

Impact of Debt Maturity Structure, Financial Market Development and Ownership Structure on the Financial Performance of Vietnamese Listed Firms

Thuy An Chung

MBus (Finance), BCom

A thesis submitted in fulfilment of the requirements for the degree of
Doctor of Philosophy

Institute for Sustainable Industries and Liveable Cities
Victoria University
Melbourne, Australia

December 2022

Abstract

Debt maturity structure (DMS) is an important financial aspect that a firm's managers must make decisions about as it impacts a firm's long-term investment decisions, rollover risk, cash-flow budgeting and external monitoring. Although previous research has examined DMS and firm financial performance, few studies have examined the determinants of DMS and the consequences of DMS for firm financial performance in Vietnam. The limited empirical evidence relating to determinants of DMS and the influence of DMS on firm financial performance in developing countries, especially in Vietnam, is the motivation for this thesis. Moreover, prior empirical studies show inconsistent results and indicate that determinants of DMS depend on specific circumstances. For Vietnam, these special circumstances relate to a high stock market concentration, a bank-based financial system and a high level of State control in both the private and banking sectors. Given this, it is important to examine the DMS for Vietnamese firms to facilitate decision making relating to an appropriate DMS to reduce refinancing risks and interest rate fluctuations. In particular, there are two phases of this study which examine: (1) the effects of firm-level, financial market development-level and various ownership structures on DMS; and (2) the effect of DMS on firm financial performance. This study contributes to the literature by examining the impact of stock market concentration and the moderating effect of bank debt and outside shareholders on DMS. An area that has been overlooked in DMS studies.

The study employed the most common measurement of DMS, which is the ratio of long-term debt to total debt, in both phases. In the first phase, the firm-level variables employed were effective tax rate, term structure of interest rates, volatility of interest rates, growth opportunities, firm size, asset maturity structure, firm quality, firm liquidity and firm leverage. Bank debt was measured as the ratio of bank debt to total debt. While financial market development was proxied by stock market concentration and banking sector size (measured as the ratio of domestic credit to the private sector by banks to GDP), ownership structure was proxied by state ownership, foreign ownership, managerial ownership and large shareholder ownership. Firm financial performance was measured using Tobin's

Q, return on assets and return on equity to reflect the profitability of a firm based on market and accounting value.

This study employed a sample of 4170 observations from 536 non-financial firms listed on the Ho Chi Minh Stock Exchange and the Hanoi Stock Exchange. The sample period was from 2009 to 2019. The data was collected from various databases and annual financial reports. The study mainly used a fixed-effects estimator and a system-generalized method of moments (GMM) estimator in Stata for analyzing the data. System-GMM helps to control for potential endogeneity issues so that findings are valid and reliable. The study employed the Hausman test and Wooldridge's strict exogeneity test to select the appropriate models. For the system-GMM, the study employed a second-order serial correlation test and an overidentification test (Hansen test), which are two post-estimation tests.

The study found evidence to support all three main hypotheses on DMS: the tax-based hypothesis, agency costs hypothesis, and signalling and liquidity risks hypothesis. Furthermore, the study reports that only the effects of firm quality and term structure of interest rates on DMS varied depending on a firm's reliance on bank debt. Next, the study found significant impacts of stock market concentration and banking sector size on DMS. The study also provides evidence to support the influence of state ownership and managerial ownership on DMS choice. However, it was found that only foreign investors significantly affected the negative relationship between managerial ownership and debt maturity, while the state and large shareholders did not significantly affect the relationship between managerial ownership and DMS. Further, DMS had a significant effect on firm financial performance as proxied by Tobin's Q, return on assets and return on equity. In summary, the findings from this study can be generalized to other countries that have market conditions such as high stock market concentration, heavy dependence on bank debt by firms and a relatively small and illiquid bond market.

The following policy implications arise from the study. First, the study raises awareness for market participants of the potentially troubling consequences of

high stock market concentration. Second, the government needs to formulate new policies to attract foreign investment by removing the foreign ownership caps in some major sectors such as banks, postal services and telecommunications. Third, to allocate capital sources equally, the state needs to reduce its ownership stakes in both state-owned enterprises and state-owned banks.

Declaration of Authenticity

I, Thuy An Chung, declare that the PhD thesis entitled “Impact of debt maturity structure, financial market development and ownership structure on the financial performance of Vietnamese listed firms” is no more than 80,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

I have conducted my research in alignment with the Australian Code for the Responsible Conduct of Research and Victoria University’s Higher Degree by Research Policy and Procedures.

Signature:

A large black rectangular box redacting the signature of the author.

Date: 18 December 2022

Acknowledgements

First, I am extremely grateful to my principal supervisor, Dr Guneratne Wickremasinghe, and my associate supervisor, Dr Riccardo Natoli, who have given their time, patience and encouragement to guide me in doing research. I have learnt a lot from their knowledge and experience.

Accredited professional editor Mary-Jo O'Rourke AE provided copyediting and proofreading services according to the national university-endorsed *Guidelines for editing research theses*. Editorial intervention was restricted to the ACGR/IPED national guidelines for editing research theses and the current Australian Standards for Editing Practice, specifically parts D and E.

I would also like to express my gratitude and love to my family, especially my parents, Chung Tai and Luong Ngoc Diep, who were always there to give me unconditional love, care, support and encouragement throughout my PhD journey. I also offer deep thanks to my husband, Nguyen Viet Thanh, who has supported and taken care of me and our daughter so that I could focus on my study. He is always beside me and encourages me to overcome challenges in my life. Importantly, my daughter, Nguyen Minh Anh, has been a gift for me during the PhD journey. She is the greatest motivation whenever I feel stressed and lost.

Finally, I would like to thank all of my dearest friends in Vietnam and in Australia, especially Hoang Thi Thuy Linh and Phan Quynh Trang. They also encouraged me and helped me through my hard times.

Table of Contents

Abstract	ii
Declaration of Authenticity	v
Acknowledgements.....	vi
Table of Contents	vii
List of Figures	xi
List of Tables	xii
List of Abbreviations	xiv
CHAPTER 1: INTRODUCTION	1
1.1. Background to the research problem	1
1.2. Research problems	7
1.3. Research questions.....	9
1.4. Definition of key terms.....	10
1.5. Overview of the research methods.....	11
1.6. Contributions and significance of the research.....	12
1.6.1. Academic contributions.....	12
1.6.2. Practical contributions.....	13
1.7. Summary of main findings.....	14
1.8. Organization of the thesis.....	15
CHAPTER 2: OVERVIEW OF THE RESEARCH CONTEXT	16
2.1. Introduction	16
2.2. Vietnam's economy	16
2.2.1. <i>Doi Moi</i> reforms	16
2.2.2. Trades, laws and regulations.....	18
2.2.3. Privatization process.....	19
2.2.4. Gross domestic product.....	21
2.2.5. Foreign direct investment	23
2.3. Development of Vietnam's financial markets.....	25
2.3.1. Banking sector	25
2.3.2. Stock market.....	30
2.3.3. Bond market	35
2.4. Summary.....	41

CHAPTER 3: LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT	43
3.1. Introduction	43
3.2. Theories on debt maturity structure.....	43
3.2.1. Irrelevancy theory (capital structure irrelevance)	43
3.2.2. Traditional theory of capital structure.....	45
3.2.3. Trade-off theory	47
3.2.4. Agency costs theory	49
3.2.5. Pecking order theory.....	52
3.2.6. Signalling theory	55
3.2.7. Summary of applicability of main theories reviewed	58
3.3. Identifying firm-level determinants.....	59
3.3.1. Tax-based hypotheses	59
3.3.2. Agency costs (contracting costs) hypotheses.....	65
3.3.3. Signalling and liquidity risks hypotheses.....	73
3.3.4. Debt maturity structure and bank debt.....	82
3.4. Debt maturity and financial market development	83
3.4.1. Stock market development	84
3.4.2. Banking sector development	87
3.5. Debt maturity structure and ownership structure	89
3.5.1. Large shareholder ownership	90
3.5.2. Foreign ownership	92
3.5.3. State ownership.....	94
3.5.4. Managerial ownership.....	96
3.5.5. Moderating effect of outside shareholders.....	98
3.6. Debt maturity structure and firm performance	101
3.7. Summary.....	108
CHAPTER 4: DATA AND RESEARCH METHODS.....	109
4.1. Introduction	109
4.2. Conceptual framework	109
4.3. Research methods review.....	111
4.3.1. Research methods used in previous studies	111

4.3.2. Research method for the study.....	119
4.4. Research design and approach	123
4.4.1. Data collection	123
4.4.2. Sample size	123
4.5. Variable measurements	126
4.5.1. Debt maturity structure	126
4.5.2. Firm-level variables.....	127
4.5.3. Financial market development.....	137
4.5.4. Ownership structure.....	140
4.5.5. Firm performance	143
4.5.6. Control variables for models of debt maturity structure and firm performance.....	144
4.6. Empirical models	148
4.7. Summary.....	150
CHAPTER 5: RESULTS AND DISCUSSION	152
5.1. Introduction	152
5.2. Pre-estimation diagnostic tests	152
5.3. Statistical descriptions.....	154
5.3.1. Determinants of debt maturity structure model	156
5.3.2. Debt maturity structure and financial market development model	159
5.3.3. Debt maturity structure and ownership structure model.....	160
5.3.4. Debt maturity structure and firm performance model.....	161
5.4. Regression results and discussion.....	162
5.4.1. Determinants of debt maturity structures model	162
5.4.2. Debt maturity structure and bank debt model	173
5.4.3. Debt maturity structure and financial market development model	180
5.4.4. Debt maturity structure and ownership structure model.....	187
5.4.5. Moderating effect of outside shareholders on relationship between debt maturity structure and managerial ownership	194

5.4.6. Firm performance model: Effect of debt maturity structure on firm performance.....	199
5.5. Summary.....	205
CHAPTER 6: CONCLUSION AND IMPLICATIONS	207
6.1. Introduction	207
6.2. Research summary	207
6.3. Research conclusions	209
6.3.1. Research question 1: What specific firm characteristics of Vietnamese listed firms affect the debt maturity structure?.....	209
6.3.2. Research question 2: To what extent do bank-dependent firms affect the association between firm-level determinants and the debt maturity structure in Vietnam?	210
6.3.3. Research question 3: To what extent does the development of financial markets affect the debt maturity structure in Vietnam?	210
6.3.4. Research question 4: To what extent does the ownership of shares by foreigners, government, large shareholders, and managers affect the debt maturity structure in Vietnam?	211
6.3.5. Research question 5: To what extent does outside ownership affect the relation between inside ownership and the debt maturity structure in Vietnam?.....	211
6.3.6. Research question 6: To what extent does the debt maturity structure affect Vietnamese firm financial performance?	211
6.4. Contributions to knowledge	214
6.5. Research implications	215
6.5.1. Practical implications	215
6.5.2. Policy implications	216
6.6. Limitations and future directions for research.....	218
APPENDIX	220
A: List of firms used in this study	220
REFERENCES	224

List of Figures

Figure 2.1: The GDP growth of Vietnam from 2009 to 2021	22
Figure 2.2: The Vietnamese economic structure in 2021	23
Figure 2.3: FDI allocation by sector in 2021	24
Figure 2.4: Market shares of banking sector in terms of total assets.....	28
Figure 2.5: Deposits and lending by banking groups in 2020.....	29
Figure 2.6: The Vietnamese financial markets' size during the period 2015–2020	32
Figure 2.7: Stock market capitalization to GDP of Asian countries for the period 2015–2020	33
Figure 2.8: Number of listed firms in Vietnam over the period 2000–2021	34
Figure 2.9: Government bonds/GDP and corporate bonds/GDP (2015–2020)	36
Figure 2.10: Average tenure of government bonds in 2020	37
Figure 2.11: Vietnam's corporate bond issuers in 2019 and 2020.....	40
Figure 4.1: Conceptual framework for this study	110

List of Tables

Table 1.1: Key definitions of research.	10
Table 2.1: HOSE Index in Vietnam as at 31 January 2020.	35
Table 3.1: Summary of all hypotheses in the present research.....	107
Table 4.1: Summary of the research methods used in previous studies.	117
Table 4.2: Data summary.	125
Table 4.3: Variable measurements.....	145
Table 5.1: Variance inflation factor (VIF) tests for models 1–4.....	152
Table 5.2: Hausman tests for models 1–4.....	153
Table 5.3: Wald’s test and Wooldridge’s test for models 1–4.....	154
Table 5.4: Wooldridge’s strict exogeneity test for models 1–4.....	154
Table 5.5: Descriptive statistics for the debt maturity structure model and firm performance model.	155
Table 5.6: Correlation matrix between debt maturity structure and its determinants.....	163
Table 5.7: Determinants of debt maturity structure model results.	164
Table 5.8: Correlation matrix between debt maturity structure and bank debt.	175
Table 5.9: Debt maturity structure and bank debt model results.	176
Table 5.10: Correlation matrix of debt maturity structure and financial market development model.....	182
Table 5.11: Debt maturity structure and financial market development model results.....	183
Table 5.12: Correlation matrix of debt maturity structure and ownership model.	188
Table 5.13: Debt maturity structure and ownership structure model results...	190
Table 5.14: Moderating effects of outside shareholders on the relationship between managerial shareholders and debt maturity structure – sys-GMM with robust standard error.....	195
Table 5.15: Moderating effect of outside shareholders on the relationship between CEO and debt maturity structure – sys-GMM with robust standard error.	197

Table 5.16: Correlation matrix between firm performance and its determinants.	199
Table 5.17: Firm performance and debt maturity structure model results.	201
Table 6.1: Summary of results.....	213

List of Abbreviations

2SLS	Two-stage least squares
3SLS	Three-stage least squares
AMS	Asset maturity structure
ASEAN	Association of Southeast Asian Nations
BANK	Banking sector size
BD	Bank debt
CEO	Chief executive officer
CFO	Chief financial officer
COGS	Cost of goods sold
Dif-GMM	Difference generalized method of moments
DMS	Debt maturity structure
EBIT	Earnings before interest and tax
EBITDA	Earnings before interest, tax, depreciation and amortization
EPS	Earnings per share
EVFTA	European Union–Vietnam Free Trade Agreement
FDI	Foreign direct investment
FE	Fixed effects
FO	Foreign ownership
GCC	Gulf Cooperation Council
GDP	Gross domestic product
GMM	Generalized method of moments
GROW	Growth opportunity
HNX	Hanoi Stock Exchange
HOSE	Ho Chi Minh Stock Exchange
IMF	International Monetary Fund
IPO	Initial public offering
IV	Instrumental variables
IV-GMM	Instrumental variables–generalized method of moments
JSCB	Joint-stock commercial bank
LEV	Firm leverage

LIQ	Liquidity
LO	Large shareholder ownership
M&M's	Modigliani and Miller's
MENA	Middle East and North Africa
MO	Managerial ownership
OLS	Ordinary least squares
P/E	Price to earnings ratio
PPE	Property, plant and equipment
q-o-q	Quarterly growth rate
QUAL	Firm quality
RCEP	Regional Comprehensive Economic Partnership
RE	Random effects
ROA	Return on assets
ROE	Return on equity
SBV	State Bank of Vietnam
SCON	Stock market concentration
SD	Standard deviation
SGR	Sales growth rate
SIZE	Firm size
SIZEM	Firm market size
SMEs	Small and medium-sized enterprises
SO	State ownership
SOB	State-owned bank
SOE	State-owned enterprise
Sys-GMM	System generalized method of moments
TAN	Tangibility
TAX	Effective tax rate
TERM	Term structure of interest rate
TOQ	Tobin's Q
TPP	Trans-Pacific Partnership
UAE	United Arab Emirates
VDB	Vietnam Development Bank

VIF	Variance inflation factor
VN30	Top 30 listed firm
VOLR	Volatility of interest rate
VSD	Vietnam Securities Depository
VSPB	Vietnam Social Policy Bank
WACC	Weighted average cost of capital
WB	World Bank
WTO	World Trade Organization

CHAPTER 1: INTRODUCTION

1.1. Background to the research problem

There are three main decisions that a firm must make, which are financing decisions, investment decisions and payout decisions. Selecting an appropriate debt maturity structure (DMS) is an important corporate financing decision. The optimal DMS is a trade-off between a firm's preference for short-term borrowing and liquidity risks (Diamond, 1991). A firm prefers short-term debt as the firm expects their future credit rating will be improved. Furthermore, short-term debt has lower transaction costs than long-term debt (Khoo and Cheung, 2022). However, the maturity of short-term debt does not match the timing of the cash flows from the firm's investments. Hence, they also face liquidity risks such as not obtaining refinancing. For instance, lenders are not likely to refinance when a firm receives bad news (Diamond, 1991). The effect of DMS on firm financial performance and the optimal DMS are among the important corporate financing decisions. To be specific, choosing an appropriate DMS can assist firms to reduce refinancing risks and interest rate fluctuations, as well as making it easier to seek growth opportunities (GROW). Although DMS has frequently been researched (Adachi-Sato & Vithessonthi, 2019; Dangl & Zechner, 2021; Nguyen et al., 2020b), the present research contends that the approaches of these studies are not appropriate for Vietnam. For instance, Antoniou et al. (2006) stated that the impact of stock market conditions on the term structure of debt maturity is country dependent as they obtained mixed findings for the three main hypotheses on DMS in the UK, Germany and France. However, Antoniou et al. (2006) employed data from three developed countries. While the majority of existing studies have focused on developed countries (Barclay & Smith, 1995; Jungherr & Schott, 2021; Nguyen et al., 2020b), Vietnam has its own unique market conditions. For instance, the Vietnamese stock market is at an early stage of development (Vo, 2017a). The stock market capitalization to gross domestic product (GDP) ratio of Vietnam was approximately 54.2% in 2020, which is lower than those of other countries in the region such as China (83.16%), India (97.3%), Thailand (108.7%), Malaysia (129.5%) and Singapore (191.9%) (World Bank,

2022). The Vietnamese bond market is also small and illiquid. According to the Asian Development Bank (2022a), while the local currency bond market of Vietnam is the smallest in the emerging East Asian bond markets, the growth rate of the Vietnamese market is the fastest one in the region. For example, at the end of December 2021, the amount of bonds outstanding was USD 91.5 billion, with a quarterly growth rate (q-o-q) of 9.8% in quarter 4, 2021 for both government and corporate bonds, while the local currency bond markets of Indonesia, the Philippines, Malaysia and Thailand were worth USD 372.6 billion (4.4% q-o-q), USD 191.9 billion (0.3% q-o-q), USD 416.7 billion (8.2% q-o-q) and USD 443.5 billion (1.1% q-o-q), respectively. Moreover, due to the underdevelopment of both bond and stock markets, Vietnamese firms heavily rely on bank debt (BD). The Vietnamese financial system is viewed as a bank-based system (Phan, 2018; Vo, 2016a; Vo, 2019b). In 2016, the banking sector's assets accounted for 194% of GDP and 96% of the assets in the financial sector (Le et al., 2022). Furthermore, state-owned banks (SOBs) dominate the banking sector in Vietnam (Vo, 2018a) and large state-owned enterprises (SOEs) are likely to hold the majority of bank credit in Vietnam (Vo, 2016a). According to Tran-Thi and Vu-Thanh (2020), four large SOBs comprise almost 50% of the lending market. Le (2015) reported that more than one third of the total bank credit was provided to SOEs.

Alcock et al. (2012) and Cai et al. (2008) stated that Australian and Chinese firms, respectively, rely heavily on BD. They acknowledged that their results regarding firm-level determinants of debt maturity were inconsistent with those of other previous studies due to the market conditions, especially dependence on excessive BD. While Australia is a developed country, Vietnam and China are developing countries. Alcock et al. (2012) did not examine the effect of the Australian financial markets on DMS, while Cai et al. (2008) found that Chinese managers combined information from both debt and stock markets when choosing the term of debt. Cai et al. (2008) stated that it was surprising to find a negative relationship between financial markets (debt and stock markets) and debt maturity as the Chinese corporate sector and economy had not become market-oriented during the period 1994–2004. Vietnam has become a market-oriented socialist economy since 1986. Between 1994–2004, the average ratio

of stock market capitalization to GDP in China was 1.12% while for Vietnam it was 29.07% for 2009-2019 which is the study period for the present research (Cai et al., 2008; World Bank, 2022). Importantly, nor did Cai et al. (2008) or Alcock et al. (2012) examine the moderating effect of BD on debt maturity. This implies that the results of the studies of Cai et al. (2008) and Alcock et al. (2012) may not apply for Vietnamese firms. The effect of the Vietnamese financial markets, especially the dependence on BD, may significantly influence the choice of debt maturity in Vietnamese firms.

The issue of underdeveloped capital markets is exacerbated in Vietnam as it has a very high stock market concentration (SCON). For instance, the total market capitalization of the VN30 (i.e., the 30 largest and highest liquidity listed firms) comprises up to 80% of the whole stock market capitalization of the Ho Chi Minh Stock Exchange (HOSE) (Dao, 2014). Furthermore, the market capitalization of the VN30 accounts for 74% of Vietnam's stock market (SSI Securities Corporation, 2022). However, the majority of existing studies captured market size and market liquidity as indicators of the development of stock markets when examining the relationship between stock market development and corporate financing decisions (Demirgüç-Kunt & Levine, 1996; Demirguc-Kunt & Maksimovic, 1999), while high SCON was reported as an important factor that reduced the development of the stock market (Demirgüç-Kunt & Levine, 1996; Kanasro et al., 2009). Furthermore, previous studies have focused on the influence of SCON on financial markets, economic growth and firm performance (Bae et al., 2021, Chelley-Steeley, 2008, Pham, 2018). In particular, SCON leads to inefficient capital allocation and slower economic growth (Bae et al., 2021). Gallagher et al. (2015) found that SCON affects corporate financing decisions as a high level of SCON leads to a decrease in the debt level. Moreover, Antoniou et al. (2006) stated that prior studies have not found sufficient evidence relating to the influence of equity market conditions on DMS. They also argue that equity market conditions should not be ignored when managers choose a debt maturity structure. In the available literature of DMS, there is no study that examines the impact of SCON on DMS where SCON is an important characteristic of the stock market (Demirgüç-Kunt and Levine, 1996). Further, Bae et al. (2021) found that

high SCON reduces the ability to raise capital of new firms in the stock market. High SCON can force small firms to choose long-term debt instead of issuing equity. Therefore, the effect of SCON potentially impacts the DMS of Vietnamese listed firms. Further, the development of the stock market and banking sectors are strongly related to financial market development (Demirgüç-Kunt and Levine, 1996, Kirch and Terra, 2012), as stock markets and banks provide both capital to firms and information to investors. Furthermore, since Vietnam is a bank-based financial system, any measure of financial market development should also reflect the development of the banking sector which is measured as banking sector size (Fan et al., 2012, González, 2017).

Additionally, there are inconsistent findings about the effect of managerial ownership (MO) on the choice of debt maturity. For example, Datta et al. (2005), Guney and Ozkan (2005) and Tanaka (2016) stated that managers with higher share ownership prefer issuing short-term debt as this signal to the market that their firms will be monitored frequently by creditors. This indicates that managerial owners try to reduce agency conflicts. However, Mehran (1992) implied that large shareholders with efficient monitoring may restrain managers' financial decisions. Ben-Nasr et al. (2015) argued that controlling owners prefer long-term debt to avoid frequent monitoring regardless of higher agency costs. The incentive to avoid bank monitoring of controlling owners is decreased by the presence of multiple large shareholders (Boubaker et al., 2017). Several empirical studies found that firms with state, foreign or large shareholder ownership prefer issuing long-term debt (Arslan & Karan, 2006; Ruan et al., 2014; Tanaka, 2010). This implies that the presence of these external shareholders can substitute for the role of short-term debt in reducing agency costs due to their efficient monitoring activity. However, there is limited research about whether outside shareholders can influence managerial owners' decisions in relation to DMS, especially in cases of high MO such as in Vietnam. For instance, as a transitional country, the government in Vietnam still exercises strong intervention in the private sector and banks. For example, SOBs held over 45% and 35% of total Vietnamese bank assets and the credit system, respectively (Bui, 2018). However, foreign ownership (FO) has recently emerged as playing an important role in the

Vietnamese economy due to the privatization process (Vo, 2016b; Vo, 2019a). For instance, the total ownership of the government and foreigners equated to over 50% of GDP in 2012 (Phung & Mishra, 2016)¹. Managerial owners also hold significant shares in total Vietnamese listed firms (approx. 38%) and 59% in state-owned firms (Do & Wu, 2013).

In summary, Vietnamese firms are faced with three main issues regarding BD, stock market development and ownership structure which potentially affect their financing decisions relating to DMS. In particular, as BD is the main source of funds for Vietnamese firms, it is important to understand the moderating effect of BD on the firm-level determinants of DMS. High SCON reduces the development of the stock market and leads to inefficient allocation of capital to firms (Bae et al., 2021; Demirgüç-Kunt & Levine, 1996). According to Noland and Park (2015), providing efficient allocation of capital is one of the main functions of financial development. Hence, managers need to consider the impact of SCON on DMS since Vietnam has high SCON. Furthermore, the ownership structure of Vietnamese firms has changed due to the privatization process and the incentive of attracting more foreign investors. Manager-shareholders hold a significant share of Vietnamese firms. However, the DMS preferences of manager-shareholders and outside shareholders (the state, foreigners and large shareholders) were found to be different in previous studies. Therefore, it is important to understand whether outside shareholders influence the relationship between MO and DMS. In Vietnam, a few studies have examined the determinants of DMS (Chung & Phan, 2020; Ngo & Le, 2021; Nguyen, 2022b). However, this study is different from prior Vietnamese studies via its focus on issues that have not been addressed by previous Vietnamese studies such as SCON, BD and the moderating effect of outside shareholders. For instance, Ngo and Le (2021) and Chung and Phan (2020) examined the effect of stock market development on DMS in Vietnam. These two studies focused on market size and market liquidity, while this thesis study focuses on market concentration. SCON is an important issue for the Vietnamese stock markets since it reduces the ability to raise equity of start-up and small firms. Since SCON is one of main factors that leads to the inefficient allocation of capital to firms, this study differentiates from

¹ As of March 2023, no updates have occurred since 2012.

other studies by focusing on the impact of SCOR on DMS as opposed to market size or market liquidity. This aspect will enhance the understanding of how Vietnamese firms choose their DMS when they face difficulty in accessing external capital. Moreover, although this study is close to the study of Le (2015), who examined the influence of ownership structure on capital structure and the effect of capital structure on firm performance, there are some key differences between Le's (2015) study and the present research. First, Le (2015) focused on capital structure while this study focuses on DMS. Capital structure is defined as a mix between debt and equity while DMS is defined as the proportion of long-term debt to total debt. This study focuses on DMS as it is a critical element of fund matching. A mismatch between the maturity of assets and debts may lead to high liquidity risk. Second, this study investigates both firm-level determinants of DMS and the effect of financial market development on DMS while Le (2015) did not examine firm-level determinants of capital structure nor the effect of financial market development on capital structure. Furthermore, although Vietnam is a bank-based economy (Le et al., 2022), the stock market is still an important function of the economy as debt and equity financing are not perfect substitutes. Hence, the development of the banking sector and equity market impacts the financing decisions of individual firms. Given this, the present study is motivated to investigate the influence of the financial market development on DMS when the Vietnamese stock market is highly concentrated. Third, this study differs from Le (2015) by focusing on the moderating effect of bank debt as Vietnamese firms mainly depend on bank debt. Although two prior studies argued that high level of bank debt could be a reason for inconsistent findings within the DMS literature (Cai et al., 2008, Alcock et al., 2012), this study aims to further explore this by examining how bank debt has a moderating effect on the relationship between firm characteristics and DMS. Furthermore, Nguyen (2022b) investigated the firm-level determinants of DMS, focusing on 176 small and medium listed firms in Vietnam, while the present research employs a sample of 536 non-financial listed firms. Nguyen (2022b) included macroeconomic factors (such as inflation and GDP) in their model of DMS, while the present research focuses on the effects of financial market development and ownership structure

on DMS. Since the Doi Moi reform in the 1990s, the ownership structure of Vietnamese firms has changed sharply due to the privatization process along with a rapid increase in foreign investment. Different types of ownership have different choices of debt maturity due to their efficient monitoring ability and their inability to access capital sources. However, to the best of my knowledge, there is no Vietnamese research that examines the relationship of diverse aspects of ownership and DMS. Consequently, this study aims to provide new evidence of how ownership structure influences DMS.

Overall, Vietnam has its own issues relating to high stock market concentration, high levels of bank debt, tight State control of both the banking sector and private sector, and a significant increase in foreign ownership. While these issues potentially influence DMS, they have been overlooked in the literature of DMS, including prior Vietnamese studies. Hence, due to these specific contextual issues, this study extends the literature of DMS by examining factors and consequence of DMS on firm financial performance. The contribution and significance of this study are discussed in section 1.6.

1.2. Research problems

A review of previous studies has indicated several gaps in the field regarding DMS and firm performance. These are:

1. While some studies support Flannery's (1986) hypothesis that good quality firms prefer short-term debt to signal their quality to the market (Alcock et al., 2012; Berger et al., 2005; Zheng et al., 2012), Cai et al. (2008) found contrasting results that good quality firms in China choose long-term debt instead of short-term debt. The authors believed that the signalling hypothesis does not work in China because Chinese firms rely heavily on BD. Alcock et al. (2012) reported that most traditional hypotheses on DMS, except for the signalling hypothesis, do not work in Australia due to the specifics of the capital marketplace, especially the strong reliance on BD. The firm-level determinants of DMS were found to be inconsistent with previous studies, especially firm quality (QUAL), due to the effect of BD. However, the

moderating effect of BD on the relationship between firm-level determinants and debt maturity has been overlooked in DMS studies.

2. Some studies have noted that there are mixed and controversial findings in the literature on choosing the term structure of debt (Antoniou et al., 2006; Kashefi Pour, 2012). Antoniou et al. (2006) confirmed that the determinants of DMS are country specific, especially the impact of equity market conditions. Vietnam has a very high SCON as the market capitalization of the VN30 accounts for 74% of Vietnam's stock market (SSI Securities Corporation, 2022). High SCON is an important factor that reduces the development of the stock market, while Vietnamese firms generally raise fund from banks and the stock market. Further, the development of the stock market is correlated with the development of the banking sector (Demirgüç-Kunt & Levine, 1996). However, to the best of my knowledge, there is no empirical research that examines the effects of the development of the stock market (measured by SCON) and the banking sector on DMS.
3. Although the majority of existing studies have focused on examining the relationship between one type of ownership structure and DMS (Boubakri & Saffar, 2019; Ruan et al., 2014; Tanaka, 2016), there is limited research about the impact of the four main types of ownership structure, which are FO, state ownership (SO), MO and large shareholder ownership (LO), on debt maturity choice in one model. In other words, a firm generally has more than one type of ownership structure, but there is no empirical research that provides a full picture of how the four main types of ownership structure affect DMS. Further, Mehran (1992) implied that large shareholders with efficient monitoring may restrain managers' financial decisions. To the best of my knowledge, there are no existing studies that examine how outside shareholders (state, foreign and large shareholder ownership) affect the influence of MO on the choice of debt maturity.
4. Most existing studies have focused on the effect of capital structure on firm performance (Le & Phan, 2017; Margaritis & Psillaki, 2010; Ramli et al., 2019). There are a few studies that have examined the relationship between DMS and firm performance (Hattem, 2017; Vijayakumaran & Vijayakumaran, 2019;

Zeitun & Haq, 2015). However, several studies defined DMS as long-term leverage (measured by the ratio of long-term debt to total assets) (Hatem, 2017; Nwude et al., 2016; Zeitun & Haq, 2015), which is different to this study. This study measures DMS as the ratio of long-term debt to total debt. Some studies focused on firm productivity performance (Schiantarelli & Jaramillo, 2002; Schiantarelli & Sembenelli, 1997; Schiantarelli & Srivastava, 1997) or firm accounting-based performance (Vijayakumaran & Vijayakumaran, 2019). There is limited empirical research that fully interprets the effect of DMS on both firm market-based and accounting-based performance, especially in emerging markets.

The knowledge gap identified in existing studies yields the research problem this thesis aims to address:

To examine the moderating effect of bank debt and the impact of financial market development and ownership structure on debt maturity structure and the impact of debt maturity structure on the financial performance of Vietnamese listed firms.

1.3. Research questions

As a result of the research problems identified above, six main research questions arise:

RQ1: What specific firm characteristics of Vietnamese listed firms affect the debt maturity structure?

RQ2: To what extent do bank-dependent firms affect the association between firm-level determinants and the debt maturity structure in Vietnam?

RQ3: To what extent does the development of financial markets affect the debt maturity structure in Vietnam?

RQ4: To what extent does the ownership of shares by foreigners, government, large shareholders and managers affect the debt maturity structure in Vietnam?

RQ5: To what extent does outside ownership affect the relation between inside ownership and the debt maturity structure in Vietnam?

RQ6: To what extent does the debt maturity structure affect Vietnamese firm financial performance?

The main objective of this study is to empirically examine the effects of financial market development and ownership structure on DMS and the effect of DMS on firm financial performance. The specific research objectives pursued in order to answer the research questions are:

- I. Examining the effects of firm-level determinants and financial market development on debt maturity structure
- II. Explaining whether the determinants of debt maturity structure are related to the dependence on BD
- III. Analyzing the influence of the four types of ownership structure on debt maturity choice and the moderating effect of outside shareholders on the relationship between MO and debt maturity choice
- IV. Examining the impact of debt maturity structure on firm financial performance

1.4. Definition of key terms

Table 1.1 summarizes the definitions of the key terms used in this study.

Table 1.1: Key definitions of research.

Key terms	Definition
Capital structure	“Capital structure is a firm’s mix of debt and equity” (Miglo, 2016, p. 3).
Debt maturity structure	“to choose finance between short-term and long-term debt” (Kashefi Pour, 2012, p. 36).
Financial development	“Financial development is the improvement of the financial system with regard to its five functions, including: (i) Providing information before making investment decisions; (ii) Monitoring investments and implementing corporate governance; (iii) Diversification and risk management; (iv) Accumulating of savings; and (v) Exchange of goods and services” (Tram et al., 2022, p. 681).
Stock market development	“stock market development is defined as a process of improvements in the quantity, quality, and efficiency of stock market services” (Pradhan et al., 2014, p. 159).
Ownership structure	“classified ownership structure in terms of capital contributions that comprise of inside investors (managers) and outside investors (debt holder and equity holder)” (Le, 2015, p. 30).

State-owned enterprises (SOEs)	“An SOE is an economic organisation in which the State keeps the whole charter capital or some shares, or contributes controlling capital (at least 50% of the shares outstanding), established under the form of either a State company or a joint-stock company or a limited liability company” (Bui, 2018, p. 30).
Firm performance	“firm performance can represent the capability of the firm to handle its limited resources and to develop competitive advantages over the competitors” (Wattanawarangkoon et al., 2022, p. 464).

1.5. Overview of the research methods

To empirically examine the determinants and consequences of DMS, this study gathered financial data from various databases for the period 2009–2019. In particular, the study collected firm-level and market-level financial data for Vietnamese non-financial listed companies from the Datastream database. While data on ownership structure was obtained from the Vietstock database, data on the banking sector was obtained from the World Bank (WB) Financial Structure Database. The data on BD was hand-collected from firms’ annual financial reports published on their websites. The study also collected annual interest rates from the International Monetary Fund (IMF). The final sample comprised 536 firms with 4170 firm-year observations.

The study addresses the six research questions proposed in Section 1.3 by developing four structural models. The models are then developed into eight equations which are estimated by using the ordinary least squares (OLS) method and the generalized method of moments (GMM) method in Stata software. The OLS method is the most used in existing studies of DMS (Fu et al., 2022; González, 2017; Hasan et al., 2022; Lugo & Piccillo, 2019; Nguyen et al., 2020b; Orman & Köksal, 2017). Similarly, the GMM method is widely employed in studies in developed countries (Alcock et al., 2012; Antoniou et al., 2006; D’Amato, 2020) and developing countries (Cai et al., 2008; Kirch & Terra, 2012; Martins et al., 2017). The GMM estimator is used for controlling the potential endogeneity issue in DMS studies. These methods are discussed in detail in Chapter 4.

1.6. Contributions and significance of the research

1.6.1. Academic contributions

The thesis provides four main contributions to the literature. First, most studies have measured the effect of stock market development on DMS via the size and liquidity of the stock market (Chung & Phan, 2020; Demirgüç-Kunt & Maksimovic, 1996; Demirguc-Kunt & Maksimovic, 1999). However, given the nature of the Vietnamese stock market, these two measures may not fully explain the development of its stock market as SCON is one of the main aspects of stock market development. Consequently, this study includes a new indicator, SCON, to develop a more comprehensive measure of stock market development. This constitutes a contribution to the existing literature.

Second, this study builds on the works of Alcock et al. (2012) and Cai et al. (2008) by investigating the impact of the dependence of firms on BD on the relationship between firm characteristics and DMS in Vietnam. These two studies found inconsistent results, in particular inconclusive support for the agency costs hypothesis and signalling hypothesis. They did not examine the moderating effect of BD on the firm-level determinants of DMS. Hence, this study helps to explain how DMS is selected in a bank-based country.

Third, recent research has generally concentrated on the impact of MO and different types of external ownership, especially large shareholders, on the choice of debt maturity (Arslan & Karan, 2006; Ben-Nasr et al., 2015; Datta et al., 2005). However, there is a lack of research on whether outside shareholders reduce self-interest managerial behaviour when managers are being efficiently monitoring while making financial decisions, especially in Vietnam, where firms seem to have high MO. Therefore, this study contributes to the existing literature as the first study to investigate the moderating impact of outside owners on the relationship between inside owners and the term structure of debt.

Finally, current frameworks in the existing literature which have addressed the issue of the determinants and consequences of debt maturity on firm

performance have mostly focused on developed countries (Alcock et al., 2012; Antoniou et al., 2006; Schiantarelli & Sembenelli, 1997). However, Vietnam has its own issues regarding reliance on BD, high SCON and a high level of managerial shareholders. Thus, the present study develops a more comprehensive framework by adding the effects of BD and SCON, and the moderating effect of outside shareholders to the framework. Such an approach can help to generalize this study to other countries that have similar conditions to those of Vietnam.

1.6.2. Practical contributions

This research has practical significance for firms and corporate debt holders. The findings will help to improve financing decisions of Vietnamese firms. In particular, firms can recognise which corporate characteristics are the most important factors in corporate DMS in Vietnam. For example, highly leveraged firms should lengthen their debt maturity to reduce rollover risks as well as liquidity risks. Moreover, firms with high-liquidity assets should increase their debt maturity due to creditors' preference. Creditors believe high-liquidity firms can generate cash more quickly to meet fixed payments or long-term debt. Also, when firms' managers make decisions relating to choosing debt maturity, they should consider financial market conditions. They should employ more long-term debt when the stock market is less concentrated and the size of the banking sector is smaller.

Further, the research findings will be important for bank loan officers considering loan applications by measuring the association between debt maturity and firm performance. For instance, large state-owned firms tend to hold the majority of bank credit (Vo, 2016a), while banks have recently been faced with high levels of non-performing loans in Vietnam. SOEs are widely accepted to have greater access to long-term debt than private companies (Cai et al., 2008; Phan, 2018; Ruan et al., 2014). SOEs are also responsible for 60% of non-performing loans (Dang et al., 2020). Therefore, the results of this study indicate that banks should make their lending decisions based on firm profitability rather than the type of firm ownership.

1.7. Summary of main findings

The empirical results show strong evidence of positive relationships between firm size (SIZE), leverage, liquidity, term structure of interest rates (TERM) and volatility of interest rates (VOLR) and DMS (at the 1% level). The study also finds a negative relationship between the effective tax rate (TAX) and DMS (at the 5% level). Although the study finds no evidence to support the effect of firm GROW, QUAL or asset maturity structure (AMS) on DMS based on the fixed-effects (FE) estimation, findings support the three main hypotheses on DMS in Vietnam, the tax-based hypothesis, agency costs hypothesis, and signalling and liquidity risks hypothesis. Furthermore, the study finds moderate evidence to support the moderating effect of BD on the effects of TERM and QUAL on DMS. Specifically, BD strengthens the negative relationship between QUAL and DMS, whereas it weakens the positive relationship between TERM and DMS. Moreover, the positive impact of AMS on DMS is found to be significant. The finding of the moderating effect of BD builds on the works of Alcock et al. (2012) and Cai et al. (2008). This reflects that the signalling hypothesis works while the maturity matching hypothesis does not work in a country with a bank-based system. Next, the study finds strong support for the negative impacts of SCON and banking sector size (BANK) on DMS based on the FE estimator. These results imply that firms are likely to borrow short-term debt when SCON and BANK increase. Further, regarding ownership structure, the study finds weak evidence to support associations between SO and MO and DMS. While SO positively influences debt maturity, MO negatively influences debt maturity. In contrast, the effects of FO and LO on DMS are found to be insignificant. However, FO has a moderate impact on the relationship between MO and debt maturity. Other external shareholders (the state and large shareholders) seem not to impact on the financing decisions relating to choosing debt maturity. Finally, the study finds a significantly negative relationship between debt maturity and firm financial performance (measured by Tobin's Q (TOQ), return on assets (ROA) and return on equity (ROE)).

1.8. Organization of the thesis

The remainder of this thesis is structured as follows. Chapter 2 provides an overview of Vietnam's capital market. It first describes the Vietnamese economy in relation to *Doi Moi* reform, GDP, trades and regulations. It then presents the historical and current background of the banking sector, stock market and bond market in Vietnam.

Chapter 3 explains the theories and empirical literature regarding DMS, financial market development, ownership structure and firm performance. It also provides the hypothesis development for the effects of debt maturity firm characteristics, BD, ownership structure and stock market development on debt maturity, as well as the effect of DMS on firm performance.

Chapter 4 discusses the data and methodology. The chapter explains how the data has been collected and constructs the variables and models. It also details the methods employed to examine the effects of firm factors, BD, ownership structure and financial market development on the term structure of debt, as well as the relationship between debt maturity and firm performance.

Chapter 5 presents and discusses the results of the study. It begins by presenting the descriptive statistics, which demonstrate that the findings can be generalized based on the sample. Then, the chapter provides the correlation analyses and variance inflation factor (VIF) tests to prevent collinearity issues. The chapter discusses the influence of firm factors, BD, ownership structure and financial market development on DMS. This is followed by a presentation of the effect of debt maturity on firm performance. The findings are also compared with the finding of previous studies.

Chapter 6 presents the conclusion of the study by suggesting the implications for Vietnamese firms and policymakers. The chapter also describes the limitations of the study.

CHAPTER 2: OVERVIEW OF THE RESEARCH CONTEXT

2.1. Introduction

The objective of this chapter is to provide a full picture of the economy and the financial markets of Vietnam. This helps in understanding their impact on corporate financial decisions. The chapter is organized as follows. It begins with an overview of the Vietnamese economy in Section 2.2 by describing and analyzing the economy regarding a remarkable strategy – the *Doi Moi* reforms – along with trades, laws, the regulatory framework, the privatization process and GDP. An overview of Vietnamese financial markets is given in Section 2.3. Specifically, the capital markets include the banking sector, bond market and stock market. Then, Section 2.4 provides a summary of this chapter.

2.2. Vietnam's economy

2.2.1. *Doi Moi* reforms

Before 1986, Vietnam had a centrally planned economy based on SOEs. Furthermore, the economy suffered from hyperinflation, food shortages and a fiscal crisis (Le, 2015; Tuan, 2009). The peak inflation rate was recorded at 700% and the economy needed help of USD 4 million per day from the Soviet Union (Baum, 2020). However, 1986 was one of the most important milestones for the impressive success of Vietnam's economy when the government introduced an economic reform campaign which opened the closed economy to global markets. The new strategy, called the *Doi Moi* reforms, was launched to develop the economy. The Vietnamese economy has moved from a highly centralized planned economy to a socialist market-oriented economy since 1986 (Nguyen et al., 2019). The purpose of the *Doi Moi* reforms was to improve firm performance and to integrate Vietnam's economy into the world. The Vietnamese economy has significantly developed within 35 years from one of the poorest to becoming an emerging market economy (Baum, 2020). For example, the poverty rate has dropped from over 60% in 1980 to below 5% in 2017 (Baum, 2020). The following briefly discusses some main focuses of the *Doi Moi* reforms.

Agriculture was the main sector of Vietnam's economy before 1986. In the 1980s, over two-thirds of the Vietnamese population worked in the agriculture sector (Baum, 2020). Hence, agriculture was the first focus of the *Doi Moi* reforms. For instance, agricultural collectives were removed while agricultural land was subdivided and allocated to small farmers with a lease contract of 20 years. Furthermore, farmers and industrial producers were permitted to gain profit from selling their agricultural goods by the removal of price controls. According to Baum (2020), Vietnam has become one of the largest rice exporters in the world due to the reform of international trade systems.

One of the main reform efforts was trade integration, which is a key driver of economic growth. The Vietnamese economy is now strongly connected with the global economy. Vietnam is a member of several global organizations such as the World Trade Organization (WTO), the Regional Comprehensive Economic Partnership (RCEP) and the Trans-Pacific Partnership (TPP). Even though the Vietnamese state has expressed its interest in becoming globally oriented by following global standards and practices, it still wants to maintain a socialist-oriented economy by keeping the dominant role of the state sector. For instance, while the state directly controls the economy through SOEs and SOBs, which play the leading roles, the state indirectly controls the economy through interventionist regulations (Tran-Thi & Vu-Thanh, 2020). For instance, the banking sector dominates the financial markets in Vietnam. In 2017, the four largest SOBs comprised almost 46% of total assets whereas the ten largest non-SOBs comprised 33% of total assets. Foreign-owned banks accounts for roughly 10% of total assets (Tran-Thi & Vu-Thanh, 2020).

Another key policy of the *Doi Moi* reforms was privatization of SOEs. The privatization process consists of three main phases: 1980–1986, 1986–2001 and from 2001 to the present. The purpose of privatization is to improve the management and operation of top SOEs and to raise funds for the national budget deficit. Furthermore, according to Allens and Linklaters (2018), the state aimed to equitize and divest its capital in over 500 SOEs by 2020. However, the state retains ownership in SOEs operating in core sectors (telecommunications,

transportation, electricity and oil, etc.). Investment opportunities have been opened up for private investors. In particular, foreign investors can easily access the market by investing in firms that have leading market positions and/or nationwide distribution.

The education and health sectors have been national priorities since 1986. For instance, 99% of children of primary school age attend school (Baum, 2020). The state aims to spend 20% of its budget expenditure each year on the education sector to improve the quality. Similarly, according to Baum (2020), the health sector has improved significantly as more than two-thirds of the population have access to essential health services. Furthermore, over 86% of Vietnamese people are covered by health insurance.

2.2.2. Trades, laws and regulations

The *Doi Moi* reforms have changed the regulatory environment significantly in order to achieve the goal of becoming a socialist market-oriented economy. In other words, the state has constantly revised the legal framework to provide better regulations for investors to invest and operate their businesses in Vietnam. For example, there have been at least three changes in defining SOEs since 1986 (Bui, 2018; Dang et al., 2020; Le, 2015). In 1995, SOEs were defined as economic organizations formed and managed by the state. The definition of SOEs was modified as enterprises of which the state owns a dominant share (more than 50%) for the period 2003–2013. From 2014 to the present, SOEs are only enterprises that are owned 100% by the state.

In 1987, the government introduced the Foreign Investment Law with many favourable conditions for foreign investors. Foreign investors could now get business registration for all sectors of the economy, including the banking sector (Schellhorn, 1992). Further, the government passed several laws from 1987 such as the Company Law (1990), State Enterprises Law (1995), State Bank Law (1997) and Enterprises Law (1999–2005) (Bui, 2018; Oh, 2000). From 2014 to 2019, the state passed almost 30 laws, decrees and circulars to enhance the investment environment as investors could base themselves on these guidelines

for better market access (Foreign Investment Agency of Vietnam & Deloitte, 2019).

In 2015, a major change in the cap on FO is that foreign investors can own up to 100% of the total shares of a public company (including a listed company) rather than the previous 49% cap (Allens & Linklaters, 2019, Dang et al., 2020). However, there are some conditional sectors where external investors (including foreign investors) are limited to 50% of total shares and/or require an approval investment from the state, such as import/export, banking, education, telecommunications and mining (Dang et al., 2020). Furthermore, in 2019, two circulars were passed in order to facilitate the privatization process and attract foreign investment. For example, Circular No. 03/2019/TT-NHNN permits foreign investors to use their foreign currencies to make deposits when they register for first-time sales of SOEs and divestments of the state (Nguyen, 2022c).

Regarding trade integration, Vietnam has a prestige location at the centre of the Asia–Pacific region. Hence, Vietnam quickly adapted and joined several trade agreements such as the Association of Southeast Asian Nations (ASEAN) (1995), the ASEAN free trade agreements (1995), bilateral trade agreements with the USA, Japan and the EU (2000 and later), the WTO (2007) and the European Union–Vietnam Free Trade Agreement (EVFTA) (2020). After joining global trade bodies such as the WTO, the regulations on trading activity have been broadened, especially for foreign investors, who were previously restricted in exporting, importing and distributing (Allens & Linklaters, 2019). In relation to the banking sector, the State Bank of Vietnam (SBV) plays an important role in speeding up the signing of many trade agreements through studying, reviewing, negotiating and approving them (The State Bank of Viet Nam, 2020). For example, to join the WTO, the SBV actively reviewed trade policies and improved legal frameworks regarding the banking sector to meet WTO requirements.

2.2.3. Privatization process

The privatization process is where SOEs sell their shares to employees and private investors to become joint-stock companies. The Vietnamese privatization

process, as part of deregulation and trade liberalization, is a key driver of the *Doi Moi* reforms. In the 1990s, privatization began and became popular in Asia (Nguyen, 2017). In Vietnam, the first privatization program was introduced in 1992 under Decision 202 of the prime minister. There were only 5 small and medium-sized SOEs privatized in the pilot stage (1992–1996), whereas 25 SOEs were privatized in the second stage (1996–1998) under Decree 28/1996/ND-CP. However, the process of privatization was inefficient. In 1998, the government launched the first comprehensive legal framework for privatization to increase the process of privatization, under Decree 44/1998/ND-CP. As a result, there were 758 SOEs privatized during the period 1998–2001. However, the government passed four more decrees to accelerate the privatization process and 3055 and 3875 firms were privatized by the end of 2005 and 2011, respectively. Over 11,300 SOEs were privatized from 12,000 SOEs in 1990s to 652 SOEs in 2015 (Le, 2019). Furthermore, 175 SOEs were privatized from 2016 to June 2020, reaching VND 207.1 trillion of state capital (General Statistics Office, 2020). Due to the COVID-19 pandemic, only 3 SOEs were privatized and 18 SOEs were divested in 2021, with a total value of VND 1.66 trillion (Nguyen, 2022c). This reflects that the economic environment was difficult. Further, the prime minister signed a decision in 2022 with the aim of enhancing the competitiveness and efficiency of SOEs so that the restructuring process of SOEs will be completed by 2025 (Nguyen, 2022c).

Due to the privatization process, there was a decrease in the performance of SOEs in areas such as the number of enterprises, the number of employees, capital, turnover, profit before tax and state budget contribution (Dang et al., 2020). In contrast, the performance of foreign firms and domestic private firms increased gradually. Although the number of SOEs has decreased, the size of SOEs is still large. According to Dang et al. (2020), SOEs contributed 20% to Vietnamese GDP even though the number of SOEs accounted for 0.4% of the total number of companies in Vietnam in 2017. The possible explanation is that SOEs still operate in the main sectors of the economy such as petroleum, electricity, telecommunications, finance, minerals and food. From the 1980s to

2017, the privatized SOEs were mainly in commercial sectors including consumer staples (45%), transportation (21%) and energy (16%) (Dang et al., 2020).

2.2.4. Gross domestic product

The growth rate of GDP is used to measure economic growth. In the mid-1980s, Vietnam was one of the poorest countries. Due to implementing the *Doi Moi* reforms, the performance of Vietnam's economy has developed impressively. In particular, while real GDP per capita tripled during the period 1990–2015, GDP per capita rose ten times (Baum, 2020). According to Le (2019), the annual growth rate in 2015 was 6.7% almost double the annual growth rate across the world (3.4%). The average rate of Vietnam's economic growth was 6.3% annually from 2010 to 2019 (Asian Development Bank, 2022b). Vietnam had the highest economic growth rate in the ASEAN sub-region for the period 2016–2020. Specifically, on average Vietnam's GDP growth rate was 6.8%, followed by the Philippines (6.6%), Indonesia (5.07%), Malaysia (4.8%), Thailand (3.4%) and Singapore (2.4%) (General Statistics Office, 2020). Since 2020 – the beginning of the COVID-19 pandemic years – Vietnam is one of the rare nations that have had two consecutive years of growth even though the growth rate in 2021 (2.58%) was recorded to be lower than in 2020 (2.9%) (PwC Vietnam, 2022) (see Figure 2.1). Vietnam managed the COVID-19 impacts well in 2020, but the significant increase in COVID-19 cases from the Delta variant negatively impacted the economy in 2021. However, Vietnam is predicted to be the fastest growing economy in ASEAN, with GDP growth at 6.6% in 2022, followed by the Philippines (6.3%) and Malaysia (6%) (PwC Vietnam, 2022). According to the Asian Development Bank (2022b), it is possible that Vietnam is rebounding strongly due to high COVID-19 vaccination coverage, flexible pandemic containment strategy and expanding trade. Moreover, Vietnam is on the list of the fastest growing economies in Asia identified by the IMF in 2020 (Anh & Gan, 2021).



Figure 2.1: The GDP growth of Vietnam from 2009 to 2021

Source: Ministry of Finance and Vietnam Bond Market Association (2020) and (Le, 2015)

The Vietnamese economic structure has changed significantly in recent years. Vietnam was well-known as an agricultural country. In the 1980s, over two-thirds of the Vietnamese population worked in the agriculture sector (Baum, 2020). However, Vietnam has become an emerging manufacturing hub in the region since 2019. Vietnam has benefited from manufacturing relocations from China or other Southeast Asian countries due to its attractive investment environment and strong economic fundamentals. In particular, although Vietnam is well-known for textile and garment manufacturing, it has recently become a leading hub for electronics manufacturing in Southeast Asia (PwC Vietnam, 2022). Figure 2.2 shows that the construction sector is the largest contributor to the economic growth rate, contributing 55.6% of GDP in 2021. While the service sector accounts for roughly 28.7% of GDP, the agriculture, forestry and fishery sector accounts for 15.7% of GDP.

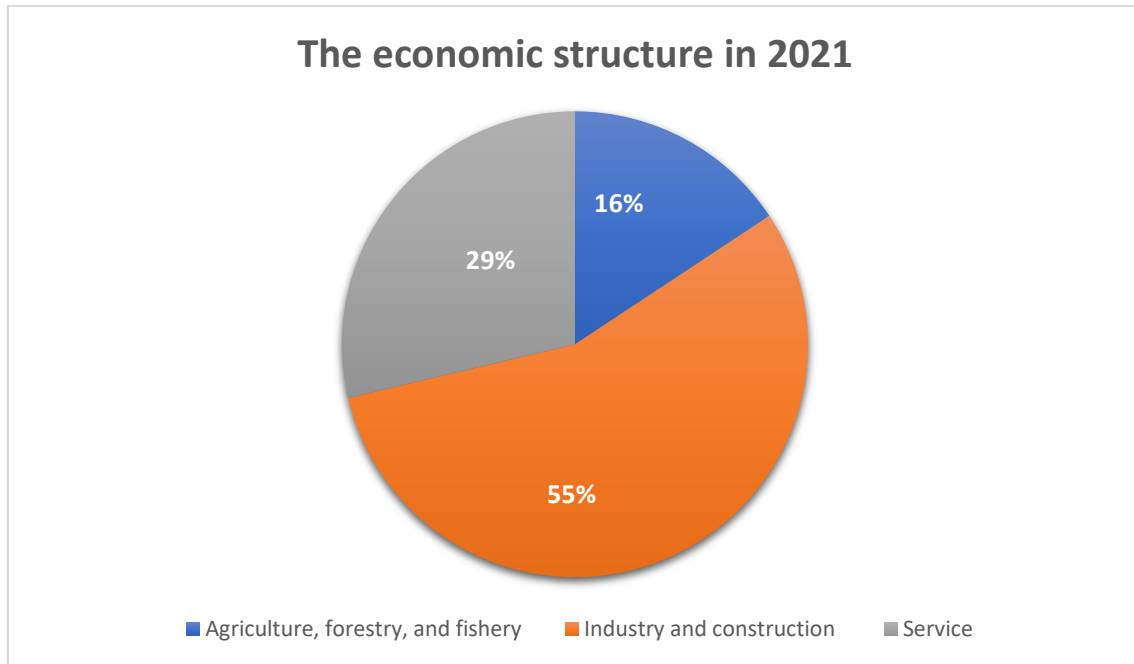


Figure 2.2: The Vietnamese economic structure in 2021

Source: General Statistics Office (2021)

2.2.5. Foreign direct investment

Foreign direct investment (FDI) has been one of the key drivers of Vietnam's economic growth since 1987. In general, Vietnam is viewed as a developing country that has a high growth rate and a stable exchange rate (Huong et al., 2020). Furthermore, with increasing trade openness Vietnam has become an attractive country for foreign investors. According to the General Statistics Office (2020), the economic openness of Vietnam ranks it in second place in the ASEAN region after Singapore. After joining the largest commercial organization (the WTO) in 2006, Vietnam received a huge amount of foreign investment capital that led to a substantial increase in the value of Vietnamese stock markets in 2007. In particular, foreign portfolio investment inflows increased significantly from USD 0.9 billion in 2005 to USD 1.9 billion in 2006 (Nguyen & Ryu, 2022). Further, there is no doubt that foreign investment has significantly contributed to the development of the Vietnamese economy, especially after 2015 when the relaxation of FO was implemented. The total FDI was USD 170.4 billion between 2016 and 2020 (General Statistics Office, 2020). According to PwC Vietnam

(2022), foreign investors invested USD 31.15 billion by the end of 2021, up 9.2% annually. Recently, the FDI sector accounted for roughly 20% of GDP (Huong et al., 2020). According to the Ministry of Planning and Investment and Foreign Investment Agency (2021) and Samuel (2022), the manufacturing and processing sector received most of the FDI, accounting for 58.2% of the total registered FDI capital in 2021. Figure 2.3 presents details of the FDI capital allocated by sector in 2021.

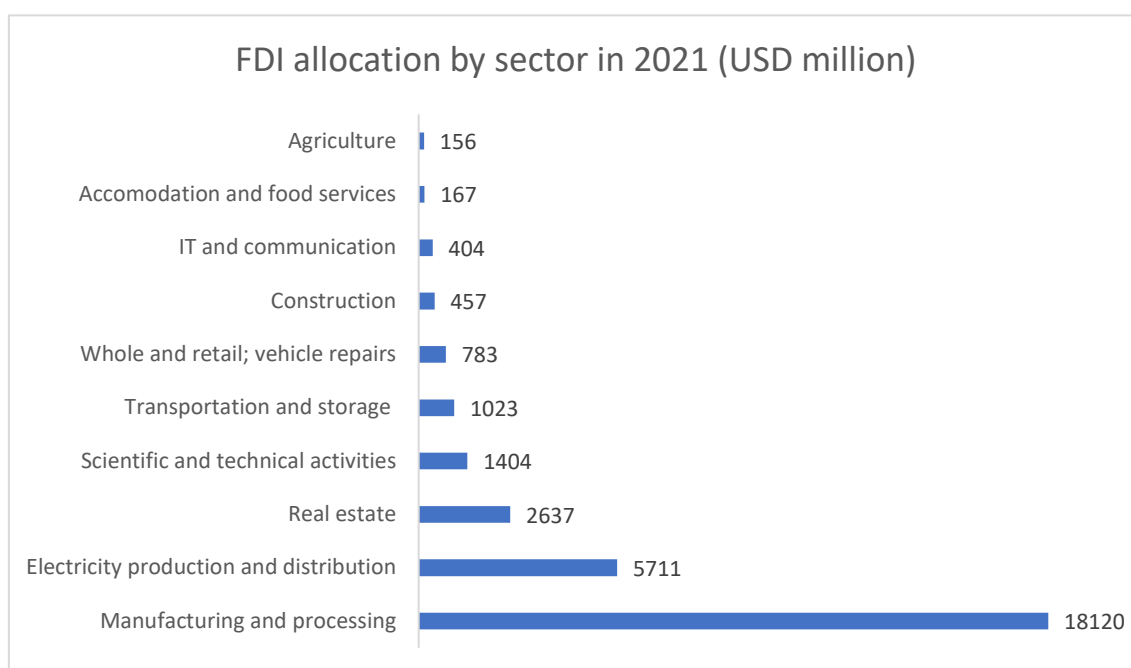


Figure 2.3: FDI allocation by sector in 2021

Source: Ministry of Planning and Investment and Foreign Investment Agency (2021)

According to Ngo et al. (2017), 70% of FDI funds are from Asian countries such as China, Japan, Korea and Singapore. On average, FDI sectors contributed 66% of total merchandise exports during the period 2011–2016 (Huong et al., 2020). According to Nguyen et al. (2020a), foreign investment flows into the Vietnamese stock market have increased substantially. For example, the number of stock accounts owned by foreign individuals and institutions increased to over 38,000 (35% y-o-y) as of September 2021 (The Ministry of Finance, 2021).

Recently, the COVID-19 pandemic has impacted different industries in different ways. For example, the annual growth rate of tourism dropped sharply by over

60% in 2020 and 2021 (PwC Vietnam, 2022). Similarly, the annual growth rate of domestic hospitality and food services reduced by 14% and 23% in 2020 and 2021, respectively (PwC Vietnam, 2022). In contrast, the annual growth rate of export value increased by 7% and 19% in 2020 and 2021, respectively. Hence, due to its export-based economy, Vietnam could maintain a positive GDP growth rate during the pandemic, while countries that have strong tourism sectors have suffered substantially. For example, in 2020 the GDP growth rate of Thailand was -6% while in the Philippines it was -9.6% (PwC Vietnam, 2022).

2.3. Development of Vietnam's financial markets

The constant development of financial markets is one of the important factors in economic success. Firms can easily access more investment if the financial markets develop substantially. Long-term investment needs long-term funds, which firms can raise from: (1) the stock market, by issuing new shares; (2) banks, by borrowing long-term loans; or (3) the bond market, by issuing corporate bonds. The financial markets in Vietnam comprise the banking system, stock market and bond market.

2.3.1. Banking sector

2.3.1.1. *Overview of banking system*

In 1951, the Vietnam National Bank (renamed the State Bank of Vietnam [SBV] in 1961) was established, which greatly enhanced Vietnam's monetary and banking systems. The SBV implemented a credit expansion strategy to boost the economy, focusing on the development of collective enterprises, small and handicraft industrial production and SOEs (State Bank of Viet Nam, 2016). The first two SOBs were the Vietnam Construction Bank and Vietnam Bank for Foreign Trade. Further, the SBV built cooperative connections with 265 international banks from 41 countries by the end of 1964. During Vietnam's war with the USA, the SBV had some flexible strategies to adapt to wartime conditions such as managing state budget funds, mobilizing foreign currency revenues and making smooth international payments. After the end of the war in 1975, the

banking industry quickly rebuilt its system and unified the national currency (State Bank of Viet Nam, 2016).

In the period 1975–1985, the SBV began to provide various types of lending to support the economy, to raise living standards and to stabilise prices. Furthermore, the SBV issued some policies relating to monetary, credit and foreign exchange policy. For example, an important currency exchange policy relating to circulation and distribution was issued in 1985. The purpose was to stabilise the VND purchasing power. The SBV also focused on building strong relationships and international cooperation based on global support for Vietnam's recovery. The SBV became a member of the International Investment Bank and the Bank of International Economic Cooperation in 1977 (State Bank of Viet Nam, 2016).

From 1986, Vietnam aimed to transform from a centrally planned economy to a market economy. Thus, the banking industry underwent significant reconstruction. The Vietnamese banking sector shifted from a one-tier system to a two-tier system from the mid-1980s (Nguyen & Ryu, 2022). In the one-tier system, the SBV had acted as both the central bank and the commercial bank. Banks operated as branches or divisions of the SBV and their credit supply plans followed government plans instead of following the demand of economic activities. Thus, state-owned firms held most of the bank loans (Vo, 2016a). With the two-tier system, the SBV concentrates on its role as the central bank such as managing currency and banking operations, managing monetary policies, setting base interest rates, and issuing and revoking licences to credit institutions. The SBV supervises the operation of banks and non-bank financial institutions, except insurance companies, through both on-site and off-site inspection. The SBV sets the minimum capital requirements, as well as efficient rules on lending (Oh, 2000).

The new system consists of one central bank and four commercial SOBs, namely, the Agricultural Development Bank, the Bank for Foreign Trade of Vietnam, the Bank for Investment and Construction of Vietnam and the Industrial and Commercial Bank of Vietnam (State Bank of Viet Nam, 2016). These four banks

have been the largest commercial banks in term of chartered capital since 1988 (Le, 2015; Le et al., 2022). According to Le (2015), 50% of the total loans and deposits in the market are provided by SOBs. Further, due to this transformation, non-SOEs can access bank credit as the operation of SOBs was more independent. This helped the development of the private sector as well as the economy.

The liberalization of the banking system started in 1990. For instance, two more SOBs were established and 54 joint-stock commercial banks (JSCBs) were allowed to progressively operate from 1990 (Oh, 2000). Foreign banks were also permitted to open branches or to establish joint ventures with local banks. The SOBs were restructured in 2005 in order to be equitized in 2010. Therefore, the dominance of the SOBs decreased as the number of non-SOBs increased. In other words, the Vietnamese banking system has become more competitive. For instance, the number of JSCBs increased sharply to 41 banks in 1993 and reached a peak of 56 banks before the financial crisis during the period 1997–1998 (Vo, 2016a). Recently, the number of non-SOBs gradually reduced to 48 including JSCBs, joint-venture commercial banks and branches of foreign banks in 2019 (State Bank of Vietnam, 2019). Roughly 75% of the banking sector is small and medium sized banks, whose charter capital is USD 150–250 million (Le, 2015). Although the Vietnamese banking sector has developed significantly, the capital size of Vietnamese banks is smaller than for other banks in regional countries. According to Le (2015), the total charter capital of the four largest Vietnamese banks (the SOBs) was approximately USD 3.2 billion, which equals one medium-sized bank in the region.

Further, the Vietnamese banking sector has diversified and grown not only in terms of size and type, but also in terms of ownership structure. After signing the Vietnam–USA Bilateral Trade Agreement in 2001 and joining the WTO in 2007, Vietnam has continued to open its financial markets to foreign institutions. For instance, the Hongkong and Shanghai Banking Corporation was the first 100% foreign-owned bank established in Vietnam in 2009. In 2014, the government issued a new decree regarding the FO limitation in domestic banks. A foreign

strategic investor could acquire up to 20% of shares instead of 15% as under the old decree. The new decree maintained the limit of 30% of total FO in domestic commercial banks. However, the decree introduced a new exception that with approval from the prime minister, foreign strategic investors could acquire more than 30% of shares of a domestic commercial bank which underwent restructuring of its bad debts. To sum up, commercial banks in Vietnam can be divided into three groups based on their ownership: state, domestic private and foreign.

2.3.1.2. Market share

In general, the banking system is dominated by the SOBs (Rosengard & Du, 2009; Vo, 2018a). According to Rosengard and Du (2009), in 2005 the five largest SOBs accounted for almost 71% of the total assets of the banking sector, whereas 37 JSCBs accounted for 17% of the banking sector's assets. Although the market share of bank assets of the SOBs has recently decreased gradually, it is still higher than that of the others. Figure 2.4 shows that in 2017 four SOBs and ten non-SOBs held 45.7% and 33% of total assets in the Vietnamese banking system, respectively. Foreign-owned banks made up only 9.5% of total assets (Tran-Thi & Vu-Thanh, 2020).

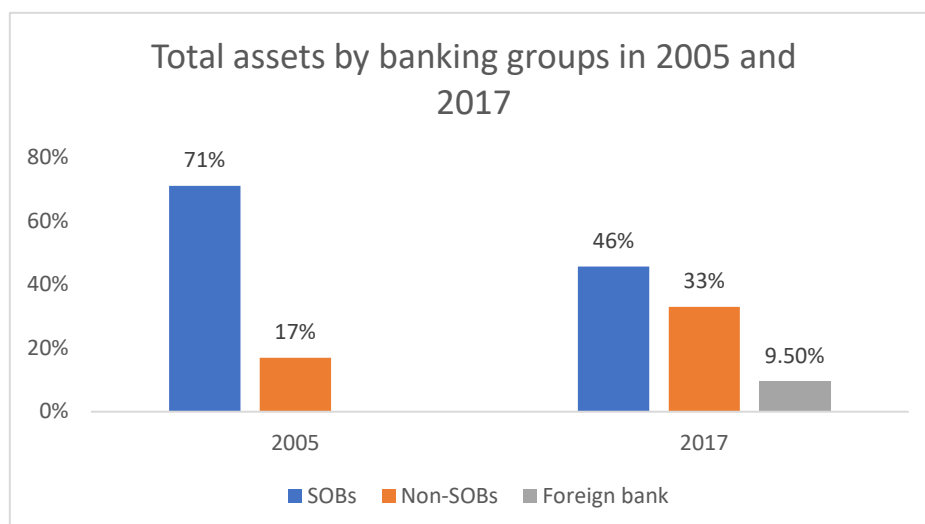


Figure 2.4: Market shares of banking sector in terms of total assets

Source: Rosengard and Du (2009) and Tran-Thi and Vu-Thanh (2020)

In terms of lending, in 2017 four SOBs accounted for over 48% of the credit market share, whereas the ten largest private banks accounted for 31% of the credit market share (Tran-Thi & Vu-Thanh, 2020). In term of deposits, in 2013 SOBs accounted for roughly 50% of the total deposits of the banking system, while JSCBs made up 41.2% of the total deposits (Le, 2015). In 2020, the market shares of SOBs in term of lending and deposit slightly reduced, while the market shares of non-SOBs increased (see Figure 2.5).

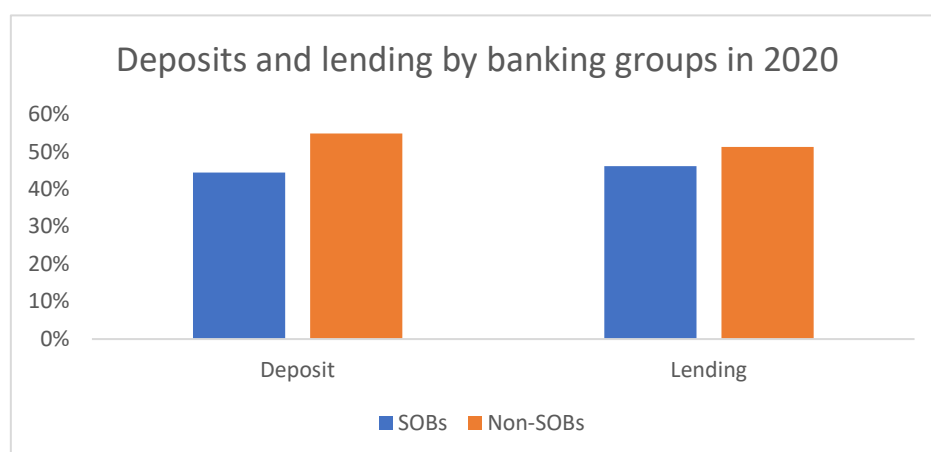


Figure 2.5: Deposits and lending by banking groups in 2020

Source: The State Bank of Viet Nam (2020)

Overall, the banking system plays an important role in the Vietnamese economy. The Vietnamese financial system mainly depends on banks, especially the four largest SOBs (Tran-Thi & Vu-Thanh, 2020). Likewise, Vietnamese firms heavily rely on BD to finance their investments (Phan, 2018; Vo, 2019b). However, the banking sector still needs to tackle some problems in order to develop strongly and sustainably. For example, SOEs hold up to one-third of the total bank credit even though SOBs account for around 1% of total registered firms in the market (Le, 2015). Le (2015) also noted that SOEs have a high percentage of non-performing loans and have higher leverage than non-SOEs and foreign firms.

2.3.2. Stock market

2.3.2.1. *Overview of stock market*

In 1996, the Vietnamese government established the State Securities Commission and in 1998 launched the legal foundation to govern the stock exchanges. This implies that a new channel of fundraising was created for development investment. In 2000, the Ho Chi Minh Securities Trading Center was established in Ho Chi Minh City as the first stock exchange in Vietnam with four listed firms and four securities firms. In 2005, the Vietnam Securities Depository (VSD) and the Hanoi Stock Exchange (HNX) were established. In 2007, the Ho Chi Minh Securities Trading Center was converted into the HOSE. Furthermore, the Ho Chi Minh Index was renamed the VN-Index. The HNX is smaller and has less restrictive conditions than the HOSE for firms to be listed. For example, firms with a minimum charter capital of VND 120 billion can be listed on the HOSE, whereas firms need a minimum charter capital of VND 30 billion to be listed on the HNX (Anh & Gan, 2021). Despite higher requirements, the HOSE is more liquid than the HNX (Allens & Linklaters, 2019). The typical types of securities traded on the two stock exchanges are ordinary shares, bonds, fund certificates and derivatives.

The Vietnamese stock market has had many changes and volatilities since it was established in 2000. The VN-Index grew to 571.04 points in June 2001 and fell sharply to 203.12 points, 180.73 points and 139.64 points in October 2001, March 2002 and April 2003, respectively (Nguyen, 2011). In terms of market capitalization, the market value rose sharply from USD 27.95 million at the first trading session in 2000 to USD 398.96 million in 2005 (Le, 2015). Although the market value increased roughly 14 times in five years, it accounted for just 1.11% of GDP in 2005. In March 2007, the VN-Index reached its peak of 1170.67 points due to large and new SOEs being listed on HOSE such as Vinamilk, Vietcombank and Bao Viet Insurance. In addition, the stock market capitalization to GDP was 43% in 2007 (Le, 2015).

However, the Vietnamese financial system was impacted by global shocks as Vietnam was building strong linkages with the global market due to the globalization process. Furthermore, the prime minister relaxed both fiscal and monetary policy with the aim of boosting GDP growth during the mid-2000s. As a result, in 2008 inflation went up to 28% together with increases in bubbles of stock and real estate as the rapid credit growth occurred particularly from private banks (Tran-Thi & Vu-Thanh, 2020). Due to the global financial crisis in 2008 and the local bubble of the stock market, the stock market capitalization to GDP reduced to 15% in 2008 before rising back to 38% in 2009 (Le, 2015).

The active participation of foreign investors is an important factor in the development of stock markets, especially in developing countries. Thus, Vietnam has issued many policies focusing on attracting more investment from foreign investors. For example, according to Vietnamese law in 2009, foreign organizations and individuals could only hold up to 49% of total shares in listed firms. In 2015, the government decided to allow foreign investors to own up to 100% of total shares in a Vietnamese listed firm (Allens & Linklaters, 2019). Furthermore, the government has kept improving the legal framework, offering new securities products as well as enhancing the market environment.

The market value of the stock market increased significantly from 32.4% of GDP in 2015 to 84.1% of GDP in 2020 (Ministry of Finance & Vietnam Bond Market Association, 2020) (see Figure 2.6). Overall, the stock market has developed significantly since 2015. In 2017, Vietnam was awarded the top performing stock market in Asia (Quan, 2019).

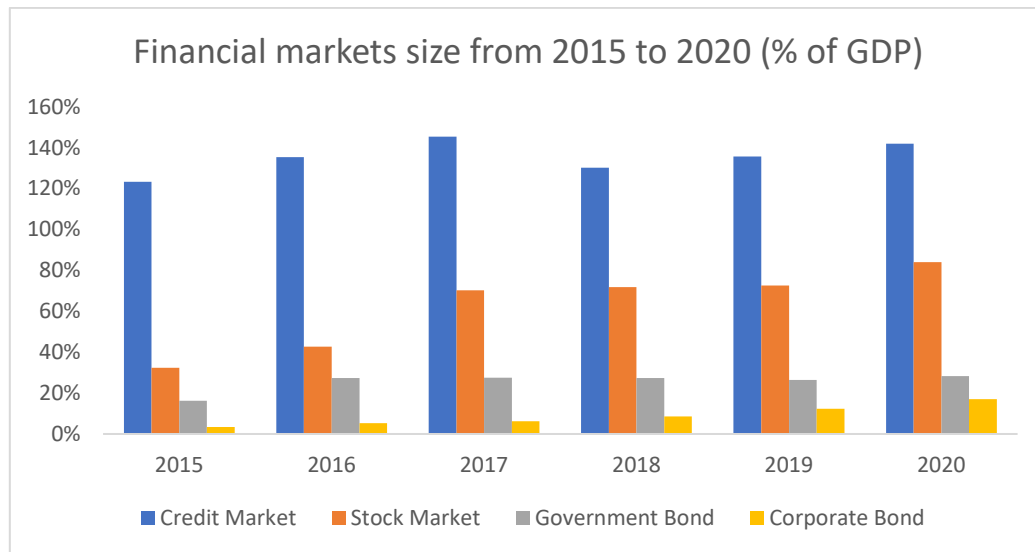


Figure 2.6: The Vietnamese financial markets' size during the period 2015–2020

Source: Ministry of Finance and Vietnam Bond Market Association (2020)

However, the COVID-19 pandemic has led to a global economic crisis since 2019. The Vietnamese stock markets are also affected negatively as during the global crisis in 2008. For instance, when the government imposed a nationwide lockdown from 1 April to 15 April 2020 to control the transmission of COVID-19 virus in the community, the VN-Index dropped by 28% on 30 March 2020 compared to 31 December 2019 (equivalent to a loss of USD 37.4 billion or 15% of GDP in 2019) (Anh & Gan, 2021). After the nationwide lockdown, the stock markets showed signs of recovery after the government announced that the COVID-19 virus outbreak was well controlled. The performance of the Vietnamese stock markets was viewed as the best in the world and in the Asian region in April and May 2020, respectively (Anh & Gan, 2021).

Further, the development of the stock markets plays an important role in facilitating the Vietnamese economy. However, the Vietnamese stock markets are still in an early stage of development (Vo, 2017a). Most investors in the stock market are individual investors (including domestic and foreign investors), who normally invest in short-medium terms (Phan, 2018). For instance, the number of domestic individual investors was 2,725,087, accounting for 98.6% of the total of investors by the end of August 2021 (State Securities Commission of Viet Nam,

2022). According to Dang et al. (2020), many large firms (including SOEs) are suggested to raise funds from global platform. However, they need to increase their standards of reporting and disclosure to meet the requirements of large and sophisticated institutional investors on foreign stock markets. Also, the stock markets have not yet developed sufficiently to support the funding requirements of private firms, especially with high growth opportunity (Dang et al., 2020). In comparison with other countries in the region, Figure 2.7 shows the stock market capitalization to GDP of Vietnam in 2020 was 54.2%, which is lower than in China (83.2%), Thailand (108.7%), Malaysia (129.5%) and Singapore (189%) (World Bank, 2022). This supports the argument of Dang et al. (2020) that the Vietnamese stock markets do not have sufficient depth to provide a ready exit plan for SOEs.

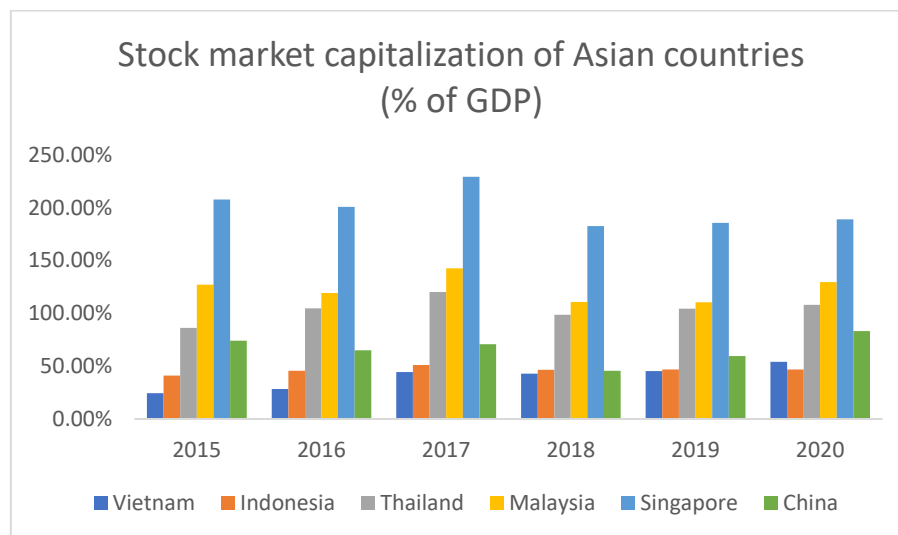


Figure 2.7: Stock market capitalization to GDP of Asian countries for the period 2015–2020

Source: World Bank (2022)

2.3.2.2. Number of listed firms

Figure 2.8 shows that the number of listed firms on the stock market increased slowly from 4 listed firms in 2000 to 41 listed firms in 2005. This implies that in the beginning years of the stock market, the stock market developed slowly. The situation has changed quickly since 2006. According to Le (2015), the number of listed firms on both the HOSE and HNX increased sharply to 193 firms in 2006.

There were several factors that boosted the Vietnamese stock market in 2006 such as increasing investors' expectation (the average price to earnings ratio [P/E] of Vietnamese firms is lower than in other countries in the region), high economic growth rate (8.4% in 2005), allowing foreign investors to own up to 49% of a public firm's total shares and encouraging the privatization process by the state (Prasso, 2006). The growth in the number of listed firms continued to rise significantly from 193 firms in 2006 to 645 firms in 2010. Then it increased gradually to 749 in 2021 (State Securities Commission of Viet Nam, 2022).

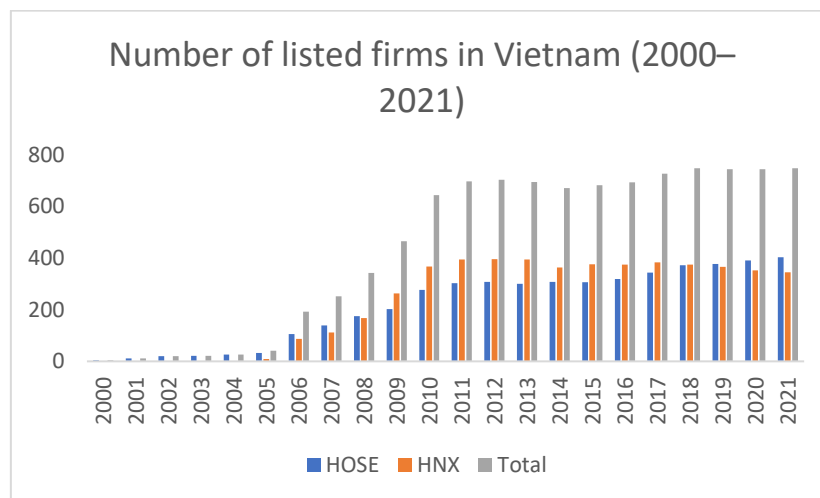


Figure 2.8: Number of listed firms in Vietnam over the period 2000–2021

Source: Le (2015) and State Securities Commission of Viet Nam (2022)

2.3.2.3. HOSE Index structure

The HOSE Index is a market capitalization weighted index series consisting of the public companies listed on the HOSE. The HOSE Index series includes VNAllshare, VN30, VNMidcap, VN100 and VNSmallcap, which are represented for all listed firms, the 30 largest firms, 70 medium firms, the 100 largest and medium firms (VN30 and VNMidcap) and the rest of the small firms listed on the HOSE, respectively. Table 2.1 shows that the total market capitalization of the VN30 accounts for over 87% of the total market capitalization of the HOSE, whereas the VNMidcap and VNSmallcap account for 13%. The HOSE is the largest stock exchange in Vietnam and the HOSE Index is the main element of

the VN-Index (Hochiminh Stock Exchange, 2020; Truong & Friday, 2021). Hence, this implies that the Vietnamese stock market is highly concentrated.

In particular, the VN30 represents a market capitalization weighted index of the 30 listed firms with the highest market capitalization and liquidity on the HOSE. The VN30 was constructed in 2012 and is managed by the HOSE. The VN30 is reviewed twice per year by a group of independent financial experts formed by the HOSE, namely, the Index Committee. The selection of the VN30 is based on three main criteria which are market capitalization, liquidity and free-float ratio. In the beginning years, the VN30 made up 80% of the total market capitalization and 60% of the market value volume (Dao, 2014; Thanh Nien News, 2012). However, the ratio of market capitalization of the VN30 to total market capitalization dropped to 65% in 2021 (SSI Securities Corporation, 2022). The correlation of VN Index and VN30 was higher than 95% in 2020 (Hochiminh Stock Exchange, 2020).

Table 2.1: HOSE Index in Vietnam as at 31 January 2020.

	VNAllshare	VN30	VNMidcap	VN100	VNSmallcap
Number of stocks	240	30	70	100	140
Total market capitalization (VND billion)	2,916,012	2,554,728	281,482	2,836,210	79,803

Source: Hochiminh Stock Exchange (2020)

2.3.3. Bond market

2.3.3.1. Overview of bond market

The Vietnamese bond market was formed in the mid-1990s, but it has started to develop substantially in both size and depth since 2000. For instance, the bond market's size was just 2.8% of GDP in 2001 (Ministry of Finance & Vietnam Bond Market Association, 2020). Then, the bond market's size increased strongly from 20% of GDP in 2012 to 39% of GDP in 2018 and to almost 50% of GDP in 2020 (Quan, 2019; Vietcombank Securities, 2021). The bond market is expected to

increase its size to 60% of GDP by 2030 (Quan, 2019). The increasing of the bond market's size over the past two decades reflects that the bond market has become an efficient channel for firms and the state to raise funds. Furthermore, bonds have become an increasingly attractive product in the Vietnamese financial market. They have also contributed to developing the economy as a tool for the state to conduct fiscal and monetary policy.

Figure 2.9 shows the trends in the issuance of three types of government bonds and corporate bonds from 2015 to 2020. The government bond market size is 28.2% of GDP, followed by the government-guaranteed bonds (2.3% of GDP) and the municipal bonds (0.2% of GDP) in 2020 (Ministry of Finance & Vietnam Bond Market Association, 2020). The corporate bond market size was 17.1% of GDP in 2020. Although the government bonds dominate the bond market, corporate bonds have increased strongly since 2015 and are predicted to become an important capital supply channel for firms as well as reducing lending pressure from banks. For example, in 2020 the amount of government bonds newly issued was roughly VND 300 billion while the amount of corporate bonds issued was VND 437 billion (Vietcombank Securities, 2021).

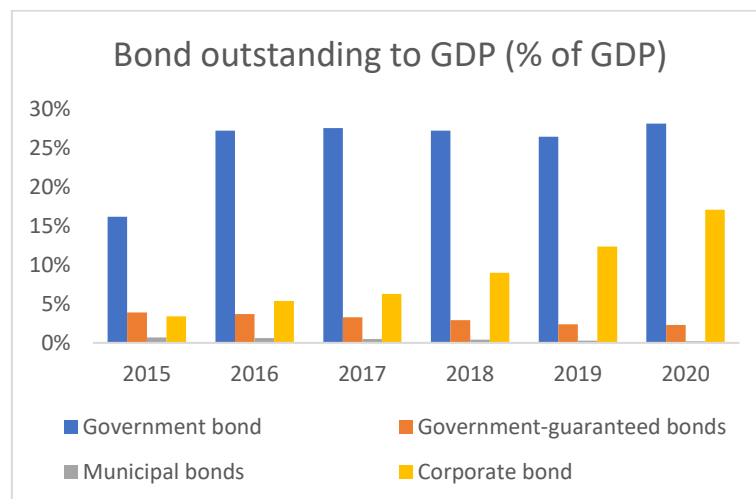


Figure 2.9: Government bonds/GDP and corporate bonds/GDP (2015–2020)

Source: Ministry of Finance and Vietnam Bond Market Association (2020)

2.3.3.2. Government bond market

There are three kinds of government bonds: government bonds, government-guaranteed bonds and municipal bonds. While a government bond is issued by the government to support government spending and invest in public projects, a municipal bond is issued by local governments to finance local programs and projects. In general, bonds issued by the State Treasury, Vietnam Social Policy Bank (VSPB), Vietnam Development Bank (VDB) or SOEs with a guarantee from the Vietnamese government are viewed as government bonds (Ministry of Finance & Vietnam Bond Market Association, 2020; Le, 2015). Government bonds are normally viewed as long-term bonds as they are used to raise capital for long-term public projects. According to the Ministry of Finance & Vietnam Bond Market Association (2020), the average tenure of government bonds was 13.9 years in 2020. The most popular tenure of government bonds was 10 years in 2020, accounting for 41% of total issued government bonds (see Figure 2.10). Government bonds are generally issued through auctions on the HNX.

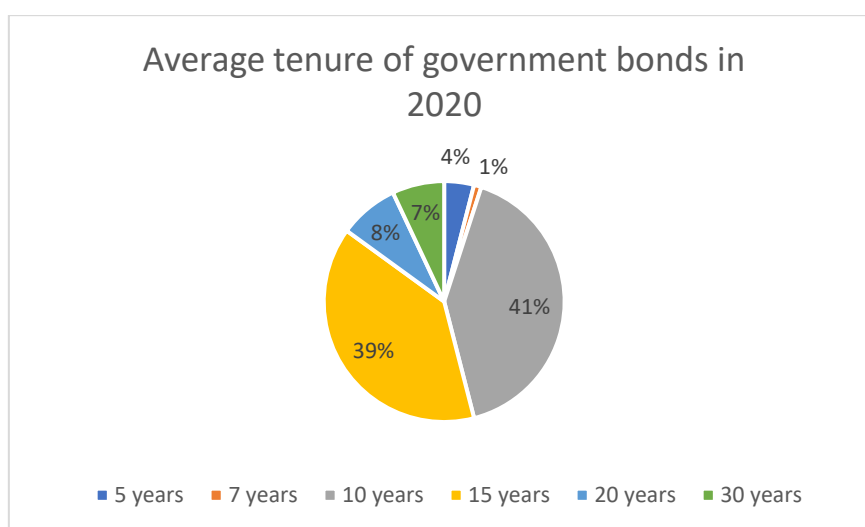


Figure 2.10: Average tenure of government bonds in 2020

Source: Ministry of Finance and Vietnam Bond Market Association (2020)

The issuing interest rates of government bonds dropped in all maturity spectrums from 0.78% to 1.45% in 2020 (Ministry of Finance & Vietnam Bond Market Association, 2020). There are two main reasons to explain the decrease in issuing interest rates. First, due to the COVID-19 pandemic the credit growth of

banks was low. The liquidity of the whole banking sector was high in 2020, which led to a rise in demand to invest in risk-free assets – government bonds. Second, the market's confidence in the government's orientation and management was built strongly as Vietnam's growth rate was positive and higher than in other countries in the region in 2020. Also, the macro-economy (such as inflation and exchange rates) was stable. Further, commercial banks are normally the main investors in government bonds. According to the Ministry of Finance and Vietnam Bond Market Association (2020), they held 45.2% of government bonds outstanding in 2020. The remaining government bonds outstanding were held by non-bank institutions such as insurance companies, investment funds and social security funds.

Regarding government-guaranteed bonds, the prime minister approved two policy banks (the VDB and VSPB) to issue bonds with a total value of VND 26,275 billion in 2020 through auctions on the HNX (Ministry of Finance & Vietnam Bond Market Association, 2020). The average tenures in 2020 of VDB's bonds and VSPB's bonds were 12.87 years and 12.71 years, respectively. Like government bond yields, government-guaranteed bond yields decreased in all maturity spectrums. For instance, the issuing interest rate of VDB's 10-year bonds dropped by 1.38–1.5% while the issuing interest rate of VSPB's 10-year bonds dropped by 1.65%. Furthermore, Ho Chi Minh City was the only local government that issued municipal bonds to fund local budget expenditure in 2020. The total issuances were VND 2000 billion with an average issuing interest rate of 3.71% per annum (Ministry of Finance & Vietnam Bond Market Association, 2020). The majority of municipal bonds were 30-year bonds, accounting for 80% of total issued bonds.

Overall, the development of the government bond market should be a priority even though government bonds have had the largest share of the total bond market (Quan, 2019). This will help to develop the corporate bond market. It also reflects the strong impact of the state on the development of the financial markets.

2.3.3.3. Corporate bond market

Corporate bonds are issued by private enterprises to raise medium and/or long-term funds for expanding their production and business. Corporate bonds help firms to reduce their dependence on bank loans. While corporate bonds are registered and deposited at the VSD, they are listed and traded on two stock exchanges: the HNX and HOSE. The corporate bond market size amounted to 17% of GDP, exceeding the government's goal – 7% of GDP in 2020 (Vietcombank Securities, 2021). The legal framework for issuing corporate bonds was completed in 2020 so that the publicity and transparency in raising capital from the bond market could be improved. A significant rise in the amount of corporate bonds in 2020 could be due to the new decree with stricter conditions that took effect from September 2020. Hence, firms preferred to issue bonds before the decree was implemented. The corporate bond market size of Vietnam is still very small compared to other countries in the region such as Thailand (20% of GDP), Indonesia (20% of GDP) and China (30% of GDP) (Vietcombank Securities, 2021).

Corporate bonds are issued under private placement or public offering. The Ministry of Finance and Vietnam Bond Market Association (2020) reported that corporate bonds were mainly issued under private placements, accounting for 93.5% of the issued volume. The majority of privately placed corporate bonds were issued with collateral, accounting for 54.7%. No bonds with warrants were issued in 2020. Moreover, the average tenure of corporate bonds issued under private placements increased from 4.06 years in 2019 to 4.21 years in 2020. The average tenure of corporate bonds issued to the public was over 5 years. The average tenure of corporate bonds is generally lower than that of government bonds.

Real estate companies and banks are the two major corporate bond issuers, accounting for over 60% of total corporate bonds (Ministry of Finance & Vietnam Bond Market Association, 2020; Quan, 2019; Vietcombank Securities, 2021) (see Figure 2.11). Real estate companies prefer issuing bonds as they are highly concentrated and do not depend on the process of projects. To meet the

minimum capital safety and capital adequacy ratio requirements, banks also need to raise capital from the corporate bond market.

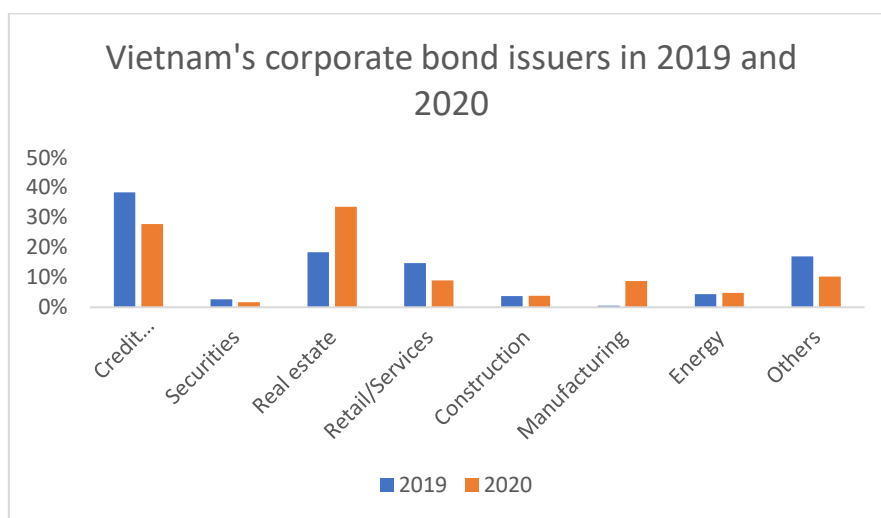


Figure 2.11: Vietnam's corporate bond issuers in 2019 and 2020

Source: Ministry of Finance and Vietnam Bond Market Association (2020)

The top two types of corporate bond holders are securities companies and banks. However, securities companies act as distribution agents who redistribute bonds to other investors. According to Quan (2019), securities companies and banks hold roughly 41% and 36% of the total Vietnamese corporate bonds, respectively. Individual investors have emerged as important bond investors, accounting for 13% of the total corporate bond market (Ministry of Finance & Vietnam Bond Market Association, 2020).

The substantial increase in the issuing of corporate bonds in recent years could be because investors have been seeking alternative investments with high return. Corporate bonds seem to provide better yields than traditional investments such as bank deposits or government bonds, especially in the context of downward trends in deposit rates and government bond interest rates. For example, according to the Ministry of Finance and Vietnam Bond Market Association (2020), the 12-month deposit interest rates went down from 7.2% in 2019 to 6% in 2020. The average issuing interest rate of government bonds decreased from 4.51% per annum in 2019 to 2.86% per annum in 2020. In contrast, the average

issuing yield of corporate bond under private placement was 9.3% per annum in 2020. Overall, it is important to develop the corporate bond market, which raises medium- and long-term capital for firms and reduces firms' reliance on BD.

2.4. Summary

This chapter has described the background of Vietnam's economy and its financial markets. As a result of economic reform (the *Doi Moi* reforms), Vietnam's economy has grown strongly since 1986. Vietnam had the highest GDP in the ASEAN sub-region over the period 2016–2020 (General Statistics Office, 2020). The privatization process has been pointed out as the key driver of the *Doi Moi* reforms, transforming Vietnam from a highly centralized planned economy to a socialist market-oriented economy. Even though the state has sold a large proportion of its shares to public investors since 1992, the state maintains its controlling position in both the corporate sector and financial markets. In particular, SOBs' market share in terms of bank credit and deposits still accounts for more than 45% (State Bank of Viet Nam, 2020). SOEs are reported to have greater ability to access BD (Le, 2015) and to choose long-term maturity of debt (Ruan et al., 2014).

Regarding debt capital, BD is viewed as the main source for Vietnamese firms to raise capital (Vo, 2019b; Phan, 2018), while government bonds have dominated the bond market in terms of the number and size of bonds. The Vietnamese bond market is still small and illiquid compared to other regional countries (Vietcombank Securities, 2021). Only SOEs and some large non-SOEs can issue corporate bonds (Le, 2015). As a result of inability to access the bond market by the majority of non-SOEs, this study does not examine the impact of bond market development on DMS.

Regarding equity capital, the Vietnamese stock markets have been growing gradually and becoming an important channel for firms to raise capital. Due to removing the ownership cap for foreign investors, the stock market is predicted to receive greater foreign investment inflows. Hence, FO seems be increasing substantially and foreign investors will affect corporate financing decisions.

The Vietnamese stock markets have very high concentration as the market capitalization of the VN30 accounts for 65% of total stock market capitalization (SSI Securities Corporation, 2022). This may force other smaller firms to raise long-term capital by borrowing from banks instead of issuing equity.

The next chapter will discuss main theories on DMS and empirical studies to develop hypotheses for firm-specific determinants and the effects of BD, financial market development, ownership structure on DMS. The chapter also develops a hypothesis for the effect of DMS on firm financial performance.

CHAPTER 3: LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

3.1. Introduction

The previous chapter presented the background of the economy and financial markets in Vietnam with the aim of gaining better understanding about raising capital in Vietnam. This chapter provides a review of the theories on DMS and firm performance and any discrepancies which exist in previous studies. This chapter develops hypotheses based on the review to examine the impact of firm-specific determinants, BD, financial market development and ownership structure on DMS and the impact of DMS on firm performance. In particular, Section 3.2 provides a critical review of main theories on DMS to identify which theories are related to the study framework. Sections 3.3 and 3.4 review previous empirical studies to develop hypotheses for firm-specific determinants and the effects of Vietnamese financial market development and BD on DMS. Section 3.5 discusses the empirical evidence on the relationship between different ownership structures and DMS. Finally, Section 3.6 develops hypotheses for the impact of DMS on firm performance based on existing studies.

3.2. Theories on debt maturity structure

Theories on DMS are built from theories of capital structure. Even though this section focuses on six major capital structure theories, some of these are more appropriate and relevant to this study than others. Thus, this section discusses these main theories identified as the most relevant theories to the study.

3.2.1. Irrelevancy theory (capital structure irrelevance)

Modigliani and Miller (1958) first suggested that a firm's market value is not affected by its financing decisions under perfect market conditions. Their study was based on strong assumptions such as no taxes, no bankruptcy costs, no brokerage costs, no information asymmetry, no different borrowing rates between investors and institutions, and earnings before interest and tax (EBIT) which are

not affected by the use of debt. Under these assumptions, Modigliani and Miller (1958) introduced two famous propositions.

The first proposition states that if a firm has a mix of debt and equity financing, its weighted average cost of capital (WACC) will be exactly the same as its cost of equity with all-equity financing. This means that the firm's WACC is constant and independent of its capital structure. Thus, if Modigliani and Miller's (M&M's) assumptions are correct, capital structure decisions become irrelevant no matter how a firm finances its operations. In other words, proposition one suggests that a firm's market value is independent of the mix of debt and equity in its capital structure.

The second proposition suggests that higher leverage leads to greater financial risk since it states that the expected return of shareholders increases with leverage because the risk to shareholders increases with leverage (Modigliani & Miller, 1958). Like shareholders, debt holders also require a higher return to compensate for the risk from higher leverage. Therefore, an attempt to reduce the WACC by substituting debt for equity will fail even though debt is generally cheaper than equity. Hence, proposition two states that the proportion of debt in the capital structure directly relates to the change in the cost of equity.

Overall, the two propositions argue that not only capital structure but also debt policy, including the choice of long-term debt versus short-term debt, have no effect on firm value (Brealey et al., 2011).

In 1963, Modigliani and Miller (1963) revision of their original theorem refined proposition two by relaxing the assumption of no corporate taxes. Here, interest payments to debt holders are tax deductible, while dividend payments to shareholders are not tax deductible. Thus, even though the cost of equity increases as the level of debt increases due to increasing financial risk, the cost of equity does not rise as fast as it would if there were no corporate taxes. Therefore, the WACC decreases as the level of debt increases. Under the M&M model with corporate taxes, the optimal capital structure is 100% debt (Ehrhardt & Brigham, 2011).

Although some of M&M's assumptions do not exist, such as no brokerage costs, no financial distress costs, no agency costs and no information asymmetry, their irrelevancy result is important. It shows us under which conditions capital structure is relevant and affects firm value (Ehrhardt & Brigham, 2011). In addition, Brealey et al. (2011) stated that fully understanding M&M's assumptions will assist in knowing why one capital structure is better than another.

Furthermore, Titman (2002) stated that while the M&M propositions seem to be all about a firm's debt–equity ratio, the logic of the M&M propositions can be expanded to discuss other financing issues such as debt maturity and risk management. For instance, Stiglitz (1974) authored a pioneering study that extended the M&M model to a multi-period model and considered not only debt–equity mix decisions but also DMS and the dividend–retention ratio. Furthermore, even though Stiglitz (1974)'s model is based on the general equilibrium rather than the partial equilibrium analysis of Modigliani and Miller (1958), Stiglitz (1974) reported results consistent with Modigliani and Miller (1958) that none of these financial policies affect firm value under similar assumptions as M&M.

However, in reality, perfect capital markets do not exist (Deesomsak, 2006). Therefore, several major theories and empirical research have been developed that significantly negate M&M's assumptions regarding DMS (Brick & Ravid, 1985; Jensen & Meckling, 1976; Kane et al., 1985; Lewis, 1990). For example, Baker et al. (2001) demonstrated that the WACC could be decreased by timing the debt market since M&M's propositions do not require that returns on long-term and short-term bond have to be constant over time.

The irrelevancy principle has formed the basis of modern thinking on capital structure. Consequently, a number of theories have emerged from M&M's seminal work. These theories are reviewed in the remainder of Section 3.2.

3.2.2. Traditional theory of capital structure

Traditionalists believe that there is an optimal ratio of debt and equity which leads to the lowest WACC (Brealey et al., 2011). In particular, issuing debt is likely to

be cheaper than issuing equity because of the tax shields of debt (Atrill, 2006; Deesomsak, 2006). However, an increase in the level of debt leads to an increase in the financial risk. Therefore, when debt holders and shareholders notice the increase in financial risk, they will require a greater return to compensate them for the additional levels of debt used.

Further, the WACC is used as the discounted rate to measure firm value. According to Brealey et al. (2011), if M&M's proposition one holds, minimizing the WACC is equivalent to maximizing firm value. However, if M&M's proposition one does not hold, these two objectives are still equivalent when operating income is independent of capital structure.

On the other hand, traditionalists argue that capital structure should be stable (Frank & Goyal, 2009; Graham et al., 2015; Lemmon et al., 2008). For instance, Lemmon et al. (2008) found that highly or lowly leveraged firms are unlikely to change their leverage ratio for over two decades, with a sample of all global firms available in the Compustat database from 1965 to 2003, excluding financial firms. While Lemmon et al. (2008) FE model reported that time-varying determinants may not be explanations for capital structure heterogeneity, Deangelo and Roll (2015) argued that factors can vary over time. In other words, Deangelo and Roll (2015) pointed out that firm-specific time-series variation is systematically important in their panel leverage analyses. Unlike previous studies (Graham et al., 2015; Lemmon et al., 2008), Deangelo and Roll (2015) found that a stable capital structure is the exception rather than the rule, especially occurring at a low leverage level, when they examined 15,096 non-financial firms obtained from the Compustat database between 1950 and 2008.

In general, under the traditional view the main objective in financing decisions is minimizing the WACC (Brealey et al., 2011; Deesomsak, 2006). The WACC is related and important to firm value since the WACC is used as a discounted rate to calculate the present value of the net cash flow. Thus, the lowest WACC will lead to the highest firm market value in the case that the cash flows of the firm are held constant. However, financial managers may make erroneous decisions or become short-sighted if they strictly follow the approach of minimizing the

WACC. For example, it is a mistake if the managers increase the proportion of short-term debt just because the interest rate for short-term debt is lower than for long-term debt (Vernimmen et al., 2018). If firms rely greatly on short-term debt, they will have to face liquidity risk and mismatching maturity issues. In particular, lenders have the right to liquidate or take control over some of a firm's assets if the firm cannot repay short-term debt in full at the maturity date (Diamond, 1991). Furthermore, Stohs and Mauer (1996) stated that a firm may not have enough cash on hand to pay back its debt if debt has a shorter maturity than assets.

3.2.3. Trade-off theory

Trade-off theory argues that the optimal capital structure is 100% debt under the assumption of no bankruptcy costs. However, bankruptcy costs, which seem to be a major missing element, can help to expand the concept of the optimal capital structure based on the M&M model (Robichek & Myers, 1966). Bankruptcies occur when shareholders exercise their right to default (Brealey et al., 2011). In reality, bankruptcy costs are quite costly, such as legal and accounting expenses. Moreover, bankruptcy force a firm to sell its assets quickly and at a lower price than they would be worth in order to keep the firm's operation running. Thus, a firm choosing debt–equity ratio is a trade-off between the tax benefits of debt and the costs of bankruptcy (Brealey et al., 2011).

There are several studies which have examined the trade-off between the tax advantages of debt and bankruptcy costs, which is the problem of optimal capital structure (Brennan & Schwartz, 1978; Kim, 1978; Kraus & Litzenberger, 1973; Lemmon et al., 2008). For instance, Scott (1976) found a similar result to M&M that debt policy does not impact a firm's value when we assume the probability of bankruptcy is zero. However, when Scott (1976) employed a multi-period model of debt, equity and firm valuation which captures bankruptcy costs and corporate taxes, the author found that debt is valuable within the model due to tax shields. Importantly, the aforementioned studies showed that when the firm level debt increases, the bankruptcy costs of the firm also increase. Moreover, according to Ehrhardt and Brigham (2011), beyond a firm's threshold debt level the expected bankruptcy costs increase significantly, which reduces the tax

advantages of debt. They completely offset the tax advantages when the level of debt reaches the optimal capital structure. From the optimal point, the value of the firm decreases if the firm issues more debt. Overall, the probability of bankruptcy rises with additional loans. Thus, bankruptcy costs discourage firms from having a very high level of debt (Ehrhardt & Brigham, 2011). This also implies that target debt–equity ratios vary from firm to firm.

Although there are some situations where trade-off theory cannot explain how firms actually behave (Lemmon et al., 2008; Wald, 1999), Brealey et al. (2011) asserted that there is no study which disproves trade-off theory. Moreover, trade-off theory can explain capital structure decisions as well as the choice of debt maturity. For instance, choosing the term structure of debt considers the balance between the potential costs of bankruptcy and the benefits of tax. Unlike the above studies which focus on optimal capital structure (Brennan & Schwartz, 1978; Kim, 1978; Lemmon et al., 2008), Kane et al. (1985) developed an option valuation model to explain optimal debt maturities regarding trade-off theory. Several empirical papers support the result of Kane et al. (1985) that a firm tends to borrow more long-term debt in the event that tax benefits of debt are not smaller than expected flotation and bankruptcy costs (Bas, 2012; Kirch & Terra, 2012; Krishnankutty & Chakraborty, 2014). Moreover, Jun and Jen (2003) constructed a model that focuses on the trade-off between the risk and reward of borrowing short-term. The principal advantage of short-term borrowing is interest savings from several sources such as reduction in agency costs, low flotation, loan design and monitoring costs, and no credit cost in some short-term credit (trade credit). Two main costs of short-term debt are rollover risks and interest rate risks. Using a sample size of 39,874 US firm-year observations between 1978 and 1996, Jun and Jen (2003) found a negative relationship between DMS and two factors of financial attributes: financial flexibility and financial strength. Further, Fu and Subramanian (2011) developed a trade-off model between benefits and costs of undiversified owner-managers when making financing decisions. They found that debt maturity has a U-shaped relationship with the drift and volatility of a project. For example, when the project drift has a lower value, short-term debt increases liquidity risk and managers should choose long-term debt. When the project drift

goes up, managers choose to shorten their debt. They could roll over their debt on more favourable terms due to high recognition of the project (firm value). However, if the project drift further rises, managers lengthen their debt as bankruptcy risks increase due to a higher leverage ratio.

3.2.4. Agency costs theory

The agency costs theory is based on trade-off theory. Jensen and Meckling (1976), who were the first to investigate the role of financial contracts in constructing and managing agency problems, defined two main types of agency costs: (i) agency costs of equity; and (ii) agency costs of debt. While the agency costs of equity emerge via the conflict of interest between managers and shareholders, the agency costs of debt occur via the conflict of interest between shareholders and debtholders. For instance, the agency problem is a problem where managers prefer acting in their own interest rather than in the best interest of shareholders (Ehrhardt & Brigham, 2011). Shareholders are interested in maximizing fundamental share prices, whereas managers are interested in their own personal aims such as salary incentives and rewards. Agency costs are the sum of monitoring costs and the costs of implementing control devices in order to resolve the conflict of interest between managers and shareholders. Further, when a firm issues debt, conflict of interest occurs between shareholders and debt holders. Unlike shareholders' interest, debt holders are interested in debt repayment and interest payment.

Overall, there are three main agency conflicts of debt: (1) the problem of asset substitution or risk shifting (Jensen & Meckling, 1976); (2) the underinvestment problem (Myers, 1977); and (3) the overinvestment problem or free cash flow (Jensen, 1986). In particular, managers who are responsible for making all decisions of firms may relocate firm assets for their personal benefit (Jensen & Meckling, 1976). Jensen and Meckling (1976) stated that if managers increase their percentage of firm equity, the loss from this problem is decreased. Furthermore, an increase in the level of debt may help to increase their ownership.

The framework of Jensen and Meckling (1976), with the existence of debt, focuses on the impacts of the incidence of agency costs, wealth transfers, monitoring and bonding costs. Myers (1977) extended their work by examining the agency costs of suboptimal investment policy caused by risky debt such as costs of monitoring, negotiation and enforcement of contracts. Myers (1977) found that although debt helps to decrease conflict between managers and shareholders, it increases conflict between shareholders and debt holders. Debt may force shareholders to invest more in underinvested projects. In other words, shareholders in unleveraged firms prefer positive net present value projects, whereas shareholders in firms with high levels of debt tend to choose risky projects. This could be because shareholders believe that debt holders suffer the main loss if the projects fail. Thus, debt holders tend to require higher interest rates to offset the higher risk of underinvestment when firms have higher levels of debt.

Unlike the above studies, Jensen (1986) examined the role of debt in motivating managers and their firms to be efficient, otherwise known as the control hypothesis. Jensen pointed out that debt and dividends are the two methods to reduce the agency problem of free cash flow, which is how to motivate managers not to invest excess cash in negative net present value projects or waste it on inefficient work. While the promise of increasing future dividend payouts is weak, the promise of paying the interest and principal is much stronger. Therefore, debt can help to mitigate the agency cost of free cash flow by decreasing the freedom of managers to use the available cash. Further, Stulz (1990) developed a model in which debt reduces the problem of free cash flow, but increases the underinvestment problem.

On the other hand, agency costs theory can also examine the impact of a bankruptcy threat on management activity. It is argued that the threat of bankruptcy can make managers' interests align with shareholders' interests. The reason is that if bankruptcy occurs, managers lose all their income and their position or reputation. Therefore, managers tend not to choose to issue debt which leads to a higher bankruptcy threat. However, Grossman and Hart (1982)

also emphasized the benefit of debt to managers. Debt can increase the market value of a firm because it convinces the market that managers will act in line with shareholders' interests. In other words, they are under pressure to make better investment decisions to mitigate the probability of bankruptcy. Unlike other studies (Jensen & Meckling, 1976; Stiglitz, 1974), Grossman and Hart (1982) assumed that managers do not hold shares in their firms. Hence, a change in bankruptcy penalties is a crucial factor in the model of Grossman and Hart (1982), while it would not have a significant impact in the models of Jensen and Meckling (1976) and Stiglitz (1974). In the model of Grossman and Hart (1982), the benefit of managers from a rise in profit does not change when a firm changes from debt finance to equity finance.

Overall, there are several papers that attempted to extend the agency costs of debt theory (Jensen & Meckling, 1976; Jensen, 1986; Myers, 1977). They mainly focused on the level of debt, whereas the length of debt is also important in reducing the agency costs of debt. For instance, there is a lack of reasoning for the standard finance theory of matching maturities between a firm's assets and liabilities. Myers (1977) introduced a new approach which is not based on previous ideas (Miller, 1977; Modigliani & Miller, 1963; Robichek & Myers, 1966) in order to explain why firms try to match their assets and liabilities. Although the approach is similar to the approach of Jensen and Meckling (1976), it stresses costs of negotiation, monitoring and enforcement contracts. Myers (1977) stated that short-term debt can reduce the agency costs of debt. For example, short-term debt can lower the monitoring costs, which can mitigate the conflict between shareholders and debt holders. Datta et al. (2005) found that manager-owners prefer short-term debt, while self-interested managers prefer long-term debt, using a sample of 1185 US firms from 1992 to 1999. Managers with more share ownership choose short-term debt as they agree to themselves and their firms being monitored frequently to lower agency costs. Furthermore, Gul and Goodwin (2010) employed data from 6015 firms with non-zero audit fees and total assets listed in the USA for the period 2003–2006. They showed that firms with more short-term debt pay less audit fees due to better monitoring and corporate governance mechanisms. The negative relationship is more pronounced for firms

with low-quality credit ratings. This finding is consistent with the argument of Myers (1977) rather than the viewpoint of risk-based auditing. For example, audit fees should increase when firms have more debt, especially short-term debt, due to higher liquidity risk. Although several empirical studies found evidence to support an effective monitoring mechanism for short-term debt (Fung & Goodwin, 2013; Pan & Tan, 2019), Graham and Harvey (2001) conducted a survey-based approach which reported the practice of corporate finance and found little evidence to support the finding of Myers (1977) with a sample of 392 responses from chief financial officers (CFOs) in the USA and Canada in 1999. Likewise, Richards (2018) found no support for the traditional solutions to the underinvestment problem proposed by Myers (1977) of short-term debt or reducing gearing. The author employed a sample of 23,600 US non-financial firms from 1995 to 2014.

3.2.5. Pecking order theory

Donaldson (1961) presented the idea that when a firm wants to invest in new projects, managers prefer internally generated funds first. If internal funds are not enough for the project, then managers prefer external funds to issuing equity. This is known as the pecking order. The managers' preference is due to minimizing flotation costs. Later, Myers and Majluf (1984) developed Donaldson (1961) concept and defined it as pecking order theory. However, Myers and Majluf (1984) argued that flotation costs are not the reason for choosing internal equity instead of debt. The reason is that the net benefit of tax advantages and bankruptcy risks seems to be higher than the flotation costs.

Pecking order theory states that firms prefer internal funds to external funds due to the presence of information asymmetry (Myers & Majluf, 1984). The theory focuses on the relationship between investment decisions, financing decisions and asymmetric information. There are three main assumptions: (1) managers have better information about firm value than potential investors; (2) no transaction costs are required to issue new equity due to efficient and perfect capital markets; (3) a firm's share value equals its expected future value. According to this theory, managers or insiders of a firm know more about the

value of the firm's assets and opportunities than outside investors. Thus, outside creditors tend to increase borrowing costs since they do not have all information like insiders. This leads to those managers choosing to use internal funds instead of external funds (such as debt) in order to minimize borrowing costs. Regarding issuing new equity, managers tend to choose issuing equity last as they do not want to decrease existing shareholders' claims. Moreover, due to asymmetric information, only overvalued firms tend to issue new shares while undervalued firms try to avoid issuing shares. Thus, the new shares' price will drop to compensate for the asymmetric information. This is called the adverse selection cost. Furthermore, existing shareholders are not interested in issuing new shares as it may lead to a decrease in the existing company share price (Marsh, 1982). According to Kjellman and Hansén (1995), debt increases monitoring costs, whereas equity both increases monitoring costs and reduces control. In other words, debt seems to be less sensitive to outside investors regarding asymmetric information. Later, Krasker (1986) supported the finding of Myers and Majluf (1984) by extending the model that combined different sizes of equity issue. The larger the number of shares issued, the lower the share price.

In contrast, Halov and Heider (2011) argued that the original theory is based on the mispricing of equity because outside investors do not know the value of investments. They concluded that firms choose to issue new equity before debt.

Overall, pecking order theory emphasizes the importance of debt. Shyam-Sunder and Myers (1999) found that pecking order theory has better explanatory power than trade-off theory, especially in explaining the financing behaviour of firms. Similarly, Fama and French (2002) found that short-term variation in earnings and investments of firms is mainly due to debt in relation to pecking order theory. However, pecking order theory has some limitations such as incorporating equity and riskless debt (Brennan & Kraus, 1987; Halov & Heider, 2011) and inability to explain the effects of taxes and bankruptcy costs on capital structure compared to trade-off theory (Deesomsak, 2006). For instance, Shyam-Sunder and Myers (1999) found that pecking order theory works well for large firms, while it is unable to explain why some firms with high levels of asymmetric information such as

small, young or non-dividend firms issue equity. Halov and Heider (2011) argued that the theory focuses only on the mispricing of equity, while high levels of asymmetric information actually lead to a rise in the cost of debt and a decrease in debt capacity. Halov and Heider (2011) supported the argument that firms with higher risks such as small, young firms should issue more equity than debt when they examined a large and unbalanced sample of 103,351 observations collected from the merged CRSP-Compustat database between 1971 and 2001. Although pecking order theory has some limitations, the theory works well in some circumstances, like other capital structure theories.

Miglo (2010) stated that trade-off theory can explain many aspects of capital structure except the very important relationship between profitability and debt which could be explained by pecking order theory. It is suggested that high-profit firms prefer using retained earnings for financing as much as possible, while low-profit firms have to use external funds (usually debt) more frequently. Hence, the relationship between profitability and debt is negative based on pecking order theory (Chipeta & Deressa, 2016; Chipeta & McClelland, 2018; Miglo, 2010). Further, Jong et al. (2011) argued that pecking order theory helps to explain firms' financing behaviour better than trade-off theory in term of issuing decisions. They found that over 75% of US firms which are over-leveraged but have no limitation in their debt issuing still issue more debt. Their sample data comprised 2259 non-financial listed firms from 1985 to 2005.

Regarding the term structure of debt, Richards (2018) built on the option model of Myers and Majluf (1984) by adding alternative steps. The author suggested that bridge financing can overcome the problem of information asymmetry. In particular, when the share price of a firm does not indicate the management's viewpoint on value, the firm can still make investments by using short-term debt (usually from banks). Then the firm refinances with debt and equity when its share price reflects all information. This approach supports pecking order theory as it suggests using debt, but not the exact theory, which requires permanent debt (Richards, 2018).

3.2.6. Signalling theory

While Myers and Majluf (1984) developed pecking order theory based on asymmetric information, Ross (1977) argued that the market value of a firm is directly related to debt level under asymmetric information. They all assumed that managers have more information than outside investors. In Ross's model, the author assumed that managers do not own firm shares and their compensation is related to firm value. The idea is that managers in high-quality firms have a strong incentive to give information to poorly informed outsiders in order to increase their firm's share price. In other words, managers use a costly signalling strategy so that they can distinguish their firms from weaker firms. High debt levels are likely to signal high-quality firms. High-quality firms generally have lower bankruptcy costs than low-quality firms. Thus, managers of high-quality firms tend to choose to issue debt and commit to higher cash flow, whereas managers of low-quality firms do not tend to issue debt because of high expected bankruptcy costs. Managers of low-quality firms prefer to issue equity so that they can avoid additional risks imposed by issuing debt. This means that whereas an increase in debt levels is viewed as a positive signal of an optimistic future or stable financial situation of firms because they can meet their commitments, a decrease in debt levels is viewed as a negative signal. Thus, the choice of capital structure can signal to outside investors about the quality of firms.

Similarly, Leland and Pyle (1977) supported a positive relationship between firm value and leverage. Leland and Pyle (1977) also suggested the market value of a firm is positively related to the share of the firm held by managers. This means that MO can signal the quality of firms. Unlike Ross (1977) model, Leland and Pyle (1977) model does not use contingent contracts and the resulting equilibrium is dissipative. Even though Ritter (1984) questioned Downes and Heinkel (1982) findings, Downes and Heinkel (1982) showed empirical evidence to support the hypothesis of Leland and Pyle (1977) about market valuation with a sample of 297 listed firms in the USA from 1965 to 1969. However, Heinkel (1982) argued that high-quality firms tend to have low debt levels, which refutes the arguments of Ross (1977) and Leland and Pyle (1977). While all debt in Leland and Pyle

(1977) model is assumed to be risk-free, Heinkel (1982) assumed that all debt is risky. Moreover, Heinkel (1982) developed Ross (1977) model, a non-dissipative model, without reliance on the use of contingent contracts. Furthermore, when Brick et al. (1998) examined asymmetric information about risks and variance of returns, they pointed out that high-quality firms signal their value to the market through issuing new shares alongside offering cash dividends. In contrast, when Noe (1988) relaxed two main assumptions: (1) insiders notice a firm's cash flow perfectly; and (2) the pecking order between debt and equity, Noe (1988) found that the average quality of firms financing with equity seems to be lower than the average quality of firms financing with debt.

Signalling theory is not valid in every country. For example, Markopoulou and Papadopoulos (2009) found that signalling theory does not work with Greek firms. A normal expectation that a firm's share price will decrease when the firm chooses to issue new equity shares. However, Markopoulou and Papadopoulos (2009) employed 13 cases that issued equity during the period 2004–2006. Only 2 out of 13 firms had a fall in their share prices after the announcement of issuing equity. The finding is not in line with the argument of Noe (1988) that firms that use debt are better than firms that issue equity.

Beside several studies of the signalling effect and capital structure, Flannery's (1986) study was the first seminal work to examine the impact of asymmetric information on a firm's debt maturity choice. A firm's DMS may not give a valid signal if debt issue is costless. Then both high-quality and low-quality firms will not issue long-term debt even though their assets have long maturities. In contrast, when debt issue is costly, high-quality firms have strong incentive to issue short-term debt while low-quality firms tend to issue long-term debt (Flannery, 1986).

In regards to asymmetric information between outside investors and insiders, if insiders of a firm have better information than outsiders, they tend to issue overvalued securities. For example, high-quality firms tend to issue short-term debt which is underpriced. The reason is that high-quality firms might agree to pay extra transaction costs to refinance when their misinformation value is larger

than the extra cost of a rollover incentive, especially if the misinformation causes negative value. In addition, good firms signal to the market and lenders that they are not worried about scrutiny from them. On the contrary, low-quality firms may not use high-quality firms' borrowing strategy because they may not be able to afford to pay transaction costs. Therefore, low-quality firms might be forced to borrow long term.

Separating equilibrium occurs when different debt maturity strategies lead to differences in value between high-quality and low-quality firms (Flannery, 1986). Therefore, higher quality firms can use short-term debt to signal their quality to outside investors. In other words, rational investors can obtain information in order to evaluate the quality of companies by observing their choice of debt maturity.

In 1990, Kale and Noe (1990) extended Flannery (1986) work. They demonstrated that Flannery's separating equilibrium might exist when debt issue is costless. Kale and Noe (1990) found that if flotation costs are costless but changes in firms are not independent of the debt maturity choice over time, this will lead to the same separating equilibrium. On the other hand, Titman (1992) developed Flannery (1986) model by considering interest rate uncertainty and financial distress costs. These two factors are a good explanation for swapping short-term for long-term debt by high-quality firms. However, there are several empirical studies that support Flannery's model (Awartani et al., 2016; Barclay & Smith, 1995; Choi & Park, 2022; Stephan et al., 2011). For instance, Khoo and Cheung (2022) examined the effect of managerial ability on DMS using a sample of 17,925 non-financial firms in the USA between 1981 and 2016. They found that firms with high-ability managers prefer short-term borrowings. Their finding is consistent with signalling theory by pointing out the importance of short-term debt, which helps to reduce information asymmetry and enhance the reputation of high-ability managers. The positive relationship between managerial ability and DMS is more pronounced in high-quality firms, unconstrained firms and firms with high information asymmetry. Similarly, Shang (2021) found managers' personal qualities are an important characteristic in choosing debt maturity. With the use

of US data over the period 1985–2018, the author confirmed the positive impact of talented managers on short-term debt, especially becoming greater in firms with higher GROW. Furthermore, Choi and Park (2022) employed data from 228 private firms in Korea to explore signalling theory in relation to DMS. They found strong evidence to support signalling theory, proxied by the Z-score, that high-quality firms use more short-term debt while low-quality firms use more long-term debt.

3.2.7. Summary of applicability of main theories reviewed

In summary, even though the above theories were mainly developed to become capital structure theories, some of them were extended to explain DMS as the debt maturity decision is an elemental part of the capital structure decision. In particular, trade-off theory, agency costs theory and signalling theory are used to develop hypotheses in the next section, whereas irrelevancy theory, the traditional view and pecking order theory are not relevant to the study. Irrelevancy theory is based on some strong assumptions that are not realistic such as no taxes, no transaction costs or no asymmetric information, while the traditional view focuses on minimizing WACC, which may cause liquidity risks and mismatching of maturities between debt and assets. Furthermore, pecking order theory is about a preferred choice between debt and equity to finance new investments. In other words, the objective of pecking order theory is not to predict the optimal debt ratio (Tram et al., 2022).

Although pecking order theory and signalling theory are based on asymmetric information, signalling theory can explain how a firm chooses its term structure of debt to signal its quality to the capital markets. Moreover, trade-off theory considers the balance of tax shield benefits and bankruptcy costs in order to select the maturity of debt. In addition, agency costs theory describes how debt maturity reduces the conflict between managers, shareholders and debt holders, and explains why a firm should match the maturities of its assets and liabilities. Finally, financial theories such as DMS actually affect firm value. This is because these theories were developed through relaxing several assumptions of M&M theory.

3.3. Identifying firm-level determinants

A number of pioneering research papers have proposed frameworks to explain factors affecting corporate DMS (Barclay & Smith, 1995; Brick & Ravid, 1985; Flannery, 1986; Myers, 1977). DMS is generally defined as the ratio of long-term debt to total debt (Alcock et al., 2012; Antoniou et al., 2006; Barclay & Smith, 1995). Firm-specific characteristics are built on well-established seminal studies and have been used in most of the existing empirical studies. There are three types of hypotheses which are commonly used to explain corporate debt maturity: tax-based hypotheses, agency costs hypotheses, and signalling and liquidity risk hypotheses (Alcock et al., 2012; Antoniou et al., 2006; Cai et al., 2008; Stohs & Mauer, 1996). These three main hypotheses were developed based on trade-off theory, agency costs theory and signalling theory. In particular, the tax-based hypotheses were developed based on trade-off theory between tax benefits and bankruptcy costs (Cai et al., 2008; Kane et al., 1985). Liquidity risks theory is a sub-part of signalling theory as Diamond (1991) extended signalling theory by adding liquidity risks to the model of Flannery (1986) (see details in Section 3.3.3). In summary, the tax-based hypotheses, agency cost hypotheses, and signalling and liquidity risks hypotheses form the basis for the firm-level hypotheses.

3.3.1. Tax-based hypotheses

After the work of Modigliani and Miller (1958), several studies demonstrated that tax affects not only capital structure decisions but also debt maturity decisions (Brick & Ravid, 1985; Kane et al., 1985). Tax-based hypotheses are generally developed under TAX, TERM and VOLR (Antoniou et al., 2006; Orman & Bülent, 2015; Orman & Köksal, 2017). Debt financing generally has an explicit benefit compared to equity financing in term of interest deductibility. The tax advantage encourages firms to issue more debt in accordance with increases in TERM and TAX.

3.3.1.1. *Effective tax rate*

TAX is expected to impact not only the level of debt but also its maturity if any of the assumptions in the irrelevancy propositions are breached (Brick & Ravid, 1985). While the one-period model of Brennan and Schwartz (1978) assumes that a firm borrows for some fixed interval and then becomes unleveraged permanently, the multi-period model of Kane et al. (1985) is a more realistic model that assumes the firm will continue issuing new debt after retiring its current debt. Kane et al. (1985) found that tax rates have a negative relationship with debt maturity and ensure that the tax shield advantages are larger than the amortized flotation costs. There are several empirical studies that corroborated the finding of Kane et al. (1985) (Cai et al., 2008; Kirch & Terra, 2012; Krishnankutty & Chakraborty, 2014; Stohs & Mauer, 1996).

In contrast, Stephan et al. (2011) demonstrated when they examined 4500 Ukrainian listed firms for the period 2000–2006 that tax was one of the positive key factors in choosing the length of debt. This finding is in line with that of Newberry and Novack (1999), who confirmed this positive effect due to higher tax advantage for long-term debt with a sample of 2148 firm-year observations of public and private US firms between 1988 and 1995. Furthermore, Antoniou et al. (2006) found a positive influence of tax rates on corporate debt maturity in Germany, although they also found weak evidence for this effect in France and the UK.

On the other hand, Lewis (1990) stated that there is no effect of tax on making debt maturity decisions if tax is the only imperfection under the M&M assumptions. This result is inconsistent with those of Brick and Ravid (1985) and Kane et al. (1985). This is because Lewis (1990) investigated capital structure and debt maturity simultaneously, whereas Brick and Ravid (1985) and Kane et al. (1985) examined these two major issues consecutively. There are many empirical studies in developed and developing countries that support the finding of Lewis (1990) (Kalsie & Nagpal, 2018; Orman & Köksal, 2017; Ozkan, 2000; Zheng et al., 2012). For instance, although Orman and Köksal (2017) found an inverse relationship between tax rate and debt maturity in their equation without

leverage, they found no support for this relationship in their equation with leverage for a sample of 11,694 both public and private non-financial firms for the period 2004–2013 in Turkey.

Overall, according to trade-off theory, debt covers tax benefits, flotation costs and bankruptcy costs. If the tax rate decreases, the tax benefits from borrowings will decrease. Thus, firms tend to borrow long term to reduce flotation costs and bankruptcy costs. Regarding developing countries, Kirch and Terra (2012) found evidence to support an inverse relationship between tax rate and DMS with a sample of 359 non-financial listed firms in six South American developing countries over 11 years from 1996. Furthermore, Cai et al. (2008) analyzed 259 non-financial listed firms in China for the period 1999–2004 by employing several methods such as cross-sectional, pooled, FE and random-effects (RE) methods. All methods showed insignificant negative coefficients except the sys-GMM method, which is the most up-to-date and efficient method. Moreover, their model includes the impact of leverage. While Kirch and Terra (2012) and Cai et al. (2008) employed the sys-GMM method to deal with the endogenous variable which is the leverage ratio, Nguyen et al. (2018) applied a quantile regression method, which seems not to manage endogenous issues. Nguyen et al. (2018) examined the impact of external and internal constraints on DMS with a sample of all listed firms on the HOSE and HNX in Vietnam for the period 2007–2016. Although Nguyen et al. (2018) found that firms are more likely to have long-term debt for tax reasons in the 90% quantile – a very high long-term debt structure – this study examines leverage and debt maturity simultaneously, following Lewis (1990), to avoid erroneous conclusions caused by endogenous issues (Alcock et al., 2012; Cai et al., 2008; Kirch & Terra, 2012). Following trade-off theory, previous studies have shown a negative relationship between tax rate and DMS (Cai et al., 2008; Kirch & Terra, 2012). Hence, the following hypothesis is proposed:

Hypothesis 1: The effective tax rate has a negative effect on debt maturity structure.

3.3.1.2. Term structure of interest rates

Brick and Ravid (1985) made an important assumption that when any of the conditions in the irrelevancy propositions are breached, tax may affect the debt maturity decision. They show in a model that when TERM increases, in the early years the expectation of the interest expense from issuing long-term debt is greater than the expected interest expense from rolling over short-term debt. Thus, issuing long-term debt leads to a decrease in the firm's expected tax liability and an increase in the firm's current market value. This means that when TERM slopes upward (i.e., a normal yield curve), firms may have more long-term debt. While Brick and Ravid (1985) examined the dataset of 3999 industrial listed firms obtained from the Compustat database from 1974 to 1992, Kim et al. (1995) analyzed 328 industrial listed firms in the USA between 1980 and 1989. The model of Kim et al. (1995) focuses on the effect of DMS on maximizing investor tax-timing option value. They demonstrated that firms issue more long-term debt when the TERM slope increases.

Although there are not many studies that have used TERM as an indicator of tax compared to tax rate, there are several that support the effect of TERM on DMS. Newberry and Novack (1999) found a result consistent with that of Brick and Ravid (1985) when they used a sample of both public and private bond offerings by US firms between 1988 and 1995. Moreover, Antoniou et al. (2006) confirmed that TERM positively affected the choice of the debt maturity of listed firms in France, Germany and the UK. However, some studies found no evidence to support this argument (Fu & Tang, 2016; Johnson, 2003; Stohs & Mauer, 1996).

On the other hand, several studies have argued that firms prefer short-term debt due to its low interest rates compared to long-term debt (Faulkender, 2005; Graham & Harvey, 2001; Marsh, 1982). This implies that DMS tends to have a negative relationship with the term structure premium (Harford et al., 2014). Guedes and Opler (1996) supported this inverse relationship in examining 7369 US bonds and notes issued over the period 1982–1993. Similarly, Abdulla (2015) showed a positive relationship between short-term debt and TERM when the author investigated 1712 private and public firms in the USA from 1994 to 2012

using multivariate analysis. The model of Abdulla (2015) includes the effects of initial public offering (IPO) and leverage on DMS.

In general, the majority of existing studies have concentrated on developed countries, especially the USA. Even though there are mixed results on the relationship between TERM and DMS, this study develops a hypothesis based on the theoretical prediction (Barclay & Smith, 1995; Brick & Ravid, 1985) and recent results which do not focus only on US data. For instance, Zheng et al. (2012) showed a positive coefficient of TERM when they analyzed a large sample of 114,723 firm-year observations from 40 countries over 15 years from 1991. The result is significant in that all four panels represent four cultural dimensions: uncertainty avoidance, collectivism, power distance and masculinity. Their model also includes the effect of leverage. In addition, Orman and Köksal (2017) found that TERM was significantly positively related to debt maturity in Turkey (a developing country) even though it is found in a model without leverage like that of Brick and Ravid (1985). Although Nguyen et al. (2018) recently found that Vietnamese firms tend to borrow more short term if interest rates of short-term debt is cheaper than long-term debt, their approach is different to this study in using quantile regression which shows how long-term debt changes in different conventional quantiles. Based on trade-off theory, a firm can trade off a rise in TERM for a lower expected tax liability by employing long-term debt (Brick & Ravid, 1985). This review of previous studies has revealed a positive link between TERM and DMS (Antoniou et al., 2006; Orman & Köksal, 2017). Therefore, the following hypothesis is proposed:

Hypothesis 2: The term structure of interest rates has a positive effect on debt maturity structure.

3.3.1.3. Volatility of interest rates

Brick and Ravid (1985) first introduced a tax-induced framework to examine debt maturity issues as discussed above. Later, they suggested that if the interest rate is uncertain, firms are more likely to have long-term debt to provide a benefit in a tax induction situation (Brick & Ravid, 1991). Next, Kim et al. (1995) extended

previous studies (Brick & Palmon, 1992; Douglas et al., 1988) by establishing empirical predictions and testing them. Their key predictions were that firms lengthen their term debt when VOLR increases and TERM increases. They employed an FE regression method to examine a sample of 328 industrial firms in the USA for the period 1980–1989 to support their arguments. They documented that a high VOLR leads to high volatility of bond prices. This means that the tax-timing option becomes larger. Kim et al. (1995) argued that the investor tax-timing option value can be maximized by issuing long-term debt. Hence, from a tax-timing option viewpoint, firms prefer issuing long-term debt rather than rolling over short-term debt. López-Gracia and Mestre-Barberá (2011) found strong evidence to support the argument of Kim et al. (1995). López-Gracia and Mestre-Barberá (2011) examined the influence of VOLR on DMS using a sample of 11,028 small and medium enterprises (SMEs) in Spain from 1997 to 2004. The authors stated that there is a positive relationship between short-term interest rate volatility and debt maturity, especially in years when interest rates are highly volatile.

However, there are several studies that have reported contrasting findings to those of Kim et al. (1995) using samples in both developing and developed countries. For example, Antoniou et al. (2006) documented that firms in the UK avoid borrowing long-term debt when VOLR is high. They also reported the insignificant role of VOLR in choosing the term structure of debt in France and Germany. In other words, the relationship between interest rate volatility and DMS is country dependent.

In the context of developing countries, Cai et al. (2008) supported the argument of Antoniou et al. (2006) that firms in China seem to shorten their term of debt when interest rate volatility is high. Moreover, Orman and Bülent (2015) found a negative relationship between interest rate volatility and long-term debt in a model that includes leverage using a sample of 11,687 large firms, SMEs and microenterprises in Turkey for the period 2004–2013. Similarly, Orman and Köksal (2017) found evidence to support a negative relationship in both models with and without leverage using almost the same sample with Orman and Bülent

(2015). Although Cai et al. (2008) employed different measures of interest rate volatility, they still found a result consistent with those of Antoniou et al. (2006) and Orman and Köksal (2017). For instance, Cai et al. (2008) used the standard deviations of short-term and long-term lending rates over the previous year, whereas Orman and Köksal (2017) used the standard deviation of monthly short-term (three-month) Turkish government bond yields over the current year.

Unlike Cai et al. (2008), Chung and Phan (2020) found strong evidence to support a positive relationship between VOLR and the term structure of debt using a sample of Vietnamese listed firms for the period 2007–2016. Chung and Phan (2020) also measured the VOLR as the annual standard deviation of the monthly 12-month lending rates. Regarding trade-off theory, long-term debt is preferred when the interest rate is uncertain due to debt tax benefits (Brick & Ravid, 1991). Hence, this study predicts a positive relationship between VOLR and DMS.

Hypothesis 3: Interest rate volatility has a positive effect on debt maturity structure.

3.3.2. Agency costs (contracting costs) hypotheses

Agency costs theory, which was developed by Jensen and Meckling (1976) and Jensen (1986), generally refers to conflicts of interest between a company's managers, shareholders and debt holders. In particular, the agency cost of equity is the conflict between managers and shareholders, whereas the agency cost of debt is the conflict between equity holders and debt holders. This study focuses only on the agency cost of debt, which is also defined as the conflict of interest between managers and debt holders (Deesomsak, 2006). Underinvestment and risky asset substitution are the two main types of agency problems. Agency costs hypotheses are generally developed under the GROW hypothesis, SIZE hypothesis and AMS hypothesis.

3.3.2.1. Growth opportunities

According to Myers (1977), firms with risky debt outstanding are likely to reject positive net present value investment opportunities which could lead to a

significant increase in their market value. This was defined by Myers (1977) as the underinvestment problem. The reason could be that the benefits of these positive investment projects are shared between stockholders and debt holders. Thus, debtholders may capture the profit whereas stockholders may not receive a normal return. If a firm's managers aim to maximize stockholders' wealth, they tend to reject new profitable projects. As a result, the problem seems to be severe for firms with high valuable GROW.

Myers (1977) suggested some possible ways to mitigate the problem such as by having less debt in a firm's capital structure, by adding restrictive terms to agreements between firms and lenders or by decreasing the maturity of debt. In particular, if a debt matures before any growth options are exercised, the disincentive to invest is significantly reduced. The possible reason is that firms will have an opportunity to renegotiate their debt contract. Therefore, firms with more GROW should employ shorter term debt.

Later, Barnea et al. (1980) demonstrated that two complex financial instruments, the call provision and the maturity structure of debt, can solve the agency problems including the underinvestment problem and the risky asset substitution problem. Thus, agency problems disappear when the debt matures before the investment option is exercised. Overall, Barnea et al. (1980) noted that complex financial instruments are necessary because markets cannot provide any sufficient and costless solutions to the agency problems. Their findings are partially in line with those of Myers (1977), who also found that short-term debt can overcome the underinvestment problem.

In regards to managerial discretion, the findings of Stulz (1990) and Hart and Moore (1998) are somewhat consistent with the findings of Myers (1977). They suggested that firms with little GROW should have more long-term borrowings. This is because long-term borrowing is effective in limiting managerial discretion and so it helps to prevent firms from making bad investments. Overall, many empirical studies are in line with the view that high-growth firms tend to issue more short-term debt (Barclay et al., 2003; Barclay & Smith, 1995; Johnson, 2003).

However, Myers (1977) also implied that in some cases, firms may prefer long-term debt to short-term debt because costs of refinancing are greater than costs of issuing long-term debt. An example of the cost of rollover short-term debt is maintaining costs with creditors (Myers, 1977). There are some studies that support this idea (Krishnankutty & Chakraborty, 2014; Mohammad Nauman et al., 2015; Zheng et al., 2012).

In contrast, Stohs and Mauer (1996) found moderate support for the expectation that high-growth firms will employ more short-term debt. This is because the authors found that high-growth firms have little leverage. Stohs and Mauer (1996) argued that their results are inconsistent with the findings of Barclay and Smith (1995) even though their sample was US firms. This is because Barclay and Smith (1995) did not control for differences in leverage, which led to misspecification in the regression of Barclay and Smith (1995). Later, Barclay et al. (2003) supported the findings of Myers (1977) and Barclay and Smith (1995) that firms with high GROW will reduce their leverage and long-term debt when they examined the joint determination of leverage and debt maturity by concentrating on the effect of investment opportunities for over 5000 industrial firms in the USA. Barclay et al. (2003) also stated that the results of Stohs and Mauer (1996) may have suffered from simultaneous equation bias. However, current empirical studies support the findings of Stohs and Mauer (1996), such as Alcock et al. (2012), Kirch and Terra (2012), Mimouni et al. (2019), and Orman and Köksal (2017).

Furthermore, Awartani et al. (2016) found that only two out of 10 countries in the Middle East and North Africa (MENA) region support the idea of Myers (1977), whereas they found weak evidence for the effect of GROW on DMS in the other 8 countries. Awartani et al. (2016) examined 444 listed firms from 2003 to 2011 in the MENA region which includes Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia, Tunisia and the United Arab Emirates (UAE). Awartani et al. (2016) explained that this irrelevancy is because the debt holders in the MENA region are banks. Therefore, the need to use short-term debt to reduce underinvestment problem is reduced due to banks' efficient monitoring

and enforcing of restrictive covenants. Likewise, Heyman et al. (2008) showed that GROW is not likely to affect TERM when they investigated 1132 privately held firms in Belgium over 1996–2000. The authors argued that the underinvestment problem could be minimized by reducing leverage and by bank monitoring, instead of by shortening debt maturity. However, Heyman et al. (2008) acknowledged that they may have used an inappropriate measure of GROW – past growth.

Moving on to developing countries, there are mixed results. While Krishnankutty and Chakraborty (2014) found a positive relationship between GROW and long-term debt with a sample of 321 non-financial listed firms on the Bombay Stock Exchange 500 Index during the period 2002–2011, Kalsie and Nagpal (2018) found no evidence to support this relationship with a sample of 29 non-financial listed firms on the Indian National Stock Exchange for the period 2008–2016. Although Krishnankutty and Chakraborty (2014) and Kalsie and Nagpal (2018) examined Indian non-financial listed firms, their results are inconsistent with each other and the theoretical prediction. The possible reason is that these two studies did not handle endogeneity problems. Although Krishnankutty and Chakraborty (2014) employed FE and GMM methods, they acknowledged that their results still had the endogeneity problem. Kalsie and Nagpal (2018) employed only the FE method. In Vietnam, Nguyen (2022b) found that firms with high GROW tend to issue long-term debt. As Nguyen (2022b) used a sample of 176 SME listed firms between 2010 and 2019, the author argued that small firms cannot access long-term debt, which decreases their GROW. On the other hand, Nguyen and Tran (2017) supported the theoretical prediction that GROW has an inverse relation with long-term debt when they examined 267 non-financial listed firms in Vietnam during the period 2008–2015. The authors employed several methods including FE, RE, GMM and two-stage least squares (2SLS) methods. The purpose of using the 2SLS method was to handle the endogeneity problem. Previous studies have revealed that firms with more GROW should employ more short-term debt to overcome the underinvestment problem (Barclay et al., 2003; Nguyen & Tran, 2017). Therefore, this study predicts a negative relationship between GROW and DMS.

Hypothesis 4: Growth opportunities have a negative effect on debt maturity structure.

3.3.2.2. Firm size

The risky asset substitution problem, which is another problem of agency costs, refers to risk shifting or the risk-incentive costs of debt (Deesomsak, 2006). For instance, if firms use risky debt, their assets tend to be shifted from low risk to high risk because stockholders need more compensation. Moreover, smaller firms are likely to have larger number of future investment opportunities and may have more asset substitution problems (Smith & Warner, 1979; Stohs & Mauer, 1996). In other words, small firms, which seem to face more conflicts of interest between shareholders and debt holders than large firms, tend to use more short-term debt to mitigate these conflicts.

Furthermore, small firms seem to pay more flotation costs of issuing new equity and long-term debt than large firms. Therefore, smaller firms tend to choose BD, especially short-term debt (Barclay & Smith, 1995). Titman and Wessels (1988) reported that smaller firms have more short-term borrowings in order to avoid high transaction costs of long-term debt when they employed a factor-analytic method to examine the effect of unobservable characteristics on choosing corporate DMS by US firms. Their sample was 469 manufacturing firms from 1974 to 1982.

Moreover, Queen and Roll (1987) showed that large firms seem to survive better than smaller firms in the long run, while Warner (1977) found a negative relationship between SIZE and the ratio of bankruptcy costs to firm value. Johnson (2003) found that large firms can access long-term debt more easily than small firms due to their better financial conditions when the author examined 4945 non-financial listed firms in the USA for the period 1986–1995. Later, Custódio et al. (2013) examined a significant decrease in using long-term debt in the smallest firms in the USA from 53% in 1976 to 6% in 2008 with a large sample of 12,938 US listed firms from 1976 to 2008, excluding financial firms. They found

that smaller firms seem to face much more information asymmetry and therefore are unable to use more long-term debt.

The majority of empirical studies have found a positive relationship between SIZE and DMS. In other words, large firms are able to finance their operations with long-term borrowings due to their lower transaction, monitoring and bankruptcy costs, less asymmetric information and better credit quality compared to small firms. For instance, Barclay and Smith (1995) found that larger firms with few GROW issues use more long-term debt. While Stohs and Mauer (1996) supported a positive relationship between SIZE and DMS, they found mixed support for a negative relationship between GROW and DMS. Like US firms (Barclay & Smith, 1995; Stohs & Mauer, 1996), small firms in other countries were found to use more short-term debt than large firms in 8 countries of the MENA region (Awartani et al., 2016), in 6 countries of the GCC region (Mimouni et al., 2019) and in a developing country – Turkey (Orman & Köksal, 2017). Furthermore, González (2015) showed that the debt maturity of smaller firms reduced more than larger firms during the period of the global financial crisis, especially in countries where banks play an important role.

Unlike the majority of existing research, some studies have found inconsistent results about the effect of SIZE on DMS in both developing and developed countries. For example, Guedes and Opler (1996) found that smaller and riskier firms are not likely to issue short-term debt with a sample of new debt issues in the USA from 1982 to 1993. They argued that firms with high risk prefer issuing long-term debt to minimize the risk of inefficient liquidation. Furthermore, Heyman et al. (2008) reported that larger privately held Belgian firms seem to have a higher leverage ratio and a shorter debt maturity. Kalsie and Nagpal (2018) also found an inverse relation between SIZE and debt maturity in India. On the other hand, Alcock et al. (2012) found a lack of support for this effect in Australia when they controlled for endogeneity and considered the interaction between leverage and debt maturity.

In Vietnam, while Lensink and Pham (2011) examined the effect of the signalling view on DMS, Nguyen and Tran (2017) investigated the effect of institutional

quality on DMS. Unlike the use of 267 listed firms' data obtained by Nguyen and Tran (2017), Lensink and Pham (2011) collected data on 277 loan contracts from a private bank as of July 2003; these two studies confirmed a positive impact of SIZE on DMS. Thus, based on the theoretical prediction and empirical evidence, this study expects that large firms tend to issue more long-term debt.

Hypothesis 5: Firm size has a positive effect on debt maturity structure.

3.3.2.3. *Asset maturity structure*

The matching principle is when the maturity of a firm's liabilities matches the maturity of its assets (Stohs & Mauer, 1996). When a maturity mismatch occurs, a firm may not have enough cash on hand to pay back its debt if debt has a shorter maturity than assets (Morris, 1976). In contrast, if the maturity of debt is longer than that of assets, then cash flows from assets stop, while debt obligations remain due. As a result, maturity matching reduces not only these risks but also expected costs of financial distress as a form of corporate hedging (Stohs & Mauer, 1996).

According to the agency costs theory, maturity matching can help reduce the underinvestment problem, which is caused by agency conflicts between stockholders and debt holders (Myers, 1977). This is because maturity matching can ensure that debt repayments are scheduled to match the decrease in value of assets in place. Therefore, a firm with more long-term assets in place might fund more long-term borrowings. This means that the maturity matching principle permits firms to lengthen their debt maturity without a significant rise in the agency costs of the debt (Guedes & Opler, 1996). Similarly, Chang (cited in Stohs & Mauer (1996)) confirmed that agency costs of debt financing can be reduced by maturity matching.

Furthermore, maturity matching is beneficial for firms based on not only the agency costs perspective but also the liquidity risk perspective. In particular, Diamond (1991) argued that employing long-term debt to finance long-term assets can help firms to reduce liquidity risk. However, when Orman and Bülent

(2015) analyzed a large sample of 11,687 Turkish non-financial public and private firms for the period 2004–2013, they found that SMEs were unable to use maturity matching to hedge liquidity risks, whereas listed firms did not need to do that. This was due to their low liquidity and bankruptcy risks in Turkey. SMEs, which are small and/or low credit quality firms, are likely to have their debts of shorter maturity than their assets, whereas listed firms have their debts longer than their assets. Thus, the maturity mismatch in SMEs is considered a serious concern in Turkey (Orman & Bülent, 2015).

On the other hand, there are a few studies that have found weak evidence to support this traditional corporate finance theory. Krishnankutty and Chakraborty (2014) found a positive but non-significant coefficient for AMS in India, but their model did not control for the endogeneity issue. Similarly, after Alcock et al. (2012) handled endogeneity problems in their model by employing several estimation methods such as pooled, instrumental variable (IV)–GMM, 2SLS and three-stage least squares (3SLS) methods, they found no support for the maturity matching theory in Australia. Furthermore, Kirch and Terra (2012) found an insignificant coefficient for asset maturity in six South American countries. However, the majority of previous studies support this theory in both developed and developing countries.

In the context of developed countries, maturity matching is an important determinant of DMS regardless of firm type or environment. Most existing studies have found strong evidence to support the prediction of the agency costs theory about a positive relationship between asset maturity structure and DMS (Morris, 1976; Myers, 1977). For instance, Guedes and Opler (1996) found that asset maturity positively affected the maturity of new debt issues in the USA by employing multivariate regression and sensitivity analysis, although they noted that this effect was nonlinear when using multinomial logit regression. In addition, Stohs and Mauer (1996) demonstrated that US non-regulated firms were likely to match their asset maturity to their debt maturity when they used cross-sectional, pooled and FE regressions. Furthermore, nearly 400 CFOs of US and Canadian firms confirmed that maturity matching was a critical factor in

choosing the term structure of debt (Graham & Harvey, 2001). Outside the USA, several studies in other countries have found strong evidence to support this effect, such as in the UK (Ozkan, 2000; Ozkan, 2002), in Belgium (Heyman et al., 2008) and in France and Germany (Antonioni et al., 2006). Recently, when Casino-Martínez et al. (2019) examined a large sample of 4897 unlisted firms and 1230 listed firms in France, Germany, Italy, Spain and the UK, they showed a significant and positive impact of asset maturity on DMS. They also employed an IV method to handle the endogeneity problem in their model.

Regarding developing countries, Cai et al. (2008) found strong evidence to support the maturity matching theory in China. Although Kalsie and Nagpal (2018) employed a different measure of asset maturity and used fewer methods to examine their model compared to Cai et al. (2008), they found that the asset maturity of Indian listed firms matched their debt maturity. Likewise, Stephan et al. (2011) and Orman and Köksal (2017) showed positive relationship between asset maturity and DMS in Ukrainian listed firms and Turkish medium-to-large private service firms, respectively. In Vietnam, there are two studies that found strong evidence to support this theory (Lensink & Pham, 2011; Nguyen & Tran, 2017). Furthermore, there are several cross-country studies that support this argument (Awartani et al., 2016; Demirguc-Kunt & Maksimovic, 1999; Zheng et al., 2012). Overall, the matching maturity principle receives strong support from empirical studies. This study predicts that firms tend to match their debt maturities with the duration of their assets.

Hypothesis 6: Asset maturity structure has a positive effect on debt maturity structure.

3.3.3. Signalling and liquidity risks hypotheses

In the presence of asymmetric information, it is difficult for outside investors to determine which firms are high or low quality and high or low risk. However, it is suggested that debt maturity may help to reduce the problem of asymmetric information (Flannery, 1986). Due to positive transaction costs, short-term borrowing is used by high-quality firms to indicate their quality to outside

investors. On the other hand, there is a trade-off between the benefit of short-term borrowing in enhancing a firm's quality (credit rating) and their liquidity risk (Diamond, 1991). Thus, even though firms with low quality or high risk prefer long-term debt to reduce liquidity risks and rollover costs, they may be forced to use short-term debt. This is because their low credit rating limits their access to the long-term debt market.

3.3.3.1. Firm quality

According to signalling theory, when there is a high level of asymmetric information, the market tends to require an unreasonably high default premium, especially for long-term debt. Thus, good quality firms want to choose short-term debt, which low-quality firms cannot do due to high transaction costs, to give a sign of their quality to the market. There are some empirical studies that support Flannery's model. For example, Barclay and Smith (1995) examined the validity of Flannery (1986) model using 39,949 observations for the period 1974–1992 from the USA. The authors confirmed that high-growth firms, which potentially have large information asymmetries, use more short-term borrowings. Similarly, Stohs and Mauer (1996) investigated corporate DMS for a sample of 328 industrial firms in the USA between 1980 and 1989. They also supported Flannery's hypothesis that short-term debt tends to be issued by firms with larger earnings. Although these two studies used different samples and DMS measurements, their results are in line with Flannery's signalling model. In general, there are several studies that have found consistent results for the hypothesis in developed countries (Alcock et al., 2012; Berger et al., 2005; Datta et al., 2005; Zheng et al., 2012).

According to Alcock et al. (2012), the findings of Barclay and Smith (1995) and Stohs and Mauer (1996) are not economically significant. Furthermore, Barclay and Smith (1995) admitted that the economic impact of the abnormal earnings variable, which they selected to represent the quality of firms, is trivial even though the estimated coefficient is significant. However, Alcock et al. (2012) supported the signalling hypothesis that good firms use short-term debt to signal their quality to the market in Australia. Alcock et al. (2012) also used abnormal

earnings as a proxy for QUAL like Barclay and Smith (1995) and Stohs and Mauer (1996). Interestingly, Alcock et al. (2012) found no support for many traditional theories on DMS (except the signalling hypothesis) when they considered the relationship between leverage and debt maturity in their model.

Furthermore, Awartani et al. (2016) showed a compatible result with the above studies in MENA countries even though they used ROA as a proxy for QUAL. While their sample comprised 3717 firm-year observations obtained from 10 countries between 2003 and 2011, only firms in Saudi Arabia and Qatar chose to use short-term debt to signal their strong financial position to the markets. Moreover, Fu and Tang (2016) analyzed a sample of 10,561 acquisitions for the period 1991–2010 in the USA. They found that the use of short-term debt by the acquirers was viewed by the capital markets as an indicator of high quality or high future profitability.

On the other hand, there are several major empirical studies that are not compatible with Flannery's hypothesis. For instance, Mitchell (1993) argued that there is weak evidence to support the signalling hypothesis that firms with positive net present value projects use bond maturity to signal their quality. The author used a subsample of 252 corporate bonds issued in the USA during the period 1982–1986 to test this hypothesis. Similarly, Ozkan (2000) found little support for signalling theory, although Ozkan (2000) explored the relationship between debt maturity choice and signalling theory in 429 non-financial UK firms during the years 1983–1996. Later, Ozkan (2002) investigated a smaller sample with 321 non-financial firms from 1986 to 1996 in the UK. The author continued to confirm that there is no evidence that non-financial UK firms use the maturity of their debt to signal their quality to the market. These two results are consistent, despite the fact that the samples, the models and the estimation methods were different. In addition, Antoniou et al. (2006) supported the findings of Ozkan (2000) and Ozkan (2002) when the authors examined three major European countries, France, Germany and the UK. In contrast, Mimouni et al. (2019) supported that long-term debt is used by more profitable firms to show their strong financial health and their ability to access long-term debt in GCC countries. They examined

a sample of 208 listed firms in six GCC countries including Saudi Arabia, Kuwait, Oman, Qatar, the UAE and Bahrain from 2003 to 2013.

In the context of developing countries, Stephan et al. (2011) supported the signalling theory in Ukraine. The authors confirmed that Ukrainian firms with lower earnings volatility tend to borrow long-term. This indicates that signalling theory is not only supported in developed countries such as the USA but also in developing countries such as Ukraine. Similarly, González (2017) confirmed the negative impact of QUAL on debt maturity when they used the same large sample of 30,727 firms in 39 developed and developing countries during the period 1995–2012. While González (2015) focused on the impact of the financial crisis on DMS, González (2017) focused on the effects of the banking environment, institutions and legal system on DMS. Furthermore, public firms in Turkey were found to use short-term debt to signal their quality (Orman & Köksal, 2017) even though the study used a different measure of QUAL – Altman's Z-score – to previous studies. However, Orman and Köksal (2017) also showed an insignificant relationship between QUAL and debt maturity for private SME firms. Their finding was consistent whether leverage was included in the model or not. Kalsie and Nagpal (2018) and Krishnankutty and Chakraborty (2014) found weak evidence to support the signalling hypothesis in India.

Meanwhile, Fan et al. (2012) argued that high-profit firms tended to issue long-term debt in 25 out of 39 countries in their sample over the period 1991–2006. Furthermore, Cai et al. (2008) found that high-quality firms in China tended to issue long-term debt. They argued that the financing sources of Chinese firms are mainly from banks. Therefore, long-term debt is not viewed by banks as a bad signal because banks believe that their close relationships with their borrowers permit them to evaluate the risks and the quality of firms properly. Conversely, Australian firms used short-term debt to show their high quality to the market even though they mainly rely on BD (Alcock et al., 2012).

The signalling hypotheses introduced by Flannery (1986) has received much support in both developed and developing countries, especially in Vietnam. For instance, Lensink and Pham (2011) and Nguyen and Tran (2017) found strong

evidence to support this hypothesis. Furthermore, only large firms in Vietnam seemed to use short-term debt to signal their quality, whereas firms with high cash flow seemed not to do the same as large firms (Nguyen et al., 2018). Chung and Phan (2020) found weak evidence to support a relationship between QUAL and debt maturity using a sample of 358 Vietnamese listed firms during the period 2007–2016.

Regarding signalling theory, high-quality firms prefer short-term debt to signal their high quality to the capital markets. The review of prior research has revealed a negative relationship between QUAL and debt maturity (Alcock et al., 2012; González, 2017). Hence, the following hypothesis is proposed:

Hypothesis 7: Firm quality has a negative effect on debt maturity structure.

3.3.3.2. *Liquidity*

Shortening debt maturity can reduce incentive for managers to profit themselves because it forces them to regularly return to debt holders for renegotiation (Harris & Raviv, 1991; Stulz, 1990). However, shorter debt maturity may lead a firm to face liquidity risk. Liquidity risk refers to the risk that lenders are not willing to refinance a debt (Diamond, 1991). This means that borrowers will be forced into costly liquidation. This causes a trade-off for borrowers between a firm's preference for short-term borrowing and liquidity risk. Diamond (1991) extended Flannery's (1986) signalling model by adding liquidity risk to the model.

While Flannery (1986) implied that all firms generally prefer short-term borrowing because of private information about their future profitability unless it leads to higher transaction costs, Diamond (1991) argued that liquidity risk needs to be considered as an important factor in choosing the length of debt. This is because lenders have a substantial controlling power if firms borrow short term. In other words, lenders have the right to liquidate or take control over some of a firm's assets when a firm cannot repay short-term debt in full at the maturity date. Therefore, some firms have an incentive to borrow long term to prevent the chance that they will be viewed as high-risk firms. This may lead to higher

borrowing costs or lenders may not refinance their debt. However, they are unable to access long-term borrowing because of their level of credit rating. They can be forced to choose riskier low-quality projects so that the rate of return can compensate investors for bearing long-term credit risk.

Overall, Diamond (1991) demonstrated that firms with the highest credit ratings normally chose to borrow short-term because of the low refinancing risk. On the other hand, firms with lower credit ratings tended to issue long-term debt to minimize the refinancing risk. Nevertheless, very low rated firms cannot issue long-term debt because their cash flows are not sufficient to support long-term debt. In other words, both very high-quality and low-quality firms are likely to issue short-term debt, while medium-quality firms prefer to issue long-term debt. Diamond (1991) developed a non-monotonic relationship between credit quality and debt maturity choice. Clearly, contract terms will be different between very high and low rated firms (Stohs & Mauer, 1996).

Orman and Köksal (2017) had similar findings to Diamond (1991) that low- and medium-quality firms seemed to have more long-term debt. However, the authors found no support for this in relation to high-quality firms in Turkey. Brick and Liao (2017) reported that low-credit-rating firms had more intermediate or long-term borrowings since these firms were locked out of the commercial paper market. Unlike previous studies (Heyman et al., 2008; Orman & Köksal, 2017), Brick and Liao (2017) developed a simultaneous model between cash holdings, leverage and debt maturity for a sample of 11,729 listed firms in the USA from 1985 to 2013. On the other hand, Heyman et al. (2008) showed that firms with high credit risk tended to be forced to use short-term debt, while firms with low credit risk attempted to lengthen their debt maturity in the context of a developed European economy – Belgium.

According to Myers and Rajan (1998), in some cases greater asset liquidity may decrease firms' capacity to raise funds. The authors explained that more liquid assets (e.g., inventories) may decrease managers' ability to carry out investment strategies, although excessive liquidity will increase firms' capacity to generate cash on short notice. On the other hand, lenders will face a risk that firm

managers may choose riskier investment projects before long-term debt matures or the conditions of firms might deteriorate over time (Antoniou et al., 2006). Therefore, lenders intend to impose limitations on long-term debt to minimize such risks. This also means that higher liquidity firms may raise long-term debt. Guedes and Opler (1996) and Antoniou et al. (2006) stated that firms with long-term investment opportunities tend to use long-term debt to avoid liquidity risks. Moreover, Morris (1992) (cited in Cai et al. (2008)) stated that firms with longer maturity of debt should have greater asset liquidity to meet the fixed payments of long-term debt during economic downturns. In addition, when Mimouni et al. (2019) added the effects of financial dependence, liquidity and the financial crisis on DMS to the same models, they found that the effect of the crisis became insignificant in GCC countries. The authors also reported that firms with higher liquidity seemed to have more long-term debt although they potentially had high financial dependence before the financial crisis.

In regards to developing countries, although Krishnankutty and Chakraborty (2014) reported a negative effect of liquidity on DMS in India, Kalsie and Nagpal (2018) and Cai et al. (2008) supported the liquidity risk hypothesis in India and China, respectively. Krishnankutty and Chakraborty (2014) explained that the negative effect could be because of high operating costs and a decrease in competition in the Indian market. Moreover, the difference in these two Indian studies could be because of differences in sample size and methods. While Kalsie and Nagpal (2018) employed the FE method, Krishnankutty and Chakraborty (2014) employed several methods such as FE, RE and GMM methods. Stephan et al. (2011) found that Turkish firms with high liquidity and low cash constraints tended to issue short-term debt so that underinvestment and asset substitution problems could be reduced. However, Nguyen and Tran (2017) reported a positive effect of liquidity through default risk control insolvency on DMS. Based on the theoretical prediction and empirical studies, this study predicts that firms with high liquidity tend to issue long-term debt.

Hypothesis 8: Firm liquidity has a positive effect on debt maturity structure.

3.3.3.3. *Firm leverage*

Leverage helps to reduce wasteful investment by using excess cash flow to make debt payments. In other words, leverage gives incentive for managers to work more efficiently, although it increases financial distress and conflict between debt holders and shareholders. Many empirical papers have argued that highly leveraged firms prefer long-term borrowing (Antoniou et al., 2006; Awartani et al., 2016; Mimouni et al., 2019; Zheng et al., 2012). Flannery (1986) explained that long-term debt can lower refinancing risks for highly leveraged firms. Similarly, Diamond (1991) stated that leverage increases liquidity risk. Thus, the author indicated that highly leveraged firms borrow more long-term debt because they can have more time to repay their debts. This means that long-term debt helps to prevent suboptimal liquidation. González (2015) and González (2017) found strong evidence to support Diamond's argument in their cross-country studies.

On the other hand, Barclay et al. (2003) examined the influence of regulatory environment and firms' investment opportunity sets on determining leverage and debt maturity policies in the USA. The authors showed a negative association between leverage and debt maturity because these two factors acted as substitutes rather than complements in reducing over- and under-investment problems. While Stohs and Mauer (1996) developed the debt maturity model of Barclay and Smith (1995) by controlling for differences in leverage, Barclay et al. (2003) argued that it is not appropriate to treat leverage as predetermined when examining how firms choose the length of debt. Barclay et al. (2003) employed structural equation models. While Dennis et al. (2000) employed a simultaneous model, they found the same result with Barclay et al. (2003) when leverage and contract terms were added in the model. Dennis et al. (2000) analyzed 2634 bank revolver facilities of medium and large listed firms in the USA.

Dang (2011) examined 678 listed firms in the UK between 1996 and 2003, excluding financial and utilities firms. The author developed a system-based model comprising three structural equations on leverage, debt maturity and firm investment. The system-based model was better than the single-equation model because of its ability to test several predictions about debt maturity, leverage and

firm investment. Furthermore, it simultaneously handled endogeneity and dynamics in making financing and investment decisions by a firm. Dang (2011) also employed IV and GMM methods to enhance the efficiency and consistency of their estimations. The author confirmed the positive effect of leverage on debt maturity.

Unlike Barclay et al. (2003) and Dang (2011), the purpose of this study does not focus on investigating whether leverage and short-term debt are strategic substitutes in reducing underinvestment problems. The study employs a simultaneous model to identify the determinants of DMS, like previous studies (Alcock et al., 2012; Cai et al., 2008; Orman & Köksal, 2017). In addition, leverage is an important factor in determining debt maturity. Stohs and Mauer (1996) argued that the findings of Barclay and Smith (1995) are misspecified due to not controlling for leverage. This could be because controlling for leverage can prevent downward bias in the coefficient of GROW. Similarly, Alcock et al. (2012) stated that erroneous findings on debt maturity theories could be made if not considering the relation between leverage and debt maturity. Alcock et al. (2012) employed the model of Merton (1974) and an IV method, and they found that Australian highly leveraged firms tended to issue more long-term debt. Furthermore, Mimouni et al. (2019) found strong evidence to support the positive relationship between leverage and debt maturity in the GCC region.

In the context of developing countries, although Kalsie and Nagpal (2018) found weak evidence to support the hypothesis in India, the positive relationship has received much support in China (Cai et al., 2008; Vijayakumaran & Vijayakumaran, 2019), in India (Krishnankutty & Chakraborty, 2014), in Turkey (Orman & Köksal, 2017) and in Vietnam (Nguyen & Tran, 2017). Regarding the liquidity risk theory, long-term debt could reduce the refinancing risks for highly leveraged firms. Previous empirical studies have shown that highly leveraged firms prefer long-term borrowing (Antoniou et al., 2006; Awartani et al., 2016; Mimouni et al., 2019; Zheng et al., 2012). Therefore, this study predicts that highly leveraged firms have high long-term debt.

Hypothesis 9: Firm leverage has a positive effect on debt maturity structure.

3.3.4. Debt maturity structure and bank debt

BD is viewed as private debt, whereas bonds are viewed as public debt. Choosing BD or bonds depends on a firm's asymmetric information issues (Johnson, 1997). According to Bolton and Freixas (2000), the riskiest firms tend to borrow from bank while the safest firms choose to issue bonds to avoid paying intermediation costs, while somewhat safer firms prefer issuing bonds and equity. This is because BD is more expensive than bonds due to intermediation costs even though it is more flexible. Overall, the mix between BD, bonds and equity varies across firms.

Furthermore, Kashyap et al. (1993) stated that firms change from BD to commercial paper when bank spreads rise. However, it has been shown that renegotiation for BD is easier than bond restructuring (Gilson et al., 1990; Hart & Moore, 1995). BD is also used to reduce the problem of asymmetric information between firms and debt holders. When Johnson (1998) examined 716 listed firms in the USA in 1989, the author found that firms with BD had higher debt to equity ratios. DMS is linked to some theoretical models such as agency costs, liquidity risks and signalling. These theories are also relevant to leverage. Thus, BD could be related to debt maturity.

BD seems to be predominant in some countries that have small and illiquid debt markets such as Australia (Alcock et al., 2012), China (Cai et al., 2008) and Vietnam (Phan, 2018). While several studies have supported the signalling hypothesis that firms use short-term debt to signal their high quality to markets (Orman & Köksal, 2017; Stephan et al., 2011), Cai et al. (2008) found that high-quality firms in China tended to issue long-term debt due to a unique condition of the Chinese financial markets that is heavy reliance on BD. Cai et al. (2008) argued that long-term debt is not viewed by banks as a bad signal due to the close relationship between banks and their customers, and banks' efficient monitoring activities. On the other hand, Australian firms supported the signalling hypothesis even though they mainly rely on BD (Alcock et al., 2012). Overall, the signalling hypothesis is not consistent although BDs dominate in both Chinese and Australian firms. This indicates that the impact of BD has not been examined

in the DMS research field, while it has been analyzed in current studies (Chen et al., 2020; Fernández et al., 2018; Lin et al., 2013). For example, González (2015) found that the impact of the financial crisis on TERM was stronger in firms with higher dependence on external finance. Furthermore, Azofra et al. (2020) examined the moderating effects of BD in the relationship between macroeconomic factors and LEV using a sample of five European countries for the period 2004–2015. The authors found that the influence of macroeconomic variables on capital structure was more pronounced in firms with higher reliance on BD. Thus, it is expected that the effects of firm-level determinants on DMS will vary depending on reliance on BD.

Hypothesis 10: The dependence of firms on bank debt has a moderating effect on the relation between firm characteristics and debt maturity structure.

3.4. Debt maturity and financial market development

The financial market development of a country has two dimensions, stock market development and banking sector development (Bekaert et al., 2005; Vithessonthi & Tongurai, 2016). The relationship between the development of financial markets and debt maturity is hypothesized based on the signalling and liquidity risks theory and the agency costs theory.

There are several studies that have explored the effect of national financial market development on DMS. For instance, Demirguc-Kunt and Maksimovic (1999) found that large firms in active stock markets and small firms in a country with a large banking sector had more long-term debt when they examined 30 countries in the period 1980–1991. However, there were mixed results on the effect of the banking system on the debt maturity of large firms. Their sample generally included countries with developed financial systems. On the other hand, Kirch and Terra (2012) found no evidence to support a relationship between the level of financial market development and debt maturity choice in five South American countries during the period 1996–2007. Kirch and Terra (2012) employed a factorial analysis of financial market development, whereas Tresierra and Reyes (2018) employed a factorial analysis of banking sector

development. Tresierra and Reyes (2018) supported the negative relationship between banking development and debt maturity. Both two studies used the GMM method in order to provide consistent and efficient results.

Overall, the majority of studies which have focused on the development of financial systems are cross-country studies (Demirguc-Kunt & Maksimovic, 1999; Kirch & Terra, 2012; Tresierra & Reyes, 2018), whereas this study is a single-country study. Fan et al. (2012) argued that researchers can control data quality in a single-country study better than in a cross-country study. Similarly, ElBannan (2017) stated that a single-country approach can provide a better explanation of the main characteristics and features of the target country.

3.4.1. Stock market development

According to the signalling hypothesis, high-quality firms tend to issue short-term debt to indicate their undervaluation. Thus, long-term debt is expected to be issued when there is a rise in share price (Guedes & Opler, 1996). Antoniou et al. (2006) also supported the argument that managers in the UK and Germany observed the equity market conditions before choosing TERM. They measured stock market conditions as share price performance and equity risk premium. They found evidence to support the signalling theory that firms tend to have more long-term borrowing after their shares go up. Moreover, Grossman and Stiglitz (1976) and Grossman (1976) argued that listed firms are viewed as less risky firms because their stock prices represent how much information investors are holding. Thus, listed firms are able to issue long-term debt.

Firms in countries with developed stock markets may switch from long-term borrowing to equity because they have more opportunities to diversify their financing structure (Demirguc-Kunt & Maksimovic, 1999). However, Demirgüç-Kunt and Maksimovic (1996) found that while firms in developed markets preferred long-term debt rather than equity financing, only large firms in developing markets tended to have more debt when their stock markets developed. This could be because listed firms must disclose information that makes creditors assess listed firms as less risky borrowers. Information

asymmetry has been a prevalent problem in financial markets (Tram et al., 2022). In other words, disclosing information leads to a decrease in cost of borrowing. Importantly, there is an increase in cost of risk-taking behaviour of shareholders due to the liquidity of stock markets, which allows informed shareholders to avoid the consequences of failed gambles (Demirguc-Kunt & Maksimovic, 1999).

According to Demirgüç-Kunt and Levine (1996), the indicators of stock market development identified in the literature are: (1) stock market size; (2) stock market liquidity; (3) SCON; (4) stock market volatility; (5) regulatory environment and development of institutions; (6) asset pricing efficiency; (7) and conglomerate indexes that aggregate the information contained in the individual measures. Giannetti (2003) confirmed that listed firms always had longer debt maturity in countries that had higher stock market capitalization – the main measurement of stock market size. The author analyzed a large sample of 61,577 unlisted and listed firms in eight European countries for the period 1993–1997. Furthermore, Cai et al. (2008) found that Chinese firms tended to borrow short term when there was high volatility and high market return in the stock market. Kirch and Terra (2012) reported a positive relationship between institution quality and long-term debt in five South American countries. Further, previous studies in corporate finance research have reported that stock market liquidity can reduce agency costs conflicts (Bharath et al., 2013; Brogaard et al., 2017; Marks & Shang, 2021; Chen et al., 2019; Chen et al., 2021). Marks and Shang (2021) found that when stock market liquidity increased, firms used less short-term debt due to a decrease in the need for debt market monitoring using a sample of 11,106 firms over the period 1985–2017 in the USA. Furthermore, firms which aimed to decrease refinancing costs and risks could have incentive to increase the proportion of long-term debt in their DMS. The negative relationship between stock market liquidity and short-term debt was more pronounced in the presence of large institutional investors and when firms faced higher refinancing risks (Marks & Shang, 2021).

Stephan et al. (2011) stated that there is a need to revisit and verify the findings from developed countries in developing country frameworks. For example, firms

in underdeveloped financial markets are forced to access and raise expensive outside funds. This is because there is more loan denial as well as default premiums due to lack of history credit and high volatility of the macroeconomic environment (Stephan et al., 2011). According to ElBannan (2017), developing countries are described as having inefficient capital markets and domination by the banking sector. Furthermore, high information asymmetry, high debt–equity ratios, limited access to financing sources and illiquid financial markets, which lead to high volatility, have been widely discussed as characteristics of developing economies (Ahunwan, 2002; Claessens & Djankov, 2002; ElBannan, 2017; Rwegasira, 2000). Hence, each developing country can have different capital structure determinants due to its different market conditions (ElBannan, 2017). This implies that, due to the unique financial market environment (discussed in Chapter 2), the stock market influence on the choice of debt maturity in Vietnam is different from other developed countries as found in previous studies (Demirgüç-Kunt & Maksimovic, 1996; Giannetti, 2003).

In the context of Vietnam, when Nguyen et al. (2012) investigated 116 listed firms over 2007–2010, they reported that short-term bank loans dominated in the capital structure of Vietnamese firms. This could be because the Vietnam stock markets are still not mature compared to other developed economies, although they have continued growing since establishment in 2000 (Vo, 2019a). Furthermore, Nguyen and Tran (2017) employed the ratio of total market capitalization to GDP as a proxy for stock market development. Nguyen and Tran (2017) found that firms tended to issue more long-term debt when the stock market developed. This is consistent with the finding of Giannetti (2003). Even though Chung and Phan (2020) measured stock market development as the ratio of total value of all trade shares in the stock market exchanges to GDP, the authors found evidence to support a positive relationship between the stock market and DMS using a sample of 358 listed firms on the HOSE and HNX from 2007 to 2016. Overall, stock market development significantly and positively influences the choice of DMS in Vietnam.

The Vietnamese stock market has a very high concentration. Kanasro et al. (2009) stated that SCON is an important factor in a capital market. Recently, Bae et al. (2021) employed the size, liquidity and concentration of the stock market as proxies for stock market development when they examined the impact of SCON on the economy using a sample of 47 countries. The authors found that SCON had a negative effect on capital allocation efficiency, economic growth, IPO and innovation activity. They also stated that the characteristic of SCON was completely distinct from a stock market's size and liquidity. Similarly, Demirgüç-Kunt and Levine (1996) stated that the liquidity of the stock market could be negatively affected by SCON. In other words, SCON seems to reduce the liquidity of the stock market, or stock market development in general. In Vietnam, Chung and Phan (2020) measured stock market development as the liquidity of the stock market as the ratio of total value of all trade shares on the stock market exchanges to GDP. They confirmed a positive relationship between stock market liquidity and DMS. Hence, as SCON is used as the proxy for stock market development, firms are expected to lengthen their debt when SCON decreases.

Hypothesis 11: Stock market concentration has a negative effect on debt maturity structure.

3.4.2. Banking sector development

Monitoring borrowers is viewed as a main function of banks. Banks have higher incentive to obtain information and use the collected information to discipline borrowers than small investors (Diamond, 1984). Thus, a developed banking sector can facilitate access to external funding. Agarwal and Mohtadi (2004) highlighted that there is a positive relationship between development of the banking sector and leverage. In addition, Demirgüç-Kunt and Maksimovic (1998) stated that countries with developed and active financial markets and large financial institutions such as banks should facilitate firms to raise long-term capital due to two major comparative advantages of banks: economies of scale and the ability to monitor covenants that support them to provide long-term loans. However, banks also prefer lending short term because of their comparative

advantage in monitoring. This means that banks are able to change covenants or not renew loans (Diamond, 1991).

In general, BANK is usually used as an indicator for the development of the banking sector. Fan et al. (2012) investigated 36,767 listed firms from 39 countries from 1991 to 2006, including developed and developing countries. They found that firms in countries with larger banking sectors or larger government bond markets seemed to shorten their debt, while firms in countries with explicit deposit insurance and larger private bond markets tended to lengthen their debt. This is in line with the finding of Demirguc-Kunt and Maksimovic (1999) that banks were likely to use their great monitoring advantage through short-term debt. Furthermore, González (2017) stated that due to bank preference for short-term borrowing, the weight of banks in the economy negatively affected the length of debt in a sample of 39 countries. Unlike Fan et al. (2012), the model of González (2017) included country-level determinants which were also found to be economically significant. In contrast, Awartani et al. (2016) found firms in the MENA region were more likely to issue long-term debt as the weight of financial intermediates increased.

On the other hand, Rajan and Zingales (1995) reported that small firms in the USA had greater financial constraints in less concentrated debt markets. In addition, González and González (2008) found a positive relationship between leverage and bank concentration. Due to this, there was a prediction that relationship banking can lead to a decrease in the asymmetric information problem. Thus, bank concentration may influence DMS. Giannetti (2003) stated that firms tended to shorten their debt in countries where the banking sector was concentrated. In contrast, González (2017) and González (2015) reported that bank concentration influenced bank incentive to lengthen debt. This finding implies that banks have strong incentive to build close relationships with firms when the banking sector is concentrated. When Hernández-Cánovas and Koëter-Kant (2008) investigated the effect of relationship lending on debt maturity for a survey sample of 3366 SMEs in 2002 from 19 European countries, they found a positive association between debt maturity and firm–bank relationship. Thus,

financial constraints on firms were decreased. Furthermore, while bank concentration mitigates the negative impact of financial crises on debt maturity (González, 2015), the effect of BANK and bank concentration on DMS is greater for smaller firms in the private sector (González, 2017).

In the context of developing countries, Etudaiye-Muhtar et al. (2017a) examined a sample of 599 listed firms from nine countries in Africa over the period 2003–2012. They showed a positive relationship between BANK and debt maturity, which is inconsistent with Awartani et al. (2016). However, Tresierra and Reyes (2018) found that the level of banking development had a negative relationship with DMS for a sample of 116 non-financial firms in Peru and Brazil between 2004 and 2014. Due to the undeveloped financial markets in these two countries, firms were expected to shorten their debt maturity as the banking system developed. Similarly, Vietnamese firms tend to have more short-term debt when the financial intermediates develop (Nguyen & Tran, 2017). While Vietnam is a bank-based system (Phan, 2018; Vo, 2019b), Nguyen and Tran (2017) measured the development of financial intermediates as the measurement of BANK. Therefore, this study expects an inverse relation between the development of the banking sector in the economy and DMS due to bank preference for short-term debt.

Hypothesis 12: Banking sector development has a negative effect on debt maturity structure.

3.5. Debt maturity structure and ownership structure

The study hypothesizes a relationship between ownership structure and DMS following the agency theory of Jensen and Meckling (1976) and Jensen (1986) and the liquidity risk theory of Diamond (1991). In the context of Vietnam, four main aspects of ownership structure – state, foreign, large shareholder and managerial ownership – are examined in the study. As it is a transitional country, SO is prevalent among Vietnamese companies while FO has increased significantly. According to Phung and Mishra (2016), the total ownership of the government and foreign investors equated to more than 50% of Vietnamese GDP

in 2012. Furthermore, approximately 38% shares in Vietnamese listed firms and 59% shares in state-owned firms are owned by managers (Do & Wu, 2013).

3.5.1. Large shareholder ownership

Large shareholders refer to those who hold a sizeable percentage of voting shares in publicly held firms (Zeckhauser & Pound, 1990). LO and short-term debt are generally viewed as governance mechanisms as they can reduce managerial discretion (Shyu & Lee, 2009). The presence of large shareholders can solve the free rider problem because they have more motivation to monitor the actions of management than small shareholders (Shleifer & Vishny, 1986; Zeckhauser & Pound, 1990). Zeckhauser and Pound (1990) employed a cross-sectional method to examine the impact of large shareholders on corporate financial policies through a sample of 286 listed firms in the USA in 1988. The authors found that their presence provided a strong signal to the market that the management was monitored frequently and closely. Moreover, the presence of large shareholders helps to reduce the need for other financial policies such as dividend payouts and capital structure that give a sign of higher future profit rates to the market.

Furthermore, large shareholders can reduce the agency problem between managers and shareholders due to their strong incentives to collect information and monitor management (Fernández-Méndez & González, 2018). This implies that there could be a substitution effect between short-term debt and LO on monitoring activity. In other words, creditors may not need to offer short-term debt to monitor managers while firms prefer longer maturity loans to avoid costly liquidation. While Marchica (2007) found a negative relationship between large shareholders and short-term debt, Ben-Nasr et al. (2015) reported that firms with multiple large shareholders shortened their debt maturity. In particular, Marchica (2007) employed three methods: OLS in levels, within-group and GMM, to examine a sample of 625 listed non-financial firms from the UK from 1991 to 2001. The author used two measurements for large external investors: (1) the total percentage of all large shareholders who owned over 5% of the stocks in

each firm; and (2) the percentage of the largest shareholder, and these proxies negatively affected short-term debt.

On the other hand, Ben-Nasr et al. (2015) analyzed 604 French listed non-financial firms during the period 1998–2013. They used a propensity-score matching procedure and IV regressions to address the endogeneity problem. The presence of multiple large shareholders was viewed as an efficient monitoring role that helped to prevent controlling owners from seeking private benefits such as avoiding using short-term debt to protect them from frequent monitoring by creditors.

Similarly, when Lin et al. (2013) constructed a large international sample of 9831 listed firms in 20 East Asian and Western European countries for the period 2001–2010, they reported that a firm that had large shareholders with excess control rights preferred public debt rather than BD. BD generally has shorter maturity than public debt (Johnson, 1997; Stohs & Mauer, 1996).

Furthermore, the presence of dominant shareholders increases the degree of control over a firm. According to Aslan and Kumar (2012), dominant shareholders can lead to a decrease in payoff conditional on the default of creditors and an increase in the unconditional probability of default. Martins et al. (2017) found a negative relationship between long-term debt and the largest shareholder who had high ownership concentration. Low ownership concentration increases long-term debt in line with the monitoring impact of large shareholders (Martins et al., 2017). Their sample included 1382 firm-year observations from Brazilian and Chilean listed firms over the period 2008–2013.

Recently, Fernández-Méndez and González (2018) found that Spanish firms that had bank-shareholders were more likely to have long-term debt when they examined a sample of 3044 listed and unlisted firms, excluding financial firms, between 2005 and 2012. Being a large shareholder permit banks to have better inside information so that they can determine the borrower's solvency. Hence, the presence of bank-shareholders could reduce the agency conflict between firms and creditors. Furthermore, during a financial crisis bank ownership also

helps to access to debt financing (Fernández-Méndez & González, 2018). In addition, García-Teruel and Martínez-Solano (2010) showed a positive effect of large shareholders on long-term debt for a sample of Spanish listed firms although their ownership was low.

In the context of developing countries, Le and Tannous (2016) reported weak evidence for the effect of LO, although MO, SO and FO significantly affected debt level of Vietnamese listed firms. However, Arslan and Karan (2006) examined 134 non-financial firms listed on the Istanbul Stock Exchange between 1997 and 2003 and found that Turkish firms with the presence of large shareholders seemed to have more long-term debt. This is because the presence of large shareholders demonstrates that they control and monitor managers well. It means that short-term debt is less necessary.

As discussed above, the study expects a positive relationship between large shareholders and DMS.

Hypothesis 13: Large shareholders have a positive effect on debt maturity structure.

3.5.2. Foreign ownership

Foreign investors generally behave like institutional investors, especially in having the same investment strategy, in Vietnam (Vo, 2010; Vo, 2016a). This could be because foreign institutional investors normally account for a large percentage of foreign investment (Coval & Moskowitz, 1999; Dahlquist & Robertsson, 2001; Vo, 2010). As foreign institutional shareholders, they have better experience and knowledge to gather and analyze information to interpret firm performance than small shareholders. Thus, agency costs can be reduced because foreign shareholders are able to monitor managers and force them to invest efficiently. The presence of foreign shareholders can substitute for short-term debt to reduce agency costs. Tanaka (2010) supported this argument as the author found a positive relationship between FO and DMS using a sample of 225

Japanese listed firms that had newly issued corporate bonds during the period 2005–2009.

In contrast, Choi and Choi (2013) found that firms with high FO employed more short-term debt in Korea. Their sample included 2903 firm-year observations from listed firms between 2006 and 2008. They argued that FO has the ability to monitor managers, thereby mitigating agency conflicts. Thus, managers have less incentive to issue long-term debt to seek personal benefit and to insulate them from frequent monitoring by debt holders. Furthermore, Muñoz-Mendoza et al. (2019) demonstrated that firms with low FO levels had a negative relationship with long-term debt because short-term debt could help to reduce wealth expropriation, as well as improving the matching between firm and foreign owner interests. However, they also found that when foreign owners held more than 50% of shares in SMEs or 60% of shares in large firms, the impact of FO on DMS became positive. This could be because foreign owners seem to take control of firms at this stage. Thus, firms do not need to issue short-term debt to reduce agency conflicts. Muñoz-Mendoza et al. (2019) found these results by investigating a large sample of 20,586 Chilean large companies and SMEs in 2007, 2009, 2013 and 2015.

On the other hand, Marchica (2001) found weak evidence to support a relationship between institutional investors and debt maturity when they investigated 200 English listed firms, excluding financial firms, during the period 1990–1999. The authors argued that institutional investors are less likely to become involved in a firm.

In the context of developing countries, even though Salehi and Sehat (2019) considered both active and passive institutional owners, they found a non-significant coefficient between institutional ownership and DMS for a sample of 143 listed firms in Iran over the period 2011–2016.

In contrast, Gurunlu and Gursay (2010) found a negative relationship between FO and long-term leverage when they analyzed 143 non-financial listed firms in Turkey from 2007 to 2008. Long-term leverage is a ratio of long-term debt to

equity. They stated that leverage and FO have an inverse relationship because of the efficient monitoring role of foreign owners. This finding is somewhat in line with that of Le and Tannous (2016), who supported the negative impact of FO on leverage in Vietnam.

However, Huang et al. (2011) found a positive association between institutional ownership and corporate leverage in highly leveraged Chinese firms. Likewise, Phung and Le (2013) argued that the monitoring role of foreign owners seemed not to work in Vietnam when they showed a positive coefficient between FO and leverage. This could be because foreign owners were restricted to holding up to 49% ownership of Vietnamese listed firms. The authors employ pooled, FE and RE method to examine Vietnamese non-financial firms listed on the HOSE between 2008 and 2011.

On the other hand, some studies have suggested that FO impacts some areas. For instance, Le and Le (2017) found that Vietnamese firms that have state and foreign owners as the largest shareholders tended to have greater dividend payout ratios. Furthermore, while foreign investors help to enhance stock price informativeness in the Vietnamese stock markets (Vo, 2017b), they improve the stock price efficiency in the Vietnamese stock markets by combining both local and global information in stock prices (Vo, 2019a). Further, while Pham and Do (2015) reported that Vietnamese firms had high voluntary disclosure when they had high FO, Allaya et al. (2022) found that firms with higher voluntary disclosure tended to lengthen their debt. Thus, FO could play an efficient monitoring role to reduce agency problems. This means that FO could substitute for the role of short-term debt. Therefore, the study expects that firms with high FO have more long-term debt.

Hypothesis 14: Foreign ownership has a positive effect on debt maturity structure.

3.5.3. State ownership

Firms with higher SO normally have greater ability to access the debt market due to the guarantee offered by the government (Huang et al., 2011; Li et al., 2009).

For instance, Huang et al. (2011) showed a positive relationship between SO and leverage in highly leveraged firms when they analyzed 767 listed firms, excluding financial firms, in China for the period 2002–2005. They stated that Chinese firms mainly rely on bank loans because the Chinese bond market is immature. This is in line with the explanation of Cai et al. (2008). Furthermore, although highly leveraged firms have high expected default risks, they can borrow more because the controlling shareholder in most Chinese firms is the government (Huang et al., 2011).

Similarly, Ruan et al. (2014) reported that state-controlled firms had better access to long-maturity debt in China than private firms. Banks in China, and in transition countries broadly, may consider that SOEs are less risky than private firms. Therefore, banks tend to provide longer maturity loans to state-owned firms and shorter ones to private firms to avoid default risk. While Ruan et al. (2014) used a sample of 4646 firm-year observations of state-owned firms and 1278 observations of private firms over the period 2001–2008, Boubakri and Saffar (2019) conducted a study that examined the relationship between SO and debt maturity for a sample of 453 privatized firms from 62 countries from 2001 to 2014. Boubakri and Saffar (2019) found that firms with SO prefer bank loans rather than public debt such as bonds, especially in countries that have high SO of banks. They also found a positive relationship between SO and debt maturity. They argued that firms with SO not only have better access but also borrow at preferential rates due to an implicit guarantee of rescue in case of liquidation.

Regarding the context of Vietnam, Nguyen and Ramachandran (2006) reported that managers of state-owned SME firms seemed to have stronger relationships with banks than private SMEs. They also found that state-owned SMEs had higher leverage than private SMEs due to their high ability to access bank loans when they examined 176 state-owned SMEs and 382 privately owned SMEs for the period 1998–2001. Their findings are similar to those of Boubakri and Saffar (2019) and Huang et al. (2011). Likewise, Okuda and Lai (2012) and Nguyen et al. (2012) supported the argument of Nguyen and Ramachandran (2006) for a sample of Vietnamese firms. Furthermore, Thai (2017) found that firms with low

SO seemed to have more short-term borrowings, whereas they found weak evidence to support a positive effect of higher SO on long-term debt. The author employed four methods including FE, RE, pooled and clustered FEs to examine 261 non-financial firms listed on the HOSE from 2007 to 2014. However, Vietnamese firms with higher SO prefer less risk-taking activity (Vo, 2018c), while short-term debt has more liquidity risk than long-term debt.

In summary, previous studies have supported the argument that firms with SO have better access to BD than private firms, while firms prefer long-term debt due to low liquidity risk. The study expects that state-owned firms issue more long-term debt.

Hypothesis 15: State ownership has a positive effect on debt maturity structure.

3.5.4. Managerial ownership

Managers with higher share ownership are likely to choose a greater proportion of short-term debt to maximize shareholder value. This is mainly because short-term debt indicates the strong commitment of managers to reducing agency problems and keeping expropriating risks under control. Furthermore, managers generally have favourable private information about the profitability and cash flow of future projects. Therefore, they tend to avoid locking into long-maturity debt, which has high default premiums required by creditors.

Datta et al. (2005) extended the model of liquidity risk and debt maturity of Diamond (1991) by relaxing the assumption of perfect interest alignment between managers and shareholders. When they analyzed 1185 industrial firms listed in the USA during the period 1992–1999, they found that firms with low MO tended to issue more long-term debt even in the case of low liquidation risk. This could be because self-interested managers with no or low ownership prefer long-term borrowing to protect them from frequent monitoring by lenders. Their model controlled almost all main factors of DMS, especially the jointly endogenous variables of leverage and debt maturity.

Likewise, Guney and Ozkan (2005) supported a negative relationship between MO and debt maturity for a sample of 780 listed firms in the UK over the period 1996–2000. They argued that this negative effect could be a result of managerial incentive to make firms riskier for outside investors to decrease the chance of takeover. Furthermore, while Custódio et al. (2013) supported the negative effect for a sample of firms in the USA, Tanaka (2016) reported that Japanese firms with higher MO chose to shorten their newly issued bonds with a sample of 283 listed firms during the period 2005–2012. Unlike previous studies, Tanaka (2016) focused on newly issued corporate bonds. Tanaka (2016) also found that firms with higher MO had higher risk-taking activity, which led to higher performance, but they had lower credit ratings.

However, entrenched owner-managers may lengthen the maturity of debt to reduce frequent monitoring by lenders. Furthermore, they try to avoid losing their job, reputation and rewards by choosing long-term debt. García-Teruel and Martínez-Solano (2010) found a positive relationship between MO and debt maturity in firms with lower MO. The positive effect became a negative effect for higher levels of MO. García-Teruel and Martínez-Solano (2010) employed a sample of 67 non-financial listed firms from 1995 to 2001. Although Guney and Ozkan (2005) tested a non-monotonic relationship between debt maturity and MO, they found weak evidence for the nonlinear relation. This result is inconsistent with those of Guney and Ozkan (2005) and Datta et al. (2005). This could be because of using different methods to estimate. For instance, García-Teruel and Martínez-Solano (2010) employed GMM methods, whereas Datta et al. (2005) used multivariate analysis and 2SLS methods.

In regards to emerging countries, Akhbar (2017) examined the effect of MO on debt maturity for a sample of 47 manufacturing firms listed on the Indonesian Stock Exchange for the period 2009–2012. The author employed a 2SLS method to estimate the sample and found that firms with MO had shorter debt maturity. This is in line with Datta et al. (2005) that owner-managers had freedom to choose the level of debt as well as the maturity of debt to reduce agency costs. In addition, when Abdioglu and Abdioglu (2017) analyzed a sample of 159 firm-year

observations from Turkish listed firms between 2005 and 2013, they found evidence to support a negative association between MO and debt maturity. They also found that firms with managerial entrenchment tended to choose long-term debt. In the Vietnam context, Le and Tannous (2016) found a positive effect of MO on leverage for a sample of 2797 firm-year observation between 2007 and 2012. Leverage increases bankruptcy costs and decreases finance costs. Thus, the study predicts that firms with MO choose to shorten their debt because managers trade off between risks and returns, as suggested by Tanaka (2016).

Hypothesis 16: Managerial ownership has a negative effect on debt maturity structure.

3.5.5. Moderating effect of outside shareholders

Managers who own higher proportions of shares will lose their jobs, reputations and wealth if their firms do poorly or go bankrupt. Thus, they prefer less risky projects which have lower expected returns, while other shareholders have the opposite preference (Marchica, 2007). Furthermore, entrenched insiders prefer long-term debt to reduce frequent monitoring by creditors even though there are high borrowing costs and/or high agency conflicts between controlling and minority shareholders (Ben-Nasr et al., 2015; Datta et al., 2005). However, firms with high MO prefer high-risk activity to enhance their firm performance (Tanaka, 2016). This leads to an increase in managers' wealth. Thus, owner-managers are likely to choose short-term debt, which is riskier, than long-term debt in terms of liquidity risk. Overall, when managers have enough shares and voting power, they can seek their own self-interest, which takes corporate resources in a different direction at the cost of other shareholders.

However, Shleifer and Vishny (1986) argued that large outside shareholders are able to pay monitoring costs, whereas small shareholders do not have enough motivation to pay for this. Thus, by concentrating ownership, the management team is monitored efficiently by large shareholders. In addition, a firm's financial structure is improved when the management team is monitored effectively by outside board members (Morck et al., 1988). Furthermore, Mehran (1992) found

a negative relationship between MO and the presence of outside directors for a sample of 170 manufacturing listed firms in the USA during the period 1973–1983. Outside directors, who are not hired by managers, can monitor managers efficiently and affect their financial decisions indirectly. However, not all outside directors can monitor management effectively to affect financial decisions, because Mehran (1992) found no evidence to support an association between leverage ratio and outside directors. The author found that firms with outside directors appointed by banks or investment banking companies preferred long-term debt, while the largest individual investors were positively related to short-term borrowing. While the presence of financial institutions on the board can help firms to have better borrowing terms without providing too much information to the market, the largest individual shareholders generally appear in smaller firms, which depend more on short-term than long-term borrowings.

Moreover, Ben-Nasr et al. (2015) reported a positive relationship between multiple large shareholders and short-term debt for a sample of French firms. They confirmed that multiple large shareholders play an effective monitoring role to restrain entrenched controlling owners from choosing long-term debt which helps them to avoid external monitoring by lenders. Boubaker et al. (2017) stated that multiple large shareholders have both voting rights and incentive to impact internal financing decision-making such as the choice of debt source. The authors used a sample of 654 listed firms for the period 1998–2013 in France. They found a positive relationship between multiple large shareholders and the level of BD. They stated that controlling owners are not likely to borrow funds from banks as banks have better ability to monitor and renegotiate loan contract terms than other creditors. Thus, the presence of multiple large shareholders decreases the incentive of controlling owners to avoid BD. This impact is stronger when agency problems are more severe. Hence, the governance role and voting power of other large shareholders could influence the relationship between controlling managers and the choice of DMS.

A few studies have examined the moderating effects of outside shareholders in corporate finance. For instance, Ratnawati et al. (2016) examined the role of

institutional investors in the relationship between MO and earnings of management due to inconsistent findings on the impact of MO and institutional ownership on earnings of management. The authors found that institutional ownership strengthened the negative relationship between MO and earnings management when they examined a sample of 115 manufacturing listed firms in Indonesia between 2008 and 2012. This is because institutional shareholders had better monitoring of management activity due to their ability to access, collect and analyze a firm's relevant information. They could actively restrict manager-shareholders to involvement in earnings management. Thus, firms with more institutional shareholders have lower MO because their presence decreases managers' willingness to own shares in the firms. Le (2015) aimed to provide better understanding of the link between ownership structure and capital structure decisions by examining the relationship between them. Le (2015) argued that prior studies seemed to link ownership with capital structure in order to find the determinants of capital structure. Hence, the author contributed to the literature of capital structure by providing an in-depth analysis of this relationship, especially in developing countries. In particular, Le (2015) employed a sample of 2797 firm-year observations of Vietnamese listed firms, excluding the financial sector, for the period 2007–2012 to examine the moderating effect of outside shareholders on the relationship between inside shareholders and capital structure. Le (2015) found that while foreign shareholders negatively weakened the positive relationship between MO and capital structure, other outside shareholders were unlikely to influence management action. This could be because foreign shareholders in Vietnam are mainly institutional investors who have strong incentive to protect their capital through monitoring activity. Thus, they could limit managers to issue more debt when the debt level reaches the optimal capital structure. This implies that with the presence of foreign investors, managers are unable to increase their control and to seek their own interests. Furthermore, Abidi et al. (2022) aimed to investigate the moderating impact of SO on the relationship between systematic risk and corporate governance. They argued that firms with higher SO had better governance mechanisms as the state may play an important role in reducing financial risks and information asymmetry.

Abidi et al. (2022) obtained a dataset of 22 banks in the GCC from 2004 to 2018. The authors found strong evidence to support their argument that the state strengthens the effect of corporate governance on systematic risk.

In summary, outside and inside shareholders can interact with each other to affect a firm's operations, especially the firm's capital structure decisions (Chaganti & Damanpour, 1991). Several studies have supported the argument that large outside shareholders directly and indirectly reduce the risks of information asymmetry based on their effective monitoring role (Le, 2015; Shleifer & Vishny, 1986). According to agency costs theory, the interests of managers and shareholders may conflict, especially in making financial policy decisions. Besides using short-term debt, monitoring by major shareholders can also mitigate agency conflicts. While government, foreign and large shareholders are considered outsider ownership, they generally have knowledge, experience and voting power to monitor managers and reduce managerial discretion. These outside shareholders seem to have more motivation and authority to monitor management than small individual shareholders. To get the best return on their investment, they will influence managers' decisions to make sure that managers will seek to maximize firm value instead of seeking personal benefit. Therefore, the study expects that large outside shareholders may affect the relationship between manager-shareholders and DMS.

Hypothesis 17: State, foreign and large shareholders have an effect on the relationship between managerial ownership and debt maturity structure.

3.6. Debt maturity structure and firm performance

Agency costs of debt arise from conflicts of interest between shareholders and debt holders when debt financing is used to deal with the agency costs of equity. However, when leverage is relatively high, it may affect firm performance negatively because of high expected bankruptcy costs. Myers and Majluf (1984) suggested a negative relationship between leverage and firm value under pecking order theory. Furthermore, McConnell and Servaes (1995) found that leverage negatively affected corporate value of high-growth firms whereas

leverage positively affected corporate value of low-growth firms. McConnell and Servaes (1995) employed a large cross-sectional sample of 1173 firms, 1093 firms and 1943 firms listed on the New York Stock Exchange or the American Stock Exchange in 1976, 1986 and 1988, respectively. The authors used TOQ to measure corporate value.

Furthermore, theoretical corporate finance research has studied the effects of debt maturity on financial decisions and firm performance. Myers (1977) stated that conflicts between bondholders and shareholders are reduced by shortening the maturity of debt. Schiantarelli and Sembenelli (1997) stated that creditors will monitor firms with more short-term debt frequently. This causes favourable effects on firm performance (Schiantarelli & Sembenelli, 1997).

Regarding empirical studies, although existing studies have mainly focused on the relationship between capital structure and firm performance (Dessí & Robertson, 2003; Le & Phan, 2017; McConnell & Servaes, 1995; Ramli et al., 2019; Rashid & Islam, 2009), there are some empirical studies on the effect of DMS on firm performance (Vijayakumaran, 2016; Schiantarelli & Jaramillo, 2002; Schiantarelli & Sembenelli, 1997).

In the context of developed countries, Schiantarelli and Sembenelli (1997) employed a sample of 604 listed firms in the UK from 1976 to 1991 and a sample of 750 private firms in Italy from 1977 to 1990. They found a positive relationship between long-term debt and firm productivity performance. On the other hand, Accetturo et al. (2019) found weak evidence to support the effect of debt maturity on firm performance under an exceptional circumstance where the Italian government launched an innovative policy to encourage firms to increase their debt maturity. Accetturo et al. (2019) constructed a sample of nearly 5000 limited liability companies in the province of Trento, Italy, for the period 2008–2012. However, Schiantarelli and Sembenelli (1997) and Accetturo et al. (2019) measured firm performance differently. While Accetturo et al. (2019) measured firm financial performance as ROE, Schiantarelli and Sembenelli (1997) measured firm productivity performance as an augmented Cobb–Douglas production function.

In the context of developing countries, Schiantarelli and Srivastava (1997) and Schiantarelli and Jaramillo (2002) found a positive effect of long-term debt on firm productivity performance. Schiantarelli and Srivastava (1997) argued that longer term debt could increase firm productivity because firms could invest in more productive technologies. While Schiantarelli and Srivastava (1997) examined a sample of 2149 non-financial public limited firms in India over the period 1980/81–1989/90, Schiantarelli and Jaramillo (2002) analyzed a sample of 731 manufacturing firms in Ecuador between 1984 and 1988. Like Schiantarelli and Sembenelli (1997), these two studies focused on analyzing the impact of DMS on firm productivity performance.

Regarding the impact of DMS on firm financial performance, Zeitun and Haq (2015) found a negative effect of both long-term and short-term debt on firm financial performance. Zeitun and Haq (2015) used a sample of 400 non-financial firms listed on the stock exchanges of six GCC countries. While Zeitun and Haq (2015) measured both accounting performance (ROA) and market performance (TOQ and the ratio of market value of equity to book value of equity), they used the ratio of long-term debt to total assets and the ratio of short-term debt to total assets as the measurements of debt maturity. Likewise, Hatem (2017) stated that firms with a higher ratio of short-term debt to total assets were less profitable when the author examined 116 Malaysian firms and 92 Mexican firms during the period 2005–2011. While firm performance was measured as ROA and ROE, debt maturity was measured as the ratio of long-term debt to total assets, the ratio of short-term debt to total assets and the ratio of total debt to total assets. However, Hatem (2017) found mixed results for these three measures of debt maturity. Although Nwude et al. (2016) employed the same measurements as Hatem (2017) for debt maturity, they found that firms with shorter debt maturity had higher firm financial performance. Nwude et al. (2016) examined the relationship between debt maturity and firm performance using a sample of 43 listed firms in Nigeria from 2001 to 2012. However, the measures of debt maturity in the studies of Zeitun and Haq (2015), Hatem (2017), and Nwude et al. (2016) seem to reflect a firm's short-term and long-term capital structure rather than a firm's DMS. For instance, Chen (2004) and Aivazian et al. (2005b) employed the

ratio of long-term debt to total assets as the measure of leverage. Similarly, Demircuc-Kunt et al. (2015) stated that while the ratio of long-term debt to total debt reflects the DMS, the ratio of total debt to total assets and the ratio of long-term debt to total assets reflect the extent to which firms' assets are funded by debt and long-term debt, respectively. Furthermore, most empirical studies have measured DMS by the ratio of long-term debt to total debt (Alcock et al., 2012; Antoniou et al., 2006; Barclay & Smith, 1995; Cai et al., 2008).

Recently, Vijayakumaran and Vijayakumaran (2019) found a positive effect between long-term debt and firm performance for a sample of 1420 Chinese listed firms from 2003 to 2010, excluding financial firms. This result is consistent with those of Schiantarelli and Sembenelli (1997) and Schiantarelli and Srivastava (1997), although Vijayakumaran and Vijayakumaran (2019) measured firm performance as firm financial performance (ROA) instead of firm productivity performance. Vijayakumaran and Vijayakumaran (2019) calculated long-term debt ratio as long-term debt to total debt.

In the context of Vietnam, a very limited number of empirical studies have been conducted. Le and Phan (2017) found a negative relationship between capital structure and firm performance for a sample of 2797 firm-year observations of non-financial listed firms between 2007 and 2012. They implied that if firms issue debt, their firm value will decrease. They explained that Vietnam has unique market conditions such as the dominant banking sector, higher levels of both deposit and lending interest rates compared with other countries during the period of 2007–2012 and the tax savings of debt being less than bankruptcy costs. Similarly, Nguyen and Nguyen (2020) found that capital structure had a significantly negative impact on firm performance when they used a sample of 488 non-financial listed firms for the period 2013–2018. Specifically, Nguyen and Nguyen (2020) stated that both accounting and market firm performance will decrease when firms increase their debt (both short-term and long-term debt). While Nguyen and Nguyen (2020) measured firm performance as ROA, ROE and earnings per share (EPS), they measured capital structure as: (1) the ratio of

short-term liabilities to total assets; (2) the ratio of long-term liabilities to total assets; and (3) the ratio of total liabilities to total assets.

Although previous studies have examined the impact of DMS on firm performance, they mainly focused on firm productivity performance and accounting-based firm performance such as ROA (Hatem, 2017; Vijayakumaran & Vijayakumaran, 2019; Zeitun & Haq, 2015). Market-based firm performance, measured as TOQ, is less likely to be used in analyzing the relationship between DMS and firm performance. Hence, this study analyzes the relationship between DMS and firm financial performance, measured as both accounting-based firm performance (ROA and ROE) and market-based firm performance (TOQ). TOQ has been employed as a measure of firm financial performance in several studies (Adachi-Sato & Vithessonthi, 2019; Butt et al., 2021; Ganguli & Deb, 2021; Pandey et al., 2022). TOQ is viewed as a good indicator of firm GROW or market perception. For instance, Butt et al. (2021) stated that TOQ is a forward-looking measure which is better than historical financial performance (such as ROA or ROE). To avoid reflecting market perception only, this study uses both market- and accounting-based firm performance to provide a more robust picture of actual firm financial performance.

Further, the underinvestment problem is one of two major problems caused by the conflicts between managers and creditors. Managers mainly aim to maximize shareholders' wealth, so they may forego profitable new investment opportunities (positive net present value projects). The reason is that part of the benefit will be shared with creditors and creditors may receive more benefit than shareholders. Meanwhile, shareholders may not have enough required returns. Myers (1977) stated that high GROW firms seem to have a higher underinvestment issue than low GROW firms. Hence, firm value will reduce when investment opportunity decreases, especially for risky firms with high GROW (Deesomsak, 2006). Shortening debt maturity is one of the ways to reduce the underinvestment problem (Barnea et al., 1980; Myers, 1977). Aivazian et al. (2005a) found that firms with high GROW will reduce their investment when they lengthen their debt maturity. There is also a link between investment and profitability. According to

Hou et al. (2015), firms that are more profitable seem to have more investments than less profitable firms. Moreover, short-term debt requires firms to pay higher interest than long-term debt as they face higher refinancing risks. Therefore, this naturally leads firms to invest in riskier projects to receive higher expected returns (Zeitun & Haq, 2015). Regarding signalling theory, high-quality firms seem to choose short-term debt, which is a costly signalling strategy, to signal their quality to the market. Low-quality firms cannot do this because of high transaction costs. Following the risk–return trade-off principle, the study expects a negative relationship between debt maturity and firm performance.

Hypothesis 18: Debt maturity has a negative effect on firm financial performance (measured by TOQ).

Table 3.1 provides a summary of all the hypotheses discussed above.

Table 3.1: Summary of all hypotheses in the present research.

Research question	Hypotheses
RQ1	Determinants of debt maturity structure model
	H1 The effective tax rate has a negative effect on debt maturity structure.
	H2 The term structure of interest rates has a positive effect on debt maturity structure.
	H3 Interest rate volatility has a positive effect on debt maturity structure.
	H4 Growth opportunities have a negative effect on debt maturity structure.
	H5 Firm size has a positive effect on debt maturity structure.
	H6 Asset maturity structure has a positive effect on debt maturity structure.
	H7 Firm quality has a negative effect on debt maturity structure.
	H8 Firm liquidity has a positive effect on debt maturity structure.
	H9 Firm leverage has a positive effect on debt maturity structure.
RQ2	Debt maturity structure and bank debt model
	H10 The dependence of firms on bank debt has a moderating effect on the relationship between firm characteristics and debt maturity structure.
RQ3	Debt maturity structure and financial market development model
	H11 Stock market concentration has a negative effect on debt maturity structure.
	H12 Banking sector development has a negative effect on debt maturity structure.
RQ4	Debt maturity structure and ownership structure model
	H13 Large shareholders have a positive effect on debt maturity structure.
	H14 Foreign ownership has a positive effect on debt maturity structure.
	H15 State ownership has a positive effect on debt maturity structure.
	H16 Managerial ownership has a negative effect on debt maturity structure.
RQ5	Debt maturity structure and external ownership model
	H17 State, foreign and large shareholders have an effect on the relationship between managerial ownership and debt maturity structure.
RQ6	Debt maturity structure and firm performance
	H18 Debt maturity has a negative effect on firm financial performance (measured by TOQ).

3.7. Summary

This chapter has discussed the capital structure theories and the empirical research focusing on DMS. Capital structure theories, such as trade-off theory, signalling theory and agency costs theory, help to identify the determinants of DMS and to explain how DMS affects firm financial performance. In accordance with the theories, the study has developed the 18 hypotheses that were tested and are discussed in Chapter 5.

In particular, hypotheses 1–9 define the firm-level determinants of DMS, while hypothesis 10 investigates whether BD has an effect on defining the firm-level determinants. The impacts of stock market development and banking sector development on DMS are identified through hypotheses 11 and 12, respectively. The study developed hypotheses 13–17 to provide better understanding of the role of the four main shareholders: large shareholders, state and foreign shareholders, and manager-owners. In particular, the study developed hypothesis 17 to test whether outside shareholders have a moderating effect on the relationship between MO and DMS. Finally, hypothesis 18 was developed to test how DMS affects firm financial performance.

The next chapter will describe data collection, variables measurements, and the method of testing the hypotheses.

CHAPTER 4: DATA AND RESEARCH METHODS

4.1. Introduction

The previous chapter reviewed the main theories and empirical studies regarding DMS and firm performance. The study developed 18 hypotheses based on the theories. This chapter discusses the data collection and research methods that the study employed to test the hypotheses developed in Chapter 3. In particular, this study gathers data from two main databases, Datastream for firm-level variables and the WB Financial Structure Database for financial market development variables. Next, this chapter describes how to measure the variables which are used in the empirical sections. There are four main sets of variables: firm-level variables, financial market development variables, ownership structure variables and firm performance variables. Finally, this chapter presents the empirical models and methods that the study applies in the empirical chapters. The study employs descriptive analysis, correlation analysis and panel data regression analyses to test the models and to interpret the relationships among the variables. This is how the study answers the research questions.

This chapter is organized as follows. Section 4.2 provides the study's conceptual framework, while Section 4.3 reviews the research methods employed in previous studies and discusses the research methods used in this study. Section 4.4 provides the data selection criteria and data sources for the study sample. Section 4.5 describes how the variables are measured. Section 4.6 presents the empirical models, while Section 4.7 provides a summary of the chapter.

4.2. Conceptual framework

Figure 4.1 shows the conceptual framework for this study. Overall, the framework has two phases. The first phase focuses on how DMS responds to changes in the independent variables, categorized into the following three groups: (1) firm-level determinants; (2) financial market development; and (3) ownership structure. The second phase examines how DMS explains variation in firm financial performance.

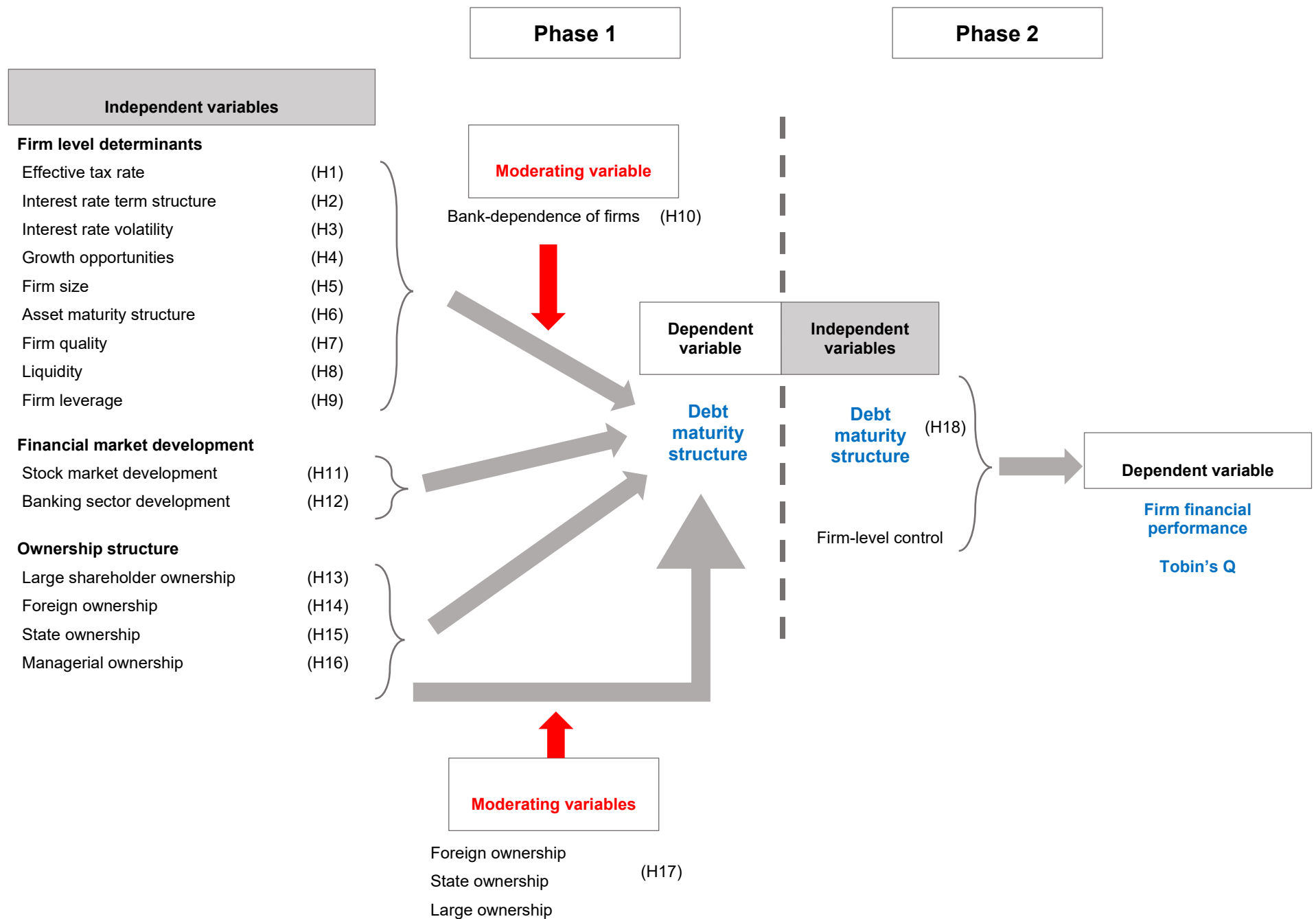


Figure 4.1: Conceptual framework for this study

Specifically, in phase 1 the study explores the firm-level determinants of DMS based on three main theories. In particular, the tax-based theory comprises three hypotheses: TAX, TERM and VOLR. The agency cost theory is proxied by GROW, SIZE and AMS, while the signalling and liquidity theory is proxied by QUAL, LIQ and LEV. Hence, the first nine hypotheses (H1–9) are examined to determine the extent to which the main firm characteristics affect DMS in Vietnam. The study also examines whether dependence on BD impacts the relationship between firm-level determinants and DMS through hypothesis 10. Second, the study analyzes whether the development of the stock market (hypothesis 11) and the banking sector (hypothesis 12) influence DMS choice. Third, regarding ownership structure, the study concentrates on four main types of corporate ownership: MO, FO, SO and LO. The study develops four hypotheses (H13–16) to test whether these four types of ownership structure affect DMS. Further, hypothesis 17 is developed to understand whether the relationship between MO and DMS can be affected due to the impact of outside investors – the government, foreign and large shareholders. In summary, hypothesis 10 and hypothesis 17 are different to the other hypotheses because they focus on the moderating effects of BD and outside shareholders, while the other hypotheses (H1–9 and H11–16) examine the direct effects of firm-level determinants, financial market development and ownership structure on DMS.

In the second phase, DMS becomes the independent variable which explains the variation in firm performance (hypothesis 18). Firm performance is proxied by TOQ – a popular measure for firm market performance. The study also employs firm-level control variables such as TAN, SIZE, LIQ and SGR in the regression.

4.3. Research methods review

4.3.1. Research methods used in previous studies

The relationships around DMS and firm performance have been estimated via various methods. One such estimation method is the OLS method (Barclay & Smith, 1995; Hoang, 2017; Stohs & Mauer, 1996). The OLS method estimates the relationship between a dependent variable and one or more independent

variables. The relationship is measured by minimizing the sum of squares in the difference between the observed and predicted values of the dependent variable configured as a straight line. The OLS is consistent and has no bias when it satisfies four main assumptions: (1) random sampling; (2) linear parameters; (3) zero conditional mean; and (4) no perfect collinearity. However, assumption (3) is violated because several studies have confirmed an endogenous relationship between DMS and leverage (Alcock et al., 2012; Antoniou et al., 2006; Cai et al., 2008). This means that the OLS estimator would provide biased and inconsistent results. Hence, it is important to control for endogeneity issues. In this section, the study reviews some common research methods that have been used to examine the determinants of DMS and firm performance in previous studies.

Most recent studies have employed a panel data regression method which combines time-series and cross-sectional observations when examining DMS (Antoniou et al., 2006; Awartani et al., 2016; Orman & Köksal, 2017; Salehi & Sehat, 2019). Deesomsak (2006) stated that panel data analysis is better than cross-sectional analysis in the capital structure field. Deesomsak (2006) also pointed out that some effects on debt maturity cannot be captured by cross-sectional analysis such as abnormal earnings. Furthermore, there are some major advantages of using a panel dataset compared to a cross-sectional dataset. The first benefit is controlling for unobserved firm heterogeneity due to obtaining multiple observations on the same units. In addition, potential biases, which are interactions between unobserved individual factors and independent variables, in estimates can be eliminated. Further, due to a large number of observations, panel data increases in degrees of freedom and decreases the multicollinearity problem. This problem generally appears in types of financial data which are associated to each other by nature. Finally, panel data permits investigation of the importance of lags in decision-making behaviour. This means that the dynamic of financing decisions can be captured.

There are three main panel data regressions: pooled OLS, FE and RE models. There are some studies that have used pooled OLS regression in investigating DMS (Alcock et al., 2012; Kirch & Terra, 2012; Le & Tannous, 2016). However,

the FE model and RE model are the prevalent estimation models employed in the DMS field. For example, Lugo and Piccillo (2019) employed the FE method to explain variations at the firm level or country level in debt maturity over time when they investigated the relationship between corporate and government debt maturity with a sample of nine European countries during the period 1990–2014. The authors also stated that this method has a better explanation than cross-sectional variations at one point in time. This is in line with Pandey (2001) that estimation is improved by using the FE model compared to the pooled OLS and the means of variables OLS regressions. Pandey (2001) found that the adjusted R-squared value of the FE model was much higher than that of the pooled OLS model. Similarly, Orman and Köksal (2017) and Kalsie and Nagpal (2018) employed the FE method to examine the choice of debt maturity in Turkey and in India, respectively.

Regarding the RE model, Zheng et al. (2012) conducted the Breusch–Pagan Lagrange multiplier tests to select the RE model instead of the pooled OLS model. They examined the relationship between national culture and DMS in 40 countries between 1991 and 2006. Therefore, they did not use the FE model due to the presence of focal cultural variables – time constant variables. In addition, while Mimouni et al. (2019) investigated the influence of liquidity on debt maturity after a financial crisis in six GCC countries, they reported that the RE model was better than pooled OLS as it controlled for firm heterogeneity and incorporated the effect of quality of institutions – a time-invariant variable – in the regressions. Moreover, Awartani et al. (2016) employed the RE method to explore the impact of institutional quality on DMS in 10 MENA countries from 2003 to 2011, arguing that this method reduced the potential for serially correlated error due to including all relevant factors of debt maturity in their model. They also stated that the coefficients of the FE method were incidental parameters' bias if the number of time periods was not long. However, when Nguyen and Tran (2017) examined the relationship between institutional quality elements and DMS in Vietnam for the period 2008–2015, the FE model is found to be better than the RE model based on the result of the Hausman (1978) test in their study. The Hausman test helps to choose between the FE model and RE model by testing the correlation

between individual effects and observable variables in panel data models. Similarly, González (2017) and González (2015) used the Hausman (1978) test to choose FE estimators for their studies.

Unlike other studies, Nguyen et al. (2018) employed quantile regression and Oaxaca–Blinder decomposition in examining how Vietnamese listed firms chose their debt maturity. Nguyen et al. (2018) acknowledged that these techniques are generally used in the economics literature rather than the capital structure literature.

Several existing studies have shown that leverage and debt maturity decisions are jointly considered (Barclay et al., 2003; Datta et al., 2005; Wang, 2020). Alcock et al. (2012) calculated the difference in Sargan–Hansen statistic, which confirms the endogeneity of leverage, when they investigated the determinants of DMS in Australia. Hence, it can be concluded that leverage and debt maturity are endogenous.

González (2017) employed an IV estimator which was introduced by Anderson and Hsiao (1982). IV estimators are one of the most well-known techniques to deal with the potential endogeneity issue. This method is an extension of the OLS method by incorporating IVs in a model. González (2017) used one-year-lagged values of all independent firm-level variables as IVs in a study of DMS in 39 countries. To test the overidentifying restrictions, González (2017) employed a Durbin–Wu–Hausman test for each of the regressions. While Tosun and Senbet (2020) conduct IV regression using a non-compliant dummy variable as the IV, they used the Cragg and Donald (1993) test to make sure the IV was not weak. They did not test for overidentification because they used only one IV in the model.

2SLS regression is known to be a popular form of the IV method. For instance, when Orman and Köksal (2017) examined the term structure of debt maturity with a sample of 11,694 listed and private Turkish firms, they performed Newey and West (1987)'s variance estimator to estimate their FE panel data model with and without leverage. This estimator controls for heteroscedasticity and

autocorrelation in standard errors. They also performed a Hansen test to test the validity of the two IVs, which were the first lagged values of leverage and firm profitability, in order to control for the simultaneity between leverage and debt maturity. Likewise, Mimouni et al. (2019) employed the 2SLS RE method and used the first lag of leverage and the first lag of firm profitability as the IVs. These IVs all passed the instrumental validity test of Sargan (1958) and Hansen (1982) in their regression analyses. Nguyen et al. (2020b) used 2SLS regression caused by corporate social responsibility (CSR) when they examined the impact of CSR on corporate debt maturity in Australia and their IVs were a firm's initial CSR score and the industry-year average of CSR. These variables passed the Cragg and Donald (1993) test of instrumental relevance and the Sargan (1958) test of overidentification.

Kirch and Terra (2012) emphasized that while 2SLS is a common technique to deal with endogeneity in panel data models, this technique is not asymptotically efficient compared to the GMM which was developed by Hansen (1982). Moreover, Awartani et al. (2016) employed both 2SLS and GMM estimators (known as IV-GMM). Although these two methods reinforced their previous results, they argued that IV-GMM is more efficient than 2SLS due to two reasons. First, this method can resolve heteroscedasticity. Second, distributional assumptions on the error terms are not required. Similarly, while Nguyen and Tran (2017) employed 2SLS and GMM methods to deal with leverage – the endogenous variable – they stated that the GMM method provided the most reliable results.

On the other hand, Alcock et al. (2012) employed IV-GMM, 2SLS and 3SLS estimations in their study. They stated that 3SLS is more efficient than 2SLS if the errors are not heteroscedastic. This is because 3SLS can help to explain both cross-equation correlation of the errors and dependent variables. Duong et al. (2015) also supported the argument of Alcock et al. (2012) that the 3SLS method controls for not only potential endogeneity issues but also error term correlation among regressions. Thus, they used 3SLS regression with two IVs (peer equity shock and peer lagged equity shock) when they examined the influence of

industry peer effect on DMS with a sample of 6144 listed US firms. They also conducted the Hausman test, which supports the use of 3SLS rather than OLS.

Overall, many current studies have employed the recently developed sys-GMM estimator (Arellano & Bover, 1995; Blundell & Bond, 1998) to control for potential endogeneity issues (Allaya et al., 2022; Etudaiye-Muhtar et al., 2017a; Kirch & Terra, 2012; Vijayakumaran & Vijayakumaran, 2019). According to Antoniou et al. (2006), difference GMM (dif-GMM) is superior to many other techniques such as IV estimators, while dif-GMM is less efficient than sys-GMM in the case of having a short sample period and persistent data. Therefore, Antoniou et al. (2006) stated that they used the sys-GMM estimator because it was the best technique to investigate determinants of DMS in three European countries. Similarly, Le and Tannous (2016) analyzed the relationship between ownership structure and debt level by employing the sys-GMM method. The sys-GMM method was selected due to their data with a large number of companies and a short period of six years. Furthermore, while Vijayakumaran and Vijayakumaran (2019) employed sys-GMM to estimate the association between debt maturity, leverage and firm performance in China, Lugo and Piccillo (2019) used this method to explain the impact of government debt maturity on corporate debt maturity choice in Europe. Vijayakumaran and Vijayakumaran (2019) argued that the sys-GMM method can control for both potential endogeneity and weak instrument problems. Table 4.1 shows a summary of the research methods used in previous studies.

Table 4.1: Summary of the research methods used in previous studies.

Authors	Country	Research period	Sample size	Methodology
Cai et al. (2008)	China	1999–2004	259 listed firms on three stock exchanges	Cross-sectional method, time-series method, pooled OLS, FE, RE methods and sys-GMM
Alcock et al. (2012)	Australia	1989–2006	147 listed firms	Pooled OLS, RE, IV-GMM, 2SLS and 3SLS
Kirch and Terra (2012)	6 South American countries	1996–2007	359 listed firms	Sys-GMM
Zheng et al. (2012)	40 countries	1991–2006	114,723 firm-year observations	RE method
Le and Tannous (2016)	Vietnam	2007–2012	2797 firm-year observations	Pooled OLS, FE, RE methods and sys-GMM
Awartani et al. (2016)	MENA region	2003–2011	444 listed firms with 3717 firm-year observations	RE method
Orman and Köksal (2017)	Turkey	2004–2013	11,694 public and private firms	FE method and IV method
Nguyen and Tran (2017)	Vietnam	2008–2015	267 listed firms	FE, RE method, 2SLS, GMM
González (2017)	39 countries	1995–2012	30,727 firms with 171,892 firm-year observations	FE method
Li and Zhang (2019)	USA	1997–2016	1379 firms with 10,285 observations	FE, logistic regression, propensity score matching and IV method

Authors	Country	Research period	Sample size	Methodology
Lugo and Piccillo (2019)	9 European countries	1990–2014	225 country-year observations and 29,524 firm-year observations	FE method and sys-GMM
Mimouni et al. (2019)	6 GCC countries	2003–2013	208 listed firms	RE method and 2SLS-RE method
Nguyen et al. (2020b)	Australia	2004–2014	222 listed firms	OLS using two-way (firm and year) cluster robust standard errors and 2SLS
D'Amato (2020)	Italy	2006–2016	159,500 observations of SMEs	FE method and sys-GMM

4.3.2. Research method for the study

This section discusses the appropriate research method that this study uses to test the hypotheses. The present research uses the FE and sys-GMM estimators, which are the most well-known methods in examining DMS (Cai et al., 2008; D'Amato, 2020; Kirch & Terra, 2012; Lugo & Piccillo, 2019). There are three main methods used to estimate panel data: pooled OLS, FE and RE methods. The FE and RE models are better than the pooled OLS model when there are missing unobserved variables (such as firm-specific effects) and the error term $\mu_{i,t}$ is independent of the explanatory variables $x_{i,t}$. Due to the results of an F-test after running the FE models ($\text{prob} > F < 0.001$), the pooled OLS method becomes biased and inconsistent. Hence, pooled OLS is not considered any further as the research method for this study. Further, the sys-GMM method is superior to many other techniques in controlling the problem of endogeneity (Antoniou et al., 2006). For instance, D'Amato (2020) investigated the impact of the global financial crisis on capital structure decisions of Italian SMEs during the period 2006–2016. D'Amato (2020) employed the FE model with robust standard errors confirmed by the Hausman test. The author also employed the sys-GMM method to control for potential endogeneity issues.

To be specific, first this study employs two commonly used panel data methods, the FE and RE methods. The Hausman test is used to choose between the FE and RE models. The Hausman test shows that the FE is more appropriate than the RE (see details in Section 5.2). This means that there is correlation between unobserved variables and observed variables. Furthermore, the FE method seems to have been employed the most in previous studies (Cai et al., 2008; González, 2017; Lugo & Piccillo, 2019; Orman & Köksal, 2017). The FE model (static model) is presented as follows:

$$y_{it} = \alpha + x_{i,t} * \beta + \alpha_i + \mu_{it}$$

where:

y_{it} : dependent variable for firm i at time t

$x_{i,t}$: $K \times 1$ vector of independent variables

β : $K \times 1$ vector of slopes

α : intercept

$\mu_{i,t}$: error term

α_i : captures all unobserved time-constant factors that affect $y_{i,t}$

After this, the present research uses the Wald test and the Wooldridge test for identifying the issues of heteroscedasticity and autocorrelation. These tests show that autocorrelation and heteroscedasticity exist in the models. To deal with heteroscedasticity and autocorrelation issues, the study runs the model with robust standard errors. Although this technique improves the efficiency of the model, it could not address endogeneity issues, which are normally due to reverse causality, measurement errors and time-invariant endogenous variables. The presence of endogeneity makes the estimators biased and inconsistent.

There are two potential endogeneity problems in the study. First, previous studies have explicitly mentioned that capital structure and DMS decisions are made simultaneously. This means that leverage and DMS are endogenous (Antoniou et al., 2006; Cai et al., 2008; Lewis, 1990). Second, Wintoki et al. (2012) stated that empirical studies often overlook one source of endogeneity in corporate finance which is that the relationships among a firm's observable characteristics seem to be dynamic. In other words, a firm's current decisions will affect its future environment, which will in turn impact its future decisions. For instance, Le (2015) employed the sys-GMM method to deal with a potentially simultaneous reverse relation between capital structure and firm performance.

Hence, the study employs Wooldridge's strict exogeneity test to identify the problem of endogeneity in the study. Wooldridge (2010) proposed a test based on an augmented regression. The Wooldridge's strict exogeneity test results suggest that the models of BD and firm financial performance violate the assumption of strict exogeneity, while there is not enough evidence to reject the null hypothesis of strict exogeneity in the models of determinants of debt maturity, ownership structure and financial market development. However, according to Su et al. (2016), Wooldridge's test only tests for correlation between independent variables ($x_{i, t+1}$) and idiosyncratic error ($\mu_{i,t}$). This implies that not all forms of

intertemporal correlation between $x_{i,t}$ and $\mu_{i,t}$ are observed by Wooldridge's test. In other words, in the models of determinants of debt maturity, ownership structure and financial market development, $x_{i,t+1}$ is strictly exogenous whereas other forms of x_i are unsure. Potential endogeneity issues identified in the literature may still exist in these models. In summary, the study employs FE with robust standard error as the main analysis and sys-GMM with robust standard error as the robustness check for the models of determinants of debt maturity, ownership structure and financial market development. Sys-GMM with robust standard error is used for the main analysis for the models of BD and firm financial performance.

Regarding the sys-GMM estimator, the dynamic panel GMM method was introduced by Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998) to control for potential endogeneity problems. The dynamic model is presented as follows:

$$y_{it} = \alpha + \gamma * y_{i,t-1} + x_{i,t} * \beta + \alpha_i + \mu_{it}$$

Although some previous studies have suggested that IV estimators help to eliminate endogeneity problems (Alcock et al., 2012; Antoniou et al., 2006; Le & Phan, 2017), Antoniou et al. (2006) argued that IV estimators seem to be inefficient. The IV method does not account for the different structure of error terms and does not employ all the related moment conditions (Antoniou et al., 2006). Similarly, Kirch and Terra (2012) stated that the GMM estimator is asymptotically efficient while the 2SLS estimator (a well-known form of the IV method) is not asymptotically efficient. Furthermore, Le (2015) and Khoo and Cheung (2022) argued that it is difficult to find strong instruments which associate with independent variables but not with a dependent variable. Invalid instruments may lead to no improvement over the OLS method. Lagged variables can be employed as valid instruments when using the GMM method. According to Vijayakumaran and Vijayakumaran (2019), a potential weak instrument can be eliminated by the sys-GMM method. In addition, the GMM method is compatible with panel data that has small T (few time periods) and large N (many individuals) like a study with 4170 observations over nine years. Furthermore, many recent

studies have used the GMM method to deal with endogeneity problems, especially the sys-GMM method developed by Arellano and Bover (1995) and Blundell and Bond (1998) (Cai et al., 2008; Kirch & Terra, 2012; Le, 2015; Lugo & Piccillo, 2019).

In particular, Arellano and Bond (1991) first introduced two-step GMM called the dif-GMM method. The instruments for the first-differences equation are lagged level variables. Error terms must not have second-order autocorrelation. However, the dif-GMM method has the problem of weak instruments. According to Arellano and Bover (1995), the lagged values of the independent variables give weak IVs for the equation in first differences. Furthermore, the method leads to a loss of information across cross-section units. Moreover, the effect of measurement error bias becomes worse (Antonioni et al., 2006). Thus, Arellano and Bover (1995) and Blundell and Bond (1998) developed the dif-GMM method by adding an assumption in the initial conditions that there is no correlation between the first difference of the IVs and the unobserved effects. The extended method is called sys-GMM (Arellano & Bover, 1995; Bond, 2002), which combines the equation in differences with the equation in levels. While the sys-GMM method employs first differences as IVs for equations in levels, it can reduce the bias that emerges when the level variables become weak IVs for equations in the first differences (Kirch & Terra, 2012). This leads to an increase in the efficiency of the estimators. Another advantage is that time-constant variables can be estimated in the level equations (Roodman, 2006).

To check for the validity of the sys-GMM method, there are two main tests which were recommended by Arellano and Bond (1991). The first test is the Arellano–Bond test for first- and second-order serial correlation based on the residuals of the estimation. While the first-order serial correlation is expected in a dynamic panel, the second-order serial correlation should be insignificant. This means that there is no autocorrelation of the order 2 (or higher). The second test is the Hansen test of overidentification to see whether the instruments are exogenous. The Hansen test has the null hypothesis (H_0) that the instruments as a group are exogenous. The test must be insignificant to prove that the instruments as a

group are exogenous. If the tests for second-order autocorrelation and/or overidentification fail, lagged three times or more explanatory variables can be employed as instruments (Bond, 2002). Further, it is suggested that the number of instruments should not be larger than the number of individuals (Roodman, 2006).

Finally, to check for the robustness of results, the study employs alternative measurements of the dependent and independent variables following previous studies (Cai et al., 2008; Chen et al., 2021; Dangl & Zechner, 2021).

4.4. Research design and approach

4.4.1. Data collection

The study obtained firm-level and market-level financial data on Vietnamese listed firms from the Datastream database for the period 2009–2019. Datastream seems to be reliable as it has been used in many existing studies (Deesomsak, 2006; Lugo & Piccillo, 2019; Nguyen et al., 2020b). Data on ownership structure and BD was hand-collected on an annual basis from firms' annual financial reports published on their websites and the Tai Viet Corporation (Vietstock), which is one of the leading financial information providers in Vietnam and used in previous Vietnamese studies (Nguyen & Tran, 2017; Phung & Mishra, 2016; Vo, 2019a). Furthermore, the study obtained Vietnamese financial market development data from the WB Financial Structure Database for the period 2009–2019, except for SCON. SCON was calculated based on the data collected from Datastream. Moreover, the study collected interest rates from 2009 to 2019 from the IMF.

4.4.2. Sample size

The sample for this research is Vietnamese companies listed on the HOSE and HNX from 2009 to 2019. The sample starts in 2009 because 2009 is the year after the global financial crisis in 2008. The sample concludes in 2019 because 2019 is the year before the appearance of COVID-19, which may have affected firms' financial performance and decisions. Like most existing studies (Dangl &

Zechner, 2021; Harford et al., 2018; Lugo & Piccillo, 2019), the study excluded the financial sector due to its unique regulatory capital requirements. Furthermore, this study dropped any firms that had incomplete data during the above period. Specifically, this study deleted firms that did not have at least three consecutive observations. The reason is that this is the minimum requirement for performing sys-GMM regressions (Awartani et al., 2016; Kirch & Terra, 2012; Richards, 2018). Then, the study winsorized all variables with extreme values at 1% and 99% to reduce the impact of potential outliers (Lugo & Piccillo, 2019; Orman & Köksal, 2017; Zheng et al., 2012). The total sample size is 536 firms with 4170 firm-year observations.

A panel dataset was constructed because panel data analysis can capture the effect of future abnormal earnings, which cannot be picked up by cross-sectional analysis, on debt maturity. While cross-sectional data includes a sample of a variety of other units taken at a given point in time, a panel dataset contains a time-series for each cross-sectional unit in the dataset (Wooldridge, 2012). Furthermore, time-series data is not appropriate for this study because it is a collection of observations for a single entity at different time intervals. Moreover, panel data is unbalanced because the number of firms in the sample is different each year. Table 4.2 shows how the study constructed the sample from 2009 to 2019.

Table 4.2: Data summary.

Firm-year observations	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Beginning (after excluding financial firms)	404	821	1,244	1,669	2,115	2,597	3,121	3,660	4,204	4,742	5,298
Less:											
Missing values	191	295	359	416	485	584	699	803	887	935	966
Less than 3 consecutive observations				211	146	136	138	157	174	166	162
Total	213	526	885	1,042	1,484	1,877	2,284	2,700	3,143	3,641	4,170

4.5. Variable measurements

4.5.1. Debt maturity structure

Previous empirical studies have used different methods to measure DMS. This study measures DMS as the ratio of long-term debt to total debt, where long-term debt is payable after a year (Allaya et al., 2022; Demirguc-Kunt et al., 2015; Harford et al., 2018; Lugo & Piccillo, 2019). In fact, there is no precise definition of long-term debt. Long-term debt can be defined as debt unpaid after either one year (Scherr & Hulburt, 2001), three years (Barclay & Smith, 1995) or five years (Ozkan, 2002). However, Alcock et al. (2012) and Nguyen et al. (2020b) stated that different definitions of long-term debt have little effect on estimation. In addition, the majority of previous research considered debt long term when it is due after one year (Alcock et al., 2012; Antoniou et al., 2006; Casino-Martínez et al., 2019; Deesomsak, 2006; Orman & Köksal, 2017). Therefore, this study follows the most common definition of long-term debt, that is, the debt matures after more than one year.

On the other hand, Stohs and Mauer (1996) computed DMS as the average maturity of liabilities of a firm including all debt, debt-like obligations and current liabilities. Under maturity matching, when a firm intends to match the maturity of its liabilities structure with that of its assets, the firm will examine both the volume and maturity of its current liabilities (Stohs & Mauer, 1996). This is why Stohs and Mauer (1996) included current liabilities to measure DMS. Although the ratio of long-term debt to total debt is the most popularly used measure in previous empirical research (Alcock et al., 2012; Allaya et al., 2022; Barclay & Smith, 1995; Harford et al., 2018), this ratio is not likely to be the best measure of DMS. According to Deesomsak (2006), a precise measure of debt maturity is the weighted average maturity of a firm's liabilities, which was applied by Stohs and Mauer (1996) and Scherr and Hulburt (2001). The reason is this measure follows an incremental approach that investigates DMS by using the term to maturity (Deesomsak, 2006).

In contrast, the ratio of long-term debt to total debt follows the balance sheet approach. Balance sheet data normally includes the averages of financing choices over time. This may lead to inaccurate indications of the choice of debt maturity. However, a few studies have used the weighted average maturity of liabilities because it requires detailed information on a firm's remaining debts. This data is usually difficult to obtain or may not be available to collect due to disclosure rules in each country (Alcock et al., 2012; Deesomsak, 2006; Kirch & Terra, 2012; Nguyen et al., 2020b). Unfortunately, the annual reports of Vietnamese listed firms do not provide detailed maturity data on each debt instrument. Therefore, the lack of detailed information prevented the study from calculating the weighted average debt maturity. Some Vietnamese studies also employed the ratio of long-term debt to total debt as the measure of DMS (Nguyen & Tran, 2017; Nguyen et al., 2018). Furthermore, Scherr and Hulburt (2001) utilized both the long-term debt to total debt ratio and the weighted average debt maturity in their study. The authors pointed out that the use of different maturity calculations has little effect on empirical results. Furthermore, the aim of this study is quite similar to that of Barclay and Smith (1995) in that debt maturity is measured as the long-term debt to total debt ratio in order to separate the debt maturity decision from the leverage decision. Consequently, this study defines DMS as the proportion of long-term debt to total debt.

4.5.2. Firm-level variables

4.5.2.1. *Tax-based hypotheses*

4.5.2.1.1. *Effective tax rate*

Many studies which have examined the relationship between DMS and TAX measured TAX by the ratio of income tax expense to pre-tax income (Awartani et al., 2016; Cai et al., 2008; Orman & Köksal, 2017). For instance, the study of Stohs and Mauer (1996), which is one of first empirical studies investigating the determinants of DMS with a sample of US firms, defined the ratio of tax paid to taxable income as the firm tax rate. Similarly, Nguyen et al. (2018) used this

measure to analyze the relationship between the tax rate and term structure of debt in the Vietnamese context.

There are some other measurements of TAX. Barclay and Smith (1995), Lensink and Pham (2011) and Martins et al. (2017) used the ratio of tax paid to total assets to calculate TAX in their studies. Furthermore, Guedes and Opler (1996) used not only the ratio of tax expense to total assets but also the ratio of tax loss carryforwards to sales and the ratio of deferred taxes to total assets. Although they used different calculations of TAX, their conclusions about the relationship between tax rate and DMS were the same.

To sum up, the study follows the majority of studies in measuring TAX for a firm as the ratio of income tax expense to pre-tax income (Cai et al., 2008; Orman & Köksal, 2017).

4.5.2.1.2. *Term structure of interest rates*

TERM has an effect on the tax shield value of long-term debt (Brick & Ravid, 1985). Thus, TERM is employed in models when examining determinants of DMS. Brick and Liao (2017) used the difference between 10-year and 1-year US government bond yields. Nguyen et al. (2018) and Alcock et al. (2012) employed the difference between 10-year and 2-year government bond yields in Vietnamese and Australian studies, respectively. On the other hand, Wang (2020) calculated TERM as the difference between the month-end yields on a 10-year government bond and a 6-month US treasury bond, matched to the month of a firm's fiscal year end.

Although TERM is mainly measured by the difference between long-term and short-term government bond yields, some studies define TERM differently. For instance, Deesomsak (2006) used the difference between long-term (10 years or longer) government bond yields and short-term lending interest rates in their study exploring corporate financing decisions in Asia–Pacific countries. Cai et al. (2008) employed the difference between short-term (0–6 months) and long-term (5 years or more) lending rates because of data limitations in China. On the other

hand, Casino-Martínez et al. (2019) measured the term structure as the difference between the long-term and short-term interest rates in a European cross-country study. Furthermore, whereas the term structure was calculated by Orman and Köksal (2017) as the difference in 12-month average yields between 2-year and 3-month government bonds in a developing country – Turkey – many studies have used the month-end bond yields matched to the month of a firm's fiscal year end.

Overall, this study measures TERM by taking the difference between the month-end yields on 10-year and 1-year government bonds, matched to the month of a firm's fiscal year end (Brick & Liao, 2017; Custódio et al., 2013).

4.5.2.1.3. Volatility of interest rates

Interest rate volatility is mainly measured as the standard deviation of monthly short-term or long-term government bond yields over the current year. For example, Kim et al. (1995) employed three different measures of VOLR: the standard deviations of the three-month, six-month and three-year yields on US Treasury securities over the 12 months of its fiscal year. Antoniou et al. (2006) used the standard deviation of the monthly long-term (10-year) government bond yields over the previous year, matched with the month of firm's fiscal year end, in three European countries. On the other hand, López-Gracia and Mestre-Barberá (2011) employed the standard deviation of short-term (12 months) interbank interest rates over the current year to calculate VOLR. Furthermore, Orman and Bülent (2015) and Orman and Köksal (2017) measured it as the standard deviation of the monthly short-term (three-month) Turkish government bond yields over the current year. On the other hand, Cai et al. (2008) employed both short-term and long-term VOLR to examine its effect on DMS. They measured short-term VOLR as the standard deviation of monthly short-term (0–6 months) lending rates over the previous year, while long-term VOLR was measured as the standard deviation of long-term (5 years and more) lending rates over the previous year. Likewise, Chung and Phan (2020) used the standard deviation of monthly lending rates over the current year as the proxy for VOLR. While Cai et

al. (2008) employed a sample of Chinese firms, Chung and Phan (2020) employed a sample of Vietnamese firms.

In summary, VOLR can be measured as the standard deviation of short-term or long-term government bond yields, interbank interest rates or lending rates. This study calculates VOLR as the annual standard deviation of monthly lending rates (Cai et al., 2008).

4.5.2.2. Agency costs hypotheses

4.5.2.2.1. Growth opportunities

In general, GROW is calculated by the ratio of market value of equity to book value of equity (market-to-book ratio) (Allaya et al., 2022; González, 2017; Martins et al., 2017). According to Nguyen et al. (2020b), the market-to-book ratio represents a firm's investment opportunities. On the other hand, another measure of GROW employed in several studies is the ratio of market value of assets to total assets (Alcock et al., 2012; Awartani et al., 2016; Nguyen & Tran, 2017; Wang, 2020). The total market value of assets is the sum of market value of equity and book value of liabilities (Wang, 2020). These two ratios show the market's expectations about the value of a firm's growth and investment opportunities.

Unlike the above studies, Orman and Köksal (2017) defined GROW as a firm's annual growth in total assets. This measure assumed that faster growth in a firm's assets in the past leads to greater GROW in the future. This measure has been employed in other previous studies (Heyman et al., 2008; Mimouni et al., 2019; Scherr & Hulburt, 2001). Fernández-Méndez and González (2018) calculated GROW based on a firm's annual growth in sales. Some studies have used the ratio of a firm's sales growth to total assets growth as a proxy for GROW (Kalsie & Nagpal, 2018; Krishnankutty & Chakraborty, 2014; Nguyen et al., 2018). Further, while Johnson (2003) measured GROW as the ratio of R&D expenses to sales, Etudaiye-Muhtar et al. (2017a) and Tosun and Senbet (2020) used the

ratio of capital expenditures to total assets. These measures capture a firm's GROW based on accounting data.

Even though there are several measures of a firm's GROW, this study chooses the market-to-book ratio as the primary proxy for GROW following many existing studies (Allaya et al., 2022; González, 2017; Martins et al., 2017; Nguyen et al., 2020b; Tosun & Senbet, 2020). For the robustness test, the study also employs the ratio of market value of assets to total assets (GROWM) (Alcock et al., 2012; Awartani et al., 2016).

4.5.2.2.2. Firm size

SIZE is generally measured as the natural logarithm of total assets (Boubakri & Saffar, 2019; Nguyen et al., 2020b; Orman & Köksal, 2017). For instance, Allaya et al. (2022) used this measure as a proxy for firm size to examine the effect of voluntary disclosure on debt maturity using a sample of French listed firms. Likewise, Mimouni et al. (2019) reported that the logarithm of total assets, which acted as the proxy for SIZE, statistically affected the choice of debt maturity in the GCC region. Similarly, both Nguyen et al. (2018) and Nguyen and Tran (2017) employed this measure as the firm size proxy to examine the effects of financial constraints and institutional quality on corporate debt maturity in Vietnam, respectively.

Although many studies have used the natural logarithm of total assets as the proxy for SIZE, some studies have used the natural logarithm of net sales, total sales or market value of equity to measure SIZE. For example, Cai et al. (2008), González (2015) and Wang (2020) measured SIZE using the natural logarithm of net sales, whereas Duong et al. (2015) and Martins et al. (2017) measured SIZE using the natural logarithm of total sales. On the other hand, while Barclay and Smith (1995) and Stohs and Mauer (1996) used the natural logarithm of a firm's market value as the SIZE proxy, Salehi and Sehat (2019) and Cai et al. (2008) employed the natural logarithm of market value of equity as the SIZE proxy.

In summary, this study measures SIZE as the natural logarithm of total assets (in millions of VND) following many studies of assets (Allaya et al., 2022; Boubakri & Saffar, 2019; Nguyen et al., 2020b; Orman & Köksal, 2017). The study also uses the natural logarithm of firm market value to check the robustness of the findings (SIZEM) (Barclay & Smith, 1995; Stohs & Mauer, 1996).

4.5.2.2.3. Asset maturity structure

AMS is normally calculated as the value weighted average of the maturities of current assets and property, plant and equipment (PPE) (Allaya et al., 2022; Chen et al., 2021; Nguyen et al., 2020b). The maturity of current assets is the ratio of current assets to cost of goods sold (COGS), while the maturity of long-term assets is the ratio of gross PPE to depreciation expenses (Allaya et al., 2022; Awartani et al., 2016; Nguyen et al., 2020b). Likewise, several studies have measured the maturity of long-term assets as the ratio of net fixed assets (net PPE) to depreciation expenses (Kirch & Terra, 2012; Orman & Bülent, 2015; Orman & Köksal, 2017). Overall, the ratio of current assets to COGS describes the rate of consuming current assets, whereas the ratio of fixed assets to annual depreciation expenses shows the rate of consuming long-term assets. In other words, current assets support production, while production is measured by COGS (Stohs & Mauer, 1996).

In contrast, Deesomsak (2006) argued that it would be more appropriate to measure AMS as the ratio of long-term assets to total assets. The ratio of long-term assets to total assets indicates the structure of a firm's assets, while the ratio of long-term debt to total debt, which was used as a proxy for DMS in Deesomsak (2006) study, indicates the structure of a firm's debt. Thus, Deesomsak (2006) stated that these maturity structures should be matched. The ratio of fixed assets over total assets is also used as the proxy for AMS in some studies (Etudaiye-Muhtar et al., 2017a; González, 2017).

However, the majority of studies have used the proportion of long-term debt to total debt, while they have used the value weighted averages of the maturities of current assets and long-term assets (Awartani et al., 2016; Cai et al., 2008;

Casino-Martínez et al., 2019; Chen et al., 2021). This could be due to a lack of debt maturity data. Recently, Tosun and Senbet (2020) computed DMS as the ratio of long-term debt to total debt and the average maturity of debt, while they computed AMS as the ratio of fixed assets to depreciation expenses and the weighted average of the maturities of current assets and gross PPE. Even though they used different measures for debt maturity and AMS, they found similar results that a firm's debt is matched with the firm's assets using a sample of 1152 US listed firms from 1996 to 2009. Like Tosun and Senbet (2020), there are several studies that have computed AMS as the ratio of net fixed assets over depreciation expenses (Cai et al., 2008; Kalsie & Nagpal, 2018; Martins et al., 2017; Ozkan, 2000).

In summary, similar to many previous studies, this study uses the value weighted average of current assets and net PPE as the proxy for AMS (see the equation in Table 4.3) (Allaya et al., 2022; Chen et al., 2021; Nguyen et al., 2020b). For the robustness test, AMS is proxied by the ratio of net PPE over annual depreciation expense (AMSP) (Cai et al., 2008; Martins et al., 2020).

4.5.2.3. *Signalling and liquidity risks hypotheses*

4.5.2.3.1. *Firm quality*

There are two main measures which are used as proxies for QUAL, Altman's Z-score and abnormal earnings. First, Altman's Z-score (Altman, 1984) is used to predict the probability of a firm's bankruptcy. In other words, Altman's Z-score represents a firm's credit quality. A firm with a high score is a high-quality firm due to its lower default risk. Several studies have employed Altman's Z-score as a proxy for QUAL (Arslan & Karan, 2006; Muñoz-Mendoza et al., 2019; Orman & Köksal, 2017). On the other hand, Barclay and Smith (1995) employed a firm's abnormal future earnings. They argued that managers seem to have greater information about firm future performance than outside investors. Abnormal future earnings are calculated as EPS in year $t+1$ minus EPS in year t , divided by share price in year t . This measure has been used in many previous studies (Cai et al., 2008; Custódio et al., 2013; Nguyen et al., 2020b). Unlike Barclay and

Smith (1995), Allaya et al. (2022) defined abnormal earnings as EBITDA in year $t+1$ minus EBITDA in year t , scaled by the market value of equity in year t .

As well as these two common proxies, there are some different measures of QUAL. For instance, the ratio of net income plus depreciation to net debt has been employed to measure QUAL in previous studies such as those of Antoniou et al. (2006), González (2017), and Fernández-Méndez and González (2018). Furthermore, Antoniou et al. (2006) used the ratio of shareholders' funds to net debt for the robustness test. While Cai et al. (2008) calculated QUAL using abnormal earnings, they tested the robustness of their results using the ratio of EBIT to total assets. Awartani et al. (2016) measured QUAL as the quality of a firm's investments, which is the ROA.

Overall, different studies have used different measures of QUAL. According to Barclay and Smith (1995) and Orman and Köksal (2017), that it is not easy to determine the best proxy for QUAL. This study uses abnormal future earnings as the proxy for QUAL following many current studies (Barclay & Smith, 1995; Cai et al., 2008; Nguyen et al., 2020b). QUAL is computed as EPS in year $t+1$ minus EPS in year t , divided by share price in year t .

4.5.2.3.2. Liquidity

LIQ has mainly been measured as the ratio of current assets to current liabilities in prior studies (Antoniou et al., 2006; Cai et al., 2008; D'Amato, 2020). This ratio indicates a firm's ability to satisfy borrowing requirements. Further, there are some measures that act as proxies for LIQ. For instance, Cai et al. (2008) employed the collateral ratio to measure LIQ in their robustness test. The collateral ratio is calculated as the ratio of net fixed assets to total assets. Moreover, the ratio of current assets to total assets has been used in prior studies (Antoniou et al., 2006; Cai et al., 2008; Martins et al., 2017). Similarly, the ratio of cash and cash equivalent to total assets was used to measure LIQ in the studies of Le and Phan (2017) and Vijayakumaran and Vijayakumaran (2019).

To conclude, this study employs the ratio of current assets to current liabilities as the proxy for firm LIQ following many existing studies related to both capital structure and DMS (Cai et al., 2008; Casino-Martínez et al., 2019; D'Amato, 2020; Stephan et al., 2011).

4.5.2.3.3. Firm leverage

LEV is generally measured as the book value of leverage, which is computed as total debt divided by total assets (Allaya et al., 2022; Arslan & Karan, 2006; Awartani et al., 2016). The ratio indicates a firm's financial structure. In other words, it concentrates on the relationship of debt as a part of a firm's total assets. Although this ratio is one of the more meaningful debt ratios, there are several financial measurements employed to measure a firm's leverage. For instance, Bui (2018) and Muñoz-Mendoza et al. (2019) used the ratio of total debt to total equity as a proxy for leverage when they examined the relationships between ownership structure and firm performance, and between FO and DMS, respectively.

While many existing studies have employed the book value of leverage, several studies have used the market value of leverage (González, 2015; Johnson, 2003; Stohs & Mauer, 1996). The market value of leverage is calculated as the ratio of total debt to firm market value. Firm market value is computed as total assets minus the book value of equity plus the market value of equity. On the other hand, Deesomsak (2006) defined leverage as the ratio of total debt to total capital. Total capital is calculated as the sum of total debt, market value of equity and book value of preference share. Antoniou et al. (2006) calculated market leverage as the ratio of book value of total debt to market value of equity plus book value of total debt. Other calculations of leverage in the study of Antoniou et al. (2006) were the book value of leverage and the ratio of total debt less cash and cash equivalent to total assets. Their findings about the significantly positive relationship between debt maturity and leverage were qualitatively similar.

Furthermore, some studies have employed the ratio of long-term debt to total assets as a proxy for leverage (Boubakri & Saffar, 2019; Huang et al., 2011).

Stohs and Mauer (1996) and Fu et al. (2022) used the ratio of long-term debt to firm value. Like Antoniou et al. (2006), Stohs and Mauer (1996) found similar results for a positive relationship between debt maturity and leverage when they used the market value of leverage and the ratio of long-term debt to firm value as proxies for leverage. On the other hand, Brick and Liao (2017) and Tosun and Senbet (2020) defined leverage as the ratio of current liabilities plus long-term debt to total assets, while Lugo and Piccillo (2019) measured leverage as the ratio of total liabilities to total assets.

Overall, this study employs the book value of LEV as it is the most well-known proxy for leverage in examining DMS (Arslan & Karan, 2006; Cai et al., 2008; Nguyen et al., 2020b).

4.5.2.3.4. Bank debt

Boubakri and Saffar (2019) used the debt structure of a firm to capture reliance on BD when the authors examined the relationship between SO and debt choice using a sample of 453 privatized firms from 62 countries. The debt structure was measured by the ratio of BD to total debt. Similarly, Lin et al. (2013) computed the ratio of BD to total debt as a proxy for the choice between BD and public debt when they examined the link between a firm's ownership structure and its choice of debt structure using a sample of 9831 listed firms in 20 countries. Lin et al. (2013) also employed the ratio of public debt to total debt to test the choice between public debt and BD. While Chen et al. (2020) investigated the impact of a firm's asset redeployability on choosing between BD and public debt, the authors constructed BD of a firm as the ratio BD to total debt. The ratio of BD to total debt was set to 1 if the firm raised BD and zero if the firm issued public debt during a fiscal year.

Unlike Chen et al. (2020), Azofra et al. (2020) employed the level of BD to moderate the effect of macroeconomic conditions on a firm's capital structure using a sample of listed firms in five European countries between 2004 and 2015. The level of BD to total assets was set to 1 or zero if it was above or below the yearly sample median, respectively. The authors also used the ratio of BD to total

financial debt to test the robustness of their results. There are several studies that have constructed BD as the ratio of BD to total assets. For instance, Fernández et al. (2018) defined a firm's bank dependence as the proportion of BD to total assets when they examined the influence of the bank credit crisis on debt structure by focusing on the substitution between bank debt and non-BD using a large sample of listed firms in 34 countries. Furthermore, the dummy variable of BD ratio was set above or below the median to indicate greater or less dependence on BD in their study, respectively. Similarly, when García-Teruel et al. (2014) investigated the impact of accrual quality on the access to BD of SME Spanish firms from 1998 to 2005, BD was proxied by the ratio of BD over total assets.

In summary, there are two main measures of BD, which are the ratio of BD to total debt and the ratio of BD to total assets. This study employs the ratio of BD to total debt in order to capture the choice between BD and non-BD (Boubakri & Saffar, 2019; Lin et al., 2013). In particular, the study tests the effect of BD in relation to agency costs, tax-based, signalling and LIQ factors on a firm's DMS. Thus, the study sets the dummy variable of BD (DBD) to 1 if the BD ratio is above the median to indicate higher bank dependence of a firm (Azofra et al., 2020; Cai et al., 1999). The variable of BD becomes zero if the BD ratio is below the median to indicate lower bank dependence of a firm.

4.5.3. Financial market development

4.5.3.1. *Stock market development*

Previous studies have mainly measured stock market development using stock market size. The size of the stock market is defined as the ratio of stock market capitalization of listed domestic firms to GDP (Awartani et al., 2016; Bajaj et al., 2020; Demirguc-Kunt & Maksimovic, 1999). Sett and Sarkhel (2010) stated that stock market capitalization will increase when firms issue equity shares or retain earnings. In other words, large firms provide better quality of information in the beginning stages of stock market development. Thus, issuing new shareholders' equity is substituted for debt. After that, when the financial markets are in a semi-

strong position of efficiency, firms prefer retained earnings. Therefore, the size of the stock market is used as an indicator of the development of the stock market. Likewise, Mimouni et al. (2019) investigated the influence of LIQ on debt maturity after the 2008 global financial crisis. They employed the ratio of stock market capitalization to GDP as a proxy for stock market development.

Chinn and Ito (2006) examined the link between financial liberalization and financial development using a sample of 108 developed and developing countries. They used not only the size but also the LIQ of the stock market to measure stock market development. The LIQ of the stock market was proxied by the ratio of stock market turnover and the ratio of total value of stock traded to GDP. The stock market turnover ratio was calculated by dividing the total value traded by market capitalization (Demirguc-Kunt & Maksimovic, 1999). Furthermore, Vithessonthi and Tongurai (2016) examined the moderating effect of banking crises or business cycles on the relationship between financial market development and bank risk using 37 listed commercial banks in seven South American countries in the period 1991–2012. The authors used the ratio of stock market capitalization to GDP as a proxy for stock market development. In their robustness tests, an alternative measure for stock market development was the ratio of total value of stock traded to GDP.

Demirgüç-Kunt and Levine (1996) stated that there is no proper measure to capture stock market development. They suggested some stock market development indicators such as market size, LIQ, concentration, volatility and asset pricing. Recently, Bae et al. (2021) employed the size, LIQ and concentration of the stock market as proxies for stock market development when they examined the impact of SCON on the economy using a sample of 47 countries. While the ratio of total value of stock traded to GDP represented the LIQ of the stock market, the ratio of stock market capitalization of the five largest firms to total stock market capitalization represented SCON. The authors found that SCON had a negative effect on capital allocation efficiency, economic growth, IPO and innovation activity. They stated that the characteristic of SCON was completely distinct from a stock market's size and LIQ.

In Vietnam, while Chung and Phan (2020) employed market LIQ as a proxy for stock market development, Nguyen and Tran (2017) employed market size as a proxy for stock market development. These two studies examined the influence of stock market development on DMS. Unlike previous studies, the studies measured stock market development using SCON. It was calculated as the ratio of stock market capitalization of the top ten largest firms to total stock market capitalization, as used by Bae et al. (2021). To the best of my knowledge, there is no study that has explored the effect of SCON on debt maturity, while high SCON could force small firms to choose to issue debt instead of issuing equity.

4.5.3.2. *Banking sector development*

Banking sector development is mainly measured as the weight of banks in the economy. The weight of banks in the economy is measured as the ratio of private credit supplied by banks to GDP (Chinn & Ito, 2006; González, 2017; Nwosa, 2018; Vithessonthi & Tongurai, 2016). For instance, Etudaiye-Muhtar et al. (2017b) investigated the impact of banking sector development on commercial banks' capitalization ratio in African countries. They used the ratio of domestic credit to the private sector by banks to GDP to measure banking sector development. Furthermore, Nguyen et al. (2018) found that banks were likely to lend short-term debt when the weight of the banking sector in the economy increased in Vietnam. Their result is compatible with the evidence provided by Fan et al. (2012). Further, Vithessonthi and Tongurai (2016) employed an alternative measure of BANK which was the ratio of domestic credit provided by financial institutions to GDP to check the robustness of their results.

Bank concentration is also used as a proxy for banking sector development (González, 2015; González, 2017). For instance, Álvarez-Botas and González-Méndez (2019) examined the impact of economic development on DMS using a large sample of 39 countries, employing both the weight of banks and bank concentration to proxy banking structure. They found that debt maturity increased with bank concentration but decreased with the weight of banks in the economy. Bank concentration was computed as the proportion of bank assets held by the three largest commercial banks in a country. González (2015) examined whether

the role of the banking sector affected the negative relationship between financial crises and DMS. The author found that while bank concentration reduced the negative relationship, the size of the banking sector increased that negative relationship.

On the other hand, Kirch and Terra (2012) constructed a factor for financial development using factor analysis. They argued that the WB database has 32 variables to indicate financial development but they are highly correlated. Hence, they employed factor analysis to avoid multicollinearity problems. Likewise, Tresierra and Reyes (2018) performed factor analysis to build a factor for banking development using the WB database. Kirch and Terra (2012) found no evidence to support the impact of financial development on debt maturity, whereas Tresierra and Reyes (2018) found a negative relationship between banking sector development and long-term maturity.

Banking sector development is mainly measured as the weight of banks in the economy. The weight of banks in the economy is measured as the ratio of private credit supplied by banks to GDP (Chinn & Ito, 2006; González, 2017; Nwosa, 2018; Vithessonthi & Tongurai, 2016

To summarize, this study uses the most well-known measurement of banking sector development. This study measures banking sector development as BANK, which is computed as the ratio of private credit provided by banks to GDP following previous studies (Álvarez-Botas & González-Méndez, 2019; Chinn & Ito, 2006; González, 2017).

4.5.4. Ownership structure

4.5.4.1. *Managerial ownership*

MO is commonly defined as the percentage of shares held by managers (Ruan et al., 2014; Tanaka, 2016). For example, Ruan et al. (2014) examined the impact of different ownership control types on the choice of debt maturity in China between 2001 and 2008. They found a significantly negative effect of MO on short-term debt, while they measured MO as the proportion of shares held by all

board members. However, Le and Tannous (2016) found a positive relationship between debt level and MO, which was proxied by the percentage of total shares held by a CEO or chairperson. Their study used a sample of listed firms in Vietnam from 2007 to 2012. On the other hand, the proportion of total shares held by the top five executives in a firm has been employed in prior studies such as those of Custódio et al. (2013) and Datta et al. (2005). Custódio et al. (2013) used MO as a proxy for agency costs and found a positive association between MO and short-term debt using a sample of US firms during the period 1976–2008. Their finding is in line with that of Datta et al. (2005), who also used a sample of US firms in the period 1992–1999.

Overall, this study measures MO as the number of shares held by all board managers to total shares outstanding, following existing studies (Muñoz-Mendoza et al., 2019; Ruan et al., 2014; Tanaka, 2016,). For the robustness tests, the study employs the proportion of shares held by a CEO, as used in the study of Le and Tannous (2016).

4.5.4.2. Foreign ownership

According to Choi and Choi (2013), the presence of high FO can protect minority shareholders' rights. In other words, FO can influence debt maturity decisions by reducing the level of conflict of interest between managers and outside investors. It is well-known that FO is measured as the proportion of shares held by foreigners (Boubakri et al., 2013; Choi & Choi, 2013; Guedhami et al., 2009; Gurunlu & Gursoy, 2010; Muñoz-Mendoza et al., 2019). In the context of Vietnam, Le and Tannous (2016) employed the percentage of FO in their study in order to provide evidence that the presence of foreigners and leverage could control managerial self-interest. Phung and Mishra (2016) found a non-monotonic relationship between FO and firm performance.

In summary, this study employs the number of shares held by foreign investors to total shares outstanding as a proxy for FO.

4.5.4.3. State ownership

In general, SO is defined as the proportion of shares owned by the government to total shares outstanding (Boubakri & Saffar, 2019). Le and Tannous (2016) reported a strong relationship between SO and capital structure in Vietnam, while Boubakri and Saffar (2019) found an impact of SO on some aspects of debt structure such as debt maturity and debt security using a sample of 453 newly privatized firms from 62 countries. These two studies employed the same measure of SO. Furthermore, Bui (2018) gave specific definitions of SO in Vietnam. SO was the total shares directly owned by Vietnamese state authorities such as the Provincial People's Committee, the State Capital Investment Corporation, the State General Corporations, line ministries and the Ministry of Finance. Hence, the study used the ratio of shares held by government to total share outstanding as a proxy for SO.

4.5.4.4. Large shareholder ownership

García-Teruel and Martínez-Solano (2010) found that debt maturity had a concave relationship with LO in Spain. The authors measured LO as the ratio of shares held by a major shareholder to total shares outstanding. Although Fernández-Méndez and González (2018) examined the effect of bank ownership and lending relationship on capital structure using a sample of Spanish firms, their measure of LO was similar to that of García-Teruel and Martínez-Solano (2010). However, Mimouni et al. (2019) calculated LO as the proportion of shares owned by the three largest shareholders in a firm when they investigated the influence of LIQ on DMS in the GCC region. While Marchica (2007) computed LO as the ownership by the largest external investor, they defined an alternative measure which was the total ownership of all large external shareholders that hold over 5% of total shares in a firm. Those two measures indicated the ownership concentration of large shareholders. Likewise, Le and Tannous (2016) defined large shareholders as the sum of large shareholders who held at least 5% of total shares. Furthermore, the percentage of institutional shareholders who owned at least 5% of total shares was used as a proxy for block-holder ownership in the study of Harford et al. (2018).

Overall, this study defines LO as the percentage of investors who own at least 5% equity shares.

4.5.5. Firm performance

In general, there are two main aspects of measuring firm performance, firm productivity performance and firm financial performance. However, this study focuses on how firm financial performance is affected by the choice of debt maturity. There are several proxies for firm financial performance such as ROA, ROE, EPS and TOQ (Bui, 2018; Hatem, 2017; Vijayakumaran & Vijayakumaran, 2019). TOQ is measured as the ratio of firm market value to total assets (Bennouri et al., 2018; Bui, 2018; Le & Phan, 2017). TOQ is a stock market-based performance indicator, while ROA, ROE and EPS are accounting-based performance indicators. Although these accounting-based measures have generally been used in previous studies (Hatem, 2017; Nwude et al., 2016; Vijayakumaran & Vijayakumaran, 2019; Zeitun & Tian, 2007), they reflect purely historical performance information. On the other hand, TOQ represents a firm's future profitability. In other words, TOQ reflects how the market evaluates the firm's past and future performance (Bui, 2018; Singh et al., 2018). Furthermore, Bui (2018) stated that TOQ seems not to be influenced by accounting manipulation or earnings management, which are prevalent in Vietnamese companies. Indeed, TOQ is commonly used as the firm performance measure in Vietnamese studies (Bui, 2018; Le & Phan, 2017; Nguyen & Nguyen, 2016; Phung & Mishra, 2016).

In summary, this study employs TOQ as the main proxy for firm performance (Fu et al., 2022). The study uses ROA and ROE to measure the accounting performance of firms in robustness tests. ROA is calculated as the ratio of net profit to total assets, while ROE is measured as the ratio of net profit to total equity (Bennouri et al., 2018; Lau, 2016).

4.5.6. Control variables for models of debt maturity structure and firm performance

To examine the influence of DMS on firm performance, the study employs several control variables to control for firm-specific determinants that could impact on firm performance. They are firm market size (SIZEM) (Barclay & Smith, 1995; Stohs & Mauer, 1996), tangibility (TAN) (Azofra et al., 2020; Margaritis & Psillaki, 2010), SGR (Fernández-Méndez & González, 2018) and LIQ (Antonioni et al., 2006; Cai et al., 2008). Table 4.3 summarizes the measurement of dependent and independent variables in all models, including robustness tests.

Table 4.3: Variable measurements.

Variable name	Measurement	Source of data	Related literature
DMS	DMS = Long-term debt/Total debt	Datastream	(Allaya et al., 2022; Casino-Martínez et al., 2019; González, 2017)
Firm-level determinants			
Effective tax rate	TAX = Tax expense/Pre-tax income	Datastream	(Awartani et al., 2016; Cai et al., 2008; Choi & Park, 2022)
Term structure of interest rates	TERM = Difference between year-end yields on 10-year and 1-year government bonds	Datastream	(Brick & Liao, 2017; Custódio et al., 2013)
Volatility of interest rates	VOLR = SD of annual lending rate	IMF	(Cai et al., 2008; Chung & Phan, 2020)
Asset maturity structure	AMS = Weighted average of maturities of current assets and net PPE Equation: $(\text{netPPE} / (\text{netPPE} + \text{CA})) * (\text{netPPE} / \text{Dep}) + (\text{CA} / (\text{netPPE} + \text{CA})) * (\text{CA} / \text{COGS})$	Datastream	(Cai et al., 2008; Kirch & Terra, 2012)
Firm quality	QUAL = $(\text{EPS1} - \text{EPS0}) / \text{EPS0}$	Datastream	(Cai et al., 2008; Stohs & Mauer, 1996)
Liquidity	LIQ = Current assets/Current liabilities	Datastream	(Antoniou et al., 2006; Deesomsak, 2006)
Firm leverage	LEV = Total debt/Total assets	Datastream	(Antoniou et al., 2006; Awartani et al., 2016; Khoo & Cheung, 2022)
Growth opportunities	GROW = Market/Book value of equity	Datastream	(González, 2017; Tosun & Senbet, 2020)

Variable name	Measurement	Source of data	Related literature
Firm size	SIZE = Ln (Total Assets)	Datastream	(Boubakri & Saffar, 2019; Bui, 2018; Khoo & Cheung, 2022)
Bank debt	BD = Bank debt/Total debt	Annual report	(Boubakri & Saffar, 2019; Chen et al., 2020)
	DBD = Dummy variable taking value of 1 if BD is higher than median and 0 otherwise		(Azofra et al., 2020; Cai et al., 1999)
Financial market development			
Stock market development			
Stock market concentration	SCON = Stock market capitalization of 5 largest firms/Total stock market capitalization	Datastream	(Bae et al., 2021)
Banking sector development			
Banking sector size	BANK = Domestic credit to private sector by banks /GDP	WB	(Álvarez-Botas & González-Méndez, 2019; Chinn & Ito, 2006)
Ownership structure			
Managerial ownership	MO = Shares held by all board managers/Total shares outstanding	Vietstock	(Guney & Ozkan, 2005; Ruan et al., 2014)
Foreign ownership	FO = Shares held by foreign investors/Total shares outstanding	Vietstock	(Choi & Choi, 2013; Phung & Mishra, 2016)
	DF = Dummy variable takes value of 1 if FO is higher than mean and 0 otherwise		(Le, 2015)
State ownership	SO = Shares held by government/Total shares outstanding	Vietstock	(Boubakri & Saffar, 2019, Huang et al., 2011)

Variable name	Measurement	Source of data	Related literature
Large shareholders ownership	DS = Dummy variable takes value of 1 if SO is higher than mean and 0 otherwise		(Le, 2015)
	LO = Shares held by investors who own at least 5% equity shares/Total shares outstanding	Vietstock	(Le & Tannous, 2016; Marchica, 2007)
	DL = Dummy variable takes value of 1 if LO is higher than mean and 0 otherwise		(Le, 2015)
Firm performance	TOQ = Firm market value/Total assets	Datastream	(Bennouri et al., 2018; Bui, 2018; Fu et al., 2022)
	ROA = Net income/Total assets	Datastream	(Bennouri et al., 2018; Lau, 2016)
	ROE = Net income/Total equity	Datastream	(Bennouri et al., 2018; Lau, 2016)
Control variables			
Tangibility	TAN = Net PPE/Total assets	Datastream	(Allaya et al., 2022; Duong et al., 2015)
Firm market size	SIZEM = Natural logarithm of market value of equity plus total debt	Datastream	(Barclay & Smith, 1995; Stohs & Mauer, 1996)
Firm sales growth rate	SGR = Annual sales growth	Datastream	(Fernández-Méndez & González, 2018)

4.6. Empirical models

As discussed above, the study employs a combination of FE and sys-GMM methods where appropriate. Since the FE model is a static model and the sys-GMM model is a dynamic model, lagged dependent variables are added to the sys-GMM model.

An FE model (model 1a) is used to test hypotheses 1 to 9 (research question 1) in order to find the firm-level determinants of DMS. These determinants represent different dimensions of three main theories: (i) tax-based; (ii) agency costs; and (iii) signalling and LIQ risks (Antoniou et al., 2006; Cai et al., 2008; Stohs & Mauer, 1996). This is briefly reviewed below.

$$DMS_{i,t} = \alpha + \beta_1 TAX_{i,t} + \beta_2 TERM_{i,t} + \beta_3 GROW_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 LIQ_{i,t} + \beta_7 QUAL_{i,t} + \beta_8 AMS_{i,t} + \beta_9 VOL_{i,t} + \varepsilon_{i,t} \quad (1a)$$

where:

α	: intercept
β_{1-9}	: slopes
i, t	: firm i at time t
$\varepsilon_{i,t}$	: error term

Dependent variable : DMS = debt maturity structure

Independent variables : TAX = effective tax rate; TERM = term structure of interest rates; GROW = growth opportunities; LEV = firm leverage; SIZE = firm size; LIQ = firm liquidity; QUAL = firm quality; AMS = asset maturity structure; VOLR = volatility of interest rates

A sys-GMM model (model 1b) is established to test hypothesis 10 (research question 2) to investigate the relationship between the dependence of firms on BD and DMS.

$$DMS_{i,t} = \alpha + \beta X_{i,t} + \gamma_1 DMS_{i,t-1} + \delta X_{i,t} * DBD_{i,t} + \varepsilon_{i,t} \quad (1b)$$

where:

γ_1	: slopes
β, δ	: $K \times 1$ vector of slopes

$X_{i,t}$: $K \times 1$ vector of firm-level control variables including TAX, TERM, GROW, LEV, SIZE, LIQ, QUAL, AMS, VOLR
 DBD : Dummy variable for BD

An FE model (model 2) is used to test hypotheses 11 and 12 (research question 3) in order to explore the effect of financial market development on DMS.

$$DMS_{i,t} = \alpha + \beta X_{i,t} + \gamma_1 SMCON_t + \gamma_2 BANK_t + \varepsilon_{i,t} \quad (2)$$

where:

$\gamma_{1,2}$: slopes
 β : $K \times 1$ vector of slopes
 $X_{i,t}$: $K \times 1$ vector of firm-level control variables as above
 SMCON : stock market concentration
 BANK : banking sector size

A sys-GMM model (model 3a) is established to test hypotheses 13 to 16 (research question 4) in order to examine the relationship between various ownership types and DMS. The study focuses on SO, FO, LO and MO.

$$DMS_{i,t} = \alpha + \beta X_{i,t} + \gamma_1 DMS_{i,t-1} + \gamma_2 SO_{i,t} + \gamma_3 FO_{i,t} + \gamma_4 LO_{i,t} + \gamma_5 MO_{i,t} + \varepsilon_{i,t} \quad (3a)$$

where:

SO : state ownership
 FO : foreign ownership
 LO : large shareholder ownership
 MO : managerial ownership

Next, the study explores the moderating impact of outside ownership on the association between inside ownership and debt maturity choice. Thus, the following models 3b to 3d are established to test hypothesis 17 (research question 5):

$$DMS_{i,t} = \alpha + \beta X_{i,t} + \gamma_1 DMS_{i,t-1} + \gamma_2 MO_{i,t} + \gamma_3 MO_{i,t} * DS_i + \varepsilon_{i,t} \quad (3b)$$

$$DMS_{i,t} = \alpha + \beta X_{i,t} + \gamma_1 DMS_{i,t-1} + \gamma_2 MO_{i,t} + \gamma_3 MO_{i,t} * DF_i + \varepsilon_{i,t} \quad (3c)$$

$$DMS_{i,t} = \alpha + \beta X_{i,t} + \gamma_1 DMS_{i,t-1} + \gamma_2 MO_{i,t} + \gamma_3 MO_{i,t} * DL_i + \varepsilon_{i,t} \quad (3d)$$

where:

- MO* : managerial ownership
- DS* : dummy variable for state ownership
- DF* : dummy variable for foreign ownership
- DL* : dummy variable for large shareholder ownership

Finally, a sys-GMM model (model 4) is built to test hypothesis 18 (research question 6) about the effect of DMS on Vietnamese firm performance.

$$TOQ_{i,t} = \alpha + \beta X_{i,t} + \gamma_1 DMS_{i,t} + \varepsilon_{i,t} \quad (4)$$

where:

- TOQ* : Tobin's Q
- DMS* : debt maturity structure
- X_{i,t}* : *K* x 1 vector of firm-level control variables including *SIZEM* = firm market size; *TAN* = firm tangibility; *SGR* = firm growth rate

4.7. Summary

This chapter has presented the conceptual framework of this study comprising two phases. While phase 1 examines the firm-level determinants of DMS and the impact of financial market development and various types of ownership on debt maturity, phase 2 analyses the effect of DMS on firm financial performance.

The chapter has also provided a summary of the research methods, the data, variable measurements and empirical models. In particular, the study employs a sample of 536 non-financial firms listed on two stock exchanges (HOSE and HNX) in Vietnam for the period 2009–2019. An FE estimator and sys-GMM estimator are used to examine the relationship between DMS, financial market development, ownership structure and firm financial performance. An FE model is used to capture the unobserved heterogeneity, while a sys-GMM model is used

to control potential endogenous problems. Chapter 5 will present the findings from the data analysis.

CHAPTER 5: RESULTS AND DISCUSSION

5.1. Introduction

The previous chapter presented the data, variable measurements, empirical models and research methods used in this study. The objective of this chapter is to provide the empirical results of the tests on the relationships between DMS, financial market development, ownership structure and firm performance. The chapter is presented as follows. Section 5.2 provides pre-estimation diagnostic tests such as the VIF test for multicollinearity, Wooldridge's test for strict exogeneity of variables, the Breusch–Pagan test for heteroscedasticity and Wooldridge's test for autocorrelation in the panel data. Section 5.3 presents the descriptive analysis of the data sample. Sections 5.4 present the empirical results and discussion of the determinants of the DMS model (empirical model 1), the model of debt maturity and financial market development (empirical model 2) and the model of debt maturity and ownership structure (empirical model 3), respectively. The model of debt maturity and firm financial performance (empirical model 4) is also discussed in Section 5.4. Finally, Section 5.5 provides a summary of this chapter.

5.2. Pre-estimation diagnostic tests

First, the VIF test is employed to identify the problem of multicollinearity. The VIF test examines how much the variance of an OLS regression coefficient is due to collinearity. Table 5.1 presents the results of the VIF test for the four models. There is no significant collinearity among the variables as none of the VIF reached the accepted threshold of 10 (Neter et al., 1985).

Table 5.1: Variance inflation factor (VIF) tests for models 1–4.

	Model (1a)		Model (1b)		Model (2)		Model (3)		Model (4)
	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	
TAX	1.02	0.97	1.02	0.97	1.03	0.97	1.03	0.97	
TERM	1.30	0.76	1.31	0.76	1.10	0.91	1.40	0.71	
VOLR	1.38	0.72	1.39	0.72			1.65	0.60	

GROW	1.08	0.92	1.09	0.92	1.12	0.89	1.18	0.85		
SIZE	1.14	0.87	1.16	0.86	1.15	0.86	1.34	0.74		
AMS	1.01	0.98	1.02	0.98	1.01	0.98	1.03	0.96		
LEV	1.36	0.73	1.41	0.70	1.36	0.73	1.42	0.70		
LIQ	1.26	0.79	1.28	0.78	1.26	0.79	1.27	0.78		
QUAL	1.01	0.98	1.01	0.98	1.03	0.97	1.02	0.98		
BD			1.09	0.91						
SCON					1.12	0.89				
BANK					1.19	0.84				
SO							1.54	0.64		
FO							1.26	0.79		
LO							1.31	0.76		
MO							1.16	0.86		
DMS									1.43	0.70
TAN									1.37	0.73
LIQ									1.17	0.85
SIZEM									1.10	0.90
SGR									1.01	0.98
Mean	1.17		1.18		1.14		1.28		1.22	
VIF										

Second, the Hausman test is used to choose between FE and RE models. As can be seen in Table 5.2, all test statistics reject the null hypothesis of differences in coefficients not being systematic. This means that the FE model is selected as there is a correlation between unobserved variables and observed variables.

Table 5.2: Hausman tests for models 1–4

	Model (1a)	Model (1b)	Model (2)	Model (3)	Model (4)
<i>Chi-square</i>	80.84	52.64	81.32	78.53	478.01
<i>p-value</i>	<0.001	<0.001	<0.001	<0.001	<0.001

Third, the study conducts Wald's test and Wooldridge's test to identify the problems of heteroscedasticity and autocorrelation, respectively. Table 5.3 presents the results of these two tests for the four models. The Wald's test statistic follows a chi-squared distribution with the null hypothesis of constant

variance, whereas Wooldridge's test follows an F distribution with the null hypothesis of no autocorrelation. With the results for p-values less than 0.05 as shown in Table 5.3, this confirms the existence of heteroscedasticity as well as serial correlation in the sample.

Table 5.3: Wald's test and Wooldridge's test for models 1–4

	Model (1a)	Model (1b)	Model (2)	Model (3)	Model (4)
Wald's test for heteroscedasticity					
Chi-square	4.4e+07	3.8e+07	1.7e+07	2.7e+09	1.5e+06
p-value	<0.001	<0.001	<0.001	<0.001	<0.001
Wooldridge's test for autocorrelation					
F statistic	F(1, 520) = 96.293	F(1, 423) = 57.244	F(1, 520) = 95.637	F(1, 462) = 110.592	F(1, 524) = 175.150
p-value	<0.001	<0.001	<0.001	<0.001	<0.001

Finally, the study employs Wooldridge's strict exogeneity test to make sure the assumption of strict exogeneity is not violated. Table 5.4 shows that the models of BD (model 1b), ownership structure (model 3) and firm performance (model 4) violate the assumption of strict exogeneity. This means that sys-GMM should be used for model 1b, model 3 and model 4 as it is more efficient than FE under the problems of heteroscedasticity, autocorrelation and endogeneity. Model 1a and model 2 are estimated by FE with robust standard error to control for heteroscedasticity and autocorrelation issues.

Table 5.4: Wooldridge's strict exogeneity test for models 1–4.

	Model (1a)	Model (1b)	Model (2)	Model (3)	Model (4)
F statistic	F(7, 535) = 1.90	F(18, 469) = 2.68	F(7, 535) = 1.90	F(11, 486) = 2.01	F(5, 539) = 8.46
p-value	0.0678	0.0002	0.0678	0.0258	<0.001

5.3. Statistical descriptions

Table 5.5 provides the descriptive statistics for the sample of the DMS model and firm performance model.

Table 5.5: Descriptive statistics for the debt maturity structure model and firm performance model.

(a) Firm-level determinants						
Variable	N	Mean	Median	SD	Min	Max
DMS	4170	0.31	0.17	0.33	0	1
TAX	4170	0.20	0.20	0.14	-0.10	0.82
TERM (%)	4170	0.67	0.95	1.37	-2.90	2.38
VOLR (%)	4170	0.51	0.25	0.43	0.00	1.31
GROW	4170	0.81	0.65	0.62	0.11	3.76
SIZE	4170	20.59	20.52	1.42	17.47	24.39
AMS	4170	8.79	3.16	20.39	0.46	157.59
LEV	4170	0.27	0.26	0.17	0.001	0.69
LIQ	4170	1.76	1.38	1.2	0.36	7.33
QUAL	4170	-0.004	0	0.25	-1	1.21
BD	3281	0.79	0.94	0.30	0	1
(b) Financial market development						
Variable	N	Mean	Median	SD	Min	Max
SCON (%)	4170	58.06	56.80	7.85	41.58	69.76
BANK (%)	4170	115.39	114.72	15.32	94.83	137.91
(c) Ownership structure						
Variable	N	Mean	Median	SD	Min	Max
SO	3636	0.20	0.00	0.25	0	0.80
FO	3636	0.10	0.04	0.14	0	0.49
LO	3636	0.51	0.51	0.20	0.07	0.94
MO	3636	0.06	0.01	0.10	0	0.51
(d) Firm performance						
Variable	N	Mean	Median	SD	Min	Max
TOQ	4228	0.66	0.60	0.36	0.11	2.38
ROA	4228	0.05	0.04	0.06	-0.13	0.25
ROE	4228	0.10	0.10	0.12	-0.42	0.43
SIZEM	4228	20.03	19.97	1.59	16.54	24.61
TAN	4228	0.27	0.21	0.22	0	0.89
SGR	4228	0.16	0.08	0.53	-0.77	3.37

Note: DMS = debt maturity structure; TAX = effective tax rate; TERM = term structure of interest rates; VOLR = volatility of interest rates; GROW = firm growth opportunities; SIZE = firm size; AMS = asset maturity structure; LEV = firm leverage; LIQ = firm liquidity; QUAL = firm quality; BD = bank debt; SCON =

stock market concentration; BANK = banking sector size; SO = state ownership; FO = foreign ownership; LO = large ownership; MO = managerial ownership; TOQ = Tobin's Q; ROA = return on total assets; ROE = return on total equity; SIZEM = firm market size; TAN = firm tangibility; SGR = firm growth rate; Min = minimum; Max = maximum; SD = standard deviation. Definitions of variables are presented in Table 4.3.

5.3.1. Determinants of debt maturity structure model

Overall, the mean (median) of DMS is roughly 0.31 (0.17) in Table 5.5a, which shows that almost 31% of total debt is long-term debt on average. This means that short-term debt is popular among Vietnamese listed firms. This figure is similar to the average value of DMS of 34% reported by Nguyen and Tran (2017) for Vietnamese firms. This figure is also consistent with the argument that firms in developing countries seem to rely heavily on short-term debt (Demirguc-Kunt & Maksimovic, 1999; Vijayakumaran, 2016). The minimum and maximum values of the long-term debt ratio range from 0% to 100% with a standard deviation of 33%. The ratio of DMS is 0% as some firms used only short-term debt (such as stock codes: ABT, BCE, etc.). In contrast, the ratio of DMS is 100% as some firms used only long-term debt (such as stock codes: LIX, MCC, etc.).

Furthermore, the variable of LEV shows the mean (median) value of 27% (26%), which indicates the proportion of total debt over total assets. This is in line with the mean of 24% reported by Nguyen et al. (2018) in the Vietnamese context. In general, Vietnamese listed firms used debt to finance nearly 30% of their total assets, while nearly one third of their debt came from long-term debt.

The mean (median) of GROW is 0.81 (0.65). This figure indicates the expectation of a firm's future growth from the investor's perspective as it is measured as the ratio of market value of equity to book value of equity. Vietnamese investors evaluated a listed firm's equity equal to 81% of its book equity on average. This implies that Vietnamese firms provided low growth expectations to their investors, compared to China (2.38) (Cai et al., 2008) and the USA (2.1) (Tosun & Senbet, 2020). This figure is consistent with other Vietnamese studies. For instance, Chung and Phan (2020) reported a mean value of firm GROW of 0.9, while Nguyen et al. (2018) reported a mean value of 0.84. Vietnamese firms have a high level of liquid assets with the mean (median) of 1.76 (1.38). This figure shows that current assets of a firm were higher (1.76 times) than its current

liabilities. In other words, firms had the ability to pay off their current liabilities. In the Vietnamese context, this figure (1.76) is much higher than the means of 0.11 and 0.09 reported by Lai (2018) and Phung and Mishra (2016), respectively. While these two studies used different sample periods, they employed a different measure of LIQ, the ratio of cash and cash equivalent to total assets. This study employs the most well-known measurement of LIQ in the DMS research field (Antoniou et al., 2006; Cai et al., 2008; Deesomsak, 2006).

In regards to AMS, the average (median) value is 8.8 (3.2), which indicates the book value–weighted average of the maturities of current and non-current assets. In other words, the average firm in the sample had a weighted average asset maturity of 8.8 years. The mean of 8.8 is higher than the mean of 4.01 reported in the Vietnamese study of Nguyen and Tran (2017). Even though both studies use non-financial firms listed on the HOSE and HNX, this study employs more current data and does not exclude firms that do not have long-term debt for at least six years like Nguyen and Tran (2017). Chung and Phan (2020) reported a mean value of AMS of 3.18 in the context of Vietnam, but the authors employed a different measurement of asset maturity as the ratio of fixed assets to depreciation. Further, this figure (8.8) is somewhat similar to that reported in other studies (Chen et al., 2021; Li & Zhang, 2019; Wang, 2020). For example, while Cai et al. (2008) documented a mean of 8.2 using a sample of Chinese listed firms, Casino-Martínez et al. (2019) reported means for AMS of 7.8 and 10.9 of unlisted and listed non-financial firms, respectively, in five European countries.

Next, the average (median) value of SIZE, which is measured as the natural logarithm of total assets, is 20.6 (20.52), equivalent to average total assets of VND 3.05 billion. The mean of SIZE is consistent with the mean of 19.9 reported in a Vietnamese study by Nguyen et al. (2018). Furthermore, the mean (median) value of QUAL is -0.004 (0), which shows the change in a firm's future earnings. The negative figure represents overvalued (low-quality) firms. Based on the median, half of Vietnamese firms were high-quality firms, while half of them were low-quality firms. This figure is lower than the mean of 0.07 documented by Ngo

and Le (2021). Ngo and Le (2021) used profitability as a proxy for QUAL, while this study employs future abnormal earnings as a proxy for QUAL.

Further, the mean (median) of TAX is 0.2 (0.2), which is equal to the Vietnamese general corporate tax rate of 0.2 (which took effect from January 2016) (Foreign Investment Agency of Vietnam and Deloitte, 2019). The smallest figure of TAX is negative because some firms had negative income before tax or deferral tax liability. The mean of 0.2 is similar to those of other Vietnamese studies such as Nguyen et al. (2018), who reported a mean for TAX of 0.19. Next, the mean (median) of TERM is 0.67 (0.95), which indicates the difference in rate between long-term debt (10-year government bonds) and short-term debt (1-year government bonds). This figure (67 bps) is less than the mean of 107.5 bps reported by Nguyen et al. (2018). This could be due to the different periods of research and measurements of TERM. Nguyen et al. (2018) employed the different rates between 10-year government bonds and 2-year government bonds. The minimum of TERM is -2.9 as Datastream reports that the 1-year government bond rate was 12.7%, while the 10-year government bond rate was 9.8% in 2012. Vietnam faced high inflation rate in 2011 which led to a high deposit interest rate of 14% in 2011 while the majority of bonds matured in 2012 (Vietnamnet Global, 2012). This could have made the interest rate of 1-year government bonds higher than that of 10-year government bonds in 2012 to attract investors. Finally, the mean (median) of VOLR is 0.5 (0.25), which shows the standard deviation of lending rates. This figure is lower than the mean of 0.9 documented by Chung and Phan (2020) in Vietnam. This could be because Chung and Phan (2020) used a dataset between 2007 and 2016 which showed a high fluctuation in interest rates. The SBV aimed to keep interest rates stable in 2016 (Vietnam Investment Review, 2016). Hence, VOLR decreased after 2016 while the standard deviation of interest rates in 2016 was 0, which is the minimum of VOLR.

Regarding BD, the observations of BD dropped to 3281 as several firms did not report their debt structure specifically. The mean (median) value of BD is 0.79 (0.94). This figure indicates that 79% of the amount of debt raised by the average

firm was BD. This implies that Vietnamese firms depended heavily on BD. The minimum and maximum values of the BD ratio range from 0% to 100% with a standard deviation of 30%. The ratio of BD is 100% as some firms only borrowed from banks (such as stock codes: VXB, VTO, etc.). In contrast, the ratio of BD is 0% as some firms borrowed from employees (such as stock codes: PJC) or holding companies (such as stock codes: PPC) instead of borrowing from banks. The average value of BD (0.79) is a little higher than the average value of BD in Malaysia (0.75), then the Philippines (0.71) and Thailand (0.66) (Fernández-Méndez & González, 2018).

5.3.2. Debt maturity structure and financial market development model

Table 5.5b shows the statistical information for Vietnamese SCON and the banking sector. The weight of Vietnamese banking sector (BANK) in the economy has a mean (median) value of 115.39% which indicates that on average the total amount of private debt issued by banks exceeded annual economic output (GDP), around 115% of GDP. This figure is in line with existing studies in Vietnam. For example, while Nguyen et al. (2018) reported a mean of the private credit granted by banks to GDP ratio of 109% over the period 2007–2016, Thuy (2019) and Open Development Vietnam (2021) stated that the private credit to GDP ratio increased rapidly by over 130% in 2018 and 2019. In other words, the banking sector has developed significantly in Vietnam. Thuy (2019) stated that Vietnam has the highest ratio of credit to GDP among the lower middle-income countries.

Next, the mean (median) value of SCON is 58%, which means that the total stock market value of the top ten listed firms accounted for 58% of total stock market capitalization. In 2019, Son (2020) reported the top ten listed firms had a total market value of nearly USD 88 billion, Trading Economics (2021) reported the total market capitalization of Vietnam was nearly USD 150 billion. This means that the SCON of the top ten list firms accounted for 59% of total market capitalization (Trading Economics, 2021). Vietnam has high SCON in the region, compared to China (0.19), India (0.35) and Malaysia (0.35) (Bae et al., 2021).

5.3.3. Debt maturity structure and ownership structure model

Table 5.5c contains the descriptive statistics of the ownership variables. On average, the government (SO) held 20% of total ownership in Vietnamese firms. This figure is in line with previous Vietnamese studies (Bui, 2018; Hoang, 2017; Phung & Mishra, 2016; Thai, 2017). For example, Phung and Mishra (2016) documented that the average SO of Vietnamese listed firms was 25%, while Thai (2017) reported that the average SO was 22%. Overall, the SO has reduced slightly. According to Le and Le (2017), the Vietnamese government has shown effort in reducing its shares in privatized companies.

Furthermore, the mean (median) value of FO is 0.10 (0.04), which means that foreign investors held 10% of total ownership in Vietnamese firms on average. This figure is close to those of other Vietnamese studies (Le & Tannous, 2016; Phung & Mishra, 2016; Vo, 2016b; Vo, 2017b). For instance, Vo (2017b) reported that FO generally accounted for 9% using a sample of firms listed on the HOSE, while Nguyen et al. (2021) reported the average FO was 9.8% using a sample of firms listed on the HOSE and HNX for the period 2009–2018.

Next, the average (median) value of LO is 0.51 (0.51), which shows that large shareholders held 51% of total ownership in Vietnamese listed firms. This figure (0.51) is consistent with previous Vietnamese studies (Bui, 2018; Hoang, 2017; Le, 2019; Le & Tannous, 2016). For instance, Bui (2018) reported the mean value of the top five largest shareholders (who owned 5% or more of a firm's shares) was 48% of firm shares, while Nguyen et al. (2021) reported the mean value for large shareholders was nearly 49% of firm shares. According to Le (2019), the mean of 0.51 showed highly concentrated ownership in Vietnam.

The mean (median) of MO is 0.06 (0.01), which means that the percentage of shares held by boards of managers (executive boards) was 6%. MO is measured as the total ownership of top managers (executive boards) (Ruan et al., 2014). This figure is lower than those reported by previous Vietnamese studies due to different measures, research periods and sample sizes. For example, while Hoang (2017) documented that the average value of MO was 0.15, the author

measured MO as the percentage of shares owned by boards of directors, supervisory boards and executive boards. Recently, Nguyen et al. (2021) reported an average value of MO of 10%, which is close to this study. They measured MO as the total ownership of all managers.

5.3.4. Debt maturity structure and firm performance model

Table 5.5d presents the descriptive statistics of firm performance and its factors. First, the mean (median) value of TOQ is 0.66 (0.6), which shows the firm's future profitability as perceived by the market. On average, the market value of a firm was evaluated as 67% of its total assets in Vietnam. This figure (0.66) is comparable with the study of Lai (2018), who reported that the average value of TOQ was 0.6. Next, the mean (median) values of ROA and ROE are 0.05 (0.04) and 0.1 (0.1), respectively. On average, a firm could generate 5% and 10% profit on its total assets and equity, respectively. The mean value of ROA (0.05) is consistent with those of several Vietnamese studies such as the means of 0.04, 0.039, 0.06 and 0.07 reported by Lai (2018), Nguyen and Tran (2017), Vo (2018b) and Phung and Le (2013), respectively. Similarly, the mean value of ROE (0.1) is comparable with those of other Vietnamese studies such as the means of 0.09, 0.11 and 0.12 documented by Le (2019), Lai (2018) and Kim et al. (2021), respectively. Next, the mean value of SIZE, which is measured as the natural logarithm of firm market value, is 20.03. The mean (median) value of TAN is 0.27 (0.21), which indicates that net PPE was equal to 27% of total assets on average. This figure (0.27) is comparable with several Vietnamese studies (Nguyen & Tran, 2017; Nguyen et al., 2018; Vo, 2017a; Vo, 2018c). Furthermore, on average, Vietnamese firms had an SGR of 16% annually. Although this figure (0.16) is higher than the mean value of SGR of 0.10 reported by Kim et al. (2021), it is consistent with the mean value of SGR of 0.17 reported by Bui (2018). While Kim et al. (2021) employed a sample of 30 listed firms manufacturing food products in Vietnam, Bui (2018) employed a sample of 817 non-financial firms listed on the HOSE and HNX.

To summarize, all of the descriptive statistics of the firm characteristics of DMS, BD, financial market development and firm performance are generally consistent

with previous Vietnamese studies. This means that the findings are generalizable based on this sample.

5.4. Regression results and discussion

5.4.1. Determinants of debt maturity structures model

This section provides the findings for research question 1, which examines the firm-level determinants of DMS. In particular, the study investigates hypothesis 1–9 regarding the effects of TAX, TERM, VOLR, GROW, SIZE, AMS, LEV, LIQ and QUAL on DMS.

5.4.1.1. Correlation analysis

Table 5.6 contains the correlation matrix between DMS and its firm characteristics. In general, the coefficients of correlation of the independent variables are quite low. The highest correlations are -0.46 and -0.44 , which show a moderate relationship between TERM and VOLR and a strong relationship between LEV and LIQ, respectively. DMS has the strongest significant correlation (0.3) with SIZE among the determinants, followed by AMS (0.2) and LIQ (0.17). This means that large and high LIQ firms tended to have more long-term debt and the matching maturity hypothesis could be present. Furthermore, this analysis shows the significantly positive correlation between LEV and DMS, which is in line with previous findings (Cai et al., 2008; Nguyen & Tran, 2017; Vijayakumaran & Vijayakumaran, 2019). This implies that firms with high leverage are likely to use more long-term debt, especially large firms, due to the strong and significant correlation between LEV and SIZE (0.25). DMS also has positive correlations with TERM, VOLR and GROW. In contrast, TAX and QUAL have negative correlations with DMS. The signs of these correlations are consistent with the predictions, except for GROW. However, the positive correlation between GROW and DMS is similar to the Vietnamese study of Nguyen and Tran (2017). It also supports the argument that firms prefer long-term debt to avoid high refinancing costs (Mohammad Nauman et al., 2015).

Table 5.6: Correlation matrix between debt maturity structure and its determinants.

	DMS	TAX	TERM	VOLR	GROW	SIZE	AMS	LEV	LIQ	QUAL
DMS	1.00									
TAX	-.0167	1.00								
TERM	.0143	-.0164	1.00							
VOLR	.0188	-.0157	-.4699*	1.00						
GROW	.0073	-.0684*	.0825*	-.2169*	1.00					
SIZE	.3025*	.0138	.0073	-.1593*	.1211*	1.00				
AMS	.2006*	-.0250	.0029	-.0189	-.0478*	.0938*	1.00			
LEV	.0651*	-.0458*	-.0074	.0301	-.0868*	.2469*	.0227	1.00		
LIQ	.1667*	-.0358*	.0333*	-.0036	.0657*	-.0381*	.0084	-.4381*	1.00	
QUAL	-.0067	-.0831*	-.0298	-.0161	.0045	-.0342*	-.0022	.0490*	-.0382*	1.00

Note: * shows significance at 5%. DMS = debt maturity structure; TAX = effective tax rate; TERM = term structure of interest rates; VOLR = volatility of interest rates; GROW = firm growth opportunities; SIZE = firm size; AMS = asset maturity structure; LEV = firm leverage; LIQ = firm liquidity; QUAL = firm quality; Definitions of variables are presented in Table 4.3.

5.4.1.2. Fixed-effects regression results

To test the hypotheses (H1–9) as well as to answer research question 1 relating to the relationship between firm characteristics and DMS, this study applies the FE estimator with robust standard errors to control for heteroscedasticity and autocorrelation issues. This study chose the FE estimator as the assumption of a strict exogeneity condition was met through Wooldridge's strict exogeneity test (see Section 5.2). As can be seen in Table 5.7, the adjusted R-squares of the models are approximately 0.12, indicating that the models explain 12% of the change in DMS. Even though 12% is not high, several studies in the corporate finance research field have reported R-square values below 15% (Chen et al., 2020; D'Amato, 2020; Le, 2015). For example, D'Amato (2020) reported an R-squared FE model with long-term debt ratio as the dependent variable as 8%. According to Vo et al. (2020), the R-square of FE models that examined the effect of the local business environment and domestic CEOs on firm performance were less than 4%.

Table 5.7: Determinants of debt maturity structure model results.

Variable	Predicted sign	FE	Sys-GMM (robustness)
AMS	+	0.0002343 (0.0003307)	0.000583** (0.0002908)
SIZE	+	0.0473584*** (0.0155915)	0.0144502*** (0.0044491)
GROW	–	0.0138231 (0.0114638)	–0.0004405 (0.0054057)
LEV	+	0.4090818*** (0.0635696)	0.080742*** (0.0239061)
LIQ	+	0.0707253*** (0.0085998)	0.0200702*** (0.0051355)
QUAL	–	0.0129534 (0.0117326)	0.0138279 (0.0106119)
TAX	–	–0.053863** (0.0235971)	0.0197964 (0.0209824)

Variable	Predicted sign	FE	Sys-GMM (robustness)
TERM	+	0.0142155*** (0.0023448)	0.0049358** (0.0020066)
VOLR	+	0.0945982*** (0.0158499)	-0.0023588 (0.0079361)
L.DMS			0.7956201*** (0.0545617)
Intercept		-0.9613858*** (0.3262857)	-0.3165988*** (0.0844471)
Firm-fixed effects		Yes	
Adjusted R-squared		0.1169	
Overall F-test		15.24	
Prob > F		<0.001	
AR (2) test (p-value)			0.455
Hansen test (p-value)			0.226
Number of obs.		4,170	3,497

Note: *, **, *** shows significance at 10%, 5% and 1%, respectively. Robust standard errors in the parentheses. DMS = debt maturity structure; TAX = effective tax rate; TERM = term structure of interest rates; VOLR = volatility of interest rates; GROW = firm growth opportunities; SIZE = firm size; AMS = asset maturity structure; LEV = firm leverage; LIQ = firm liquidity; QUAL = firm quality; Definitions of variables are presented in Table 4.3.

Column 1 in Table 5.7 provides the main results for DMS and its determinants based on the FE estimator with robust standard errors, while column 2 (sys-GMM) acts as an additional robustness test. The findings generally support the debt maturity determinants based on the tax-based hypothesis, agency costs hypothesis, and signalling and LIQ risks hypothesis.

First, the debt maturity determinants based on the tax-based hypothesis approach are proxied by TAX, TERM and VOLR. While TAX is significantly negatively related to DMS at the 5% level, TERM and VOLR are significantly positively related to DMS at the 1% level.

Hypothesis 1 predicts that when the tax rate decreases, firms prefer long-term borrowings. The finding on TAX (p-value = 0.023) in Table 5.7 provides statistical

support for this hypothesis for Vietnam. A decrease in the tax rate leads to a decrease in tax deductibility. This indicates that firms prefer issuing long-term debt so that they can reduce flotation costs and bankruptcy costs. This finding is consistent with other findings in Vietnam. For example, Phan (2020) reported a significantly negative relationship between DMS and TAX in both SOEs and non-SOEs during the period 2009–2019 based on the FE method. Similarly, Chung and Phan (2020) documented that firms in Vietnam preferred having more long-term borrowings if there was a reduction in tax rate, for the period 2007–2016 based on the RE method. Furthermore, the finding is similar to those of some previous studies in developing countries. For instance, Kirch and Terra (2012) and Cai et al. (2008) employed the sys-GMM method to examine the relationship between TAX and DMS in five South American countries and in China, respectively. Their results supported a significantly negative relationship between TAX and DMS.

In contrast, when TERM and VOLR increase, firms preferred long-term debt. The findings on TERM and VOLR provide statistical support for hypotheses 2 and 3, respectively.

The result for TERM ($p\text{-value} < 0.001$) in Table 5.7 provides evidence to support hypothesis 2, which is that firms tend to have more long-term debt when TERM increases. TERM is found to be significantly and positively related to DMS in the FE regression. This finding suggests that in early years, high interest expense from issuing long-term debt can reduce a firm's expected tax liability and increase the firm's current market value. The finding not only supports the theoretical prediction (Barclay & Smith, 1995; Brick & Ravid, 1985), but is also similar to those from previous empirical studies (Antoniou et al., 2006; Orman & Köksal, 2017; Zheng et al., 2012). In the context of Vietnam, Nguyen et al. (2018) examined DMS decisions under internal and external financial constraints. The authors used quantile regression and Oaxaca–Blinder decomposition to analyze how firms' factors affected long-term debt's distribution for the period 2007–2016. They employed methods that are different to this study and the majority of existing studies (Alcock et al., 2012; Cai et al., 2008; D'Amato, 2020). They reported a

significant negative effect of TERM on DMS. The finding of Nguyen et al. (2018) is in contrast with this study. According to Barclay and Smith (1995) (cited in Deesomsak (2006)), the relationship between TERM and DMS depends on the method employed. Further, according to Ha et al. (2021), while interest rates in Vietnam increased sharply because of high inflation, the amount of non-performing loans was significantly high in the banking system from 2009 to 2012. Moreover, the banking system faced limited access to credit and low overall LIQ (Ha et al., 2021). The Vietnamese government conducted a series of interventions and bank restructuring reforms after the crisis in 2012 (Ha et al., 2021). Thus, when the term spread is high, firms may not have access to long-term borrowings from banks. This may explain for the negative relationship between TERM and DMS reported by Nguyen et al. (2018). After the inventions of the government, there have been some significant results since 2013, especially since 2016. For instance, while there has been an increase in LIQ in the banking system due to the declines in lending and deposit rates, there has been a decline in the percentage of short-term capital used for medium and long-term loans from 50% in 2017 to 40% in 2019 (Ha et al., 2021). Thus, these results could have led to a change from a negative to a positive relationship between TERM and DMS. The significant positive relationship between TERM and DMS is also consistent with findings in Turkey (Orman & Köksal, 2017), in the UK, Germany and France (Antonioni et al., 2006) and in the USA (Barclay & Smith, 1995).

Next, hypothesis 3 predicts that VOLR has a positive effect on long-term debt structure. The study finds that VOLR ($p\text{-value} < 0.001$) is significantly positively related to TERM in the FE model. This supports the argument that if the interest rate is uncertain, firms are likely to have more long-term debt to provide a benefit in a tax induction situation (Brick & Ravid, 1991). The study also examines the impacts of both VOLR and TERM on DMS using the same equation as Kim et al. (1995), who used a sample of the US listed firms. The study supports the finding of Kim et al. (1995) that with high VOLR, firms prefer issuing long-term debt. Moreover, the finding is in line with previous empirical studies (Chung & Phan, 2020; Kim et al., 1995; López-Gracia & Mestre-Barberá, 2011). For instance, in

Vietnam, Chung and Phan (2020) provided strong evidence to support a positive relationship between VOLR and DMS in both RE and sys-GMM estimators.

Second, debt maturity determinants based on the agency costs hypothesis are proxied by GROW, SIZE and AMS. Only SIZE has a significant positive impact on the choice of DMS at 1% level. The study finds no support for GROW or AMS.

In particular, hypothesis 4 suggests that firms with a high value of GROW tend to have more short-term borrowings. This study expected to see a strong negative relationship between GROW and DMS as Vietnam is an emerging country that has a lot of new GROW. Firms tend to have more short-term debt to mitigate underinvestment problems. However, the study finds no evidence to support a negative relationship between GROW ($p\text{-value} = 0.228$) and DMS in Vietnam. This indicates that the agency costs hypothesis does not help much in explaining and predicting the observed pattern of choosing the term structure of debt in Vietnam. The insignificant relationship between GROW and DMS could be the result of not having enough variation in GROW within the sample to examine the effects or most previous studies may have overestimated the impact of GROW on DMS. This argument is in line with Mauer and Ott (2000), who stated that short-term debt could not reduce agency costs while maintaining a target leverage capital structure could considerably reduce agency costs. They demonstrated that when a firm employed more short-term debt, tax shields became smaller due to a rise in bankruptcy costs. Shareholders decided to send the firm to creditors sooner without considering the bankruptcy costs. Hence, the difference between the first- and second-best exercises approach becomes wider. This means that a decrease in DMS leads to an increase in agency costs instead of a decrease.

The insignificant effect of GROW on DMS is also consistent with several studies. In Vietnam, while Chung and Phan (2020) measured GROW as the ratio of market to book value of total assets, Ngo and Le (2021) measured GROW as the ratio of sales growth to total asset growth. Although this study measures GROW as the ratio of market to book value of equity, the finding of the study is still compatible with those two studies, which found weak evidence to support a

relationship between GROW and DMS. This also could show that Vietnamese banks monitor their debts effectively as firms are not likely to shorten their debts to mitigate underinvestment. Further, an insignificant relationship between GROW and DMS has been found not only in Vietnam, but also in India (Kalsie & Nagpal, 2018), in Turkey (Orman & Köksal, 2017), in South American countries (Kirch & Terra, 2012) and in Malaysia (Deesomsak, 2006).

Next, Table 5.7 provides strong support for hypothesis 5, which predicts a positive effect of SIZE on DMS. The study finds a significant positive relationship between SIZE (p -value = 0.003) and DMS at the 1% level. Small firms have more future investments, which leads to higher interest conflicts between shareholders and creditors (Stohs & Mauer, 1996). Moreover, small firms can avoid high transaction costs of issuing long-term debt (Titman & Wessels, 1988). Thus, the finding indicates that in Vietnam, small firms prefer using short-term debt to reduce agency costs, while large firms prefer issuing long-term debt due to their easier access to the market and lower costs of issuing long-term debt than small firms. This finding supports not only the agency costs hypothesis but also the signalling hypothesis. Small firms have more motivation to use short-term debt in order to signal to the market that they are using more short-term debt to reduce their high level of information asymmetry. The significant relationship between SIZE and DMS is similar to many previous studies, especially studies in developing countries such as Vietnam (Chung & Phan, 2020, Nguyen & Tran, 2017), India (Krishnankutty & Chakraborty, 2014) and China (Ruan et al., 2014).

Furthermore, the study finds no support for hypothesis 6, which predicts a positive relationship between AMS and DMS. The coefficient of AMS (p -value = 0.479) is positive but not significant, as shown in Table 5.7. It is surprising to find that Vietnamese firms do not match the maturities of their assets and debts to mitigate underinvestment and asset substitution problems. The maturity matching hypothesis means firms issue long-term debt without significantly increasing the agency cost of debt (Guedes & Opler, 1996) and LIQ risks (Diamond, 1991). Nguyen and Tran (2017) found weak evidence to support a positive association between AMS and DMS in Vietnam using an FE estimator. Similarly, Phan (2020)

reported an insignificant relationship between AMS and DMS for both Vietnamese SOEs and non-SOEs. Likewise, Orman and Köksal (2017), Stephan et al. (2011) and Krishnankutty and Chakraborty (2014) found no support for the maturity matching hypothesis in Turkey, Ukraine and India, respectively. Furthermore, this finding is in line with Alcock et al. (2012) and Deesomsak (2006), who reported an insignificant relationship between AMS and DMS in Australia. Alcock et al. (2012) argued that the mismatching maturity between assets and debt reflects the Australian capital market conditions. In Australia, firms depend heavily on bank borrowings and find it difficult to access the long-term debt market. Similarly, Vietnamese firms mainly borrow from banks and the financial market is viewed as a bank-based system (Phan, 2018; Vo, 2019b). However, after Nguyen and Tran (2017) controlled for leverage – an endogenous variable – the influence of AMS on DMS became significant at the 1% level using a 2SLS estimator. Similarly, Chung and Phan (2020) found a significant and positive effect of AMS on DMS for a full sample of Vietnamese firms and subsamples such as bank-dependent firms, large firms and non-SOE firms using the sys-GMM estimator. Hence, this study continues to examine the effect of AMS on DMS using the sys-GMM estimator in order to control for the interaction between leverage and debt maturity in the next section.

Third, the debt maturity determinants based on the signalling and LIQ risks hypothesis are proxied by QUAL, LEV and LIQ. Overall, LEV (p-value < 0.001) and LIQ (p-value < 0.001) are significantly and positively related to DMS, whereas QUAL (p-value = 0.270) is not significantly related to DMS.

In particular, Table 5.7 shows the insignificant coefficient of QUAL (p-value = 0.270). This indicates that the study finds no evidence to support hypothesis 7, which predicts that QUAL has a negative impact on the choice of debt maturity. High-quality (low-risk) firms are likely to shorten their borrowings to separate themselves from low-quality (high-risk) firms. In other words, Vietnamese firms do not use the maturity of borrowings to signal their quality. There are mixed findings about the impact of QUAL on DMS in Vietnam. The insignificant finding on QUAL is consistent with Chung and Phan (2020), who reported QUAL was

not an important factor in determining DMS for Vietnamese firms. On the other hand, Lensink and Pham (2011) and Nguyen and Tran (2017) found strong evidence to support a negative relationship between QUAL and DMS in Vietnam. However, Lensink and Pham (2011) and Nguyen and Tran (2017) measured QUAL as Altman's Z-score and ROA, which are different from this study. Chung and Phan (2020) employed the same measure, future abnormal earnings, as this study. Danisevska (2002) argued that the mixed results on QUAL in previous empirical studies are due to using different measures. For example, future abnormal earnings, Altman's Z-score and ROA are used as proxies for information asymmetry. Further, there are three possible explanations for the observed insignificant relationship. According to Diamond (1993), short-term borrowings could lead to inefficient liquidation. Hence, high-quality firms want to combine short-term and long-term debt to finance their investments. Another explanation is that a non-monotonic relationship between QUAL and TERM was found in the study of Diamond (1991). Diamond (1991) found that higher and lower quality firms chose short-term debt, whereas medium-quality firms preferred long-term debt. In addition, Danisevska (2002) stated that a firm is not likely to shorten its debt to signal its quality if the firm does not have both positive information asymmetry and inside information. In general, an insignificant relationship between QUAL and DMS has been found in several previous studies (Alcock et al., 2012; Deesomsak, 2006; Orman & Köksal, 2017).

Next, the study finds strong evidence to support hypothesis 8, which predicts a positive effect of LIQ on debt maturity. The result for LIQ ($p\text{-value} < 0.001$) indicates that firms in Vietnam with highly liquid assets tend to have more long-term debt as they can generate cash at short notice to meet the fixed payments of long-term debt. Although Myers and Rajan (1998) stated that highly liquid assets could limit firms' capacity to raise fund, creditors prefer offering long-term borrowings to firms with highly liquid assets. Creditors could avoid the risk that firm managers may choose riskier investment project before long-term debt matures or the conditions of firms might deteriorate over time (Antoniou et al., 2006). This finding is compatible with empirical studies that have examined

developing countries such as China (Cai et al., 2008), India (Kalsie & Nagpal, 2018), Vietnam (Ngo & Le, 2021) and Asia–Pacific countries (Deesomsak, 2006).

Finally, hypothesis 9 predicts that the leverage ratio (LEV) has a positive effect on TERM. The coefficient of LEV (< 0.001) is significant and positive at the 1% level, as shown in Table 5.7. LEV has the strongest effect on DMS among the independent variables as the coefficient of LEV is the highest and most significant. This implies that Vietnamese firms with high leverage ratios prefer issuing long-term debt so that they can reduce refinancing and LIQ risks. Furthermore, although a high leverage ratio leads to rises in financial distress and conflicts between shareholders and debt holders, high leverage gives great incentive for managers to work more efficiently. Hence, the significant and positive relationship between LEV and DMS supports both the LIQ risk and agency costs hypotheses. This finding is in line with many existing studies. For instance, Chung and Phan (2020) and Nguyen and Tran (2017) reported that LEV was significantly and positively related to DMS using samples of listed firms in Vietnam. Likewise, highly leveraged firms in China and Turkey had more long-term debt as reported in the studies of Vijayakumaran and Vijayakumaran (2019) and Orman and Köksal (2017), respectively.

5.4.1.3. Robustness check: Endogeneity

Although the study has employed an FE regression with robust standard errors to control for heteroscedasticity and autocorrelation issues, several previous studies have suggested that there is a potential endogeneity problem between DMS and leverage (Alcock et al., 2012; Cai et al., 2008). For instance, Barclay et al. (2003), Johnson (2003) and Alcock et al. (2012) found evidence to support that leverage and debt maturity are endogenous aspects of capital structure decisions. If this potential endogeneity issue is not controlled, the result may be inconsistent. Hence, to address any potential endogeneity concerns, the study applies the two-step GMM estimator with robust standard errors, which is efficient (controlling endogeneity issues) and robust to heteroscedasticity and autocorrelation. The results of the two post-estimation tests, which are second-order serial correlation (AR(2)) and overidentification (Hansen test), are shown in

column 2 of Table 5.7. The AR(2) test has a p-value of 0.455, which is higher than 0.05. This indicates that the null hypothesis of no second-order serial correlation cannot be rejected. The Hansen-test has a p-value of 0.226, which is higher than 0.05. This means that the IVs are valid. As a result, the results of the sys-GMM model are valid.

Column 2 of Table 5.7 presents the results for DMS and its determinants based on the sys-GMM estimator. As can be seen in the table, there is a positive and significant effect of previous DMS on current DMS. This is consistent with many previous studies in Vietnam (Chung & Phan, 2020), in South American countries (Kirch & Terra, 2012), in European countries (Antoniou et al., 2006) and in Spain (López-Gracia & Mestre-Barberá, 2011). Next, the coefficients of SIZE, LEV, LIQ and TERM are positive and significant. This means that the study finds strong support for hypothesis 2 on TERM (p-value = 0.014), hypothesis 5 on SIZE (p-value < 0.001), hypothesis 8 on LIQ (p-value < 0.001) and hypothesis 9 on LEV (p-value < 0.001). After controlling for leverage, the coefficient of AMS (H6) (p-value = 0.045) becomes significant, whereas the coefficients of TAX (H1) (p-value = 0.345) and VOLR (H3) (p-value = 0.766) become not significant. Overall, the coefficients for the explanatory variables in the sys-GMM model are similar to the FE results, except for AMS, TAX and VOLR. The results from the sys-GMM estimator still support the three main hypotheses on DMS. Thus, the study can conclude that the results reported in Table 5.7 are robust.

5.4.2. Debt maturity structure and bank debt model

This section presents the findings for research question 2. The study examines hypothesis 10 in order to understand the moderating effect of BD on the association between firm-level determinants and DMS.

5.4.2.1. Correlation analysis

Table 5.8 shows a significant negative correlation between DMS and BD (-0.17). In other words, firms with more long-term debt seem to have less BD. This is consistent with the argument that banks prefer lending short-term (Diamond,

1991; González, 2017). All other variables have the same correlations as discussed in Section 5.4.1.1.

Table 5.8: Correlation matrix between debt maturity structure and bank debt.

	DMS	TAX	TERM	VOLR	GROW	SIZE	AMS	LEV	LIQ	QUAL	BD
DMS	1.00										
TAX	-0.0287	1.00									
TERM	0.0235	-0.0340	1.00								
VOLR	0.0224	-0.0160	-0.4737*	1.00							
GROW	0.0330	-0.0602*	0.0849*	-0.2153*	1.00						
SIZE	0.3047*	0.0223	0.0075	-0.1525*	0.1146*	1.00					
AMS	0.1858*	-0.0075	-0.0025	-0.0083	-0.0455*	0.0748*	1.00				
LEV	0.1166*	-0.0247	-0.0109	0.0282	-0.1084*	0.2823*	0.0350*	1.00			
LIQ	0.1582*	-0.0479*	0.0294	0.0039	0.0725*	-0.0464*	0.0037	-0.4323*	1.00		
QUAL	0.0072	-0.0858*	-0.0254	-0.0171	0.0028	-0.0315	-0.0102	0.0383*	-0.0324	1.00	
BD	-0.1693*	-0.0094	0.0051	-0.0234	-0.0481*	0.0248	-0.0685*	0.2277*	-0.2332*	0.0029	1.00

Note: * shows significance at 5%. DMS = debt maturity structure; TAX = effective tax rate; TERM = term structure of interest rates; VOLR = volatility of interest rates; GROW = firm growth opportunities; SIZE = firm size; AMS = asset maturity structure; LEV = firm leverage; LIQ = firm liquidity; QUAL = firm quality; BD = bank debt. Definitions of variables are presented in Table 4.3.

5.4.2.2. System-GMM regression results

To test hypothesis 10 (research question 2) on whether the level of existing BD affects the association between firm-level determinants and DMS in Vietnam, the study extends the previous model (model 1a) by adding the moderating effect of BD. Wooldridge's strict exogeneity test confirms that model 1b violates the assumption of strict exogeneity. Thus, the study uses the two-step GMM estimator with robust standard error to test this hypothesis. Column 1 of Table 5.9 shows the results of two tests, AR(2) and overidentification (Hansen test), to ensure the validity of findings. These two tests confirm that: (1) there is no second-order serial correlation; and (2) the IVs are valid.

Table 5.9: Debt maturity structure and bank debt model results.

	Column 1 (sys-GMM)	Column 2 (sys-GMM) (robustness)	Column 3 (sys-GMM) (robustness)	Column 4 (sys-GMM) (robustness)	Column 5 (sys-GMM) (robustness)
AMS	0.0001762 (0.000422)		0.0001891 (0.0004259)	0.0001879 (0.00043)	0.0001662 (0.0004104)
SIZE	0.0136514* (0.0081269)	0.0177686** (0.0086558)		0.0146965* (0.0077474)	0.0127712* (0.0077603)
GROW	0.0312446 (0.0422527)	0.0175898 (0.0427102)	0.0226428 (0.0427752)		0.0519099 (0.0459835)
LEV	0.1698168*** (0.0529862)	0.1774267*** (0.0557459)	0.156756*** (0.0549507)	0.1382126** (0.0589957)	
LIQ	0.0193607** (0.009328)	0.0220674** (0.0096491)	0.0194619** (0.0091721)	0.0177392* (0.0093059)	0.0193934** (0.0090615)
QUAL	-0.2231478* (0.1173252)	-0.2156808* (0.1179675)	-0.2283616* (0.1193629)	-0.2281815* (0.1179528)	-0.1962632* (0.1098865)
TAX	0.014762 (0.0376534)	0.0066155 (0.039028)	0.0195597 (0.0377796)	0.0167641 (0.0386273)	0.021354 (0.0373238)
TERM	0.0236138*** (0.0076985)	0.0247044*** (0.0076579)	0.0239698*** (0.0076361)	0.0236949*** (0.0077236)	0.0225594*** (0.0076542)
VOLR	0.0299907 (0.0207741)	0.0320393 (0.0210932)	0.0311183 (0.0212123)	0.0280144 (0.0204461)	0.0277025 (0.0206899)

	Column 1 (sys-GMM)	Column 2 (sys-GMM) (robustness)	Column 3 (sys-GMM) (robustness)	Column 4 (sys-GMM) (robustness)	Column 5 (sys-GMM) (robustness)
BD*AMS	0.0006218 (0.0006602)		0.000618 (0.0006549)	0.0006393 (0.0006523)	0.0005704 (0.0006326)
BD*SIZE	0.0024283 (0.0048564)	0.0012089 (0.0050306)		0.0020032 (0.0041662)	0.004807 (0.0067809)
BD*GROW	-0.0474063 (0.0807136)	-0.0209604 (0.0814179)	-0.0502734 (0.0818116)		-0.0737388 (0.0894692)
BD*LEV	-0.1186563 (0.0784656)	-0.1150349 (0.0790542)	-0.1403363 (0.0983326)	-0.0685555 (0.072154)	
BD*LIQ	0.0048 (0.0124823)	0.0030604 (0.0125639)	0.0018079 (0.0125531)	0.0084714 (0.0156948)	0.0006842 (0.0130357)
BD*QUAL	0.5121603** (0.2556815)	0.4952766* (0.2531943)	0.5269892** (0.2610897)	0.5268435** (0.2585914)	0.4548003* (0.2400072)
BD*TAX	0.0513198 (0.068155)	0.0527978 (0.0700563)	0.0459907 (0.0703713)	0.0473465 (0.0701704)	0.0390747 (0.0688111)
BD*TERM	-0.016093** (0.0079562)	-0.0159483** (0.0079318)	-0.0166757** (0.0079451)	-0.0158468** (0.0079777)	-0.0152847* (0.0079462)
BD*VOLR	-0.0305642 (0.0331013)	-0.0228049 (0.0341392)	-0.0323283 (0.0341704)	-0.026381 (0.0283185)	-0.0303474 (0.0304759)
AMSPPE		0.0001261 (0.0001973)			
BD*AMSPPE		0.0001385 (0.0002974)			
SIZEM			0.0136639 (0.0085178)		
BD*SIZEM			0.0032339 (0.0057488)		
GROWM				0.0517215 (0.080312)	
BD*GROWM				-0.0785489 (0.1423793)	
LEV M					0.1687225** (0.0669698)
BD*LEV M					-0.1646976 (0.1365659)

	Column 1 (sys-GMM)	Column 2 (sys-GMM) (robustness)	Column 3 (sys-GMM) (robustness)	Column 4 (sys-GMM) (robustness)	Column 5 (sys-GMM) (robustness)
L.DMS	0.7518794*** (0.1098668)	0.7026709*** (0.112257)	0.7457254*** (0.1115626)	0.7449548*** (0.11073)	0.7605828*** (0.1001306)
Intercept	-0.3521486** (0.146812)	-0.4168354*** (0.1533564)	-0.3340793** (0.1414912)	-0.3674808** (0.1495888)	-0.3581344*** (0.1362601)
Number of obs.	2,437	2,437	2,437	2,437	2,437
AR(2) test (P-value)	0.461	0.490	0.470	0.480	0.427
Hansen test (P-value)	0.168	0.149	0.167	0.167	0.227

*Note: *, **, *** shows significance at 10%, 5% and 1%, respectively. Robust standard errors in the parentheses. DMS = debt maturity structure; TAX = effective tax rate; TERM = term structure of interest rates; VOLR = volatility of interest rates; GROW = firm growth opportunities; SIZE = firm size; AMS = asset maturity structure; LEV = firm leverage; LIQ = firm liquidity; QUAL = firm quality; BD = bank debt. Definitions of variables are presented in Table 4.3.*

In general, column 1 of Table 5.9 presents the coefficients of significant variables that have similar signs to the predictions and the main findings shown in Table 5.7. The coefficients of SIZE, LEV, LIQ, TERM and lagged DMS are positive and significant. Furthermore, the coefficient of QUAL (p-value = 0.057) becomes significant at the 10% level. This finding supports the signalling hypothesis (H7) that high-quality firms seem to borrow more short-term debt in order to signal their quality to the market. This is in line with several empirical studies (Alcock et al., 2012; Awartani et al., 2016; Zheng et al., 2012). In the context of Vietnam, Lensink and Pham (2011) and Nguyen and Tran (2017) also confirmed a negative relationship between QUAL and DMS. Furthermore, one part of this effect of QUAL depends on the amount of BD a firm borrows. As can be seen in column 1 of Table 5.9, BD strengthens the relationship between QUAL and debt maturity, whereas BD weakens the relationship between TERM and debt maturity. The effects of other firm characteristics on debt maturity are not impacted by the amount of BD a firm holds. This means that the effects of AMS, SIZE, GROW, LEV, LIQ, TAX and VOLR on DMS do not differ between firms with high and low levels of BD.

The finding of the moderating term $BD \times QUAL$ supports the argument of Alcock et al. (2012). Both Cai et al. (2008) and Alcock et al. (2012) mentioned heavy reliance on BD in China and Australia, respectively, to argue for their findings relating QUAL and AMS. In particular, Alcock et al. (2012) stated that the most surprising result was a lack of support for the matching maturity hypothesis. They argued that their findings reflect the conditions of the capital market in Australia such as the heavy reliance on BD and illiquid debt market. Although Cai et al. (2008) found evidence to support the matching maturity theory, they found no support for the signalling hypothesis. Both studies have not investigated the moderating effect of BD. Like China and Australia, firms in Vietnam mainly depend on bank loans, while the Vietnamese bond market is very small and inactive (Phan, 2018). Thus, using a sample of Vietnamese listed firms, the study confirms the findings of Alcock et al. (2012) that a higher presence of BD increases the negative relationship between QUAL and DMS. However, this study found support for all of the traditional theories of DMS after controlling for the moderating effect of BD, while Alcock et al. (2012) found no support for many of the traditional DMS theories since they did not control for the effect of BD. Furthermore, this study supports signalling theory which suggests that high-quality Vietnamese firms tend to issue more short-term debt since these firms expect their future credit rating will be improved. Thus, when their good news arrives, they can refinance with a better interest rate. However, this finding does not support the argument of Cai et al. (2008) that signalling theory does not work in China due to a high reliance on BD of Chinese firms.

Further, the maturity matching hypothesis seems not to work in a country that has a bank-based system and an illiquid bond market. The reason could be that banks prefer lending short-term bank loans in order to reduce non-performing loans. In addition, Phan (2020) argued that Vietnamese firms employ short-term borrowings to invest in long-term projects because they have limited accessibility to long-term funds, limited risk management skills and their own risk appetite. Hence, this finding contributes to the literature of DMS by exploring the moderating effect of BD.

5.4.2.3. Robustness check

The study conducts robustness tests by replacing AMS, SIZE, LEV and GROW with AMSP, SIZEM, LEVM and GROWM, respectively. To be specific, SIZEM is firm market size measured as the natural logarithm of market value of equity (Barclay & Smith, 1995; Stohs & Mauer, 1996). GROWM is GROW calculated by the market value of equity plus total debt, scaled by total assets (Awartani et al., 2016). AMSP is the asset maturity structure measured by the ratio of net PPE over annual depreciation expense (Martins et al., 2017; Ozkan, 2000). LEVM is market leverage proxied by the ratio of total debt to firm market value (Álvarez-Botas & González-Méndez, 2019; Wang, 2020). The robustness tests of these replaced variables – AMSP, SIZEM, GROWM and LEVM – are estimated using the system two-step GMM estimator with robust standard error and reported in columns 2–5 of Table 5.9, respectively. The AR(2) have p-values over 0.4 (shown in Table 5.9), which indicates no second-order serial correlation in any estimates. P-values for the Hansen test (shown in Table 5.9) are over 0.14, which confirms the validity of the chosen instruments.

Columns 2–5 of Table 5.9 show the findings for AMSP, SIZEM, GROWM, and LEVM, which do not change the main findings shown in column 1. In conclusion, the study provides evidence to support hypothesis 10 that the effects of QUAL and TERM on DMS differ between firms with high and low BD levels.

5.4.3. Debt maturity structure and financial market development model

This section shows the findings for research question 3. The study examines hypotheses 11 and 12 to explain how the development of the stock market and banking sector impacts on corporate DMS.

5.4.3.1. Correlation analysis

Table 5.10 presents the correlation matrix between DMS and financial market development. Due to the relatively high correlation (0.8) between VOLR and BANK, including these two variables together in the regression could create multicollinearity problems. Therefore, the study excludes VOLR in the regression.

The highest correlation in Table 5.10 is -0.27 , which shows a negative relationship between SCON and BANK. DMS has a significant negative correlation with SCON. This implies that when the stock market becomes more concentrated, firms seem to shorten their debt maturity. Similarly, due to the negative correlation between BANK and DMS, firms seem to shorten their debt maturity when BANK increases. The signs of the correlations between DMS and SCON and between DMS and BANK are consistent with the predictions.

Table 5.10: Correlation matrix of debt maturity structure and financial market development model.

	DMS	SCON	BANK	AMS	SIZE	GROW	LEV	LIQ	QUAL	TAX	TERM	VOLR
DMS	1.00											
SCON	-0.0409*	1.00										
BANK	-0.0116	-0.1893*	1.00									
AMS	0.2006*	-0.0035	0.0095	1.00								
SIZE	0.3025*	0.0569*	0.1720*	0.0938*	1.00							
GROW	0.0073	-0.0883*	0.2731*	-0.0478*	0.1211*	1.00						
LEV	0.0651*	0.0016	-0.0344*	0.0227	0.2469*	-0.0868*	1.00					
LIQ	0.1667*	-0.0257	-0.0230	0.0084	-0.0381*	0.0657*	-0.4381*	1.00				
QUAL	-0.0067	0.1249*	-0.0435*	-0.0022	-0.0342*	0.0045	0.0490*	-0.0382*	1.00			
TAX	-0.0167	0.0532*	0.0302	-0.0250	0.0138	-0.0684*	-0.0458*	-0.0358*	-0.0831*	1.00		
TERM	0.0143	-0.2461*	0.2078*	0.0029	0.0073	0.0825*	-0.0074	0.0333*	-0.0298	-0.0164	1.00	
VOLR	0.0188	-0.0402*	-0.7937*	-0.0189	-0.1593*	-0.2169*	0.0301	-0.0036	-0.0161	-0.0157	-0.4699*	1.00

Note: * shows significance at 5%. DMS = debt maturity structure; TAX = effective tax rate; TERM = term structure of interest rates; VOLR = volatility of interest rates; GROW = firm growth opportunities; SIZE = firm size; AMS = asset maturity structure; LEV = firm leverage; LIQ = firm liquidity; QUAL = firm quality; SCON = stock market concentration; BANK = banking sector size. Definitions of variables are presented in Table 4.3.

5.4.3.2. Regression results

To test hypotheses 11 and 12 of research question 3, which examine whether the development of financial markets affects DMS in Vietnam, the study applies the FE estimator with robust standard error. As discussed in Section 5.2, the model of financial market development does not violate the assumption of strict exogeneity based on Wooldridge's strict exogeneity test result. The results for the FE estimator with robust standard error are presented in column 1 of Table 5.11.

Table 5.11: Debt maturity structure and financial market development model results.

	Predicted sign	FE	Sys-GMM (robustness)
SCON	–	–0.0037789*** (0.0005295)	–0.0018742*** (0.0006738)
BANK	–	–0.002226*** (0.0004387)	–0.0011938** (0.0004812)
AMS	+	0.0001785 (0.0003338)	0.0008562*** (0.0002857)
SIZE	+	0.0569229*** (0.0164653)	0.0251379*** (0.0060133)
GROW	–	0.0087663 (0.0116855)	0.005117 (0.0064497)
LEV	+	0.3954307*** (0.0639379)	0.0822619*** (0.0286925)
LIQ	+	0.0685123*** (0.0084411)	0.022997*** (0.0054703)
QUAL	–	0.0188015 (0.0117736)	0.0146816 (0.0103065)
TAX	–	–0.0396461 (0.0240967)	0.0305283 (0.0400625)
TERM	+	0.0004512 (0.0016842)	0.0027366 (0.0030175)
L.DMS			0.6705322*** (0.0693843)

	Predicted sign	FE	Sys-GMM (robustness)
Intercept		-0.6147417** (0.31258)	-0.2637445*** (0.0876018)
Firm-fixed effects		Yes	
Adjusted R-squared		0.1226	
Overall F-test		14.99	
Pro > F		<0.001	
AR (2) test (p-value)			0.494
Hansen test (p-value)			0.637
Observations		4,170	3,497

*Note: *, **, *** shows significance at 10%, 5% and 1%, respectively. Robust standard errors in the parentheses. DMS = debt maturity structure; TAX = effective tax rate; TERM = term structure of interest rates; VOLR = volatility of interest rates; GROW = firm growth opportunities; SIZE = firm size; AMS = asset maturity structure; LEV = firm leverage; LIQ = firm liquidity; QUAL = firm quality; SCON = stock market concentration; BANK = banking sector size. Definitions of variables are presented in Table 4.3.*

This study finds evidence to support hypothesis 11 that SCON has a negative relationship with DMS. In column 1 of Table 5.11, the coefficient of SCON (p-value < 0.001) is significantly and negatively related to DMS at the 1% level. In other words, the finding strongly supports the prediction that firms tend to issue long-term debt when SCON decreases in Vietnam. The finding of a significant and negative relationship between SCON and DMS is consistent with Demirgüç-Kunt and Levine (1996), who argued that high concentration of the stock market leads to reduction in the LIQ of the stock market. The development of the stock market, proxied by stock market LIQ, is confirmed to have a significantly positive relationship with TERM in Vietnam (Chung & Phan, 2020). In other words, an increase in SCON leads to a decrease in the LIQ of the stock market, which leads to a decrease in TERM. This finding is also in line with the argument of Bae et al. (2021) that a highly concentrated stock market negatively affects economic health such as capital allocation efficiency and funding for new firms (Bae et al., 2021). Overall, the development of the stock market helps firms to issue long-term bond or equity. However, high SCON hinders the development of the stock market. Hence, in Vietnam firms finance their investments through BD, while

banks prefer lending short term due to their efficient monitoring services. This indicates that firms have more short-term debt when SCON increases.

Regarding the development of the banking sector, the study finds strong evidence to support hypothesis 12 that banking sector development negatively affects the choice of debt maturity in Vietnam. The coefficient of BANK ($p\text{-value} < 0.001$) is significantly and negatively related to DMS at the 1% level, as shown in Table 5.11. This result suggests that firms have more short-term debt when the weight of the banking sector increases. This implies that banks take advantage of short-term debt, which helps banks monitor borrowers efficiently. The finding supports the monitoring role of banks (Deesomsak, 2006). In the Vietnam context, the result of a significant and negative relationship between BANK and DMS is consistent with Nguyen and Tran (2017), who reported that when financial intermediaries including banks and other financial companies developed, firms seemed to shorten their debt maturity. This study and Nguyen and Tran (2017) found a significant negative relationship between the development of the banking sector and DMS in Vietnam using the same measure of BANK. The result reflects the actual market conditions in Vietnam. According to Phan (2020), while the majority of Vietnamese firms finance their investments by BD, roughly 45% of total BD are short-term debt (the rest is medium and long-term debt). The result is consistent with some other developing countries such as Peru and Brazil (Tresierra & Reyes, 2018) and Thailand and Malaysia (Deesomsak, 2006).

In summary, this study confirms the impact of financial market development on the selection of the term structure of debt. Consequently, managers should not ignore the financial market conditions when they make financing decisions, especially the impact of SCON. While previous studies have mainly concentrated on how SCON affects financial markets and the performance of firms and portfolios (Chelley-Steeley, 2008, Chen and Chen, 2017, Gallagher et al., 2015), this study extends the discussion by investigating the effect of SCON on DMS. Due to high levels of SCON, Vietnamese firms are unlikely to access long-term debt, which helps firms reduce liquidity risks. This finding is in line with Gallagher et al. (2015), who showed that firms reduce their level debt, and with Bae et al.

(2021), who found that small and new firms have limited capacity to raise capital. Hence, this finding raises awareness of market participants regarding the potentially troubling consequences of large and successful firms' perceived power.

5.4.3.3. Results for control variables

Findings for the control variables in the regression of financial market development and DMS (shown in Table 5.11) are mainly consistent with those in the regression of DMS determinants (shown in Table 5.7). The coefficients of SIZE (p-value < 0.001), LEV (p-value < 0.001) and LIQ (p-value < 0.001) are still significantly and positively related to DMS. They support the agency costs hypothesis and the signalling and LIQ hypothesis. However, the results fail to support the tax-based hypothesis due to the insignificant coefficients of TERM (p-value = 0.789) and TAX (p-value = 0.100). The insignificant effect of TAX on DMS has been found and is discussed in Section 5.4.1.3, while the insignificant effect of TERM on DMS is in line with some previous studies (Fu & Tang, 2016; Johnson, 2003).

5.4.3.4. Robustness check: Endogeneity

As discussed in Section 5.4.1.3, the study uses the two step sys-GMM estimator with robust standard error to control for any potential endogeneity concerns as shown in previous studies (Cai et al., 2008; Antoniou et al., 2006). The sys-GMM estimator is employed as a robustness check to validate the findings on the relationship between DMS and financial market development. Column 2 of Table 5.11 shows the results of two tests, AR(2) and overidentification (Hansen test). These two tests confirm that: (1) there is no second-order serial correlation; and (2) the IVs are valid. This means that the results of the sys-GMM model are valid. After controlling for potential endogeneity issues, the results of the impact of SCON and BANK on debt maturity do not change. In conclusion, the study provides strong evidence to support hypotheses 11 and 12, which indicate the significant and negative effects of SCON and BANK on DMS.

5.4.4. Debt maturity structure and ownership structure model

This section provides the results for research questions 4 and 5. In particular, the study examines research question 4, which focuses on the relationship between four types of ownership (hypothesis 13–16) and DMS. Then, the study tests hypothesis 17 (research question 5) to explain the moderating effect of outside shareholders on the relationship between MO and DMS.

5.4.4.1. Correlation analysis

Table 5.12 presents the correlation matrix between DMS and ownership structure. Overall, there are low coefficients of correlations among DMS and the four types of ownership. The highest coefficient of correlation (0.38) is between SO and LO, while the lowest figure (-0.0002) is between FO and LO. This reflects that the state normally holds a large proportion of ownership of a firm, while Vietnamese firms seem not to attract many foreign investors. Long-term debt has significant and positive correlations with LO, SO and FO, whereas it has a significant and negative correlation with MO at the 5% significance level. The signs of the coefficients of MO, SO, FO and LO are consistent with the predicted signs and previous studies (Boubakri & Saffar, 2019; García-Teruel & Martínez-Solano, 2010; Muñoz-Mendoza et al., 2019). For example, both Akhbar (2017) and Abdioglu and Abdioglu (2017) found a negative relationship between DMS and MO in Indonesia and Turkey, respectively.

Table 5.12: Correlation matrix of debt maturity structure and ownership model.

	DMS	SO	FO	LO	MO	AMS	SIZE	GROW	LEV	LIQ	QUAL	TAX	TERM
DMS	1.00												
SO	0.1122*	1.00											
FO	0.0687*	-0.1357*	1.00										
LO	0.0479*	0.3847*	-0.0002	1.00									
MO	-0.1105*	-0.3233*	-0.0580*	-0.0930*	1.00								
AMS	0.2111*	-0.0659*	-0.0336*	-0.0867*	-0.0074	1.00							
SIZE	0.3040*	-0.0142	0.3490*	0.0771*	-0.0798*	0.0981*	1.00						
GROW	0.0125	0.0338*	0.1397*	0.2386*	-0.1002*	-0.0650*	0.1269*	1.00					
LEV	0.0548*	0.0006	-0.1206*	0.0812*	0.0737*	0.0267	0.2408*	-0.1082*	1.00				
LIQ	0.1742*	-0.0109	0.1529*	-0.0124	-0.0044	0.0028	-0.0313	0.0819*	-0.4380*	1.00			
QUAL	-0.0090	-0.0055	-0.0044	0.0227	0.0155	-0.0021	-0.0314	-0.0158	0.0558*	-0.0489*	1.00		
TAX	-0.0229	0.0257	-0.0421*	-0.0032	-0.0116	-0.0318	0.0111	-0.0715*	-0.0406*	-0.0419*	-0.0908*	1.00	
TERM	0.0144	-0.0217	0.0224	-0.0105	-0.0087	0.0062	0.0119	0.0810*	-0.0026	0.0346*	-0.0169	-0.0222	1.00

Note: * shows significance at 5%. DMS = debt maturity structure; TAX = effective tax rate; TERM = term structure of interest rates; GROW = firm growth opportunities; SIZE = firm size; AMS = asset maturity structure; LEV = firm leverage; LIQ = firm liquidity; QUAL = firm quality; SO = state ownership; FO = foreign ownership; MO = managerial ownership; LO = largest ownership. Definitions of variables are presented in Table 4.3.

5.4.4.2. Regression results

To test hypotheses H13–16, relating to research question 4, on the relationships between ownership structure and DMS in Vietnam, the study employs the two-step GMM estimator with robust standard error (see Section 5.2). Table 5.13 shows the results of two tests, AR(2) and overidentification (Hansen test). These two tests confirm that: (1) there is no second-order serial correlation; and (2) the IVs are valid. The results show the validity of the sys-GMM estimator.

Column 1 in Table 5.13 shows the main findings for all ownership variables that influence DMS. Overall, SO and MO have significant effects on DMS, while FO and LO do not affect DMS. First, the study finds no evidence to support hypothesis 13 that LO has a positive effect on DMS. Table 5.13 shows the insignificant coefficient of LO on DMS. This suggests that large shareholders are not involved in choosing the term structure of a firm's debt in Vietnam. This is a surprising finding because large shareholders have more motivation to monitor managers' actions than small shareholders so that they can reduce agency costs problems (Fernández-Méndez & González, 2018; Shleifer & Vishny, 1986; Zeckhauser & Pound, 1990). In other words, creditors may not need to offer short-term debt, which acts as a monitoring mechanism, for firms with high large ownership, while firms prefer longer maturity loans to avoid costly liquidation. However, the effect of LO on DMS is inconsistent in previous studies. For instance, while García-Teruel and Martínez-Solano (2010) found a positive effect of large shareholders on long-term debt for a sample of Spanish listed firms, Ben-Nasr et al. (2015) found a negative effect of multiple large shareholders on long-term debt for a sample of French listed firms. Vietnam has its own financial conditions. As discussed above, Vietnamese firms heavily rely on bank loans, whereas Vietnamese banks prefer offering short-term loans. In Section 5.4.3.2, the study confirms that firms tend to have more short-term debt when the banking sector develops. Simply put, like FO, LO does not impact on debt maturity if just based on efficient monitoring activity. This is in line with Le and Tannous (2016), who found no evidence to support the effect of LO on capital structure in a two-

step sys-GMM estimator. The authors documented that there was no support for an active monitoring role of large shareholders in Vietnamese firms.

Table 5.13: Debt maturity structure and ownership structure model results.

	Predicted sign	Column1 (sys-GMM)	Column2 (sys-GMM) (robustness)
LO	+	-0.0029361 (0.0234763)	-0.0015059 (0.0236118)
FO	+	-0.0230224 (0.0348802)	-0.0237057 (0.0350308)
SO	+	0.0403688* (0.0207241)	0.0408209* (0.0211654)
MO	-	-0.0759293* (0.0419188)	
AMS	+	0.001484*** (0.0004279)	0.001495*** (0.0004323)
SIZE	+	0.0278391*** (0.0069943)	0.0281799*** (0.0071192)
GROW	-	-0.0012799 (0.0061745)	-0.0015721 (0.0062159)
LEV	+	0.0691136** (0.031882)	0.0681817** (0.0319518)
LIQ	+	0.0285199*** (0.007773)	0.0287285*** (0.007844)
QUAL	-	0.0184233 (0.012069)	0.0182636 (0.0121117)
TAX	-	0.0036957 (0.0256182)	0.0034525 (0.0257097)
TERM	+	0.0053863** (0.0024063)	0.0053703** (0.0024138)
VOLR	+	0.0008963 0.0106895	0.0008564 (0.0106842)
CEO	-		-0.0930615** (0.0470683)

Predicted sign	Column1 (sys-GMM)	Column2 (sys-GMM) (robustness)
L.DMS	0.6122987*** (0.0854988)	0.6100028*** (0.0867285)
Intercept	-0.5516509*** (0.1303117)	-0.5591374*** (0.1329026)
Number of obs.	2,968	2,968
AR(2) test (p-value)	0.893	0.892
Hansen test (p-value)	0.495	0.493

*Note: *, **, *** shows significance at 10%, 5% and 1%, respectively. Robust standard errors in the parentheses. DMS = debt maturity structure; TAX = effective tax rate; TERM = term structure of interest rates; VOLR = volatility of interest rates; GROW = firm growth opportunities; SIZE = firm size; AMS = asset maturity structure; LEV = firm leverage; LIQ = firm liquidity; QUAL = firm quality; SO = state ownership; FO = foreign ownership; MO = managerial ownership; LO = largest ownership. Definitions of variables are presented in Table 4.3.*

Second, column 1 of Table 5.13 shows the insignificant coefficient of FO (p-value = 0.509), which provide no evidence to support hypothesis 14. This implies that foreign shareholders are less likely to be involved in DMS decision. There are several possible explanations for this insignificant result. Le and Tannous (2016) reported a negative relationship between FO and capital structure for Vietnamese firms. The authors stated that firms with high FO seemed not to need external funds due to the contribution to firms' equity by foreign shareholders. Although foreign shareholders can affect the level of debt, they cannot affect the choice of term structure. Specifically, FO can substitute for short-term debt to reduce agency costs (Muñoz-Mendoza et al., 2019; Tanaka, 2010). In other words, foreign owners have experience and knowledge to gather and analyze information so that they can monitor managers and force them to invest efficiently. While firms with high FO prefer issuing long-term debt due to foreign owners' efficient monitoring activity (Tanaka, 2010), Vietnamese banks prefer providing short-term borrowings. This implies that foreign investors may not control or be involved in the choice of debt maturity based on their efficient monitoring ability. This is in line with Phung and Le (2013), who stated that the monitoring role of foreign shareholders seemed not to work in Vietnam. Furthermore, FO has no effect not only on the choice of debt maturity but also on

some areas. For example, according to Tran et al. (2018) (cited in Le (2019)), foreign shareholders were not significant in driving the stock market in Vietnam as they found no evidence to support the influence of FO on stock LIQ during and after the global financial crisis in 2008. Hence, this could explain the insignificant impact of FO on debt maturity in Vietnam. Further, foreign investors generally behave like institutional investors (Le, 2015; Vo, 2016a). The finding is in line with Marchica (2001), who reported an insignificant effect of institutional investors on DMS in the UK. The author stated that institutional investors tended not to engage in a firm's operation. For example, some foreign investors such as pension funds and investment trusts preferred LIQ rather than management. Furthermore, in the context of developing countries, Salehi and Sehat (2019) confirmed that both active and passive institutional shareholders did not significantly influence the term structure of debt in Iran.

On the other hand, the coefficient of SO (p-value = 0.051) is significantly and positively related to DMS, shown in column 1 of Table 5.13. This supports hypothesis 15 that firms with high SO will have more long-term debt. Although banks in Vietnam prefer lending short term, SOEs can borrow long-term debt. Several studies have confirmed that SOEs have greater ability to access long-term borrowings than non-SOEs due to the guarantee offered by the government (Boubakri & Saffar, 2019; Nguyen & Ramachandran, 2006; Ruan et al., 2014). Furthermore, firms with SO not only have better access but also borrow at preferential rates due to an implicit guarantee of rescue in case of liquidation (Boubakri & Saffar, 2019). In Vietnam, SOEs have stronger relationships with banks than non-SOEs as SOBs dominate the Vietnamese banking market (Vo, 2018b). According to Vo (2016a), large SOEs held the most bank credits in Vietnam. Hence, there are some Vietnamese studies that have supported the argument that SOEs have higher debt ratios than non-SOEs (Nguyen et al., 2012; Nguyen & Ramachandran, 2006; Okuda & Lai, 2012). Further, Vietnamese firms with higher SO prefer less risk-taking activity (Vo, 2018c), while short-term debt has more LIQ risk than long-term debt. Thai (2017) examined 261 firms listed on the HOSE from 2007 to 2014 using four estimators, FE, RE, pooled and clustered FE estimators. Thai (2017) found that firms with low SO seemed to have more

short-term borrowings, whereas they found weak evidence to support a positive effect of higher SO on long-term debt. Unlike Thai (2017), this study employs a more recent research period (2008–2019), the sys-GMM estimator to control leverage – the endogenous variable – and a larger sample (firms listed on the HOSE and HNX). The study confirms the significant effect of SO on DMS, which is consistent with previous studies in China (Ruan et al., 2014) and in 62 countries (Boubakri & Saffar, 2019).

Next, the study finds evidence to support hypothesis 16 that MO has a negative effect on the term structure of debt (DMS). The coefficient of MO (p-value = 0.070) is significantly and negatively related to DMS at the 10% level. This suggests that managers with higher share ownership prefer short-term debt in Vietnam. According to Le and Tannous (2016), Vietnamese firms with high MO tended to increase the level of debt in order to reinforce their control and avoid takeover risks. This study extends their argument that Vietnamese firms with high MO prefer issuing short-term debt which makes the firms become riskier to outside investors. Thus, this reduces the chance of takeover. Moreover, managers can have more inside information regarding profitability and cash flow of future investments. Therefore, they may not want to lock into long-term debt, which requires higher costs than short-term debt. In addition, managers tend to use short-term debt to signal their strong commitment to reduce agency problems and to keep expropriating risks under control. The significant and negative relationship between MO and DMS is consistent with studies in the USA (Custódio et al., 2013; Datta et al., 2005), in the UK (Guney & Ozkan, 2005), in Japan (Tanaka, 2016) and in Turkey (Abdioglu & Abdioglu, 2017).

5.4.4.3. Results for control variables

Findings for the control variables in the regression of ownership structure and DMS (shown in Table 5.13) are mainly consistent with those in the regression of DMS determinants (shown in Table 5.7). They support the three main hypotheses including the tax-based hypothesis, agency costs hypothesis, and signalling and LIQ hypothesis based on the significant and positive coefficients of AMS, SIZE,

LEV, LIQ and TERM. Discussions of their effects on DMS are given in Section 5.4.1.3.

5.4.4.4. Robustness check

For robustness, the study uses an alternative measure for MO replacing it with CEO. CEO represents MO, which is measured as the percentage of shares held by CEOs (Le & Tannous, 2016). Le (2019) reported that in Vietnamese listed firms, nearly 40% of CEOs were also the chair of the board. The dual role of CEO and chair helped to increase their discretion in making financial decisions. Column (2) in Table 5.13 documents the significant and negative relationship between CEO ($p\text{-value} = 0.048$) and DMS at the 5% significance level. This finding suggests that when more shares are held by CEOs, more short-term debt is employed in Vietnamese listed firms. The significant negative effect of CEO on DMS is consistent with the effect of MO on DMS. All other variables remain unchanged.

5.4.5. Moderating effect of outside shareholders on relationship between debt maturity structure and managerial ownership

Besides testing the direct influence of various ownership structures on DMS, the study also tests hypothesis 17 (research question 5) which is the moderating effect of outside shareholders (state, foreign and large shareholders) on the relationship between inside shareholders (managerial shareholders) and DMS. The present study creates three dummy variables, DS, DF and DL, representing SO, FO and LO, respectively. DS, DF and DL capture whether SO, FO and LO are higher than the means following the study of Le (2015).

Table 5.14: Moderating effects of outside shareholders on the relationship between managerial shareholders and debt maturity structure – sys-GMM with robust standard error.

	Column 1 (sys-GMM)	Column 2 (sys-GMM)	Column 3 (sys-GMM)
MO	-0.1103761** (0.0469927)	-0.0881549* (.0498062)	-0.0815307 (0.0637761)
MO*DS	-0.1187876 (0.1047765)		
MO*DF		-0.1143302* (0.0627564)	
MO*DL			-0.0428645 (0.0593402)
AMS	0.0004156 (0.0005637)	0.0004469 (0.0005688)	0.0003933 (0.0005724)
SIZE	0.0349278*** (0.007182)	0.0359348*** (0.0071924)	0.0349104*** (0.0072289)
GROW	-0.0002105 (0.006961)	0.000185 (0.0070941)	0.0000827 (0.0070778)
LEV	0.0572624 (0.0360176)	0.0557964 (0.0361002)	0.0562767 (0.035766)
LIQ	0.0299203*** (0.007602)	0.0304118*** (0.0076873)	0.0298363*** (0.0076086)
QUAL	0.0158451 (0.0122601)	0.0154004 (0.0122107)	0.0154134 (0.0122742)
TAX	0.0079949 (0.0263383)	0.0087068 (0.026309)	0.0071762 (0.0262617)
TERM	0.0106744*** (0.002402)	0.0107492*** (0.0024056)	0.0106536*** (0.0024077)
VOLR	0.0466586*** (0.0146077)	0.0464379*** (0.0143316)	0.0450091*** (0.0145345)
L.DMS	0.5361359*** (0.083782)	0.5348191*** (0.0827887)	0.5437149*** (0.0817407)
Intercept	-0.6863327*** (0.1344558)	-0.7080873*** (0.1348969)	-0.688165*** (0.1358707)
Number of obs.	2968	2968	2968

	Column 1	Column 2	Column 3
	(sys-GMM)	(sys-GMM)	(sys-GMM)
AR(2) test (P-value)	0.726	0.725	0.725
Hansen test (P-value)	0.842	0.829	0.817

*Note: *, **, *** shows significance at 10%, 5% and 1%, respectively. Robust standard errors in the parentheses. DMS = debt maturity structure; TAX = effective tax rate; TERM = term structure of interest rates; VOLR = volatility of interest rates; GROW = firm growth opportunities; SIZE = firm size; AMS = asset maturity structure; LEV = firm leverage; LIQ = firm liquidity; QUAL = firm quality; MO = managerial ownership; DS = dummy variable of state ownership; DF = dummy variable of foreign ownership; DL = dummy variable of large shareholders. Definitions of variables are presented in Table 4.3.*

Table 5.14 shows that the coefficients of MO have significantly negative influences on DMS in the regression of the moderating effects of SO and FO. The negative effect of MO is consistent with the main finding shown in column 1 of Table 5.13. Further, only FO influences the association between MO and DMS. Column 2 shows that the coefficient of dummy FO (MO*DF) (p-value = 0.068) is negative and significant. This implies that FO decreases the negative effect of MO on DMS. This finding confirms the significant role of foreign investors in affecting management action in Vietnamese listed firms. To be specific, although this study finds that foreign investors do not directly influence firms to issue long-term debt as banks prefer lending short term (as discussed in Section 5.4.4.2), they can influence managers to use less short-term debt to avoid refinancing risks. Foreign investors in Vietnam are generally institutional investors (Le, 2015; Vo, 2016a). Thus, they have knowledge and experience to monitor managers to protect and enhance their investment. For instance, Khanna and Palepu (2000) found that foreign financial institutions in emerging countries were better at monitoring managers than domestic financial institutions. Similarly, Nguyen et al. (2021) confirmed the superior management supervising capability of foreign investors in reducing earnings management in Vietnam. Furthermore, this study is in line with Le (2015), who documented that FO negatively affected the relationship between MO on capital structure in Vietnam. Likewise, Ratnawati et al. (2016) confirmed the important role of institutional ownership in strengthening a negative relationship between MO and earnings management in Indonesia. Hence, this study confirms the role of foreign shareholders in improving the governance system of a firm. Due to their effective monitoring of management,

foreign shareholders can restrain managers from choosing a term structure of debt for their own interests. Simply put, FO is considered a monitoring mechanism that decreases the influence of MO on corporate financial decisions, especially DMS decisions.

On the other hand, columns 1 and 3 show the insignificant coefficients of dummy SO and LO, respectively. LO is found not to directly affect the choice of debt maturity or indirectly influence managers to use short-term loans. SO directly affects DMS, while it does not influence managers to choose DMS. These findings are in line with Le (2015), who confirmed insignificant roles of SO and LO in influencing the effect of MO on capital structure in Vietnam. Thus, this study supports the argument that the roles of SO and LO are not statistically significant in management action through monitoring the board of managers in Vietnamese firms.

5.4.5.1. Robustness check

In order to examine the robustness of the moderating effect of outside shareholders on the relationship between MO and the term structure of debt, this study replaces MO with CEO. Overall, Table 5.15 shows the results are consistent with the main findings in Table 5.14. In other words, FO weakens the negative relationship between CEO and DMS, while SO and LO do not influence the relationship between CEO and DMS.

Table 5.15: Moderating effect of outside shareholders on the relationship between CEO and debt maturity structure – sys-GMM with robust standard error.

	Column 1 (sys-GMM)	Column 2 (sys-GMM)	Column 3 (sys-GMM)
CEO	-0.1263229** (0.0520774)	-0.1046534* (0.0616015)	-0.1040065 (0.0718918)
CEO*DS	-0.1161617 (0.1389719)		
CEO*DF		-0.1739309** (0.0754959)	
CEO*DL			-0.0248008

	Column 1	Column 2	Column 3
	(sys-GMM)	(sys-GMM)	(sys-GMM)
			(0.0703852)
AMS	0.0004293 (0.0005623)	0.0004575 (0.0005715)	0.0004077 (0.0005685)
SIZE	0.0357061*** (0.0073257)	0.0373279*** (0.0073215)	0.0354794*** (0.0073283)
GROW	-0.000191 (0.007028)	-0.0004778 (0.0072119)	-0.0003296 (0.0071226)
LEV	0.0555625 (0.0361515)	0.0548049 (0.0361948)	0.0549006 (0.03602)
LIQ	0.0302592*** (0.00767)	0.0314021*** (0.0077931)	0.0301456*** (0.0076559)
QUAL	0.0156032 (0.0123059)	0.0155493 (0.0120868)	0.0153262 (0.0123688)
TAX	0.0076379 (0.0264264)	0.0074911 (0.0262079)	0.0071774 (0.0264522)
TERM	0.0106346*** (0.0023932)	0.0107489*** (0.0023992)	0.0106595*** (0.002393)
VOLR	0.0465864*** (0.0145504)	0.047485*** (0.0142787)	0.0452493*** (0.014467)
L.DMS	0.5309149*** (0.0852379)	0.5208371*** (0.0848902)	0.5388646*** (0.0828951)
Intercept	-0.7023718*** (0.1371859)	-0.7340739*** (0.1366609)	-0.6995716*** (0.1376372)
Number of obs.	2968	2968	2968
AR(2) test (p-value)	0.720	0.710	0.721
Hansen test (p-value)	0.845	0.832	0.831

*Note: *, **, *** shows significance at 10%, 5% and 1%, respectively. Robust standard errors in the parentheses. DMS = debt maturity structure; TAX = effective tax rate; TERM = term structure of interest rates; VOLR = volatility of interest rates; GROW = firm growth opportunities; SIZE = firm size; AMS = asset maturity structure; LEV = firm leverage; LIQ = firm liquidity; QUAL = firm quality; CEO = CEO's ownership; DS = dummy variable of state ownership; DF = dummy variable of foreign ownership; DL = dummy variable of large shareholders. Definitions of variables are presented in Table 4.3.*

5.4.6. Firm performance model: Effect of debt maturity structure on firm performance

This section presents the findings for research question 6. The study tests hypothesis 18 to examine how DMS affects firm financial performance (measured by TOQ).

5.4.6.1. Correlation analysis

Table 5.16 shows the correlation matrix between firm performance and its factors including DMS. The coefficients of correlation of the independent variables are generally low. This indicates that a severe problem of multicollinearity may not exist in the firm performance model. Moreover, the coefficients of all the independent variables significantly correlate with TOQ. Specifically, TOQ has the strongest correlation (0.42) with SIZEM among the factors, followed by TAN (0.18) and LIQ (0.09). This means that increases in SIZEM, TAN and LIQ lead to an increase in firm market performance. Positive correlations between firm performance and its factors have been reported in previous studies (Kim et al., 2021; Vijayakumaran & Vijayakumaran, 2019).

Table 5.16: Correlation matrix between firm performance and its determinants.

	TOQ	DMS	LIQ	SIZEM	TAN	SGR
TOQ	1.0000					
DMS	.0581	1.0000				
LIQ	.0997*	.1655*	1.0000			
SIZEM	.4227*	.2918*	-.0251	1.0000		
TAN	.1862*	.4110*	-.2359*	.1437*	1.0000	
SGR	-.0457*	.0591*	.0349*	.0642*	-.0520*	1.000

Note: * shows significance at 5%. TOQ = Tobin's Q; DMS = debt maturity structure; LIQ = firm liquidity; SIZEM = firm market size; TAN = assets tangibility; SGR = sales growth rate. Definitions of variables are presented in Table 4.3.

5.4.6.2. Regression results

To examine hypothesis 18 (research question 6) on whether DMS has a negative effect on financial performance, the study employs Wooldridge's test to check the strict exogeneity assumption of the FE model. The result shows the p-value is less than 5% ($\text{prob} > F < 0.001$). This means the test for strict exogeneity has failed. Hence, to control for the endogenous issue, the study employs sys-GMM to examine the relationship between debt maturity and firm performance.

Column 1 in Table 5.17 presents the empirical results for the effect of DMS on firm financial performance using TOQ as the proxy for firm performance. The study uses a system two-step GMM estimator with robust standard errors. The validity of the sys-GMM results is provided by two tests: (i) AR(2); and (ii) overidentification (Hansen test), which are shown in column 1 of Table 5.17. The AR(2) test has the p-value = 0.467, which indicates that the null hypothesis of no second-order serial correlation cannot be rejected. Similarly, the Hansen test has a p-value = 0.177, which means that the IVs are valid. Hence, the sys-GMM is suitable to be employed. The study controls for time-fixed effects in the regression model so that it controls for factors that affect all firms in a specific time. Time-fixed effects have been controlled in several previous studies (Adachi-Sato & Vithessonthi, 2019; Vijayakumaran, 2016; Vo et al., 2020).

Table 5.17: Firm performance and debt maturity structure model results.

	Predicted sign	Tobin's Q (sys-GMM)	ROA (sys-GMM) (robustness)	ROE (sys-GMM) (robustness)
DMS	–	–0.0591326*** (0.0173636)	–0.0091029** (0.0041987)	–0.0185311** (0.0092941)
LIQ	+	0.010496** (0.0046179)	0.0058553*** (0.0018598)	0.0042376* (0.0025735)
SIZEM	+	0.0306122*** (0.0053191)	0.0006106 (0.0008638)	0.0058879** (0.0024288)
TAN	+	0.0856232*** (0.0254193)	0.0189267*** (0.0055736)	0.0178492 (0.0122267)
SGR	+	–0.0032364 (0.0069285)	0.0131237*** (0.0021682)	0.0284993*** (0.0052409)
L.TOQ		0.7802707*** (0.048146)		
L.ROA			0.5980821*** (0.0820235)	
L.ROE				0.3525275*** (0.0894985)
Intercept		–0.4684002*** (0.0855513)	–0.0066825 (0.0157821)	–0.0444906 (0.0399809)
Time-fixed effects		Yes	Yes	Yes
Number of obs.		3,579	3,579	3,579
AR(2) test (p-value)		0.467	0.456	0.800
Hansen test (p-value)		0.177	0.111	0.153

Note: *, **, *** shows significance at 10%, 5% and 1%, respectively. Robust standard errors in the parentheses. TOQ = Tobin's Q; ROA = return on total assets; ROE = return on shareholder's equity; DMS = debt maturity structure; LIQ = firm liquidity; SIZEM = firm market size; TAN = asset tangibility; SGR = sales growth rate. Definitions of variables are presented in Table 4.3.

In column 1 of Table 5.17, the estimated coefficients of DMS (p-value < 0.001) are significantly negative at the 1% level, supporting hypothesis 18. This suggests that firms with a higher ratio of long-term debt to total debt are less profitable. This is in line with the signalling theory that high-quality firms signal their quality to the market by shortening their debt (Diamond, 1991). Moreover, short-term debt reduces underinvestment problems (Myers, 1977). In other words, the share price of a firm will increase when the firm issues short-term debt. This is because

managers have strong incentive to increase the market value of the firm even though they have to choose a costly signal strategy. However, due to high credit rating, the refinancing risks of high-quality firms are low. On the contrary, weaker firms seem to choose long-term debt to reduce refinancing risks and contracting costs. Also, outside investors believe that insiders have better information relating to profits and investments. Hence, the share price of a firm may decrease when the firm chooses to issue long-term debt. This leads to a reduction in TOQ. Furthermore, the result is consistent with the statement of Zeitun and Haq (2015) that short-term borrowings naturally lead firms to invest in riskier projects to receive higher expected returns as they suffer more refinancing risks than from long-term debt.

This result is contrary to other previous studies (Schiantarelli & Jaramillo, 2002; Schiantarelli & Sembenelli, 1997; Schiantarelli & Srivastava, 1997). However, previous studies that found a positive relationship between DMS and firm performance measured firm performance as firm productivity performance – an augmented Cobb–Douglas production function (Schiantarelli & Jaramillo, 2002; Schiantarelli & Sembenelli, 1997; Schiantarelli & Srivastava, 1997). They argued that firms with higher long-term debt could increase their firm productivity as they could invest in better productive technologies. This study measures firm performance as firm market financial performance (TOQ). Simply put, the study focuses on how long-term debt affects a firm's market value. There are several current studies that have focused on the relationship between debt maturity and firm financial performance (TOQ). However, the majority of them have measured DMS as the ratio of long-term debt to total assets (Hatem, 2017; Le & Phan, 2017; Nwude et al., 2016; Zeitun & Haq, 2015), whereas this study employs the long-term debt ratio calculated as the ratio of long-term debt to total debt. This study is in line with the argument that long-term debt leads to lower firm financial performance even though previous studies employed long-term leverage instead of the long-term debt ratio. For instance, Zeitun and Haq (2015) confirmed the important roles of both short-term and long-term leverage on firm financial performance. The authors found that both short-term and long-term leverage led to lower firm performance in GCC countries during the period 2004–2012.

Similarly, in Vietnam Le and Phan (2017) employed the long-term market leverage ratio, which was measured as the ratio of long-term debts to market value of total assets. They found that firms with high long-term market leverage ratio decreased their market performance (TOQ) using a sample of Vietnamese listed firms for the period 2007–2012.

Furthermore, the negative relationship between DMS and TOQ could be due to the stage of financial market development in Vietnam. For instance, large SOEs hold the most bank credits in Vietnam (Vo, 2016a) and SOEs have priority in accessing long-term borrowings from banks due to the guarantee from the government (Phan, 2018). The study also finds that firms with higher SO seem to have more long-term debt (see Table 5.13) due to their ease in accessing fund from banks. However, SOEs are described as having poor productivity and low profitability. For instance, while SOEs account for 17% of the total outstanding debt, they are responsible for 60% of non-performing loans (Dang et al., 2020). SOEs seem not to face liquidation risks, while losses and bad debts exist in many SOEs. This is because losses and bad debts are covered by the state budget and the state banks (Bui, 2018). Le (2015) stated that SOEs have high leverage but their returns are low compared to non-SOEs and foreign companies. Moreover, the influence of FO and LO on debt maturity is found to be not significant, as shown in Table 5.13. This means that long-term debt cannot be monitored efficiently as managers realize that the monitoring roles of foreign and large shareholders are not significant in reducing agency costs (discussed in Section 5.4.4.2). Firms, therefore, can have more funds to invest in discretionary projects including unprofitable projects, which impacts firm financial performance negatively.

5.4.6.2.1. Results for control variables

First, Table 5.17 shows the significant and positive relationship between firm LIQ (p-value = 0.023) and firm performance (TOQ). This indicates that firms with high LIQ seem to manage their working capital efficiently so that they can enhance their profitability. High LIQ means firms have high capacity to cover short-term debt payments. It also builds their creditability in the market. The significant and

positive relationship between LIQ and TOQ is consistent with previous studies including Vietnamese studies (Le & Phan, 2017; Phung & Le, 2013; Vijayakumaran & Vijayakumaran, 2019). Second, firm market size (SIZEM) (p -value < 0.001) significantly and positively affects firm performance (TOQ). This result supports the argument that larger firms in Vietnam tend to require higher levels of management skills or knowledge to improve their performance (Vo et al., 2020). Furthermore, a significantly positive relationship between TAN (p -value < 0.001) and firm performance (TOQ) has been reported in existing studies (Margaritis & Psillaki, 2010; Vijayakumaran & Vijayakumaran, 2019; Zeitun & Haq, 2015). This indicates that Vietnamese firms control their tangible assets efficiently, which could reduce agency problems and enhance TOQ. Next, SGR (p -value = 0.640) is found to be negative but not significant in the regression of TOQ shown in Table 5.17. This result is consistent with Zeitun and Haq (2015), who found a negative and non-significant influence of SGR on firm market performance before and after the financial crisis in GCC countries. Finally, it is in line with previous studies that the previous year performance of a firm positively affects its accounting and market performance in the current year (Le & Phan, 2017; Phung & Le, 2013; Vijayakumaran & Vijayakumaran, 2019; Zeitun & Haq, 2015).

5.4.6.2.2. Robustness check

For the robustness tests, the study uses alternative measures of firm performance, which are ROA and ROE. While ROA is calculated as the ratio of net income to total assets, ROE is calculated as the ratio of net income to total equity. The coefficients of DMS are all significant and negative at the 5% level, as reported in columns 2 and 3 of Table 5.17.

The market size of a firm (SIZEM) does not affect its ROA, as shown in column 1. A firm's TAN does not affect its ROE, as shown in column 2. In the context of Vietnam, Nguyen and Nguyen (2020) found a positive relationship between TAN and ROA in long-term leverage regression for both SOE and non-SOE groups. However, the authors found a non-significant coefficient between TAN and ROE in the long-term leverage regression, similar to this study. Next, a firm's SGR is

positively and significantly related to ROA and ROE, while SGR is found to be not significantly related to TOQ. According to Nguyen and Nguyen (2020), there was a significant positive relationship between SGR and firm performance (ROA and ROE) in Vietnamese non-SOEs. However, the authors found weak evidence to support positive relationships between SGR and ROA or ROE in Vietnamese SOEs.

5.5. Summary

This chapter has examined the determinants of DMS in Vietnam using a sample of 536 non-financial firms listed on the two Vietnamese stock exchanges (the HOSE and HNX) over the period 2009–2019. While the study employs FE and sys-GMM methods, the results from the two different approaches are consistent in all models. The study finds evidence to support the three main theories (discussed in Chapter 3) including the tax-based, agency costs, and signalling and LIQ risks hypotheses. In particular, only 3 out of 9 firm-level characteristics are found to be insignificant, GROW, QUAL and AMS, whereas TAX, TERM, VOLR, SIZE, LIQ and LEV are found to have significant impacts on DMS. Furthermore, the study finds that BD significantly affects two firm-level determinants of DMS. While BD strengthens the effect of QUAL on debt maturity, it weakens the effect of TERM on debt maturity. The study finds a consistent result to that of Alcock et al. (2012) to support the QUAL hypothesis in countries that have high levels of BD in their debt structure.

Regarding financial market development, the study finds strong evidence to support the negative impacts of SCON and BANK on DMS. This means that when stock markets become more concentrated and the banking sector increases its weight in the economy, firms tend to shorten their debt due to the bank preference of providing short-term debt. Next, the study investigates the effects of the four main types of ownership structure. The study finds that while firms with higher SO increase their long-term debt ratio, firms with greater MO decrease their long-term debt ratio, while the effects of LO and FO on DMS are found to be insignificant. However, the results show that only foreign shareholders influence the relationship between MO and DMS. Specifically, FO weakens the negative

effect of MO on DMS. Finally, the findings reveal that DMS has a negative relationship with firm financial performance measured by TOQ, ROE and ROA. The next and final chapter will provide the conclusion and implications of this study. Also, limitations of this study and future research will be presented in the next chapter.

CHAPTER 6: CONCLUSION AND IMPLICATIONS

6.1. Introduction

This thesis study aims to understand the effects of BD, stock market development and ownership structure on DMS and its consequences for firm performance. Six central research questions have been generated. To address these questions, the study obtained a large panel data sample including 4170 firm-year observation of Vietnamese firms listed on the HOSE and HNX. The sample period is between 2009 and 2019. FE and sys-GMM estimators with robust standard error have been employed to provide reliable findings, reported in the previous chapter. This chapter begins with a summary of the findings in Section 6.2, followed by the research conclusions in Section 6.3. While Section 6.4 presents the contributions of this study to the literature, the research implications are described in Section 6.5, including practical implications and policy implications. Limitations of the study and future directions for research are presented in Sections 6.6, respectively.

6.2. Research summary

Finding an appropriate term structure of debt and understanding how it affects firm financial performance are important in corporate finance as they help to reduce several major risks and costs such as refinancing risks, bankruptcy risks, interest rate fluctuation and agency costs of debt. Furthermore, Chen et al. (2020) stated that understanding DMS is one of the major ways to understand capital structure. Although the determinants of DMS have received attention in existing studies, few studies have examined the determinants of debt maturity regarding BD, SCON and ownership structure or the consequences of debt maturity for firm financial performance, especially in Vietnam. This study has examined these relationships using a sample of Vietnamese listed firms over the period 2009–2019.

The research problem was presented as follows:

To examine the moderating effect of bank debt and the impact of financial market development and ownership structure on debt maturity structure and the impact of debt maturity structure on firm financial performance of Vietnamese listed firms.

Based on the research problem, six research questions were developed:

RQ1: What specific firm characteristics of Vietnamese listed firms affect the debt maturity structure?

RQ2: To what extent do bank-dependent firms affect the association between firm-level determinants and the debt maturity structure in Vietnam?

RQ3: To what extent does the development of financial markets affect the debt maturity structure in Vietnam?

RQ4: To what extent does the ownership of shares by foreigners, government, large shareholders, and managers affect the debt maturity structure in Vietnam?

RQ5: To what extent does outside ownership affect the relation between inside ownership and the debt maturity structure in Vietnam?

RQ6: To what extent does the debt maturity structure affect Vietnamese firm financial performance?

The main objective of this study was to empirically investigate the determinants of DMS in relation to firm-level characteristics, high level of BD, financial market development and different types of ownership, as well as the effect of DMS on firm financial performance. The research objectives were presented as follows:

- I. Examining the effects of firm-level determinants and financial market development on debt maturity structure
- II. Explaining whether the determinants of debt maturity structure are related to the dependence on BD
- III. Analyzing the influence of the four types of ownership structure on debt maturity choice and the moderating effect of outside shareholders on the relationship between MO and debt maturity choice

IV. Examining the impact of debt maturity structure on firm financial performance

The study developed 18 hypotheses based on the trade-off theory, agency costs theory and signalling theory to address the research problem. To test the hypotheses, the study used a sample of 4170 observations from 536 non-financial firms listed on the HOSE and HNX in Vietnam between 2009 and 2019. The data was obtained from various databases such as Datastream, the IMF, the WB, Vietstock and firms' annual reports. The study also developed four equations, which were estimated by FE and sys-GMM methods in Stata. Section 6.3 presents the research conclusions.

6.3. Research conclusions

The first research question was addressed by examining the firm-level determinants of DMS and the second research question was answered by investigating the variation in the firm-level determinants of debt maturity based on dependence on BD. The third research question was resolved by examining the impact of the stock market and banking sector on the term structure of debt. The study also analysed the influence of ownership structure on DMS and the moderating effect of external shareholders on the association between MO and DMS to answer research questions 4 and 5, respectively. The sixth question was explained by examining the effect of DMS on firm financial performance. The findings of the research questions are presented as follows.

6.3.1. Research question 1: What specific firm characteristics of Vietnamese listed firms affect the debt maturity structure?

The study provides evidence to support the three main hypotheses on DMS: (1) tax-based hypothesis; (2) agency costs hypothesis; (3) signalling and LIQ hypothesis. First, the study strongly supports the tax-based hypothesis as the three main proxies of the hypothesis are found to be significant. In particular, when TAX decreases, firms are likely to lengthen their debt to reduce flotation costs and bankruptcy costs. Firms prefer long-term debt when TERM increases. Similarly, high VOLR leads to high long-term debt to have an advantage in a tax

induction situation. Second, regarding the tax-based hypothesis, SIZE is found to have a positive and significant relationship with debt maturity. This means that larger firms tend to have more long-term debt as they can access debt markets more easily than smaller firms. In addition, large firms have lower costs of long-term borrowings than smaller firms. In contrast, the study finds no support for the effects of GROW or AMS on debt maturity. However, AMS becomes significant in the sys-GMM model. After controlling for leverage, firms seem to match the maturities of their assets and debt to reduce underinvestment problems. Third, LEV and LIQ, which are the two proxies of the signalling and LIQ hypothesis, are found to be significant. Firms with high leverage prefer issuing long-term debt as they can reduce refinancing and LIQ risks. Similarly, firms with high LIQ assets seem to have more long-term debt. The study finds no support for the effect of QUAL on debt maturity.

6.3.2. Research question 2: To what extent do bank-dependent firms affect the association between firm-level determinants and the debt maturity structure in Vietnam?

The study aimed to explain the moderating effects of BD. The study found that only the effects of TERM and QUAL on debt maturity are changed due to the presence of BD. In particular, BD decreases the positive impact of TERM on debt maturity, while a greater presence of BD creates a higher level of short-term debt for high-quality firms. Moreover, including the moderating effect of BD, the effect of AMS on debt maturity remained insignificant. These findings build on the work of Alcock et al. (2012) and Cai et al. (2008) by providing evidence to support the signalling hypothesis and not support the maturity matching hypothesis. These two hypotheses are found inconsistently in the study of Alcock et al. (2012) and Cai et al. (2008) as they did not examine the moderating effect of BD.

6.3.3. Research question 3: To what extent does the development of financial markets affect the debt maturity structure in Vietnam?

The study evaluated the impact of financial market development on DMS. The study found that both SCON and BANK negatively influence TERM. SCON is

likely to decrease the development of the stock market. This means that firms need to borrow from banks while banks prefer lending short term. The finding is consistent with Bae et al. (2021), who reported SCON led to inefficient allocation of capital to firms.

6.3.4. Research question 4: To what extent does the ownership of shares by foreigners, government, large shareholders, and managers affect the debt maturity structure in Vietnam?

The study examined the influence of various ownership structures on the choice of debt maturity. In particular, the study employed four main types of ownership: SO, FO, MO and LO. Only the coefficients of SO and MO were found to be significant. While firms with SO prefer issuing long-term debt, firms with MO prefer having short-term debt.

6.3.5. Research question 5: To what extent does outside ownership affect the relation between inside ownership and the debt maturity structure in Vietnam?

The study aimed to provide a better understanding of the role of outside shareholders on the relationship between MO and DMS. It was found that foreign shareholders decrease owner-managers' incentive to choose short-term debt, while state and large shareholders do not influence owner-manager incentive. Foreign investors seem not to directly affect DMS, but they indirectly affect debt maturity via owner-managers' decisions in Vietnamese firms.

6.3.6. Research question 6: To what extent does the debt maturity structure affect Vietnamese firm financial performance?

The study examined the relationship between DMS and firm financial performance. Firm financial performance was measured by TOQ. The study found that long-term debt tends to decrease firm financial performance. This finding is consistent with signalling theory as higher quality firms prefer short-term debt in order to signal their quality to the market (Diamond, 1991). Due to high credit rating, high-quality firms have low refinancing risks and agency costs when

they use short-term debt. Outside investors believe that managers have better information about profits and investments. When firms choose to issue short-term debt, their share price will increase as investors have optimistic expectations of the firms' performance.

The findings are summarized in Table 6.1.

Table 6.1: Summary of results.

Variable	Research question	Hypotheses		Results
Effects of determinants on debt maturity structure				
Effective tax rate	1	H1	Supported	Negative and statistically significant at 5% level
Term structure of interest rates	1	H2	Supported	Positive and statistically significant at 1% level
Volatility of interest rates	1	H3	Supported	Positive and statistically significant at 1% level
Growth opportunities	1	H4	Rejected	Insignificant
Firm size	1	H5	Supported	Positive and statistically significant at 1% level
Asset maturity structure	1	H6	Rejected	Insignificant
Firm quality	1	H7	Rejected	Insignificant
Liquidity	1	H8	Supported	Positive and statistically significant at 1% level
Firm leverage	1	H9	Supported	Positive and statistically significant at 1% level
Bank debt	2	H10	Supported	Positive and statistically significant at 5% level – firm quality Negative and statistically significant at 5% level – term structure of interest rates
Effects of financial market development on debt maturity structure				
Stock market concentration	3	H11	Supported	Negative and statistically significant at 1% level
Banking sector size	3	H12	Supported	Negative and statistically significant at 1% level
Effects of ownership structure on debt maturity structure				
Large shareholders ownership	4	H13	Rejected	Insignificant
Foreign ownership	4	H14	Rejected	Insignificant
State ownership	4	H15	Supported	Positive and statistically significant at 10% level
Managerial ownership	4	H16	Supported	Negative and statistically significant at 10% level
Moderating effects of MO/FO/SO on relation between DMS and MO	5	H17	Supported	Negative and statistically significant at 10% level – only FO
Effect of debt maturity structure on firm performance (Tobin's Q)				
DMS	6	H18	Supported	Negative and statistically significant at 1% level

6.4. Contributions to knowledge

The study contributes to the existing literature on DMS in the following aspects:

1. The study examined the moderating effect of BD on the firm-level determinants of DMS. The study provides a better understanding of DMS by extending the works of Alcock et al. (2012) and Cai et al. (2008), who found inconsistent results on firm-level determinants of DMS due to heavy dependence on BD in Australia and China, respectively.
2. Existing studies have mainly measured the development of the stock market through its size and LIQ. While the Vietnamese stock market is very concentrated, the effect of SCON is particularly lacking in the literature. Due to the nature of the Vietnamese stock market, this study is the pioneering study to use SCON as a proxy for the development of the stock market in the DMS research field. In other words, the study has developed a more comprehensive measure of financial market development and the finding provides a deeper explanation of the impact of stock market development on DMS.
3. Although there are several studies that have focused on the effect of ownership structure on debt maturity (Arslan & Karan, 2006; Boubakri & Saffar, 2019; Ruan et al., 2014), this study is the first to incorporate four main types of ownership into one model in the DMS literature. The study also contributes to the literature by examining the moderating effect of external shareholders on the association between internal shareholders and DMS. This reflects the full picture of the relationship between ownership structure and DMS.
4. The study contributes to building comprehensive understanding of the relationship between DMS and firm performance. Previous studies have mainly focused on firm productivity performance (Schiantarelli & Sembenelli, 1997) or long-term capital structure (Hatem, 2017; Zeitun & Haq, 2015). This study focused on the relationship between DMS and firm financial performance measured by three main proxies based on book value (ROA and ROE) and market value (TOQ). To the best of my knowledge, the study is the

first to provide a comprehensive framework for debt maturity and firm performance in the literature, especially in a developing country – Vietnam.

6.5. Research implications

This section provides important practical implications for firms and policy implications for policymakers based on the empirical results.

6.5.1. Practical implications

The empirical findings of the determinants and consequences of corporate DMS show that firms should raise awareness of high SCON, strengthen the function and quality of managers and attract more foreign investors. These implications are discussed in detail below.

First, the Vietnamese stock market has developed significantly, but high SCON is one of the greatest limitations of its stock market development. In other words, large firms in the stock market play a major role in boosting the market while they place new and small firms in difficulty such as having to issue equity to raise funds. The study found that when the stock market is more concentrated, firms seem to shorten their debt maturity. However, free competition creates concentration, while concentration creates monopoly (Bae et al., 2021). Thus, it would not be logical to reverse the gains of very successful companies. The study recommends that Vietnamese firms and academia should raise awareness of market participants about the potentially troubling consequences of large and successful firms' power. For instance, the GROW of small firms decreases as they cannot access long-term debt (Kim et al., 2021). Hence, if banks understand the problem of SCON, they may give more opportunities to help smaller firms with strong growth to access long-term borrowings.

Second, the study found that MO influences debt maturity choice. Managers with high ownership have high incentive to choose risky financial choices like increasing the level of debt (Vijayakumaran, 2016) and decreasing the maturity of debt (hypothesis 16). The study also found that long-term debt reduces a firm's financial performance. Hence, the study suggests that Vietnamese firms should

concentrate on strengthening the function and quality of their managers, such as appointing managers based on their expertise and experience. Firms could also design and introduce appropriate incentive-based remuneration packages for owner-managers to eliminate their potential misconduct.

Third, foreign shareholders were found to reduce owner-managers' incentive in choosing debt maturity. Foreign investors in Vietnam generally behave like institutional investors (Vo, 2010, Vo, 2016b) who have high experience and knowledge to help managers make appropriate financial choices. This implies that firms should maintain and attract more foreign investors so that they can influence owner-managers' management and improve firm performance.

The findings of this study can be generalized to other countries that have similar contexts to Vietnam. For example, China and Australia have illiquid bond markets and firms in these two countries heavily rely on BD (Alcock et al., 2012). SO is still dominant in Chinese firms (Ruan et al., 2014). Some countries that have high SCON like Vietnam (top ten listed firms/total market capitalization = 0.59) are Indonesia (0.54), Singapore (0.59), Austria (0.59), Belgium (0.59) and Colombia (0.6).

6.5.2. Policy implications

The findings of the thesis suggest some recommendations for policymakers in Vietnam, as discussed below.

First, corporate bonds are an alternative capital channel to BD. Firms could choose to issue bonds to raise funds without dilution of ownership. In other words, corporate bonds allow firms to raise long-term capital and avoid the problem of SCON. Hence, the study suggests policymakers should develop strict regulations to reduce risks and build up trust in the market. For instance, Decree 153 is suggested to be amended so that its power to protect investors increases, regardless of whether investors are retail or institutional (Nguyen, 2022a). The state should also reorganize the bond market with more participation from the global standard credit rating agencies. Currently, the bond market is controlled

by the Ministry of Finance, but it would be better if the SBV could co-manage the corporate bond market (Dung, 2022). This means that banks would cooperate with firms to sell bonds in order to attract more investors.

Second, the study suggests that the state continues issuing policies that attract more foreign investors to invest in Vietnamese firms. For example, the state could consider removing the FO cap in equitized SOEs which specifies FO limits. Furthermore, even though the state has allowed foreign investors could hold up to 100% ownership of public firms from 2015, limitations are imposed on foreign investors in some certain sectors such as commercial banks (limited to 30%), postal services and telecommunications, and import, export and distribution (Allens and Linklaters, 2019).

Finally, SOEs may have advantages in access to long-term BD as SOBs still dominate the banking sector. According to Le (2022), SOEs still have a priority in accessing credit and foreign currencies from VDB and four SOBs - largest banks in Vietnam. Furthermore, the State leases or allocates prime-location lands to SOEs with a price below the market price (Le, 2022). Thus, SOEs could use these assets as collateral to obtain more long-term debt from banks. This is consistent with the study's result that firms with higher state ownership will use more long-term debt. However, Le (2022) found that state ownership policy, which favours SOEs, is the main issue of capital misallocation in Vietnam. The study supports the current direction of reducing SO in both SOEs and SOBs so that all types of firms can access capital sources equally. However, just over 10% of total state-owned capital in SOEs has been divested since 1990s (Le, 2022). Hence, the equitisation process needs to be expedited. The present study suggests that the State should develop a competitive auction mechanism and provide transparent information to attract more investors, especially foreign investors, as the value of SOEs could be evaluated accurately. According to Nguyen (2022), factors that cause slow equitisation are the lack of transparent equitisation process and unreasonable corporate valuation.

6.6. Limitations and future directions for research

The study has answered all the research questions, but it still has some limitations. It is important to review these critically so that the study can provide potential directions for future research. The study limitations and future directions for research are discussed below.

First, examining a single country can provide deep analysis and enable generalizing the findings to other developing countries that have similar features. However, a sample that contains many countries may provide more persuasive results. Hence, there is scope for future research to examine debt maturity and firm performance through international comparisons.

Second, due to the COVID-19 pandemic, the study ended the sample at 2019. Anh and Gan (2021) found that the effects of the number of COVID-19 cases during pre-lockdown period negatively impacted stock returns in Vietnam, while it positively affected the entire stock market during the lockdown period. Future research could examine the impact of the COVID-19 pandemic on debt maturity, focusing on different business sectors. For instance, the business sectors that have been hit the hardest are tourism, hospitality and food services, while export-based sectors have recovered quickly (PwC Vietnam, 2022).

Third, the study only focuses on the effect of foreign investors on DMS and has clearly shown the importance of foreign investors in financing decisions. As a result, future studies should concentrate on the optimal fraction of capital held by foreign investors.

Fourth, González (2017) found that the impact of banking sectors on DMS is higher in smaller firms. In other words, DMS could be varied across different groups of firms. While the present study focuses on the moderating effects of bank debt and outside shareholders on DMS, future research could examine how results of DMS vary depending on different groups of firms, such as differences between SOEs and non-SOEs firms, and differences across industry groups. Furthermore, due to the high intervention of the State in both private sectors and

banks, future studies should consider how firms' political connections affect the capital structure and DMS of listed firms.

Finally, since this study found an important impact of the financial market development on DMS, future studies may focus on the impact of other macroeconomic factors, such as the unemployment rate, economic uncertainty, and inflation/hyperinflation. This is in keeping with a recent World Bank (2023) report which suggests that the economy of Vietnam seems to face downside risks due to a rise in uncertainty of the global economy in 2023. The risks could include financial sector vulnerabilities, weaknesses in the balance sheets of banking and private sectors and tightening financial conditions.

APPENDIX

A: List of firms used in this study

No.	Code	No.	Code	No.	Code	No.	Code	No.	Code
1	30J	28	BCC	55	CCL	82	CTB	109	DHC
2	79K	29	BCE	56	CDC	83	CTC	110	DHG
3	AAA	30	BCG	57	CDN	84	CTF	111	DHM
4	AAM	31	BCI	58	CEE	85	CTI	112	DHP
5	ABT	32	BFC	59	CEO	86	CTM	113	DHT
6	ACC	33	BHN	60	CHP	87	CTT	114	DIG
7	ACL	34	BHS	61	CIG	88	CTX	115	DIH
8	ACM	35	BII	62	CII	89	CVN	116	DL1
9	ADS	36	BKC	63	CJC	90	CVT	117	DLG
10	AGC	37	BLF	64	CKV	91	CX8	118	DMC
11	AGD	38	BMC	65	CLC	92	D11	119	DNC
12	AGM	39	BMP	66	CLH	93	D2D	120	DNP
13	ALP	40	BPC	67	CLL	94	DAD	121	DP3
14	ALT	41	BRC	68	CLM	95	DAE	122	DPC
15	AMC	42	BST	69	CLW	96	DAG	123	DPG
16	AMD	43	BTP	70	CMC	97	DAH	124	DPM
17	AME	44	BTS	71	CMG	98	DAT	125	DPR
18	AMV	45	BTT	72	CMS	99	DBC	126	DQC
19	ANV	46	BTW	73	CMV	100	DBD	127	DRC
20	APC	47	BXH	74	CMX	101	DBT	128	DRH
21	API	48	C32	75	CNG	102	DC2	129	DST
22	APP	49	C69	76	COM	103	DC4	130	DTA
23	ASM	50	C92	77	CPC	104	DCL	131	DTK
24	ASP	51	CAN	78	CSC	105	DCM	132	DTL
25	ATS	52	CAP	79	CSG	106	DGC	133	DTT
26	BBC	53	CAV	80	CSM	107	DGW	134	DVP
27	BBS	54	CCI	81	CSV	108	DHA	135	DXG

A (continued ...)

No.	Code	No.	Code	No.	Code	No.	Code	No.	Code
136	DXV	165	HAG	194	HRC	223	KHP	252	LIG
137	DZM	166	HAH	195	HSG	224	KKC	253	LIX
138	EBS	167	HAI	196	HT1	225	KLF	254	LM8
139	EID	168	HAP	197	HTC	226	KMR	255	LSS
140	ELC	169	HAR	198	HTI	227	KMT	256	LUT
141	EMC	170	HAS	199	HTL	228	KPF	257	MAC
142	EVE	171	HAX	200	HU1	229	KSA	258	MAS
143	EVG	172	HBC	201	HU3	230	KSB	259	MBG
144	FBT	173	HBE	202	HUT	231	KSD	260	MCC
145	FCM	174	HCC	203	HVN	232	KSS	261	MCF
146	FCN	175	HCD	204	HVT	233	KVC	262	MCG
147	FDC	176	HCT	205	HVX	234	L10	263	MCO
148	FIT	177	HDA	206	IBC	235	L14	264	MCP
149	FLC	178	HDC	207	ICG	236	L18	265	MDC
150	FMC	179	HDG	208	IDI	237	L35	266	MDG
151	FPT	180	HHC	209	IDV	238	L43	267	MHC
152	FTM	181	HHG	210	IJC	239	L61	268	MHL
153	GAS	182	HHL	211	IMP	240	L62	269	MIM
154	GDT	183	HJS	212	INC	241	LAF	270	MKV
155	GEG	184	HKB	213	INN	242	LAS	271	MSN
156	GEX	185	HKT	214	ITA	243	LBM	272	MVB
157	GIL	186	HLC	215	ITC	244	LCG	273	MWG
158	GIT	187	HLD	216	ITD	245	LCS	274	NAF
159	GMC	188	HMC	217	ITQ	246	LDG	275	NAG
160	GMD	189	HNG	218	JVC	247	LDP	276	NAV
161	GMX	190	HOM	219	KBC	248	LGC	277	NBB
162	GSP	191	HOT	220	KDC	249	LGL	278	NBP
163	GTA	192	HPG	221	KDH	250	LHC	279	NDN
164	GTN	193	HQC	222	KDM	251	LHG	280	NDX

A (continued ...)

No.	Code	No.	Code	No.	Code	No.	Code	No.	Code
281	NET	310	PET	339	PVD	368	SD2	397	SJC
282	NFC	311	PGC	340	PVG	369	SD4	398	SJD
283	NHA	312	PGS	341	PVL	370	SD5	399	SJE
284	NHP	313	PHC	342	PVS	371	SD6	400	SJS
285	NHW	314	PHP	343	PVT	372	SD9	401	SKS
286	NKG	315	PHR	344	PXI	373	SDA	402	SLS
287	NLG	316	PIC	345	PXS	374	SDC	403	SMA
288	NSC	317	PIT	346	QBS	375	SDG	404	SMC
289	NSN	318	PJC	347	QCG	376	SDN	405	SMT
290	NST	319	PJT	348	QHD	377	SDS	406	SNG
291	NT2	320	PLC	349	QST	378	SDT	407	SPI
292	NTL	321	PLX	350	RAL	379	SDU	408	SPM
293	NTP	322	PMP	351	RDP	380	SEB	409	SRC
294	NVL	323	PMS	352	REE	381	SEC	410	SRF
295	NVN	324	PNC	353	RIC	382	SED	411	SSC
296	NVT	325	PNJ	354	ROS	383	SFC	412	SSM
297	OCH	326	POM	355	S4A	384	SFG	413	ST8
298	OGC	327	POT	356	S55	385	SFN	414	STC
299	ONE	328	PPC	357	S91	386	SGC	415	STG
300	OPC	329	PPP	358	S99	387	SGD	416	STK
301	PAC	330	PRC	359	SAB	388	SGR	417	STP
302	PAN	331	PSC	360	SAM	389	SGT	418	SVC
303	PBP	332	PSD	361	SAV	390	SHA	419	SVI
304	PC1	333	PTB	362	SBA	391	SHI	420	SVT
305	PDB	334	PTC	363	SBT	392	SHN	421	SZL
306	PDC	335	PTL	364	SBV	393	SHP	422	TA9
307	PDN	336	PTS	365	SC5	394	SIC	423	TAC
308	PDR	337	PVB	366	SCI	395	SII	424	TBC
309	PEN	338	PVC	367	SCR	396	SJ1	425	TBX

A (continued ...)

No.	Code	No.	Code	No.	Code	No.	Code	No.	Code
426	TC6	455	TMT	484	VC2	513	VNC		
427	TCD	456	TNA	485	VC3	514	VNE		
428	TCL	457	TNC	486	VC7	515	VNF		
429	TCM	458	TNG	487	VC9	516	VNG		
430	TCR	459	TNI	488	VCC	517	VNM		
431	TCS	460	TNT	489	VCF	518	VNS		
432	TDC	461	TPC	490	VCG	519	VNT		
433	TDH	462	TPP	491	VCM	520	VOS		
434	TDM	463	TRA	492	VCS	521	VON		
435	TDN	464	TRC	493	VDL	522	VPD		
436	TDW	465	TS4	494	VE2	523	VPH		
437	TEG	466	TSC	495	VE8	524	VPS		
438	TFC	467	TSM	496	VFG	525	VRC		
439	THB	468	TST	497	VGC	526	VSA		
440	THG	469	TTB	498	VGP	527	VSC		
441	THS	470	TTC	499	VHC	528	VSH		
442	THT	471	TTF	500	VHL	529	VSI		
443	TIG	472	TTZ	501	VHM	530	VTB		
444	TIX	473	TV2	502	VIC	531	VTF		
445	TJC	474	TV3	503	VID	532	VTH		
446	TKC	475	TV4	504	VIE	533	VTJ		
447	TKU	476	TXM	505	VIF	534	VTL		
448	TLC	477	TYA	506	VIP	535	VTO		
449	TLG	478	UDC	507	VIS	536	VTV		
450	TLH	479	UIC	508	VIT				
451	TMB	480	UNI	509	VJC				
452	TMC	481	V12	510	VKC				
453	TMP	482	V21	511	VMC				

REFERENCES

- Abdioglu, N & Abdioglu, H 2017, 'Managerial ownership and corporate debt maturity: evidence from bist-100 firms', *International Journal of Economic Perspectives*, vol. 11, no. 1, pp. 102-115.
- Abdulla, Y 2015, *Debt maturity and trade credit in public and private firms*, PhD Thesis, University of Manchester, viewed 2021, <<https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=edsble&AN=edsble.727801&site=eds-live&custid=s1145751>>.
- Abidi, I, Nsaibi, M & Hussainey, K 2022, 'Does ownership structure moderate the relationship between systemic risk and corporate governance? Evidence from gulf cooperation council countries', *Journal of Risk and Financial Management*, vol. 15, no. 5, pp. 1-17.
- Accetturo, A, Canzian, G, Cascarano, M & Stefani, M 2019, *Debt maturity and firm performance: evidence from a quasi-natural experiment*, viewed 2020, <https://www.bancaditalia.it/pubblicazioni/temi-discussione/2019/2019-1250/en_Tema_1250.pdf?language_id=1>.
- Adachi-Sato, M & Vithessonthi, C 2019, 'Corporate debt maturity and future firm performance volatility', *International Review of Economics and Finance*, vol. 60, pp. 216-237.
- Agarwal, S & Mohtadi, H 2004, 'Financial markets and the financing choice of firms: evidence from developing countries', *Global Finance Journal*, vol. 15, no. 1, pp. 57-70.
- Ahunwan, B 2002, 'Corporate governance in Nigeria', *Journal of Business Ethics*, vol. 37, no. 3, pp. 269-287.
- Aivazian, V, Ge, Y & Qiu, J 2005a, 'Debt maturity structure and firm investment', *Financial Management*, vol. 34, no. 4, pp. 107-119.
- Aivazian, V, Ge, Y & Qiu, J 2005b, 'The impact of leverage on firm investment: Canadian evidence', *Journal of Corporate Finance*, vol. 11, no. 1-2, pp. 277-291.
- Akhbar, T 2017, 'Simultaneous effect on debt and managerial ownership: agency theory framework', *KINERJA Journal of Business and Economics*, vol. 21, no. 2, pp. 201-213.
- Alcock, J, Finn, F & Tan, K 2012, 'The determinants of debt maturity in Australian firms', *Accounting and Finance*, vol. 52, no. 2, pp. 313-341.
- Allaya, M, Derouiche, I & Muessig, A 2022, 'Voluntary disclosure, ownership structure, and corporate debt maturity: a study of French listed firms', *International Review of Financial Analysis*, vol. 81, pp. 1-17.
- Allens & Linklaters 2018, *Privatisation in Vietnam: opportunities and challenges for investors*, viewed 2021, <<https://www.allens.com.au/globalassets/pdfs/insights/asia/privatisationinvietnam3dec2018.pdf>>.
- Allens & Linklaters 2019, *Legal Guide to Investment in Vietnam*, viewed 2022, <<https://www.allens.com.au/globalassets/pdfs/insights/asia/legalguidetoinvestmentinvietnam.pdf>>.
- Altman, E, I 1984, 'A further empirical investigation of the bankruptcy cost question', *Journal of Finance*, vol. 39, no. 4, pp. 1067-1089.
- Álvarez-Botas, C & González-Méndez, V 2019, 'Corporate debt maturity and economic development', *International Journal of Managerial Finance*, vol. 15, no. 5, pp. 669-687.
- Anderson, W & Hsiao, C 1982, 'Formulation and estimation of dynamic models using panel data', *Journal of Econometrics*, vol. 18, no. 1, pp. 47-82.

- Anh, D & Gan, C 2021, 'The impact of the covid-19 lockdown on stock market performance: evidence from Vietnam', *Journal of Economic Studies*, vol. 48, no. 4, pp. 836-851.
- Antoniou, A, Guney, Y & Paudyal, K 2006, 'The determinants of debt maturity structure: evidence from France, Germany and the UK', *European Financial Management*, vol. 12, no. 2, pp. 161-194.
- Arellano, M & Bond, S 1991, 'Some tests of specification for panel data: monte carlo evidence and an application to employment equations', *The Review of Economic Studies in Economics and Finance*, vol. 58, no. 2, pp. 277-297.
- Arellano, M & Bover, O 1995, 'Another look at the instrumental variable estimation of error-components models', *Journal of Econometrics*, vol. 68, no. 1, pp. 29-51.
- Arslan, Ö & Karan, M, B 2006, 'Ownership and control structure as determinants of corporate debt maturity: a panel study of an emerging market', *Corporate Governance: An International Review*, vol. 14, no. 4, pp. 312-324.
- Asian Development Bank 2022a, *Asia bond monitor March 2022*, viewed 2022, retrieved from Asian Development Bank database.
- Asian Development Bank 2022b, *Asian development bank and viet nam: fact sheet*, viewed 2022, retrieved from Asian Development Bank database.
- Aslan, H & Kumar, P 2012, 'Strategic ownership structure and the cost of debt', *Review of Financial Studies*, vol. 25, no. 7, pp. 2257-2299.
- Atrill, P 2006, *Financial Management for Decision Makers*, FT Prentice Hall, New York.
- Awartani, B, Belkhir, M, Maghyereh, A & Boubaker, S 2016, 'Corporate debt maturity in the MENA region: does institutional quality matter?', *International Review of Financial Analysis*, vol. 46, pp. 309-325.
- Azofra, V, Rodríguez-Sanz, J A & Velasco, P 2020, 'The role of macroeconomic factors in the capital structure of European firms: how influential is bank debt?', *International Review of Economics and Finance*, vol. 69, pp. 494-514.
- Bae, K-H, Bailey, W & Kang, J 2021, 'Why is stock market concentration bad for the economy?', *Journal of Financial Economics*, vol. 140, no. 2, pp. 436-459.
- Bajaj, Y, Kashiramka, S & Singh, S 2020, 'Capital structure dynamics: China and India (Chindia) perspective', *European Business Review*, vol. 32, no. 5, pp. 845-868.
- Baker, M, Greenwood, R & Wurgler, J 2001, *Do firms borrow at the lowest-cost maturity? the long-term share in debt issues and predictable variation in bond returns*, viewed 2020, <<https://archive.nyu.edu/bitstream/2451/26558/2/FIN-01-020.pdf>>.
- Barclay, M, Marx, L & Smith, C 2003, 'The joint determination of leverage and maturity', *Journal of Corporate Finance*, vol. 9, no. 2, pp. 149-167.
- Barclay, M & Smith, C 1995, 'The maturity structure of corporate debt', *The Journal of Finance*, vol. 50, no. 2, pp. 609-631.
- Barnea, A, Haugen, R & Senbet, L 1980, 'A rationale for debt maturity structure and call provisions in the agency theoretic framework', *The Journal of Finance*, vol. 35, no. 5, pg. 1223-1234.
- Bas, T 2012, *Capital Structure and Debt Maturity Choices of Firms in Developing Countries*, PhD thesis, University of London, London, viewed 2021, <https://openaccess.city.ac.uk/id/eprint/1073/1/Bas,_Tugba.pdf>.
- Baum, A 2020, *Vietnam's development success story and the unfinished sdg agenda*, viewed 2022, retrieved from IMF database.
- Bekaert, G, Harvey, C & Lundblad, C 2005, 'Does financial liberalization spur growth?', *Journal of Financial Economics*, vol. 77, no. 1, pp. 3-55.
- Ben-Nasr, H, Boubaker, S & Rouatbi, W 2015, 'Ownership structure, control contestability, and corporate debt maturity', *Journal of Corporate Finance*, vol. 35, pp. 265-285.

- Bennouri, M, Chtioui, T, Nagati, H & Nekhili, M 2018, 'Female board directorship and firm performance: what really matters?', *Journal of Banking and Finance*, vol. 88, pp. 267-291.
- Berger, A, N, Espinosa-Vega, M, A, Frame, W, S & Miller, N, H 2005, 'Debt maturity, risk, and asymmetric information', *The Journal of Finance*, vol. 60, no. 6, pp. 2895-2923.
- Bharath, S, T, Jayaraman, S & Nagar, V 2013, 'Exit as governance: an empirical analysis', *The Journal of Finance*, vol. 68, no. 6, pp. 2515-2547.
- Blundell, R & Bond, S 1998, 'Initial conditions and moment restrictions in dynamic panel data models', *Journal of Econometrics*, vol. 87, no. 1, pp. 115-143.
- Bolton, P & Freixas, X 2000, 'Equity, bonds, and bank debt: capital structure and financial market equilibrium under asymmetric information', *Journal of Political Economy*, vol. 108, no. 2, pp. 324-351.
- Bond, S, R 2002, 'Dynamic panel data models: a guide to micro data methods and practice', *Portuguese Economic Journal*, vol. 1, no. 2, pp. 141-162.
- Boubaker, S, Rouatbi, W & Saffar, W 2017, 'The role of multiple large shareholders in the choice of debt source', *Financial Management*, vol. 46, no. 1, pp. 241-274.
- Boubakri, N, Cosset, J, C & Saffar, W 2013, 'The role of state and foreign owners in corporate risk-taking: evidence from privatization', *Journal of Financial Economics*, vol. 108, no. 3, pp. 641-658.
- Boubakri, N & Saffar, W 2019, 'State ownership and debt choice: evidence from privatization', *Journal of Financial and Quantitative Analysis*, vol. 54, no. 3, pp. 1313-1346.
- Brealey, R, A, Myers, S, C & Allen, F 2011, *Principles of Corporate Finance*, McGraw-Hill/Irwin, New York, NY.
- Brennan, M & Kraus, A 1987, 'Efficient financing under asymmetric information', *Journal of Finance*, vol. 42, no. 5, pp. 1225-1243.
- Brennan, M, J & Schwartz, E, S 1978 'Corporate income taxes, valuation, and the problem of optimal capital structure', *Journal of Business*, vol. 51, no. 1, pp. 103-114.
- Brick, I, E, Frierman, M & Kim, Y, K 1998, 'Asymmetric information concerning the variance of cash flows: the capital structure choice', *International Economic Review*, vol. 39, no. 3, pp. 745-761.
- Brick, I, E & Liao, R, C 2017, 'The joint determinants of cash holdings and debt maturity: the case for financial constraints', *Review of Quantitative Finance and Accounting*, vol. 48, no.3, pp. 597-641.
- Brick, I, E & Palmon, O 1992, 'Interest rates fluctuations and the advantage of long-term debt financing: a note on the effect of the tax-timing option', *Financial Review*, vol. 27, no. 3, pp. 467-474.
- Brick, I, E & Ravid, S, A 1985, 'On the relevance of debt maturity structure', *Journal of Finance*, vol. 40, no. 5, pp. 1423-1437.
- Brick, I, E & Ravid, S, A 1991, 'Interest rate uncertainty and the optimal debt maturity structure', *Journal of Financial and Quantitative Analysis*, vol. 26, no.1, pp. 63-81.
- Brogaard, J, Li, D & Xia, Y 2017, 'Stock liquidity and default risk', *Journal of Financial Economics*, vol. 124, no. 3, pp. 486-502.
- Bui, T, M, T 2018, *Ownership as a moderator of the relation between corporate governance and firm performance in Vietnam*, PhD thesis, Queensland University of Technology, Queensland, viewed 2021, < https://eprints.qut.edu.au/122945/1/Minh%20Tam_Bui%20Thi_Thesis.pdf>.
- Butt, M, N, Baig, A, S & Seyyed, F, J 2021, 'Tobin's q approximation as a metric of firm performance: an empirical evaluation', *Journal of Strategic Marketing*, pp. 1-17.

- Cai, J, Cheung, Y-L & Goyal, V, K 1999, 'Bank monitoring and the maturity structure of Japanese corporate debt issues', *Pacific-Basin Finance Journal*, vol. 7, no. 3-4, pp. 229-250.
- Cai, K, Fairchild, R & Guney, Y 2008, 'Debt maturity structure of Chinese companies', *Pacific-Basin Finance Journal*, vol. 16, no. 3, pp. 268-297.
- Casino-Martínez, A, López-Gracia, J, Mestre-Barberá, R & Peiró-Giménez, A 2019, 'An agency approach to debt maturity of unlisted and listed firms in the European setting', *European Management Journal*, vol. 37, no. 3, pp. 339-352.
- Chaganti, R & Damanpour, F 1991, 'Institutional ownership, capital structure, and firm performance', *Strategic Management Journal*, vol. 12, no. 7, pp. 479-491.
- Chen, H, Maslar, D, A & Serfling, M 2020, 'Asset redeployability and the choice between bank debt and public debt', *Journal of Corporate Finance*, vol. 64, pp. 1-25.
- Chelley-Steeley, P 2008, 'Concentration of the UK Stock Market', *Journal of Business Finance & Accounting*, vol. 35, no. 3-4, pp. 541-562.
- Chen, H-H & Chen, L-H 2017, 'An Analysis of the Investment Concentration of Equity Mutual Funds in China', *Emerging Markets Finance & Trade*, vol. 53, no. 3, pp. 511-520.
- Chen, H, Xu, Y & Yang, J 2021, 'Systematic risk, debt maturity, and the term structure of credit spreads', *Journal of Financial Economics*, vol. 139, no. 3, pp. 770-799.
- Chen, J, J 2004, 'Determinants of capital structure of Chinese-listed companies', *Journal of Business Research*, vol. 57, no. 12, pp. 1341-1351.
- Chen, Y, Ge, R, Louis, H & Zolotoy, L 2019, 'Stock liquidity and corporate tax avoidance', *Review of Accounting Studies*, vol. 24, no. 1, pp. 309-340.
- Chinn, M, D & Ito, H 2006, 'What matters for financial development? capital controls, institutions, and interactions', *Journal of Development Economics*, vol. 81, no. 1, pp. 163-192.
- Chipeta, C & Deressa, C 2016, 'Firm and country specific determinants of capital structure in sub Saharan Africa', *International Journal of Emerging Markets*, vol. 11, no. 4, pp. 649-673.
- Chipeta, C & McClelland, D 2018, 'In search of conclusive evidence on the trade-off and pecking order theories of capital structure: evidence from the Johannesburg stock exchange', *Investment Analysts Journal*, vol. 47, no.1, pp. 15-30.
- Choi, Y & Choi, J 2013, 'The foreign ownership and the debt maturity structure'. *International Journal of Digital Content Technology and its Applications*, vol. 7, no. 13, pp. 491-495.
- Choi, Y, M & Park, K 2022, 'Debt maturity structure of private lodging firms', *Applied Economics Letters*, vol. 29, no. 8, pp. 706-712.
- Chung, T, A & Phan, Q, T 2020, 'Debt maturity and the development of financial markets in Vietnamese listed firms', *Afro-Asian Journal of Finance and Accounting*, vol. 10, no. 2, pp. 184-206.
- Claessens, S & Djankov, S 2002, 'Disentangling the incentive and entrenchment effects of large shareholdings', *Journal of Finance*, vol. 57, no. 6, pp. 2741-2771.
- Coval, J, D & Moskowitz, T, J 1999, 'Home bias at home: local equity preference in domestic portfolios', *Journal of Finance*, vol. 54, no. 6, pp. 2045-2073.
- Cragg, J, G & Donald, S, G 1993, 'Testing identifiability and specification in instrumental variable models', *Econometric Theory*, vol. 9, no. 2, pp. 222-240.
- Custódio, C, Ferreira, M, A & Laureano, L 2013, 'Why are US firms using more short-term debt?', *Journal of Financial Economics*, vol. 108, no. 1, pp. 182-212.
- D'Amato, A 2020, 'Capital structure, debt maturity, and financial crisis: empirical evidence from SMEs', *Small Business Economics: An Entrepreneurship Journal*, vol. 55, no. 4, pp. 919-941.

- Dahlquist, M & Robertsson, G 2001, 'Direct foreign ownership, institutional investors, and firm characteristics', *Journal of Financial Economics*, vol. 59, no. 3, pp. 413-440.
- Dang, L, N, Nguyen, D, D & Taghizadeh-Hesary, F 2020, *State-owned enterprise reform in Viet nam: progress and challenges*, viewed 2022, retrieved from Asian Development Bank database.
- Dang, V, A 2011, 'Leverage, debt maturity and firm investment: an empirical analysis', *Journal of Business Finance and Accounting*, vol. 38, no. 1-2, pp. 225-258.
- Dangl, T & Zechner, J 2021, 'Debt maturity and the dynamics of leverage. *Review of Financial Studies*, vol. 34, no. 12, pp. 5796-5840.
- Danisevska, P 2002, *Is debt maturity determined by asymmetric information about short-term or long-term earnings?*, viewed 2021, < https://papers.ssrn.com/sol3/papers.cfm?abstract_id=302737>.
- Dao, T, T, B 2014, *VN30 index: an overview and default probability analysis*, viewed 2020, < https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2543084>.
- Datta, S, Iskandar-Datta, M & Raman, K 2005, 'Managerial stock ownership and the maturity structure of corporate debt', *Journal of Finance*, vol. 60, no. 5, pp. 2333-2350.
- Jong, A, D, Verbeek, M & Verwijmeren, P 2011, 'Firms' debt–equity decisions when the static tradeoff theory and the pecking order theory disagree', *Journal of Banking and Finance*, vol. 35, no. 5, pp. 1303-1314.
- Deangelo, H & Richard, R 2015, 'How stable are corporate capital structures?', *Journal of Finance*, vol. 70, no. 1, pp. 373-418.
- Deesomsak, R 2006, *Corporate financing decisions: evidence from the Asia Pacific region*, PhD Thesis, Durham University, Durham.
- Demirgüç-Kunt, A & Levine, R 1996, 'Stock market development and financial intermediaries: stylized facts', *World Bank Economic Review*, vol. 10, no. 2, pp. 291-321.
- Demirguc-Kunt, A & Maksimovic, V 1999, 'Institutions, financial markets, and firm debt maturity', *Journal of Financial Economics*, vol. 54, no. 3, pp. 295-336.
- Demirgüç-Kunt, A & Maksimovic, V 1996, 'Stock market development and financing choices of firms', *World Bank Economic Review*, vol. 10, no. 2, pp. 341-369.
- Demirgüç-Kunt, A & Maksimovic, V 1998, 'Law, finance, and firm growth', *Journal of Finance*, vol. 53, no. 6, pp. 2107-2137.
- Demirguc-Kunt, A, Martinez-Peria, M, S & Tressel, T 2015, *The impact of the global financial crisis on firms' capital structure*, viewed 2020, retrieved from World Bank Group database.
- Dennis, S, Nandy, D & Sharpe, I, G 2000, 'The determinants of contract terms in bank revolving credit agreements', *Journal of Financial and Quantitative Analysis*, vol. 35, no. 1, pp. 87-110.
- Dessí, R & Robertson, D 2003, 'Debt, incentives and performance: evidence from UK panel data', *The Economic Journal*, vol. 113, no. October, pp. 903-919.
- Diamond, D, W 1984, 'Financial intermediation and delegated monitoring', *Review of Economic Studies*, vol. 51, no. 3, pp. 393-414.
- Diamond, D, W 1991, 'Debt maturity structure and liquidity risk', *The Quarterly Journal of Economics*, vol. 106, no. 3, pp. 709-737.
- Diamond, D, W 1993, 'seniority and maturity of debt contracts', *Journal of Financial Economics*, vol. 33, no. 3, pp. 341-368.
- Do, X, Q & Wu, Z, X 2013, 'Impact of ownership structure and corporate governance on capital structure: the case of Vietnamese firms', *Australian Journal of Business and Management Research*, vol. 3, no. 3, pp. 11-19.

- Donaldson, G 1961, *Corporate debt capacity: a study of corporate debt policy and the determination of corporate debt capacity*, Division of Research, Graduate School of Business Administration, Harvard University.
- Douglas, R, E, Adam K Gehr, Jr, Douglas, R, E & Adam, K, G, Jr 1988, 'Tax options, capital structure, and miller equilibrium: a numerical illustration', *Financial Management*, vol. 17, no. 2, pp. 30-40.
- Downes, D, H & Heinkel, R 1982, 'Signaling and the valuation of unseasoned new issues', *Journal of Finance*, vol. 37, no. 1, pp. 1-10.
- Dung, L, V 2022, 'Corporate bond market has ample room for improvement', *Vietnam News*, 14 September, viewed 20 September 2022, < <https://vir.com.vn/corporate-bond-market-has-ample-room-for-improvement-96354.html>>.
- Duong, H, K, Ngo, A, D & McGowan, C, B 2015 'Industry peer effect and the maturity structure of corporate debt', *Managerial Finance*, vol. 41, no. 7, pp. 714-733.
- Ehrhardt, M, C & Brigham, E, F 2011, *Financial Management: Theory and Practice*, South-Western Cengage Learning.
- Elbannan, M, A 2017, 'Stock market liquidity, family ownership, and capital structure choices in an emerging country', *Emerging Markets Review*, vol. 33, pp. 201-231.
- Etudaiye-Muhtar, O, F, Ahmad, R & Matemilola, B, T 2017a, 'Corporate debt maturity structure: the role of firm level and institutional determinants in selected African countries', *Global Economic Review*, vol. 46, no. 4, pp. 422-440.
- Etudaiye-Muhtar, O, F, Ahmad, R, Olaniyi, T, A & Abdulmumin, B, A 2017b, 'Financial market development and bank capitalization ratio', *Paradigm*, vol. 21, no. 2, pp. 126-138.
- Fama, E, F & French, K, R 2002, 'Testing trade-off and pecking order predictions about dividends and debt', *Review of Financial Studies*, vol. 15, no. 1, pp. 1-33.
- Fan, J, P, H, Titman, S & Twite, G 2012, 'An international comparison of capital structure and debt maturity choices', *Journal of Financial and Quantitative Analysis*, vol. 47, no. 1, pp. 23-56.
- Faulkender, M 2005, 'Hedging or market timing? selecting the interest rate exposure of corporate debt', *Journal of Finance*, vol. 60, no. 2, pp. 931-962.
- Fernández-Méndez, C & González, V, M 2018, 'Bank ownership, lending relationships and capital structure: evidence from Spain', *Business Research Quarterly*, vol. 22, no. 2, pp. 137-154.
- Fernández, A, I, González, F & Suárez, N 2018, 'Bank supply shocks and the substitution between bank and nonbank debt', *Journal of Corporate Finance*, vol. 48, pp. 122-147.
- Flannery, M, J 1986, 'Asymmetric information and risky debt maturity choice', *Journal of Finance*, vol. 41, no. 1, pp. 19-37.
- Foreign Investment Agency of Vietnam & Deloitte 2019, *Doing Business in Vietnam 2019*, viewed 2022, < <https://www2.deloitte.com/content/dam/Deloitte/vn/Documents/tax/vn-tax-vietnam-doing-business-2019.pdf>>.
- Frank, M, Z & Goyal, V, K 2009, 'Capital structure decisions: which factors are reliably important?', *Financial Management*, vol. 38, no. 1, pp. 1-37.
- Fu, R & Subramanian, A 2011, 'Leverage and debt maturity choices by undiversified owner-managers', *Journal of Corporate Finance*, vol. 17, no. 4, pp. 888-913.
- Fu, X, Huang, M & Tang, T 2022, 'Duration of executive compensation and maturity structure of corporate debt', *Journal of Corporate Finance*, vol. 73, pp. 1-22.
- Fu, X & Tang, T 2016, 'Corporate debt maturity and acquisition decisions', *Financial Management*, vol. 45, no. 3, pp. 737-768.
- Fung, S, Y, K & Goodwin, J 2013, 'Short-term debt maturity, monitoring and accruals-based earnings management', *Journal of Contemporary Accounting and Economics*, vol. 9, no. 1, pp. 67-82.

- Gallagher, D, R, Ignatieva, K, Mcculloch, J & Berkman, H 2015, 'Industry concentration, excess returns and innovation in Australia', *Accounting & Finance*, vol. 55, no. 2, pp. 443-466.
- Ganguli, S, K & Deb, S, G 2021, 'Board composition, ownership structure and firm performance: new indian evidence', *International Journal of Disclosure and Governance*, vol. 18, no. 3, pp. 256-268.
- García-Teruel, P, J & Martínez-Solano, P 2010, 'Ownership structure and debt maturity: new evidence from Spain', *Review of Quantitative Finance and Accounting*, vol. 35, no. 4, pp. 473-491.
- García-Teruel, P, J, Martínez-Solano, P & Sánchez-Ballesta, J, P 2014, 'The role of accruals quality in the access to bank debt', *Journal of Banking and Finance*, vol. 38, pp. 186-193.
- General Statistics Office 2020, *Statistical Yearbook of Viet Nam*, viewed 2022, retrieved from General Statistics Office database.
- General Statistics Office 2021, *Statistical Yearbook of Viet Nam*, viewed 2022, retrieved from General Statistics Office database.
- Ghasemzadeh, M, Heydari, M & Mansourfar, G 2021, 'Earning Volatility, Capital Structure Decisions and Financial Distress by SEM', *Emerging Markets Finance and Trade*, vol. 57, no. 9, pp. 2632-2650.
- Giannetti, M 2003, 'Do better institutions mitigate agency problems? evidence from corporate finance choices', *Journal of Financial & Quantitative Analysis*, vol. 38, no. 1, pp. 185-212.
- Gilson, S, C, John, K & Lang, L, H, P 1990, 'Troubled debt restructurings: an empirical study of private reorganization of firms in default', *Journal of Financial Economics*, vol. 27, no. 2, pp. 315-353.
- González, V, M 2015, 'The financial crisis and corporate debt maturity: the role of banking structure', *Journal of Corporate Finance*, vol. 35, pp. 310-328.
- González, V, M 2017, 'Firm and country determinants of debt maturity: new international evidence', *International Finance*, vol. 20, no. 3, pp. 256-270.
- González, V, M & González, F 2008, 'Influence of bank concentration and institutions on capital structure: new international evidence', *Journal of Corporate Finance*, vol. 14, no. 4, pp. 363-375.
- Graham, J, R & Harvey, C, R 2001, 'The theory and practice of corporate finance: evidence from the field', *Journal of Financial Economics*, vol. 60, no. 2-3, pp. 187-243.
- Graham, J, R, Leary, M, T & Roberts, M, R 2015, 'A century of capital structure: the leveraging of corporate America', *Journal of Financial Economics*, vol. 118, no. 3, pp. 658-683.
- Grossman, S 1976, 'On the efficiency of competitive stock markets where trades have diverse information', *Journal of Finance*, vol. 31, no. 2, pp. 573-585.
- Grossman, S, J & Hart, O, D 1982, *Corporate financial structure and managerial incentives*, University of Chicago Press, Chicago.
- Grossman, S, J & Stiglitz, J, E 1976, 'Information and competitive price systems', *American Economic Review*, vol. 66, no. 2, pp. 246-253.
- Guedes, J & Opler, T 1996, 'The determinants of the maturity of corporate debt issues', *Journal of Finance*, vol. 51, no. 5, pp. 1809-1833.
- Guedhami, O, Pittman, J, A & Saffar, W 2009, 'Auditor choice in privatized firms: empirical evidence on the role of state and foreign owners', *Journal of Accounting and Economics*, vol. 48, no. 2, pp. 151-171.
- Gul, F, A & Goodwin, J 2010, 'Short-term debt maturity structures, credit ratings, and the pricing of audit services', *The Accounting Review*, vol. 85, no. 3, pp. 877-909.

- Guney, Y & Ozkan, A 2005, 'New insights on the importance of agency costs for corporate debt maturity decisions', *Applied Financial Economics Letters*, vol. 1, no. 4, pp. 233-238.
- Gurunlu, M & Gursoy, G 2010, 'The influence of foreign ownership on capital structure of non-financial firms: evidence from Istanbul stock exchange', *Journal of Corporate Governance*, vol. 9, no. 4, pp. 21-29.
- Ha, D, T, Thang, P, M & Huyen, V, D 2021, *The Lending and Secured Finance Review: Vietnam*, viewed 2022, < https://ykvn-law.com/wp-content/uploads/vietnam_the-lending-and-secured-finance-review_the-law-reviews_fifth-edition_2019.pdf>.
- Halov, N & Heider, F 2011, 'Capital structure, risk and asymmetric information', *Quarterly Journal of Finance*, vol. 1, no. 4, pp. 767-809.
- Hansen, L, P, 1982, 'Large sample properties of generalized method of moments estimators', *Econometrica*, vol. 50, no. 4, pp. 1029-1054.
- Harford, J, Kecskés, A & Mansi, S 2018, 'Do long-term investors improve corporate decision making?', *Journal of Corporate Finance*, vol. 50, pp. 424-452.
- Harford, J, Klasa, S & Maxwell, W, F 2014, 'Refinancing risk and cash holdings', *Journal of Finance*, vol. 69, no. 3, pp. 975-1012.
- Harris, M & Raviv, A 1991, 'The theory of capital structure', *Journal of Finance*, vol. 46, no.1, pp. 297-355.
- Hart, O & Moore, J 1995, 'Debt and seniority: an analysis of the role of hard claims in constraining management', *American Economic Review*, vol. 85, no. 3, pp. 567-585.
- Hart, O & Moore, J 1998, 'Default and renegotiation: a dynamic model of debt', *Quarterly Journal of Economics*, vol. 113, no. 1, pp. 1-41.
- Hasan, M, M, Asad, S & Wong, J, B 2022, 'Oil price uncertainty and corporate debt maturity structure', *Finance Research Letters*, vol. 46, pp. 1-9.
- Hatem, B, S 2017, 'Influence of debt maturity on firm performance: an international comparison'. *International Journal of Economics and Finance*, vol. 9, no. 5, pp. 106-113.
- Hausman, J, A 1978, 'Specification tests in econometrics', *Econometrica*, vol. 46, no. 6, pp. 1251-1271.
- Heinkel, R 1982, 'A theory of capital structure relevance under imperfect information', *Journal of Finance*, vol. 37, no. 5, pp. 1141-1150.
- Hernández-Cánovas, G & Koëter-Kant, J 2008, 'Debt maturity and relationship lending: an analysis of European SMEs', *International Small Business Journal*, vol. 26, no. 5, pp. 595-617.
- Heyman, D, Deloof, M & Ooghe, H 2008, 'The financial structure of private held Belgian firms', *Small Business Economics*, vol. 30, no. 3, pp. 301-313.
- Hoang, L, T 2017, 'Ownership concentration, state ownership and firm performance: empirical evidence from the Vietnamese stock market', Master thesis, Lincoln University, Lincoln.
- Hochiminh Stock Exchange 2020, *HOSE-Index series*, viewed 2022,< http://www.fpts.com.vn/FileStore2/File/2020/02/12/20200211FormFactsheetMCI ndicesEngT022020_57a46d7b.pdf>.
- Hou, K, Xue, C & Zhang, L 2015, 'Digesting anomalies: an investment approach', *Review of Financial Studies*, vol. 28, no. 3, pp. 650-705.
- Huang, B-Y, Lin, C-M & Huang, C-M 2011, 'The influences of ownership structure: evidence from China'. *Journal of Developing Areas*, vol. 45, pp. 209-227.
- Huong, T, T, X, Nguyen, M, L, T & Lien, N, T, K 2020, 'An empirical study of the real effective exchange rate and foreign direct investment in Vietnam', *Investment Management and Financial Innovations*, vol. 17, no. 4, pp. 1-13.
- Hussain, S, Quddus, A, Tien, P, P, Rafiq, M & Pavelková, D 2020, 'The moderating role of firm size and interest rate in capital structure of the firms: selected sample from

- sugar sector of Pakistan', *Investment Management and Financial Innovations*, vol. 17, no. 4, pp. 341-355.
- Scott, J, H 1976, 'A theory of optimal capital structure', *The Bell Journal of Economics*, vol. 7, no. 1, pp. 33-54.
- Jensen, M, C 1986, 'Agency costs of free cash flow, corporate finance, and takeovers', *American Economic Review*, vol. 76, no. 2, pp. 323-329.
- Jensen, M, C & Meckling, W, H 1976, 'Theory of the firm: managerial behavior, agency costs and ownership structure', *Journal of Financial Economics*, vol. 3, no.4, pp. 305-360.
- Johnson, S, A 1997, 'An empirical analysis of the determinants of corporate debt ownership structure', *Journal of Financial and Quantitative Analysis*, vol. 32, no. 1, pp. 47-69.
- Johnson, S, A 1998, 'The effect of bank debt on optimal capital structure', *Financial Management*, vol. 27, no. 1, pp. 47-56.
- Johnson, S, A 2003, 'Debt maturity and the effects of growth opportunities and liquidity risk on leverage', *Review of Financial Studies*, vol. 16, no. 1, pp. 209-236.
- Jun, S-G & Jen, F, C 2003, 'Trade-off model of debt maturity structure', *Review of Quantitative Finance and Accounting*, vol. 20, no. 1, pp. 5-34.
- Jungherr, J & Schott, I 2021, 'Optimal debt maturity and firm investment', *Review of Economic Dynamics*, vol. 42, pp. 110-132.
- Kale, J, R & Noe, T, H 1990, 'Risky debt maturity choice in a sequential game equilibrium', *Journal of Financial Research*, vol. 13, no. 2, pp. 155-165.
- Kalsie, A & Nagpal, A 2018, 'The determinants of corporate debt maturity for NSE-listed corporates', *FIIB Business Review*, vol. 7, no. 1, pp. 43-56.
- Kanasro, H, A, Junejo, M, A & Lal Rohra, C 2009, 'The effects of stock concentration on market capitalization: a case study of Karachi stock exchange', *Australian Journal of Basic and Applied Sciences*, vol. 3, no. 3, pp. 2344-2349.
- Kane, A, Marcus, A, J & Mcdonald, R, L 1985, 'Debt policy and the rate of return premium to leverage', *Journal of Financial and Quantitative Analysis*, vol. 20, no. 4, pp. 479-499.
- Kashefi Pour, E 2012, *Leverage and Debt Maturity: The Implication of Size and Market Quotation*, PhD thesis, City University London, London.
- Kashyap, A, K, Stein, J, C & Wilcox, D, W 1993, 'Monetary policy and credit conditions: evidence from the composition of external finance', *American Economic Review*, vol. 83, no. 1, pp. 78-98.
- Khanna, T & Palepu, K 2000, 'Is group affiliation profitable in emerging markets? an analysis of diversified indian business groups', *Journal of Finance*, vol. 55, no. 2, pp. 867-891.
- Khoo, J & Cheung, A 2022, 'Managerial ability and debt maturity', *Journal of Contemporary Accounting and Economics*, vol. 18, no. 1, pp. 1-23.
- Kim, C-S, Mauer, D, C & Stohs, M, H 1995, 'Corporate debt maturity policy and investor tax-timing options: theory and evidence', *Financial Management*, vol. 24, no. 1, pp. 33-45.
- Kim, E, H 1978, 'A mean-variance theory of optimal capital structure and corporate debt capacity', *Journal of Finance*, vol. 33, no. 1, pp. 45-63.
- Kim, N, L, T, Duvernay, D & Thanh, H, L 2021, 'Determinants of financial performance of listed firms manufacturing food products in Vietnam: regression analysis and blinder–oaxaca decomposition analysis', *Journal of Economics and Development*, vol. 23, no. 3, pp. 267-283.
- Kirch, G & Terra, P, R, S 2012, 'Determinants of corporate debt maturity in South America: do institutional quality and financial development matter?', *Journal of Corporate Finance*, vol. 18, no. 4, pp. 980-993.

- Kjellman, A & Hansén, S 1995, 'Determinants of capital structure: theory vs. practice', *Scandinavian Journal of Management*, vol. 2, pp. 91-102.
- Krasker, W, S 1986, 'Stock price movements in response to stock issues under asymmetric information', *Journal of Finance*, vol. 41, no. 1, pp. 93-105.
- Kraus, A & Litzenberger, R, H 1973, 'A state-preference model of optimal financial leverage', *Journal of Finance*, vol. 28, no. 4, pp. 911-922.
- Krishnankutty, R & Chakraborty, K, S 2014, 'The determinants of corporate debt maturity: a study on listed companies of Bombay stock exchange 500 index', *Romanian Economic Journal*, vol. 17, no. 51, pp. 67-90.
- Lai, T, N 2018, 'The impact of state ownership, leverage over firm performance of Vietnamese listed firms', *51th Research World International Conference, Vietnam*, viewed 2021, <
https://www.worldresearchlibrary.org/up_proc/pdf/1803-153578369916-29.pdf>.
- Lau, C, K 2016, 'How corporate derivatives use impact firm performance?', *Pacific-Basin Finance Journal*, vol. 40, pp. 102-114.
- Le, C, Sevic, A, Tzeremes, P & Ngo, T 2022, 'Bank efficiency in Vietnam: Do scale expansion strategies and non-performing loans matter?', *International Journal of Finance & Economics*, vol. 27, no. 1, pp. 822-843.
- Le, P 2022, 'Capital misallocation and state ownership policy in Vietnam', *Economic Record*, vol. 98, pp. 52-64.
- Le, T, D, Q, Ho, T, H, Ngo, T, Nguyen, D, T & Tran, S, H 2022, 'A data set for the Vietnamese banking system (2002-2021)', *Data*, vol. 7, no. 120, pp. 1-8.
- Le, T, N, L 2019, *Ownership structure, governance and stock liquidity in Vietnam*, PhD thesis, Queensland University of Technology, Queensland.
- Le, T, P, V 2015, *Ownership structure, capital structure and firm performance: a study of Vietnamese listed firms*, PhD thesis, University of Western Sydney, Sydney.
- Le, T, P, V & PHAN, T, B, N 2017, 'Capital structure and firm performance: empirical evidence from a small transition country', *Research in International Business and Finance*, vol. 42, pp. 710-726.
- Le, T, P, V & Tannous, K 2016, 'Ownership structure and capital structure: a study of Vietnamese listed firms', *Australian Economic Papers*, vol. 55, no. 4, pp. 319-344.
- Le, T, V & Le, T, H 2017, 'Ownership and identities of the largest shareholders and dividend policy: evidence from Vietnam', *Organizations and Markets in Emerging Economies*, vol. 8, no. 1, pp. 86-104.
- Leland, H, E & Pyle, D, H 1977, 'Informational asymmetries, financial structure, and financial intermediation', *Journal of Finance*, vol. 32, no. 2, pp. 371-387.
- Lemmon, M, L, Roberts, M, R & Zender, J, F 2008, 'Back to the beginning: persistence and the cross-section of corporate capital structure', *Journal of Finance*, vol. 63, no. 4, pp. 1575-1608.
- Lensink, R & Pham, T, T, T 2011, 'On the signalling property of debt maturity: empirical evidence from a private bank in Vietnam', *Applied Economics Letters*, vol. 18, no.9, pp. 809-816.
- Lewis, C, M 1990, 'A multiperiod theory of corporate financial policy under taxation', *Journal of Financial and Quantitative Analysis*, vol. 25, no. 1, pp. 25-43.
- Li, K, Yue, H & Zhao, L 2009, 'Ownership, institutions, and capital structure: evidence from China', *Journal of Comparative Economics*, vol. 37, no. 3, pp. 471-490.
- Li, Y & Zhang, X, Y 2019, 'Impact of board gender composition on corporate debt maturity structures', *European Financial Management*, vol. 25, no. 5, pp. 1286-1320.
- Lin, C, Ma, Y, Malatesta, P & Xuan, Y 2013, 'Corporate ownership structure and the choice between bank debt and public debt', *Journal of Financial Economics*, vol. 109, no. 2, pp. 517-534.

- López-Gracia, J & Mestre-Barberá, R 2011, 'Tax effect on spanish sme optimum debt maturity structure', *Journal of Business Research*, vol. 64, no. 6, pp. 649-655.
- Lugo, S & Piccillo, G 2019, 'The relation between corporate and government debt maturity in Europe', *Journal of Financial and Quantitative Analysis*, vol. 54, no. 5, pp. 2119-2140.
- Marchica, M-T 2001, *A new determinants of debt maturity structure: the ownership and control structure*, University of York, York.
- Marchica, M-T 2007, *Debt maturity and the characteristics of ownership structure: an empirical investigation of UK firms*. University of York, York.
- Margaritis, D & Psillaki, M 2010, 'Capital structure, equity ownership and firm performance', *Journal of Banking and Finance*, vol. 34, no. 3, pp. 621-632.
- Markopoulou, M, K & Papadopoulos, D, L 2009, 'Capital structure signaling theory: evidence from the Greek stock exchange', *Portuguese Journal of Management Studies*, vol. 14, no. 3, pp. 217-238.
- Marks, J, M & Shang, C 2021, 'Does stock liquidity affect corporate debt maturity structure?', *Quarterly Journal of Finance*, vol. 11, no. 1, pp. 1-53.
- Marsh, P 1982, 'The choice between equity and debt: an empirical study', *Journal of Finance*, vol. 37, no. 1, pp. 121-144.
- Martins, H, C, Schiehl, E & Terra, P, R, S 2017, 'Country-level governance quality, ownership concentration, and debt maturity: a comparative study of Brazil and Chile', *Corporate Governance: An International Review*, vol. 25, no. 4, pp. 236-254.
- Martins, H, C, Schiehl, E & Terra, P, R, S 2020, 'Do shareholder protection and creditor rights have distinct effects on the association between debt maturity and ownership structure?', *Journal of Business Finance and Accounting*, vol. 47, pp. 708-729.
- Mauer, D, C & Ott, S, H 2000, *Agency costs, underinvestment, and optimal capital structure: the effect of growth options to expand*, viewed 2020, Oxford University Press, Oxford.
- McConnell, J, J & Servaes, H 1995, 'Equity ownership and the two faces of debt', *Journal of Financial Economics*, vol. 39, no. 1, pp. 131-157.
- Mehran, H 1992, 'Executive incentive plans, corporate control, and capital structure', *Journal of Financial and Quantitative Analysis*, vol. 27, no. 4, pp. 539-560.
- Merton, R, C 1974, 'On the pricing of corporate debt: the risk structure of interest rates', *Journal of Finance*, vol. 29, no. 2, pp. 449-470.
- Miglo, A 2010, 'The pecking order, trade-off, signaling, and market-timing theories of capital structure: a review', *Munich Personal RePEc Archive*, pp. 1-27.
- Miglo, A 2016, *Capital Structure in the Modern World*, Palgrave Macmillan, Cham.
- Miller, M, H 1977, 'Debt and taxes', *Journal of Finance*, vol. 32, no. 2, pp. 261-275.
- Mimouni, K, Temimi, A, Goaied, M & Zeitun, R 2019, 'The impact of liquidity on debt maturity after a financial crisis: evidence from the Gulf Cooperation Council region', *Emerging Markets Finance and Trade*, vol. 55, no. 1, pp. 181-200.
- Ministry of Finance & Vietnam Bond Market Association 2020, *Annual Report 2020: Vietnam's Bond Market*, viewed 2022, retrieved from Ministry of Finance database.
- Ministry of Planning And Investment & Foreign Investment Agency 2021, *Report on foreign direct investment in 2021*, viewed 2022, retrieved from Ministry of Planning and Investment database.
- Mitchell, K 1993, 'The debt maturity choice: an empirical investigation', *Journal of Financial Research*, vol. 16, no. 4, pp. 309-320.
- Modigliani, F & Miller, M, H 1958, 'The cost of capital corporation finance and the theory of investment', *American Economic Review*, vol. 48, no. 3, pp. 261-297.

- Modigliani, F & Miller, M, H 1963, 'Corporate income taxes and the cost of capital: a correction', *American Economic Review*, vol. 53, no. 3, pp. 433-443.
- Mohammad Nauman, K, Faisal, K & Fatima Nauman, K 2015, *Determinants of debt maturity structure: case of non-financial firms in Pakistan (KSE)*, *International Institute of Social and Economic Sciences*, 2015.
- Morck, R, Shleifer, A & Vishny, R, W 1988, 'Management ownership and corporate performance: an empirical analysis', *Journal of Financial Economics*, vol. 20, pp. 293-316.
- Morris, J, R 1976, 'On corporate debt maturity strategies', *Journal of Finance*, vol. 31, no.1, pp. 29-37.
- Muñoz-Mendoza, J, A, Sepúlveda-Yelpo, S, M, Veloso-Ramos, C, L & Delgado-Fuentealba, C, L 2019, 'Effects of foreign ownership and international financial reporting standards on debt maturity in Chilean firms', *Journal of Management and Economics for Iberoamerica*, vol. 35, no. 153, pp. 416-428.
- Myers, S, C 1977, 'Determinants of corporate borrowing', *Journal of Financial Economics*, vol. 5, no. 2, pp. 147-175.
- Myers, S, C & Majluf, N, S 1984, *Corporate financing and investment decisions when firms have information that investors do not have*, Massachusetts Institute of Technology, Massachusetts.
- Myers, S, C & Rajan, R, G 1998, 'The paradox of liquidity', *Quarterly Journal of Economics*, vol. 113, no. 3, pp. 733-771.
- Neter, J, Wasserman, W & Kutner, M 1985, *Applied linear statistical models: regression, analysis of variance and experimental designs*, Homewood, Illinois: Richard D, Irwin Inc, Illinois.
- Newberry, K, J & Novack, G, F 1999, 'The effect of taxes on corporate debt maturity decisions: an analysis of public and private bond offerings', *Journal of the American Taxation Association*, vol. 21, no. 2, pp. 1-16.
- Newey, W, K & West, K, D 1987, 'A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix', *Econometrica*, vol. 55, no. 3, pp. 703-708.
- Ngo, P, H, Dao, V, H, Nguyen, T, H & Dao, T, T, T 2017, 'Improving quality of foreign direct investment attraction in Vietnam', *International Journal of Quality Innovation*, vol. 3, no. 7, pp. 1-16.
- Ngo, V, T & Le, T, L 2021, 'Factors influencing corporate debt maturity: an empirical study of listed companies in Vietnam', *Journal of Asian Finance, Economics and Business*, vol. 8, no. 5, pp. 551-559.
- Nguyen, D. 2022a, 'Vietnam's bond market should have stronger presence of global rating companies, experts say', *BizLIVE*, 14 Sept, viewed 2022, < <https://nhipsongkinhdoanh.vn/vietnams-bond-market-should-have-stronger-presence-of-global-rating-companies-experts-say-post3100918.html>>.
- Nguyen, D, T, T, Diaz-Rainey, I & Gregoriou, A 2012, *Financial development and the determinants of capital structure in Vietnam*, University of Otago, Otago.
- Nguyen, H & Ryu, Y 2022, 'Assessing the performance of Vietnam's banks in the era of free trade agreements', *Sustainability*, vol. 14, no. 2, pp. 1-22.
- Nguyen, H, A, Le, Q, L & Vu, T, K, A 2021, 'Ownership structure and earnings management: empirical evidence from Vietnam', *Cogent Business and Management*, vol. 8, no. 1, pp. 1-22.
- Nguyen, H, T & Nguyen, A, H 2020, 'The impact of capital structure on firm performance: evidence from Vietnam', *Journal of Asian Finance, Economics and Business*, vol. 7, no. 4, pp. 97-105.
- Nguyen, H, T, B, T & Tran, T, T, L 2017, 'Institutional quality matters and Vietnamese corporate debt maturity', *VNU Journal of Science: Economics and Business*, vol. 33, no. 5, pp. 26-39.

- Nguyen, K, Q, T 2022b, 'Determinants of debt maturity structure: evidence in Vietnam', *Cogent Business & Management*, vol. 9, no. 1, pp. 1-27.
- Nguyen, N, D, L & Nguyen, N, D, T 2016, 'An examination of the relationship of corporate governance to firm performance: empirical evidence from Vietnamese listed companies', *International Journal of Financial Research*, vol. 7, no. 4, pp. 190-197.
- Nguyen, T 2022c, 'Vietnam's equitisation and divestment: opportunities and challenges for investors', *Vietnam Briefing*, 4 Apr, viewed 2022, < <https://www.vietnam-briefing.com/news/vietnams-equitisation-divestment-opportunities-and-challenges.html/>>.
- Nguyen, T, B, N 2017, *Privatization of Vietnam airlines: a successful reform or a timid policy step*, Master thesis, Norwegian University of Life Sciences, Norwegian.
- Nguyen, T, D, K & Ramachandran, N 2006, 'Capital structure in small and medium-sized enterprises: the case of Vietnam', *ASEAN Economic Bulletin*, vol. 23, no. 2, pp. 192-211.
- Nguyen, T, K, Y 2011, *Efficient market and signalling hypothesis on Vietnam stock exchange 2006-2009*, Master thesis, Buskerud University College, Buskerud.
- Nguyen, T, L, Nguyen, T, N, D & Nguyen, T, L 2018, 'Internal financial constraints, external financial constraints and corporate debt maturity structure of Vietnamese listed firms', *Pacific Business Review International*, vol. 10, no. 9, pp. 41-53.
- Nguyen, T, T, Trinh, T, A & Do, T, T 2019, 'Ownership structure and firm growth: evidence from Vietnam', *International Journal of Business Marketing and Management*, vol. 4, no. 8, pp. 1-11.
- Nguyen, T, X, H, Pham, T, H, Dao, T, N, Nguyen, T, N & Tran, T, K, N 2020a, 'The impact of foreign ownership and management on firm performance in Vietnam', *Journal of Asian Finance, Economics and Business*, vol. 7, no. 9, pp. 409-418.
- Nguyen, V, H, Choi, B & Agbola, F, W 2020b, 'Corporate social responsibility and debt maturity: Australian evidence', *Pacific-Basin Finance Journal*, vol. 62, pp. 1-14.
- Noe, T, H 1988, 'Capital structure and signaling game equilibria', *Review of Financial Studies*, vol. 1, no. 4, pp. 331-355.
- Noland, M & Park, D 2015, *From stress to growth: strengthening Asia's financial systems in a post-crisis world*, viewed 2022, retrieved from Asian Development Bank database.
- Nwosa, P, I 2018, 'The impact of financial development on capital structure of firms in Nigeria', *Journal of Accounting and Management*, vol. 8, no. 1, pp. 69-75.
- Nwude, E, C, Idam Okpara, I, Bamidele Oyakhromhe, A & Sergius Nwannebuikwe, U 2016, 'The impact of debt structure on firm performance: empirical evidence from Nigerian quoted firms', *Asian Economic and Financial Review*, vol. 6, no. 11, pp. 647-660.
- Oh, S-N, 2000, *Financial deepening in the banking sector - Viet Nam*, viewed 2021, retrieved from Asian Development Bank database.
- Okuda, H & Lai, T, P, N 2012, 'Capital structure and investment behavior of listed companies in Vietnam: an estimation of the influence of government ownership', *International Journal of Business and Information*, vol. 7, no. 2, pp. 137-164.
- Open Development Vietnam 2021, *Economy and commerce*, viewed 2021, < <https://vietnam.opendevelopmentmekong.net/topics/economy-and-commerce/>>.
- Orman, C & Bülent, K 2015, *Structure of debt maturity across the firm type spectrum*, viewed 2020, retrieved from Munich Personal RePEc Archive database.
- Orman, C & Köksal, B 2017, 'Debt maturity across firm types: evidence from a major developing economy', *Emerging Markets Review*, vol. 30, pp. 169-199.
- Ozkan, A 2000, 'An empirical analysis of corporate debt maturity structure', *European Financial Management*, vol. 6, no. 2, pp. 197-212.

- Ozkan, A 2002, 'The determinants of corporate debt maturity: evidence from UK firms', *Applied Financial Economics*, vol. 12, no. 1, pp. 19-24.
- Pan, Z & Tan, K, J, K 2019, 'The role of blockholders in the corporate debt maturity structure', *Economics Letters*, vol. 185, pp. 1-3.
- Pandey, I, M 2001, *Capital structure and the firm characteristics: evidence from an emerging market*, viewed 2020, retrieved from Indian Institute of Management Ahmedabad, Research and Publication Department database.
- Pandey, N, Kumar, S, Post, C, Goodell, J, W & García-Ramos, R 2022, 'Board gender diversity and firm performance: a complexity theory perspective', *Asia Pacific Journal of Management*, pp. 1-32.
- Pham, D, H & Do, T, H, L 2015, 'Factors influencing the voluntary disclosure of Vietnamese listed companies', *Journal of Modern Accounting and Auditing*, vol. 11, no. 12, pp. 656-676.
- Pham, T, A, T 2018, 'Industry Concentration, Firm Efficiency and Average Stock Returns: Evidence from Australia', *Asia-Pacific Financial Markets*, vol. 25, pp. 221-247.
- Phan, D, T 2020, 'Factors affecting debt maturity structure: evidence from listed enterprises in Vietnam', *Journal of Asian Finance, Economics and Business*, vol. 7, no. 10, pp. 141-148.
- Phan, Q, T 2018, 'Corporate debt and investment with financial constraints: Vietnamese listed firms', *Research in International Business and Finance*, vol. 46, pp. 268-280.
- Phung, D, N & Le, T, P, V 2013, 'Foreign ownership, capital structure and firm performance: empirical evidence from Vietnamese listed firms', *Journal of Corporate Governance*, vol. 12, no. 2, pp. 40-58.
- Phung, D, N & Mishra, A, V 2016, 'Ownership structure and firm performance: evidence from Vietnamese listed firms', *Australian Economic Papers*, vol. 55, no. 1, pp. 63-98.
- Pradhan, R, P, Arvin, M, B, Hall, J, H & Bahmani, S 2014, 'Causal nexus between economic growth, banking sector development, stock market development, and other macroeconomic variables: the case of ASEAN countries', *Review of Financial Economics*, vol. 23, no. 4, pp. 155-173.
- Prasso, S 2006, 'Vietnam's stock market is booming', CNN Money, 12 Apr 2006, viewed 2022, <
https://money.cnn.com/magazines/fortune/fortune_archive/2006/04/17/8374384/index.htm>.
- PWC Vietnam 2022, 'Vietnam outlook 2022: economic prospects in the wake of covid-19', viewed 2021, retrieved from PWC database.
- Quan, T, T, K 2019, 'Vietnam corporate debt market - fast growing & promising', viewed 2022, retrieved from Eastspring Investments Vietnam database.
- Queen, M & Roll, R 1987, 'Firm mortality: using market indicators to predict survival', *Financial Analysts Journal*, vol. 43, no. 3, pp. 9-26.
- Rajan, R, G & Zingales, L 1995, 'What do we know about capital structure? Some evidence from international data', *Journal of Finance*, vol. 50, no. 5, pp. 1421-1460.
- Ramli, N, A, Latan, H & Solovida, G, T 2019, 'Determinants of capital structure and firm financial performance—a PLS-SEM approach: evidence from Malaysia and Indonesia', *Quarterly Review of Economics and Finance*, vol. 71, pp. 148-160.
- Rashid, K & Islam, S, M, N 2009, 'Capital structure and firm performance in the developed financial market', *Corporate Ownership and Control*, vol. 7, no. 2, pp. 189-201.
- Ratnawati, V, Hamid, M, A, A & Popoola, O, M, J 2016, 'The interaction effect of institutional ownership and firm size on the relationship between managerial ownership and earnings management', *International Conference on Accounting*

- Studies 2016, Langkawi, Kedah, Malaysia, 15-18 Aug 2016, viewed 2020, <https://mpra.ub.uni-muenchen.de/75943/1/MPRA_paper_75943.pdf>.
- Richards, P, H 2018, *Pecking order and trade-off explanations of capital structure and the maturity structure of corporate debt obligations*, PhD Thesis, University of Birmingham, Birmingham.
- Ritter, J, R 1984, 'Signaling and the valuation of unseasoned new issues: a comment', *Journal of Finance*, vol. 39, no. 4, pp. 1231-1237.
- Robichek, A, A & Myers, S, C 1966, 'Problems in the theory of optimal capital structure', *Journal of Financial and Quantitative Analysis*, vol. 1, no. 2, pp. 1-35.
- Ronoowah, R. K & Seetanah, B 2023, 'The moderating and mediating effects of corporate governance and capital structure on firm performance: empirical evidence from an emerging market', *Managerial Finance*, ahead-of-print.
- Roodman, D 2006, *How to do xtabond2: an Introduction to "Difference" and "System" GMM in Stata*, viewed 2021, Center for Global Development.
- Rosengard, J, K & Du, H, T 2009, *Funding economic development: a comparative study of financial sector reform in Vietnam and China*, viewed 2020, Harvard Kennedy School - Harvard University.
- Ross, S, A 1977, 'The determination of financial structure: the incentive-signalling approach', *The Bell Journal of Economics*, vol. 8, no. 1, pp. 23-40.
- Ruan, W, Cullen, G, Ma, S & Xiang, E 2014, 'Ownership control and debt maturity structure: evidence from China', *International Journal of Managerial Finance*, vol. 10, no. 3, pp. 385-403.
- Rwegasira, K 2000, 'Corporate governance in emerging capital markets: whither Africa?', *Corporate Governance: An International Review*, vol. 8, no. 3, pp. 258-267.
- Salehi, M & Sehat, M 2019, 'Debt maturity structure, institutional ownership and accounting conservatism : evidence from Iranian listed companies', *Asian Journal of Accounting Research*, vol. 4, no. 1, pp. 35-51.
- Samuel, P 2022, 'Vietnam's FDI drops slightly in 2021, but reopening measures boosting economy', *Vietnam Briefing*, 27 Jan, viewed 2022, <<https://www.vietnam-briefing.com/news/vietnams-fdi-drop-slightly-in-2021-but-reopening-measures-boosting-economy.html/#:~:text=Vietnam's%20FDI%20and%20GDP%20figures,prospects%20are%20bright%20for%202022>>.
- Sargan, J, D 1958, 'The estimation of economic relationships using instrumental variables', *Econometrica*, vol. 26, no. 3, pp. 393-415.
- Schellhorn, K, M 1992, 'Political and economic reforms in Vietnam', *Contemporary Southeast Asia*, vol. 14, no. 3, pp. 231-243.
- Scherr, F, C & Hulburt, H, M 2001, 'The debt maturity structure of small firms', *Financial Management*, vol. 30, no. 1, pp. 85-111.
- Schiantarelli, F & Jaramillo, F 2002, *Access to long term debt and effects on firms' performance: lessons from Ecuador*, viewed 2019, retrieved from Inter-American Development Bank, Research Department.
- Schiantarelli, F & Sembenelli, A 1997, *The maturity structure of debt: determinants and effects on firms' performance - evidence from the United Kingdom and Italy*, viewed 2019, retrieved from World Bank, Policy Research Department.
- Schiantarelli, F & Srivastava, V 1997, Debt maturity and firm performance: a panel study of Indian companies, viewed 2019, retrieved from World Bank.
- Sett, K & Sarkhel, J 2010, 'Macroeconomic variables, financial sector development and capital structure of Indian private corporate sector during the period 1981-2007', *Journal of Applied Finance*, vol. 16, no. 1, pp. 40-56.
- Shang, C 2021, 'Dare to play with fire? managerial ability and the use of short-term debt', *Journal of Corporate Finance*, vol. 70, pp. 1-18.

- Shleifer, A & Vishny, R, W 1986, 'Large shareholders and corporate control', *Journal of Political Economy*, vol. 94, no. 3, pp. 461-488.
- Shyam-Sunder, L & Myers, S, C 1999, 'Testing static tradeoff against pecking order models of capital structure', *Journal of Financial Economics*, no. 2, pp. 219-244.
- Shyu, Y-W & Lee, C, I 2009, 'Excess control rights and debt maturity structure in family-controlled firms', *Corporate Governance: An International Review*, vol. 17, no. 5, pp. 611-628.
- Singh, S, Tabassum, N, Batsakis, G & Darwish, T, K 2018, 'Corporate governance and Tobin's q as a measure of organizational performance', *British Journal of Management*, vol. 29, no. 1, pp. 171-190.
- Smith, C, Jr & Warner, J, B 1979, 'On financial contracting : an analysis of bond covenants', *Journal of Financial Economics*, vol. 7, pp. 117-161.
- Son, M 2020, 'Vietnam's top 10 listed firms capitalize on 2019', *Vnexpress*, 8 Jan, viewed 2021, <<https://e.vnexpress.net/news/business/companies/vietnam-s-top-10-listed-firms-capitalize-on-2019-4037831.html>>
- SSI Securities Corporation 2022, *SSIAM VN30 ETF*, SSI, viewed 2022, <<https://www.ssi.com.vn/en/ssiam/fund-information-ssiam-vn30>>.
- State Securities Commission Of Viet Nam 2022, *Trading results of the HOSE*, State Securities Commission Of Viet Nam, viewed 2022, <http://www.ssc.gov.vn/ubck/faces/en/enmenu/enpages_enthongtinthitruong/hoseinfo?_adf.ctrl-state=mw6132zmf_81&dDocName=APPSSCGOVVN162140749&_afLoop=42121122520000>.
- Stephan, A, Talavera, O & Tsapin, A 2011, 'Corporate debt maturity choice in emerging financial markets', *Quarterly Review of Economics and Finance*, vol. 51, no. 2, pp. 141-151.
- Stiglitz, J, E 1974, 'On the irrelevance of corporate financial policy', *American Economic Review*, vol. 64, no. 6, pp. 851-866.
- Stohs, M, H & Mauer, D, C 1996, 'The determinants of corporate debt maturity structure', *Journal of Business*, vol. 69, no. 3, pp. 279-312.
- Stulz, R 1990, 'Managerial discretion and optimal financing policies', *Journal of Financial Economics*, vol. 26, no. 1, pp. 3-27.
- Su, L, Zhang, Y & Wei, J 2016, 'A practical test for strict exogeneity in linear panel data models with fixed effects', *Economics Letters*, vol. 147, pp. 27-31.
- Tanaka, T 2010, *Foreign investors and the maturity structure of corporate public debt*, Ritsumeikan University, viewed 2019.
- Tanaka, T 2016, 'How do managerial incentives affect the maturity structure of corporate public debt?', *Pacific-Basin Finance Journal*, vol. 40, pp. 130-146.
- Thai, A 2017, 'Ownership and capital structure of Vietnamese listed firms', *International Journal of Business and Information*, vol. 12, no. 3, pp. 243-286.
- Thanh Nien News 2012, *VN30 Provides a "Better Reflection"*, Thanh Nien News, 17 Feb, viewed 2021, <<http://www.thanhniennews.com/business/vn30-provides-a-better-reflection-8180.html>>.
- The Ministry Of Finance 2021, *Stock market attracts more foreign investors*, The Ministry Of Finance, viewed 2022, <https://mof.gov.vn/webcenter/portal/tttpen/pages_r//detail?dDocName=MOFUCM217189>.
- The State Bank Of Viet Nam 2016, *History and development of the Central Bank*, State Bank of Viet Nam, viewed 2022, <https://www.sbv.gov.vn/webcenter/portal/en/home/rm/museum/hadotcb?_afLoop=39069265182316311#%40%3F_afLoop%3D39069265182316311%26centerWidth%3D80%2525%26leftWidth%3D20%2525%26rightWidth%3D0%2525%>

- 26showFooter%3Dfalse%26showHeader%3Dfalse%26_adf.ctrl-state%3Dns09z86i2_9>.
- The State Bank Of Viet Nam 2020, *Annual Report 2020*, State Bank Of Viet Nam, viewed 2022, <<https://www.sbv.gov.vn/webcenter/ShowProperty?nodeId=/UCMServer/SBV471009/idcPrimaryFile&revision=latestreleased>>.
- Thuy, N 2019, *Vietnam's credit-to-GDP ratio on par with OECD countries*, Ha Noi Times, 24 Dec, viewed 2022, <<http://hanoitimes.vn/vietnams-credit-to-gdp-ratio-on-par-with-oecd-countries-300581.html>>.
- Titman, S 1992, 'Interest rate swaps and corporate financing choices', *Journal of Finance*, vol. 47, no. 4, pp. 1503-1516.
- Titman, S 2002, 'The Modigliani and Miller theorem and the integration of financial markets', *Financial Management*, vol. 31, no. 1, pp. 101-115.
- Titman, S & Wessels, R 1988, 'The determinants of capital structure choice', *Journal of Finance*, vol. 43, no. 1, pp. 1-19.
- Tosun, O, K & Senbet, L, W 2020, 'Does internal board monitoring affect debt maturity?', *Review of Quantitative Finance and Accounting*, vol. 54, no.1, pp. 205-245.
- Trading Economics 2021, *Vietnam - Market capitalization of listed companies*, viewed 2021, retrieved from Trading Economics database.
- Tram, B, L, Nguyen, V, T, Ngo, V, T & Nguyen, T, L 2022, 'Impact of financial institutions development on capital structure of listed firms in Asean developing countries', *Financial Econometrics: Bayesian Analysis, Quantum Uncertainty, and Related Topics*, vol. 427, pp. 679-698.
- Tran-Thi, Q-G & Vu-Thanh, T-A 2020, 'Vietnam: The dilemma of bringing global financial standards to a socialist market economy', in Emily Jones (ed.), *The political economy of bank regulation in developing countries: risk and reputation*, Oxford Academic, pp. 305-326.
- Tresierra, A, E & Reyes, S, D 2018, 'Effects of institutional quality and the development of the banking system on corporate debt', *Journal of Economics, Finance and Administrative Science*, vol. 23, no. 44, pp. 113-124.
- Truong, L, D & Friday, H, S 2021, 'The impact of the introduction of index futures on the daily returns anomaly in the Ho Chi Minh stock exchange', *International Journal of Financial Studies*, vol. 9, no. 43, pp. 1-14.
- TUAN, H, A 2009, 'Doi moi and the remaking of Vietnam', *Global Asia*, vol. 4, no. 3, viewed 2022, <https://www.globalasia.org/v4no3/cover/doi-moi-and-the-remaking-of-vietnam_hong-anh-tuan#:~:text=The%20reform%20policies%20launched%20in,of%20the%20country%20in%201975>.
- Vernimmen, P, Quiry, P, Dallochio, M, Le Fur, Y & Salvi, A 2018, *Corporate Finance : Theory and Practice*, John Wiley and Sons.
- Vietcombank Securities 2021, *Outlook Report Corporate Bonds Market 2021*, viewed 2022, retrieved from Vietcombank Securities database.
- Vietnam Investment Review 2016, Central Bank to Keep Interest Rates Stable in 2016, *Vietnam Investment Review*, 22 Feb, viewed 2022, <<https://vir.com.vn/central-bank-to-keep-interest-rates-stable-in-2016-40239.html>>.
- Vietnamnet Global 2012, The bright and dark parts of the bond market in 2012, *Vietnamnet Global*, 12 Feb, viewed 2022, <<https://vietnamnet.vn/en/the-bright-and-dark-parts-of-the-bond-market-in-2012-E18433.html>>.
- Vijayakumaran, R & Vijayakumaran, S 2019, 'Leverage, debt maturity and corporate performance: evidence from Chinese listed companies', *Asian Economic and Financial Review*, vol. 9, no. 4, pp. 491-506.

- Vijayakumaran, S 2016, *Leverage and Debt Maturity of Chinese Listed Firms: Determinants and Effects on Corporate Performance*, PhD thesis, Durham University, Durham.
- Vithessonthi, C & Tongurai, J 2016, 'Financial markets development, business cycles, and bank risk in South America', *Research in International Business and Finance*, vol. 36, pp. 472-484.
- Vo, X, V 2010, 'Foreign ownership in Vietnam stock markets - an empirical analysis', *Munich Personal RePEc Archive*.
- Vo, X, V 2016a, 'Finance in Vietnam - an overview', *Afro-Asian Journal of Finance and Accounting*, vol. 6, no.3, pp. 202-209.
- Vo, X, V 2016b, 'Foreign investors and corporate risk taking behavior in an emerging market', *Finance Research Letters*, vol. 18, pp. 273-277.
- Vo, X, V 2017a, 'Determinants of capital structure in emerging markets: evidence from Vietnam', *Research in International Business and Finance*, vol. 40, pp. 105-113.
- Vo, X, V 2017b, 'Do foreign investors improve stock price informativeness in emerging equity markets? evidence from Vietnam', *Research in International Business and Finance*, vol. 42, pp. 986-991.
- Vo, X, V 2018a, 'Bank lending behavior in emerging markets', *Finance Research Letters*, vol. 27, pp. 129-134.
- Vo, X, V 2018b, 'Determinants of capital flows to emerging economies - evidence from Vietnam', *Finance Research Letters*, vol. 27, pp. 23-27.
- Vo, X, V 2018c, 'Do firms with state ownership in transitional economies take more risk? evidence from Vietnam', *Research in International Business and Finance*, vol. 46, pp. 251-256.
- Vo, X, V 2019a, 'Do foreign investors promote stock price efficiency in emerging markets?', *International Review of Finance*, vol. 19, no. 1, pp. 223-235.
- Vo, X, V 2019b, 'Leverage and corporate investment – evidence from Vietnam', *Finance Research Letters*, vol. 28, pp. 1-5.
- Vo, X, V, Nguyen, T, L, A, Tuan, L, Q, Luu, H, N & Vu, K, T 2020, 'Local business environment, domestic CEOs and firm performance in a transitional economy: empirical evidence from Vietnam', *Economic Analysis and Policy*, vol. 66, pp. 236-249.
- Wald, J, K 1999, 'How firm characteristics affect capital structure: an international comparison', *Journal of Financial Research*, vol. 22, no. 2, pp. 161-187.
- Wang, C 2020, 'International diversification, SFAS 131, and debt maturity structure', *Journal of Accounting, Auditing and Finance*, vol. 35, no. 2, pp. 438-468.
- Warner, J, B 1977, 'Bankruptcy costs: some evidence', *Journal of Finance*, vol. 32, no. 2, pp. 337-347.
- Wattanawarangkoon, T, Sinthupundaja, J, Suppakitjarak, N & Chiadamrong, N 2022, 'Examining internal capability determinants on firms' financial performance before and after going public: a case of listed firms in Thailand', *Journal of Advances in Management Research*, vol. 19, no. 3, pp. 464-487.
- Wintoki, M, B, Linck, J, S & Netter, J, M 2012, 'Endogeneity and the dynamics of internal corporate governance', *Journal of Financial Economics*, vol. 105, no. 3, pp. 581-606.
- Wooldridge, J, M 2010, *Econometric analysis of cross section and panel data*, MIT Press, Cambridge, Massachusetts.
- Wooldridge, J, M 2012, *Introductory econometrics: a modern approach*, South-Western Cengage Learning, Ohio.
- World Bank 2022, *Global financial development database*, viewed 2022, retrieved from *World Bank Database*.
- World Bank 2023, Vietnam's economy forecast to grow by 6.3% in 2023, *World Bank*, viewed 2023, <<https://www.worldbank.org/en/news/press->

release/2023/03/13/vietnam-s-economy-forecast-to-grow-by-6-3-in-2023-world-bank-report-says#:~:text=Hanoi%2C%20March%2013%2C%202023%E2%80%94,Taking%20Stock%20report%20released%20today>.

- Zeckhauser, R, J & Pound, J 1990, *Are Large Shareholders Effective Monitors? An Investigation of Share Ownership and Corporate Performance*, National Bureau of Economic Research.
- Zeitun, R & Haq, M, M 2015, 'Debt maturity, financial crisis and corporate performance in GCC countries: a Dynamic-GMM approach', *Afro-Asian Journal of Finance and Accounting*, vol. 5, no. 3, pp. 231-247.
- Zeitun, R & Tian, G, G 2007, 'Does ownership affect a firm's performance and default risk in Jordan?', *Corporate Governance*, vol. 7, no. 1, pp. 66-82.
- Zheng, X, Ghoul, S, E, Guedhami, O & Kwok, C, C, Y 2012, 'National Culture and Corporate Debt Maturity', *Journal of Banking and Finance*, vol. 36, no. 2, pp. 468-488.