.e, basic materials, consumer goods, consumer services, health care, industrials, technology, utilities, and other, during the period 2007-2014. Of the 2,177, a total of 1,077 are state observations.

**Table 2: Industry summarize**

Industry	Number of firm-year observations	Percent %	Number of State observations	Percent %	Number of Block observations	Percent %	Number of Foreign observations	Percent %
Basic Materials	329	15.11	162	15.04	206	12.81	251	15.18
Consumer Goods	422	19.38	216	20.06	292	18.16	349	21.11
Consumer Services	93	4.27	43	3.99	79	4.91	71	4.30
Health Care	75	3.45	41	3.81	62	3.86	61	3.69
Industrials	662	30.41	325	30.18	501	31.16	492	29.76
Technology	67	3.08	34	3.16	44	2.74	45	2.72
Utilities	147	6.75	73	6.78	134	8.33	114	6.90
Other	382	17.55	183	16.99	290	18.03	270	16.33
Total	2,177	100	1,077	100	1,608	100	1,653	100



We employ the whole range of listed enterprises on Ho Chi Minh stock exchange from 2007 to 2014. 261 individual firms are observed within 8 years, which build up the panel with 2,177 observations. There is no evidence suggesting sample selection bias drives our results.

**Table 3: Year summarize**

Year	Frequency	Percent	Cumulative %
2007	236	10.84	10.84
2008	248	11.39	22.23
2009	268	12.31	34.54
2010	275	12.63	47.17
2011	285	13.09	60.26
2012	288	13.23	73.49
2013	289	13.28	86.77
2014	288	13.23	100
Total	2,177	100	

### 3.2. Research model

Three techniques are popularly used to analyze panel data; namely, pooled ordinary least squares (POLS), fixed effect (FEM), and random effect (REM). When testing the determinants of capital structure, the POLS regression seems to provide biased outcomes when ignoring omitted specific factors that are not mentioned in relationship equations (Serrasqueiro & Nunes, 2008). The POLS technique does not indicate whether the propensity of using debt varies between firms and between different periods of time. By “pooling” all observations, regardless of the difference between the firms and the change in response of the capital structure, POLS ignores the firms' specificities and assumes that the intercept and coefficients do not vary over time. If these assumptions do not hold, the POLS results are biased and inconsistent. Thus, to solve the issue of heterogeneity, it is necessary to run FEM and REM.

With the awareness of the possible existence of correlation between firm-specific non-observable individual effects and the determinants of capital structure, some previous studies suggested using FEM to test hypotheses about leverage and ownership structure (Sogorb-Mira, 2005; Degryse et al., 2012, and Köksal & Orman, 2014). Under FEM assumptions, the individual specific effect is allowed to be correlated with the

independent variables, whereas REM does not allow such a correlation. In the case of running both FEM and REM, the Hausman test must be used to determine which one is more appropriate. If the REM assumption holds, the REM is more efficient than the fixed effects model and vice versa. [See Kurt Schmidheiny (2016) on how to use Stata14 to run these types of regressions on panel data.]

The current paper follows some empirical studies that use all the estimators (POLS, FEM, and REM), and then uses several tests to decide the most appropriate models; namely, the Wald test, the Breusch and Pagan Lagrangian multiplier test for REM, the Hausman test to evaluate the explanatory power of FEM and REM, F-test, the modified Wald test for group-wise heteroskedasticity for FEM, and the Wooldridge test for autocorrelation in panel data. In addition, if heteroskedasticity exists, cluster-robust errors are reported by  $vce^2$  command.

The equation to test the non-linear impact of outside ownership of capital structure is as follows:

$$(1) CS_{it} = + \beta_1 STATE_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} + \beta_6 GROWTH_{it} + \beta_7 NDT S_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

$$(2) CS_{it} = + \beta_1 BLOCK_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} + \beta_6 GROWTH_{it} + \beta_7 NDT S_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

$$(3) CS_{it} = + \beta_1 FOREIGN_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} + \beta_6 GROWTH_{it} + \beta_7 NDT S_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

$$i = 1, \dots, 261$$

$$t = 2007, \dots, 2014$$

Indeed, the data of listed firms in Vietnam only exist after 2005, among those, the information related to ownership is only collected after 2007, and not all listed firm report ownership information. So, I have a very limited number of ownership observations: around 1077 for state, 1,653 for foreign and 1,608 firm-year observation for large ownership. So I decide to use contemporaneous terms in order to avoid the loss of degrees of freedom.

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<sup>2</sup> A command provided by STATA14 to tackle cluster-robust errors

To check the existence of a non-linear relationship, consistent with Le (2015), the following quadratic equation is used:

$$(4) CS_{it} = \alpha + \beta_1 STATE_{it} + \beta_2 STATE_{it}^2 + \beta_3 SIZE_{it} + \beta_4 MTB_{it} + \beta_5 PROFIT_{it} + \beta_6 TANG_{it} + \beta_7 GROWTH_{it} + \beta_8 NDTS_{it} + \beta_9 MIL_{it} + \epsilon_{it}$$

$$(5) CS_{it} = \alpha + \beta_1 BLOCK_{it} + \beta_2 BLOCK_{it}^2 + \beta_3 SIZE_{it} + \beta_4 MTB_{it} + \beta_5 PROFIT_{it} + \beta_6 TANG_{it} + \beta_7 GROWTH_{it} + \beta_8 NDTS_{it} + \beta_9 MIL_{it} + \epsilon_{it}$$

$$(6) CS_{it} = \alpha + \beta_1 FOREIGN_{it} + \beta_2 FOREIGN_{it}^2 + \beta_3 SIZE_{it} + \beta_4 MTB_{it} + \beta_5 PROFIT_{it} + \beta_6 TANG_{it} + \beta_7 GROWTH_{it} + \beta_8 NDTS_{it} + \beta_9 MIL_{it} + \epsilon_{it}$$

$CS_{it}$  indicates the capital structure of the firm  $i$ , including SDA (short-term debt to total assets), LDA (long-term debt to total assets), TDA (total debt to total assets), SDM (short-term debt to market value of total assets), LDM (long-term debt to market value of total assets), and TDM (total debt to market value of total assets) of the firm  $i$  at time  $t$ .

$STATE_{it}$  is the proportion of firm  $i$  owned by the state at time  $t$ . The control variables are chosen based on prior studies; namely, firm size (SIZE), profit (PROFIT), tangibility (TANG), growth opportunity (GROWTH), market-to-book ratio (MTB), non-debt-tax shield (NDTS), and median industry leverage (MIL).

We use median industry leverage to reflect partly the industry factor. Besides, we also use dummy variables for years effects, industry effects when running regressions.

### 3.3. Dependent variable: Capital structure (CS)

In the current study, capital structure is related to financial leverage or funding decision, not operating leverage. In fact, most studies of the relationship between funding choice and ownership in Vietnam use the book measure for debt ratios. Myers (1977) posited that managers prefer to use book leverage since debts are funded by assets held by firms at the current time, and the market measure is unreliable because of the vast fluctuation in the stock market. Welch (2014), however, supposed that the book measure of equity has little relevance since it measures things in the past.

Although there is still a debate about the most suitable leverage measure for a particular emerging market like Vietnam, this study uses four proxies of firm leverage (Table 4);

namely, short-term leverage, long-term leverage, total book leverage, and total market leverage.

Consistent with Frank and Goyal (2009), the market value of assets in the calculations in this study is the total of the market value of equity and debt (both short-term and long-term), minus deferred taxes and investment tax credit.

**Table 4: Explanation of dependent variables**

Variable	Description	Measurement	References
SDA	Short-term debt ratio	Short-term debt divided by the book value of total assets	Frank & Goyal (2009) Le (2015)
LDA	Long-term debt ratio	Long-term debt divided by the book value of total assets	Frank & Goyal (2009) Le (2015)
TDA	Total book leverage	Total debt divided by the book value of total assets	Frank & Goyal (2009) Le (2015)
SDM	Market short-term debt ratio	Short-term debt divided by the market value of total assets	Le (2015)
LDM	Market long-term debt ratio	Long-term debt divided by the market value of total assets	Le (2015)
TDM	Total market leverage	Total debt divided by market value of assets	Frank & Goyal (2009) Le (2015)

### 3.4. Key predictor variable

This study focuses to explore the link between the special type of outside ownership structure, including state, large and foreign ownership, and the capital structure of Vietnamese listed firms.

**Table 5: Explanatory for main predictor variables**

Variable	Description	Measurement	Reference
STATE	State ownership	Number shares owned by the state divided by total of outstanding shares	Gurunlu and Gursoy 2010, Huang, Lin and Huang 2011
BLOCK	Large ownership	The number of shares owned by blockholders divided by total of outstanding shares	TPV Le (2015)
FOREIGN	Foreign ownership	The number of shares owned by foreign investors divided by total of outstanding shares	Zou and Xiao (2006), Li et al. (2009), DN Phung and TPV Le (2013)

### **3.4.1. State ownership**

This study uses the fraction of firm shares held by the state to measure state ownership. Although previous studies by Nguyen et al. (2012) and Okuda and Nhung (2010) used a dummy variable to represent the state (1 for state ownership; 0 if otherwise) when observing funding behavior of Vietnamese firms, the current study follows Gurunlu and Gursoy (2010), Huang and Huang (2011), and Le (2015) to choose percentage measurement.

### **3.4.2. Block ownership**

To measure large ownership, we use the blockholder measure. Within the framework of the 2006 Law on security issued by the Vietnamese government, investors holding more than 5% of firm shares are considered blockholders. Therefore, block ownership is defined by the fraction of total outstanding shares held by the blockholders. Although the impacts of sub-categories of blockholders should be clarified, such as state/non-state,

domestic/foreign, active/passive, individual/institution block investors, the lack of information prevents us from further separation.

### **3.4.3. Foreign ownership**

Similarly to the research conducted by Zou and Xiao (2006), Li et al. (2009), TPV Le (2013) foreign ownership (FOREIGN) equal to the total shares held by offshore investors divided by the total shares issued by a particular firm, then multiply by 100 to obtain proportion. However, the lack of information in Vietnam prevents us from separating the differences in behavior of institutions and individuals foreign investors, as well as offshore investors from different regions in the world.

### **3.5. Control variables**

To examine theories, several empirical studies have been conducted, with one main strand focusing on determining factors that have impacts on firm leverage. Harris and Raviv (1991) stated that debt ratio has a positive relationship with fixed assets, non-debt tax shields, growth opportunities, and firm size, but has a negative link to volatility, advertising expenditures, bankruptcy probability, profitability, and research and development expenditures. Titman and Wessels (1988), however, did not provide any support for non-debt tax shields, volatility, and collateral value as significant influencing factors. After testing 39 key factors, Frank and Goyal (2009) found that the most reliable determinants are median industry leverage, market-to-book ratio, the tangibility of assets, profits, size, and expected inflation. Other studies, such as those by Baker and Wurgler (2002) and Hovakimian (2006), explore the main determinants, but the results were still mixed and varied from country to country.

Some empirical studies support the trade-off theory when providing the evidence of positive impacts of size, profitability, and tangibility on debt ratios, but other studies are on the side of pecking-order theory when showing the debt desirability of firms.

Regarding Vietnam, the current study follows prior research and the information availability of the stock market, and includes in its model with firm size, profitability, tangibility, growth, market-to-book ratio, non-debt tax shield, and median industry leverage (Table 6).

**Table 6: Explanation of control variables**

Variable	Description	Measurement	References
SIZE	Size	The logarithm of total assets	Titman & Wessels (1988), Booth et al. (2001) Frank & Goyal (2009)
PROFIT	Profitability	Earnings before interest, tax and depreciation divided by total assets	Titman & Wessels (1988) Frank & Goyal (2009)
TANG	Tangibility	Net fixed assets divided by total assets	Booth et al. (2001) Frank & Goyal (2009) Okuda & Nhung (2012)
GROWTH	Growth	The percentage of change in total assets	Frank & Goyal (2009) Köksal & Orman (2015)
MTB	Market-to-book	The market value divided by book value of equity	Frank & Goyal (2009) Le (2015)
NDTS	Non-debt tax shields	The total of depreciation and amortization expenses divided by total assets	Bauer (2004) Huang & Song (2011)
MIL	Median industry leverage	Industry average debt to equity ratio (for 8 different sections)	Harris & Raviv (1995) Frank & Goyal, (2009)

**3.5.1. Size**

Size is predicted to have a positive link to firm leverage. The explanation is that larger firms may have a lower default risk and lower financial distress cost (Titman & Wessels, 1988; Booth et al., 2001). In addition, creditors consider it less risky to lend to large firms because repayments are secured by diversified and stable cash flows, and large firms suffer less information asymmetry than smaller ones. For Vietnamese firms, Nguyen and

Ramachandran (2006) and Biger et al. (2008) also confirmed the positive association between the two.

### **3.5.2. Profitability**

Static trade-off theory predicts that profitability has a positive relationship to leverage as highly profitable firms are associated with lower financial distress costs and higher benefits from the debt tax shield. However, the pecking order theory implies that highly profitable companies will use less debts because retained earnings are the most favorite source of funds for current projects of the firms (Titman & Wessels, 1988). Most empirical studies support the pecking order hypothesis, including Rajan and Zingales (1995), Wald (1999), and Fama and French (2002).

### **3.5.3. Tangibility**

Tangibility is expected to be positively related to leverage because firms with highly valuable physical assets that can be used as collateral can borrow money more easily and tend to be charged a lower interest rate by lenders. Nevertheless, they will face lower distress costs and lower agency costs. However, the market timing theory predicts a negative relation between asset tangibility and debt-to-equity ratio (Booth et al., 2001). For Vietnam, Nguyen and Ramachandran (2006) and Nha et al. (2016) showed that firms with a high level of tangible assets are more geared.

### **3.5.4. Growth**

Growth opportunities may add value to firms in the way of intangible assets. Pecking order theory expects a positive relationship between growth and debt ratio since internal funds may not satisfy the demands of high-growth firms (Köksal & Orman, 2015). However, the trade-off theory expects that firms become less leveraged in a growth period. On the empirical aspect, Nguyen and Ramachandran (2006) and Biger et al. (2008) demonstrated that the more firms grow, the more they are leveraged.

### **3.5.5. Market-to-book ratio**

The market timing hypothesis suggests that firms have a tendency to issue equity when firm shares are highly appreciated by investors (high market-to-book ratio), leading to the



reduction of debt ratio. In most empirical studies of Vietnamese firm data, the variable denoting market-to-book ratio is absent.

### **3.5.6. Non-debt-tax-shield**

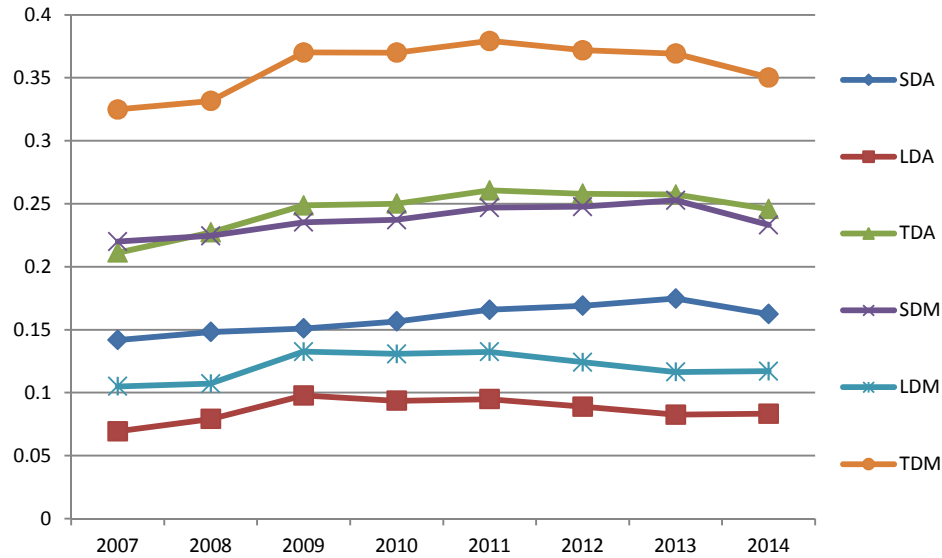
Non-debt tax shields, including tax deduction for depreciation and investment tax credits, are expected to be negatively correlated to leverage. The explanation is that they reduce total corporate income tax and then reduce the benefits of using debt. As a consequence, firms with larger non-debt tax shields will be less leveraged. Following Frank and Goyal (2009), the current study observed this variable to discover the association between non-debt tax shield and the capital structure of Vietnamese listed firms.

### **3.5.7. Median industry leverage**

Many studies, including those by Harris and Raviv (1991) and Frank and Goyal (2009), showed evidence of the existence of a relationship between the capital structures of industries and enterprises. However, research on the funding decisions of Vietnamese listed firms rarely mentions this factor because the lack of an industry classification system causes many difficulties in collecting data related to industrial leverage.

## **3.6. Summary of variables**

Figure 3 depicts the difference among six measures of capital structure decisions from 2007 to 2014 for both book and market aspects. The figure shows that Vietnamese firms listed on HOSE prefer short-term debts to long-term debts. The high level of short-term debt compared with long-term debt is consistent with the findings of previous studies, such as those by Nguyen et al. (2012), Okuda and Nhung (2012), and Le (2015). The low long-term leverage implies that firms depend heavily on equity capital to satisfy their investment demand. It is a consequence of privatization of the public zone and the development of the equity market. Interestingly, all three market measures of leverage are notably higher than book measures.



**Figure 3:** Leverage ratios for the period 2007-2014

Table 7 presents average debt ratios and ownership measures by industry. As indicated, the average percentage of shares owned by the state is significantly high in the oil and gas (45.64%) and utility (45.25%) industries, and is extremely low (around 4%) for the technology industry. These figures reflect the fact that, in the Vietnamese economy, most of the high-tech firms are young and funded by private equity. Foreign investors seem to prefer to invest in Health care, and Oil & Gas with the ownership proportions at 26.48% and 30.94%<sup>3</sup>. The blockholders own the considerable percentage of shares issued by Consumer Goods and Technology firms (with 45.85% and 33.34% respectively). Consumer goods and Basic materials acquire large amounts of short-term debt, but small amounts of long-term debt. A contrast situation can be seen on Oil&Gas and Utilities.

<sup>3</sup> The largest percentage of shares of a firm that foreign investors can own is 49%

**Table 7: Average debt ratios and outside ownership measures by industry**

	SDA	LDA	TDA	SDM	LDM	MDA	STATE	BLOCK	FOREIGN
Basic Materials	0.210771	0.052472	0.263243	0.311514	0.074082	0.385597	0.205701	0.283505	0.083336
Consumer Goods	0.254322	0.046059	0.300381	0.31058	0.054378	0.364958	0.154198	0.458469	0.148144
Consumer Services	0.144265	0.055873	0.200138	0.210082	0.084743	0.294825	0.326336	0.201214	0.130948
Health Care	0.115473	0.029927	0.1454	0.201883	0.042836	0.244719	0.248143	0.246919	0.264787
Industrials	0.141867	0.119967	0.261834	0.237031	0.165295	0.402326	0.267821	0.149012	0.124801
Oil & Gas	0.09559	0.275716	0.371306	0.107343	0.295128	0.402471	0.456443	0.013	0.309375
Technology	0.159574	0.049668	0.209242	0.223016	0.086605	0.309621	0.043998	0.332432	0.233733
Utilities	0.067777	0.163026	0.230803	0.087282	0.157527	0.24481	0.452507	0.121341	0.102868
Other	0.089384	0.094606	0.183991	0.17306	0.172265	0.348352	0.169647	0.311918	0.153659

Table 8 presents descriptive statistics for all the variables. Surprisingly, the total leverage of listed firms (excluding the financial companies) over the eight-year period, 2007-2014, is 24.6% on average, which is much lower than 52% during the period 2002-2003 (Binger et al., 2008) and 48% for 2007-2010 (Nguyen et al., 2014). This finding can be explained by the development of the equity market and a higher loan interest rate – from 7% to 11% throughout that period. The use of long-term leverage is low, with an average of 8.6%. Consistent with Nguyen and Ramachandran (2006), the current study shows that Vietnamese listed firms have a tendency to rely on short-term debt because of underdeveloped financial markets and the lending behavior of banks (to reduce credit risk). In terms of the market measure, debts dominate around 36% of total firm value instead of 24.6% of book recording. These figures also imply that the market value of assets is much lower than the book value of assets.

**Table 8: Descriptive statistics of regression variables**

Variable	Obs.	Mean	Std.	p90	p75	p50 (median)	p25	p10
Leverage measure								
SDA	2,175	0.159	0.164	0.403	0.254	0.105	0.022	0.000
LDA	2,175	0.086	0.128	0.261	0.121	0.029	0.000	0.000
TDA	2,175	0.246	0.196	0.522	0.393	0.227	0.069	0.000
SDM	2,175	0.238	0.238	0.620	0.388	0.164	0.026	0.000
LDM	2,175	0.121	0.173	0.387	0.178	0.038	0.000	0.000
TDM	2,175	0.360	0.283	0.764	0.600	0.345	0.080	0.000
Outside ownership measures								
STATE	1,077	0.227	0.243	0.557	0.500	0.135	0.000	0.000
BLOCK	1,608	0.260	1.224	0.600	0.394	0.158	0.000	0.000
FOREIGN	1,653	0.136	0.165	0.400	0.211	0.065	0.010	0.002

Other capital structure determinants								
SIZE	2,175	11.921	0.549	12.613	12.243	11.876	11.55 5	11.30 9
MTB	2,175	0.883	0.681	1.488	1.027	0.727	0.518	0.357
PROFIT	2,173	0.105	0.091	0.212	0.145	0.090	0.051	0.022
TANG	2,175	0.186	0.193	0.466	0.265	0.121	0.043	0.012
GROWTH	2,169	1.438	34.907	0.524	0.252	0.085	0.000	-0.080
NDTS	2,175	0.023	0.033	0.057	0.032	0.015	0.002	0.000
MIL	2,073	0.476	0.159	0.686	0.603	0.497	0.343	0.271

The mean and median of foreign ownership in our sample is 13.6% and 6.5%, respectively. It reflects that on average, the foreign funds invested in Vietnamese listed firms are quite limited compared to other countries in the same region. The average amount of shares held by the state is 22.7% on average, while block holders own 26% of total firm shares on average. The mean and median of block ownership in our sample is 26%, and 18.5%, respectively. Firms in the sample are quite profitable with earnings, before interest and tax take more than 10% of the book value of total assets. About 19% of total assets are tangibility, and the average growth rate of assets is around 143.8%.

Using the wide range of firm-level data, the current study suffers the problem of outliers when some observations are far away from the zone the rest locate. However, it was decided to run regression with the whole sample without winsorizing or trimming outliers because the author did not want to bias the results, and the sample is quite small to worry about overvaluing outliers. To solve the problem of outliers, the author follows the instructions of Ghosh and Voght (2012).

### 3.7. Correlation among variables

Table 9 shows the pairwise correlation coefficient matrix of dependent and independent variables. As indicated, state ownership variables have low correlation coefficients with four proxies of capital structure. The state is positively correlated to the LDA (0.0748)

and LDM (0.0107) but moves in the opposite direction with SDA (-0.1563), SDM (-0.1856), TDA (-0.0674), and TDM (-0.1299).

Six proxies of leverage have an adverse correlation with firm profitability and market-to-book value, while firm size, growth, and medium industry leverage are positively associated with all debt measures. Between independent variables -- STATE, FOREIGN, BLOCK, SIZE, MTB, PROFIT, TANG, GROWTH, NDTs, and MIL -- correlation coefficients are less than 0.8; so, multicollinearity may not be a big problem here. [Kennedy (1992) suggested that 0.8 is the highest accepted level.]

We also calculate Variance Inflation Factors (VIF) using STATA software, and VIF of all independent variables are not too large.

Variable	VIF	1/VIF
STATE	1.15	0.868994
BLOCK	1.03	0.969518
FOREIGN	1.30	0.767861
MTB	1.51	0.663935
PROFIT	1.39	0.719301
TANG	1.32	0.758334
SIZE	1.25	0.799648
NDTS	1.23	0.814031
GROWTH	1.13	0.886716
MIL	1.07	0.931508
Mean VIF	1.24	

**Table 9: Correlation matrix**

	SDA	LDA	TDA	SDM	LDM	TDM	STATE	BLOCK	FOREIGN	SIZE	MTB	PROFIT	TANG	GROWTH	NDTS	MIL
SDA	1															
LDA	-0.1353	1														
TDA	0.6844	0.6298	1													
SDM	0.8892	0.1703	0.5718	1												
LDM	0.1342	0.9243	0.575	-0.099	1											
TDM	0.615	0.4963	0.8474	0.7308	0.5983	1										
STATE	0.1563	0.0748	0.0674	0.1856	0.0107	0.1299	1									
BLOCK	0.022	-0.024	0.0004	0.0105	0.0239	0.0256	0.0817	1								
FOREIGN	0.1776	0.0785	0.1969	0.2178	0.0991	0.2467	0.1706	0.0027	1							
SIZE	0.0705	0.3222	0.2924	0.0688	0.2914	0.2645	0.0918	0.0001	0.3365	1						
MTB	0.1183	0.0487	0.1285	0.3274	-0.188	0.3962	0.0693	0.0927	0.2651	0.0183	1					
PROFIT	-0.195	0.2318	0.3235	0.2986	0.2756	0.4323	0.0995	-0.045	0.1806	0.0686	0.4884	1				
TANG	0.0857	0.3862	0.2171	0.1886	0.288	0.0399	0.2734	0.0372	-0.039	-0.06	0.1656	0.0371	1			
GROWTH	0.08	0.1144	0.1469	0.0607	0.1076	0.1246	0.1104	-0.018	0.0079	0.2173	0.1042	0.1037	-0.14	1		
NDTS	-0.082	0.11	0.0167	0.1255	0.0649	0.0596	0.1696	0.0243	-0.017	0.0737	0.1205	0.1092	0.4111	-0.107	1	
MIL	0.0445	0.1626	0.1545	0.1321	0.1913	0.2369	0.0278	0.0132	-0.104	0.1322	0.2085	0.1301	-0.001	0.0042	0.0467	1

## 4. Results

### 4.1. Linear relationship between state ownership and leverage

Table 10 shows the results for the relationship between state ownership and three book measures of capital structure decisions used by four estimators (POLS, REM, FEM, and clustered FEM). Based on Hypothesis 1, one would expect that  $\beta_1$  has a positive sign for the first equation. In Table 8, the POLS outcomes show that, although state ownership has an insignificant impact on long-term debt ratio and market debt ratio, it has a negative and significant influence on short-term debt, at the 1% level, with the coefficient at -0.0606. The adjusted R-squared in the model of SDA run by POLS, however, is inconsiderable, of only 5.6%.

When testing the determinants of capital structure, the POLS regression seems to provide bias outcomes when ignoring omitted specific factors that are not mentioned in the equations. By pooling all observations without awareness of the uniqueness of firms, the estimated outcomes seem to be inconsistent. Furthermore, the results of the Breusch-Pagan test confirm that REM is better than POLS. With REM, state investors have an inconsiderable impact on debt-to-asset ratio. To conclude which model is more appropriate between FEM and REM, the Hausman test is performed. For all models, the  $p$ -value of the Hausman test is less than 0.05, which indicates that FEM is better than REM. With FEM results, state coefficients are insignificantly correlated with dependent variables, which indicates that, *ceteris paribus*, corporate capital structure is not involved in state ownership.

The author also conducted the modified Wald test for group-wise heteroskedasticity, and the outcomes (all Prob > Chi2 = 0.000) indicate that there is a heteroskedasticity problem in the panel data. Furthermore, the Wooldridge test for autocorrelation reveals the presence of autocorrelation. This study, therefore, needs to use FEM with adjusted standard errors. With a 99% confidence interval, the outcome confirms that debt-to-asset ratio does not have a non-linear relationship with the number of shares owned by the state. These results contrast with the findings of prior empirical studies on the funding behavior of Vietnamese listed firms, including Bigger et al. (2008), Okuda and Nhung (2012), and Le (2015).



**Table 10: Relationship between capital structure (book measures) and state ownership**

$$CS_{it} = \alpha + \beta_1 STATE_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} + \beta_6 GROWTH_{it} + \beta_7 NDTs_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

CS indicates the book measures of short-term debt to total assets (SDA), long-term debt to total assets (LDA) and total debt to total assets (TDA).

Four different estimators are applied, including Pooled ordinary least squares (POLS), Random-effects (REM), Fixed-effects (FEM) and Fixed effects with robust-standard error (clustered-FEM)

	SDA				LDA				TDA			
	POLS	REM	FEM	Clustered-FEM	POLS	REM	FEM	Clustered-FEM	POLS	REM	FEM	Clustered-FEM
STATE	- 0.0606* *	-0.00071	0.0766	0.0766	0.0203	0.0167	-0.00461	-0.00461	-0.0402	0.0115	0.072	0.072
	(-3.02)	(-0.03)	(1.91)	(1.02)	(1.39)	(0.83)	(-0.13)	(-0.13)	(-1.81)	(0.38)	(1.56)	(0.93)
SIZE	0.0127	0.0730** *	0.146***	0.146***	0.0855** *	0.0739** *	0.0586** *	0.0586	0.0981** *	0.141***	0.205***	0.205***
	(1.37)	(5.81)	(8.1)	(4.73)	(12.71)	(7.8)	(3.64)	(1.89)	(9.55)	(9.96)	(9.91)	(5.19)
MTB	- 0.00857	0.0214*	0.0486** *	0.0486*	0.00359	0.0156*	0.0308** *	0.0308	-0.00498	0.0396** *	0.0794** *	0.0794*
	(-0.97)	(2.54)	(4.77)	(2.31)	(0.56)	(2.29)	(3.38)	(1.52)	(-0.51)	(4.15)	(6.8)	(2.29)
PROFIT	- 0.314** *	- 0.271***	- 0.203***	- 0.203***	- 0.277***	- 0.181***	-0.133**	-0.133**	- 0.591***	- 0.439***	- 0.336***	- 0.336***
	(-4.93)	(-5.94)	(-4.16)	(-3.80)	(-5.98)	(-4.64)	(-3.04)	(-2.83)	(-8.36)	(-8.43)	(-6.00)	(-5.21)
TANG	- 0.00291	-0.0187	-0.0161	-0.0161	0.277***	0.184***	0.0921**	0.0921	0.274***	0.140***	0.0760*	0.076
	(-0.10)	(-0.67)	(-0.50)	(-0.31)	(13.65)	(8.08)	(3.17)	(1.71)	(8.84)	(4.41)	(2.04)	(1.17)
GROWTH	0.0287*	0.0186*	0.0173*	0.0173	0.0380** *	0.0261** *	0.0198**	0.0198	0.0668** *	0.0430** *	0.0370** *	0.0370*
	(2.26)	(2.42)	(2.22)	(1.33)	(4.12)	(3.87)	(2.85)	(1.68)	(4.73)	(4.87)	(4.15)	(2.02)
NDTS	-0.0871	-0.0576	-0.0489	-0.0489	-0.037	-0.0721	-0.0765	-0.0765	-0.124	-0.131	-0.125	-0.125
	(-0.65)	(-0.67)	(-0.57)	(-0.89)	(-0.38)	(-0.96)	(-1.00)	(-0.77)	(-0.83)	(-1.34)	(-1.27)	(-1.71)
MIL	0.0376	0.107**	0.141**	0.141*	0.159***	0.160***	0.144**	0.144*	0.196***	0.263***	0.285***	0.285***

	(1.2)	(2.78)	(2.84)	(2.16)	(6.98)	(5.34)	(3.27)	(2.58)	(5.65)	(6.04)	(5.03)	(3.69)
Constant	0.0319	- 0.769***	- 1.709***	- 1.709***	- 1.048***	- 0.909***	- 0.711***	-0.711	- 1.016***	- 1.597***	- 2.420***	- 2.420***
	(0.28)	(-4.92)	(-7.66)	(-4.45)	(-12.50)	(-7.69)	(-3.57)	(-1.84)	(-7.93)	(-9.09)	(-9.47)	(-4.96)
Adj_R2	0.056				0.331				0.2481			
F-test that all $\beta = 0$	8.54				63.9				42.95			
Pro>F	0.0000				0.0000				0.0000			
R2 (within)		0.1189	0.1418	0.1418		0.0653	0.0745	0.0745		0.2105	0.2331	0.2331
Wald test for REM - chi2		90.21				193.64				260.41		
Prob>chi2		0.0000				0.0000				0.0000		
Breusch and Pagan Lagrangian multiplier test for REM - chibar2		858.11				562.01				780.75		
Prob>chibar2		0.0000				0.0000				0.0000		
Overall F-test			15.47	5.87			7.54	3.33			28.45	14.64
Pro>F			0.0000	0.0000			0.0000	0.0000			0.0000	0
F-test that all $u_i = 0$			12.6				7.37				11.64	
Pro>F			0.0000				0.0000				0.0000	
Hausman test - chi2			43.74				43.24				48.99	
Prob>Chi2			0.0000				0.0000				0.0000	
Modified Wald test for groupwise heteroskedastici			8.50E+05				6.60E+06				3.00E+05	

ty for FEM- chi2												
Prob>Chi2			0.0000				0.0000				0.0000	
Wooldridge test for autocorrelation in panel data			0.591				19.599				20.871	
Prob>F			0.0000				0.0000				0.0000	
N	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018
t statistics in parentheses												
*, ** and *** denote the significance level at 10%, 5%, 1% respectively												

**Table 11: Relationship between capital structure (market measures) and state ownership**

$$CS_{it} = \alpha + \beta_1 STATE_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} + \beta_6 GROWTH_{it} + \beta_7 NDTs_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

CS indicates the market measures of short-term debt to total assets (SDM), long-term debt to total assets (LDM) and total debt to total assets (TDM).

Four different estimators are applied, including Pooled ordinary least squares (POLS), Random-effects (REM), Fixed-effects (FEM) and Fixed effects with robust-standard error (clustered-FEM)

	SDM				LDM				TDM			
	POLS	REM	FEM	Clustered-FEM	POLS	REM	FEM	Clustered-FEM	POLS	REM	FEM	Clustered-FEM
STATE	- 0.0910* *	-0.0145	0.0968	 0.0968	-0.00107	-0.00553	-0.0142	 -0.0142	- 0.0802**	-0.0104	0.0801	 0.0801
	(-3.28)	(-0.40)	(1.85)	(1.14)	(-0.05)	(-0.20)	(-0.30)	(-0.35)	(-2.63)	(-0.26)	(1.49)	(0.96)
SIZE	0.0148	0.0826** *	0.156***	0.156** *	0.103***	0.0884** *	0.0776** *	0.0776*	0.121***	0.184***	0.253***	0.253***
	(1.16)	(4.85)	(6.65)	(4.1)	(10.92)	(6.64)	(3.68)	(2.06)	(8.62)	(10.04)	(10.51)	(5.87)
MTB	- 0.0717* **	-0.0261*	0.0129	 0.0129	- 0.0308** *	-0.00559	0.0236*	 0.0236	- 0.104***	-0.0188	0.0377**	 0.0377
	(-5.91)	(-2.33)	(0.97)	(0.82)	(-3.46)	(-0.60)	(1.97)	(1.26)	(-7.76)	(-1.58)	(2.76)	(1.72)
PROFIT	- 0.492***	- 0.300***	-0.178**	-0.178*	- 0.351***	-0.157**	-0.0537	-0.0537	- 0.851***	- 0.407***	- 0.227***	-0.227**
	(-5.59)	(-4.99)	(-2.80)	(-2.47)	(-5.42)	(-3.01)	(-0.94)	(-0.98)	(-8.78)	(-6.47)	(-3.48)	(-3.15)
TANG	-0.102**	-0.0359	0.0118	0.0118	0.290***	0.173***	0.0938*	0.0938	0.181***	0.111**	0.108*	0.108
	(-2.64)	(-0.96)	(0.28)	(0.19)	(10.23)	(5.57)	(2.46)	(1.47)	(4.25)	(2.82)	(2.49)	(1.46)
GROWTH	0.0437*	0.0352** *	0.0346** *	0.0346*	0.0448** *	0.0339** *	0.0270**	0.027	0.0898** *	0.0698** *	0.0651** *	0.0651** *
	(2.49)	(3.49)	(3.41)	(2.16)	(3.47)	(3.8)	(2.97)	(1.91)	(4.65)	(6.65)	(6.26)	(3.36)
NDTS	-0.0688	-0.0641	-0.0543	-0.0543	-0.0495	-0.0151	-0.00019	-0.00019	-0.122	-0.0652	-0.0466	-0.0466
	(-0.37)	(-0.57)	(-0.48)	(-0.95)	(-0.36)	(-0.15)	(-0.00)	(-0.00)	(-0.60)	(-0.56)	(-0.41)	(-0.41)
MIL	0.128**	0.141**	0.118	0.118	0.218***	0.212***	0.172**	0.172**	0.348***	0.378***	0.344***	0.344***

	(2.96)	(2.73)	(1.82)	(1.54)	(6.85)	(5.09)	(2.97)	(2.61)	(7.32)	(6.83)	(5.21)	(4.09)
Constant	0.133	- 0.778***	- 1.731***	- 1.731** *	- 1.206***	- 1.050***	- 0.921***	-0.921	- 1.119***	- 2.009***	- 2.908***	- 2.908***
	(0.84)	(-3.67)	(-5.95)	(-3.65)	(-10.31)	(-6.33)	(-3.52)	(-1.94)	(-6.38)	(-8.80)	(-9.76)	(-5.44)
Adj_R2	0.1632				0.269				0.3184			
F-test that all $\beta = 0$	25.8				47.78				60.39			
Pro>F	0.0000				0.0000				0.0000			
R2 (within)		0.0688	0.0968	0.0968		0.0402	0.0493	0.0493		0.1886	0.2182	0.2182
Wald test for REM - chi2		89.28				123.63				258.03		
Prob>chi2		0.0000				0.0000				0.0000		
Breusch and Pagan Lagrangian multiplier test for REM - chibar2		901.05				569.95				895.49		
Prob>chibar2		0.0000				0.0000				0.0000		
Overall F-test			10.03	5.29			4.86	1.84			26.13	10.64
Pro>F			0.0000	0.0000			0.0000	0.0692			0.0000	0.0000
F-test that all $u_i = 0$			14.47				8.7				17.13	
Pro>F			0.0000				0.0000				0.0000	
Hausman test - chi2			45.6				44.05				71.12	
Prob>Chi2			0.0000				0.0000				0.0000	
Modified Wald test for groupwise			5.80E+06				1.80E+07				3.10E+05	

heteroskedasticity for FEM-chi2												
Prob>Chi2			0.0000				0.0000				0.0000	
Wooldridge test for autocorrelation in panel data			3.329				12.206				36.42	
Prob>F			0.0705				0.0007				0.0000	
N	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018
t statistics in parentheses												
*, ** and *** denote the significance level at 10%, 5%, 1% respectively												

Table 11 indicates the results for alternative proxies of capital structure, including short-term debt to market value of assets, long-term debt to market value of assets, and total debt to market value of assets. It can be said that state ownership has no non-linear impact on the capital structure of Vietnamese listed firms, in neither book measure or market value.

In terms of other determinants, size and profitability have strong impacts on capital structure decisions, but in opposite directions. The negative relationship between leverage ratio and profitability is consistent with previous studies, including those by Titman and Wessels (1988), Baker and Wugler (2002), and Huang and Ritter (2009). This result is predicted by pecking order theory because profitable firms can produce more internal funds by themselves to use so they use fewer debts. Moreover, the results suggest that firms are more leveraged when they are large, a finding consistent with of Booth et al. (2001). The explanations are economies of scale, small bankruptcy costs, and reputation that bring many advantages to borrow from banks. The current study does find that firm growth has persistent positive effects on leverage ratios. This direction of impact is predicted by pecking order theory because internal funds will not satisfy the demands of high-growth firms. However, non-debt tax shield is insignificantly associated with debt ratio. Tangibility is an important factor that affects long-term and total leverage, but does not have a significant impact on the short-term debt ratio.

#### **4.2. Linear relationship between large ownership and leverage**

Table 12 provides the regression results of equation (2) given in section 3.2 for book measures of leverage. As seen from the table, the FE and FE-cluster are more appropriate in explaining the models. The outcomes show the level of shares held by large investors is negatively associated with SDA and TDA, with the coefficients of  $-0.00435$  and  $-0.00542$  respectively, suggesting that ceteris paribus, firms with high large ownership are less levered. Adjusted R-squared is only 9.6% for SDA, but 12.8% for LDA and 21.8% for TDA. This means the combination of block variable and other firm-specific determinants explain up to 21.8% of the variability in the total debt-to-asset ratio.

Based on Table 13, we find this relationship is significant and strong for short-term and total market leverage. With a 99% confidence interval, the coefficient estimates on BLOCK are  $-0.00518$  and  $-0.00606$ , while the figures for the t-stat are  $-13.91$  and  $-12.52$ . That means a 1% increase in large ownership of listed firms results in about a 0.5% decrease in

short-term and market debt ratio. Moreover, the results suggest that large ownership has a negative, but insignificant impact on long-term debt. A possible explanation is that firms in our sample acquire a very small number of long-term debts during observed periods, around 8% of total debt, due to the unstable and non-preferable market conditions. Adjusted R-squared is 17.34% for TDM showing the explanatory power of the chosen model.

Our paper is one of the first discovering the impact of large shareholders on the capital structure decisions of Vietnamese listed firms. This study finds a negative link between block investors and short term as well as total debt ratios, both book and market measures, holding other things constant. This finding is consistent with the studies of Zeckhauser and Pound (1990) and Driffield et al. (2007). One possible reason is that firms with high controlling ownership may reduce their level of debts if the monitoring requirements from creditors increase. Block shareholders in firms with highly concentrated ownership have to face the increasing undiversifiable risks so they tend to reduce debt to eliminate bankruptcy and distress costs. Moreover, in firms with considerable large ownership, managers often act in the interest of shareholders under the pressure of powerful blockholders, so debts do not need to be issued. In addition, the existence of large ownership can be seen as evidence of good performance and a bright prospect. Thus, large ownership can substitute for debts in playing the monitoring role.

Our paper also demonstrates the good fit of FE models after running several tests. This outcome is similar to the studies of Sogorb-Mira (2005) and Degryse et al. (2012). In terms of other determinants, the negative relationship between leverage ratio and profitability is consistent with previous studies, including Titman and Wessels (1988), Baker and Wurgler (2002) and Huang and Ritter (2009). This result is predicted by the pecking order theory because profitable firms can produce more internal funds by themselves to use so they have fewer debts. Moreover, the results suggest that firms have more debts when they have a larger size, which is consistent with the empirical study of Booth et al. (2001). The explanations are economies of scale, small bankruptcy costs, and reputation that bring them many advantages to borrow from banks.

Furthermore, we find that firm growth has persistent positive effects on leverage ratios. This result is in line with the pecking order theory because internal funds will not satisfy the



demands of high growth firms. However, non-debt tax shield is insignificantly associated with debt ratios. Tangibility is an important factor that affects long-term, total and market leverage, but does not have a significant impact on the short-term debt ratio. The impacts of TANG on both book and market leverage measures are similar, and higher asset tangibility is associated with increases in long-term and total debt-to-asset ratios. This evidence implies that Vietnamese firms that have more tangible assets use more debt-finance for long-term activities. Further, the empirical results in Table 7 indicated that the sign of the MTB variable is mostly positive in all regression equations.

**Table 12: The impact of large ownership on capital structure (book measures)**

$$CS_{it} = \alpha + \beta_1 BLOCK_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} + \beta_6 GROWTH_{it} + \beta_7 NDTs_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

CS indicates the book measures of short-term debt to total assets (SDA), long-term debt to total assets (LDA) and total debt to total assets (TDA). Four different estimators are applied, including Pooled ordinary least squares (POLS), Random-effects (REM), Fixed-effects (FEM) and Fixed effects with robust-standard error (clustered-FEM)

	SDA				LDA				TDA			
	POLS	REM	FEM	Clustered FEM	POLS	REM	FEM	Clustered FEM	POLS	REM	FEM	Clustered FEM
BLOCK	0.00288	-0.00389*	-0.00435*	0.00435**	-0.00149	-0.00103	-0.00107	0.00107**	0.00139	0.00489*	0.00542**	0.00542**
	(0.91)	(-2.27)	(-2.54)	(-10.36)	(-0.66)	(-0.67)	(-0.70)	(-3.16)	(0.39)	(-2.44)	(-2.72)	(-11.22)
SIZE	0.00866	0.0482**	0.0613**	0.0613**	0.0892**	0.0788**	0.0797**	0.0797**	0.0979**	0.126**	0.141**	0.141***
	(1.16)	(5.69)	(6.2)	(2.8)	(16.78)	(11.45)	(9.09)	(4.42)	(11.61)	(12.78)	(12.24)	(4.44)
MTB	-0.0102	0.0138	0.0238**	0.0238	0.00689	0.0157*	0.0300**	0.0300*	-0.00328	0.0333**	0.0538**	0.0538*
	(-1.50)	(1.91)	(2.85)	(1.49)	(1.42)	(2.66)	(4.06)	(2)	(-0.43)	(3.96)	(5.53)	(2.18)
PROFIT	-0.271**	-0.244***	-0.226***	-0.226***	0.326**	0.155**	0.105**	-0.105**	0.597**	0.382**	0.331**	-0.331***
	(-5.60)	(-7.33)	(-6.49)	(-4.34)	(9.40)	(5.37)	(3.38)	(-2.99)	(-10.87)	(-9.84)	(-8.14)	(-5.82)
TANG	-0.0523*	-0.033	-0.026	-0.026	0.308**	0.189**	0.139**	0.139**	0.256**	0.137**	0.113**	0.113*
	(-2.33)	(-1.52)	(-1.09)	(-0.90)	(19.22)	(10.45)	(6.55)	(3.16)	(10.07)	(5.43)	(4.05)	(2.45)
GROWTH	0.000057	0.000325**	0.000341**	0.000341	-1.90E-05	-9.70E-05	-0.00011	0.000112	3.81E-05	0.000222	0.00023	0.00023
	(0.26)	(2.75)	(2.89)	(1.09)	(-0.12)	(-0.92)	(-1.06)	(-1.43)	(0.15)	(1.6)	(1.67)	(0.8)

NDTS	-0.116	-0.033	-0.028	-0.028	-0.0996	-0.0531	-0.0588	-0.0588	-0.216	-0.0873	-0.0867	-0.0867
	(-0.93)	(-0.44)	(-0.37)	(-0.59)	(-1.12)	(-0.79)	(-0.87)	(-0.90)	(-1.53)	(-0.99)	(-0.98)	(-1.27)
MIL	0.0404	0.103***	0.115**	0.115*	0.147** *	0.100** *	0.0552	0.0552	0.188** *	0.191** *	0.170** *	0.170**
	(1.61)	(3.34)	(3.09)	(2.36)	(8.23)	(4.07)	(1.67)	(1.29)	(6.61)	(5.33)	(3.92)	(2.78)
Constant	0.0768	-0.456***	-0.631***	-0.631*	- 1.073** *	- 0.931** *	- 0.927** *	- 0.927** *	- 0.996** *	- 1.366** *	- 1.558** *	-1.558***
	(0.83)	(-4.47)	(-5.39)	(-2.44)	(-16.25)	(-11.15)	(-8.93)	(-4.29)	(-9.52)	(-11.52)	(-11.42)	(-4.13)
Adj_R2	0.0437				0.3561				0.2207			
F-test that all $\beta = 0$	9.76				106.98				55.27			
Pro>F	0				0				0			
R2 (within)		0.094	0.096	0.096		0.1225	0.1279	0.1279		0.2138	0.2182	0.2182
Wald test for REM - chi2		127.56				321.9				390.73		
Prob>chi2		0				0				0		
Breusch and Pagan Lagrangian multiplier test for REM - chibar2		2725.84				1630.74				2422.88		
Prob>chibar2		0				0				0		
Overall F-test			16.92	23.83			23.36	7.97			44.44	62.95
Pro>F			0	0			0	0			0	0
F-test that all $u_i = 0$			19.71				10.98				18.31	
Pro>F			0				0				0	
Hausman test - chi2			25.55				52.69				34.08	

Prob>Chi2			0.0013				0				0	
Modified Wald test for groupwise heteroskedasticity for FEM-chi2			610000				4.50E+06				4.90E+05	
Prob>Chi2			0				0				0	
Wooldridge test for autocorrelation in panel data			56.938				78.107				96.561	
Prob>F			0				0				0	
N	1534	1534	1534	1534	1534	1534	1534	1534	1534	1534	1534	1534
t statistics in parentheses												
*, ** and *** denote the significance level at 10%, 5%, 1% respectively												

**Table 13: The impact of large ownership on capital structure (market measures)**

$$CS_{it} = \alpha + \beta_1 BLOCK_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} + \beta_6 GROWTH_{it} + \beta_7 NDTs_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

CS indicates the market measures of short-term debt to total assets (SDM), long-term debt to total assets (LDM) and total debt to total assets (TDM). Four different estimators are employed, including Pooled ordinary least squares (POLs), Random-effects (REM), Fixed-effects (FEM) and Fixed effects with robust-standard error (clustered-FEM)

	SDM				LDM				TDM			
	POLS	REM	FEM	Clustered FEM	POLS	REM	FEM	Clustered FEM	POLS	REM	FEM	Clustered FEM
BLOCK	0.00164	-0.00453	-0.00518*	- 0.00518* **	- 0.000517	- 0.000644	-0.000917	- 0.000917	0.000974	- 0.00536*	- 0.00606*	- 0.00606* **
	(0.37)	(-1.87)	(-2.15)	(-13.91)	(-0.17)	(-0.31)	(-0.45)	(-1.82)	-0.2	(-2.15)	(-2.47)	(-12.52)
SIZE	0.00725	0.0404***	0.0562***	0.0562*	0.109***	0.111***	0.126***	0.126** *	0.119** *	0.160** *	0.184** *	0.184***
	(0.7)	(3.38)	(4.03)	(2.08)	(15.13)	(11.74)	(10.72)	(5.42)	(10.37)	(12.65)	(12.97)	(5.94)
MTB	- 0.0777** *	-0.0373***	-0.013	-0.013	- 0.0268** *	-0.00639	0.0216*	0.0216	- 0.105** *	- 0.0315* *	0.0071	0.0071
	(-8.26)	(-3.66)	(-1.10)	(-0.89)	(-4.08)	(-0.79)	(2.18)	(1.49)	(-10.05)	(-2.92)	(0.59)	(0.41)
PROFIT	- 0.375***	-0.194***	-0.126*	-0.126*	- 0.404***	- 0.144***	-0.0519	-0.0519	- 0.783** *	- 0.291** *	- 0.178** *	-0.178**
	(-5.57)	(-4.12)	(-2.56)	(-2.50)	(-8.60)	(-3.69)	(-1.25)	(-1.32)	(-10.47)	(-5.95)	(-3.56)	(-3.13)
TANG	- 0.180***	-0.0855**	-0.05	-0.05	0.334***	0.199***	0.158***	0.158**	0.152** *	0.0984* *	0.108**	0.108*
	(-5.77)	(-2.80)	(-1.49)	(-1.35)	(15.39)	(8.09)	(5.56)	(2.81)	(4.4)	(3.07)	(3.15)	(2.03)
GROWTH	0.000284	0.000556* **	0.000572* **	0.000572	0.000011 1	- 0.000348 *	- 0.000394 **	- 0.000394 4	0.000292 2	0.00019	0.00018	0.00018
	(0.93)	(3.33)	(3.43)	(1.5)	(0.05)	(-2.46)	(-2.80)	(-1.95)	(0.86)	(1.11)	(1.06)	(0.97)

NDTS	-0.242	-0.0575	-0.0304	-0.0304	-0.23	-0.0427	-0.0293	-0.0293	-0.473*	-0.0887	-0.0603	-0.0603
	(-1.40)	(-0.54)	(-0.28)	(-0.53)	(-1.91)	(-0.47)	(-0.32)	(-0.33)	(-2.47)	(-0.80)	(-0.55)	(-0.52)
MIL	0.137***	0.157***	0.143**	0.143*	0.204***	0.121***	0.0218	0.0218	0.342** *	0.250** *	0.173**	0.173*
	(3.95)	(3.6)	(2.71)	(2.15)	(8.39)	(3.58)	(0.49)	(0.4)	(8.84)	(5.4)	(3.24)	(2.41)
Constant	0.225	-0.256	-0.477**	-0.477	- 1.266***	- 1.269***	-1.432***	- 1.432** *	- 1.072** *	- 1.630** *	- 1.931** *	-1.931***
	(1.75)	(-1.78)	(-2.89)	(-1.48)	(-14.15)	(-11.12)	(-10.30)	(-5.07)	(-7.52)	(-10.72)	(-11.51)	(-5.25)
Adj_R2	0.1615				0.3071				0.291			
F-test that all $\beta = 0$	37.92				85.92				79.67			
Pro>F	0				0				0			
R2 (within)		0.042	0.0466	0.0466		0.114	0.1251	0.1251		0.163	0.1734	0.1734
Wald test for REM - chi2		94.43				264.15				310.92		
Prob>chi2		0				0				0		
Breusch and Pagan Lagrangian multiplier test for REM - chibar2		2548.6				1581.92				2537.18		
Prob>chibar2		0				0				0		
Overall F-test			7.78	29.72			22.76	6.66			33.42	87.91
Pro>F			0	0			0	0			0	0
F-test that all $u_i = 0$			18.87				11.39				23.6	
Pro>F			0				0				0	
Hausman test - chi2			30.63				63.09				69.07	
Prob>Chi2			0.0002				0				0	

Modified Wald test for groupwise heteroskedasticity for FEM-chi2			1.30E+31				4.80E+06				3.10E+05	
Prob>Chi2			0				0				0	
Wooldridge test for autocorrelation in panel data			53.318				59.1				36.42	
Prob>F			0				0				0	
N	1534	1534	1534	1534	1534	1534	1534	1534	1534	1534	1534	1534
t statistics in parentheses												
*, ** and *** denote the significance level at 10%, 5%, 1% respectively												

### 4.3. Linear relationship between foreign ownership and leverage

Table 14 shows the results of the relationship between foreign ownership and the book measures of leverage employ by four different estimators: POLS, REM, FEM and FEM with clusters. In terms of short-term leverage, the POLS outcomes show that level of foreign investment has negatively significant influence at the 1% level (coefficients is -0.183). However, the adjusted R squares in the model run by POLS is quite small at 8.3%. When testing the determinants of capital structure, the pooled OLS regression seems to provide bias outcomes when ignoring omitted specific factors which are not mentioned in equations. By pooling all observations without awareness of uniqueness of firms, the estimated outcomes seem to be inconsistent. Furthermore, the results of the Breusch-Pagan test confirm that REM is better than POLS. With REM, foreign investors affects negatively to debt to asset ratio with coefficients at -0.187. Between FEM and REM, to conclude which model is more appropriate, we perform the Hausman test. As can be seen, the p-value of Hausman test is less than 0.05 which show FEM better fit over REM. With FEM results, foreign coefficient is significantly negative, at the 1 % level which indicates that, ceteris paribus, firms with higher foreign ownership are less involved to short-term debts.

We also conduct the modified Wald test for group-wise heteroskedasticity. The outcomes (all Prob > Chi2 = 0.000) indicate that there is an heteroskedasticity problem in our panel data. Besides, the Wooldridge test for autocorrelation reveals the presence of autocorrelation. Therefore, our study needs to employ FEM with adjusted standard errors. The clustered-FEM shows that, with a 99% confidence interval, the ratio of short-term debt to asset is affected by the number of shares owned by foreign investors. Besides, the adjusted R squares are high.

Considering the ratio of long-term debt to the book value of total asset, when results from POLS and REM suggest a significant negative association between the level of offshore investment and the gearing ratio, the Breusch-Pagan and Hausman tests reveal that FEM is more relevant. However, FEM outcome does not support a link between foreign investment and the size of long-term debt. Similarly, using FEM with adjusted standard errors does not allow finding a notable influence of foreign ownership on the use of debt.

Turning to total debt to total asset ratio, both estimators reveal an adverse link to foreign ownership. Depending on the results of Breusch-Pagan and Hausman tests, FEM and



clustered-FE seem to be more appropriate. With a 99% confidence interval, the foreign ownership coefficient is -0.188 ( $t = -4.81$ ) which indicates that, ceteris paribus, a 1 % increase in foreign ownership leads to 18.8% decrease in the total debt ratio. Regarding the other determinants, size and profitability have strong impacts on capital structure decisions but in opposite directions. The negative relationship between leverage and profitability is consistent with previous studies, including Titman and Wessels (1988), Baker and Wugler (2002) and Huang and Ritter (2009). This result is predicted by pecking order theory because profitable firms can produce more internal funds so they use less debt. Moreover, the results suggest that firms are more levered when they have large size, which is in line with the empirical results obtained by Booth et al (2001). The explanations are the presence of economies of scale, small bankruptcy costs, and reputation, which allow borrowing from banks at favorable terms. Furthermore, our results show that firm growth has persistent positive effects on leverage. This result supports the pecking order theory because internal funds will not satisfy the demands of high growth firms. However, non-debt tax shield is insignificantly associated with the debt ratio. Tangibility is an important factor that affects long-term, and total leverage, but has no significant impact on the short-term debt ratio.

The combination of foreign ownership and other firm-specific characteristics explains up to 18% of the short term debt, and 27.36% of the book leverage ratio. However, R-squared for long-term debt ratio is only 7% and does not change much when we add median industry leverage as an additional variable. A possible explanation is that firms in our sample acquire small amounts of long-term debt during observed periods, around 8% of total debt, due to the unstable and non-preferable market conditions.

**Table 14: The impact of large ownership on capital structure (book measures)**

$$CS_{it} = \alpha + \beta_1 FOREIGN_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} + \beta_6 GROWTH_{it} + \beta_7 NDTs_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

CS indicates the book measures of short-term debt to total assets (SDA), long-term debt to total assets (LDA) and total debt to total assets (TDA).

Four different estimators are applied, including Pooled ordinary least squares (POLS), Random-effects (REM), Fixed-effects (FEM) and Fixed effects with robust-standard error (clustered-FEM)

	SDA				LDA				TDA			
	POLS	REM	FEM	Clustered FEM	POLS	REM	FEM	Clustered FEM	POLS	REM	FEM	Clustered FEM
FOREIGN	-0.183***	-0.187***	-0.167***	-0.167***	-0.127***	-0.0631**	-0.0211	-0.0211	-0.310***	-0.237***	-0.188***	-0.188***
	(-7.10)	(-7.02)	(-5.63)	(-4.07)	(-7.10)	(-2.93)	(-0.81)	(-0.58)	(-11.09)	(-8.01)	(-5.68)	(-4.81)
SIZE	0.0219**	0.103***	0.160***	0.160***	0.102***	0.0730**	0.0525**	0.0525*	0.124***	0.168***	0.213***	0.213***
	(2.7)	(9.26)	(11.29)	(5.38)	(18.16)	(8.69)	(4.24)	(2.03)	(14.1)	(13.61)	(13.42)	(5.96)
MTB	-0.00185	0.0277**	0.0482**	0.0482**	0.0100*	0.0148*	0.0292**	0.0292	0.00815	0.0462**	0.0774**	0.0774*
	(-0.25)	(3.65)	(5.36)	(2.74)	(1.97)	(2.47)	(3.72)	(1.42)	(1.02)	(5.49)	(7.71)	(2.42)
PROFIT	-0.338***	-0.290***	-0.251***	-0.251***	-0.264***	-0.144***	-0.109***	-0.109**	-0.602***	-0.422***	-0.359***	-0.359***
	(-6.88)	(-8.86)	(-7.37)	(-5.29)	(-7.75)	(-5.18)	(-3.65)	(-3.04)	(-11.30)	(-11.58)	(-9.46)	(-6.69)
TANG	-0.0244	-0.00352	-0.000518	-0.00052	0.294***	0.186***	0.120***	0.120*	0.270***	0.158***	0.119***	0.119*
	(-1.06)	(-0.15)	(-0.02)	(-0.01)	(18.46)	(10.13)	(5.44)	(2.55)	(10.82)	(6.27)	(4.23)	(2.46)
GROWTH	0.0289*	0.0258**	0.0222**	0.0222	0.0378**	0.0263**	0.0236**	0.0236*	0.0667**	0.0511**	0.0458**	0.0458**
	(2.49)	(4.05)	(3.47)	(1.96)	(4.7)	(4.78)	(4.21)	(2.12)	(5.31)	(7.21)	(6.4)	(2.82)
NDTS	-0.113	-0.0631	-0.0551	-0.0551	-0.0579	-0.0921	-0.103	-0.103	-0.171	-0.159	-0.158	-0.158
	(-0.91)	(-0.85)	(-0.74)	(-1.08)	(-0.67)	(-1.44)	(-1.59)	(-1.12)	(-1.26)	(-1.93)	(-1.91)	(-1.77)
MIL	-0.0308	0.0484	0.0495	0.0495	0.141***	0.0871**	0.048	0.048	0.110***	0.121***	0.0975*	0.0975
	(-1.23)	(1.53)	(1.31)	(1.02)	(8.11)	(3.56)	(1.46)	(1.46)	(4.05)	(3.47)	(2.32)	(1.6)
Constant	-0.0288	-1.079***	-1.788***	-	-1.222***	-0.853***	-0.595***	-0.595	-1.251***	-1.825***	-2.384***	-

				1.788***								2.384***
	(-0.29)	(-8.00)	(-10.48)	(-5.09)	(-17.76)	(-8.34)	(-4.00)	(-1.93)	(-11.62)	(-12.23)	(-12.51)	(-5.65)
Adj_R2	0.0834				0.371				0.2925			
F-test that all $\beta = 0$	18.82				116.54				81.98			
Pro>F	0.0000				0.0000				0.0000			
R2 (within)		0.1708	0.1813	0.1813		0.0702	0.076	0.076		0.263	0.2736	0.2736
Wald test for REM - chi2		248.21				261.34				531.46		
Prob>chi2		0.0000				0.0000				0.0000		
Breusch and Pagan Lagrangian multiplier test for REM - chibar2		2332.00				1558.54				2112.29		
Prob>chibar2		0.0000				0.0000				0.0000		
Overall F-test			35.58	10.80			13.22	3.92			60.49	21.06
Pro>F			0.0000	0.0000			0.0000	0.0000			0.0000	0.0000
F-test that all $u_i = 0$			21.33				11.75				19.9	
Pro>F			0.0000				0.0000				0.0000	
Hausman test - chi2			51.28				66.7				47.8	
Prob>Chi2			0.0000				0.0000				0.0000	
Modified Wald test for groupwise heteroskedasticity for FEM- chi2			1500000				1.60E+08				5.70E+07	
Prob>Chi2			0.0000				0.0000				0.0000	
Wooldridge test			53.3020				61.624				79.962	

for autocorrelation in panel data												
Prob>F			0.0000				0.0000				0.0000	
N	1568	1568	1568	1568	1568	1568	1568	1568	1568	1568	1568	1568
t statistics in parentheses												
*, ** and *** denote the significance level at 10%, 5%, 1% respectively												

Table 15 shows the results on the relationship between foreign ownership and three measures of market leverage with four different estimators: POLS, REM, FEM and FEM with clusters. In terms of short-term leverage, the POLS outcomes show that the level of foreign investment has a negative and significant influence at the 1% level (the coefficient is -0.25). However, the results of the Breusch-Pagan test confirm that REM performs better than POLS. With REM, foreign investors affects negatively the debt to asset ratio, with a coefficient of -0.254. Between FEM and REM, the  $p$ -value of the Hausman test (less than 0.05) shows that FEM dominate REM. With FEM results, the foreign coefficient is significantly negative, -0.221, which reveals that, ceteris paribus, firms with higher foreign ownership tend to use less short-term debt. Similarly, the clustered-FEM shows that, with a 99% confidence interval, short-term debt to asset ratio is affected by the number of shares owned by foreign investors. Considering the ratio of long-term debt to the market value of total asset, results from POLS and REM suggest a significant negative association between the level of offshore investment and this gearing ratio. However, Breusch-Pagan test and the Hausman test indicates that FEM is more appropriate. With FEM, there is no significant association between foreign investment and level of long-term debt. Similarly, FEM with adjusted standard errors does not exhibit a notable influence of foreign ownership on the amount of debt.

Turning to market debt ratio, both estimators reveal an adverse link to foreign ownership. Depending on the results of Breusch-Pagan and Hausman tests, FEM and clustered-FE seem to be more appropriate. With a 99% confidence interval, the foreign coefficient is at -0.244 implying that, ceteris paribus, a 1 % increase in foreign ownership leads to a 24.4% decrease in the total debt ratio. Regarding the other determinants, results do not change much compared to those presented in table 7 while size, growth and profitability still exhibit a strong impact on capital structure decisions. Our results are consistent with previous studies, including Titman and Wessels (1988), Baker and Wugler (2002) and Huang and Ritter (2009). Non-debt tax shield, and industry median leverage are insignificantly associated with debt ratios. Tangibility is an important factor that affects long-term, and total leverage, but has not a significant impact on the short-term debt ratio. The combination of foreign ownership and other firm-specific characteristics explain up to 23.5% change in total market leverage.

**Table 15: The impact of foreign ownership on capital structure (market measures)**

$$CS_{it} = \alpha + \beta_1 FOREIGN_{it} + \beta_2 SIZE_{it} + \beta_3 MTE_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} + \beta_6 GROWTH_{it} + \beta_7 NDTs_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

CS indicates the market measures of short-term debt to total assets (SDM), long-term debt to total assets (LDM) and total debt to total assets (TDM). Four different estimators are employed, including Pooled ordinary least squares (POLs), Random-effects (REM), Fixed-effects (FEM) and Fixed effects with robust-standard error (clustered-FEM)

	SDM				LDM				TDM			
	POLS	REM	FEM	Clustered FEM	POLS	REM	FEM	Clustered FEM	POLS	REM	FEM	Clustered FEM
FOREIGN	- 0.250** *	- 0.254** *	- 0.221** *	- 0.221** *	- 0.145** *	-0.0715*	-0.0221	-0.0221	- 0.401** *	- 0.304** *	- 0.244** *	- 0.244** *
	(-6.98)	(-7.02)	(-5.55)	(-3.93)	(-5.73)	(-2.40)	(-0.64)	(-0.37)	(-10.33)	(-8.23)	(-6.15)	(-5.74)
SIZE	0.0295* *	0.125** *	0.191** *	0.191** *	0.123** *	0.0815**	0.0557**	0.0557	0.156** *	0.210** *	0.256** *	0.256** *
	(2.63)	(8.19)	(10.04)	(5.11)	(15.54)	(6.87)	(3.34)	(91.7)	(12.83)	(13.27)	(13.46)	(6.42)
MTB	- 0.0694* **	-0.0213*	0.0121	0.0121	- 0.0258* **	-0.0101	0.0144	0.0144	- 0.0957* **	-0.0191	0.0251*	0.0251
	(-6.83)	(-2.06)	(1)	(0.8)	(-3.58)	(-1.22)	(1.36)	(0.76)	(-8.68)	(-1.80)	(2.09)	(1.18)
PROFIT	- 0.467** *	- 0.273** *	- 0.198** *	- 0.198** *	- 0.347** *	- 0.127** *	-0.0616	-0.0616	- 0.816** *	- 0.363** *	- 0.261** *	- 0.261** *
	(-6.86)	(-6.19)	(-4.33)	(-4.09)	(-7.20)	(-3.36)	(-1.54)	(-1.50)	(-11.06)	(-8.14)	(-5.74)	(-4.88)
TANG	- 0.137** *	-0.0279	0.00439	0.00439	0.315** *	0.192** *	0.140** *	0.140*	0.175** *	0.146** *	0.146** *	0.146* *
	(-4.30)	(-0.91)	-0.13	-0.1	(13.98)	(7.55)	(4.73)	(2.25)	(5.07)	(4.64)	(4.32)	(2.42)
GROWTH	0.0344* *	0.0345* **	0.0304* **	0.0304* *	0.0446* **	0.0344* **	0.0317* **	0.0317*	0.0796* **	0.0704* **	0.0652* **	0.0652* **
	(2.14)	(4.02)	(3.53)	(2.31)	(3.92)	(4.63)	(4.21)	(2.39)	(4.57)	(8.17)	(7.6)	(4.01)
NDTS	-0.163	-0.0449	-0.0228	-0.0228	-0.151	-0.0785	-0.0694	-0.0694	-0.313	-0.109	-0.0864	-0.0864
	(-0.94)	(-0.45)	(-0.23)	(-0.39)	(-1.23)	(-0.91)	(-0.80)	(-0.55)	(-1.67)	(-1.09)	(-0.87)	(-0.70)

MIL	0.0465	0.0887*	0.0612	0.0612	0.199** *	0.110**	0.0485	0.0485	0.247** *	0.190** *	0.135**	0.135
	(1.34)	(2.07)	(1.21)	(1)	(8.14)	(3.21)	(1.1)	(1.01)	(6.56)	(4.3)	(2.67)	(1.92)
Constant	0.0227	- 1.225** *	- 2.059** *	- 2.059** *	- 1.430** *	- 0.909** *	-0.594**	-0.594	- 1.445** *	- 2.193** *	- 2.768** *	- 2.768** *
	(0.16)	(-6.65)	(-8.99)	(-4.61)	(-14.70)	(-6.30)	(-2.97)	(-1.50)	(-9.69)	(-11.44)	(-12.13)	(-5.77)
Adj_R2	0.1757				0.307				0.343			
F-test that all $\beta = 0$	42.74				87.78				103.25			
Pro>F	0.0000				0.0000				0.0000			
R2 (within)		0.1134	0.1269	0.1269		0.0407	0.046	0.046		0.2223	0.235	0.235
Wald test for REM - chi2		193.17				161.13				456.39		
Prob>chi2		0.0000				0.0000				0.0000		
Breusch and Pagan Lagrangian multiplier test for REM - chibar2		2304.65				1455.15				2249.51		
Prob>chibar2		0.0000				0.0000				0.0000		
Overall F-test			23.35	8.97			7.74	2.08			49.35	15.33
Pro>F			0.0000	0.0000			0.0000	0.0000			0.0000	0.0000
F-test that all $u_i = 0$			23.04				13.43				28.16	
Pro>F			0.0000				0.0000				0.0000	
Hausman test - chi2			54.73				64.74				71.06	
Prob>Chi2			0.0000				0.0000				0.0000	
Modified Wald			2.70E+0				2.10E+0				1.70E+0	

test for groupwise heteroskedasticity for FEM-chi2			6				9				6	
Prob>Chi2			0.0000				0.0000				0.0000	
Wooldridge test for autocorrelation in panel data			49.25				45.533				121.999	
Prob>F			0.0000				0.0000				0.0000	
N	1568	1568	1568	1568	1568	1568	1568	1568	1568	1568	1568	1568
t statistics in parentheses												
*, ** and *** denote the significance level at 10%, 5%, 1% respectively												



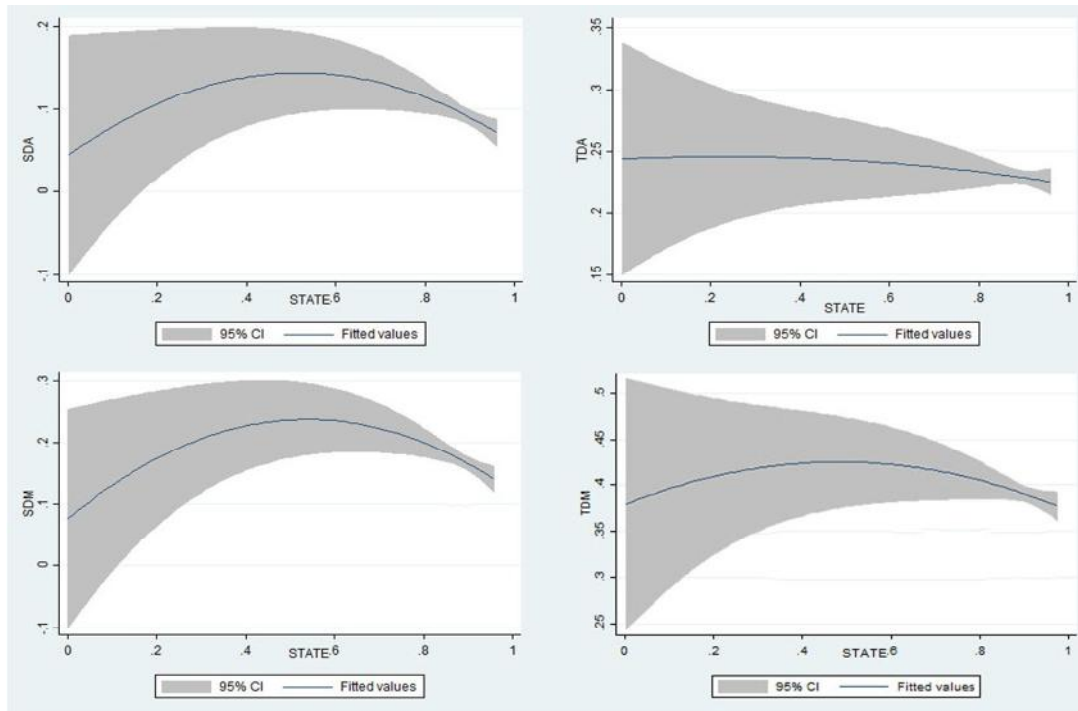
#### 4.4. Robustness check

##### 4.4.1. The non-linear relationship between outside ownership and capital structure

To check the existence of the non-linear association between the dependent variables and state ownership factor, we use quadratic equations. Figure 4 shows the results of the quadratic equations, which include both State and State\_squared.

If there is a non-linear relationship, one would expect that  $\beta_1$  and  $\beta_2$  would have an opposite sign, significantly related to debt measures. Based on the Hausman test, it is clear that the FE estimator is more suitable for explaining the modes of all six leverage measures. The regression results reveal the U-shaped relationship between short-term leverage, total leverage, and state investment. The coefficients of both State, and State\_squared in the equation of SDA are significant at 1% (0.331 and -0.402, respectively). This finding implies that, when state ownership is low, firms tend to use more short-term debt instead of other sources of capital, a strategy that helps them avoid outside takeover attempts and share dilution. Then, together with the increase in shares held by the state, debt level increases, which in turn increases both distress and bankruptcy costs and thereby threatens the survival of the firm. Therefore, whenever state ownership is concentrated enough, firms will use other funding resources to substitute for debt, causing the debt level to decrease gradually. This situation means that the link between the two has the shape of an inverted U. This relationship is robust when both book and market measures of short-term debt are measured. Similarly, the same scenario appears when considering total leverage.

The significant inverted U-shaped relationship is found in the equations of TDA and TDM, with a 99% confidence interval. For TDA, the FEM yields coefficients of 0.485 and -0.653, respectively, for State and State\_squared, correspondingly. For TDM, the coefficients are 0.560 and -0.758, significant at the 1% level. In terms of long-term debt, we do not find any obvious evidence of such a relationship.



Before my study, Nguyen et al. (2012), Le (2015), found a positive relationship between state ownership and leverage, while Okuda and Nhung (2012) found no significant link between the two. Two of them use dummy variable for state, only Le (2015) use proportion of shareowners. All of these studies used data for a 4 year period, 2007-2010 for Nguyen et al. (2012), 2006-2009 for Okuda and Nhung (2012), 2008-2011 for Le (2015). All are before the year of 2012, when privatization process has just begun. My study investigates a longer time, 8 years, and covers time when privatization process is promoted strongly by the government, so the difference in findings is understandable.

Table 17 and 18 are used to check for the existence of a non-linear relationship between large and foreign ownership and 6 measures of leverage. However, the results show that there is no such association between them of observed firms.

**Table 16: Non-linear relationship between capital structure and state ownership**

$$CS_{it} = + \beta_1 STATE_{it} + \beta_2 STATE_{it}^2 + \beta_3 SIZE_{it} + \beta_4 MTB_{it} + \beta_5 PROFIT_{it} + \beta_6 TANG_{it} + \beta_7 GROWTH_{it} + \beta_8 NDTs_{it} + \beta_9 MIL_{it} + \epsilon_{it}$$

CS indicates the market measures of short-term debt to total assets (SDM), long-term debt to total assets (LDM) and total debt to total assets (TDM).

Two different estimators are applied, including Random-effects (REM) and Fixed-effects (FEM)

	SDA		LDA		TDA		SDM		LDM		TDM	
	REM	FEM	REM	FEM	REM	FEM	REM	FEM	REM	FEM	REM	FEM
STATE	0.238** (3.15)	0.331** (3.27)	0.0757 (1.28)	0.154 (1.7)	0.332** * (3.89)	0.485** * (4.2)	0.218* (2.14)	0.350** (2.64)	0.0843 (1.03)	0.216 (1.82)	0.349** (3.2)	0.560** * (4.16)
STATE2	-0.379** * (-3.38)	-0.402** (-2.73)	-0.0936 (-1.06)	-0.251 (-1.91)	0.507** * (-4.01)	0.653** * (-3.89)	-0.369* (-2.44)	-0.400* (-2.08)	-0.143 (-1.17)	-0.364* (-2.11)	0.568** * (-3.52)	0.758** * (-3.88)
SIZE	0.0796* ** (6.3)	0.149** * (8.28)	0.0757* ** (7.85)	0.0603* ** (3.75)	0.150** * (10.55)	0.209** * (10.2)	0.0887* ** (5.17)	0.159** * (6.76)	0.0910* ** (6.73)	0.0801* ** (3.79)	0.193** * (10.5)	0.258** * (10.8)
MTB	0.0219* * (2.61)	0.0502* ** (4.93)	0.0157* (2.3)	0.0318* ** (3.49)	0.0405* ** (4.28)	0.0819* ** (7.07)	-0.0256* (-2.29)	0.0144 (1.09)	-0.00537 (-0.58)	0.0250* (2.09)	-0.0172 (-1.45)	0.0406* * (3)
PROFIT	-0.276** * (-6.08)	-0.205** * (-4.21)	-0.183** * (-4.67)	-0.134** (-3.07)	0.445** * (-8.61)	0.338** * (-6.10)	0.305** * (-5.08)	-0.180** (-2.83)	-0.158** (-3.04)	-0.0551 (-0.96)	0.411** * (-6.58)	0.230** * (-3.56)
TANG	-0.0102 (-0.37)	0.00043 4 (0.01)	0.185** * (8.11)	0.102** * (3.47)	0.150** * (4.75)	0.103** (2.74)	-0.0271 (-0.72)	0.0283 (0.66)	0.175** * (5.62)	0.109** (2.81)	0.126** (3.19)	0.140** (3.18)
GROWTH	0.0190* (2.49)	0.0174* (2.24)	0.0263* ** (3.9)	0.0198* * (2.86)	0.0435* ** (4.98)	0.0372* ** (4.21)	0.0355* ** (3.53)	0.0347* ** (3.43)	0.0341* ** (3.83)	0.0271* * (2.98)	0.0702* ** (6.74)	0.0653* ** (6.34)

NDTS	-0.0617	-0.0566	-0.0726	-0.0813	-0.137	-0.138	-0.0685	-0.062	-0.0161	-0.00719	-0.0724	-0.0612
	(-0.73)	(-0.66)	(-0.97)	(-1.06)	(-1.41)	(-1.41)	(-0.61)	(-0.55)	(-0.16)	(-0.07)	(-0.63)	(-0.54)
MIL	0.0968*	0.129**	0.158** *	0.137**	0.249** *	0.266** *	0.131*	0.106	0.208** *	0.162**	0.362** *	0.323** *
	(2.52)	(2.61)	(5.24)	(3.1)	(5.75)	(4.73)	(2.53)	(1.64)	(4.98)	(2.79)	(6.56)	(4.91)
Constant	- 0.856** *	- 1.754** *	- 0.932** *	- 0.739** *	- 1.720** *	- 2.492** *	- 0.858** *	- 1.775** *	- 1.085** *	- 0.961** *	- 2.136** *	- 2.992** *
	(-5.43)	(-7.87)	(-7.73)	(-3.71)	(-9.70)	(-9.81)	(-4.01)	(-6.10)	(-6.42)	(-3.67)	(-9.29)	(-10.10)
R2 (within)	0.1274	0.1503	0.0674	0.079	0.2263	0.2483	0.0739	0.102	0.0428	0.0549	0.2031	0.2336
Wald test for REM - chi2	102.58		194.03		280.45		95.7		124.45		273.11	
Prob>chi2	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
Breusch and Pagan Lagrangian multiplier test for REM - chibar2	859.71		556.7		790.97		901.7		567.5		902.07	
Prob>chibar2	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
Overall F-test		14.7		7.13		27.46		9.44		4.83		25.34
Pro>F		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
F-test that all u_i = 0		12.57		7.4		11.84		14.43		8.76		17.45
Pro>F		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
Hausman test - chi2		42.93		45.6		49.97		46.8		46.87		74.68
Prob>Chi2		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
Modified Wald test for		8.50E+0 5		6.60E+0 6		3.00E+0 5		5.80E+0 6		1.80E+0 7		3.10E+0 5

groupwise heteroskedasticity for FEM-chi2												
Prob>Chi2		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
Wooldridge test for autocorrelation in panel data		0.591		19.599		20.871		3.329		12.206		36.42
Prob>F		0.4435		0.0000		0.0000		0.0705		0.0007		0.0000
N	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018
t statistics in parentheses												
* p<0.05, ** p<0.01, *** p<0.001												

**Table 17: Non-linear relationship between capital structure and large ownership**

$CS_{it} = \alpha + \beta_1 BLOCK_{it} + \beta_2 BLOCK_{it}^2 + \beta_3 SIZE_{it} + \beta_4 MTB_{it} + \beta_5 PROFIT_{it} + \beta_6 TANG_{it} + \beta_7 GROWTH_{it} + \beta_8 NDTs_{it} + \beta_9 MIL_{it} + \epsilon_{it}$   
 CS indicates the market measures of short-term debt to total assets (SDM), long-term debt to total assets (LDM) and total debt to total assets (TDM).

Two different estimators are applied, including Random-effects (REM) and Fixed-effects (FEM)

	SDA		LDA		TDA		SDM		LDM		TDM	
	REM	FEM	REM	FEM	REM	FEM	REM	FEM	REM	FEM	REM	FEM
BLOCK	0.0308 (1.84)	0.0182 (0.99)	-0.0223 (-1.59)	-0.0248 (-1.52)	0.00744 (0.38)	-0.00658 (-0.31)	0.0314 (1.33)	0.0119 (0.46)	-0.0313 (-1.64)	-0.0477* (-2.18)	-0.0125 (-0.50)	-0.036 (-1.36)
BLOCK2	- 0.000719* (-2.08)	- 0.000467 (-1.23)	0.00044 3 (1.53)	0.00049 1 (1.46)	-0.00026 (-0.64)	2.41E- 05 (0.05)	-0.00075 (-1.53)	-0.00036 (-0.66)	0.00063 6 (1.61)	0.000970 * (2.15)	0.0001 48 (0.29)	0.00062 (1.14)
SIZE	0.0472** * (5.58)	0.0611** * (6.19)	0.0794* ** (11.53)	0.0799* ** (9.11)	0.125** * (12.72)	0.141** * (12.23)	0.0393** (3.29)	0.0560*** (4.02)	0.112** * (11.83)	0.126*** (10.77)	0.160* ** (12.62)	0.184** * (12.99)
MTB	0.0145* (2)	0.0247** (2.95)	0.0155* * (2.61)	0.0291* ** (3.91)	0.0334* ** (3.97)	0.0537* ** (5.51)	- 0.0368** * (-3.60)	-0.0123 (-1.04)	-0.00684 (-0.85)	0.0197* (1.99)	- 0.0322 ** (-2.99)	0.00591 (0.49)
PROFIT	- 0.241*** (-7.22)	- 0.224*** (-6.41)	- 0.157** * (-5.44)	- 0.107** * (-3.46)	- 0.382** * (-9.80)	- 0.331** * (-8.13)	- 0.191*** (-4.05)	-0.124* (-2.52)	- 0.147** * (-3.77)	-0.0573 (-1.38)	- 0.293* ** (-5.99)	- 0.181** * (-3.62)
TANG	-0.0328 (-1.52)	-0.0267 (-1.12)	0.188** * (10.41)	0.139** * (6.59)	0.137** * (5.45)	0.113** * (4.05)	- 0.0856** (-2.80)	-0.0505 (-1.50)	0.198** * (8.06)	0.159*** (5.62)	0.0983 ** (3.07)	0.109** (3.18)
GROWTH	0.000319	0.000339	-9.3E-05	-0.00011	0.00021	0.00023	0.000550	0.000570*	-	-	0.0001	0.00018

	**	**			9		**	**	0.00034 2*	0.000388 **	92	4
	(2.7)	(2.87)	(-0.88)	(-1.04)	(1.58)	(1.67)	(3.28)	(3.41)	(-2.41)	(-2.77)	(1.11)	(1.08)
NDTS	-0.0321	-0.028	-0.0541	-0.0587	-0.0869	-0.0867	-0.0569	-0.0304	-0.0439	-0.0293	-0.0894	-0.0603
	(-0.42)	(-0.37)	(-0.81)	(-0.87)	(-0.98)	(-0.97)	(-0.53)	(-0.28)	(-0.49)	(-0.32)	(-0.81)	(-0.55)
MIL	0.107***	0.117**	0.0972* **	0.0534	0.192** *	0.170** *	0.161***	0.144**	0.117** *	0.0182	0.250* **	0.171**
	(3.47)	(3.14)	(3.94)	(1.61)	(5.36)	(3.92)	(3.7)	(2.74)	(3.44)	(0.41)	(5.39)	(3.19)
Constant	- 0.455***	- 0.635***	- 0.932** *	- 0.922** *	- 1.365** *	- 1.557** *	-0.255	-0.480**	- 1.270** *	- 1.422***	- 1.625* **	- 1.925** *
	(-4.47)	(-5.43)	(-11.16)	(-8.88)	(-11.51)	(-11.41)	(-1.77)	(-2.91)	(-11.14)	(-10.24)	(-10.69)	(-11.47)
R2 (within)	0.0945	0.0971	0.1242	0.1294	0.2134	0.2182	0.0419	0.0469	0.117	0.1282	0.1631	0.1743
Wald test for REM - chi2	131.9		324.07		390.77		97.22		267.01		311.11	
Prob>chi2	0		0		0		0		0		0	
Breusch and Pagan Lagrangian multiplier test for REM - chibar2	2719.75		1630.55		2387.62		2542.11		1566.28		2491.8 3	
Prob>chibar2	0		0		0		0		0		0	
Overall F-test		15.21		21.02		39.47		6.96		20.8		29.86
Pro>F		0		0		0		0		0		0
F-test that all u_i = 0		19.4		11		18.06		18.58		11.42		23.21
Pro>F		0		0		0		0		0		0
Hausman test - chi2		26.51		52.39		37.27		33.44		66.17		76.77

Prob>Chi2		0.0017		0		0		0.0001		0		0
Modified Wald test for groupwise heteroskedasticity for FEM-chi2		7.30E+05		7.00E+06		4.80E+05		1.40E+31		7.20E+06		1.00E+08
Prob>Chi2		0		0		0		0		0		0
Wooldridge test for autocorrelation in panel data		56.469		78.033		96.324		53.281		59.113		75.399
Prob>F		0		0		0		0		0		0
N	1534	1534	1534	1534	1534	1534	1534	1534	1534	1534	1534	1534
c												
* p<0.05, ** p<0.01, *** p<0.001												



**Table 18: Check for non-linear relationship between capital structure and foreign ownership**

$$CS_{it} = \alpha + \beta_1 FOREIGN_{it} + \beta_2 FOREIGN_{it}^2 + \beta_3 SIZE_{it} + \beta_4 MTB_{it} + \beta_5 PROFIT_{it} + \beta_6 TANG_{it} + \beta_7 GROWTH_{it} + \beta_8 NDTS_{it} + \beta_9 MIL_{it} + \epsilon_{it}$$

CS indicates the market measures of short-term debt to total assets (SDM), long-term debt to total assets (LDM) and total debt to total assets (TDM).

Two different estimators are applied, including Random-effects (REM) and Fixed-effects (FEM)

	SDA		LDA		TDA		SDM		LDM		TDM		
	REM	FEM	REM	FEM	REM	FEM	REM	FEM	REM	FEM	REM	FEM	
FOREIGN	-0.191**	(0.10)	(0.04)	0.03	-0.213**	(0.06)	-	0.392**	-0.268**	(0.03)	0.07	-	0.373**
	(-3.23)	(-1.47)	(-0.88)	(0.58)	(-3.24)	(-0.86)	(-4.88)	(-3.04)	(-0.47)	(0.93)	(-4.55)	(-2.30)	
FOREIGN2	0.01	(0.13)	(0.04)	(0.10)	(0.04)	(0.23)	0.26	0.09	(0.07)	(0.18)	0.13	(0.08)	
	(0.08)	(-1.20)	(-0.48)	(-1.06)	(-0.40)	(-1.91)	(1.93)	(0.60)	(-0.68)	(-1.37)	(0.95)	(-0.54)	
SIZE	0.103**	0.160**	0.0726*	0.0520*	0.167**	0.212**	0.126**	0.192**	0.0808*	0.0548*	0.211**	0.255**	
	*	*	**	**	*	*	*	*	**	*	*	*	
	(9.21)	(11.23)	(8.60)	(4.19)	(13.53)	(13.36)	(8.29)	(10.05)	(6.78)	(3.28)	(13.30)	(13.43)	
MTB	0.0276*	0.0491*	0.0148*	0.0299*	0.0463*	0.0790*	-0.0222*	0.01	(0.01)	0.02	(0.02)	0.0256*	
	**	**		**	**	**							
	(3.63)	(5.45)	(2.47)	(3.79)	(5.49)	(7.85)	(-2.16)	(0.95)	(-1.20)	(1.47)	(-1.85)	(2.12)	
PROFIT	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.290**	0.249**	0.144**	0.107**	0.422**	0.356**	0.274**	0.199**	0.128**	(0.06)	0.364**	0.260**	
	*	*	*	*	*	*	*	*	*		*	*	
	(-8.86)	(-7.31)	(-5.19)	(-3.61)	(-11.57)	(-9.38)	(-6.20)	(-4.35)	(-3.37)	(-1.48)	(-8.16)	(-5.71)	
TANG	(0.00)	(0.00)	0.186**	0.120**	0.158**	0.119**	(0.03)	0.00	0.192**	0.140**	0.146**	0.146**	
			*	*	*	*			*	*	*	*	
	(-0.16)	(-0.03)	(10.13)	(5.43)	(6.27)	(4.23)	(-0.93)	(0.13)	(7.55)	(4.72)	(4.64)	(4.32)	
GROWTH	0.0258*	0.0221*	0.0264*	0.0235*	0.0511*	0.0456*	0.0345*	0.0304*	0.0345*	0.0316*	0.0704*	0.0652*	
	**	**	**	**	**	**	**	**	**	**	**	**	**
	(4.05)	(3.45)	(4.78)	(4.19)	(7.21)	(6.38)	(4.02)	(3.54)	(4.63)	(4.20)	(8.17)	(7.59)	

NDTS	(0.06)	(0.06)	(0.09)	(0.10)	(0.16)	(0.16)	(0.04)	(0.02)	(0.08)	(0.07)	(0.11)	(0.09)
	(-0.85)	(-0.75)	(-1.44)	(-1.59)	(-1.93)	(-1.92)	(-0.44)	(-0.23)	(-0.91)	(-0.81)	(-1.09)	(-0.88)
MIL	0.05	0.05	0.0876* **	0.05	0.122** *	0.0973*	0.0860*	0.06	0.111**	0.05	0.189** *	0.135**
	(1.53)	(1.31)	(3.57)	(1.46)	(3.49)	(2.32)	(2.00)	(1.21)	(3.23)	(1.10)	(4.27)	(2.67)
Constant	- 1.075** *	- 1.785** *	- 0.849** *	- 0.593** *	- 1.821** *	- 2.378** *	- 1.236** *	- 2.061** *	- 0.903** *	-0.590**	- 2.199** *	- 2.766** *
	(-7.97)	(-10.46)	(-8.28)	(-3.98)	(-12.18)	(-12.49)	(-6.72)	(-9.00)	(-6.24)	(-2.94)	(-11.47)	(-12.12)
R2 (within)	0.1705	0.1823	0.0705	0.0768	0.2636	0.2756	0.1129	0.1272	0.0413	0.0474	0.2215	0.2352
Wald test for REM - chi2	247.47		261.08		531.29		197.150 0		161.37		457.3	
Prob>chi2	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
Breusch and Pagan Lagrangian multiplier test for REM - chibar2	2279.81		1551.17		2091.49		2224.82		1453.22		2194.14	
Prob>chibar2	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
Overall F-test		31.8		11.87		54.28		20.79		7.09		43.88
Pro>F		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
F-test that all u_i = 0		21.05		11.74		19.79		22.42		13.44		27.6
Pro>F		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
Hausman test - chi2		56.8		67.77		53.38		56.79		66.63		72.98
Prob>Chi2		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
Modified Wald test for groupwise		2.50E+0 6		6.20E+0 7		3.90E+0 7		2.00E+0 6		1.20E+0 8		2.10E+0 6

heteroskedasticity for FEM-chi2												
Prob>Chi2		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
Wooldridge test for autocorrelation in panel data		53.578		61.598		80.452		49.313		45.54		122.197
Prob>F		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
N	1568	1568	1568	1568	1568	1568	1568	1568	1568	1568	1568	1568
t statistics in parentheses												
* p<0.05, ** p<0.01, *** p<0.001												

#### 4.4.2. Regression with all outside ownership variables

On the previous sections, we found an U-shape relationship between the state ownership and leverage, as well as a negative link between foreign/large ownership and debt ratios; we need to take into account all three ownership variables into a model to check the robustness of finding.

Results from FE regression is provided in the table 19. Consistent with sections 4.2 and 4.3, the short-term and total debt ratios show significant coefficients for foreign and large variables. Besides, an inverted U-shape link is also discovered with state ownership, however, only TDA and TDM show the significant at 95% confidence interval.

**Table 19: Regression with all outside ownership variables**

	SDA	LDA	TDA	SDM	LDM	TDM
STATE	0.482	0.176	0.658*	0.495	0.29	0.785*
	(1.70)	(1.22)	(2.23)	(1.52)	(1.90)	(2.50)
STATE2	-0.561	-0.271	-0.832*	-0.604	-0.44	-1.044**
	(-1.77)	(-1.17)	(-2.30)	(-1.68)	(-1.90)	(-2.77)
BLOCK	-0.00191***	-0.00112*	-0.00303***	-0.00102*	-0.000325	-0.00134*
	(-4.61)	(-2.12)	(-4.13)	(-1.98)	(-0.60)	(-2.06)
FOREIGN	-0.109*	-0.058	-0.167**	-0.109	-0.0953	-0.204**
	(-2.09)	(-1.13)	(-3.23)	(-1.77)	(-1.48)	(-3.27)
SIZE	0.139***	0.0582	0.197***	0.135**	0.0907	0.225***
	(3.60)	(1.35)	(3.70)	(2.93)	(1.83)	(4.12)
MTB	0.0599*	0.0385	0.0984	0.00487	0.0249	0.0297
	(2.27)	(1.03)	(1.74)	(0.19)	(0.73)	(0.77)
PROFIT	-0.214**	-0.184**	-0.398***	-0.149	-0.103	-0.252*
	(-3.08)	(-3.20)	(-4.88)	(-1.55)	(-1.70)	(-2.46)
TANG	-0.00607	0.164*	0.158*	0.0278	0.184*	0.212*
	(-0.11)	(2.09)	(2.05)	(0.43)	(1.99)	(2.55)
GROWTH	0.0224	0.018	0.0403	0.0401*	0.0345	0.0747**
	(1.18)	(1.00)	(1.47)	(1.97)	(1.62)	(3.02)
NDTS	-0.0572	-0.0502	-0.107*	-0.0522	0.0381	-0.0142
	(-1.28)	(-0.70)	(-2.26)	(-1.07)	(0.43)	(-0.19)
MIL	0.0974	0.121	0.218*	0.087	0.137	0.223*
	(1.36)	(1.57)	(2.34)	(0.96)	(1.69)	(2.48)
Constant	-1.644***	-0.708	-2.352***	-1.491*	-1.081	-2.565***
	(-3.45)	(-1.32)	(-3.59)	(-2.59)	(-1.74)	(-3.80)
N	738	738	738	738	738	738

t statistics in parentheses
* p<0.05, **p<0.01, *** p<0.001

#### 4.4.3. The influence of financial crisis

To alleviate the concern that the world financial crisis may drive results of this study during the period 2007-2009 (i.e., state ownership may have a linear relationship with capital ratios of Vietnamese listed firms, but financial crisis prevents one from detecting the link clearly), so we need to consider the impacts of the financial crisis. To do that, there are two ways: using an interaction term or dividing the sample into two sub-samples: crisis and non-crisis period.

In fact, the financial crisis has effects to many sides of business, not only debt ratio but also profitability, growth opportunities, and so on. When adding one interaction term in the model, only the coefficient for the variable involved is allowed to differ. But, when we run two separate regression models for two sub-groups, all coefficients are allowed to differ between these two groups. So, here it would be better to split the sample to see how the crisis affect to observed firms.

The results shown in Table 20 reflect differences on the influence of state ownership to the proportion of debt between two analyzed periods, using FEM. The table shows that the number of shares held by the local and central state has significant positive impact on long-term and total leverage (both book and market measures) throughout the crisis period with coefficients of 0.42, 0.49, 0.55, and 0.41, respectively.

This impact, however, disappeared after 2009. When other determinants are considered, firm size has a positive impact on the capital structure decision for both the post- and pre-crisis. Indeed, the results suggest that firms are more leveraged when they are large, which is consistent with the results of the empirical study by Booth et al (2001). The explanations are economies of scale, small bankruptcy costs, and reputation that bring them many advantages to borrow from banks.

Next, we describe the regression results of large ownership in table 21. It seems that the impact of blockholders do not hold strong while only TDA is affected by this kind of shareholders with a confidence interval of 90%.

Turning to table 22, the negative relationship between foreign ownership and leverage ratio is statistically significant for short-term, total and all market leverages for the period from 2009 to 2014. For the period before 2009, the associations are not significant except for the market measures of short-term and total debt ratios. The figures show that the association of different types of leverages and foreign ownership becomes stronger after the financial crisis.

When other determinants are considered, firm size has positive impact on the capital structure decision for both the post- and pre-crisis. Indeed, the results suggest that firms are more leveraged when they are large, which is consistent with the results of the empirical study by Booth et al (2001). The explanations are economies of scale, small bankruptcy costs, and reputation that bring them many advantages to borrow from banks.

Market-to-book ratio is also a strong determinant for prediction of the market timing hypothesis. The negative relationship between leverage ratio and profitability is consistent with previous studies, including those of Titman and Wessels (1988), Baker and Wugler (2002), and Huang and Ritter (2009). This result is predicted by pecking order theory because profitable firms can produce more internal funds to finance their operations; hence, they use fewer debts.

Tangibility and growth are important factors that affect long-term and total leverage of listed companies throughout the period 2009-2014 (Table 11).

We do not use clustered FEM because, for the period 2007-2009, the number of observations is too small while the number of clusters is too large. Hence, some statistical calculations, including t-test, Wald test, and Wooldridge test, could not be performed.

**Table 20: Regression results for crisis period (2007 -2009) and non-crisis period (2009- 2014) of state ownership**

	2007 - 2009						2009 - 2014					
	SDA	LDA	TDA	SDM	LDM	TDM	SDA	LDA	TDA	SDM	LDM	TDM
STATE	0.0742	0.420**	0.495***	-0.132	0.546***	0.414**	0.0684	-0.0179	0.0505	0.0868	-0.0432	0.035
	(0.61)	(3.18)	(3.57)	(-0.77)	(3.40)	(3.31)	(1.54)	(-0.48)	(1.02)	(1.52)	(-0.85)	(0.59)
STATE^2												
SIZE	0.153*	0.308***	0.461***	0.166	0.351***	0.517***	0.129***	0.0816***	0.210***	0.131***	0.117***	0.281***
	(2.33)	(4.36)	(6.22)	(1.80)	(4.08)	(7.72)	(5.59)	(4.18)	(8.21)	(4.41)	(4.46)	(9.09)
MTB	0.0464	0.148***	0.195***	-0.0976*	0.138***	0.0409	0.0402***	0.0223*	0.0625***	0.0174	0.0208	0.0414**
	(1.56)	(4.62)	(5.78)	(-2.33)	(3.54)	(1.34)	(3.67)	(2.40)	(5.12)	(1.23)	(1.66)	(2.81)
PROFIT	-0.271**	-0.084	-0.355***	-0.284*	-0.0354	-0.319***	-0.214***	-0.117*	-0.330***	-0.173*	-0.0162	-0.177*
	(-3.28)	(-0.94)	(-3.80)	(-2.44)	(-0.33)	(-3.78)	(-3.86)	(-2.48)	(-5.36)	(-2.42)	(-0.26)	(-2.37)
TANG	-0.135	0.0579	-0.0769	-0.0175	0.00452	-0.013	0.00813	0.0957**	0.104**	0.0167	0.100*	0.121*
	(-1.55)	(0.62)	(-0.78)	(-0.14)	(0.04)	(-0.15)	(0.23)	(3.13)	(2.59)	(0.36)	(2.43)	(2.48)
GROWTH	0.0191	-0.0146	0.00458	0.0368	-0.0114	0.0254	0.0143	0.0180*	0.0323***	0.0273*	0.0236*	0.0548***
	(1.07)	(-0.75)	(0.23)	(1.46)	(-0.49)	(1.39)	(1.69)	(2.51)	(3.43)	(2.50)	(2.44)	(4.81)
NDTS	-0.226	0.00353	-0.223	-0.291	0.19	-0.101	-0.0605	-0.0979	-0.158	-0.0713	-0.0452	-0.109
	(-0.58)	(0.01)	(-0.50)	(-0.53)	(0.37)	(-0.25)	(-0.68)	(-1.29)	(-1.59)	(-0.62)	(-0.44)	(-0.91)
MIL	-0.0957	0.258*	0.162	-0.271*	0.343**	0.0719	0.166**	0.132**	0.299***	0.170*	0.157*	0.400***
	(-1.05)	(2.61)	(1.57)	(-2.11)	(2.86)	(0.77)	(3.02)	(2.83)	(4.87)	(2.39)	(2.50)	(5.40)
Constant	-1.635*	-3.918***	-5.553***	-1.491	-4.463***	-5.952***	-1.506***	-0.974***	-2.480***	-1.453***	-1.389***	-3.275***
	(-2.07)	(-4.60)	(-6.21)	(-1.34)	(-4.30)	(-7.35)	(-5.26)	(-4.02)	(-7.78)	(-3.93)	(-4.24)	(-8.51)
R-Squared	0.1895	0.3148	0.4725	0.1841	0.2695	0.5108	0.1143	0.0785	0.2181	0.0696	0.056	0.1984

N	287	287	287	287	287	287	897	897	897	897	897	897
t statistics in parentheses												
*, ** and *** denote the significance level at 10%, 5%, 1% respectively												

**Table 21: Regression results for crisis period (2007 -2009) and non-crisis period (2009- 2014) of block ownership**

	2007 - 2009						2009 - 2014					
	SDA	LDA	TDA	SDM	LDM	TDM	SDA	LDA	TDA	SDM	LDM	TDM
BLOCK	-0.0515	0.0586	0.00706	-0.0603	0.0592	-0.00117	-0.00283	-0.00083	-0.00367*	-0.00248	-	-0.00304
	(-0.95)	(1.24)	(0.11)	(-0.73)	(0.95)	(-0.01)	(-1.84)	(-0.60)	(-2.13)	(-1.22)	(-0.32)	(-1.44)
SIZE	0.0128	0.127***	0.140***	0.0434	0.187***	0.230***	0.0820***	0.0932***	0.175***	0.0679***	0.131***	0.207***
	(0.51)	(5.8)	(4.65)	(1.13)	(6.45)	(6.19)	(5.58)	(7.03)	(10.64)	(3.48)	(7.29)	(10.28)
MTB	0.0336	0.0302	0.0637*	(0.02)	0.02	0.00138	0.0260**	0.0296***	0.0557***	(0.00)	0.0278*	0.0241
	(1.59)	(1.65)	(2.54)	(-0.71)	(1.00)	(0.04)	(2.88)	(3.63)	(5.49)	(-0.17)	(2.51)	(1.94)
PROFIT	-0.255***	-0.0471	-	-0.308**	(0.04)	-	-0.239***	-0.0994**	-0.338***	-0.134**	(0.03)	-0.161**
	(-3.84)	(-0.82)	(-3.82)	(-3.04)	(-0.47)	(-3.51)	(-6.43)	(-2.96)	(-8.13)	(-2.71)	(-0.61)	(-3.16)
TANG	-0.00827	0.0531	0.0449	-0.0739	-0.0234	-0.0973	-0.0186	0.147***	0.129***	-0.035	0.179***	0.144***
	(-0.15)	(1.14)	(0.7)	(-0.90)	(-0.38)	(-1.22)	(-0.69)	(6.08)	(4.27)	(-0.98)	(5.44)	(3.92)
GROWTH	0.000351	-0.0003	5.46E-05	0.000337	-	7.82E-05	-2.5E-05	-3.6E-05	-6.1E-05	0.000143	-	-1.8E-05
	(1.92)	(-1.87)	(0.25)	(1.20)	(-1.23)	(0.29)	(-0.18)	(-0.29)	(-0.40)	(0.79)	(-0.94)	(-0.10)
NDTS	-0.232	0.125	-0.106	-0.188	-0.106	-0.294	-0.0792	-0.113	-0.192*	-0.0709	-0.083	-0.151
	(-0.91)	(0.57)	(-0.35)	(-0.49)	(-0.37)	(-0.79)	(-1.09)	(-1.71)	(-2.35)	(-0.73)	(-0.93)	(-1.52)
MIL	0.101	0.0724	0.173*	0.107	0.0292	0.137	0.115*	0.0999*	0.215***	0.114	0.101	0.238***
	(1.66)	(1.38)	(2.4)	(1.16)	(0.42)	(1.53)	(2.52)	(2.43)	(4.2)	(1.88)	(1.80)	(3.81)
Constant	-0.0461	-1.490***	-	-0.259	-	-	-0.882***	-1.114***	-1.996***	-0.615*	-	-
			1.536***		2.128***	2.385***					1.544***	2.265***



	(-0.16)	(-5.83)	(-4.38)	(-0.58)	(-6.28)	(-5.48)	(-4.82)	(-6.75)	(-9.74)	(-2.54)	(-6.92)	(-9.05)
R-Squared	0.0901	0.1422	0.1842	0.0527	0.1415	0.1991	0.0924	0.1137	0.2218	0.0302	0.0902	0.1449
N	552	552	552	552	552	552	1179	1179	1179	1179	1179	1179
t statistics in parentheses												
*, ** and *** denote the significance level at 10%, 5%, 1% respectively												

**Table 22: Regression results for crisis period (2007 -2009) and non-crisis period (2009- 2014) of foreign ownership**

	2007 - 2009						2009 - 2014					
	SDA	LDA	TDA	SDM	LDM	TDM	SDA	LDA	TDA	SDM	LDM	TDM
FOREIGN	-0.115	0.0289	-0.086	-0.241*	0.0519	-0.190*	-0.108**	-0.0471	-0.155***	-0.111*	-0.107*	-0.222***
	(-1.68)	(0.51)	(-1.17)	(-2.49)	(0.69)	(-2.08)	(-2.84)	(-1.46)	(-3.77)	(-2.25)	(-2.44)	(-4.58)
SIZE	0.101	0.223***	0.324***	0.177*	0.255***	0.432***	0.174***	0.0974***	0.272***	0.186***	0.123***	0.332***
	(1.63)	(4.36)	(4.85)	(2.01)	(3.74)	(5.22)	(9.06)	(5.96)	(13.07)	(7.42)	(5.52)	(13.51)
MTB	0.0545	0.0867***	0.141***	-0.0537	0.0667*	0.013	0.0492***	0.0255**	0.0747***	0.0259*	0.0177	0.0436***
	(1.83)	(3.53)	(4.39)	(-1.27)	(2.04)	(0.33)	(5.19)	(3.16)	(7.29)	(2.1)	(1.61)	(3.6)
PROFIT	-0.359***	-0.0345	-	-	-0.00381	-	-0.241***	-0.0917**	-0.333***	-	-0.035	-0.215***
	(-4.46)	(-0.52)	(-4.52)	(-4.03)	(-0.04)	(-4.34)	(-6.68)	(-2.99)	(-8.53)	(-3.84)	(-0.84)	(-4.66)
TANG	-0.0906	0.0824	-0.0082	-0.141	0.0163	-0.125	0.0255	0.124***	0.149***	0.0246	0.148***	0.176***
	(-1.08)	(1.19)	(-0.09)	(-1.19)	(0.18)	(-1.12)	(0.93)	(5.29)	(5.01)	(0.69)	(4.63)	(5.02)
GROWTH	0.0172	0.00169	0.0189	0.0229	0.00248	0.0254	0.0226***	0.0197***	0.0423***	0.0276**	0.0260***	0.0572***
	(0.77)	(0.09)	(0.79)	(0.72)	(0.1)	(0.85)	(3.41)	(3.51)	(5.91)	(3.21)	(3.39)	(6.76)
NDTS	-0.255	-0.0156	-0.271	-0.116	-0.183	-0.299	-0.0678	-0.109	-0.177*	-0.049	-0.0897	-0.13
	(-0.73)	(-0.05)	(-0.71)	(-0.23)	(-0.47)	(-0.64)	(-0.92)	(-1.74)	(-2.21)	(-0.51)	(-1.05)	(-1.38)
MIL	0.0465	-0.0226	0.0239	-0.0274	-0.0462	-0.0736	0.0891*	0.0930*	0.182***	0.109	0.0942	0.251***
	(0.54)	(-0.32)	(0.26)	(-0.22)	(-0.49)	(-0.64)	(2.04)	(2.51)	(3.86)	(1.92)	(1.86)	(4.51)

<b>Constant</b>	-1.051	-2.638***	- 3.689***	-1.722	- 2.947***	- 4.668***	-1.993***	-1.154***	-3.147***	- 2.044***	-1.423***	-3.766***
	(-1.45)	(-4.41)	(-4.72)	(-1.67)	(-3.70)	(-4.82)	(-8.45)	(-5.76)	(-12.35)	(-6.67)	(-5.21)	(-12.52)
<b>R-Squared</b>	0.1681	0.2146	0.3527	0.1540	0.1420	0.3138	0.1533	0.0898	0.2774	0.0871	0.0650	0.2421
<b>N</b>	357	357	357	357	357	357	1364	1364	1364	1364	1364	1364
t statistics in parentheses												
*, ** and *** denote the significance level at 10%, 5%, 1% respectively												

#### 4.4.3. Large firms vs. Small firms

In the previous section, we use the log of total assets to define the size of firms. In this section, we will use the number of employees to observe the difference between small and large firms. A firm is considered as large when its employees are equal or more than 100. We can see most of observed firms have the large size. From the table 23, State seems to have no considerable impact on capital ratios of two sub-categories. Only for SDA, with 90% of confidence interval, the coefficient of State is 0.103. R-squared for this equation is quite high at 20.14%. As the previous section, we employ FEM only because clustered-FEM cannot provide t-statistic for sub-group of small firms due to the lack of observations.

Turning to table 24, the blockholders show their influence to the capital structure decisions of large firms with significant coefficients for SDA, TDA, SDM, and TDM. With the two book measures (SDA and TDA), the effect seems to be stronger with a confidence interval of 95%. However, this impact disappears from the group of small enterprises.

Considering table 25, it seems that effect of foreign ownership holds strong within 2 different size categories, especially in large firms. This result also shows the robustness of the previous outcomes. Considering to other determinants, firm size leaves its positive impacts on the capital structure decision for both post- and pre-crisis. Indeed, the results suggest that firms are more levered when they have large size, which is consistent with the empirical study of Booth et al (2001). The explanations are economies of scale, small bankruptcy costs, and reputation that bring them many advantages to borrow from banks. Market to book ratio is also a strong determinant as the prediction of the market timing hypothesis. The negative relationship between leverage ratio and profitability is consistent with previous studies, including Titman and Wessels (1988), Baker and Wugler (2002) and Huang and Ritter (2009). This result is predicted by pecking order theory because profitable firms can produce more internal funds to finance their operations so they use less debts. Besides, tangibility and growth are important factors as usual.

**Table 23: Regression results for large versus small companies of state ownership**

	Large company						Small company						
	SDA	LDA	TDA	SDM	LDM	TDM	SDA	LDA	TDA	SDM	LDM	TDM	
STATE	0.103*	0.02	0.120*	0.10	0.01	0.11	0.09	(0.01)	0.08	0.23	(0.01)	0.216*	
	(2.30)	(0.41)	(2.27)	(1.72)	(0.24)	(1.80)	(0.99)	(-0.17)	(0.86)	(1.95)	(-0.11)	(2.36)	
SIZE	0.179***	0.03	0.212***	0.191***	0.0524*	0.268***	0.03	0.167***	0.192***	0.02	0.195**	0.216***	
	(9.02)	(1.88)	(9.10)	(7.24)	(2.19)	(9.61)	(0.45)	(3.45)	(3.45)	(0.30)	(2.92)	(3.95)	
MTB	0.0811***	0.0378**	0.119***	0.02	0.03	0.0487*	(0.01)	0.03	0.02	(0.01)	0.02	0.02	
	(5.85)	(3.00)	(7.27)	(0.94)	(1.79)	(2.49)	(-0.60)	(1.87)	(1.01)	(-0.29)	(1.17)	(1.06)	
PROFIT	-0.210***	-0.0988*	-0.309***	-0.222**	-0.0249	-0.243**	-0.302*	-0.21	-	0.512***	-0.192	-0.147	-0.339**
	(-4.00)	(-2.08)	(-4.99)	(-3.18)	(-0.39)	(-3.28)	(-2.31)	(-1.89)	(-4.00)	(-1.19)	(-0.96)	(-2.69)	
TANG	0.04	0.0728*	0.109*	0.09	0.08	0.174**	(0.07)	0.00	(0.07)	(0.07)	(0.01)	(0.08)	
	(0.97)	(2.13)	(2.46)	(1.76)	(1.74)	(3.28)	(-0.82)	(0.02)	(-0.81)	(-0.65)	(-0.12)	(-0.98)	
GROWTH	0.0164*	0.0196**	0.0360***	0.0350**	0.0268**	0.0658***	0.0427	-0.00789	0.0348	0.061	-	0.0530*	
	(2.02)	(2.67)	(3.76)	(3.24)	(2.73)	(5.75)	(1.68)	(-0.36)	(1.39)	(1.94)	0.00804	(-0.27)	(2.16)
NDTS	-0.0775	-0.0199	-0.0974	-0.0798	0.0599	-0.0137	0.0528	-0.54	-0.488	-0.246	-0.791	-1.037**	
	(-0.90)	(-0.26)	(-0.96)	(-0.70)	(0.58)	(-0.11)	(0.15)	(-1.83)	(-1.43)	(-0.57)	(-1.94)	(-3.10)	
MIL	0.127*	0.176***	0.303***	0.121	0.193**	0.390***	0.193	0.224*	0.417***	0.05	0.294*	0.344**	
	(2.28)	(3.48)	(4.61)	(1.62)	(2.87)	(4.96)	(1.55)	(2.10)	(3.40)	(0.32)	(2.00)	(2.86)	
Constant	-2.137***	-0.437	-2.575***	-	-0.637*	-3.140***	-0.216	-2.003**	-2.219**	-	-	-	
	(-8.69)	(-1.96)	(-8.89)	2.164***	(-2.14)	(-9.06)	(-0.31)	(-3.37)	(-3.24)	0.0598	2.348**	2.407***	
R-Squared	0.2014	0.0616	0.2556	0.1381	0.0421	0.2404	0.1183	0.2137	0.348	0.0998	0.1564	0.3843	
N	813	813	813	813	813	813	205	205	205	205	205	205	

t statistics in parentheses

\*, \*\* and \*\*\* denote the significance level at 10%, 5%, 1% respectively

**Table 24: Regression results for large versus small companies of block ownership**

	Large company						Small company					
	SDA	LDA	TDA	SDM	LDM	TDM	SDA	LDA	TDA	SDM	LDM	TDM
BLOCK	-0.00473**	-0.00099	-	-0.00513*	-0.000901	-	-0.00444	0.0114	0.00699	-0.0147	0.00996	-0.00475
	(-2.83)	(-0.67)	(-2.91)	(-2.12)	(-0.45)	(-2.46)	(-0.10)	(0.3)	(0.14)	(-0.23)	(0.19)	(-0.08)
SIZE	0.0640***	0.0659***	0.130***	0.0577***	0.120***	0.180***	0.0237	0.0881**	0.112**	0.0745	0.0941**	0.169***
	(5.94)	(6.87)	(10.24)	(3.69)	(9.34)	(11.49)	(0.74)	(3.27)	(3.11)	(1.69)	(2.63)	(3.84)
MTB	0.0322**	0.0308**	0.0630***	-0.0287	0.0292*	-0.00234	-0.00647	0.0181	0.0116	0.00176	0.000571	0.00233
	(2.96)	(3.18)	(4.92)	(-1.81)	(2.25)	(-0.15)	(-0.47)	(1.57)	(0.75)	(0.09)	(0.04)	(0.12)
PROFIT	-0.241***	-0.0784*	-0.320***	-0.161**	-0.0428	-	-0.171	-0.168*	-0.338***	0.068	-0.069	-0.00106
	(-6.32)	(-2.30)	(-7.11)	(-2.89)	(-0.94)	(-3.66)	(-1.89)	(-2.22)	(-3.35)	(0.55)	(-0.69)	(-0.01)
TANG	-0.00896	0.133***	0.124***	-0.0289	0.140***	0.111**	-0.0276	0.0933	0.0656	-0.0624	0.0997	0.0374
	(-0.33)	(5.48)	(3.87)	(-0.73)	(4.30)	(2.81)	(-0.48)	(1.95)	(1.03)	(-0.80)	(1.57)	(0.48)
GROWTH	0.000340**	-0.00011	0.000231	0.000574***	-	0.000182	-0.00436	-0.00217	-0.00653	0.0187	-0.00149	0.0172
	(2.95)	(-1.06)	(1.71)	(3.44)	(-2.87)	(1.09)	(-0.31)	(-0.19)	(-0.42)	(0.98)	(-0.10)	(0.91)
NDTS	-0.0545	0.00852	-0.046	-0.0324	0.0482	0.015	-0.217	-0.249	-0.467	-0.456	-0.452	-0.908**
	(-0.68)	(0.12)	(-0.49)	(-0.28)	(0.50)	(0.13)	(-0.90)	(-1.24)	(-1.73)	(-1.38)	(-1.69)	(-2.77)
MIL	0.0957*	0.118**	0.214***	0.114	0.0928	0.218***	0.186*	0.0325	0.218*	0.195	0.0122	0.207
	(2.3)	(3.19)	(4.36)	(1.89)	(1.87)	(3.6)	(2.17)	(0.46)	(2.29)	(1.67)	(0.13)	(1.78)
Constant	-0.662***	-0.792***	-1.454***	-0.469*	-1.393***	-	-0.181	-1.000**	-1.181**	-0.747	-1.034*	-
	(-5.19)	(-6.97)	(-9.68)	(-2.53)	(-9.14)	(-10.19)	(-0.47)	(-3.13)	(-2.77)	(-1.43)	(-2.44)	(-3.43)
R-Squared	0.1104	0.1154	0.2183	0.0525	0.1291	0.1842	0.0583	0.1259	0.1778	0.0625	0.0719	0.1576

N	1234	1234	1234	1234	1234	1234	300	300	300	300	300	300
t statistics in parentheses												
*, ** and *** denote the significance level at 10%, 5%, 1% respectively												

**Table 25: Regression results for large versus small companies of foreign ownership**

	Large company						Small company					
	SDA	LDA	TDA	SDM	LDM	TDM	SDA	LDA	TDA	SDM		TDM
FOREIGN	-0.154***	-0.0181	-0.172***	-0.186***	-0.051	-0.237***	-0.121	-0.0392	-0.160*	-0.196*	0.0536	-0.142
	(-4.51)	(-0.60)	(-4.49)	(-4.00)	(-1.26)	(-5.14)	(-1.92)	(-0.79)	(-2.29)	(-2.29)	(0.76)	(-1.79)
SIZE	0.182***	0.0326*	0.215***	0.214***	0.0446*	0.269***	0.0432	0.143***	0.186***	0.0514	0.152**	0.203***
	(11.56)	(2.32)	(12.15)	(9.92)	(2.37)	(12.6)	(0.99)	(4.2)	(3.86)	(0.87)	(3.12)	(3.71)
MTB	0.0676***	0.0351***	0.103***	0.0161	0.02	0.0332*	-0.00502	0.0255	0.0205	-	0.027	0.0231
	(5.93)	(3.46)	(8.04)	(1.04)	(1.47)	(2.16)	(-0.30)	(1.92)	(1.09)	(-0.17)	(1.43)	(1.08)
PROFIT	-0.249***	-0.0824*	-0.331***	-0.220***	-0.0422	-0.265***	-0.337**	-0.254**	-0.591***	-0.164	-0.173	-0.337**
	(-6.91)	(-2.57)	(-8.21)	(-4.47)	(-0.99)	(-5.44)	(-3.31)	(-3.19)	(-5.23)	(-1.19)	(-1.51)	(-2.63)
TANG	0.0263	0.105***	0.131***	0.0396	0.124***	0.167***	0.017	0.0423	0.0593	0.0312	0.0243	0.0555
	(0.9)	(4.05)	(4.02)	(1)	(3.59)	(4.24)	(0.29)	(0.91)	(0.9)	(0.39)	(0.37)	(0.74)
GROWTH	0.0251***	0.0207***	0.0459***	0.0330***	0.0286***	0.0652***	0.0176	0.0119	0.0296	0.0623*	0.014	0.0763**
	(3.71)	(3.44)	(6.04)	(3.56)	(3.55)	(7.11)	(0.82)	(0.71)	(1.23)	(2.13)	(0.58)	(2.81)
NDTS	-0.0633	-0.056	-0.119	-0.0144	-0.0222	-0.0319	-0.15	-0.176	-0.326	-0.331	-0.377	-0.707*
	(-0.83)	(-0.82)	(-1.39)	(-0.14)	(-0.24)	(-0.31)	(-0.61)	(-0.91)	(-1.19)	(-0.99)	(-1.37)	(-2.28)
MIL	0.0439	0.101**	0.145**	0.0839	0.0916	0.209***	-0.0209	0.0933	0.0724	-0.15	0.125	-0.0246
	(1.03)	(2.66)	(3.03)	(1.43)	(1.8)	(3.6)	(-0.23)	(1.31)	(0.72)	(-1.22)	(1.23)	(-0.21)
Constant	-2.070***	-0.386*	-2.456***	-2.349***	-0.478*	-2.972***	-0.305	-1.673***	-1.978***	-0.284	-	-2.067**
	(-10.93)	(-2.29)	(-11.56)	(-9.08)	(-2.12)	(-11.58)	(-0.58)	(-4.05)	(-3.38)	(-0.40)	(-3.02)	(-3.11)
R-Squared	0.2199	0.1945	0.2927	0.1504	0.0417	0.2633	0.0788	0.1945	0.2497	0.0744	0.1114	0.2058

<b>N</b>	1265	1265	1265	1265	1265	1265	303	303	303	303	303	303
t statistics in parentheses												
*, ** and *** denote the significance level at 10%, 5%, 1% respectively												

## 5. Conclusion

This study is designed to explore the link between state ownership and the capital structure of Vietnamese listed firms over an eight-year period. In order to gain a complete picture of funding behaviors, we use data that cover all non-financial firms listed on HOSE whose sizes vary from very small to very large. Using four estimators (POLS, REM, FEM, and clustered FEM), we find no obvious evidence of the linear impacts of state ownership on six proxies of debt ratio. Results show, however, that the proportions of state investment are U-shaped with regard to short-term and total debt-to-asset ratio.

The results suggest that, when state ownership is low, firms tend to use more short-term debt; but, when state ownership is concentrated enough, firms become less geared and as a result the debt level decreases gradually. Since the level of long-term debt acquired by firms listed on HOSE is quite low, with an average of 8.6% for the observed period, the number of shares held by the state does not have a clear influence on this kind of borrowing. The results of this study are in contrast with the findings of previous studies using Vietnamese data, including studies by Nguyen et al. (2012), Okuda and Nhung (2012), and Phung and Le (2015).

In terms of large ownership, our paper is one of the first studies to analyze the impact of blockholders on the capital structure decisions of Vietnamese listed firms. The results demonstrate a significant negative relationship between large ownership and short-term and total leverage. This is because firms with high controlling ownership tend to reduce their level of debts to eliminate the monitoring requirement from creditors. Also, block shareholders in firms with highly concentrated ownership have to face increasing undiversifiable risks so they tend to reduce debt to eliminate bankruptcy and distress costs. Moreover, in firms with considerable large ownership, managers tend to act on the interest of shareholders under the pressure of powerful blockholders, so debts do not need to be issued. Finally, the existence of large ownership can be seen as evidence of good performance and a bright prospect, so large ownership can substitute for debts in playing a monitoring role.

Furthermore, our results suggest that the number of shares held by foreign investors affect negatively to the short-term and total debt ratios. The finding is consistent with the study of DN Phung and TPV Le (2013). Our results can be explained by some ways. Firstly, a large equity contribution from foreign investors could be an important reason. Indeed, foreign-owned firms had more available funding sources to substitute debt thanks to their skilled management,



wide-network of relationship, superior technology, strong brand name and reputation. Besides, Vietnam applies a low corporate tax rate of 20% on average, so the small benefits from debt tax shield may not enough to encourage foreign-owned firms to use more debts. Instead of using debts, keeping increasing foreign ownership is a good way to reduce not only over-investment problems caused by managers, but also the agency cost between managers and stockholders. Foreign ownership can substitute for debts by helping firms to strengthen the monitoring role, and reduce the cost of capital thanks to the existence of a group of external investors, professional analysts and economists who closely monitor firm managers.

Our paper provides clear implications for firm managers since a thorough understanding of the impact of our ownership on funding choices is necessary for the success of firm governance. It shows that ownership has a significant influence to funding choices of firms, implying their actively monitoring practice. Moreover, The substitute role between large as well as foreign ownership and debts remind firm managers about a strong internal monitoring system, so managers should adjust their activities as well as investment selections to be aligned with the interest of these investors. However, the observations are not large enough to run other estimators such as the generalized method of moments (GMM) to get more robust regression results.

Although this study can contribute to the understanding of the association between large ownership and capital structure, it only considers the Vietnamese stock exchange and thus may not be generalisable to other markets with different financial conditions. Furthermore, the lack of information in Vietnam prevents us from separating the differences in behaviour of institutional and individual shareholders. Furthermore, we do not clarify which side of debt-to-asset ratio is affected by outside ownership the most. Thus, future research can explore the specific component of capital structure (i.e., debt or equity) that is influenced more under the impact of blockholders, the direction of such relationships, and the differences in the influence of different types of large ownership.

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## **CHAPTER 3: THE HETEROGENEITY IN ADJUSTMENT SPEEDS TOWARD CORPORATE TARGET LEVERAGE: THE CASE OF VIETNAM**

**Abstract:** The paper aims to explore some new aspects of the issue of adjustment speed toward the target leverage for Vietnamese listed firms from 2005 to 2017 by adopting a partial adjustment model. Through testing the existence of the target leverage and estimating the speed of adjustment, the study tries to find evidence for heterogeneity in adjustment behavior. The assumption that the speed of adjustment is the same for all firms is inconsistent with the argument of the tradeoff theory which states that firms readjust their leverage by comparing the costs and benefits of adjustment. For different firms, these elements are different, leading to heterogeneity in speed. Even for a single company, the speed could change over time. To have an in-depth overview of the adjustment mechanism, this study goes to analyze different sub-samples of firms, i.e. above versus below the target; close versus far from the target; deficit versus surplus firms.

**JEL classification:** D91 D92 G32

**Keywords:** Capital structure; Target leverage; Speed of adjustment; Vietnam

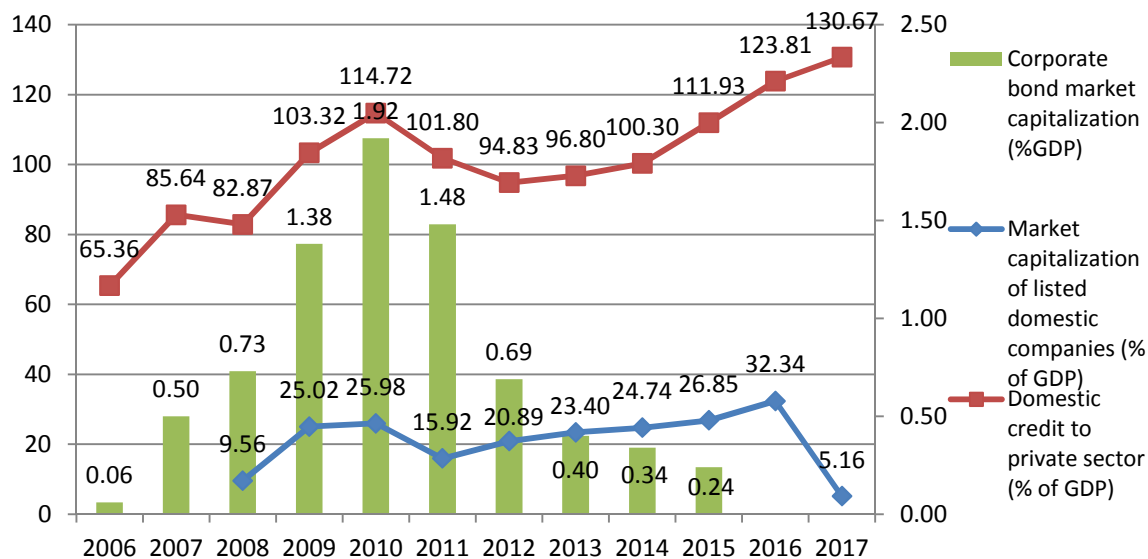
### **1. Introduction**

The issue of leverage determinants and adjustment speed towards the target have been explored by several papers. Based on the main theories, the tradeoff, pecking order and market timing as the most popular examples, the issue of how firms determine and readjust their capital structure attracts interest of researchers after the first work of Fischer et al. (1989). However, heterogeneity in the adjustment speed has not been well-explored. While such kind of studies for emerging countries is rare, China is the primary case. Another emerging market, Vietnam, which has specificities such as a bank-based economy, an under-developed bond market, and a blooming stock market, offers an interesting empirical ground to test corporate choices of funds.

Since 2009, Vietnam was ranked as a lower-middle income country by World bank (WB). After that, the Gross national income (GNI) keeps growing and reach of \$2,060 per capita in 2016. The Vietnamese government has set the long-term goal of becoming an upper-middle income country

by 2035. In particular, the short- and medium-term goals are maintaining stable economic growth, together with enhancing the process of industrialization and modernization.

**Figure 1:** Size of stock market, corporate bond market, and bank credit to the private sector



Source: Authors' calculation based on data from WB and MOF

At the end of 2010, Vietnam was ranked 16th in Grant Thornton's Emerging Markets Opportunity Index 2010. Since 2013, Vietnam has been on Morgan Stanley Capital International's review list to upgrade from frontier market to emerging market. Apart from the fast growing equity market, the Vietnamese corporate bond market is still relatively small, with the size only at 0.24% of GDP in 2015. The main reasons for this may due to the history of market development. In Vietnam, while the banking system has been developed over 70 years, the corporate bond market was only formed in 2000, and still seems to be in the early stage of its life. Indeed, only a small number of Vietnamese firms raise capital through issuing corporate bonds because of unattractive rates, undiversified bond types and low liquidity. Thus, the banking sector still plays an important role in providing capital for business. According to an IMF 2016 report, bank loans acquired by the Vietnamese listed firm are dominated by short-term borrowing.

Empirical studies of the capital decisions of Vietnamese companies began in the mid-2000s, and there are some focused on determinants of funding choices, for example, Nguyen and Ramachandran (2006), Biger et al. (2007), Nguyen et al. (2012), Okuda and Nhung (2012), Le (2015) and Thai (2017). However, studies on target leverage and movement speed to alleviate the deviation between the current and target position are very rare. The first study examining the existence of target leverage of Vietnam listed firms was by Dereeper, Sébastien and Trinh (2012). Based on the data of 300 listed firms from 2005 to 2011, they test the trade-off against pecking order hypotheses, and find that the latter theory cannot be applied for Vietnamese firms since equity issuance is not related to debt to asset ratio. They also make a comparison between private and state-owned companies to show that there was a big difference in financing decisions between the two subgroups. Specifically, they find while state-controlled firms need one and a half years to offset the gap between the current debt position and the optimal level of debt, private ones need double the time to do the same thing.

Three years after the first study by Dereeper, Sébastien and Trinh, of 47 real-estate enterprises throughout the period of 2008-2013, Minh and Dung (2015) use two groups of estimators (static, i.e., pooled ordinary least squares, random effects, fixed effects, and dynamic, i.e., generalized method of moments) to test the pecking order. They find that this theory is relevant in explaining funding behaviors of firms, and they find evidence of an adjustment speed of 45.2% per year. They assume that the speed is homogeneous for all firms, so the finding is inconsistent with the argument of the tradeoff theory which states that firms readjust their leverage by comparing the costs and benefits of adjustment. Indeed, for different firms, these elements are different, leading to heterogeneity of speed, and even within one company, the speed could change over time. Besides, their sample of 47 firms was quite small to ensure the robustness of their finding.

Our study contributes to the existing literature on capital structure decisions in several ways. First and most important, it is the first one which provides an in-depth examination of the heterogeneity in adjustment behavior of Vietnamese listed firms. We find that firms, which are below the target, often move to the target faster than those that are over-leveraged, which suggest they have greater benefits and lower costs of being at the target point.

Secondly, the speed of near-target firms is lower than that of off-target firms, and this finding holds strong with both market and book proxy of leverage. When combining the direction of the



deviation to the distance to the target, we find that the faster speed concerns off-and-below-target firms.

Last but not least, our study shows that a firm's cash flow situation has a strong effect on the incentive to offset the deviation from the target leverage ratio. Specifically, firms with a financial surplus tend to move more quickly to the optimal level of debt than those with a deficit. Indeed, financially constrained companies may find it more expensive and even impossible to issue additional securities that would help them attain the optimal level of debt. In the Vietnam's context, we are the first to investigate changes in the adjustment speed with budget constraints. Comparing to the past literature, our observed sample is the most complete, covering 10,789 observations on all exchange markets over a 13-year period, rather than focusing only on the Ho Chi Minh stock exchange like other papers on the same market, thus providing an overall look of the capital structure of Vietnam firms.

The remainder of the paper is structured as follows. Section 2 presents the previous literature on the target leverage, and the speed of adjustment towards the target. Section 3 describes the data and discusses the methodology. Section 4 shows the empirical findings and section 5 concludes the paper.

## **2. Literature review**

The trade-off theory (Kraus & Litzenberger, 1973) argues that there is an optimal target capital structure, which is the level of debt that a company is most comfortable at, and wishes to maintain. According to the static trade-off theory, the optimal leverage is determined by trading-off benefits and costs of using debt. On the one hand, use of debt has advantages of tax saving over equity. On the other hand, costs may arise in the event of bankruptcy, which diminishes the benefits of debt. Financial distress occurs when firms have problems with meeting financial obligations on time. This situation can lead to serious problems, for instance, firms have to forgo beneficial opportunities, lose loyal customers, or are unable to negotiate new contracts.

The static trade-off study suggests that adjustment will occur immediately and completely whenever deviations to the optimal leverage exist in order to maximize firm value since the re-balancing is cost-less. The dynamic version of the trade-off theory (Fischer et al., 1989; Strebulaev, 2007) states that the adjustment is costly, and costs of adjustment can prevent firms from correcting their level of debt immediately. The debt to equity ratio of a firm can be different

from the target capital structure because of many different reasons, for instance the market on which this firm lists its stocks change constantly, so the share value also changes unforeseeable; or cost of raising capital is too high so achieving the target is not favorable. Firms will avoid readjusting when the cost of adjustment is higher than the loss caused by a non-preferable level of debt (Fischer et al., 1989). This implies that actual debt-to-asset ratios tend to mean-revert around the target leverage. However, within this framework, the target is unobservable empirically, so researchers are only able to measure the speed of movement toward the target, instead of determining a specific target point. A fast speed is considered as an evidence of trade off theory.

By contrast, the other theories, including the pecking order and market timing theories, through supporting no target leverage, imply a slow speed of movement. Pecking order hypothesis (Myers and Majluf, 1984) ranks internal funds as the most favorable sources, followed by debt; and equity is considered as a last resort financing. The information asymmetry between firm managers and outside investors makes issuing equity costly. This order arises because investors perceive that better firms will be reluctant to issue common stock in order to protect the claim of current shareholders, while worse firms will always issue common stock, because it is overvalued. Thus, on average they will value a firm at lower levels, reflecting the costs of adverse selection. Since adverse selection costs are larger for equity issuance in comparison to debt (i.e., equity is more sensitive to informational asymmetries than debt), issuing equity will not be the most favorable choice (Myers and Majluf, 1984). Furthermore, the theory implies an order in issuing securities. Securities with a lower sensitivity to information costs dominate those with a higher such sensitivity. Regarding debt, its maturity matters. Indeed, short-term debt is less sensitive to information, thus preferred to long-term debt, and secured debt dominates unsecured debt (Frank and Goyal, 2003).

According to the market timing theory (Baker and Wurgler, 2002), market conditions give firms incentives to raise capital. Equity is used by firms when it is overvalued by the market, which sends pessimistic information to investors about future firm performance. A slow speed also means leverage in the past has an important role in deciding the current leverage position.

The theories of capital structure implicitly assume that company has access to efficient capital markets so most of empirical research on movement speed used data in developed countries or regions. A survey of 392 chief financial officers (CFOs) was conducted by Graham and Harvey

(2001) to test whether firms have an optimal ratio of debt. The responses indicate that 81 percent of observed firms do have a target debt ratio when only 19 percent of the sample answered no. Among firms targeting their debt-to-equity ratio, 37% of CFOs affirm that the ratio is flexible, 34% affirm they have a pre-determined range of the target, and 10% even argue their firm has a “strict target”. Moreover, large companies seem more likely to have an optimal level of debt in comparison to small firms.

To calculate the rate of adjustment, the partial adjustment model (both one-step and two-step approaches) are used in many articles; the results obtained are mixed. Fama and French (2002) use a two-step partial adjustment function and obtain a speed ranging from 7% to 17% annually. They find that the pecking order and trade-off theories are not relevant in explaining the financing choices made by U.S firms. Roberts (2002) finds that the speed can even be close to 100% for some industries.

Korajczyk and Levy (2003) test the relationship between debt ratios and financial constraints. They find that constrained firms move to the target slower, but their securities issuance selections are more sensitive to the deviations from the target than unconstrained firms. They state that the financially constrained firms often do not have sufficient cash to undertake investment opportunities and have to face higher agency costs when accessing financial markets.

Leary and Roberts (2005) also find that firms have a target debt-to-equity ratio and actively re-adjust their current capital structures to get closer to the target over time. Particularly, they investigate that companies tend to expand their debt if their current debt-to-asset ratio is relatively low, or if their debt ratio is declining, or if their indebtedness has recently been reduced by past financing choices, and vice versa. They document that firms readjust their capital structure actively to reach the optimal level of debt.

Based on the sample of the US companies over the period between 1965 and 2001, the results obtained by Flannery and Rangan (2006) support the dynamic trade-off theory, with firms moving to their target at the rate of 34.1% per year. Kayhan and Titman (2007) employ the OLS estimator and found that it takes firms one year to offset around 8% of the deviation from the optimal leverage measured by market value, and 10% per year when the book measure of leverage is used.

Drobetz and Wanzenried (2006) find that further-away-from-the-target-leverage firms adjust more rapidly. Their explanation is that the fraction of the fixed costs of adjustment is significant, so firms will only alter their leverage when they are sufficiently far away from the target.

Byoun (2008) considers two different cases. For firms suffering a financial deficit, they document that the adjustment speed will be faster when firms acquire less debt than the optimal level (20% when firms are below versus 2% when firms are above the target). The reason is deficit makes the transaction costs become higher for equity in comparison to debt, or in other words, debt becomes cheaper to issue. Otherwise, when firms falling into a surplus, the speed will be faster when firms stay above the optimal level with 33% per year compared to 5% of below-the-target firms.

Huang and Ritter (2009) support the market timing hypothesis. They find a speed of 11.3% per year after employing a long-difference panel estimator. Öztekin and Flannery (2012) find an adjustment speed of 21.11% per year across a sample of 37 countries; this means it takes firms around five years to offset the whole deviation from the current leverage to the target.

Employing the method of generalized method of moments (GMM), Faulkender et al. (2012) focus on firm-level heterogeneity and find that the speed of adjustment towards the target is asymmetric between over- and under-levered firms with the speeds of 29.8% for the under-levered companies versus 56.4% for over-levered ones. They also note that financial deficit or surplus as well as other factors, for instance growth opportunities and the availability of funds, influence strongly in the benefits and costs of adjustment.

Chang and Dasgupta (2009) suggest that previous tests of the existence of target leverage are inclusive and that the partial adjustment model has no power to reject the null of non-target behavior. They contribute to the existing empirical studies by applying a new methodology called “debt-equity choice”.

Hovakimian and Li (2011) use debt-equity choice and partial adjustment model simultaneously. They find that both models provide misleading estimates that may be interpreted as consistent with the target-adjustment hypothesis. To avoid such a bias, they suggest to use historical fixed effects proxies. Besides, at the second stage of the partial adjustment model or the debt-equity choice, the lagged leverage and target variables should be introduced into the models separately.

The bias appears to be alleviated partly by using a joined method which is the combination of the two methods above, and by excluding outliers, that is, extremely high leverage observations.

Faulkender et al. (2012) document that financial deficit affect the speed at which firms adjust toward their target debt ratios. They demonstrate that firms with large deficit/surplus adjust more adjust more rapidly toward their target debt ratios than firms with similar deviations but deficit/surplus near zero.

Guo et al. (2016) find that the economic reform in China, with attaches to the privatization and state ownership's reducing, has significantly increased the adjustment speeds for under-leveraged firms, but seems to have no effect on over-leveraged firms, making below-target firms move to the target faster than above-target one.

### **3. Methodology**

#### **3.1. Data**

In Vietnam, reliable audited financial data are available only in financial reports of listed companies; therefore, the current paper focuses on that type of firm to ensure empirical results. The raw database is from Stoxplus. We dropped 3,040 firm-year observations of the financial industry since they are different from other industries in terms of operations and regulations.

The study investigates an unbalanced panel data of non-financial Vietnamese listed firms from 2005 to 2017. Data prior 2005 is not available so expanding the observed period is not possible.

In line with previous empirical studies, we deal with the problem of outliers by (1) dropping observations where book leverage exceeds 1 or is missing, and (2) winsorizing all variables at the 1% level. Finally, we have a dataset which comprises 10,789 observations spanning over 9 industries, including Basic Material, Healthcare, Industrials, Oil & Gas, Technology, Telecommunications, Consumer Goods, Consumer Services and Other. 49.41% of observations concern industrials firms, followed by consumer goods (18.14%). Market leverage is higher than book leverage for all industries.

**Table 1:** Data summary, by industry from 2005 to 2017

Industry	Frequency	Percent	Mean of total book leverage	Mean of total market leverage
Basic Materials	1,342	12.44%	0.2970	0.5207
Consumer Goods	1,957	18.14%	0.3030	0.5288
Consumer Services	1,144	10.60%	0.1647	0.4008
Health Care	475	4.40%	0.2169	0.5211
Industrials	5,331	49.41%	0.2478	0.5814
Oil & Gas	77	0.71%	0.2201	0.5913
Technology	358	3.32%	0.1661	0.4883
Telecommunications	46	0.43%	0.1044	0.4893
Other	59	0.55%	0.2785	0.5990

### 3.2. Empirical model

#### 3.2.1. Partial-adjustment model

Most prior studies in the leverage adjustment literature, such as Flannery and Rangan (2006), Lemmon, Roberts, and Zender (2008), Huang and Ritter (2009), adopt the partial adjustment model. Following them, we use the basic partial-adjustment model which is widely used to estimate how fast the firm offsets the deviation from the target

$$DR_{i,t} - DR_{i,t-1} = \lambda (DR_{i,t}^* - DR_{i,t-1}) \quad (1)$$

where:  $DR_{i,t}$  is the target debt ratio of firm  $i$  in year  $t$ ;  $\lambda$  is the speed of adjustment to the target each year of the firm  $i$ ;  $DR_{i,t}$  is the debt ratio of the firm  $i$  at time  $t$ , which can be measured based on market value (TDM) or book value (TDA);  $DR_{i,t-1}$  is the debt ratio of the firm  $i$  at time  $t-1$  (i.e., the lagged debt ratio). This means the change in leverage each year is determined by the speed of adjustment and the gap between the target and the lagged leverage.

The equation (1) can be expressed as

$$DR_{i,t} = \lambda DR_{i,t} + (1 - \lambda) DR_{i,t-1} + \epsilon_{i,t} \quad (2)$$

which means the observed debt to asset ratio of the firm  $i$  at time  $t$  is a weighted average of the lagged one and the target with the weights at  $(1 - \lambda)$  and  $\lambda$ , respectively.

However, the target term of leverage  $DR_{i,t}$  is unobservable, so the prediction based on determinants can be used as a proxy for the target:

$$DR_{i,t} = \beta X_{i,t} + \epsilon_{i,t} \quad (3)$$

where  $X_{i,t}$  is a set of factors related to leverage ratio in year  $t$ , including firm size (SIZE), profit (PROFIT), tangibility (TANG), growth opportunity (GROWTH), market-to-book ratio (MTB), non-debt-tax shield (NDTS), and industry median leverage (IML), which are suggested by the most popular empirical studies. Reflecting the fact that target may differ over firm or over time, the error term  $\epsilon_{i,t}$  is under the effects of time, firm, and other disturbance factors.

From (2) and (3), we have the plain partial-adjustment model without unobservable indicator of the target

$$DR_{i,t} = \lambda \beta X_{i,t} + (1 - \lambda) DR_{i,t-1} + \epsilon_{i,t} \quad (4)$$

By setting  $\alpha = 1 - \lambda$  and  $\gamma = \lambda \beta$ , we have the common constant coefficients model

$$DR_{i,t} = \alpha DR_{i,t-1} + \gamma X_{i,t} + \epsilon_{i,t} \quad (5)$$

To explore capital structure determinants and adjustment speed toward the target leverage, previous studies often employ 2 different types of estimators, including static (e.g., POLS, RE and FE), and dynamic (e.g., instrumental variable (IV), difference-GMM and system-GMM). Among those, POLS does not take into account the problem of unobserved heterogeneity caused by the correlation between the lagged leverage and firm fixed effects. It overestimates lagged leverage coefficient, leading to the underestimating of the speed of adjustment. FE results are also biased because of the correlation between the lagged leverage and transformed error terms, but in the downward trend.

In terms of dynamic estimators, some studies apply the “Anderson-Hsiao’s just-identified instrumental variable” (i.e. AH-IV) (Anderson and Hsiao, 1982) since it can help to identify the issue of endogeneity, where the instrument for the first-difference of leverage lagged by one period is the two-period lagged leverage. This means we have to sacrifice the sample depth for

instrument lag depth (Roodman, 2009). Difference-GMM method (Arellano and Bond, 1991, Blundell and Bond, 1998) is supposed to be more efficient compared to the AH-IV because it sets missing observations of lags equal to 0. However, this method suffers potentially endogenous issue. System-GMM is more advanced when dealing with short, wide panels (i.e. “small T large N” sample) by expanding the set of instruments with lagged differences instead of using the available lag like difference-GMM. Indeed, this study employs the system-GMM method, and command `xtabond2` on Stata14 is used<sup>4</sup>. We then run AR2 to test the second-order serial correlation of the error term. In addition, the validity of instruments is checked by the Hansen test.

To have an in-depth knowledge of the heterogeneity in adjusting mechanism, we run the partial adjustment model (5) for different groups of firms, i.e. above versus below the target, close versus far from the target, small- and medium-sized enterprises (SMEs) versus large firms, before versus after the financial crisis; financial deficit versus surplus, and report the results in section 4.1.

To determine if a firm is above or below, near or off the target, we consider the deviation between the current position and the target leverage.

$$\text{Deviation} = DR_{i,t} - DR_{i,t} \quad (6)$$

where  $DR_{i,t}$  is defined by the equation (3), and if  $DR_{i,t}$  is smaller than 0 or larger than 1, we use “industry median leverage” instead. With equation (6), if the deviation is less than 0, it means firms are acquiring more debt than they should be (i.e., above the target). On the contrary, if the deviation is higher than 0, firms are below the target.

We also calculate the median of deviation for each industry, and compare it with the deviation of each firm. Regardless of the direction of the deviation, firms below the median (near-target firms) are separated from those above the median (off-target firms).

Inspired by Korajczyk and Levy (2003), we also take into account financial situations when calculating the adjustment speed. We also follow their definition of financially constrained firms (i.e., deficit) that this kind of firms often do not have sufficient cash to undertake investment opportunities and have to face higher agency costs when accessing financial markets.

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<sup>4</sup> See Roodman (2009) to know how to run system-GMM on Stata



We use the deficit calculation of Frank and Goyal (2003) when examining the differences between firms that have financial deficit and those that are in surplus. Deficit, according to Frank and Goyal (2003), is equal to

$$= \frac{(\text{Dividend payments} + \text{investments} + \text{change in working capital} - \text{internal cashflow})}{\text{Total assets}}$$

where :

Change in working capital = Change in current assets – change in current liabilities

Internal cash flow = Cash Flow from Operating Activities + Cash Flow from Investing Activities  
+ All Uses of Cash in Financing Activities.

However, in this study, the information of “All use of cash in financing activities” are missing, thus we use the “cash flow from financing” as an alternative.

If a firm’s deficit is smaller than 0, it will be classified as “surplus”. Otherwise, it belongs to the “deficit” sub-sample.

### 3.3. Variables

#### 3.3.1. Dependent variable

Our study uses both book and market proxies of leverage. Consistent with Frank and Goyal (2009), the market leverage is calculated by taking the total book value of debt divided by the total market value of a firm, which is the sum of outstanding debt (both short and long-term) plus the market capitalization of equity.

**Table 2:** Explanation of dependent variables

Variable	Description	Measurement
TDA	Book leverage	$\frac{\text{Long – term debt} + \text{Short – term debt}}{\text{Total assets}}$
TDM	Market leverage	$\frac{\text{Long – term debt} + \text{Short – term debt}}{\text{Long – term debt} + \text{Short – term debt} + \text{Market capitalization}}$

### 3.3.2. Independent variables

After reviewing existing literature on the same topic, we choose seven main factors, including firm size, profitability, tangibility, growth, market to book ratio, non-debt tax shield and industry median leverage for 10 sectors of industry.

Firstly, most studies show a positive relationship between size and firm leverage, which supports the tradeoff theory. The reason is that large firms are believed to have less risks of default (Booth et al., 2001). Thus, creditors may feel safe when providing loans. In addition, large firms with large fixed assets and stable operating cash flows can meet financial obligations easier than smaller firms.

On the contrary, the pecking order theory implies a negative relationship between firm size and leverage. It implies that larger firms incur less information asymmetry problems because they are observed by many analysts as well as investors, and have more retained earnings compared to smaller firms. In Vietnam, the studies of Nguyen and Ramachandran (2006), Biger et al. (2008) exhibit a positive relationship between firm size and its level of debt.

The second determinant is firm profitability. The trade off theory suggests a positive association between the two, since the more debt the high-profitable firms use, the more tax they can save under the effect of the debt tax shield. In addition, when firms are highly profitable, equity holders prefer to acquire more debt in order to reduce the free cash flow left in the hands of managers (Jensen, 1986). In contrast, the pecking order ranks internal fund as the most favorable source to use, so firms generating high profits, that is, high retained earnings, will acquire less debt (Titman & Wessels, 1988). Fama and French (2002) find evidence of the pecking order.

The next factor is tangibility, which is determined by the relative amount of fixed assets. The trade off theory implies that the level of tangible assets has a positive relationship with leverage since a high level of easy-to-liquid physical assets will secure loans in case of bankruptcy, and can be used as collateral for debt. However, when assets are highly firm-specific or industry-specific, meaning low liquidation, they are often funded by internal sources or by long-term debt, making the sign of the link between tangibility and leverage unclear. When testing Vietnamese firms, both Nguyen and Ramachandran (2006), Nha et al. (2016), and Thai (2017) find that firms with high level of tangible assets are more levered.

The evidence on the influence of firm growth to the level of debt is mixed. The pecking order theory predicts a positive association between growth and debt to asset ratio since retained earnings cannot satisfy capital demand of high growth firms (Köksal & Orman, 2015). However, firms in high-growth stage often suffer more default risks, so firms may be less levered in the growth stage. For Vietnamese firms, Nguyen and Ramachandran (2006), Biger et al. (2008), Thai (2017) find a positive link between two variables.

The market to book ratio, which reflects the market valuation of the firm, can be considered as the most significant factor influencing financial decisions by firms (Frank & Goyal, 2009). The market timing theory states that firms tend to issue equity when their shares are highly appreciated by the market, so a negative relationship between debt ratio and market to book ratio is expected. Besides, high market-to-book ratio often goes with higher bankruptcy cost, and firms will want to eliminate agency cost problems by using less debt. In Vietnam, however, Thai (2017) finds a positive relationship between the two.

Non-debt tax shield is calculated based on the size of depreciation and amortization expenses. This factor is predicted to be negatively associated with leverage by the trade-off theory. Companies with large non-debt tax shields are supposed to use less debt because depreciation and amortization reduce the amount of tax that firms have to pay to the government, reducing partly the benefit of using debt.

As can be seen from the table 1, it is obvious that some industries are highly levered compared to the others. For example, telecommunications are characterized by high market gearing while technology has the lowest level of debt, on average. The impact of industry leverage on firm leverage is analyzed in many studies, among which those of Harris and Raviv (1991) and Frank and Goyal (2009) are popular examples. Bradley et al. (1984) stat that industry alone can explain around 25% of leverage movement. Two reasons for this relationship are (1) firm managers may use industry leverage as the benchmark for their funding decisions, and (2) industry factors account for a bunch of omitted factors (Frank and Goyal, 2009). However, research on the funding decisions of Vietnamese listed firms rarely mentions this factor because the lack of an industry classification system causes many difficulties in collecting data related to industrial leverage.

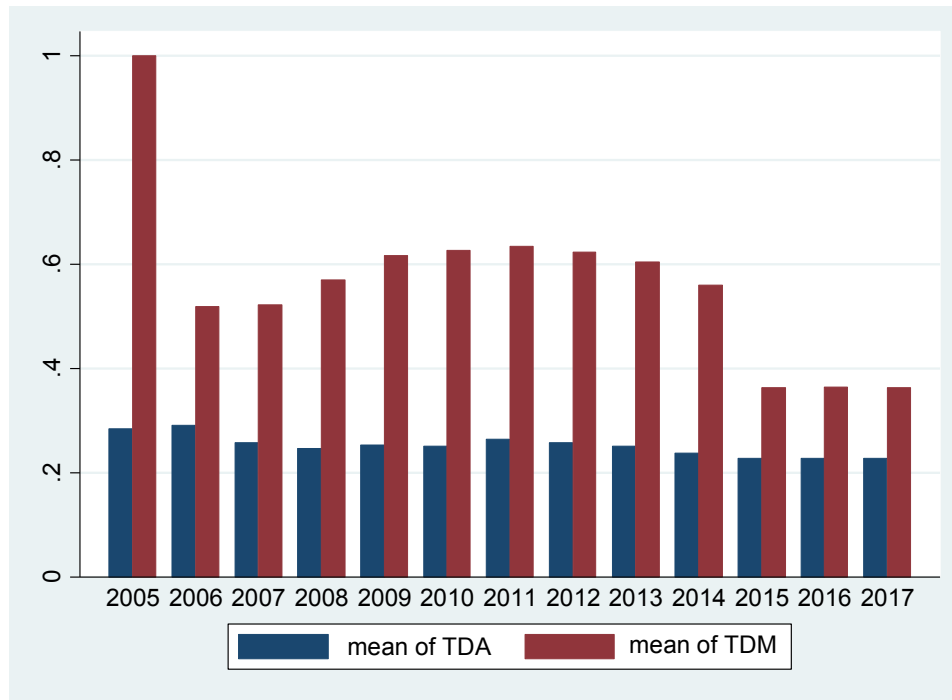
**Table 3:** Explanation of independent variables

Variable	Description	Measurement	Trade off	Pecking order	Market timing
SIZE	Size	Logarithm10 (Total assets/23000)	+	-	?
PROFIT	Profitability	$\frac{\text{Earnings before interest, tax and depreciation}}{\text{Total assets}}$	+	-	?
TANG	Tangibility	$\frac{\text{Net fixed assets}}{\text{Total assets}}$	+	-	?
GROWTH	Growth	$\frac{\text{Total assets}_t - \text{Total assets}_{t-1}}{\text{Total assets}_{t-1}}$	-	+	?
MTB	Market to book	$\frac{\text{The market value of equity}}{\text{The book value of equity}}$	-	+	-
NDTS	Non debt tax shields	$\frac{\text{Depreciation and amortization expenses}}{\text{Total assets}}$	-	?	?
MIL	Median Industry leverage	Median Industry leverage for given year Note: Depending of whether TDA and TDM are used, we calculate book_MIL and market_MIL correspondingly.	?	?	?

### 3.4. Data summary

Figure 2 presents the change in two leverage proxies TDA and TDM over 13 years, from 2005 to 2017. It shows that on average, Vietnam listed firms use considerable levels of debt over time, with both market and book measures. The distance between the two proxies is strong, reflecting the fact that in financial reports, the value of assets is recorded higher than the value assessed by the market. The book leverage has been relatively stable over time while a down-up-down pattern can be seen in the market leverage measure.

**Figure 2:** Average leverage for the period between 2005 and 2017



We notice that the variable TDM is huge (close to 1) in 2005. 2005 is the first year that the second exchange market (Hanoi stock exchange) begins its operations. In the same year, VN-index has an unpredictable rising on its points, and the owning room of foreign investor increases from 30% to 49%. All of these events made the market value of leverage change irregularly. However, it has little effect on my results since the number of observations for 2005 is small (only 225 firm-year observations), and we also fix year-effect when running estimators.

Table 4 shows that observed firms are quite profitable when the earnings before interest and tax account for more than 12% of the total assets. About 28% of total assets are tangible, and the market value of shares is more than three times higher than the book value of shares. Interestingly, the average market leverage is about two times higher than the book one. Correspondingly, the median value of industry market leverage is more than two times higher than that of industry book leverage.

**Table 4:** Descriptive statistics of regression variables

Variable	N	Mean	S.D.	Quantiles				
				Min	0.25	Median	0.75	Max
TDA	10,789	0.25	0.21	0.00	0.05	0.22	0.41	0.77
TDM	10,209	0.56	0.38	0.00	0.19	0.60	1.00	1.00
SIZE	10,789	26.44	1.40	23.50	25.49	26.34	27.30	30.42
MTB	8,780	3.80	4.38	0.00	1.21	2.44	4.59	26.68
PROFIT	8,711	0.12	0.10	-0.13	0.06	0.11	0.17	0.44
TANG	10,789	0.28	0.22	0.00	0.11	0.23	0.41	0.88
GROWTH	9,170	0.23	0.69	-0.76	-0.05	0.11	0.31	4.72
NDTS	10,789	0.02	0.03	0.00	0.00	0.01	0.04	0.14
Book_MIL	10,789	0.23	0.07	0.05	0.20	0.23	0.28	0.32
Market_MIL	10,786	0.61	0.21	0.14	0.42	0.66	0.77	1.00

### 3.5. Correlation matrix

Table 5 presents the pairwise correlation coefficient matrix within variables. TDA and TDM have a very strong correlation, so we can use them alternately. Size is positively correlated to TDA with the coefficients of 0.373, and 0.258 to TDM, supporting the trade off theory. The two proxies of debt to asset ratio have a negative relationship to firm growth, which again is in line with the trade off theory. In contrast, consistent with the predictions of the pecking order theory, the correlation matrix reveals a negative association between leverage (both book and market measures) and profitability.

A positive link is also found with tangibility, which again is in line with the trade off theory. However, the positive relationship between book leverage and non-debt tax shield does not support this theory. The non-debt tax shield's coefficients vary in the opposite direction for two leverages, i.e., positive for book leverage, and negative for market leverage. Between independent variables, all correlation coefficients are smaller than 0.8 - the highest level suggested by Kennedy (1992).

**Table 5: Pairwise correlation coefficient matrix**

	TDA	TDM	SIZE	MTB	PROFIT	TANG	GROWTH	NDTS	Book_MIL	Market_MIL
TDA	1.000									
TDM	0.702	1.000								
SIZE	0.373	0.258	1.000							
MTB	0.292	0.278	0.084	1.000						
PROFIT	-0.174	-0.261	-0.071	-0.029	1.000					
TANG	0.275	0.132	0.045	-0.147	0.169	1.000				
GROWTH	-0.032	-0.020	0.026	-0.014	0.062	-0.017	1.000			
NDTS	0.059	-0.035	0.004	-0.009	0.423	0.436	-0.063	1.000		
Book_MIL	0.218	0.165	0.196	0.067	0.075	0.019	0.033	0.070	1.000	
Market_MIL	0.163	0.242	0.012	0.066	0.093	0.094	0.010	0.019	0.624	1.000

## 4. Results

### 4.1. Above versus below the target

Firms are divided into two sub-groups based on their financial constraints. The first sub-sample includes firms which current leverage is higher than the target (i.e. Above the target), and the second includes firms with debt outstanding at a lower level than the optimal one (i.e. Below the target).

Results, reported in the table 6, show that the estimated coefficients of the lagged leverage are significant at 99 per cent confidence interval, which confirms the existence of the optimal level of leverage of Vietnam listed firms. With leverage measured by book debt to asset ratio, the implied speed is of 53.6% per year for above-target firms and 63.7% per year for below-target firms. These results suggest that firms tend to move to their target quicker when they are under-leveraged in comparison to those that are over-leveraged. Below-target firms may have more advantages when issuing more debt to offset the deviation from the target.

With the book proxy of debt, AR2 test of the second-order serial correlation of the error term, gives p-values larger than 0.05. In addition, the validity of instruments is also satisfied under the Hansen test when the high p-values are reported.

**Table 6:** Adjustment speed of firms below vs. Above the target (2005-2017)

	TDA		TDM	
	Above target	Below target	Above target	Below target
L.TDA	0.464***	0.363***		
	(0.0630)	(0.0869)		
L.TDM			0.842***	0.650***
			(0.0569)	(0.0663)
Implied speed	0.536	0.637	0.158	0.350
SIZE	0.0353***	0.0308***	0.0107**	0.0337***
	(0.0041)	(0.0042)	(0.0039)	(0.0054)
MTB	0.00625***	0.00362***	0.000946*	0.00553***
	(0.0008)	(0.0007)	(0.0005)	(0.0014)
PROFIT	-0.388***	-0.156***	-0.105**	-0.174***
	(0.0244)	(0.0282)	(0.0325)	(0.0428)
TANG	0.147***	0.110***	0.0388***	0.0807***
	(0.0168)	(0.0159)	(0.0116)	(0.0214)
GROWTH	0.00946*	-0.00074	0.0135**	0.00218
	(0.0037)	(0.0017)	(0.0045)	(0.0038)
NDTS	-0.0779	0.0681	-0.119	0.02
	(0.0660)	(0.0779)	(0.0823)	(0.1270)
Book_IML	0.0729	0.258***		
	(0.0869)	(0.0525)		
Market_IML			0.104**	-0.0401
			(0.0366)	(0.0599)
Observations	3563	4182	3553	3977



AR2 (p-value)	0.060	0.841	0.876	0.861
Hansen-J (p-value)	0.789	0.704	0.042	0.374
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Turning to the market proxy of debt, the table suggests the same story when above-target firms are still found to adjust less rapidly to the target than below-target firms. The lagged market leverage still yields coefficients that are significant at the 99.9% confidence level. Specifically, the speeds are about 15.8% per year for firms acquiring debt more than the target, and at 35% per year for firms using less debt than the target. This means that firms above the target tend to move to their optimal level of debt slower than firms below the target. On average, firms above the target need around 76 months to offset the distance between their current position and the target, while firms below the target need more than 34 months to do the same thing. The p-values of Hansen test are all higher than 0.05, showing the relevance of the GMM method. So far the outcome when using market leverage is similar with that measuring by book leverage.

Our findings are consistent with Guo et al. (2016) who also find that below-target firms move faster than above-target one in the test for 1,176 non-financial Chinese listed firms. The similarities in economic reforms of the two countries make Guo et al.'s interpretation to be applicable to Vietnam firms. They explained that privatization process, which explains the decrease in number of state-owned shares, helps firms to reduce interest conflicts between majority and minority shareholders, and improve the efficiency of the internal monitoring system, thus reducing the incentives for using equity financing. Debt become relatively cheap, which encourages below-the-target firms to acquire more debt in order to achieve the target leverage. Our findings, however, are inconsistent with the results found by Hovakimian (2004) and Faulkender et al. (2012), who document that the adjustment speed is faster when firm are over-leveraged in comparison to under-leveraged in some tests for developed markets.

#### **4.2. Near and off the target**

This section explores the difference in adjustment speed between two sub-samples: near versus far (from) the target. To indicate which sub-group a firm belongs to, we compare the median of deviation for each industry to the deviation of each firm regardless of the direction of the

deviation. Then, firms below the median (i.e., near-target firms) are separated from those above the median (i.e., off-target firms). Moreover, since section 4.1. clearly shows that there is a significant difference in speed between below- and above- target firms, we combine near-off with the below-above classifications to have a deeper view on the asymmetry of the adjustment speed.

In the table 7, we can see the book speed of near-target firms is around 39.6%, while that of off-the-target firms is 67.9% per year. With market leverage, there is also a big difference between the two sub-samples when speed is at 16.5% per year for near-target and 21.9% for off-target firms. Firms seem to adjust more quickly when they are far from the target, since the benefits of adjustment would overweight costs. Both AR2 and Hansen tests provide favorable  $p$ -values.

The result that the speed of adjustment has a positive relationship to the distance from target is consistent with Drobetz and Wanzenried (2006). Their explanation is that firms only modify their financial structure if they are adequately far away from the optimal leverage since fixed costs (e.g., legal fees and investment bank fees) account for the largest part of the total adjustment cost.

**Table 7:** Adjustment speed for firms near and off the target (2005-2017)

	TDA		TDM	
	Near target	Off target	Near target	Off target
L.TDA	0.604***	0.321**		
	(0.1540)	(0.1010)		
L.TDM			0.835***	0.781***
			(0.0568)	(0.0424)
Implied speed	0.3960	0.6790	0.1650	0.2190
SIZE	0.0297**	0.0327***	0.0140**	0.0279***
	(0.0092)	(0.0048)	(0.0047)	(0.0043)
MTB	0.00486**	0.00379***	0.00123*	0.00511***
	(0.0018)	(0.0008)	(0.0005)	(0.0010)
PROFIT	-0.347***	-0.166***	-0.0737**	-0.152***
	(0.0359)	(0.0326)	(0.0283)	(0.0345)
TANG	0.114**	0.114***	0.0272*	0.0849***
	(0.0380)	(0.0176)	(0.0127)	(0.0198)
GROWTH	0.00974*	-0.00087	0.0135*	0.00238
	(0.0046)	(0.0017)	(0.0053)	(0.0042)
NDTS	-0.0969	0.117	-0.123	-0.139
	(0.0624)	(0.0884)	(0.0784)	(0.1270)
Book_IML	0.262**	0.331***		
	(0.0963)	(0.0652)		
Market_IML			0.114**	0.0507
			(0.0357)	(0.1220)
Observations	3865	3850	3105	4392
AR2 (p-value)	0.048	0.831	0.947	0.726
Hansen-J (p-value)	0.534	0.352	0.123	0.419
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

In table 8, when combining the direction of the deviation, the near-and-below and off-and-above-target firms have insignificant lagged leverage coefficients. This may be caused by the insufficient number of observations (326 and 16 observations, respectively) to run dynamic estimators. In contrast, off- and below-target firms move very fast to the target with the speed of 68.7% per year. The speed of near-and-above subgroup is also significant at 53.6% per year.

**Table 8:** Book adjustment speed for Near & above, Near & below, Off & above, and Off & below firms (2005-2017)

	Near & above	Near & below	Off & above	Off & below
L.TDA	0.464***	0.107	0.0248	0.313**
	(0.0627)	(0.1430)	.	(0.1010)
Implied speed	0.536			0.687
SIZE	0.0354***	0.0655***	0.0752	0.0330***
	(0.0041)	(0.0091)	.	(0.0049)
MTB	0.00620***	0.00616***	0.00598	0.00381***
	(0.0008)	(0.0005)	.	(0.0008)
PROFIT	-0.388***	-0.286***	-0.318	-0.169***
	(0.0244)	(0.0487)	.	(0.0326)
TANG	0.146***	0.179***	0.192	0.115***
	(0.0168)	(0.0363)	.	(0.0177)
GROWTH	0.00967**	0.000379	0.0151	-0.00075
	(0.0037)	(0.0024)	.	(0.0017)
NDTS	-0.0817	-0.102	0.0898	0.118
	(0.0661)	(0.0783)	.	(0.0877)
Book_IML	0.0733	0.283*	0	0.330***
	(0.0878)	(0.1280)	0.0000	(0.0652)
Observations	3539	326	19	3831
AR2 (p-value)	0.072	0.366	.	0.811

Hansen-J (p-value)	0.705	0.43	.	0.392
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

With market leverage, the fastest speed is found in off-and-above-target firms, with a speed of 72.7% per year. However, the Hansen test cannot be performed. Besides, near-and-below-target firms have insignificant lagged leverage coefficients. Once again, the limitation on the number of observations prevents us to have an overview on the adjustment behavior of these sub-groups. Off-and-below-target firms move to the target with the speed of 36.5% per year. The speed of near-and-above subgroup is also significant at 19% per year.

**Table 9:** Market adjustment speed for Near & above, Near & below, Off & above, and Off & below firms (2005-2017)

	Near & above	Near & below	Off & above	Off & below
L.TDM	0.810***	0.0712	0.273**	0.635***
	(0.0780)	(0.0869)	(0.0891)	(0.0798)
Implied speed	0.19		0.727	0.365
SIZE	0.0119*	0.119***	0.0917***	0.0351***
	(0.0054)	(0.0113)	(0.0115)	(0.0061)
MTB	0.00102*	0.0112***	0.00789***	0.00626***
	(0.0005)	(0.0010)	(0.0011)	(0.0016)
PROFIT	-0.0776**	-0.186***	-0.238***	-0.175***
	(0.0291)	(0.0472)	(0.0611)	(0.0468)
TANG	0.0314*	0.152***	0.146***	0.102***
	(0.0130)	(0.0249)	(0.0177)	(0.0240)
GROWTH	0.0132**	-0.0114	-0.00235	0.00221
	(0.0050)	(0.0073)	(0.0040)	(0.0037)
NDTS	-0.123	-0.207	-0.0646	-0.0248
	(0.0856)	(0.1380)	(0.1100)	(0.1290)

Market_IML	0.122**	0.346***	-0.749	0.081
	(0.0400)	(0.0734)	(3.9240)	(0.0726)
Observations	2800	305	740	3652
AR2 (p-value)	0.92	0.265	0.325	0.919
Hansen-J (p-value)	0.053	0.0477	.	0.796
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

To sum up, both tests for market and book leverage yield consistent outcomes. The speed of off-target firms is higher than that of near-target firms, and when combining the direction of the deviation to the distance to the target, the faster speed is found for off- and below-target firms.

#### 4.1.3. Financial deficit versus surplus

Inspired by Korajczyk and Levy (2003), Byoun (2008), and Faulkender et al. (2012) who noted that financial deficit affects significantly the benefits and costs of adjustment, so it affects adjustment speed as a consequence, we separate our data into two sub-samples whether firms suffer from financial deficit or they are in a situation of surplus. Then GMM is run to find the difference in adjustment speed between them.

Results are reported in table 10. We can see the book speed of surplus firms is around 26.4%, while that of deficit firms is 19.8% per year. When considering market leverage, again, a faster speed is found for firms with financial surplus. Indeed, financially constrained firms adjust more slowly since they find it more costly to access external funds (Drobtz et al., 2006; Leary and Roberts, 2005).

**Table 10:** Adjustment speed for surplus and deficit firms (2005-2017)

	TDA		TDM	
	Surplus	Deficit	Surplus	Deficit
L.TDA	0.736***	0.802***		
	(0.0529)	(0.0406)		

L.TDM			0.914***	0.933***
			(0.0282)	(0.0176)
Implied speed	0.264	0.198	0.086	0.067
SIZE	0.0151***	0.0126***	0.0118***	0.00649***
	(0.0033)	(0.0022)	(0.0033)	(0.0019)
MTB	0.00297***	0.00430***	0.00181	0.00285***
	(0.0008)	(0.0007)	(0.0012)	(0.0007)
PROFIT	-0.247***	-0.189***	-0.363***	-0.0991**
	(0.0328)	(0.0247)	(0.0920)	(0.0303)
TANG	0.123***	0.0752***	0.0760***	0.0421**
	(0.0183)	(0.0150)	(0.0167)	(0.0141)
GROWTH	-0.00301	0.00301	0.0366	0.00761
	(0.0040)	(0.0029)	(0.0256)	(0.0039)
NDTS	-0.138	-0.112	0.0704	-0.317**
	(0.0787)	(0.0707)	(0.1900)	(0.0981)
Book_IML	0.291**	0.162*		
	(0.0992)	(0.0820)		
Market_IML			0.245	0.0649
			(0.1360)	(0.0336)
Observations	3567	3950	3466	3845
AR2 (p-value)	0.0702	0.994	0.377	0.915
Hansen-J (p-value)	0.699	0.515	0.0817	0.0464
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

When incorporating financial constraints and leverage position, the fastest book speed is found for firms with surplus-and-above-the-target with a speed of 58.3% per year. Firms with a deficit-and-below-the-target also adjust very quick at 57.9%. This means the such types of firms have sufficiently low costs of adjustment. In contrast, financially constrained firms who are over-

leveraged adjust to the target the most slowly, at a speed of 36.4% per year. Both AR2 and Hansen tests provide favorable *p*-values, significant at 5%.

**Table 11:** Book adjustment speed for Surplus & above, Surplus & below, Deficit & above, Deficit & below firms (2005-2017)

	Surplus & above	Surplus & below	Deficit & above	Deficit & below
L.TDA	0.417***	0.465***	0.636***	0.421***
	(0.1020)	(0.0818)	(0.0749)	(0.0998)
Implied speed	0.583	0.535	0.364	0.579
SIZE	0.0353***	0.0271***	0.0280***	0.0275***
	(0.0067)	(0.0043)	(0.0048)	(0.0046)
MTB	0.00670***	0.00205**	0.00473***	0.00435***
	(0.0014)	(0.0007)	(0.0009)	(0.0009)
PROFIT	-0.378***	-0.150***	-0.375***	-0.142***
	(0.0404)	(0.0307)	(0.0309)	(0.0327)
TANG	0.174***	0.106***	0.0948***	0.0960***
	(0.0259)	(0.0160)	(0.0223)	(0.0193)
GROWTH	0.00547	-0.00465	0.0145*	0.00159
	(0.0054)	(0.0031)	(0.0058)	(0.0017)
NDTS	-0.114	-0.0112	-0.0322	0.0147
	(0.1010)	(0.0795)	(0.0831)	(0.0928)
Book_IML	0.103	0.336***	-0.0192	0.234**
	(0.1280)	(0.0840)	(0.1560)	(0.0735)
Observations	1734	1833	1688	2262
AR2 (p-value)	0.49	0.272	0.863	0.073
Hansen-J (p-value)	0.312	0.244	0.357	0.606
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				



With market leverage, the fastest market speed is found for firms with a deficit-and-stay-below-the-target with a speed of 34.43% per year. Firms also adjust quickly when they are above the target, and have the financial surplus simultaneously, since the benefits of adjustment are remarkable. When firms fall into deficit, the slowest speed is found for above-target firms with a speed of 6.5% per year.

**Table 12:** Market adjustment speed for Surplus & above, Surplus & below, Deficit & above, Deficit & below firms (2005-2017)

	Surplus & above	Surplus & below	Deficit & above	Deficit & below
L.TDM	0.677***	0.853***	0.935***	0.656***
	(0.0810)	(0.1080)	(0.0570)	(0.0711)
Implied speed	0.323	0.147	0.065	0.344
SIZE	0.0178*	0.0219**	0.00461	0.0289***
	(0.0076)	(0.0078)	(0.0040)	(0.0058)
MTB	0.00363*	0.00319*	0.000271	0.00658**
	(0.0017)	(0.0014)	(0.0005)	(0.0021)
PROFIT	0.241	-0.146	-0.0521	-0.144**
	(0.3300)	(0.0743)	(0.0516)	(0.0445)
TANG	0.0574**	0.0739**	0.0185	0.0977**
	(0.0203)	(0.0226)	(0.0150)	(0.0297)
GROWTH	-0.0723	0.00182	0.0120*	0.0014
	(0.0698)	(0.0077)	(0.0050)	(0.0044)
NDTS	-0.631	-0.199	-0.202	-0.203
	(0.5140)	(0.1360)	(0.1170)	(0.1700)
Market_IML	-0.368	0.014	0.0376	0.054
	(0.4200)	(0.0346)	(0.0565)	(0.0830)
Observations	1641	1825	1767	2078
AR2 (p-value)	0.817	0.68	0.0655	0.699
Hansen-J (p-value)	0.532	0.0317	0.118	0.0914

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

When considering financial constraints and the distance from the target at the same time, we find that surplus-off and surplus-near firms adjust faster to the target with the speed of 61.8% and 56.2% correspondingly. The lowest book speed is found for firms with a deficit, but close to the target point.

**Table 13:** Book adjustment speed for Surplus & near, Surplus & off, Deficit & near, Deficit & off firms (2005-2017)

	Surplus & near	Surplus & off	Deficit & near	Deficit & off
L.TDA	0.438***	0.382*	0.648***	0.483***
	(0.0865)	(0.1570)	(0.0715)	(0.1410)
Implied speed	0.562	0.618	0.352	0.517
SIZE	0.0363***	0.0314***	0.0293***	0.0252***
	(0.0059)	(0.0078)	(0.0048)	(0.0062)
MTB	0.00666***	0.00237**	0.00466***	0.00383**
	(0.0012)	(0.0009)	(0.0009)	(0.0012)
PROFIT	-0.381***	-0.166***	-0.349***	-0.128**
	(0.0376)	(0.0501)	(0.0290)	(0.0415)
TANG	0.174***	0.121***	0.0876***	0.0875***
	(0.0237)	(0.0257)	(0.0221)	(0.0226)
GROWTH	0.00268	-0.00516	0.0119*	0.00214
	(0.0049)	(0.0031)	(0.0051)	(0.0018)
NDTS	-0.149	0.0562	-0.0461	0.00678
	(0.0979)	(0.1100)	(0.0820)	(0.1050)
Book_IML	0.328*	0.381***	0.172	0.277***
	(0.1330)	(0.0885)	(0.1330)	(0.0773)
Observations	1877	1676	1840	2094

AR2 (p-value)	0.557	0.265	0.541	0.0712
Hansen-J (p-value)	0.329	0.176	0.472	0.496
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Interestingly, with market leverage, firms with a surplus still show the fastest speed. The highest value is found at 28.5% per year for surplus- and near-target firms, and the second at 25.9% for surplus- and-off-target firms. When firms fall into deficit, the slowest speed is found in close-target firms with a speed of 13.2% per year.

**Table 14:** Market adjustment speed for Surplus & near, Surplus & off, Deficit & near, Deficit & off firms (2005-2017)

	Surplus & near	Surplus & off	Deficit & near	Deficit & off
L.TDM	0.717***	0.741***	0.868***	0.783***
	(0.0963)	(0.0765)	(0.0580)	(0.0445)
Implied speed	0.283	0.259	0.132	0.217
SIZE	0.0207	0.0330***	0.0113*	0.0255***
	(0.0135)	(0.0069)	(0.0047)	(0.0049)
MTB	0.00308	0.00516***	0.000789	0.00492***
	(0.0020)	(0.0013)	(0.0005)	(0.0014)
PROFIT	-0.114	-0.276***	-0.0525	-0.100**
	(0.3050)	(0.0674)	(0.0363)	(0.0376)
TANG	0.0573*	0.104***	0.00379	0.0854***
	(0.0259)	(0.0237)	(0.0173)	(0.0252)
GROWTH	-0.00118	-0.00407	0.0103*	0.00358
	(0.0611)	(0.0065)	(0.0052)	(0.0046)
NDTS	-0.103	-0.0522	-0.119	-0.341*
	(0.5360)	(0.1280)	(0.1080)	(0.1690)
Market_ IML	0.0737	0.0649	0.0699	0.0673

	(0.2830)	(0.0415)	(0.0506)	(0.1560)
Observations	1445	2010	1525	2299
AR2 (p-value)	0.245	0.54	0.031	0.273
Hansen-J (p-value)	0.787	0.15	0.00356	0.622
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

In short, surplus firms adjust more quickly than those with a deficit. Our findings are supported by Korajczyk and Levy (2003) who also states that the firms with a financial surplus move quicker to the target than ones with a deficit. Indeed, financially constrained companies may find it more expensive and even impossible to issue additional securities that would help them offset the deviations from the optimal level of debts. Indeed, in Vietnam, deficit firms will find it hardly to acquire debt from banks since they do not have stable cash flows to ensure the payment obligations.

## 5. Conclusion

Based on the main theories, with the tradeoff, pecking order and market timing as the most popular ones, the issue of how firms determine and readjust their capital structure has been explored after the first work of Fischer et al. (1989). However, heterogeneity in the adjustment speed still needs more research. Especially in an emerging market like Vietnam, our study provides for the first time, an in-depth analysis on the heterogeneity in adjustment behavior of publicly listed firms in this country.

Overall, this study contributes to the existing empirical literature on target leverage of Vietnamese listed firms at some main points. Firstly, by adopting the partial adjustment model, we find significant coefficients of lagged leverage in all analyses, providing a strong evidence that Vietnamese listed firms identified and pursued target leverage from 2005 to 2017. This implies that firm managers do have a target leverage in mind and will alter debt ratios to achieve the optimal level of debt. Therefore, besides developing the equity market, the government should have more solutions to improve the banking system and corporate bond market, in order to ensure the sources of funds for business demands.

Secondly, the study shows evidence of the heterogeneity in adjustment speeds. Especially, when firms are classified based on the distance from, and direction to the target, our results show that firms which are below the target often move to the target faster than the ones over-leveraged. In this country, the privatization process, which explains the decrease in number of state-owned shares, helps reducing interest conflicts between majority and minority shareholders, and improves the internal monitoring system; thus, it reduces the incentives for using equity financing. Debt becomes relatively cheap, which enhances below-the-target firms to acquire more debt to achieve the target leverage while over-the-target enterprises have no incentives to reduce the current debt level, so a faster speed is found for below-the-target firms.

In addition, the speed of off-target firms is higher than that of near-target firms, and this finding holds strong for both market and book proxy of leverage. The possible explanation is that firms only modify their financial structure if they are adequately far away from the optimal leverage since fixed costs (e.g., legal fees and investment bank fees) account for the largest part of the total adjustment cost. When combining the direction of the deviation to the distance to the target, the faster speed is found in off- and below-target firms.

Moreover, firms with a financial surplus move more quickly to the optimal level of debt than those with a deficit. Indeed, financially constrained companies will find it more expensive and even impossible to issue additional securities that would help them offset the deviations from the optimal point.

Our study focuses on a sample set of listed companies within a period of 13 years that is dominated by large listed firms. It does not cover unlisted companies, so it might prevent us to have an overall view of capital structure of the whole market. Besides, we forgo research and development expenses as a control variable due to the lack of reported information. These issues can be addressed in future research for this transition economy.

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## **CHAPTER 4: THE ADJUSTMENT SPEED TOWARD TARGET LEVERAGE OVER CORPORATE LIFE CYCLE: THE CASE OF VIETNAM**

**Abstract:** The paper provides evidence of the changes of adjustment behaviors over the business life cycle of Vietnam quoted firms from 2005 to 2017. Our results show that the adjustment speed toward the target leverage varies significantly across the five phases of life, and reaches the highest level in the stage of introduction. We also find that cash-flow pattern is a more reliable proxy of business life cycle stages than firm age and growth rate. Our empirical evidence supports the pecking order theory as the best-fit framework to understand the funding behavior of Vietnam listed firms throughout corporate life.

**JEL classification:** D91 D92 G32

**Keywords:** Firm life cycle; Speed of adjustment; Vietnam

### **1. Introduction**

Through its life, a firm develops its business by making “inside” decisions, for example, selecting business strategy, funding resources, and investment projects, corresponding to the impacts of “external” factors, for example competitors, country policies, and global financial crisis. According to each period of time, firms have different objectives, so will use different resources and strategies to achieve their goals. “Through how many stages do firms grow”, and “What are the factors that determine which phase a firm is in” are important questions that need appropriate investigations when considering the business life cycle. With the perception of the life cycle at the firm-level, the corporate life is often divided into 3, 4 or 5 phases, and can be measured by age, size, growth or cash flows.

In this paper, we use the cash-flow pattern approach of Dickinson (2011) to separate 5-stage corporate life<sup>5</sup>. Besides, firm age and growth will be used to ensure the robustness of the findings.

Understanding business life cycle is necessary due to its important influence on many aspects of firms, such as performance, investment, dividend policy, and so on. Especially, the issue of

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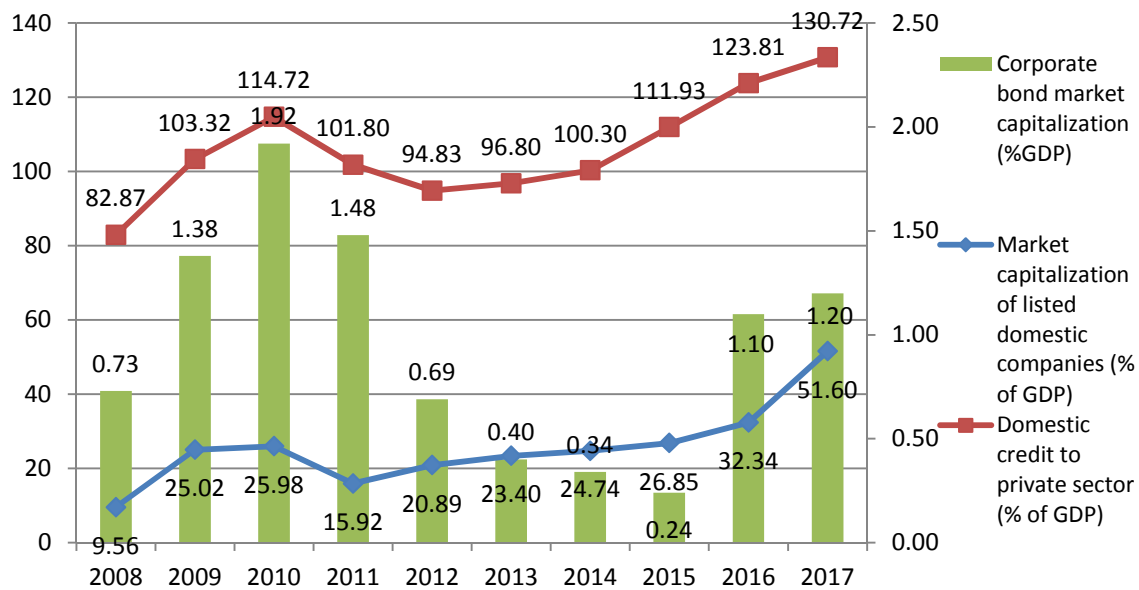
<sup>5</sup> As defined by Gort and Klepper (1982)

changes of funding behavior across stages of life has attracted the interest of researchers in recent decades.

In 1998, Berger and Udell test the changes in firm financial choices depending on firm size and age in a sample of US small firms. Kim et al. (2012) find evidence of changes in the cost of external finance over firm age. They provide evidence that young firms are treated with low or even negative interest rates from banks as a common way to attract new borrowers.

Tian & Zhang (2015) explore the impacts of the business life cycle on capital structure of Chinese publicly firms. They find that cash flow patterns have a clear influence on capital structure, stronger than firm age. In 2016, in an examination of European listed firms, Castro et al. show that the key determinants of target leverage as well as the speed of adjustment vary along three stages of the life cycle (i.e., introduction, growth and maturity). They suggest that firms offset the deviation to the target the fastest during introduction stage.

**Figure 1:** Funds from banks, corporate bond and equity markets in Vietnam



*Source: Author's calculation based on the data from WB and ADB*

Vietnam is a special case of emerging markets with government-led trade liberalization. In recent years, this country gains rapid economic development rates, and becomes more integrated with

the global economy. Since the government built the long-term project called “industrialization and modernization”, many market-oriented reforms are conducted. Some popular examples reside in the creation of stock markets, enlarging the trading room for foreign investors, as well as encouraging banks to expand corporate lending. The foundation of stock markets provides enterprises another channel to raise funds besides bank loans. As a consequence, most firms in this country rely on equity markets and banks to raise capital.

Within the topic of corporate capital structure in the context of Vietnam, the current paper provides the first evidence on changes of the adjustment speed towards the target leverage over the business life cycle. The study shows that the fastest speed concerns older and high-growth firms. Consistent with Tian & Zhang (2015), and Castro et al. (2016), we also find that cash-flow is a more reliable proxy of the corporate stages than the foundation age or growth, and the adjustment speed toward the target leverage varies significantly across the five phases of life. We do find evidence of high-low-high pattern in the changes of adjustment rate. Furthermore, our empirical evidence supports the pecking order theory as the best-fit framework to understand the funding behavior of Vietnam listed firms over time.

The paper is constructed as follows: after providing an overview of the Vietnam economy and discussing the research issue in section 1, the paper reviews previous literature on firm-level life cycle, and the variation of the capital structure over the business life cycle in section 2. Then, section 3 describes the data and discusses the methodology. Section 4 shows the empirical findings and finally, section 5 concludes the paper.

## **2. Literature review**

### **2.1. Firm-level life cycle**

Gort and Klepper (1982) state that the corporate life cycle combines 5 main stages, including introduction, growth, maturity, shake out, and then, decline<sup>6</sup>. The duration of each stage depends on product characteristic, market demand and competition. The introduction is the first stage, which involves the supply of a new product or producing an innovation. In the introduction , the

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<sup>6</sup> The 5-stage life cycle is the most common representation in the academic litterature. However, other studies consider a different divisions, from 3 to 10 stages. For example, Rutherford (2003) use a 3-stage life, Kazanjian (1988) a 4-stage model and Adizes (1989) a 10-satge classification.

volume of products is low and the uncertainty is high, so this stage is considered as the riskiest stage of the whole corporate life. It may be a start-up entrepreneurship or an on-going firm which is offering new products or entering a new industry when the success is uncertain. Launching new products costs firms a large amount of money so the profit at the beginning is not high, even negative since firms often need to re-invest their earnings to expand more.

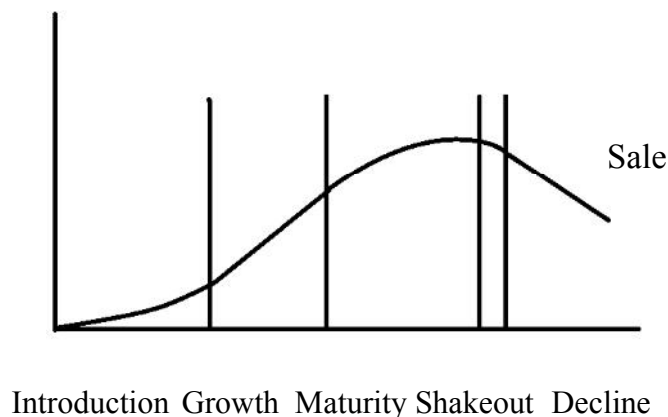
Growth is the second stage - a stage during which firms create solid positions in the markets, generate a significant amount of income, and the volume of sales increases steadily. Like the first stage, this stage also requires a significant amount of capital for operating and re-investing. In this intermediate stage, product adaptability is confirmed by the satisfaction of market demands. As can be seen from the figure 1, the life cycle curve is quite steep during this stage. This stage needs a higher amount of investment to expand operations.

Next, in the stage of maturity, the producing efficiency reaches the peak. The sales are often stable, or may continue to expand with a slow and predictable rate. When firms reach maturity, the market competition has also become more aggressive, with many new entrants who want to capture and share the market with existing firms.

A shakeout happens when sales begin to decline after the period of stability. This stage is often short and the level of decrease in sales is not large.

The decline is the final stage of the corporate life cycle when firms are not able to keep pace with their competitors, or the industry in which firms do their business move to the end. In this phase, sales suffer a rapid decrease.

**Figure 2: Firm life cycle**



An important question is how one can define which stage a firm is in. To answer it, various measurement proxies are used, with the most popular being firm age (Adizes, 1989), and sales growth (Rutherford, 2003). Currently, the cash-flow-based approach suggested by Dickinson (2011) is used by many authors (Tian & Zhang, 2015; Castro et al., 2016) to investigate the firm life cycle. From observing the interactions of operating, investing, and financing cash flows to firm profitability, growth, and risk over time, she suggests cash flow patterns as the most reliable proxy for identifying firm-level life stages. She considers that the information provided by cash flows is the reflection of different strategies firms use to react to changes within the firm and outside business environments. By combining two possible signs (i.e., negative or positive) of operating, investing, and financing cash flows, she considers up to 8 possible cases ( $2^3=8$ ) for the five stages of life as described in the table below.

**Table 1:** Cash flows' signs as a proxy for life cycle

Cash flows	Introduction	Growth	Maturity	Shakeout	Decline
Operating	-	+	+	+/-	-
Investing	-	-	-	+/-	+
Financing	+	+	-	+/-	+/-

*Source: Dickinson (2011, p.1972)*

The method of Dickinson (2011) outperforms other life cycle measurements in the previous literature (e.g., age, size, growth rate) since it can capture the interaction between business strategies, resource allocation, and operating capacity of firms. Through several tests, Dickinson's classification shows its consistency with the economic theory on the life cycle<sup>7</sup>.

## 2.2. Capital structure over the business life cycle

The first study assessing the changes of capital structure over the business life cycle is that proposed by Berger and Udell (1998) who state that having a single capital structure theory that

<sup>7</sup> Read Dickinson (2011) to see her tests of the validity of cash flow patterns

can explain the funding behavior of observed firms through a whole lifetime is imprecise because financial structure is life-cycle-determined.

Actually, the variation of leverage over time is implied by some main capital structure theories. The trade-off theory states that firms readjust their leverage by comparing the costs and benefits of adjustment. Since the costs and benefits of using debt vary over the firm's stages of life, it follows that there are changes in corporate capital structure, and the adjustment speed toward the target leverage over the firm's life cycle. For example, when firms are in the introduction stage, the risk of bankruptcy would be higher than for mature firms. New and young firms have not only high risk, but also unstable profits, so they would be harder to acquire debt, and would bear a higher interest rate compared to mature firms. The trade-off also implies that high-growth firms tend to be less leveraged because they can earn and retain more funds compared to others. The pecking order theory predicts a positive association between growth and leverage since internal funds might be insufficient to meet the demands of high-growth firms.

Berger and Udell (1998) present a model of capital structure that takes into account the life cycle. The model describes the changes of several financing sources corresponding to the increase in firm age. Specifically, they separate corporate capital into internal and external funds, and analyze the funding decisions of small firms over the age continuum. According to their study, debt from banks and other financial institutions is the main source of funding for very young enterprises. They explain that at that initial stage of business, debt is guaranteed by the personal wealth of the entrepreneur. This is in contrast with the popular view that borrowing from such creditors would not be easy for small firms since, on the early age of business life, firms lack strong assets that can be considered as stable collaterals, and do not have sufficient evidence of past performance as well as credit history, as required by creditors.

Fluck et al. (1998) conduct a study on the usage of internal and external funds throughout the business lifetime. By running regressions on both "age" and "age-squared", this study finds a nonlinear relationship between firm age and capital structure. Particularly, at early stage of corporate life, the fraction of internal sources of funds is positively related to firm age. When age reaches 108 months, the proportion of insider funds starts to decrease. In contrast, the use of external funds exhibits an opposite pattern; it first decreases, then starts to increase after 142 months.



Fluck (2000) analyzes the differences between “start-up” and “on-going” firms in making financial decisions, and find that control rights are in the hands of investors. Investors would choose on-going firms to invest rather than a startup in case the two firms have undifferentiated projects because of “the stage-dependency of the control rights of subsequent claim holders” (Fluck, 2000, p.5). They also find the following life cycle pattern for funding: outside equity and short-term debt are often used in the early stage of business life, then retained earnings, long-term debt, and even additional outside equity is often acquired in the later stages of business.

Similar to Fluck et al. (1998), La Rocca et al. (2011) focus on small- and medium-size firms to study the change in the capital structure decisions over the corporate life cycle. The study provides evidence of an inverted U-shaped relationship between firm age and leverage. Specifically, debt is shown to be the major source of funds in the early stages, which is consistent with Berger and Udell (1998). When firms become more mature, firms tend to use less debt, and increase the fraction of internal capital. This pattern seems to apply for all industries.

Kim et al. (2012) find that the cost of external financing is related to firm age. By adding a dummy variable (from 1 to 4) and considering four different age groups (i.e., 11 to 20, 21 to 30, 31 to 40, and above 40, respectively, with 1 to 10 being the benchmark group), they find that young firms obtain low or even negative interest rates from banks, which for the latter is the common way to attract new borrowers.

Tian & Zhang (2015) explore the impact of the business life cycle on capital structure of Chinese publicly-traded firms 1999 and 2011. They use two alternative measurements of life cycle: firm age and cash flow patterns. When adding age and age\_squared as additional explanatory variables into the partial adjustment model, they find a U-shaped relationship between firm age and debt ratio. However, the coefficients of age and age\_squared are insignificant. Using the cash flow approach suggested by Dickinson (2011), Tian & Zhang (2015) find that firms adjust the most quickly in the birth stage of life.

The most recent study is that of Castro et al. (2016) who find the high-low-high motif in the change of adjustment speed over the corporate life. Their study tests the adjustment behavior over the three main periods of business life (i.e., introduction, growth and maturity). Results indicate that firms move to the target leverage quickest at a speed of 46.3% per year in the introduction stage. Then, this speed reduces at 29.4% in the stage of growth, and recovers to

33.9% per year when firms come to the maturity stage. However, the study has some limitations when using only the book measure of debt, and discussing only 3 first stages of life cycle.

### 3. Methodology

#### 3.1. Data

The data come from Stoxplus. We drop all firm-year observations of the financial and the utility industries since they are different from other sectors in terms of asset structure, funding sources and operating regulations.

Our study investigates an unbalanced panel data of non-financial Vietnamese listed firms from 2005 to 2017. Data prior 2005 is not available so expanding observed period is not feasible.

In line with previous empirical studies, we deal with the problem of outliers by (1) dropping observations where book leverage exceeds 1 or is missing, and (2) winsorizing all variables at the 1% level. Finally, we have a dataset which comprises 10,789 observations spanning 9 industries, including Basic Material, Healthcare, Industrials, Oil & Gas, Technology, Telecommunications, Consumer Goods, Consumer Services and Other. 49.41% of observations are Industrial firms, followed by Consumer Goods (18.14%) and Basic Materials (12.44%). Market leverage is higher than book leverage for all industries. The Telecommunication industry seems to have the lowest book leverage, but at the same time the highest market debt ratio.

**Table 2:** Data summary

Industry	Observations	Percent	Mean of TDA	Mean of TDM
Basic Materials	1,342	12.44%	29.70%	54.80%
Consumer Goods	1,957	18.14%	30.30%	60.39%
Consumer Services	1,144	10.60%	16.47%	39.81%
Health Care	475	4.40%	21.69%	60.16%
Industrials	5,331	49.41%	24.78%	59.07%
Oil & Gas	77	0.71%	22.01%	46.11%
Technology	358	3.32%	16.61%	42.83%

Telecommunications	46	0.43%	10.44%	91.27%
Other	59	0.55%	27.85%	58.85%

### 3.2. Empirical model

#### 3.2.1. The partial-adjustment model

Most prior studies in the leverage adjustment literature, such as Flannery and Rangan (2006), Lemmon, Roberts, and Zender (2008), Huang and Ritter (2009), adopt the partial adjustment model. Following them, we have the basic partial-adjustment model which is widely used to estimate how fast the firm offsets the deviation from the target

$$DR_{i,t} - DR_{i,t-1} = \lambda (DR_{i,t}^* - DR_{i,t-1}) \quad (1)$$

Where  $DR_{i,t}^*$  is target debt ratio of firm  $i$  in year  $t$ .  $\lambda$  is the speed of adjustment to the target each year of the firm  $i$ .  $DR_{i,t}$  is the debt ratio of the firm  $i$  at time  $t$ , which can be measured based on market value (TDM) or book value (TDA).  $DR_{i,t-1}$  is the debt ratio of the firm  $i$  at time  $t-1$  (i.e. The lagged debt ratio). This means the change in leverage each year is up to the speed of adjustment and the gap between the target and the lagged leverage.

The equation (1) can be expressed as

$$DR_{i,t} = \lambda DR_{i,t}^* + (1 - \lambda) DR_{i,t-1} \quad (2)$$

which means the observed debt to asset ratio of the firm  $i$  at time  $t$  is a weighted average of the lagged one and the target with the weights of  $(1 - \lambda)$  and  $\lambda$ , respectively.

However, the target term of leverage  $DR_{i,t}^*$  is unobservable, so the prediction based on determinants can be used as a proxy for the target.

$$DR_{i,t}^* = \beta X_{i,t} + \varepsilon_{i,t} \quad (3)$$

where  $X_{i,t}$  is a set of factors related to leverage ratio in year  $t$ , including firm size (Size), profit (Profit), tangibility (Tang), growth opportunity (Growth), market-to-book ratio (MTB), non-debt-tax shield (NDTS), and industry median leverage (IML), which are suggested by the most popular empirical studies. Reflecting the fact that the target may differ over firms or over time, the error term  $\varepsilon_{i,t}$  is under the effects of time, firms, and other disturbance factors.

From (2) and (3), we have the plain partial-adjustment model without unobservable indicator of the target

$$DR_{i,t} = \lambda X_{i,t} + (1 - \lambda)DR_{i,t-1} + \epsilon_{i,t} \quad (4)$$

By setting  $\alpha=1-\lambda$  and  $\gamma=\lambda\beta$ , we have the common constant coefficients model

$$DR_{i,t} = \alpha DR_{i,t-1} + \gamma X_{i,t} + \epsilon_{i,t} \quad (5)$$

To explore capital structure determinants and adjustment speed toward the target leverage, previous studies often employ 2 different types of estimators, including static ones (e.g. POLS, RE and FE), and dynamic ones (e.g. Instrumental variable (IV), difference-GMM and system-GMM). Among those, POLS does not take into account the problem of unobserved heterogeneity caused by the correlation between the lagged leverage and firm fixed effects. It overestimates lagged leverage coefficient, thus underestimating the speed of adjustment. FE results are also biased because of the correlation between the lagged leverage and transformed error terms, but in the downward trend.

In terms of dynamic estimators, some studies apply the “Anderson-Hsiao’s just-identified instrumental variable” (i.e. AH-IV) (Anderson and Hsiao, 1982) since it can help to identify the issue of endogeneity, where the instrument for the first-difference of leverage lagged by one period is the two-period lagged leverage. This means we have to sacrifice the sample depth for instrument lag depth (Roodman, 2009). Difference-GMM method (Arellano and Bond, 1991, Blundell and Bond, 1998) is supposed to be more efficient compared to the AH-IV because it sets missing observations of lags equal to 0. However, this method suffers from potential endogeneity issues. System-GMM is more advanced when dealing with short, wide panels (i.e. “small T large N” sample) by expanding the set of instruments with lagged differences instead of using the available lag like difference-GMM. Indeed, this study employs the system-GMM method, and command `xtabond2` on Stata14 is used<sup>8</sup>. We then run AR2 to test the second-order serial correlation of the error term. In addition, the validity of instruments is checked by the Hansen test.

Importantly, to clarify the change of adjustment speed over the life cycle, we test the movement of the speed with firm age, firm growth rate, and with the change in cash flow patterns.

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<sup>8</sup> See Roodman (2009) to know how to run system-GMM on Stata

When firm growth is used as the signal for life stages, we run the two plain equations below:

$$TDA_{it} = \alpha + \beta_1 TDA_{it-1} + \beta_2 SIZE_{it} + \beta_3 PROFIT_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \beta_6 MTE_{it} + \beta_7 NDTS_{it} + \beta_8 Book\_IML_{it} + i.Year + i.Industry + \epsilon_{it} \quad (6)$$

$$TDM_{it} = \alpha + \beta_1 TDM_{it-1} + \beta_2 SIZE_{it} + \beta_3 PROFIT_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \beta_6 MTE_{it} + \beta_7 NDTS_{it} + \beta_8 Market\_IML_{it} + i.Year + i.Industry + \epsilon_{it} \quad (7)$$

by both POLS, FE and GMM estimators.

Then Eq. (6 and 7) are re-ran for two firm sub-groups classified based on the industry median growth rate. If the firm's sales growth rate is higher than the median value of its industry in a given year, it belongs to “high-growth” group, and vice versa. In this section, we use system-GMM only.

When age is used as a life cycle measurement, Age, and Age\_squared are added to the regression as stand-alone explanatory variables, and we have

$$TDA_{it} = \alpha + \beta_1 TDA_{it-1} + \beta_2 SIZE_{it} + \beta_3 PROFIT_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \beta_6 MTE_{it} + \beta_7 NDTS_{it} + \beta_8 Book\_IML_{it} + \beta_9 AGE_{it} + \beta_{10} AGE^2_{it} + i.Year + i.Industry + \epsilon_{it} \quad (8)$$

$$TDM_{it} = \alpha + \beta_1 TDM_{it-1} + \beta_2 SIZE_{it} + \beta_3 PROFIT_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \beta_6 MTE_{it} + \beta_7 NDTS_{it} + \beta_8 Market\_IML_{it} + \beta_9 AGE_{it} + \beta_{10} AGE^2_{it} + i.Year + i.Industry + \epsilon_{it} \quad (9)$$

The use of both plain and quadratic terms of age helps us explore non-linear relationship between the age and capital structure.

Also, we re-check the impact of firm age on the adjustment speed by running Eq. (6 and 7) for two firm sub-groups classified based on the industry median age. If a firm's age is higher than the median value of its industry in a given year, it belongs to “matured-firm” group, and “young-firm” otherwise. In this section, we use system-GMM only.

Importantly, some current studies (Tian & Zhang, 2015, Castro et al., 2016) suggest cash flow patterns as the most appropriate proxy for the life cycle. To test this possibility, the equation Eq. (6 and 7) is run for five different groups of firms, including introduction, growth, maturity, shakeout, and decline, as suggested by Dickinson (2011).

### 3.2.2. Theory test

#### Trade-off test

Since Berger and Udell (1998) state that having a single capital structure theory that can explain the funding behavior of observed firms through a whole lifetime is imprecise because financial structure is life-cycle-determined, we need to test capital structure theories for 5 stages of life.

To test the theories, we follow the guide of López-gracia & Sogorb-mira (2008). They suggest that the trade-off theory (Baxter, 1967; Kraus and Litzenberger, 1973) imply firms will compare the benefits and costs of using debt to choose the most favorable source of fund. The benefit of debt comes from the tax-shield which enables firms to pay less tax when using more debt. Thus, to test this theory, we should add the effective tax rate (ETR) variable to reflect the real rate at which companies actually pay to the government for using a certain level of debt.

$$ETR = \frac{\text{Tax paid}}{\text{Earnings before tax}}$$

Thus, the equation (4) becomes

$$DR_{i,t} = X_{i,t} - DR_{i,t-1} + \gamma_1 ETR_{i,t} + \epsilon_{i,t}$$

or

$$DR_{i,t} - DR_{i,t-1} = X_{i,t} - DR_{i,t-1} + \gamma_1 ETR_{i,t} + \epsilon_{i,t}$$

So we come to

$$DR_{i,t} = X_{i,t} + (1 - \gamma_1)DR_{i,t-1} + \gamma_1 ETR_{i,t} + \epsilon_{i,t} \quad (10)$$

The trade-off is supposed to have explanatory power to the changes in capital structure if the coefficient of ETR is positively significant.

#### Pecking order test

Pecking order hypothesis (Myers and Majluf, 1984) ranks internal funds as the most favorable sources, followed by debt; and equity is considered as the last option. The information asymmetry between firm managers and outside investors makes equity costly because of its high sensitivity to information. Managers will rely on internal financing (i.e., surplus or deficit) and investment requirement in order to decide the level of debt funding.

Frank and Goyal (2003) state that “the pecking order theory implies that the financing deficit ought to wipe out the effects of other variables” (pp. 219). So the equation to test pecking-order theory will be similar to the Eq.(10) but adding the variable of firm financial deficit instead of ETR.

$$DR_{i,t} = \alpha X_{i,t} + (1 - \alpha)DR_{i,t-1} + \gamma_2 DEFICIT_{i,t} + \epsilon_{i,t} \quad (11)$$

DEFICIT is the financial deficit in a year, which can be determined as in Frank and Goyal (2003)

DEFICIT

$$= \frac{(\text{Dividend payments} + \text{investments} + \text{change in working capital} - \text{internal cashflow})}{\text{Total assets}}$$

where

Change in working capital = Change in current assets – change in current liabilities

Internal cash flow = Cash Flow from Operating Activities + Cash Flow from Investing Activities + All Uses of Cash in Financing Activities.

In our sample, the information “All use of cash in financing activities” is missing, thus we use the “cash flow from financing” as an alternative. The pecking order theory is supposed to have explanatory power to changes in capital structure if the coefficient of DEFICIT is positive and significant, which implies that firms are forced to use more debt under the pressure of budget shortage.

### **Market timing test**

Market timing (Baker and Wurgler, 2002) argues that market conditions give firms signals to raise capital. This means equity should be used only when it is overvalued by the market, which implies that investors will be pessimistic about future firm performance. Sometimes, the impact of market timing can be reflected through the market-to-book ratio. However, Baker and Wurgler (2002) argue that this ratio is unable to capture all information about growth opportunities, so they suggest to use the a new variable (i.e., EFWAMB), which is the weighted average of all market-to-book ratio in the past, to analyze the impact of market timing. They argue that this weighted average term is better than a stand-alone market-to-book ratio because “it picks out, for each firm, precisely which lags are likely to be the most relevant” (Baker and Wurgler, 2002, p.12).

Similar to the tradeoff and pecking order tests, the equation to test market timing hypothesis is as below:

$$DR_{i,t} = \alpha_0 + \alpha_1 X_{i,t} + (1 - \alpha_1)DR_{i,t-1} + \gamma_3 EFWAMB_{i,t-1} + \epsilon_{i,t} \quad (12)$$

where EFWAMB for a given firm-year is an “external finance weighted-average market-to-book ratio, which is measured by the following equation:

$$EFWAMB_t = \sum_{s=1}^{t-1} \frac{e_s + d_s}{\sum_{r=1}^{t-1} e_r + d_r} MB_s$$

"e" and "d" in the equation are the net debt issue and net equity issue, so e+d is total external finance for a given year. MB is the market-to-book ratio. s and r denote time.<sup>9</sup>

Similar to Baker and Wurgler (2002), the observations which have below 0 weights will be dropped from the dataset<sup>10</sup>. The first year of calculation is the IPO year or the first year when data are collected. In our sample, we choose the latter option.

### 3.3. Variables

Although there is still a debate about the most suitable leverage measure for an emerging market like Vietnam, we use both book and market debt to asset ratios to ensure the robustness of our study.

<sup>9</sup> For example, assume we have information about debt and equity issuance of a firm i as below (t=3):

Year	e	d	e+d	MB
1	3	4	7	2
2	5	3	8	4
3	2	2	4	3
			19	

we will get  $EFWAMB_3 = \frac{7}{19} \times 2 + \frac{8}{19} \times 4 + \frac{4}{19} \times 3$

<sup>10</sup> “The purpose of not allowing negative weights is to ensure that we are forming a weighted average” (Baker and Wurgler, 2002, p.12)



**Table 3:** Explanation of dependent variables

<b>Variable</b>	<b>Description</b>	<b>Measurement</b>
TDA	Book leverage	$\frac{\text{Long – term debt} + \text{Short – term debt}}{\text{Total assets}}$
TDM	Market leverage	$\frac{\text{Long – term debt} + \text{Short – term debt}}{\text{Long – term debt} + \text{Short – term debt} + \text{Market capitalization}}$

After reviewing the existing literature on the same topic, we choose seven main factors, including firm size, profitability, tangibility, growth, market to book ratio, non-debt tax shield and industry median leverage.

**Table 4:** Explanation of independent variables

<b>Variable</b>	<b>Description</b>	<b>Measurement</b>
Size	Size	Logarithm10 (Total assets/23000)
Profit	Profitability	$\frac{\text{Earnings before interest, tax and depreciation}}{\text{Total assets}}$
Tang	Tangibility	$\frac{\text{Net fixed assets}}{\text{Total assets}}$
Growth	Growth	$\frac{\text{Total assets}_t - \text{Total assets}_{t-1}}{\text{Total assets}_{t-1}}$
MTB	Market to book	$\frac{\text{The market value of equity}}{\text{The book value of equity}}$
NDTS	Non debt tax shields	$\frac{\text{Depreciation and amortization expenses}}{\text{Total assets}}$

MIL	Median Industry leverage	Median Industry leverage for given year Note: Depending to whether TDA or TDM is used, we calculate book_MIL and market_MIL correspondingly.
AGE	Foundation age	Number of years from a firms's foundation

**3.4. Data summary**

Figure 3 shows the change in two leverage proxies: TDA and TDM over 13 years, from 2005 to 2017. It shows that on average, Vietnam listed firms use considerable levels of debt over time, for both market and book measures. However, the distance between the two proxies is quite strong, reflecting the fact that in financial reports, the value of assets may be recorded higher than the value assessed by the market.

**Figure 3:** Average leverage for the period between 2005 and 2017

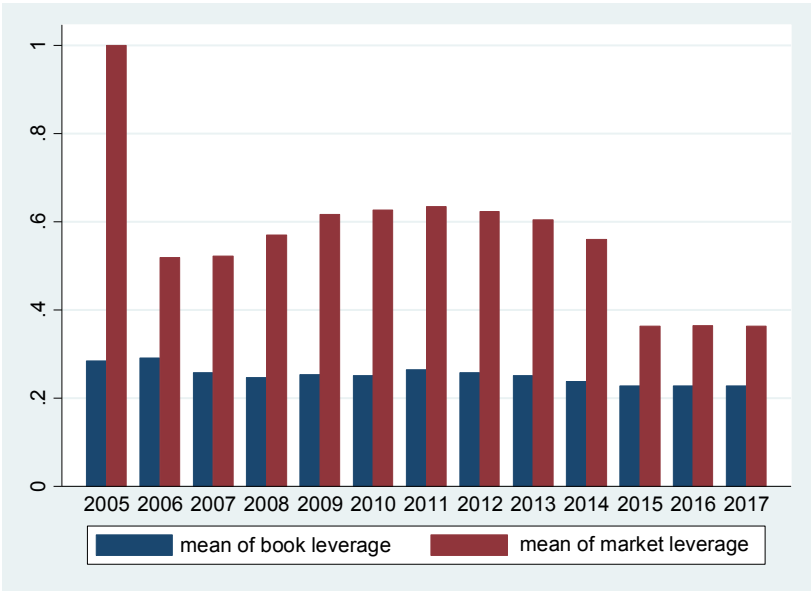


Table 5 shows that firms in our sample are quite profitable when the earnings before interest and tax account for more than 12% of the total assets. About 28% of total assets are tangibility, and market value of shares is more than three times the book value of shares. Interestingly, the average value of market leverage is about two times higher than that of the book leverage.

**Table 5:** Descriptive statistics of regression variables

Variable	Obs.	Mean	Std. Dev	Quantiles				
				Min	0.25	Median	0.75	Max
TDA	10,789	0.25	0.21	0.00	0.05	0.22	0.41	0.77
TDM	10,209	0.56	0.38	0.00	0.19	0.60	1.00	1.00
Size	10,789	26.44	1.40	23.50	25.49	26.34	27.30	30.42
MTB	8,780	3.80	4.38	0.00	1.21	2.44	4.59	26.68
Profit	8,711	0.12	0.10	-0.13	0.06	0.11	0.17	0.44
Tang	10,789	0.28	0.22	0.00	0.11	0.23	0.41	0.88
Growth	9,170	0.23	0.69	-0.76	-0.05	0.11	0.31	4.72
NDTS	10,789	0.02	0.03	0.00	0.00	0.01	0.04	0.14
Book_MIL	10,789	0.23	0.07	0.05	0.20	0.23	0.28	0.32
Market_MIL	10,786	0.61	0.21	0.14	0.42	0.66	0.77	1.00

### 3.5. Correlation matrix

Table 6 shows the pairwise correlation coefficient matrix within variables. TDA and TDM have a strong correlation, so we can use them alternately. Size is highly correlated to TDA with the coefficients of 0.3726, and 0.2584 to TDM, supporting the trade-off theory. The two proxies of debt to asset ratio have a positive association to firm market to book ratio, which supports the pecking order theory. Furthermore, consistent with the predictions of the pecking order theory, correlation matrix reveals a negative association between leverage (both book and market measures) and profitability.

A positive link is also found with tangibility, as implied by the trade-off theory. Besides, the negative relationship between leverage and growth in sales is also in line with the prediction of

this theory. The non-debt tax shield's coefficients vary in opposite directions for two leverage measures, i.e., positive to book leverage, but negatively to market leverage. Industry median leverage has positive correlation coefficients with two proxies of capital structure. Between independent variables, all correlation coefficients are smaller than 0.8 - the highest level suggested by Kennedy (1992).

**Table 6:** Pairwise correlation coefficient matrix

	TDA	TDM	Size	MTB	Profit	Tang	Growth	NDTS	Book_MIL	Market_MIL
TDA	1									
TDM	0.7024	1								
Size	0.3726	0.2584	1							
MTB	0.2916	0.278	0.0836	1						
Profit	-0.1739	-0.2608	-0.0706	-0.029	1					
Tang	0.2754	0.1324	0.0449	-0.1468	0.1689	1				
Growth	-0.032	-0.0197	0.0259	-0.0144	0.0619	-0.017	1			
NDTS	0.0588	-0.0348	0.004	-0.0086	0.4234	0.436	-0.0629	1		
Book_MIL	0.2179	0.1646	0.1957	0.0668	0.0746	0.0191	0.0334	0.0699	1	
Market_MIL	0.1633	0.242	0.0122	0.0662	0.0931	0.0937	0.0098	0.0187	0.624	1

## 4. Results

### 4.1. The change in capital structure and adjustment speed with firm growth

When the stage of the business cycle is characterized by growth in sales ratio, we first examine the role of Growth as a determinant of the capital structure function. However, with book leverage, both three estimates (i.e., POLS, FE, and GMM) provide insignificant positive coefficients. With market measurement, POLS and GMM show a significant relationship between growth ratio and capital structure at 95% confidence interval. All R2 test for POLS, and AR2 as well as Hansen test for GMM give favorable values with  $p > 0.05$ . The positive coefficients do not support the predictions of the trade off theory. Remember that the trade-off

theory suggests cost-benefit balancing for funding decisions. For growth firms, higher tax payment, high liquidity risk and asymmetric information issues will lead to higher costs of debt (Frank and Goyal, 2009). Besides, such firms are supposed to generate more retained earnings, so the trade off theory expect a decreasing in the level of debt. However, our numbers support to pecking order hypothesis, since it states that high-growth firms tend to use more debt since their internal capital cannot satisfy the high capital demand.

**Table 7:** The relationship between capital structure and firm growth (2005-2017)

	TDA <sub>it</sub>			TDM <sub>it</sub>		
	POLS	FE	GMM	POLS	FE	GMM
TDA <sub>it-1</sub>	0.761***	0.391***	0.760***			
	(0.0112)	(0.0178)	(0.0317)			
TDM <sub>it-1</sub>				0.885***	0.368***	0.851***
				(0.0069)	(0.0178)	(0.0151)
Size <sub>it</sub>	0.0142***	0.0567***	0.0139***	0.0101***	0.0948***	0.00638***
	(0.0013)	(0.0056)	(0.0019)	(0.0014)	(0.0078)	(0.0013)
MTB <sub>it</sub>	0.00394***	0.00525***	0.00389***	0.00416***	0.00788***	0.00269***
	(0.0005)	(0.0009)	(0.0006)	(0.0005)	(0.0011)	(0.0005)
Profit <sub>it</sub>	-0.206***	-0.297***	-0.204***	-0.193***	-0.191***	-0.117***
	(0.0161)	(0.0240)	(0.0200)	(0.0205)	(0.0300)	(0.0246)
Tangibility <sub>it</sub>	0.100***	0.138***	0.0979***	0.0692***	0.120***	0.0514***
	(0.0088)	(0.0182)	(0.0120)	(0.0091)	(0.0238)	(0.0089)
Growth <sub>it</sub>	0.000297	0.000946	0.00059	0.00874*	0.00272	0.00864*
	(0.0022)	(0.0023)	(0.0022)	(0.0034)	(0.0030)	(0.0035)
NDS <sub>it</sub>	-0.123*	-0.129	-0.120*	-0.221**	-0.187*	-0.254***
	(0.0513)	(0.0667)	(0.0518)	(0.0670)	(0.0893)	(0.0612)
Book_MIL <sub>it</sub>	0.247***	0.237***	0.250***			
	(0.0585)	(0.0618)	(0.0594)			
Market_MIL <sub>it</sub>				0.105***	0.101***	0.0832***
				(0.0239)	(0.0291)	(0.0230)

Observations	7745	7745	7745	7530	7530	7530
R2	0.776	0.346		0.86	0.332	
AR2 (p-value)			0.135			0.422
Hansen-J (p-value)			0.869			0.222
Standard errors in parentheses						
* p<0.05, ** p<0.01, *** p<0.001						

Rutherford (2003) suggests to break the growth rate into 7 intervals (i.e., decreased more than 5%; decreased 1%–5%; no change; increased 1%–5%; increased 6%–10%; increased 11%–15%; and 16% or more); however, due to the limited number of our observations, we only divide our sample into 3 subsets: negative growth rate; rate from 0% to 20%; and above 20%, which are denoted as low-growth, moderate and high-growth firms, respectively. Whatever the book or market debt is used, the results show that high-growth firms offset the deviation to the target leverage faster. Specifically, for more-than-20% growth firms, the speed is around 27% annually with TDA and 10.7% per year with TDM. Note that the speed of adjustment equals 1 minus the coefficient of lagged leverage).

**Table 8:** The adjustment speed for different growth rate intervals (2005-2017)

	TDA <sub>it</sub>			TDM <sub>it</sub>		
Firm growth rate	<0	0-0.2	>0.2	<0	0-0.2	>0.2
TDA <sub>it-1</sub>	0.817***	0.790***	0.730***			
	(0.0478)	(0.0543)	(0.0605)			
TDM <sub>it-1</sub>				0.929***	0.905***	0.893***
				(0.0246)	(0.0272)	(0.0312)
Size <sub>it</sub>	0.0139***	0.0115***	0.0131***	0.00857**	0.00363	0.00771**
	(0.0031)	(0.0028)	(0.0032)	(0.0027)	(0.0023)	(0.0026)
MTB <sub>it</sub>	0.00310***	0.00264**	0.00440***	0.00266***	0.000831	0.00445***
	(0.0008)	(0.0009)	(0.0010)	(0.0008)	(0.0008)	(0.0011)
Profit <sub>it</sub>	-0.202***	-0.227***	-0.217***	-0.105**	-0.145***	-0.248***

	(0.0282)	(0.0365)	(0.0337)	(0.0405)	(0.0429)	(0.0489)
Tangibility <sub>it</sub>	0.0679***	0.0882***	0.126***	0.0510***	0.0426*	0.0702***
	(0.0161)	(0.0198)	(0.0225)	(0.0135)	(0.0168)	(0.0185)
Growth <sub>it</sub>	0.0328**	-0.0771*	-0.0034	0.0351*	-0.0758	-0.00033
	(0.0122)	(0.0346)	(0.0029)	(0.0174)	(0.0468)	(0.0044)
NDTS <sub>it</sub>	-0.0923	-0.0743	-0.177	-0.288**	-0.159	-0.15
	(0.0781)	(0.0807)	(0.0910)	(0.0898)	(0.1000)	(0.1220)
Book_MIL <sub>it</sub>	0.323**	0.149	0.196			
	(0.1050)	(0.1000)	(0.1060)			
Market_MIL <sub>it</sub>				0.0597	0.0382	0.151**
				(0.0435)	(0.0335)	(0.0467)
Observations	2441	2512	2791	2380	2431	2718
AR2 (p-value)	0.234	0.0906	0.808	0.144	0.194	0.0937
Hansen-J (p-value)	0.679	0.58	0.508	0.0816	0.0941	0.152
Standard errors in parentheses						
* p<0.05, ** p<0.01, *** p<0.001						

When we use industry median growth rate as the threshold to separate high or low growth firms, a faster speed of adjustment is again found for high growth firms. Specifically, with book leverage, in the group of above-industry-median, the speed is 27.2% per year, and with market debt ratio, this speed is 9.7% per annum, which is close to what we found in the table 8.

**Table 9:** The adjustment speed for firm above and below median industry growth rate (2005-2017)

Firm growth rate	TDA <sub>it</sub>		TDM <sub>it</sub>	
	<median industry growth rate	>median industry growth rate	<median industry growth rate	>median industry growth rate
TDA <sub>it-1</sub>	0.811***	0.728***		
	(0.0455)	(0.0473)		
TDM <sub>it-1</sub>			0.940***	0.903***

			(0.0231)	(0.0260)
Size <sub>it</sub>	0.0135***	0.0130***	0.00734***	0.00679**
	(0.0026)	(0.0025)	(0.0022)	(0.0023)
MTB <sub>it</sub>	0.00294***	0.00425***	0.00238***	0.00389***
	(0.0008)	(0.0008)	(0.0007)	(0.0009)
Profit <sub>it</sub>	-0.210***	-0.228***	-0.137***	-0.218***
	(0.0259)	(0.0298)	(0.0357)	(0.0386)
Tangibility <sub>it</sub>	0.0797***	0.114***	0.0572***	0.0582***
	(0.0153)	(0.0179)	(0.0133)	(0.0163)
Growth <sub>it</sub>	0.0273**	-0.00291	0.0394**	0.00176
	(0.0094)	(0.0027)	(0.0133)	(0.0044)
NDTS <sub>it</sub>	-0.105	-0.118	-0.254**	-0.147
	(0.0667)	(0.0784)	(0.0844)	(0.1010)
Book_MIL <sub>it</sub>	0.263**	0.212*		
	(0.0840)	(0.0901)		
Market_MIL <sub>it</sub>			0.0799*	0.118**
			(0.0335)	(0.0368)
Observations	3859	3841	3746	3746
AR2 (p-value)	0.379	0.324	0.216	0.715
Hansen-J (p-value)	0.549	0.905	0.32	0.253
Standard errors in parentheses				
* p<0.05, ** p<0.01, *** p<0.001				

The results from table 8 and 9 are coherent since they all show that high-growth firms adjust more quickly to their target leverage. These firms may have more advantages (Elsas and Florysiak, 2011) or face less adjustment costs to move closer to the target.

#### 4.2. The change in capital structure and adjustment speed with firm age

Besides growth rate, firm age is widely used as a reliable proxy for the business life cycle since credit history and information transparency increase with age. Thus, it helps creditors with making lending decisions more exactly (La Rocca et al., 2011).

To see how firm age affects the source of funds and the speed at which firms move to their target leverage, we will add age variables into the partial adjustment model. Although the coefficients



of age, and age\_squared are insignificant in all columns, there is evidence of a non-linear relationship between age and the level of debt. More specifically, there is a U-shaped relationship between debt ratio and firm age. It means that, at the beginning, firms tend to use less debts over time, but in later stages, firms have higher demand for external debt finance. We use both static (POLS, FE) and dynamic (GMM) to guarantee the findings.

**Table 10:** Adjustment speed over the firm age (2005-2017)

	TDA <sub>it</sub>			TDM <sub>it</sub>		
	POLS	FE	GMM	POLS	FE	GMM
TDA <sub>it-1</sub>	0.757***	0.399***	0.746***			
	(0.0113)	(0.0172)	(0.0307)			
TDM <sub>it-1</sub>				0.882***	0.371***	0.846***
				(0.0072)	(0.0179)	(0.0155)
Size <sub>it</sub>	0.0146***	0.0571***	0.0151***	0.0109***	0.0952***	0.00705***
	(0.0013)	(0.0056)	(0.0019)	(0.0015)	(0.0078)	(0.0014)
MTB <sub>it</sub>	0.00412***	0.00513***	0.00427***	0.00434***	0.00789***	0.00291***
	(0.0005)	(0.0008)	(0.0006)	(0.0005)	(0.0011)	(0.0005)
Profit <sub>it</sub>	-0.210***	-0.299***	-0.213***	-0.195***	-0.192***	-0.121***
	(0.0165)	(0.0242)	(0.0202)	(0.0210)	(0.0301)	(0.0252)
Tangibility <sub>it</sub>	0.102***	0.137***	0.104***	0.0683***	0.121***	0.0517***
	(0.0090)	(0.0183)	(0.0121)	(0.0094)	(0.0240)	(0.0090)
Growth <sub>it</sub>	0.000544	0.00147	0.000637	0.00850*	0.00312	0.00866*
	(0.0024)	(0.0024)	(0.0024)	(0.0037)	(0.0031)	(0.0038)
NDTS <sub>it</sub>	-0.133*	-0.123	-0.128*	-0.224**	-0.190*	-0.258***
	(0.0527)	(0.0668)	(0.0538)	(0.0689)	(0.0898)	(0.0631)
Age <sub>it</sub>	-0.0000296	-0.00146	-0.0000508	-0.000684	-0.00524	-0.00057
	(0.0004)	(0.0046)	(0.0004)	(0.0004)	(0.0063)	(0.0004)

Age <sub>it</sub> ^2	0.00000191	0.000000185	0.0000021	0.0000113	0.0000126	0.0000095
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Book_MIL <sub>it</sub>	0.250***	0.233***	0.254***			
	(0.0588)	(0.0620)	(0.0601)			
Market_MIL <sub>it</sub>				0.111***	0.102***	0.0906***
				(0.0244)	(0.0291)	(0.0235)
Observations	7481	7481	7481	7288	7288	7288
R2	0.778	0.357		0.857	0.334	
AR2 (p-value)			0.384			0.418
Hansen-J (p-value)			0.814			0.300
Standard errors in parentheses						
* p<0.05, ** p<0.01, *** p<0.001						

When we use industry median age as a threshold to separate young or old firms, a faster speed of adjustment is found for old firms. In table 11, the estimated coefficients for the lagged book leverage are significant for all subgroups. When using book leverage, the fastest speed at 25.1% per year is found for firms that are older than industry median age. When leverage is measured by market value, the older firms are also shown to adjust more quickly compared to young firms.

**Table 11:** The adjustment speed for firm younger and older than median industry age (2005-2017)

	TDA <sub>it</sub>		TDM <sub>it</sub>	
	<median industry age	>median industry age	<median industry age	>median industry age
TDA <sub>it-1</sub>	0.775***	0.749***		
	(0.0458)	(0.0510)		
TDM <sub>it-1</sub>			0.934***	0.931***

			(0.0270)	(0.0202)
Size <sub>it</sub>	0.0147***	0.0132***	0.00932***	0.00600*
	(0.0029)	(0.0027)	(0.0026)	(0.0024)
MTB <sub>it</sub>	0.00383***	0.00383***	0.00266***	0.00329***
	(0.0009)	(0.0009)	(0.0007)	(0.0007)
Profit <sub>it</sub>	-0.187***	-0.233***	-0.138***	-0.160***
	(0.0262)	(0.0331)	(0.0376)	(0.0352)
Tangibility <sub>it</sub>	0.0968***	0.103***	0.0480***	0.0531**
	(0.0172)	(0.0252)	(0.0137)	(0.0179)
Growth <sub>it</sub>	-0.00311	0.00942	0.00123	0.0225***
	(0.0027)	(0.0054)	(0.0044)	(0.0062)
NDTS <sub>it</sub>	-0.192*	-0.041	-0.287**	-0.0728
	(0.0775)	(0.1260)	(0.0948)	(0.1750)
Book_MIL <sub>it</sub>	0.184*	0.277		
	(0.0851)	(1.0250)		
Market_MIL <sub>it</sub>			0.153***	-0.0737
			(0.0383)	(0.1480)
Observations	3644	3855	3534	3757
AR2 (p-value)	0.0814	0.425	0.232	0.922
Hansen-J (p-value)	0.709	0.943	0.309	0.204
Standard errors in parentheses				
* p<0.05, ** p<0.01, *** p<0.001				

To sum up, the adjustment speed toward the target leverage is higher for firms having age older than the industry median. Such firms have lower costs of adjustment thanks to reliable credit recording, long transaction relationship with banks, and lower bankruptcy risk in comparison with young firms.

### 4.3. Cash flow pattern as the proxy for the life cycle

Table 12 shows the distribution of sample by corporate life stages. We classify firms into five different categories, including introduction, growth, maturity, shake out and decline, based on the method of Dickinson (2011). As can be seen, 28.79% of firms are in the stage of the maturity, followed by shakeout firms which account for 25.02% of the sample. Firms at the introduction stage take 19.16% of the total sample. Firms at decline time is lowest with the proportion of 10.2%. In addition, firms in the introduction and growth stages have the most and the second highest ratios of debt on average, with both book and market measures, confirming the role of external debt in the early stage of corporate life. This fact invalidates the common wisdom that during early stages, firms often do not have enough strong assets that can be evaluated as stable collateral, often suffer from high levels of asymmetric information, and do not have sufficient evidences of past performances as well as credit history so credit providers do not feel safe to invest their money to young companies. Funding for this period mainly comes from the internal sources, for example, initial capital from their owners.

**Table 12:** Data summary by stages of life

Stage	Observation	Percentage	Mean of sales growth	Mean of book leverage	Mean of market leverage
Introduction	2,067	19.16%	0.3765	0.3408	0.6630
Growth	1,817	16.84%	0.3408	0.3002	0.5795
Maturity	3,106	28.79%	0.1467	0.2077	0.4895
Shakeout	2,699	25.02%	0.1419	0.2128	0.5619
Decline	1,100	10.20%	0.1881	0.2109	0.5483

We present the changes of the book adjustment speed over firm life cycle in table 13. As can be seen, the lagged leverage's coefficient is significant at the 0.01 level over 5 stages of life, confirming the existence of the target level of debt. In the introduction stage of life, firms tend to adjust faster toward the target with the speed of 27.1%. The implied adjustment speed reduces

gradually, and reaches the lowest point at 12.5% per year for firms in the maturity, before a recovery in the two last stages.

**Table 13:** Book adjustment speed over 5 stages of life cycle (2005-2017)

	Introduction	Growth	Maturity	Shake-out	Decline
TDA <sub>it-1</sub>	0.729***	0.752***	0.875***	0.795***	0.766***
	(0.0848)	(0.0653)	(0.0447)	(0.0436)	(0.0566)
Size <sub>it</sub>	0.0102	0.00532	0.00546**	0.0117***	0.0133**
	(0.0056)	(0.0032)	(0.0020)	(0.0030)	(0.0046)
MTB <sub>it</sub>	0.00639***	0.00421**	0.000631	0.00281***	0.00508***
	(0.0010)	(0.0013)	(0.0008)	(0.0008)	(0.0011)
Profit <sub>it</sub>	-0.027	-0.113*	-0.0604	-0.109**	-0.0881
	(0.0633)	(0.0443)	(0.0315)	(0.0332)	(0.0570)
Tangibility <sub>it</sub>	0.115***	0.155***	0.0513***	0.0888***	0.0682*
	(0.0310)	(0.0277)	(0.0147)	(0.0158)	(0.0342)
Growth <sub>it</sub>	-0.0207***	-0.00836	-0.00788	0.00541	-0.000788
	(0.0051)	(0.0051)	(0.0063)	(0.0047)	(0.0042)
NDTS <sub>it</sub>	0.0546	-0.13	-0.094	-0.274**	-0.053
	(0.1530)	(0.1300)	(0.0672)	(0.0982)	(0.1890)
Book_MIL <sub>it</sub>	0.174	0.0792	0.184*	0.338**	-0.0768
	(0.1610)	(0.1600)	(0.0714)	(0.1280)	(1.2410)
Observations	1520	1393	2361	1616	855
AR2 (p-value)	0.0879	0.122	0.0794	0.9	0.627
Hansen-J (p-value)	0.239	0.12	0.321	0.27	0.815
Standard errors in parentheses					
* p<0.05, ** p<0.01, *** p<0.001					

Considering the market measure of leverage, the highest speed of 22.9% per year is found in the initial stage and reduces to 12.7% in the growth stage. The high speed of adjustment suggests considerable low transaction costs. The speed is lowest at maturity with a rate of 1.3% per year. In the two latter stages, the speed recovers, making a U-shape movement. Since AR2 tests give p-values larger than 0.05, there is no evidence for second-order serial correlation of the error term at the 5% significance level.

**Table 14:** Market adjustment speed over 5 stages of life cycle (2005-2017)

	Introduction	Growth	Maturity	Shake-out	Decline
TDM <sub>it-1</sub>	0.771***	0.873***	0.987***	0.984***	0.873***
	(0.0538)	(0.0362)	(0.0184)	(0.0292)	(0.0406)
Size <sub>it</sub>	0.0111*	-0.00254	0.00432*	0.00509	0.00864
	(0.0055)	(0.0030)	(0.0020)	(0.0028)	(0.0050)
MTB <sub>it</sub>	0.00650***	0.00578***	0.000615	0.00202*	0.00431***
	(0.0014)	(0.0016)	(0.0007)	(0.0009)	(0.0011)
Profit <sub>it</sub>	-0.176*	-0.179*	0.0246	0.0145	-0.107
	(0.0794)	(0.0728)	(0.0352)	(0.0433)	(0.0814)
Tangibility <sub>it</sub>	0.0787**	0.0946***	0.0372*	-0.00937	0.0325
	(0.0283)	(0.0265)	(0.0146)	(0.0220)	(0.0318)
Growth <sub>it</sub>	-0.0160*	0.00246	0.00199	0.000822	-0.00097
	(0.0078)	(0.0085)	(0.0070)	(0.0072)	(0.0070)
NDTS <sub>it</sub>	-0.356	-0.159	-0.208*	0.192	-0.196
	(0.1900)	(0.1870)	(0.0956)	(0.1630)	(0.2530)
Market_MIL <sub>it</sub>	0.149*	0.113*	0.0342	-0.551**	0.143
	(0.0685)	(0.0538)	(0.0340)	(0.1990)	(0.0799)
Observations	1507	1379	2276	1542	826
AR2 (p-value)	0.288	0.395	0.209	0.513	0.373

Hansen-J (p-value)	0.0896	0.0871	0.183	0.127	0.529
Standard errors in parentheses					
* p<0.05, ** p<0.01, *** p<0.001					

In short, a U shape is made apparent through the changes in the adjustment speed over stages. Throughout the stage of introduction, the speed of adjustment is the highest, and needs around 44 months to offset the distance to the book target, and 52 months if the market leverage is used. This speed reduces a little during the growth period, before reaching the bottom in the stage of maturity. A smooth increase can be seen in the next stage - shake out. In the stage of decline, the speed is 23.4% and 12.7% for book and market leverage, respectively. These outcomes indicate the fact that firms may find it possible to issue additional securities or acquire more debts that would help them offset the deviations from the optimal level of debts when they are in the introduction. This is not in line with the common wisdom that during the early stages, firms have difficulties to obtain external capital since they often do not have stable collateral, and do not have sufficient evidence of past performance as well as credit history to attract creditors.

#### 4.4. Theory test

##### Trade-off theory test

Berger and Udell (1998) state that having a single capital structure theory that can explain the funding behavior of observed firms through a whole lifetime is imprecise because financial structure is life-cycle-determined. Thus, it is necessary to test main capital structure theories throughout the five stages of life. First, to test the trade off hypothesis, we add to the partial adjustment model a variable measuring the effective tax rate at which companies actually pay to the Vietnam government for using a certain level of debt.

When measuring debt with book value, the fastest speed is also found for firms in the introduction stage. The high-low-high pattern in movement of adjusting rate is also found which is consistent with the previous sections. However, the ETR coefficients are insignificant for all phases.

**Table 15: Trade-off test for different stages of life – book leverage (2005-2017)**

	Introduction	Growth	Maturity	Shakeout	Decline
TDA <sub>it-1</sub>	0.731***	0.758***	0.877***	0.795***	0.764***
	(0.0851)	(0.0664)	(0.0440)	(0.0436)	(0.0568)
Size <sub>it</sub>	0.00993	0.00501	0.00536**	0.0119***	0.0134**
	(0.0057)	(0.0033)	(0.0021)	(0.0030)	(0.0046)
MTB <sub>it</sub>	0.00634***	0.00411**	0.000614	0.00281***	0.00512***
	(0.0010)	(0.0013)	(0.0008)	(0.0008)	(0.0011)
Profit <sub>it</sub>	-0.025	-0.114*	-0.0593	-0.108**	-0.0902
	(0.0633)	(0.0453)	(0.0316)	(0.0330)	(0.0548)
Tangibility <sub>it</sub>	0.115***	0.154***	0.0508***	0.0874***	0.0697*
	(0.0307)	(0.0277)	(0.0142)	(0.0156)	(0.0329)
Growth <sub>it</sub>	-0.0204***	-0.00792	-0.00772	0.00534	-0.000664
	(0.0051)	(0.0052)	(0.0064)	(0.0047)	(0.0041)
NDTS <sub>it</sub>	0.0303	-0.126	-0.0951	-0.252*	-0.0526
	(0.1540)	(0.1360)	(0.0696)	(0.1010)	(0.1850)
Book_MIL <sub>it</sub>	0.174	0.0785	0.183*	0.332**	0.00625
	(0.1620)	(0.1600)	(0.0715)	(0.1290)	(1.1720)
ETR <sub>it</sub>	0.0137	-0.00223	0.00124	-0.014	-0.00287
	(0.0101)	(0.0131)	(0.0071)	(0.0105)	(0.0149)
Observations	1518	1390	2360	1614	855
AR2 (p-value)	0.0858	0.11	0.0804	0.896	0.623
Hansen-J (p-value)	0.232	0.119	0.32	0.259	0.821
Standard errors in parentheses					
* p<0.05, ** p<0.01, *** p<0.001					



Considering market leverage, the trade-off theory, again, seems to be unsuitable to explain the funding behavior of firms at any stages of life but maturity. For mature firms, the coefficient of ETR is significantly positive at 95% confidence interval, which is consistent with López-gracia & Sogorb-mira (2008)'s prediction that mature firms with less income volatility will enjoy a larger corporate tax deduction from using debt. Such companies tend to use a higher level of debt, leading to the positive relationship between ETR and TDM. If this statement holds true, the adjustment costs should be less for mature firms, making its adjusting rate faster. However, in the current study, the speed of firms in maturity is found lower than that of any other stages of life. Besides, since ETR and TDA have insignificant correlation, we cannot conclude anything about the explanatory power of the trade-off theory.

Considering the implied speed, the U-shaped pattern is confirmed. When firms move from the first to second and third phases, the speed decrease gradually. After falling to the bottom in the mature stage, a recovery in the rates is observed. The  $p$ -value of AR(2) test indicates the absence of second order serial correlation, while the  $p$ -value of Hansen test ensures that the instruments used in the regression are valid.

**Table 16:** Trade-off test for different stages of life – market leverage (2005-2017)

	Introduction	Growth	Maturity	Shakeout	Decline
TDM <sub>it-1</sub>	0.771***	0.873***	0.987***	0.985***	0.875***
	(0.0540)	(0.0362)	(0.0184)	(0.0289)	(0.0402)
Size <sub>it</sub>	0.0112*	-0.00262	0.00400*	0.0055	0.0085
	(0.0056)	(0.0031)	(0.0020)	(0.0029)	(0.0051)
MTB <sub>it</sub>	0.00651***	0.00576***	0.000596	0.00203*	0.00429***
	(0.0014)	(0.0016)	(0.0007)	(0.0009)	(0.0011)
Profit <sub>it</sub>	-0.178*	-0.180*	0.0268	0.0161	-0.104
	(0.0800)	(0.0748)	(0.0354)	(0.0432)	(0.0805)
Tangibility <sub>it</sub>	0.0781**	0.0969***	0.0392**	-0.0124	0.0315
	(0.0283)	(0.0265)	(0.0147)	(0.0221)	(0.0314)

Growth <sub>it</sub>	-0.0162*	0.00295	0.00236	0.00106	-0.000676
	(0.0078)	(0.0085)	(0.0070)	(0.0072)	(0.0070)
NDTS <sub>it</sub>	-0.341	-0.161	-0.232*	0.228	-0.19
	(0.1930)	(0.1980)	(0.0975)	(0.1680)	(0.2550)
Market_MIL <sub>it</sub>	0.149*	0.114*	0.0331	-0.548**	0.142
	(0.0686)	(0.0536)	(0.0340)	(0.1980)	(0.0797)
ETR <sub>it</sub>	-0.00667	0.0018	0.0225*	-0.0243	-0.00375
	(0.0118)	(0.0205)	(0.0089)	(0.0149)	(0.0174)
Observations	1505	1376	2275	1541	826
AR2 (p-value)	0.298	0.415	0.194	0.453	0.373
Hansen-J (p-value)	0.0891	0.0974	0.149	0.133	0.514
Standard errors in parentheses					
* p<0.05, ** p<0.01, *** p<0.001					

### Pecking order theory test

Table 17 presents the result of the pecking order theory test for the five phases of the business life cycle. Due to the positive significance of the variable accounting for the financial deficit with firms in growth and maturity subgroups, we can assume that the pecking order theory is able to explain partly the funding behavior of such firms. The theory implies that managers know more about the current situation and future prospects of firms than outside parties. It also implies any changes in capital structure is motivated by the financial demand, and the managers' awareness of risks and costs related to possible sources of capital. In fact, growth and mature firms often less suffer asymmetric information issues, so they tend to acquire more debt if the deficit happens.

**Table 17:** Pecking order test for different stages of life – book leverage (2005-2017)

	Introduction	Growth	Maturity	Shakeout	Decline
TDA <sub>it-1</sub>	0.726***	0.760***	0.873***	0.794***	0.766***
	(0.0848)	(0.0671)	(0.0440)	(0.0436)	(0.0570)
Size <sub>it</sub>	0.0104	0.00481	0.00527**	0.0118***	0.0134**
	(0.0054)	(0.0033)	(0.0020)	(0.0030)	(0.0046)
MTB <sub>it</sub>	0.00642***	0.00465***	0.000874	0.00279***	0.00502***
	(0.0010)	(0.0013)	(0.0007)	(0.0008)	(0.0011)
Profit <sub>it</sub>	-0.0267	-0.105*	-0.0545	-0.111***	-0.0888
	(0.0631)	(0.0444)	(0.0323)	(0.0330)	(0.0555)
Tangibility <sub>it</sub>	0.116***	0.156***	0.0561***	0.0886***	0.0669
	(0.0317)	(0.0276)	(0.0145)	(0.0159)	(0.0344)
Growth <sub>it</sub>	-0.0208***	-0.00712	-0.0063	0.00528	-0.000938
	(0.0052)	(0.0050)	(0.0067)	(0.0047)	(0.0043)
NDTS <sub>it</sub>	0.0519	-0.118	-0.0955	-0.277**	-0.0566
	(0.1580)	(0.1300)	(0.0673)	(0.0990)	(0.1890)
Book_MIL <sub>it</sub>	0.175	0.0873	0.178*	0.336**	-0.153
	(0.1590)	(0.1560)	(0.0708)	(0.1280)	(1.2480)
DEFICIT <sub>it</sub>	-0.000746	0.0332*	0.0259*	-0.00473	-0.00476
	(0.0164)	(0.0164)	(0.0109)	(0.0106)	(0.0160)
Observations	1520	1393	2361	1616	855
AR2 (p-value)	0.0869	0.17	0.0791	0.905	0.621
Hansen-J (p-value)	0.243	0.117	0.263	0.273	0.823
Standard errors in parentheses					
* p<0.05, ** p<0.01, *** p<0.001					

Considering market leverage, the pecking-order theory seems to be a suitable framework to explain the funding behavior of firms at all stages of life but growth. For mature firms, the market debt ratio has a positive relationship with deficit variables, which is consistent with what we found when we use book leverage. In terms of introduction, shake out, and decline groups, these firms have an unstable growth prospect, and will have more difficulties to acquire debt in case of deficit.

Again, the fastest rate is found for firms that are in the initial stage of life. Moreover, a U-shaped profile is revealed in the way firms move to their optimal level of debt. At 99% confidence interval, the speed is found at 23.7% per year for firms in the introduction stage, and decreases gradually to 13%, and 1.3% in the next two stages. When firms are shaking out, the speed recovers to 1.7% per year. For firms in decline stage, the speed is at 13%. The  $p$ -value of AR(2) test indicates the absence of second order serial correlation, while the  $p$ -value of Hansen test ensure that the instruments used in the regression are valid and do not suffer from the problem of over-identification.

**Table 18:** Pecking order test for different stages of life – market leverage (2005-2017)

	Introduction	Growth	Maturity	Shakeout	Decline
TDM <sub>it-1</sub>	0.763***	0.870***	0.987***	0.983***	0.870***
	(0.0524)	(0.0370)	(0.0184)	(0.0283)	(0.0407)
Size <sub>it</sub>	0.0107*	-0.00214	0.00467*	0.00552	0.00859
	(0.0053)	(0.0030)	(0.0020)	(0.0029)	(0.0050)
MTB <sub>it</sub>	0.00629***	0.00531**	0.000307	0.00186*	0.00393***
	(0.0013)	(0.0017)	(0.0007)	(0.0009)	(0.0011)
Profit <sub>it</sub>	-0.195*	-0.183*	0.0125	0.00139	-0.137
	(0.0799)	(0.0748)	(0.0357)	(0.0418)	(0.0835)
Tangibility <sub>it</sub>	0.0860**	0.0931***	0.0320*	-0.0145	0.0301
	(0.0284)	(0.0266)	(0.0148)	(0.0221)	(0.0318)
Growth <sub>it</sub>	-0.0182*	0.000434	0.00105	-0.00149	-0.00137

	(0.0077)	(0.0082)	(0.0068)	(0.0072)	(0.0069)
NDTS <sub>it</sub>	-0.457*	-0.185	-0.197*	0.19	-0.233
	(0.1970)	(0.1840)	(0.0955)	(0.1620)	(0.2540)
Market_MIL <sub>it</sub>	0.138*	0.116*	0.0363	-0.593**	0.14
	(0.0672)	(0.0542)	(0.0343)	(0.1970)	(0.0799)
DEFICIT <sub>it</sub>	-0.0628**	0.0356	0.0358*	-0.0400**	-0.0500*
	(0.0203)	(0.0244)	(0.0139)	(0.0143)	(0.0215)
Observations	1507	1379	2276	1542	826
AR2 (p-value)	0.305	0.498	0.197	0.479	0.4
Hansen-J (p-value)	0.124	0.0775	0.14	0.151	0.575
Standard errors in parentheses					
* p<0.05, ** p<0.01, *** p<0.001					

### Market timing theory test

Considering table 19, the results for the movement speed to the target leverage are similar to what we had found in the previous sections. Specifically, the highest book adjustment speed is 27.2% per year for firms in introduction stages. When testing market timing by adding a variable of external finance weighted average market to book ratio into the model, we find insignificant coefficients.

**Table 19:** Market timing test for different stages of life – book leverage (2005-2017)

	Introduction	Growth	Maturity	Shakeout	Decline
TDA <sub>it-1</sub>	0.728***	0.752***	0.870***	0.805***	0.760***
	(0.0845)	(0.0655)	(0.0439)	(0.0453)	(0.0579)
Size <sub>it</sub>	0.0103	0.00533	0.00588**	0.00949**	0.0123**
	(0.0056)	(0.0033)	(0.0020)	(0.0030)	(0.0047)
MTB <sub>it</sub>	0.00655***	0.00440**	0.00082	0.00317***	0.00515***

	(0.0013)	(0.0015)	(0.0007)	(0.0009)	(0.0013)
Profit <sub>it</sub>	-0.0265	-0.112*	-0.0705*	-0.0959**	-0.0617
	(0.0632)	(0.0445)	(0.0317)	(0.0321)	(0.0529)
Tangibility <sub>it</sub>	0.115***	0.155***	0.0545***	0.0837***	0.0643
	(0.0309)	(0.0278)	(0.0147)	(0.0169)	(0.0345)
Growth <sub>it</sub>	-0.0206***	-0.00841	-0.00853	-0.00186	-0.00126
	(0.0052)	(0.0051)	(0.0067)	(0.0034)	(0.0043)
NDTS <sub>it</sub>	0.0523	-0.128	-0.0861	-0.230*	-0.0822
	(0.1530)	(0.1300)	(0.0677)	(0.1010)	(0.1920)
Book_MIL <sub>it</sub>	0.177	0.0786	0.193**	0.268*	-0.232
	(0.1610)	(0.1600)	(0.0724)	(0.1190)	(1.2360)
EFWAMB <sub>it</sub>	-0.000146	-0.000231	-0.00012	-0.000282	0.00037
	(0.0010)	(0.0007)	(0.0005)	(0.0005)	(0.0009)
Observations	1520	1393	2300	1426	831
AR2 (p-value)	0.0976	0.162	0.397	0.0979	0.432
Hansen-J (p-value)	0.231	0.117	0.323	0.299	0.817
Standard errors in parentheses					
* p<0.05, ** p<0.01, *** p<0.001					

Considering market leverage, the market timing theory seems to be suitable to explain the funding behavior of firms in maturity. This means that in this stage of life, firms tend to use more debt when their stocks are overvalued by the market.

**Table 20:** Market timing test for different stages of life – market leverage (2005-2017)

	Introduction	Growth	Maturity	Shake-out	Decline
TDM <sub>it-1</sub>	0.771***	0.873***	0.987***	0.985***	0.875***
	(0.0540)	(0.0362)	(0.0184)	(0.0289)	(0.0402)

Size <sub>it</sub>	0.0112*	-0.00262	0.00400*	0.0055	0.0085
	(0.0056)	(0.0031)	(0.0020)	(0.0029)	(0.0051)
MTB <sub>it</sub>	0.00651***	0.00576***	0.000596	0.00203*	0.00429***
	(0.0014)	(0.0016)	(0.0007)	(0.0009)	(0.0011)
Profit <sub>it</sub>	-0.178*	-0.180*	0.0268	0.0161	-0.104
	(0.0800)	(0.0748)	(0.0354)	(0.0432)	(0.0805)
Tangibility <sub>it</sub>	0.0781**	0.0969***	0.0392**	-0.0124	0.0315
	(0.0283)	(0.0265)	(0.0147)	(0.0221)	(0.0314)
Growth <sub>it</sub>	-0.0162*	0.00295	0.00236	0.00106	-0.000676
	(0.0078)	(0.0085)	(0.0070)	(0.0072)	(0.0070)
NDTS <sub>it</sub>	-0.341	-0.161	-0.232*	0.228	-0.19
	(0.1930)	(0.1980)	(0.0975)	(0.1680)	(0.2550)
Market_MIL <sub>it</sub>	0.149*	0.114*	0.0331	-0.548**	0.142
	(0.0686)	(0.0536)	(0.0340)	(0.1980)	(0.0797)
EFWAMB <sub>it</sub>	-0.00667	0.0018	0.0225*	-0.0243	-0.00375
	(0.0118)	(0.0205)	(0.0089)	(0.0149)	(0.0174)
Observations	1505	1376	2275	1541	826
AR2 (p-value)	0.298	0.415	0.194	0.453	0.373
Hansen-J (p-value)	0.0891	0.0974	0.149	0.133	0.514
Standard errors in parentheses					
* p<0.05, ** p<0.01, *** p<0.001					

## 5. Conclusion

This study discusses the changes of adjustment speed throughout corporate life time. During each period of time, firms have different objectives, so will use different resources and methods to achieve their goals.

Understanding business life cycle is necessary due to its important influences on many aspects of firms, such as performance, investment, dividend policy, and so on. In particular, the change of funding behavior across stages of life has attracted the interest of researchers in recent decades. This study is the first examining the adjustment behavior of Vietnamese listed firms over the business life cycle. Based on 10,789 firm-year observations over a 13-year period, the essay has found some important results for this emerging market.

Firstly, by adopting the partial adjustment model, the study finds significant coefficients of lagged leverage in all examinations, providing a strong evidence that Vietnamese listed firms identify and pursue target leverage throughout the observed period of time. This indicates on different life cycle stages, the factors driving the debt targets and the speed at which firms offset the deviation from targets are different correspondingly, so firm managers should be aware of the effect of life cycle stage in order to make informed decisions concerning funding or investing/divesting, and to plan for what will happen on the next stage.

Secondly, the study shows that the adjustment speed increases with firm age and growth. Firms adjust faster when they become older and more-grown. Besides, the classification model of Dickinson (2011) is shown as a comprehensive method to separate 5 main stages of business life. The high-low-high pattern is found in the speed at which firms offset the deviation from the target. In introduction phase, firms adjust fastest and the rate reduces gradually when firms go through the growth or maturity stages. The speed is smaller when firms are matured. Then, it recovers in two last stages of life.

Last but not least, results indicate that the pecking order theory seems to be more appropriate to explain the funding choices of Vietnamese quoted firms in the stages of introduction, growth, shake out and decline. At maturity, we can combine the three main theories (i.e., trade off, pecking order and market timing) to explain funding behaviors, since the debt ratio is significantly correlated with all three variables denoted for the effective tax rate, the deficit and average weighted market to book variables.

The study sample does not cover unlisted companies, so it might prevent us to have an overall view of capital structure of the whole market. Besides, in the future, this kind of research can be expanded by taking into consideration the impacts of the government policy's changes and technology innovation. In addition, it will become more meaningful if we can capture the



availability and cost of some main sources of finance. These issues should be addressed in the future research for this transition economy since solving them by this current study is impossible due to the limitation of data.

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## **CHAPTER 5: Conclusion**

This section finishes the thesis by supplying a brief summarize on the main findings. Then, it discusses the implications with researchers, policy makers as well as managers of the firms listed on Vietnam exchange markets. In addition, it also shows some limitations of our studies and suggests some new research directions.

### **5.1. Conclusion**

In summary, Vietnam, as a typical emerging market, has provided a unique context to study the capital structure and adjustment behavior. This country has an underdeveloped corporate bond market, a fast-growing equity market, but its size is still too small to meet business capital demand. A large number of businesses depend on the banking system as the main channel to acquire debt. Compared to the private sector, SOEs have more advantages in accessing capital from financial institutions. Focusing on capital structure and the adjustment speed towards the target leverage of Vietnamese listed firms, the thesis can be divided into three essays with some main findings as presented below.

#### **5.1.1. The relationship between outside ownership and capital structure**

Within the capital structure topic, there is a research gap related to the influence of outside ownership on funding choices of firms in emerging markets like Vietnam; the majority of the papers concern developed countries such as the USA and the UK. While the studies for emerging countries are rare, China is the primary case. So, the impact of the state, large and foreign share-owners to debt ratios of Vietnam listed firms need to be investigated more.

With the awareness of such research gap, the first part of this thesis was designed to explore the link between outside ownership and the capital structure of Vietnamese listed firms over an eight-year period from 2007 to 2014. Based on a sample that considers all non-financial firms listed on the HSX, we find no obvious evidence of the linear impact of state ownership on six proxies of debt ratio. Results show, however, that the proportion of state investment has an inverted U shape with regard to short-term and total debt-to-asset ratio. The results suggest that, when state ownership is low, firms tend to use more short-term debt; but, when state ownership is concentrated enough, firms become less geared, and as a result, the debt level decreases gradually. Since the level of long-term debt acquired by firms listed on HSX is quite low, with

an average of 8.6% for the observed period, the number of shares held by the state does not have a clear influence on this kind of borrowing. This outcome is in contrast with the findings of previous studies using Vietnamese data, including studies by Nguyen et al. (2012), Okuda and Nhung (2012), and Le (2015). The paper also demonstrates the good fit of FE after several tests.

The U-shape relationship between the amount of the state-owned shares and the short-term and total leverage can be interpreted as firms tending to use more debt when state ownership is low in order to avoid outside takeover attempts and share dilution (de La Bruslerie and Latrous, 2012). Then, the amount of debt increases gradually together with the increase in shares held by the state, leading to the increase of distress and bankruptcy costs. When state ownership is large enough, firms will use less debt, making the level of debt to decrease accordingly.

In terms of blockholders, significant negative relationships between large ownership and short-term, and total leverage, are revealed. This is because firms with high controlling ownership tend to reduce their level of debt in order to eliminate the monitoring requirement from creditors. Also, block shareholders in firms with highly concentrated ownership have to face increasing undiversifiable risks so they often want to reduce debt in order to eliminate bankruptcy and distress costs. Moreover, in firms with considerable large ownership, managers could be forced to act in the interest of shareholders under the pressure of powerful blockholders. At that time, block ownership substitutes debts as the monitoring instrument, which helps firms to reduce the agency costs of equity, and therefore the demand of debt finance will reduce. Finally, the existence of large ownership can be considered as evidence of good performance and bright prospects, so large ownership can substitute for debt in playing a monitoring role. These findings are in line with Jensen and Meckling (1976), Leland and Pyle (1977) and Diamond (1984), Zeckhauser and Pound (1990), and Driffield et al. (2007).

In addition, the results clearly demonstrate that the number of shares held by foreign investors affects negatively the debt ratios of enterprises, holding other thing constant. Firstly, a large equity contribution from foreign investors could be an important reason. Indeed, foreign-owned firms had more available funding sources to substitute debt thanks to their skilled management, wide-network of relationship, superior technology, strong brand name and reputation. Besides, Vietnam applies a low corporate tax rate of 20% on average, so the small benefits from debt tax shield may not enough to encourage foreign-owned firms to use more debts. Instead of using

debts, keeping increasing foreign ownership is a good way to reduce not only over-investment problems caused by managers, but also the agency cost between managers and stockholders. Foreign ownership can substitute for debts by helping firms to strengthen the monitoring role, and reduce the cost of capital thanks to the existence of a group of external investors, professional analysts and economists who closely monitor firm managers.

### **5.1.2. The adjustment speed toward target leverage of Vietnamese listed firms**

Based on the main theories, with the tradeoff, pecking order and market timing theories as the most important, the issues of how firms determine and readjust their capital structure seems to be explored after the first work of Fischer et al. (1989). However, heterogeneity in the adjustment speed still needs more evidences. Especially in an emerging market like Vietnam, the study, for the first time, provides an in-depth exploring on the heterogeneity in adjustment behavior of publicly listed firms in this country.

Overall, this study contributes to the existing empirical literature on target leverage of Vietnamese listed firms in several ways. Firstly, by adopting the partial adjustment model, we find significant coefficients of lagged leverage in all analyses, providing strong evidence that Vietnamese listed firms identified and pursued target leverage from 2005 to 2017.

Secondly, the study does find many evidences on the heterogeneity in adjustment speeds. Especially, when firms are classified based on the distance from and direction to the target, the results show that firms, which are below the target, often move to the target faster than those that are over-leveraged. In Vietnam, the privatization process, which implied a decrease in the number of state-owned shares, has helped reduce interest conflicts between majority and minority shareholders, and improves the internal monitoring system. This reduces the incentives for using equity financing. Debt becomes relatively cheap which enhances below-the-target firms to acquire more debt in order to achieve the target leverage while over-the-target enterprises do not have incentives to reduce the current debt level, so a faster speed is found for below-the-target firms.

In addition, the speed of off-target firms is higher that of near-target firms, and this finding holds strong for both market and book proxy of leverage. The possible explanation is that firms only modify their financial structure if they are adequately far away from the optimal leverage since fixed costs (e.g., legal fees and investment bank fees) account for the largest part of the

total adjustment cost. When combining the direction of the deviation to the distance to the target, the faster speed is found for off-and-below-target firms.

Moreover, firms with a financial surplus move more quickly to the optimal level of debt than ones with a deficit. Indeed, financially constrained companies will find it more expensive and even impossible to issue additional securities that would help them offset the deviations from the optimal point.

### **5.1.3. The adjustment speed over the life cycle**

Within the last essay, the study discusses the changes of adjustment speed throughout corporate life time. According to each period of time, firms have different objectives, so will use different resources and methods to achieve their goals.

Understanding business life cycle is necessary due to its important influences on many aspects of firms, such as performance, investment, dividend policy, and so on. Especially, the change of funding behavior across stages of life has attracted the interest of researchers in recent decades. This study is the first examining the adjustment behavior of Vietnamese listed firms over the business life cycle. Based on 10,789 firm-year observations over the 13-year period, the essay has found some important evidences for this emerging market.

Firstly, by adopting the partial adjustment model, the study finds significant coefficients of lagged leverage in all examinations, providing a strong evidence that Vietnamese listed firms identified and pursued target leverage throughout the observed period of time. This finding is in line with what was found in the second essay.

Secondly, the study shows that the adjustment speed increases with firm age and growth. Firms adjust faster when they become older and more-grown. Besides, the classification model of Dickinson (2011) was shown as a comprehensive method to separate 5 main stages of business life. The high-low-high pattern is found in the speed at which firms offset the deviation from the target. In introduction phase, firms adjust at the fastest rate, and the rate reduces gradually when firms go through the growth or maturity stages. The speed is smaller when firms are matured. Then, it recovers in two last stages of life.

Last but not least, the outcomes indicate that the pecking order seems to be more appropriate to explain the funding choices of Vietnamese quoted firms in the stages of introduction, growth,



shake out and decline. At maturity, we can combine the three main theories (i.e., trade off, pecking order and market timing) to explain funding behaviors since the debt ratio is significantly correlated with both the effective tax rate, the deficit and average weighted market to book variables.

## **5.2. Implications**

The research has provided empirical evidences for the relationship between ownership structure and the capital structure of Vietnamese listed firms. These findings may have some implications for Vietnamese policymakers and firm managers. For instance, the research shows that foreign ownership has a significant influence to funding choices of firms, implying their actively monitoring practice. Foreign investors, with high management experience and skills, will help firms with enhancing the corporate governance's efficiency and reducing agency cost of equity. Thus, long-term projects related to reducing the level of state ownership and removing barriers for foreign investment in stock exchanges should be continuously implemented. The substitute role between large ownership and debts also brings a clear implication for firm managers as a reminder about a strong internal monitoring system. In other words, the existence of majority ownership contributes firms with a large amount of equity while eliminating the level of debt, so managers should adjust their activities as well as investment selections to be aligned with blockholders' interest.

The research also implies that firm managers do have a target leverage in mind and will alter debt ratios to achieve the optimal level of debt. Therefore, besides developing the equity market, the government should have more solutions to improve the banking system and corporate bond market, in order to ensure the sources of funds for business demands. The list of priority areas for lending should be reviewed carefully to make sure the money can be directed to the right enterprises. In addition, an integrated information system for corporate bonds should be built up to enhance informative transparency and attractiveness of such market. Moreover, more regulations on firms' financial statement reporting would be considered to reduce the information asymmetry for both domestic and offshore investors.

In addition, the thesis provides evidence that the adjustment speed towards target leverage are not the same for all listed firms, and it is affected by adjustment costs - which are determined by the availability and capital costs of bank loans, equity and corporate bonds. These findings

emphasize the demand on more efficient government's policies which allow firms to access funding with the lowest costs. These strategies will enable firms to achieve the target leverage quickly, and thus, can maximize value for shareholders as a consequence.

The thesis indicates on different life cycle stages, the factors driving the debt targets and the speed at which firms offset the deviation from targets are different correspondingly. This finding has some implications. Firstly, researchers should pay more attention to the corporate life cycle when investigating financial topics since pooling all firms which are in different stages of life in one integrated sample will lead to bias or even insignificant conclusions. Secondly, firm managers should be aware of the effect of life cycle stage in order to make informed decisions concerning funding or investing/divesting, and to plan for what will happen on the next stage. Furthermore, equity investors and creditors should have life cycle knowledge when considering their investment in order to minimize risks and maximize returns.

### **5.3. Limitations**

Although the data for this thesis was provided by StoxPlus, the leading company in providing financial information in Vietnam, there are still some limitations. Firstly, the observed sample is unbalanced with many missing values, especially in ownership variables since reporting ownership is not mandatory in Vietnam. Secondly, the time length is short (i.e., data are only available from 2005 onwards). Furthermore, the information related to unlisted firms is very hard to find. So far, the GSO has conducted some corporation surveys, but there are still some problems with the reliability, continuity, and accessibility of this data source.

Although the first essay can contribute to the understanding of the association between ownership and capital structure, the lack of information in Vietnam prevents us from separating the differences in behavior of institutional and individual shareholders. Furthermore, we do not clarify which side of debt-to-asset ratio is affected by large ownership the most. Thus, future research can explore the specific component of the capital structure (i.e., debt or equity) that is influenced more under the impact of ownership, the direction of such relationships, and the differences in the influence of different types of large ownership.

Besides, although the thesis uses different estimators, including pooled OLS, RE, FE for the first and GMM for the second and third essays, it is still the concern related to the selection of estimators. While pooled OLS, FE and RE cannot capture for the endogeneity problem, the

system-GMM has some shortcomings caused by its complication in calculation and sometimes, it can give invalid coefficient estimates (Roodman, 2009).

Moreover, testing only one country may reduce the ability to apply research findings to other future studies on the same topic. Although Vietnam is a typical emerging and transition nation, the findings from this market may not be generalisable to other markets with different financial conditions. Thus, it is better if the study can cover other countries in the observed sample, especially countries having comparable economic conditions with Vietnam like Philippine and Thailand, or having similar reforming processes like China.

#### **5.4. Future research directions**

It would be better if the future studies can expand the scope of this study to unlisted firms, especially, small and medium size enterprises. Furthermore, a joint study, including Vietnam and other countries who are also in ASEAN or who have similar economic conditions, might be an interesting topic since it will give more persuasive results.

Within the topic of the first essay, it would be more applicable if the next study can add new variables related to institutional, individual, managerial owners in order to have a broad view on the impacts of all types of ownership on the capital structure. Since the study only examines state, large and foreign ownership, the impacts of managerial, and institutional ownership, especially, the ownership shared by some large entities, including pension fund, investment and insurance company, on capital structure are still out of the debate. This will enable us to eliminate the overlapping between different kinds of ownership.

When testing the determinants of capital structure, the research can be expanded to take into account the influence of the government policy's changes, and technology innovation. Indeed, we forgo research and development expenses as a control variable due to the lack of reported information. These issues can be addressed in future research.

In terms of adjustment speed issue, it will become more meaningful if we can capture the availability and cost of some main sources of external finance. In addition, the domination of large firms in the sample also prevents the thesis from conducting a comparison test on the adjustment behaviors of small- and large-enterprises. Thus, a more complete data collection with sufficient information in the future will allow researchers to have a more accurate

overview on the heterogeneity in adjustment speeds toward corporate target leverage of Vietnamese firms.

When considering the influence of the life cycle to the speed, it would be more interesting when the future research can take into account more methods to separate different phases of business life, and can consider firms' reactions in 2 cases, including (1) Firms who transit from one to another stage over 2 continuous years, and (2) firms staying within one phase over 2 consecutive years.

# **TROIS ESSAIS SUR LA STRUCTURE DU CAPITAL ET LA VITESSE D'AJUSTEMENT VERS D'UN RATIO « CIBLE » D'ENDETTEMENT DES ENTREPRISES VIETNAMIENNES**

## Résumé de la thèse en français

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Cette thèse propose trois types d'études sur des problématiques de structure du capital qui suscitent un vif intérêt auprès des chercheurs académiques et décideurs en entreprise: l'impact de la structure de propriété sur les décisions de financement des entreprises, la vitesse d'ajustement vers la structure optimale de capital, et le lien entre la vitesse d'ajustement et les stades de développement de l'entreprise. La plupart des recherches sur ce type de relation ont été entreprises dans des pays développés tels que les USA et le EU. Les études pour les pays émergents sont rares, avec un certain nombre d'entre elles qui se focalisent sur le cas de la Chine. En particulier, les impacts de l'État, des grands actionnaires et des actionnaires étrangers sur les ratios d'endettement des entreprises cotées au Vietnam n'ont pas été suffisamment explorés.

Sur la base des trois théories principales, la théorie du "compromis" ou du ratio optimal d'endettement ("tradeoff theory"), de l'ordre de financement hiérarchique ("pecking order theory") et celle liée à la synchronisation par rapport au marché ("market timing"), les questions sur la manière dont les entreprises déterminent et réajustent leur structure de capital ont été examinées par de nombreux articles après les premiers travaux de Fischer et al. (1989). Pour un marché émergent tel que le Vietnam, notre thèse fournit pour la première fois une analyse approfondie de la structure du capital et de sa vitesse d'ajustement vers le ratio cible, tenant compte de l'hétérogénéité du comportement des entreprises et de leur cycles de vie, tout en tenant compte des spécificités de ce marché. Le Vietnam est un marché émergent particulier, avec des spécificités comme une forte concentration de l'État, une ouverture aux investisseurs étrangers qui reste à développer, un marché obligataire peu développé et un marché boursier en pleine croissance.

Un des aspects qui n'a jamais été étudiés au Vietnam réside dans le lien entre la structure du capital, la vitesse d'ajustement et les cycles de vie de l'entreprise. En fonction de chaque période de son cycle de vie, l'entreprise a des objectifs différents, ce qui conduit à des évolutions importantes sur un plan interne (stratégie d'entreprise, ressources financières, investissement, gestion) ou externe (concurrents, politiques nationales, crise financière mondiale, etc.). L'entreprise utilise donc différentes ressources et méthodes pour atteindre leurs objectifs. Avec le troisième article de cette thèse, nous menons la toute première recherche qui fournit un aperçu de la manière dont les entreprises cotées en bourse vietnamiennes adaptent leur structure de capital au cours de leur cycle de vie.

De manière synthétique, notre recherche a pour objectif de répondre aux questions suivantes :

1. La structure de propriété externe (y compris les blocs, la propriété étrangère et publique) a-t-elle une incidence sur les choix de financement des sociétés vietnamiennes cotées en bourse ?
2. Existe-t-il un effet de levier cible ? Dans l'affirmative, avec quelle rapidité les entreprises au Vietnam s'ajustent-elles à l'effet de levier recherché ? Cette vitesse est-elle « homogène » à travers les entreprises ?
3. Est-ce que la question du timing est importante pour les décisions relatives à la structure du capital ? Comment la vitesse d'ajustement en fonction de ratio d'endettement cible change-t-elle au cours du cycle de vie de l'entreprise ?

## **PREMIÈRE ÉTUDE**

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L'impact de la structure de propriété sur les décisions de financement est un des domaines d'étude de la structure du capital qui suscite l'intérêt des chercheurs. Shleifer et Vishny (1986) ont constaté que les principaux actionnaires pouvaient avoir une incidence sur les conflits entre le gestionnaire et les actionnaires car ils étaient fortement incités à surveiller les activités des gestionnaires.

Le Vietnam est un marché émergent avec un fort taux de croissance économique. Le gouvernement espère améliorer l'ouverture du marché boursier et éliminer progressivement les obstacles au flux de capitaux.

L'étude de Le (2015) est, à notre connaissance, la seule à traiter du rapport entre la structure de propriété et la structure du capital des sociétés vietnamiennes cotées en bourse. Il semble pertinent d'explorer une telle relation. Parmi les actionnaires, l'État/l'étranger/les grands propriétaires sont les parties prenantes les plus importantes devant être étudiées.

Zou et Xiao (2006) ont mis en évidence un lien positif entre la part des actions détenues et contrôlées par l'État et le montant de dette dans la structure du capital de l'entreprise. La première raison est que la propriété de l'Etat donne à l'entreprise une certaine "garantie" de survie. L'entreprise aura donc plus de chances de contracter des dettes car les créanciers seront plus désireux de prêter à des entreprises qui sont peu susceptibles de faire faillite. La deuxième raison est que l'État a tendance à utiliser la dette comme un moyen permettant de réduire la perte de de son contrôle sur l'entreprise et la dilution du capital. En Chine, Li et al. (2009) ainsi que Zou et Xiao (2006) montrent que les banques chinoises sont contraintes, sous la pression du gouvernement, de prêter à des entreprises contrôlées par l'État. Par ailleurs, dans certains pays où la corruption est un problème, une relation étroite avec le gouvernement permet aux entreprises d'État d'emprunter à des conditions plus avantageuses que les entreprises privées.

Certaines études ont toutefois montré que dans certains cas les entreprises sont, toutes choses égales par ailleurs, moins endettées lorsque le niveau de contrôle de l'État est élevé. Dharwadkar et al. (2000) ont montré que sur certains marchés où l'État est largement propriétaire, la gouvernance d'entreprise et le système de surveillance étant insuffisants, ce qui a tendance à diminuer la performance des entreprises. De ce fait, les emprunts des entreprises détenues majoritairement par l'Etat contiennent de nombreuses créances irrécouvrables, ce qui démotive les créanciers à prêter de l'argent.

Certaines études empiriques ont trouvé un lien en forme de U entre la structure de propriété et le ratio d'endettement. Après avoir analysé 112 entreprises françaises cotées en bourse, De la Bruslerie et Latrous (2012) ont découvert que les entreprises dont actionnaires disposent d'un faible pouvoir de contrôle utilisent davantage la dette comme moyen d'éviter les tentatives de prise de contrôle et la dilution des actions. Parallèlement à l'augmentation des dettes, les coûts de faillite augmentent, menaçant la survie de l'entreprise. Par conséquent, chaque fois que la propriété est suffisamment concentrée, les entreprises utiliseront d'autres ressources de financement pour se substituer à la dette, entraînant une diminution progressive du niveau de la dette.

Lorsqu'on examine la relation entre la propriété de bloc et la structure du capital, certaines études affirment qu'il existe un lien positif. La raison principale en est que, lorsque la concentration de propriété s'accumule, les détenteurs de blocs auront un rôle de contrôle important. En effet, les actionnaires minoritaires disposent de droits de vote, de temps et d'intérêts insuffisants, ou n'ont peut-être pas les connaissances et compétences spécifiques pour mener des activités de contrôle de manière efficace par rapport aux détenteurs de blocs. En outre, les grands actionnaires sont susceptibles d'être élus au conseil d'administration (McColgan, 2011). Par conséquent, ils favorisent le financement par emprunt plutôt que par actions, en particulier sur les marchés en développement sur lesquels le mécanisme de protection des investisseurs minoritaires n'est pas encore appliqué. En outre, les grands actionnaires renforcent leur contrôle sur l'entreprise en utilisant de manière excessive les fonds empruntés et en évitant les tentatives de prise de contrôle (Harris et Raviv, 1988).

Chidambaran et John (2000) ont fait valoir que les entreprises ayant d'importants propriétaires de bloc réduisent les coûts d'agence dus à l'asymétrie de l'information, car les actionnaires importants transféreraient rapidement et complètement les informations du management de l'entreprise vers les créanciers et vers les autres actionnaires, ce qui permet de réduire efficacement les conflits d'agences et permet aux entreprises d'obtenir des emprunts à des conditions plus avantageuses. Dans les entreprises en forte croissance, lorsque les grands propriétaires d'actions sont assurés de la perspective de succès, ils évitent d'utiliser des actions pour conserver la stabilité de leur contrôle. De même, Gillan et Starks (2000) ont constaté que les détenteurs de blocs supervisent les activités d'investissement. Cette surveillance active a comme effet de réduire les coûts d'agence entre le management et les actionnaires (Shleifer et Vishny, 1986). En outre, Fosberg (2004) a indiqué qu'une concentration plus forte de la propriété conduit à un meilleur suivi des décisions des dirigeants et à une utilisation accrue de la dette comme mode de financement.

En revanche, Jensen et Meckling (1976), Leland et Pyle (1977) et Diamond (1984) affirment que les entreprises très contrôlées avaient tendance à réduire leur niveau d'endettement si les exigences de surveillance imposées par les créanciers augmentaient. Pound (1988), soutenant cette association négative, affirme que les détenteurs de blocs pouvaient coopérer avec le management de l'entreprise au détriment des intérêts des actionnaires minoritaires, ce qui engendre une relation négative entre la part des détenteurs de blocs et l'effet de levier. De plus,



Zeckhauser et Pound (1990) ont indiqué que la présence de détenteurs de blocs réduisait les coûts des capitaux propres et donc l'utilisation du financement par emprunt. Sous le contrôle de gros détenteurs de blocs, les dirigeants peuvent dans certains cas agir dans l'intérêt des actionnaires. Par conséquent, l'émission de dettes devient moins nécessaire, la présence de grands actionnaires étant associée à des perspectives positives de l'entreprise (Zeckhauser et Pound, 1990). La propriété de bloc se substitue à la dette en tant qu'instrument de surveillance. De plus, Driffield et al. (2007) ont fait valoir que les actionnaires détenteurs de bloc de contrôle dont la propriété est fortement concentrée sont confrontés à des risques croissants en raison des difficultés de diversification. Ces actionnaires auront donc tendance à aller contre le financement de la dette pour compenser les coûts de la faillite.

Parallèlement à la vague d'investissement à l'étranger, les investisseurs internationaux ont de fortes répercussions sur la gouvernance d'entreprise et les coûts des agences. En effet, dans les marchés émergents, la propriété étrangère est considérée comme la partie la plus importante de la structure de propriété qui influe sur les décisions de capital des entreprises (Douma et al., 2006). Théoriquement, il existe deux arguments clés en faveur de la relation entre le capital étranger et le choix du financement. Premièrement, certaines études fournissent des preuves de l'impact positif de l'investissement étranger sur le niveau de la dette. Dans une étude menée en Chine, Zou et Xiao (2006) ont montré que l'asymétrie d'information constitue un problème majeur pour les investisseurs étrangers. Par conséquent, un recours accru à la dette est un bon moyen d'améliorer le rôle de surveillance. Les études de Brennan et Cao (1997) et de Choe et al. (2005) montrent que les investisseurs étrangers ont tendance à minimiser leurs risques, aux niveaux micro et macro, en améliorant le fonctionnement et la gestion des entreprises grâce à l'utilisation de technologies nouvelles, ce qui leur permet de diminuer le coût du capital de la dette (Gurunlu et Gursoy, 2010).

Cependant, certaines études s'accordent sur une relation négative entre le niveau d'endettement et la propriété étrangère. Gurunlu et Gursoy (2010) ont estimé que la principale raison était une plus grande contribution des investisseurs étrangers aux capitaux propres. Allen et al. (2005) ont suggéré que les entreprises à capitaux étrangers disposaient d'un plus grand nombre de sources de financement pour remplacer leurs dettes, grâce à leurs compétences en gestion, à leur vaste réseau de relations, à leur technologie supérieure, à leur marque et à leur réputation. En outre, la baisse des taux d'imposition des sociétés entraîne une diminution de l'avantage fiscal de la dette

ce qui diminue la propension des entreprises à utiliser ce mode de financement (Li et al., 2009). Au lieu d'utiliser des dettes, l'augmentation de la participation étrangère est un bon moyen de réduire non seulement les problèmes de surinvestissement causés par le management de l'entreprise, mais également les coûts d'agence entre ce dernier et les actionnaires (Huang et al., 2011). La propriété étrangère peut aider à renforcer le rôle de surveillance et à réduire le coût du capital grâce à l'existence d'un groupe d'investisseurs externes, d'analystes professionnels et d'économistes qui suivent de près les actions des gestionnaires.

Le marché boursier vietnamien a connu une croissance rapide depuis la création de la bourse Hochiminh en 2000. Toutefois, à l'instar d'autres économies émergentes, il n'a pas encore atteint sa maturité selon les normes mondiales. Encourager et promouvoir la participation de tous les types d'investisseurs au marché boursier local est une méthode efficace pour développer l'économie. Pour mieux comprendre la relation entre la propriété et la structure du capital au Vietnam, nous testons 2 hypothèses suivantes :

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*Hypothèse 1: La propriété est positivement liée à la structure du capital des sociétés vietnamiennes cotées en bourse.*

*Hypothèse 2: La propriété a une relation non linéaire avec la structure du capital des sociétés vietnamiennes cotées en bourse.*

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La base de données provient de Stoxplus, qui est la société leader au Vietnam fournissant une gamme complète d'informations financières et commerciales, d'outils d'analyse et de services d'études de marché. Nous employons toute la gamme des entreprises cotées en bourse sur Hochiminh Stock Exchange de 2007 à 2014. Un nombre de 261 entreprises individuelles sont analysées sur une période de 8 ans, ce qui constitue une base de panel avec 2 177 observations. Rien n'indique que les résultats soient influencés par un biais de sélection de l'échantillon.

Nous utilisons 3 estimateurs statiques (POLS, FE et RE) et plusieurs tests pour déterminer les modèles les plus appropriés à utiliser, à savoir, le test de Wald, le test de multiplicateur de Breusch et de Pagan Lagrangian pour RE, le test de Hausman pour évaluer le pouvoir explicatif des estimateurs FE et RE, le test F, le test de Wald modifié pour l'hétéroscédasticité de groupe pour l'estimateur FE et le test de Wooldridge pour l'autocorrélation dans les données de panel.

Les modèles permettant de tester l'impact de la propriété sur la structure du capital sont les suivants:

$$DR_{it} = + \beta_1 STATE_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} + \beta_6 GROWTH_{it} \\ + \beta_7 NDTs_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

$$DR_{it} = + \beta_1 BLOCK_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} + \beta_6 GROWTH_{it} \\ + \beta_7 NDTs_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

$$DR_{it} = + \beta_1 FOREIGN_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 PROFIT_{it} + \beta_5 TANG_{it} \\ + \beta_6 GROWTH_{it} + \beta_7 NDTs_{it} + \beta_8 MIL_{it} + \epsilon_{it}$$

La variable DR peut être SDA, LDA, TDA, SDM, LDM, TDM, ces variables étant respectivement le ratio d'endettement à court terme, le ratio d'endettement à long terme, et ratio d'endettement total, mesurés par des valeurs, variables mesurées avec des données comptables (A) ou de marché (M).

La variable STATE/FOREIGN/BLOCK représente le nombre d'actions détenues par l'État/étranger/grands actionnaires divisé par le nombre total d'actions en circulation.

Les variables SIZE, PROFIT, TANG, GROWTH, MTB, NDTs, MIL représentent la taille de l'entreprise, la rentabilité, la tangibilité, la croissance, le ratio valeur de marché sur valeur comptable, le bouclier fiscal sur l'endettement et l'effet de levier médian du secteur.

Pour tester la relation non linéaire, conformément à Le (2015), nous utilisons les équations quadratiques suivantes pour tester ce type de relation en incluant à la fois la valeur simple et la valeur quadriple des variables de propriété dans les modèles :

$$DR_{it} = + \beta_1 STATE_{it} + \beta_2 STATE_{it}^2 + \beta_3 SIZE_{it} + \beta_4 MTB_{it} + \beta_5 PROFIT_{it} + \beta_6 TANG_{it} + \\ \beta_7 GROWTH_{it} + \beta_8 NDTs_{it} + \beta_9 MIL_{it} + \epsilon_{it}$$

$$DR_{it} = + \beta_1 BLOCK_{it} + \beta_2 BLOCK_{it}^2 + \beta_3 SIZE_{it} + \beta_4 MTB_{it} + \beta_5 PROFIT_{it} + \beta_6 TANG_{it} \\ + \beta_7 GROWTH_{it} + \beta_8 NDTs_{it} + \beta_9 MIL_{it} + \epsilon_{it}$$

$$DR_{it} = + \beta_1 FOREIGN_{it} + \beta_2 FOREIGN_{it}^2 + \beta_3 SIZE_{it} + \beta_4 MTB_{it} + \beta_5 PROFIT_{it} \\ + \beta_6 TANG_{it} + \beta_7 GROWTH_{it} + \beta_8 NDTs_{it} + \beta_9 MIL_{it} + \epsilon_{it}$$

Les résultats de la régression révèlent la relation en forme de U entre effet de levier à court terme, effet de levier total et l'investissement public. Les coefficients de State et de State\_squared dans l'équation de la SDA sont significatifs à 1% (0.331 et -0.402, respectivement). Lorsque la dette à court terme est mesurée par la valeur de marché, une relation non linéaire avec la propriété de l'État est également trouvée.

La relation en forme de U inversé est significative pour les équations de TDA et TDM, avec un intervalle de confiance de 99%. Pour TDA, les coefficients de rendement FE de 0,485 et -0,653, respectivement, pour State et State\_squared, avec un R-carré de 24,83%. Ces résultats dénotent le pouvoir explicatif significatif des modèles. Pour TDM, R-carré est de 23,36% et les coefficients de State et State-carré sont égaux à 0.560 et -0.758 au niveau de significativité de 1%. Pour ce qui concerne la dette à long terme, cette étude n'a trouvé aucune preuve évidente d'une telle relation.

Les résultats montrent que le niveau des actions détenues par les grands investisseurs est négativement associé à SDA, LDA et TDA, avec des coefficients de -0,00435, -0,00107 et -0,00542 respectivement, ce qui suggère que les entreprises dont le capital est plus élevé sont moins endettées. Le R-carré ajusté est de 9,6% pour le SDA, mais de 12,8% pour le LDA et de 21,8% pour le TDA. Cela signifie que la combinaison de la variable par bloc et d'autres déterminants spécifiques à l'entreprise explique jusqu'à 21,8% de la variabilité du ratio dette / actif total.

De plus, cette relation est importante et solide pour l'effet de levier du marché à court terme et total. Avec un intervalle de confiance de 99%, les estimations de coefficients sur BLOCK sont -0,00518 et -0,00606. Cela signifie qu'une augmentation de 1% de la participation dans des sociétés cotées en bourse entraîne une diminution d'environ 0,5% du ratio d'endettement à court terme et de 0,6% du ratio de la dette totale. De plus, les résultats suggèrent qu'une grande propriété a un impact négatif, mais insignifiant, sur la dette à long terme. Une explication possible est que les entreprises de notre échantillon contractent un très petit nombre de dettes à long terme au cours des périodes observées, environ 8% de la dette totale, en raison de l'instabilité du marché.

Quant aux résultats de la relation entre la propriété étrangère et les (six) mesures de l'endettement du marché, l'estimateur FE-cluster montre que, avec un intervalle de confiance de 99%, le ratio dette à court terme / actif est affecté par le nombre d'actions détenues par des investisseurs étrangers. Compte tenu de la dette à long terme par rapport à la valeur marchande de l'actif total, FE avec erreurs-types ajustées montre un lien non significatif de la participation étrangère sur le montant de la dette. S'agissant de la dette totale, les résultats révèlent un lien négatif avec la propriété étrangère. Avec un intervalle de confiance de 99%, le coefficient concernant la variable propriété étrangère est à -0,244, ce qui signifie, ceteris paribus, qu'une

augmentation de 1% de la participation étrangère entraîne une diminution de 24,4% du ratio de la dette totale du marché.

En conclusion, la relation en forme de U entre le montant des actions détenues par l'État et l'effet de levier total et à court terme peut être interprétée comme signifiant que les entreprises ont tendance à avoir davantage recours à l'endettement lorsque la participation de l'État est faible afin d'éviter les tentatives de prise de contrôle par des tiers et la dilution des actions (De la Bruslerie et Latrous, 2012). Ensuite, le montant de la dette augmente progressivement parallèlement à l'augmentation du nombre d'actions détenues par l'État, ce qui entraîne une augmentation des coûts liés à la faillite. Lorsque la propriété de l'État est suffisamment importante, les entreprises utiliseront moins de dette.

Par ailleurs, notre étude met en avant des relations négatives et significatives entre la détention de bloc et la dette court terme, ainsi qu'entre la détention de bloc et la dette totale. Les entreprises avec une participation majoritaire dans le contrôle ont tendance à réduire leur niveau de dette afin de diminuer son coût lié à l'exigence de surveillance des créanciers. De plus, les actionnaires de bloc d'entreprises dont la propriété est fortement concentrée doivent faire face à des risques non diversifiables, ce qui les conduit à réduire le niveau de dette afin d'éliminer les coûts de faillite. Dans les entreprises où la détention de blocs est très importante, les dirigeants pourraient être contraints d'agir dans l'intérêt des actionnaires sous la pression de puissants détenteurs de blocs. À ce moment-là, la propriété de bloc remplace la dette en tant qu'instrument de surveillance, ce qui aide les entreprises à réduire les coûts d'agence des capitaux propres. Par conséquent, la demande de financement par emprunt diminuera. Enfin, l'existence d'une participation importante peut être considérée comme une preuve de bonne performance et de perspectives prometteuses. Les investisseurs sont donc incités à investir dans ces entreprises. Nos résultats sont conformes à ceux mis en avant dans Jensen et Meckling (1976), Leland et Pyle (1977), Diamond (1984), Zeckhauser et Pound (1990) et Driffield et al. (2007).

En outre, les résultats montrent que le nombre d'actions détenues par des investisseurs étrangers a une incidence sur les choix de financement des entreprises. Les entreprises à forts capitaux étrangers disposent davantage de sources de financement pour remplacer leurs dettes, grâce à leur gestion compétente, à leur réseau de relations étendu, à leur technologie supérieure, à leur marque et à leur réputation. En outre, le Vietnam applique en moyenne un faible taux d'imposition des sociétés, soit 20%, de sorte que les faibles avantages du bouclier fiscal de la

dette pourraient ne pas être suffisants pour inciter les entreprises sous contrôle étranger à utiliser davantage de dette comme mode de financement. Maintenir un niveau élevé de capital étranger est un bon moyen de réduire non seulement les problèmes de surinvestissement, mais également les problèmes d'agence entre le management de l'entreprise et les actionnaires. La propriété étrangère peut remplacer la dette en aidant les entreprises à renforcer leur rôle de surveillance et à réduire le coût du capital grâce à l'existence d'un groupe d'investisseurs externes, d'analystes professionnels et d'économistes surveillant de près les dirigeants des entreprises.

## DEUXIÈME ETUDE

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Sur la base des principales théories (“tradeoff”, “pecking order” et “market timing”), la question de savoir comment les entreprises déterminent et réajustent leur structure de capital suscite l'intérêt des chercheurs, les premiers travaux ayant été effectués par Fischer et al. (1989). Cependant, l'hétérogénéité de la vitesse d'ajustement n'a pas été suffisamment explorée. En tant que marché émergent, le Vietnam, qui présente des spécificités telles qu'une économie orientée vers les banques, un marché obligataire sous-développé et un marché boursier en plein essor, offre un terrain empirique intéressant pour étudier cette question.

Notre étude contribue à la littérature existante sur les décisions relatives à la structure du capital en fournissant un examen approfondi de l'hétérogénéité du comportement d'ajustement des entreprises cotées en bourse vietnamiennes.

Pour calculer la vitesse d'ajustement, de nombreux auteurs utilisent des modèles d'ajustement partiel. Fama et French (2002) ont utilisé l'approche de l'ajustement partiel en deux étapes et trouvent une vitesse de 7% à 17% par an pour l'ajustement des entreprises américaines en matière de financement. Roberts (2002) a constaté que la vitesse peut même être proche de 100% pour certaines industries. Les résultats empiriques ne soutiennent pas les théories du financement hiérarchique et du compromis et n'apporte pas suffisamment d'éléments permettant d'expliquer le comportement des entreprises américaines en matière de financement.

Flannery et Rangan (2006) étudient un échantillon des sociétés américaines entre 1965 et 2001 et trouvent des résultats qui soutiennent la théorie du compromis dynamique ; les entreprises étudiées atteignent leur objectif au taux de 34,1% par an. Les résultats empiriques de Kayhan et Titman (2007) montrent qu'il fallait un an aux entreprises pour compenser environ 8% de l'écart

par rapport à la structure optimale de capital mesurée en valeur de marché et 10% par an lorsque la structure optimale de capital est mesurée par la valeur comptable.

L'étude de Byoun (2008) sépare deux cas différents. Pour les entreprises en déficit financier, la vitesse d'ajustement est plus rapide si elles contractent moins de dettes que le niveau optimal (la vitesse varie de 20% lorsque les entreprises sont en-dessous de la cible à 2% lorsque les entreprises sont au-dessus de la cible). Le déficit fait que les coûts de transaction sont plus élevés pour les capitaux propres par rapport à la dette ou, en d'autres termes, pour que la dette devienne moins chère à émettre. Pour les entreprises en excédent, la vitesse sera plus rapide si elles restent au-dessus de l'optimum: 33% par an, contre 5% des entreprises situées en deçà de l'optimum.

A un niveau international, Öztekin et Flannery (2012) ont estimé la vitesse d'ajustement à 21,11% par an pour un échantillon de 37 pays; cela signifie qu'il faut environ cinq ans aux entreprises pour compenser l'écart entre le niveau de dette actuel par rapport à celui optimal. En utilisant la méthode de GMM, Faulkender et al. (2012) se sont concentrés sur l'hétérogénéité des vitesses d'ajustement des entreprises et ont trouvé une vitesse d'ajustement de 29,8% pour les entreprises sous-endettées contre 56,4% pour les entreprises surendettées. Ils ont également noté que le déficit ou l'excédent financier, ainsi que d'autres facteurs, tels que les opportunités de croissance et la disponibilité des fonds, influent fortement sur les avantages et les coûts de l'ajustement, ce qui a pour conséquence une rapidité d'ajustement.

Dereeper, Sébastien et Trinh (2012) ont examiné pour la première fois l'existence d'un effet de levier cible sur les sociétés cotées au Vietnam. Sur la base de données provenant de 300 sociétés cotées de 2005 à 2011, ils ont constaté que les entreprises contrôlées par l'État avaient besoin d'un an et demi pour compenser l'écart par rapport au ratio cible, tandis que les entreprises privées avaient besoin de deux fois plus de temps pour faire de même. Cependant, le processus de privatisation entraîne la disparition de toutes les entreprises contrôlées par l'État.

Minh et Dung (2015) ont montré une vitesse d'ajustement de 45,2% par an mais ils supposent que la vitesse est homogène pour toutes les entreprises. Cette hypothèse ne semble pas réaliste car pour différentes entreprises, ces éléments sont différents, ce qui conduit à une hétérogénéité de la vitesse. Même au sein d'une entreprise, la vitesse pourrait changer avec le temps. En outre, leur échantillon de 47 entreprises était petit pour assurer la robustesse de leurs conclusions.

Notre étude contribue à la littérature existante en testant 3 hypothèses :

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*Hypothèse 1: Les entreprises en deçà de la cible bougent plus rapidement que les entreprises surendettées.*

*Hypothèse 2: Les entreprises proches de la cible se dirigent plus lentement vers la cible que celles qui ne le sont pas.*

*Hypothèse 3: Les contraintes financières affectent la rapidité de l'ajustement.*

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Notre étude examine un panel non équilibré de données d'entreprises cotées vietnamiennes sur la période de 2005 à 2017. La base de données brute provient de Stoxplus. Nous avons éliminé les observations du secteur financier car elles diffèrent des autres secteurs en termes de fonctionnement et de réglementation. Suivant certaines études récentes, les entreprises de service public sont également exclues de notre échantillon. Les données antérieures à 2005 n'étant pas disponibles, il n'est pas possible d'élargir la période observée. Conformément aux études empiriques précédentes, nous traitons le problème des valeurs aberrantes en excluant les observations où l'effet de levier comptable est supérieur à 1 ou manquant, et en appliquant une procédure de "winsorisation" pour toutes les variables au niveau de 1%.

L'échantillon final comporte un ensemble de données comprenant 10 789 observations portant sur 9 secteurs comme les matériaux de base, les soins de santé, les produits industriels, le pétrole et le gaz, la technologie, les télécommunications, les biens de consommation, les services à la consommation et autres. Parmi les observations, 49,41% concernent des entreprises industrielles et 18,14% des entreprises de biens de consommation.

La plupart des études antérieures dans la littérature sur l'ajustement du levier, telles que Flannery et Rangan (2006), Lemmon, Roberts et Zender (2008), Huang et Ritter (2009), ont adopté le modèle d'ajustement partiel. Nous avons utilisé le modèle de base d'ajustement partiel qui est largement utilisé pour estimer la rapidité avec laquelle l'entreprise compense l'écart par rapport à la cible.

$$DR_{i,t} - DR_{i,t-1} = \lambda (DR_{i,t}^* - DR_{i,t-1}) \quad (1)$$

où  $DR^*$  est le ratio d'endettement cible,  $\lambda$  est la vitesse d'ajustement à la cible. Le ratio d'endettement de l'entreprise, qui peut être mesuré en valeur de marché (TDM) ou en valeur comptable (TDA)

L'équation (1) peut être réécrite de la manière suivante

$$DR_{i,t} = \lambda DR_{i,t}^* + (1 - \lambda) DR_{i,t-1} \quad (2)$$



Le niveau cible de dette est non observable, la prédiction basée sur les déterminants peut donc être utilisée comme mesure pour la cible.

$$DR_{i,t} = \beta X_{i,t} + \epsilon_{i,t} \quad (3)$$

En combinant les équations (2) et (3), nous obtenons le modèle d'ajustement partiel sans indicateur non observable de la cible

$$DR_{i,t} = \lambda X_{i,t} + (1 - \lambda) DR_{i,t-1} + \epsilon_{i,t} \quad (4)$$

En notant  $\alpha = 1 - \lambda$  et  $\gamma = \lambda \cdot \beta$ , nous obtenons le modèle commun des coefficients constants :

$$DR_{i,t} = \alpha DR_{i,t-1} + \gamma X_{i,t} + \epsilon_{i,t} \quad (5)$$

Pour déterminer si une entreprise se situe au-dessus ou en-dessous, près ou au-delà de la cible, nous considérons l'écart entre la position actuelle et l'effet de levier cible.

$$\text{Déviation} = DR_{i,t} - DR_{i,t}^c$$

$DR_{i,t}^c$  est défini par l'équation (3), et si  $DR_{i,t}$  est en dehors de la plage allant de 0 à 1, nous utilisons un effet de levier médian de l'industrie pour remplacer cette valeur ajustée. Si l'écart est inférieur à 0, cela signifie que les entreprises acquièrent plus de dettes qu'elles ne devraient (c'est-à-dire au-dessus de la cible). Au contraire, si la déviation est supérieure à 0, les entreprises sont en dessous de la cible.

Nous calculons également la médiane de déviation pour chaque industrie et la comparons à la déviation de chaque entreprise. Quel que soit le sens de la déviation, les entreprises situées au-dessous de la médiane (entreprises proches de la cible) sont séparées de celles situées au-dessus de la médiane (entreprises non ciblées).

Lorsque nous examinons les différences entre entreprises en déficit financier et celles en excédent, nous nous basons sur le calcul du déficit. Le déficit, selon les indications de Frank et Goyal (2003), est égal à:

$$\text{Déficit} = (\text{Dividendes} + \text{Investissements} + \text{Variation BFR} - \text{Flux de trésorerie interne}) / \text{Total actifs}$$

avec

*Variation du BFR*

$$= \text{variation de l'actif à court terme} - \text{variation du passif à court terme}$$

et

*Flux de trésorerie interne*

= *flux de trésorerie provenant des activités d'exploitation*

+ *flux de trésorerie provenant des activités d'investissement*

+ *toutes les utilisations des activités de financement dans les activités de financement.*<sup>11</sup>

Si le déficit d'une entreprise est inférieur à 0, elle sera classée dans la catégorie « excédent », sinon elle sera classée dans la catégorie « déficit ».

Nos résultats empiriques montrent que les coefficients estimés de l'endettement décalé sont significatifs pour un intervalle de confiance de 99%, ce qui confirme l'existence d'un niveau optimal d'endettement des entreprises cotées au Vietnam. Avec un effet de levier mesuré par le ratio de la dette comptable sur les actifs, le rythme implicite est de 53,6% par an pour les entreprises supérieures à la cible et de 63,7% par an pour les entreprises inférieures à la cible. En ce qui concerne la dette, les entreprises situées au-dessus de la cible s'ajustent encore moins rapidement à la cible que les entreprises sous la cible. En particulier, les vitesses se situent à 15,8% par an pour les entreprises ayant un endettement supérieur à l'objectif et à 35% par an pour les entreprises utilisant un niveau d'endettement inférieur à l'objectif.

Avec des valeurs comptables, la vitesse d'ajustement des entreprises proches de la cible avoisine les 39,6%, tandis que celle des entreprises loin de la cible est de 67,9% par an. Avec des valeurs de marché, il existe également une grande différence entre les deux sous-échantillons, la vitesse étant 16,5% par an pour les entreprises proches de la cible et 21,9% pour les entreprises loin de la cible .

Avec des valeurs de marché, une vitesse la plus rapide est trouvée pour les entreprises loin et au-dessus de la cible, avec une vitesse de 72,7% par an. Cependant, le test Hansen ne peut pas être effectué. En outre, les entreprises proches et en deçà de la cible ont des coefficients de levier retardés non significatifs. La limitation du nombre d'observations nous empêche d'avoir une vue d'ensemble du comportement d'ajustement de ces sous-groupes. Les entreprises loin et en

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<sup>11</sup> Comme les informations de « Toute utilisation de la trésorerie dans les activités de financement » sont manquantes, nous utilisons le « Flux de trésorerie provenant du financement » comme alternative.

dessous de la cible se rapprochent de la cible avec une vitesse de 36,5% par an. La vitesse du sous-groupe "Near-and-above" est également significative à 19% par an.

Korajczyk et Levy (2003), Byoun (2008) et Faulkender et al. (2012) qui notent que le déficit financier affecte de manière significative les avantages et les coûts de l'ajustement, ce qui à son tour affecte la rapidité de l'ajustement. En conséquence, nous séparons l'échantillon en deux sous-échantillons pour les entreprises souffrant du déficit financier, et l'excédent, puis GMM est exécuté pour trouver la différence de vitesse de réglage entre eux.

Comme on peut le constater, avec des valeurs comptables la vitesse d'ajustement des entreprises excédentaires est d'environ 26,4%, tandis que celle des entreprises déficitaires est de 19,8% par an. En ce qui concerne l'effet de levier du marché, les entreprises affichant un excédent financier sont également plus rapides. Les entreprises contraintes financièrement s'adaptent plus lentement car elles trouvent plus coûteux d'accéder à des fonds externes (Drobetz et al., 2006; Leary et Roberts, 2005).

Lorsque les contraintes financières sont prises en compte, la vitesse la plus rapide est trouvée pour les entreprises ayant un excédent financier et au-dessus de la cible, avec une vitesse de 58,3% par an. Les entreprises déficitaires et qui restent en dessous de la cible en même temps s'ajustent également très rapidement à 57,9%. Cela signifie que ces types d'entreprises ont soit des coûts d'ajustement suffisamment bas, soit de fortes incitations à l'ajustement. En revanche, les entreprises aux contraintes financières qui sont surendettées s'adaptent à la cible plus lentement, à la vitesse de 36,4% par an. La vitesse la plus rapide est constatée pour les entreprises ayant un déficit et qui restent en deçà de l'objectif, avec une vitesse de 34,4% par an.

Lorsque nous examinons les contraintes financières et la distance par rapport à la cible en même temps, nous constatons que les sociétés excédentaires et proches du ratio cible s'ajustent plus rapidement à la cible, avec une vitesse correspondant à 61,8%. En revanche, la vitesse la plus basse est trouvée pour les entreprises avec un déficit, mais proche du point cible. Avec des données de marché, les entreprises excédentaires affichent toujours une vitesse rapide, mais le taux le plus élevé est de 28,5% par an pour les entreprises excédentaires et proches de la cible, et de 25,9% pour les entreprises excédentaires et loin de la cible. Lorsque les entreprises sont en déficit, la vitesse la plus lente est constatée pour les entreprises proches de la cible, avec une vitesse de 13,2% par an.

En conclusion, l'étude révèle de nombreuses preuves de l'hétérogénéité des vitesses d'ajustement. En particulier, lorsque les entreprises sont classées en fonction de la distance et de la direction par rapport à la cible, les résultats montrent que les entreprises situées en dessous de la cible se déplacent souvent plus rapidement que les entreprises surendettées. Nos résultats sont cohérents avec Guo et al. (2016) qui ont également constaté que les entreprises loin de la cible évoluent plus rapidement dans une étude portant sur 1 176 entreprises chinoises non financières. Les similitudes entre les réformes économiques des deux pays font que l'interprétation de Guo et d'autres chercheurs est applicable aux entreprises vietnamiennes. Ils ont expliqué que le processus de privatisation lié à la diminution du nombre d'actions détenues par l'État aidait les entreprises à réduire les conflits d'intérêts entre les actionnaires majoritaires et minoritaires et à améliorer l'efficacité du système de contrôle interne, réduisant ainsi les incitations au financement par actions. La dette devient relativement peu coûteuse, ce qui permet aux entreprises situées en deçà de la cible d'obtenir davantage de ressources pour atteindre l'endettement cible, tandis que les entreprises proches de la cible ne sont pas incitées à réduire le niveau actuel de la dette.

En outre, la vitesse des entreprises loin de la cible est supérieure à celle des entreprises proches de la cible, ce qui est valable tant avec des valeurs comptables et des valeurs de marché. L'explication possible est que les entreprises ne modifient leur structure financière que si elles sont suffisamment éloignées de l'endettement optimal, car les coûts fixes (par exemple, les frais juridiques et les frais des banques d'investissement) représentent la plus grande partie du coût total de l'ajustement.

De plus, les entreprises ayant un excédent financier atteignent plus rapidement le niveau d'endettement optimal que celles qui ont un déficit. En effet, les entreprises aux contraintes financières trouveront plus coûteux, voire impossible, d'émettre des titres supplémentaires qui les aideraient à compenser les écarts par rapport au point optimal.

## **TROISIÈME ETUDE**

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Le cycle de vie d'une entreprise influence de nombreux aspects de l'entreprise tels que la performance, les investissements, la politique de dividende, etc. La question des changements de comportement dans le financement à différentes étapes de la vie a suscité l'intérêt des chercheurs

au cours des dernières décennies. A notre connaissance, au Vietnam aucune étude n'a abordé cette problématique de recherche. Par conséquent, nous souhaitons dans cette étude répondre à la question suivante: *La vitesse à laquelle la structure du capital des entreprises vietnamiennes s'ajuste vers la structure optimale change-t-elle au cours des étapes de la vie ?*

Berger et Udell (1998) ont présenté le modèle de structure du capital modifié en fonction du cycle de vie, qui décrit les modifications de plusieurs sources de financement correspondant à l'augmentation de l'âge de l'entreprise. Plus précisément, ils ont séparé le capital des entreprises en fonds internes et externes et analysé les décisions de financement des petites entreprises sur le continuum de l'âge. Selon leur étude, les dettes contractées auprès de banques et d'autres institutions financières sont considérées comme la principale et importante source de financement des très jeunes entreprises. Cette constatation contraste avec l'affirmation populaire selon laquelle il serait difficile d'emprunter auprès de ces créanciers à de petites entreprises, car dès le plus jeune âge, les entreprises sont supposées manquer d'actifs solides pouvant être évalués comme des sûretés réelles, preuves suffisantes des performances passées, ainsi que des antécédents de crédit souvent demandés par les créanciers.

Fluck et al. (1998) ont mené une étude sur l'utilisation des fonds internes et externes tout au long de la vie de l'entreprise. En effectuant des régressions à la fois sur « l'âge » et le « carré d'âge », cette étude a mis en évidence une relation non linéaire entre l'âge de l'entreprise et la structure du capital. En particulier, au début de la vie de l'entreprise, la fraction des sources de fonds internes est positivement liée à l'âge de l'entreprise. Lorsque l'âge atteint 108 mois, la part des fonds d'initiés diminue. En revanche, les financements externes affichent une évolution opposée car ils décroissent d'abord puis augmentent après 142 mois.

Fluck (2000) a analysé les différences entre les entreprises « en phase de démarrage » et « en activité » dans la prise de décision financière et a constaté que les droits de contrôle étaient entre les mains des investisseurs. Ils ont également découvert la structure de financement du cycle de vie: les capitaux propres extérieurs et la dette à court terme sont souvent utilisés au début de la vie de l'entreprise, puis les bénéfices non distribués, la dette à long terme et même des fonds propres extérieurs supplémentaires sont souvent acquis ultérieurement.

Comme Fluck et al. (1998), La Rocca et al. (2011) se sont concentrés sur les petites et moyennes entreprises pour étudier l'évolution des décisions en matière de capital au cours du cycle de vie

de l'entreprise. L'étude a mis en évidence une relation en forme de U inversé entre l'âge de l'entreprise et l'endettement. En particulier, la dette apparaît comme la principale source de fonds au début de la vie des entreprises, ce qui est cohérent avec Berger et Udell (1998). Lorsque les entreprises deviennent plus matures, elles ont tendance à utiliser moins de dette et à augmenter la fraction du capital interne. On montre que cette tendance ne varie pas d'un secteur à l'autre.

Tian et Zhang (2015) ont étudié les impacts du cycle de vie des entreprises sur la structure du capital des sociétés chinoises cotées en bourse entre 1999 et 2011. Lorsqu'ils ont ajouté l'âge et le carré de l'âge comme variables explicatives supplémentaires dans le modèle d'ajustement partiel, ils ont constaté une relation en forme de U entre l'âge de l'entreprise et le ratio d'endettement. Cependant, les coefficients d'âge et du carré de l'âge sont non significatifs. Avec l'approche des flux de trésorerie suggérée par Dickinson (2011), Tian et Zhang (2015) ont constaté que les entreprises s'adaptaient plus rapidement au stade de la naissance.

L'étude la plus récente est celle de Castro et al. (2016) qui ont trouvé le motif "haut-bas-haut" dans le changement de vitesse d'ajustement de la structure du capital au cours de la vie de l'entreprise. Leur étude a testé le comportement d'ajustement au cours des trois principales périodes de la vie de l'entreprise (introduction, croissance et maturité). Les résultats indiquent que les entreprises atteignent le levier cible le plus rapidement, à un rythme de 46,3% par an, au stade de l'introduction. Ensuite, cette vitesse diminue à 29,4% en phase de croissance et remonte à 33,9% par an lorsque les entreprises arrivent à maturité. Cependant, l'étude présente certaines limites lorsqu'elle utilise uniquement la mesure comptable de la dette et ne traite que de 3 premières étapes du cycle de vie.

Compte tenu de la littérature existante, notre étude a pour objectif de tester les hypothèses suivantes:

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*Hypothèse 1: La vitesse d'ajustement de la structure du capital change avec les cycles de vie de l'entreprise.*

*Hypothèse 2: La vitesse est la plus élevée sur la phase d'introduction*

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En considérant que les étapes de la vie de l'entreprise sont déterminées par sa croissance, le lien entre le ratio d'endettement et la croissance est décrit par les modèles suivants:

$$TDA_{it} = \alpha_0 + \beta_1 TDA_{it-1} + \beta_2 SIZE_{it} + \beta_3 PROFIT_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \beta_6 MTB_{it} + \beta_7 NDT S_{it} + \beta_8 Book\_IML_{it} + i.Year + i.Industry + \epsilon_{it} \quad (6)$$

$$TDM_{it} = \alpha + \beta_1 TDM_{it-1} + \beta_2 SIZE_{it} + \beta_3 PROFIT_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \beta_6 MTE_{it} + \beta_7 NDTs_{it} + \beta_8 Market\_IML_{it} + i.Year + i.Industry + \epsilon_{it} \quad (7)$$

avec les estimateurs POLS, FE et GMM.

Les variables TDA, TDM représentent les ratios d'endettement mesurés avec des données comptables et de marché.

Les variables SIZE, PROFIT, TANG, GROWTH, MTB, NDTs, MIL représentent la taille de l'entreprise, la rentabilité, la tangibilité, la croissance, le ratio valeur de marché sur valeur comptable, le bouclier fiscal sur l'endettement et l'endettement médian du secteur.

Nous n'ajoutons rien aux équations d'origine car la croissance est actuellement l'un des principaux déterminants de la structure du capital.

Les modèles 6 et 7 sont estimés pour deux sous-groupes d'entreprises classées en fonction du taux de croissance médian de l'industrie. Si une entreprise a un taux de croissance des ventes supérieur à la valeur médiane de son secteur au cours d'une année donnée, elle appartient au groupe « à forte croissance », et inversement. Dans cette section, nous utilisons uniquement le système GMM.

Lorsque l'âge est utilisé comme mesure du cycle de vie, les variables Age et Age\_squared sont ajoutées à la régression en tant que variables explicatives indépendantes.

$$TDA_{it} = \alpha + \beta_1 TDA_{it-1} + \beta_2 SIZE_{it} + \beta_3 PROFIT_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \beta_6 MTE_{it} + \beta_7 NDTs_{it} + \beta_8 Book\_IML_{it} + \beta_9 AGE_{it} + \beta_{10} AGE^2_{it} + i.Year + i.Industry + \epsilon_{it} \quad (8)$$

$$TDM_{it} = \alpha + \beta_1 TDM_{it-1} + \beta_2 SIZE_{it} + \beta_3 PROFIT_{it} + \beta_4 GROWTH_{it} + \beta_5 TANG_{it} + \beta_6 MTE_{it} + \beta_7 NDTs_{it} + \beta_8 Market\_IML_{it} + \beta_9 AGE_{it} + \beta_{10} AGE^2_{it} + i.Year + i.Industry + \epsilon_{it} \quad (9)$$

L'utilisation de termes simples et quadratiques d'âge nous aide à explorer toute relation non linéaire existante entre l'âge et la structure du capital.

En outre, nous vérifions à nouveau l'impact de l'âge de l'entreprise sur la vitesse d'ajustement en estimant les modèles 6 et 7 pour deux sous-groupes d'entreprises classés en fonction de l'âge médian de l'industrie. Si une entreprise est plus âgée que la valeur médiane de son secteur au cours d'une année donnée, elle appartient au groupe des entreprises « matures » et vice-versa pour les « entreprises jeunes ». Dans cette section, nous utilisons uniquement le système GMM.

Plus important encore, certaines études actuelles (Tian et Zhang, 2015, Castro et al., 2016) ont suggéré que les flux de trésorerie étaient le meilleur indicateur du cycle de vie de l'entreprise. Nous utilisons aussi cette approche et estimons les modèles 6 et 7 pour cinq groupes d'entreprises différents, à savoir Introduction, Growth, Maturity, Shake-out, and Decline, comme suggéré par Dickinson (2011).

Lorsque la phase du cycle économique est caractérisée par une croissance du ratio des ventes, nous examinons d'abord le rôle de la croissance en tant que déterminant indépendant de la fonction de la structure du capital. Avec des valeurs comptables, les trois estimateurs (POLS, FE et GMM) fournissent des coefficients positifs non significatifs. Avec des valeurs de marché, POLS et GMM montrent une relation significative entre le taux de croissance et la structure du capital à un intervalle de confiance de 95%.

Rutherford (2003) suggère de considérer le taux de croissance sur 7 intervalles. En raison du nombre limité d'observations, nous ne considérons que trois sous-ensembles : taux de croissance négatif ; taux de 0% à 20% ; et taux au-dessus de 20%. Ces trois sous-ensembles correspondent aux entreprises à faible croissance, à croissance modérée et respectivement à croissance élevée. Quel que soit le titre utilisé ou le type de dette contractée sur les marchés, les résultats montrent que les entreprises en croissance compensent plus rapidement l'écart par rapport à l'endettement cible. En particulier, pour les entreprises à plus de 20% de croissance, la vitesse est d'environ 27% par an avec le TDA et 10,7% par an avec le TDM.

Lorsque l'on utilise la médiane de l'industrie comme seuil pour séparer les entreprises à forte croissance ou à faible croissance, on retrouve encore la vitesse la plus rapide pour les entreprises à forte croissance. Plus précisément, avec des valeurs comptables, dans le groupe des médianes au-dessus de la moyenne de l'industrie, la vitesse est de 27,2% par an et avec des valeurs de marché cette vitesse est de 9,7% par an, ce qui est proche de ce que nous avons trouvé.

Lors de l'ajout de l'âge dans le modèle d'ajustement partiel, les coefficients d'âge et d'âge au carré sont non significatifs dans toutes les colonnes.

Lorsque nous utilisons la médiane de l'industrie comme seuil pour séparer les entreprises jeunes ou anciennes, la vitesse la plus rapide est trouvée pour les entreprises anciennes. Lorsque l'endettement est mesuré par des valeurs de marché, les entreprises plus âgées s'ajustent plus rapidement que les entreprises plus jeunes.



Comme on peut le constater, les coefficients de levier retardés sont significatifs au niveau de 0,01 sur 5 étapes de la vie, confirmant l'existence du niveau cible de dette. Au stade de démarrage, les entreprises ont tendance à s'ajuster plus rapidement vers la cible avec une vitesse de 27,1%. La vitesse d'ajustement implicite diminue progressivement et atteint le point le plus bas à 12,5% par an pour les entreprises à maturité, avant une reprise pendant les deux dernières étapes.

Avec des valeurs de marché, la vitesse la plus élevée de 22,9% par an se situe dans la phase initiale et diminue à 12,7% pendant la croissance. La rapidité de l'ajustement suggère des coûts de transaction bas. La vitesse atteint le niveau le plus bas en maturité avec un taux de 1,3% par an. Dans les deux dernières étapes, la vitesse récupère en effectuant un mouvement en forme de U.

En conclusion, en adoptant le modèle d'ajustement partiel, l'étude a révélé des coefficients importants d'effet de levier retardé dans toutes les étapes de la vie de l'entreprise, ce qui suggère que les entreprises vietnamiennes cotées ont identifié et poursuivi l'effet de levier ciblé tout au long de la période observée. Ce résultat est aligné avec ceux trouvés dans le deuxième essai de cette thèse.

Deuxièmement, l'étude montre que la vitesse d'ajustement augmente avec l'âge et la croissance de l'entreprise. Les entreprises s'adaptent plus rapidement quand elles deviennent plus âgées et plus grandes. En outre, le modèle de classification de Dickinson (2011) a été présenté comme une méthode complète permettant de séparer 5 grandes étapes de la vie professionnelle. La tendance élevée-faible-élevée a été observée dans la vitesse à laquelle les entreprises compensent l'écart par rapport à la cible. En phase d'introduction, les entreprises s'ajustent plus rapidement et le taux diminue progressivement lorsque les entreprises franchissent les stades de croissance ou de maturité. La vitesse est plus faible lorsque les entreprises sont matures. Ensuite, il redevient élevé durant les deux dernières étapes de la vie.

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## IMPLICATIONS

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La recherche a fourni des preuves empiriques de la relation entre la structure de propriété et la structure du capital des sociétés cotées vietnamiennes. Ces résultats pourraient avoir des conséquences pour les décideurs et les dirigeants d'entreprises vietnamiens. Par exemple, la

recherche montre que la propriété étrangère a une influence importante sur le choix des entreprises en matière de financement, ce qui implique une surveillance active de leurs pratiques. Les investisseurs étrangers, dotés d'une expérience et de compétences élevées en matière de gestion, aideront les entreprises à améliorer l'efficacité de leur gouvernance et à réduire le coût des fonds propres. Par conséquent, les projets à long terme visant à réduire le niveau de participation de l'État et à éliminer les obstacles liés aux investissements étrangers doivent être mis en œuvre de manière continue. Le rôle de substitution entre grande propriété et dettes entraîne également une claire implication pour les dirigeants d'entreprise, rappelant la mise en place d'un système de surveillance interne solide. En d'autres termes, l'existence d'une participation majoritaire contribue au fait que les entreprises disposent d'un capital important tout en éliminant le niveau d'endettement. Les gestionnaires doivent donc ajuster leurs activités et la sélection des investissements afin de les aligner sur les intérêts des détenteurs de blocs.

La recherche implique également que les dirigeants d'entreprise sont conscients qu'il y a un niveau d'endettement cible à atteindre et qu'ils modifient les ratios d'endettement actuels pour atteindre ce niveau. Par conséquent, outre le développement du marché des actions, le gouvernement devrait avoir plus de solutions pour améliorer le système bancaire et le marché des obligations, afin de garantir les sources de financement pour les demandes des entreprises. La liste des domaines de prêt prioritaires doit être examinée avec soin pour que l'argent puisse être versé aux bonnes entreprises. En outre, il faudrait envisager davantage de réglementations sur la publication des états financiers des entreprises afin de réduire l'asymétrie de l'information entre les investisseurs nationaux et étrangers.

En outre, la thèse montre que la vitesse d'ajustement en fonction de l'effet de levier cible n'est pas la même pour toutes les sociétés cotées en bourse et qu'elle est influencée par les coûts d'ajustement, qui sont déterminés par la disponibilité et le coût en capital des emprunts bancaires, des actions et des obligations de sociétés. Ces résultats soulignent la nécessité de politiques gouvernementales plus efficaces permettant aux entreprises d'avoir accès à des financements aux coûts les plus bas. Ces stratégies permettront aux entreprises d'obtenir rapidement l'effet de levier visé et, partant, d'optimiser la valeur pour les actionnaires.

La thèse indique, à différents stades du cycle de vie de l'entreprise, que les facteurs déterminant les objectifs d'endettement et la vitesse à laquelle les entreprises compensent les écarts par rapport aux objectifs sont également différents. Cette constatation a des implications

importantes. Premièrement, les chercheurs devraient accorder plus d'attention au cycle de vie de l'entreprise lorsqu'ils étudient des questions financières, car la mise en commun de toutes les entreprises qui se trouvent à des stades différents de la vie dans un même échantillon intégré conduira à des biais, voire à des conclusions erronées. Deuxièmement, les dirigeants d'entreprise doivent être conscients de l'effet du cycle de vie afin de prendre des décisions éclairées concernant le financement ou les décisions d'investissement / désinvestissement, et de planifier l'étape suivante. En outre, les investisseurs en actions et les créanciers devraient avoir une connaissance du cycle de vie lorsqu'ils envisagent d'investir ou de fournir un prêt.