Dissertation

RELATIONSHIP BETWEEN CAPITAL STRUCTURE AND FIRM PERFORMANCE: A COMPARATIVE STUDY

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ABSTRACT

This research examines the relationship between capital structure and firm performance in both directions: the effect of capital structure on firm performance and the influence of firm performance on capital structure in the context of Singaporean, Thai, and Vietnamese listed firms. Besides, this thesis also investigates the effects of some firm-specific factors that are common in corporate finance studies on firm performance and firm leverage level. Furthermore, some country-level variables are checked whether they have any impacts on the financing choices of firms. When analyzing how the capital structure of firms is affected by firm-specific and country-level factors, via using autoregressive models, this study also attempts to identify the adjustment speed of firm financial leverage.

This thesis employs the system generalized method of moments estimation and an eight-year sample, including 574 publicly listed firms (4592 firm-year observations) in Singapore, Thailand, and Vietnam to inspect the relationships mentioned above. The results show that there is no effect of capital structure on firm performance that would be explained by the "substitute hypothesis" between leverage and corporate governance. It may also be explained that the two opposite effects of using debt on firm performance (including financial distress costs and the disciplinary role of debt) are equal in the context of the three countries. A similar result is found in the opposite direction of the relationship between capital structure and firm performance. Particularly, although firm performance is theoretically expected to be related to capital structure, the findings in this study indicate that firm performance has no effect on financial leverage level. In the setting of Singaporean, Thai, and Vietnamese listed firms, it is possible that the "substitute effect" of the efficiency-risk hypothesis and the "income effect" from the franchise-value hypothesis equal to each other in terms of their magnitude. Since the "substitute effect" and "income effect" on capital structure are opposite, the "net" effect is equal to zero. Consequently, the effect of firm performance on capital structure is eliminated.

Regarding the impact of historical conditions on the current values, both current firm performance and capital structure are influenced by their previous values. In other words, they are "path-dependent". In addition, listed firms in Singapore, Thailand, and Vietnam have optimal debt ratios, and those firms adjust their leverage over time to reach their target level. However, the speed of adjustment varies among the three countries. Specifically, the

fastest speed is discovered in Singapore, then Thailand, and Vietnam. Firm-specific characteristics have impacts on both firm performance and capital structure, but they also differ from country to country in terms of the directions of effect, magnitude, and significant levels. Concerning the influence of country-level variables on capital structure, all variables included in this study (GDP growth, inflation, stock market development, and country governance quality) statistically significantly affect financial leverage decisions of firms in Singapore, Thailand, and Vietnam.

LIST OF ABBREVIATIONS

EBIT	-	Earnings before interest and taxes
EPS	-	Earnings per share
FE	-	Fixed-effects
G7	-	Group of seven
GDP	-	Gross domestic products
GCC	-	Gulf Cooperation Council
GMM	-	Generalized method of moments
HNX	-	Ha Noi Stock Exchange
HOSE	-	Ho Chi Minh City Stock Exchange
i.d.d	-	independently and identically distributed
MENA	-	The Middle East and North Africa
OLS	-	Ordinary least squares
R&D	-	Research and development
ROA	-	Return on assets
ROE	-	Return on equity
SET	-	The Stock Exchange of Thailand
SGX	-	Singapore Exchange
SMEs	-	Small and medium enterprises
SOEs	-	State-owned enterprises
UK	-	United Kingdom
U.S.	-	United States
USD	-	United States Dollar
VIF	-	Variance inflation factor
WB	-	The World Bank
WGIs	-	World Governance Indicators
WTO	-	The World Trade Organization

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CHAPTER ONE
INTRODUCTION

1.1 OUTLINE

Over many decades, the relation between the capital structure of a firm and its performance has been still a perplexity in empirical corporate finance literature. The ground-breaking theory of Modigliani and Miller (1958), which relies on unrealistic assumptions of a perfectly competitive capital market, states that a firm's market value is not influenced by its capital structure. This theory, however, provides the foundation for other theories (the trade-off theory, the pecking-order theory, and the agency theory, for example) proposed to account for the fact that in the actual world, markets are imperfect and information is asymmetric. Nevertheless, no single theory can fully clarify the "real" relation between financial leverage choices and firm performance because all theories are constructed on many critical assumptions, whereas the real business environment is highly diversified and complicated (Ardalan, 2017). Gill, Biger, and Mathur (2011) insisted that although various theories attempt to ascertain the optimal capital structure, hitherto there have been no models in corporate finance to be found in order to determine the so-called ideal capital structure of a firm.

Additionally, prior empirical research provides mixed findings. Some researchers find a positive relation between firms' financial leverage and their performance while others witness a negative or even no link between these two variables. It could be said that previous empirical results have proved that the influence of firms' capital structure on their performance is still questionable and unsettled. Some researchers claim that the contradictory evidence is due to the institutional variations among countries (Ahrens, Filatotchev, & Thomsen, 2011), and the flaw of estimation approaches (Bhagat & Bolton, 2009; Love, 2010).

This study, employing the data of listed firms in three Southeast Asian countries (specifically, Singapore, Thailand, and Vietnam) aims to find out new empirical evidence, thus strengthening the empirical literature on the topic of corporate financing decisions. This

chapter provides an introduction of the thesis and it is organized as follows. Section 1.2 presents the research motivation; Section 1.3 proposes the research questions; Section 1.4 indicates the structure of the thesis.

1.2 MOTIVATION OF RESEARCH

It is evident that capital markets in developed countries operate more efficiently and suffer less from asymmetric information in comparison with those in developing countries (Eldomiaty, 2007). Meanwhile, emerging economies confront many imperfections of the business environment such as unstable macroeconomic environment, poor institutional quality, weak protection of minority investors, high transaction costs, underdeveloped financial market (Chen, 2004; G. Huang & Song, 2006; Keister, 2004). These different characteristics at the country level may affect leverage decisions as well as the leverage-performance relationship of firms (Ahrens et al., 2011).

It is the fact that most empirical studies on leverage-performance relationship focus on firms in Western developed countries (the U.S., the UK, Germany, France, etc.), and Northeast Asian countries (Japan, Korea, and China), meanwhile there is a little empirical evidence in Southeast Asian countries such as Singapore, Thailand, and Vietnam. The lack of empirical research on the topic of capital structure in these countries raises the question: to what extent empirical evidence in these three countries supports capital structure theories that are primarily established in the context of developed economies. In this study, Singaporean, Thai, and Vietnamese firms are selected as the samples because they may play representative roles for firms in countries at different levels of economic development. Specifically, although all these countries are classified as developing countries[1], Singapore has a high income per capita and high country-governance quality; Thailand has reached to the upper middle income; while Vietnam stands at a lower level than Thailand in terms of income per capita and the quality of country governance[2]. By using such samples, it is expected that the empirical findings of this research can be generalized to some extent.

[1] The 2019 report of the World Bank can be downloaded at: https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2019_BOOK-ANNEX-en.pdf

[2] Vietnam has been a lower-middle-income country. The Worldwide Governance Indicators, which can be employed as proxies for country governance quality, provided by the World Bank are available at the link: http://info.worldbank.org/governance/wgi/#home

In addition to the lack of empirical studies in the context of Southeast Asian countries, there are other motivations encouraging the author to undertake this study. First, many previous studies bypass the potential reverse effect of performance on firms' debt level. Berger and Di Patti (2006) indicate that if the performance of a firm influences its leverage choice, not taking this reverse causal relation into consideration could result in simultaneous equation bias. In other words, the regression of firms' performance on their leverage possibly confuses the impact of leverage level on firms' performance with the impact of firms' performance on leverage. This study, thus, pays attention to both causal and reverse causal relation between capital structure and performance[3].

Second, most studies using data of Singaporean, Thai, and Vietnamese firms neglect country-level variables that may influence firms' financial leverage decisions. Those studies merely consider firm-specific factors as determinants of leverage level. Frank and Goyal (2003) posit that econometrics models that include only firm-specific factors could only explain about thirty per cent of the changes in the corporate capital structure. This implies that there are other variables (i.e., macroeconomic factors) influencing firm capital structure choices (Bokpin, 2009). Antoniou, Guney, and Paudyal (2008), among others whose studies employ cross-country data, confirm that leverage choice of firms is strongly affected by macroeconomic and institutional environment, also other factors such as tax systems, the relationship between borrowers and lenders, the strength of investor protection of the country where they operate. In this research, country-level variables are included in the model specifications to check whether they are determinants of capital structure, among others, in the setting of the Southeast Asian region.

Third, although theoretical and empirical results appear to support dynamic models (i.e. econometrics models which use the lagged regressand as a regressor) when examining the relationship between firm-specific variables (capital structure, growth opportunities, for example) and firm performance (for example, see Harris & Raviv, 2008; Phung & Le, 2013; Phung & Mishra, 2016; Wintoki, Linck, & Netter, 2012), hitherto most studies have employed static models (i.e. models without the lagged regressand on the right-hand side of regression equations). The static regression models are likely to be misspecified since performance and leverage of firms are path-dependent, especially when there is serial

[3] Henceforth, in this study the term "causal relationship" means the potential effect of capital structure on firm performance, while "reverse causality" implies the possible effect of firm performance on capital structure.

correlation in the idiosyncratic disturbance term of the static models. Banerjee, Heshmati, and Wihlborg (1999, p. 4) posit that "even if variables relating to both optimal capital structure and adjustment costs are included in the set of explanatory variables, simply regressing observed leverage on these variables will still suffer from misspecification if a model for dynamic adjustment is not employed." Misspecification along with inappropriate estimators (such as the OLS or fixed-effects estimator) in the case of examining the relation between firms' capital structure and their performance may lead to inconsistent (or even spurious) regression results (Flannery & Hankins, 2013).

These abovementioned issues raise the necessity to investigate further the topic of financial leverage-performance relationship in the context of Southeast Asian countries by using a dynamic modelling framework with an appropriate estimator that could produce consistent regression results.

1.3 RESEARCH QUESTIONS

The overall objective of this thesis is to explore both the causal and reverse causal relation between firms' capital structure and their performance in three countries in Southeast Asian region, thereby enriching the current literature of corporate finance with new empirical findings relating specifically to firms' capital structure decisions. In order to accomplish this overall objective, this research attempts to answer six research questions as presented in the next paragraph.

The first research question: (1) *Is there a causal relation between capital structure and performance of firms in Singapore, Thailand, and Vietnam?* This question is to find out whether or not firms' financial leverage has any impacts on firms' performance when the endogeneity problem is taken into account. The second research question: (2) *In addition to capital structure, which firm-specific factors affect firm performance?* As indicated by theoretical and empirical studies, some firm-specific characteristics (for example, firm size, tangible assets, growth opportunities, etc.) may have effects on firm performance. Hence, the answer of the second question helps to determine which of those factors affect performance and if so, how do they affect firms' performance in specific contexts. The third research question: (3) *Is there a reverse causal relation between performance and leverage choice of firms in Singapore, Thailand, and Vietnam?* Contrary to almost all prior studies that concentrate only on the likely effects of leverage choice on performance, this study

considers the potential reverse impacts of performance on leverage to check whether there is such a reverse relationship as indicated by Berger and Di Patti (2006). The fourth research question: (4) *At which speed do firms in Singapore, Thailand, and Vietnam adjust their leverage towards the target?* This question helps to clarify the influence of adjustment cost on the speed of adjustment and for how long firms can close the distance between their current leverage level and target one. This study also aims to determine which firm-specific and country-level variables influence leverage decisions, thereby confirming the results of prior empirical studies on the link of these variables with corporate capital structure. Thus, the fifth and sixth research questions are stated as follows: (5) *Which firm-specific characteristics are the determinants of financing decision?* And (6) *Do country-level factors influence leverage decisions of firms in Singapore, Thailand, and Vietnam?*

1.4 STRUCTURE OF THE THESIS

This thesis includes six chapters. This chapter provides a general introduction to the study. Chapter 2 reviews theories and empirical literature relating to the topic of capital structure-performance relationship that are necessary for hypothesis development in Chapter 3.

Chapter 3 describes the data and method used in this study. Specifically, this chapter includes the criteria for data collection, the data sources, measurement of the variables, model specifications, and estimation approaches. In addition, based on the theoretical and empirical literature, this chapter develops hypotheses to be tested in the next two chapters.

Chapter 4 examines the causal relation between financial leverage and performance, while Chapter 5 investigates the reverse causality between these two variables. The empirical results of these chapters will help to response the research questions as described in Section 1.3.

Chapter 6 points out the contribution, and the limitations of the study, thereby suggesting some relevant recommendations for future research. Relevant conclusions and policy implications are also presented.

CHAPTER TWO
LITERATURE REVIEW

2.1 OUTLINE

As mentioned in Section 1.4, Chapter 2 aims to review theories and empirical literature concerning the relation between leverage choices and firm performance. Section 2.2 briefly presents the theories proposed by Modigliani and Miller (1958, 1963), the trade-off theory, the agency theory, and the pecking-order theory, which are dominant in corporate capital structure theory. Section 2.3 provides empirical findings of previous studies on the impacts of firms' financing decisions on their performance. Two suppositions, including the "efficiency-risk hypothesis" and the "franchise-value hypothesis" that help to explain the potential reverse causal relation between firms' debt level and their performance, are mentioned in Section 2.4. Section 2.5 presents empirical evidence on the influence of firm-specific characteristics and country-level factors on firms' capital structure that has been found in prior studies. Section 2.6 concludes the chapter.

2.2 DOMINANT THEORIES IN CORPORATE CAPITAL STRUCTURE

2.2.1 Modigliani and Miller theories

The irrelevance proposition theorem proposed by Modigliani and Miller (1958) indicates that under a strict supposition of a perfect market in which there are no taxes, no bankruptcy costs, no agency costs and information is symmetric a firm's capital structure is irrelevant to its total value. This proposition is illustrated in the following balance sheet.

Assets-in-place	The market value of debt (D)
and growth opportunities	The market value of equity (E)
	Firm's market value (V)

In this balance sheet, V is the sum of D and E. Modigliani and Miller posit that the firm's market value is not influenced by how the firm is financed, provided that the assets-in-place and growth opportunities are kept constant.

In the following study, Modigliani and Miller (1963) add corporate income taxes in the irrelevance model. Since interest payments on debt are tax-deductible, issuing bonds or

borrowing money from banks effectively reduces the tax liability of firms while paying dividends on equity does not. The actual interest rate that firms pay on the bonds they issue or their bank loans is less than the nominal interest rate due to the tax savings. When the main supposition of no corporate income taxes is eased, Modigliani and Miller indicate that by using debt progressively to benefit from the interest tax shield, firms can raise their value. With the assumptions that the use of debt has no compensating cost and the market value of a firm is a linear function of the amount of debt this firm employs, the theory of Modigliani and Miller (1963) implies that the optimal debt level of a firm is 100% (Frank & Goyal, 2007b).

Nevertheless, Modigliani and Miller (1963) conclude that in spite of the presence of debt tax shield, for some reasons, firms should not necessarily try to reach the possible highest level of leverage. When taking into account the personal income tax that investors (i.e. debtholders and shareholders in this context) have to pay, in some cases the use of retained earnings as a financing source may be cheaper than debt. Besides, lenders often impose strict restrictions on the maximum amount a firm can borrow relatively compared to its equity. Moreover, firms usually consider strategically borrowing money or issuing bond less than the maximum possible amount so that they can preserve their untapped power of borrowing for urgent situations. Although in a particular year, the capital structure of a firm may contain only debt or equity, in the long-term all assets of a firm are funded by a mixture of debt and equity.

When taking into account the imperfections and inefficiencies of capital markets in the real world due to agency costs, transaction costs, asymmetric information, the theorem of Modigliani and Miller (1963) tend to lose its explaining power in actual cases.

2.2.2 The trade-off theory

In the trade-off theory, a firm's market value is determined by the following formula.

$$V = D + E = V_E + PV_{dts} - PV_{fdc} \quad (2.1)$$

Where V_E is the market value of a firm when it is financed by equity only, PV_{dts} is the present value of the amount of corporate income tax that this firm saves due to the use of debt in its capital structure. PV_{fdc} stands for the present value of financial distress costs (i.e. costs relating to the menace or occurrence of default or bankruptcy). The optimal financial

leverage of a firm (i.e. the debt level that makes the market value of a firm maximized) is obtained only when the PV_{dts} equal to PV_{fdc} at the margin.

As presented in Formula 2.1, Kraus and Litzenberger (1973) add bankruptcy costs to the Modigliani and Miller's corrected model with the assumption of a perfect capital market and state that a firm's optimal leverage is the result of a single-period comparison between potential bankruptcy costs and the benefits of debt in terms of saving corporate income taxes. They confirm that there exist optimal debt ratios, which are less than 100%. Particularly, at low leverage levels, a firm's market value is positively associated with its debt level, but the relationship is inverse when levels of debt become extreme. To put it differently, a firm's market value is a concave function of its financial leverage. Similarly, Myers (1984) indicates that a firm balances the value of debt tax shield with bankruptcy costs to set a target debt ratio then step-by-step reaches to this target by substituting between debt and equity till its market value is maximized.

Bradley, Jarrell, and Kim (1984) develop a model based on the fundamentals of the trade-off models developed by Kraus and Litzenberger (1973), Scott Jr (1976), and Kim (1978). In their model, they assume that investors are risk-neutral, implying that the decisions of investors when investing in either debt or equity are based only on their expected after-tax returns. There are some other assumptions in the model of Bradley et al. (1984). Specifically, the tax rate on equity's income (dividend and capital gain) is constant, while debt returns are taxed by a progressive rate. Firms have to calculate tax payments on end-of-period wealth with a constant marginal tax rate. Both interest and principal payments of firms are fully deductible, and all the payments that debtholders receive from firms are completely taxed. There is non-debt tax shield and it lowers tax payments of firms. In case that tax bills of a firm in a period are negative, these negative figures cannot be transferred from this period to following periods or across firms. If a firm cannot pay its end-of-period indebtedness, the firm will incur various types of financial distress costs such as agency costs and bankruptcy costs of debt. These costs will decrease the firm's value. The following table indicates the returns to debtholders and shareholders in each state of the pre-tax earnings of the firm.

Table 2.1: Expected pre-tax earnings of a firm and returns to debtholders and shareholders

State	Y_d	Y_s
$X < 0$	0	0
$0 \le X < B$	$X(1-k)$	0
$B \le X < B + N/t_c$	B	$X - B$
$X \ge B + N/t_c$	B	$(X-B)(1-t_c)+N$

Source: Adapted from Frank and Goyal (2007a, p. 9) "Trade-off and Pecking Order Theories of Debt".

Where: Y_d and Y_s are the gross return to debtholders and shareholders, respectively[4]; X is the earnings before taxes and debt payments; B is the debt obligation; N is the total after-tax value of non-debt tax shield if they are completely used; k is the ratio of financial distress costs to the earnings before taxes and debt payments. This ratio is presumed to be constant; t_c is the constant marginal tax rate on corporate income.

If X is negative, both debtholders and shareholders receive nothing. If X is positive but not enough to cover the indebtedness, the gross return to debtholders is $X(1 - k)$ since the costs of financial distress are kX, the gross return to shareholders is zero. If $X > B$, debtholders receive B. In case $X - B - N/t_c < 0$ (the penultimate line in the table), the firm does not have to pay corporate income tax and shareholders obtain $(X - B)$. In the last state, the firm employs all of its non-debt tax shield, then the return to shareholders is equal to $(X - B - N/t_c)(1 - t_c) + N/t_c = (X - B)(1 - t_c) + N$, and the tax payment is $(X - B - N/t_c)t_c = (X - B)t_c - N$.

As mentioned in Subsection 2.2.1, D and E denote the market value of a firm's debt and equity, respectively; V stands for a firm's total market value ($V = D + E$); t_{pd} is the progressive tax rate on return to debtholders; t_{pe} is the constant tax rate on equity return; r_f is the rate of return on risk-free, tax-exempt debt; $f(X)$ is the probability density function of X; and $F(.)$ is the cumulative probability density function of X.

With the assumption of risk-neutrality, the market value of a firm's debt and equity at the beginning of the period are computed by the following equations:

$$D = \frac{1 - t_{pd}}{1 + r_f}\left[\int_B^{\infty} Bf(X)dX + \int_0^B X(1-k)f(X)dX\right] \quad (2.2)$$

[4] All the values of Y_d, Y_s, X, B, N are calculated at the end of each period.

$$E = \frac{1 - t_{pe}}{1 + r_f}\left[\int_{B+N/t_c}^{\infty} [(X - B)(1 - t_c) + N]f(X)dX + \int_{B}^{B+N/t_c} (X - B)f(X)dX\right] \quad (2.3)$$

Adding *D* and *E* yields the market value of the firm at the beginning of the period.

$$\begin{aligned} V = \frac{1}{1 + r_f}\Bigg[&\int_0^B \left(1 - t_{pd}\right)X(1 - k)f(X)dX \\ &+ \int_B^{B+N/t_c} \left[(1 - t_{pe})(X - B) + \left(1 - t_{pd}\right)B\right]f(X)dX \\ &+ \int_{B+N/t_c}^{\infty} \left[\left(1 - t_{pe}\right)\{(X - B)(1 - t_c) + N\} + \left(1 - t_{pd}\right)B\right]f(X)dX\Bigg] \end{aligned} \quad (2.4)$$

As indicated in Equation 2.4, the firm's value is the sum of three expected values at the beginning of the period (i.e. the present value). The first integral is corresponding to the second state in Table 2.1. The payment to debtholders, $X(1 - k)$, is affected by the personal tax rate (t_{pd}). The next integral reflects the third state in Table 2.1 in which the pre-tax earnings are more than the debt obligation but less than the amount that generates a zero corporate tax bill ($B + N/t_c$). In this state, the firm does not have to pay corporate income tax but the payments that debtholders and shareholders receive are subject to the personal tax rate (t_{pd} and t_{pe}). The last integral presents the after-tax earnings of debtholders and shareholders in the state indicated by the last line of Table 2.1.

Since it is assumed that the firm determines the debt payments (B) in order to maximize its market value (V), the necessary condition is that the partial derivative, $\partial V/\partial B = V_B$, is equal to zero.

$$\begin{aligned} V_B = \frac{\partial V}{\partial B} = \frac{1 - t_{pd}}{1 + r_f}\Bigg\{&[1 - F(B)]\left[1 - \frac{(1 - t_c)\left(1 - t_{pe}\right)}{1 - t_{pd}}\right] \\ &- \frac{\left(1 - t_{pe}\right)t_c}{1 - t_{pd}}[F(B + N/t_c) - F(B)] - kBF(B)\Bigg\} \end{aligned} \quad (2.5)$$

The first term in Equation 2.5 expresses the marginal net tax advantage of debt. The last two terms denote the marginal costs relating to the firm's debt level. While the former is the increase in the probability of not fully utilizing debt tax shield if tax shields are large than pre-tax earnings, the latter is the marginal rise in financial distress costs. The firm determines its optimum leverage by equalizing the marginal net tax benefits of debt and the marginal

leverage-related costs. From this trade-off model, the major predictions are obtained by differentiating the first-order condition concerning *k*, *N*, t_{pd} and t_{pe}, respectively.

$$V_{Bk} = -\frac{(1 - t_{pd})Bf(B)}{1 + r_f} < 0 \qquad (2.5)$$

$$V_{BN} = -\frac{(1 - t_{pe})f\left(B + \frac{N}{t_c}\right)}{1 + r_f} < 0 \qquad (2.6)$$

$$V_{Bt_{pd}} = \frac{kBf(B) - [1 - F(B)]}{1 + r_f} \qquad (2.7)$$

$$V_{Bt_{pe}} = \frac{[1 - F(B)] - t_c[1 - F(B + N/t_c)]}{1 + r_f} > \frac{(1 - t_c)[1 - F(B)]}{1 + r_f} > 0 \qquad (2.8)$$

The values of the first two equations are negative. The firm's optimal debt level decreases if there are increases in the costs of financial distress or non-debt tax shield. The third equation's value is negative at the optimal leverage level. The firm's optimal capital structure decreases if the marginal tax rate on return of debtholders increases. Finally, the derivative in the last equation is positive. A rise in the personal tax rate on equity return will relatively raise the value of debt tax shield and thus inducing a rise in the optimal leverage level. The impact of risk, i.e. the volatility of the firm's value, on leverage is vague. From the results of a simulation analysis in which *X* is assumed normally distributed, Bradley et al. (1984) confirm that the volatility of earnings has a negative effect on debt ratio if financial distress costs are non-trivial. Because the major factors of the model cannot be observed directly, proxies are employed. The empirical result in the study of Bradley et al. (1984) reveals a statistically significant and positive link between non-debt tax shield and debt level. This result conflicts with the prediction of the theoretical model, but it is hard to determine whether the problem is caused by faults of the theory or the proxies.

The trade-off model mentioned as "one-period" model is a static approach. This approach ignores the fact that in most cases, firms operate more than one period and the capital structure of firms at the current period is certainly interconnected with that in both the past and the future. Frank and Goyal (2007b) criticize that retained earnings are not included in the static model. It can be interpreted that if a firm creates more retained earnings in the current year, it may use less debt in the next year. Therefore, retained earnings may be considered as a direct

sign of the firm's leverage. Many empirical studies have examined determinants of corporate leverage level, and the findings reveal that more profitable firm tends to use less debt (see Fama & French, 2002; Graham, 2000; Graham & Harvey, 2001); Kim (1978); (Long & Malitz, 1985; Rajan & Zingales, 1995; Titman & Wessels, 1988). These results are not in accordance with the static trade-off theory, which posits that the relation between profitability and firms' debt level is positive. Myers (1984) claim that the static model works to some extent, but its R-squared is inadmissibly low, and debt ratios of similar firms are considerably different. Consequently, the dynamic trade-off theory has been introduced, and it has revealed favorable results (Dudley, 2007; Flannery & Rangan, 2006).

The analyses of Kane, Marcus, and McDonald (1984) and Brennan and Schwartz (1984) are considered as the first dynamic trade-off models. In their models, taxes, bankruptcy costs, and risk are included, but there are no transaction costs. In the case of appearing unfavorable alterations, firms react immediately because they can rebalance their capital structure costlessly. Hence, they maintain high debt levels to take benefits of the debt tax shield.

Fischer, Heinkel, and Zechner (1989) introduce a dynamic model with the presence of transaction costs. The model proposes an optimal range of debt level instead of just an optimal point of financial leverage. In this model, the leverage level of firms is allowed to fluctuate within the optimal range due to the costs of recapitalizing. Whenever firms' debt ratio is far out of the boundaries, it is rebalanced discretely. If firms are profitable, they pay their debt so that their leverage decreases; in case of losing their debt increases. The main idea of this model is that when adverse shocks happen to firms' asset values, they do not adjust their capital structure immediately but allowing it to waver within optimal range because the costs of adjusting exceed the advantage of doing so. Their empirical results are stated that "smaller, riskier, lower-tax, lower-bankruptcy cost firms will exhibit wider swings in their debt ratios over time" (Fischer et al., 1989, p. 39).

2.2.3 The agency theory

Firms nowadays are usually structured in the form that ownership is segregated from managing. A contract between the principal and the agent gives the agent decision-making power to operate the firm. The agent is expected to chase objectives that can maximize the shareholders' wealth as well as the value of the firm. However, the agent may decide opportunistically to pursue his personal goals regardless of the principal's objectives. In case of the existence of asymmetric information, the principal cannot deter the agent from taking

damaging activities (Jensen & Meckling, 1976). Because of the interest conflict between principal and agent, also the problem of asymmetric information, agency cost arises, and it may be one of the core determinants of corporate financial leverage (Harris & Raviv, 1991). Additionally, Jensen and Meckling (1976) state that a firm should set the main objective of its capital structure is to minimize potentially opportunistic actions of the managers in the firm.

There are two basic types of conflict suggested by the agency theory: the shareholder-manager conflict and the shareholder-debtholder conflict. The former is induced by the separation of ownership and control (Berle & Means, 1932). If both parties of the agency relationship maximize their utilities simultaneously, it is reasonable to guess that the managers do not always act for the benefits of the shareholders (Jensen & Meckling, 1976). This is because they have different utility functions. The principal's utility function seems to be simpler with only two pecuniary factors (i.e. dividends and changes in share price) whilst the agent's utility function is made up of a combination of both pecuniary benefits (e.g. fixed and variable remuneration) and non-monetary aspects such as career prospects, job security, prestige, reputation.

Table 2.2: Types of agency problems in the shareholder-manager conflict

Problem	Definition
Effort	The agent has motives to attempt less than the principal's expectation.
Asset use	As the agent does not bear fully the costs of misusing the firm's assets and consuming excessive perquisites, he or she has motives to do such things.
Over-investment	Over-investment is a sub-form of misusing the firm's assets: the agent has motives to carry out unprofitable projects to increase the firm's size.
Horizon/Time preference	The agent tends to have shorter-term views to achieve investment results than the principal.
Risk Preference	As the agent's wealth is tied up more in the firm's on-going business, he tends to be more risk-averse than the principal.

Source: Groß (2007, p.40) "Equity ownership and performance: An empirical study of German traded companies."

All abovementioned problems may decrease firms' value. Thus, agency cost is defined by Jensen and Meckling (1976) as the reduction of firms' value due to the opportunistic

behavior of firms' managers. In general, the conflict could be lessened through controlling the agent or diminishing the asymmetric information. The principal can also pay the agent to consume resources fully to ensure that the agent does not take detrimental activities for the principal or the agent has to compensate if taking such activities. Nevertheless, all of these actions are costly.

Several solutions have been suggested to solve or at least reduce the shareholder-manager agent issues. Jensen (1986) posits that if a firm has a large amount of free cash flow, the managers tend to increase firm size by deciding to invest in unprofitable projects or spend money on perks. Managers try to avoid shareholders' monitoring by using internal funds to finance inefficient projects since the internal funds are independent of external control. The principal can prevent these actions of the agent by reducing the firm's free cash flow through raising dividend payment or increasing debt. Hunsaker (1999) indicates that when a firm uses more debt, the risk of bankruptcy rises, thus limiting the consumption of perks of the firm's managers. Higher leverage also results in more debt obligation, which reduces the firm's free cash flow. Lower free cash flow supports shareholders in controlling managers' opportunistic behavior, thereby making the use of leverage gains more benefits than costs (Harris & Raviv, 1991). Furthermore, debtholders have rights to take the firm into bankruptcy if the firm cannot pay the due debt. This threat forces firm's managers to attempt more, make more cautious investing decisions to raise firm efficiency (Frank & Goyal, 2007b).

Supplementing appropriate terms relating to managerial incentives in the agency contract and using the role of the managerial labor market are other ways to mitigate shareholder-manager conflict and exert discipline on the behavior of managers (Warokka, 2008). On the one hand, the take-over threat from the managerial labor market, the competition in the product market, and the pressure from the monitoring board of directors can adjust opportunistic activities of managers. On the other hand, if managers operate the firm successfully, they can obtain higher compensation as well as more independence. Both of them help to lessen the conflict between managers and shareholders.

Jensen and Meckling (1976) argue that by using convertible debt, managers can still be disciplined. Convertible debt decreases the agency costs of monitoring since it gives debtholders chances to be shared the firm's returns. It is supposed that if a firm has more

growth opportunities, there is a higher probability that it overinvests more. This means that the association between growth opportunities and convertible debt is positive, whereas growth opportunities have an inverse effect on ordinary debt. Kensinger and Martin (1986) posit that if a firm is restructured to become a limited partnership, the managers have restrictions on deciding how to pay dividends and invest. This restriction lessens the managers' decision-making power, thereby reducing the shareholder-manager agency costs.

The second agency problem specified by Jensen and Meckling (1976) is the conflict between debtholders and shareholders. This conflict exists since the use of debt to reduce agency problem produces chances for shareholders to invest in a suboptimal manner that could result in risk shifting. Risk shifting occurs if managers, who are presumed to behave in the interests of shareholders, make excessively risky investment decisions that maximize shareholders' value at the expense of debtholders' interests. Since the amount of interest paid to the debtholders has been fixed in the debt contract beforehand, the risk-shifting behavior may induce the changes in the cash flow and the redistribution of wealth from debtholders to shareholders if the risky projects are successful and create yield higher than the nominal interest rate of debt. However, this behavior is likely to make the debt more expensive, more restrictive, and less available as a financing source in the future. Consequently, the costs of using debt tend to exceed the benefits (Manos, 2001). The explanations above imply that the aim of utilizing debt instead of equity of firms is simply to lessen the agency costs stemming from the separation of ownership and control rather than to take advantage of debt in comparison with financial distress costs as indicated in the trade-off theory.

The model of Jensen and Meckling (1976) shows that the impact of leverage level on agency costs is not monotonic. This non-monotonic relationship is illustrated in the following figure.

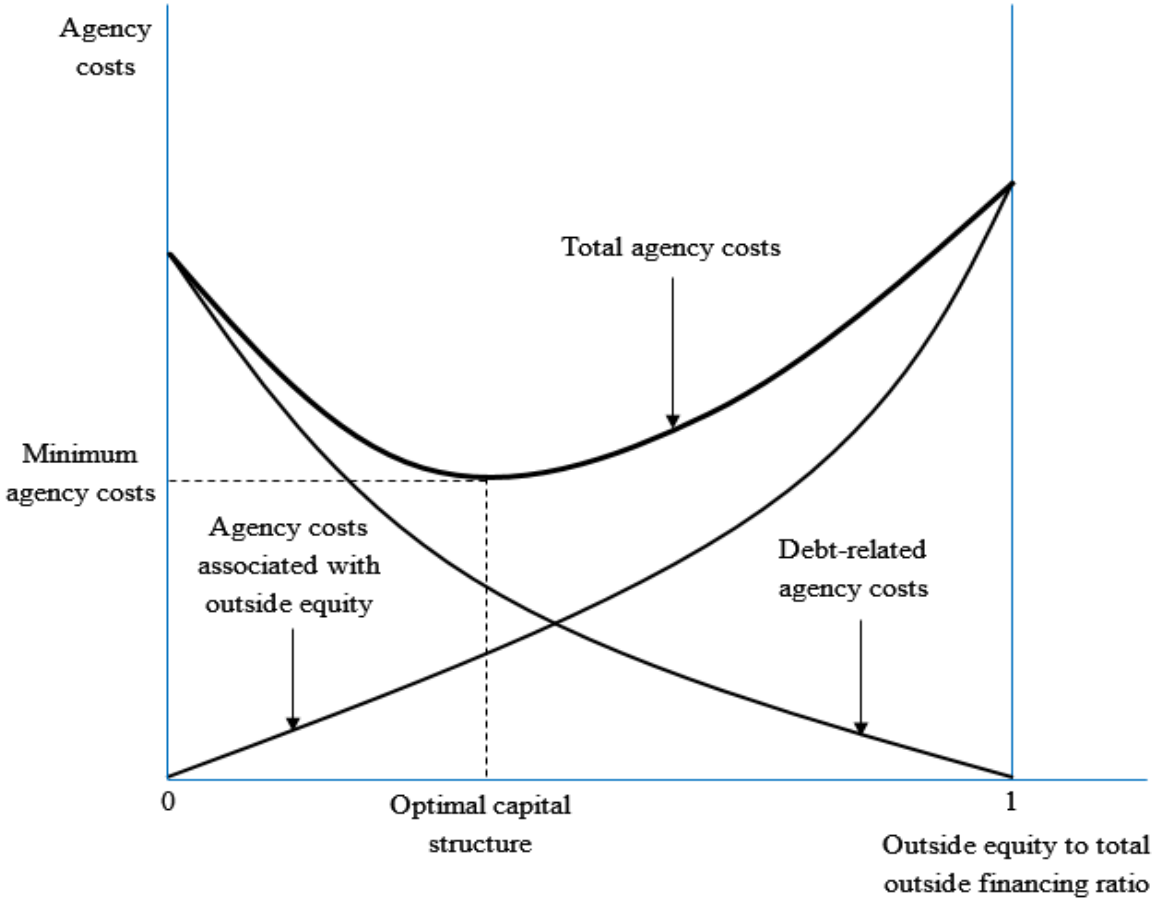

Figure 2.1: Total agency costs and the optimal capital structure

For a given firm size and a total amount of outside financing, at low debt levels (the right side of Figure 2.1), using more debt helps to control managers' opportunistic activities, hence decreases shareholder-manager agency conflict. However, at high debt levels, risk-shifting behavior (i.e. risky investment decisions of managers) leads to a higher possibility of bankruptcy and financial distress. Consequently, a further increase in debt level may cause a higher amount of total agency costs and then a negative influence on firm efficiency.

The agency theory introduced by Jensen and Meckling (1976) posits that each firm has an optimal debt level that it attempts to reach. In their agency theory, the optimal leverage of a firm is a certain capital structure which minimizes the agency costs and hence maximizes the firm's value. This means that firms' leverage decision is dynamic: capital structure varies from firm to firm and across time. In other words, each firm in a given industry can adjust its debt to equity ratio over time to assure that its total agency costs are minimized and its value is maximized.

Agency problem seems to flourish more in developing economies other than in developed countries due to many characteristics such as weak protection for shareholders and investors; weak rule enforcement; high level of corruption; immature financial development; inefficient capital market; imperfect product markets; poor corporate governance. Such poor institutional quality in developing countries not only results in high transaction costs when firms adjust their financial leverage but also increases the opportunistic behavior of managers. Higher transaction costs and more opportunistic behavior, in turn, affect the capital structure of firms. For example, weak protection of outside investors could prevent firms from accessing external finance, thereby forcing them to employ internal funds or rely on bank loans (Myers, 2003).

2.2.4 The pecking-order theory

This theory is developed by Myers and Majluf (1984). These authors argue that when choosing financing sources, firms prioritize internal funds (e.g. retained earnings) rather than outside sources. If firms require external finance, the least risky security is chosen first. Therefore, the first choice is debt, the next is hybrid securities (convertible debt security, for example), and the last one is equity. Unlike the trade-off theory, according to the pecking-order theory, there is no target leverage ratio because while retained earnings (inside equity) are at the top of the choosing order, the external equity (from issuing) is at the bottom.

A reason for the priority of internal financing is to evade issuing costs. If a firm needs external financing, debt is chosen since its issuing costs are lower than those of equity. However, Myers (1984) argues that issuing costs seem to be relatively small compared to the costs and advantages of debt, which are analyzed in the trade-off theory. The author hence emphasizes the vital role of asymmetric information between firms' agents (managers) and external investors in explaining the pecking order. A firm's managers, who are presumed to behave in the benefits of existing stockholders, hold more information about the current assets' value and potential growth opportunities of the firm than external investors do. The managers have incentives to maintain this advantage because using internal finance help them not have to reveal the information about the firm's investment chances and potential profitability to the public. Therefore, firms' decisions relating to financing are considered as an indicator of the real value of firms.

Let N is the amount of money that the firm needs to carry out its potentially profitable projects; NPV is the net present value of these projects; V is the firm's market value if these projects are rejected; V_1 is the firm's market value if the firm issues shares to raise N; N_1 is the "true" value of the new shares; and $\Delta N = N_1 - N$.

Given the asymmetric information, the firm's managers know the value of NVP, V, V_1 and N_1, but potential investors of the firm do not. It is assumed that investors know the managers' objectives, which are to maximize the market value of existing shareholders' shares. The potential investors thus logically adjust their "willing-to-pay" price of the firm's stocks.

When $NPV \geq \Delta N$, the managers decide to issue shares and invest in the projects. If $\Delta N < 0$ (the market price is higher than the "true" value of new shares, i.e. overvalued), the firm will issue even if it only has *zero-NPV* projects such as sending money raised to banks. If $\Delta N > 0$, the managers may ignore *positive-NPV* projects rather than issue underpriced shares. To put it differently, the managers of an overvalued firm are usually willing to issue shares, whereas the managers of an undervalued firm are not likely to do so. A decision of issuing shares thus seems to be a negative signal for potential external investors because they guess that the firm sells equity only if the firm's assets are overvalued (Frank & Goyal, 2007b).

By assumption, N is fixed, but the number of shares is not. It depends on the stock price at the time of issuing. ΔN thus is an endogenous variable (it is subject to V_1). For instance, if the firm issues, the proportion of stocks held by new stockholders is N/V_1. The "true" value of the new stocks of new investors known by the managers is $N_1 = N\dfrac{(V + NPV + N)}{V_1}$. With given N, V, and NPV, the higher the stock price is (i.e. overpriced), the less "true" value of the new stocks belongs to the new investors, and the less ΔN is.

Myers (1984) suggests that in addition to the issuing costs such as administrative and underwriting costs, there is another kind of cost created by asymmetric information: the firm decides not to issue (if $\Delta N > 0$ or the new shares are underpriced), and hence reject *more-than-zero-NPV* projects. If the firm's free cash flow is enough for these *positive-NPV* projects, this kind of opportunity cost is avoided. Accordingly, internal funds are better than external financing sources.

When comparing debt and equity, Myers (1984, p. 584) states that "issue safe securities before risky ones." In other words, firms decide to employ debt first and then shares. Consider an example: the firm needs \$100 for its projects, but it has to issue a volume of shares worth \$120 to get the amount of \$100 (i.e. an underpriced case). ΔN in this case is \$120 - \$100 = \$20. The firm will undertake the projects only if their *NPV* is, at least, \$20. If the *NPV* is less than \$20, (\$13, for example), the firm does not issue and invest in the projects. Then the firm loses an additional value of 13\$ from the projects. Consequently, the firm's total value decreases by \$13.

However, on the side of the existing shareholders, they tend to avoid a loss of \$7 (if the firm issues shares and invests, the firm's value increases by $N + NPV$ = \$100 + \$13 = \$113 but \$120 belong to the new equity investors. Thus, the firm's value that belongs to the existing shareholders reduces by \$7). The managers can evade the problem of bypassing *positive-NPV* investment opportunities by changing the sort of securities issued to decrease ΔN. In this example, if ΔN can be cut down (by reducing N_1) to \$13 (or less than \$13), the projects could be carried out without diluting the true value of the existing shares. To decrease ΔN (when N is assumed to be fixed), the firm issues the possibly least risky securities. In this context, they are securities that their future value fluctuates least when the firm's inside information that has been known by the managers is exposed to the market.

Because ΔN depends on V_1, it does not seem to be reasonable for the managers to control ΔN. Nevertheless, the absolute value of ΔN if a debt is issued, $|\Delta N_d|$, is always less than that if shares are issued, $|\Delta N_s|$, in reasonable cases. For instance, if the firm can issue risk-free debt, ΔN is zero, and the firm does not reject any *positive-NPV* projects. In case of risky debt, with the usual assumptions of option pricing models, $|\Delta N_d|$ is less than $|\Delta N_s|$. Hence, using debt is still a better choice than issuing shares.

The example above has considered the underpriced case. If risky securities are overpriced, the firm seems to issue shares to take benefits from new investors. Myers (1984, p. 585) indicates that "issue debt when investors undervalue the firm, and equity, or some other risky securities when they overvalue it" as a rule of issuing decisions. On the side of the potential investors, they know that the firm issue shares only when those shares are overpriced. Therefore, they decide not to buy those shares unless the firm has already used all of its

"borrowing capacity." Through this behavior, the outside investors drive the firm to follow a pecking order.

Myers and Majluf (1984) confirm that potential outside investors commonly underprice firms' shares when the managers decide to issue shares instead of debt. In the case that firms need to fund new projects by issuing shares, the undervaluation could be a serious problem if new investors seize more than the *NPV* of new projects, this state results in a "net" loss of existing shareholders. Therefore, the managers refuse to invest even though the *NPV* is positive. In order to avoid this rejection, firms can raise fund for new investment by employing securities that are not affected by the undervaluation. Inside funds and debt that do not involve the underpricing problem are preferred to new equity. Generally, an announcement of issuing equity leads to a drop of the existing shares' value while financing through internal funds or riskless debt does not make any reaction in the share price.

As mentioned earlier, the problem of underinvestment is directly related to asymmetric information. Specifically, the higher level of asymmetric information is, the more often the underinvestment problem happens. Some empirical studies support this relationship, for example, Korajczyk, Lucas, and McDonald (1991, 1992) indicate that after the information about firms' business results is announced to market through annual reports and financial statements, the problem of underinvestment is least serious. Moreover, since the ratio of tangible fixed assets to total assets is usually considered as an indicator for asymmetric information (i.e. a lower ratio means a higher level of asymmetric information), Harris and Raviv (1991) point out that firms with lower ratios of tangible assets possibly increase their debt over time.

2.3 EMPIRICAL EVIDENCE ON THE CAUSAL RELATIONSHIP

The potential effect of firms' leverage on their performance is one of the primary concerns in corporate finance literature. As mentioned in Section 2.1, the corporate finance theories suggest that due to market imperfectness in the real world, the financing structure of a firm can affect its value. Although there have been numerous theoretical and empirical studies, the question of whether or not there exists optimum financial leverage at which a firm's value is maximized seems not to be fully answered. The disputes on the topic of corporate capital structure occur not only in theories but also in empirical evidence. Hitherto, the empirical results about the relation between firms' capital structure and their performance

are mixed and inconclusive. Some studies find a positive relation while others reveal inverse association; moreover, several other studies prove that there is no relationship between the two factors.

Studies that have found no relationship include Krishnan and Moyer (1997), Alzharani, Che-Ahmad, and Aljaaidi (2012), Salameh, Al-Zubi, and Al-Zu'Bi (2012), Zeitun (2014), Chadha and Sharma (2015). Particularly, the findings of Krishnan and Moyer (1997) show that the country of origin influences both capital structure and firm performance but leverage measured by total debt to total equity ratio does not affect the performance (measured by ROE) of the large firms in Hong Kong, Korea, Malaysia, and Singapore. The evidence seems not to support the capital structure theories in these emerging market economies.

Similar results are revealed in the work of Alzharani, Che-Ahmad, and Aljaaidi (2012). These authors use a sample of 392 firms listed on the Saudi Stock Exchange from 2007 to 2010 and find no effect of debt level on firm performance (measured by ROA and ROE). In the meantime, Salameh, Al-Zubi, and Al-Zu'Bi (2012) exploiting the data of 27 listed firms on the Saudi Stock Exchange over the period 2004-2009 confirm that there is no link between debt ratios and ROE.

Zeitun (2014) focus on the effect of ownership structure and ownership concentration on the performance of 203 companies from 5 GCC countries (i.e. Bahrain, Kuwait, Oman, Qatar, and Saudi Arabia) during 2000-2010. The results point out that ownership structure influences firm performance and ownership concentration positively affects firm performance. However, financial leverage has no impact on performance.

In their recent paper, Chadha and Sharma (2015) employ a sample of 422 Indian manufacturing firms listed on the Bombay Stock Exchange to analyze the relation between leverage and firm performance. In the specific context of Indian firms, debt has no influence on ROA and Tobin’s Q except for ROE, which is negatively affected by debt level.

Among a large body of research on capital structure, many studies discover a positive effect of financial leverage on performance. For example, Schiantarelli and Srivastava (1997) investigate the impact of debt maturity on the India firms’ performance, especially on productivity. The results show that the length of maturity is positively associated with profitability and output growth. Besides, long-term debt has a positive impact on firm-level

productivity. Nonetheless, high leverage level has a strongly negative influence on productivity.

Berger and Patti (2006) provide a new path to examine the agency cost theory by using efficiency to measure firm performance. Their work investigates the effect of leverage on the performance of the United States banks. The findings point out that leverage level positively influences profit efficiency over almost the whole data series. This effect is economically and statistically significant. Particularly, a rise of 1% in the debt ratio results in a rise of 6% in profit efficiency. Even at a very high leverage level, the significant and positive impact of debt level on performance still exists. The authors posit that using higher leverage may reduce the agency cost and encourage managers' behavior toward shareholders' interests, thereby rising firm value.

Margaritis and Psillaki (2007) use a non-parametric efficiency measure and quantile regression method to test how capital structure affects the performance of New Zealand firms. The findings reveal that both the linear and quadratic terms of leverage significantly, positively affect efficiency. This result supports the agency theory that employing more debt leads to higher efficiency. Other results show that industry concentration and intangible assets have a positive impact, while firm size and risk have inverse effects on efficiency. According to the authors, the inverse relation between size and efficiency is induced by the loss of control owing to inefficiently hierarchical management structures of the firms.

Margaritis and Psillaki (2010) investigate the relation between leverage, ownership, and performance of French manufacturing firms over the period from 2002 to 2005. The quantile regression method and a quadratic functional form of debt ratio are employed to estimate the regression coefficients. The quadratic functional form allows capturing the non-monotonic relationship between leverage and profit efficiency. The results are in accordance with the prediction of the agency theory that higher debt ratio leads to better performance (measured by X-efficiency). Nevertheless, the sign of the coefficient turns from positive to negative when the leverage level is high in some industries.

Gill et al. (2011)'s study exploits a sample of 272 American firms in the service and manufacturing industries listed on the New York Stock Exchange during a period from 2005 to 2007. The findings indicate that in the service industries, short-term debt and total debt

positively influence ROE. Likewise, in the manufacturing industries, long-term debt and total debt are positively associated with performance.

Fosu (2013) uses the 1998-2009 panel data of 257 South African firms to analyze the impact of capital structure on performance and the extent to which the competitive level in product markets affects this relationship. The findings show that the debt ratio is positively related to performance. Meanwhile, product market competition boosts the impact of leverage on performance.

Salehi and Moradi (2015) carry out a study with a sample of 100 listed firms on the Tehran Stock Exchange from 2008 to 2012. The results are similar to those of Fosu (2013)'s study: leverage has a positive relation with ROA, and a higher level of competition in the product markets makes the relationship between debt ratio and ROA stronger.

On the contrary, a large number of studies indicate a negative effect of leverage on firm performance. For example, Majumdar and Chhibber (1999) find an inverse relation between total debt and profitability (measured by profit to sales ratio) of Indian firms. This inverse relationship is explained that the role of debt as a controlling tool of shareholders to enhance firm performance is not significant in the Indian context. Hence, large cash flows from borrowing may allow managers to carry out their discretion, thereby adversely affecting firm performance.

Gleason, Mathur, and Mathur (2000) using ROA, growth in sales, and pretax income as measures for firm performance reveal significant negative impact of debt level on performance of the Europe retailers. King and Santor (2008) use a sample of 613 firms over the period 1998-2005 in Canada to test the influence of ownership on firm performance. Financial leverage is employed as a regressor in their model, and it is negatively correlated with Tobin's Q. Ghosh (2008) employs firm-level data of the manufacturing sector in India from 1995 to 2004 to investigate the leverage-profitability association of firms. The findings state that a rise in debt level leads to a decline in profitability and cash flows.

Asimakopoulos, Samitas, and Papadogonas (2009) mainly focus on firm-specific variables which influence firm performance. They denote that higher leverage level leads to lower profitability of firms. Besides, sales growth and firm size positively affect the profitability of listed firms on the Athens Stock Exchange from 1995 to 2003. They contend that firms with high debt level have to use a large portion of their earnings to pay the interest costs.

That leads to fewer funds available to reinvest, thereby negatively affecting future growth opportunities of firms.

A study on 64 Egyptian listed non-financial firms of El-Sayed Ebaid (2009) reveals that short-term debt, total debt negatively affect ROA, but this effect is not statistically significant if long-term debt ratio is used as a proxy for leverage. Additionally, all measures of financial leverage do not have statistically significant effects on ROE and gross profit margin. Thus the author concludes that leverage has weak or no effect on Egypt firm performance.

Onayemi, Akindapo, Ojokuku, Adegboyega, and Abayomi (2010) develop a hypothesis to predict that firms' leverage may negatively impact on their performance. The findings affirm this supposition and provide evidence supporting agency theory that owing to the conflict between shareholders and managers, firms tend to employ debt overly, and this leads to an adverse effect on financial performance.

Manawaduge, Zoysa, Chowdhury, and Chandarakumara (2011) examine the leverage-performance relationship of 155 Sri Lankan listed firms. They state that almost all the firms are funded by short-term debt, and leverage level has an inverse impact on firm performance.

Another study for 70 listed firms on the Nigerian Stock Exchange from 2000 to 2009 of Chechet and Olayiwola (2014) demonstrates that leverage has an inverse effect on profitability. Dawar (2014)'s study reveals that after controlling for other variables including firm age, size, growth opportunities, liquidity, and tangibility, debt level inversely influences Indian firms' performance.

Vo and Phan (2013)'s study focuses primarily on the influence of corporate governance on performance of Vietnamese firms. Using a sample of 77 listed firms from 2006 to 2011, the author finds that some corporate governance variables affect firm performance, either positive or negative. Leverage used as control variable inversely affects performance.

Hasan, Ahsan, Rahaman, and Alam (2014) perform an investigation on a sample of 36 listed firms on the Dhaka Stock Exchange (Bangladesh) between 2007 and 2012. The results show that there is an inverse relationship between leverage and ROA. However, capital structure does not affect ROE and Tobin's Q. In addition, while long-term debt has an inverse impact on EPS, short-term debt positively influences EPS. They conclude that in general, performance is negatively influenced by debt level.

Nhung and Okuda (2015) divide the whole sample period into two sub-periods (before and after Lehman shock in 2008) then run regressions for listed firms on Ho Chi Minh Stock Exchange and Hanoi Stock Exchange separately. They find that, in both sub-periods and both stock exchanges, a rise in debt ratios (including short-term, long-term, and total debt ratio) results in a reduction of ROA.

Le and Phan (2017)'s findings reveal that all debt ratios have inverse influences on Vietnamese listed firms' performance. The authors state that their findings are inconsistent with those of most studies carried out in developed countries but similar to those of many studies in developing countries.

In comparison with studies that reveal no impact, positive or negative impact in each study mentioned above, some other studies have found mixed results. These mixed results depend on which measures are employed as proxies for capital structure and performance, or which control variables are included in model specifications. For instance, Simerly and Li (2000), using a sample of 700 large U.S. firms in various industries, add environmental dynamism as a control variable into the model specifications to investigate the leverage-performance relationship. The findings present that leverage positively affects the performance of firms operating in stable environments, but negatively for firms in dynamic environments. They emphasize that the positive effect occurs only for firms in relatively stable environments.

Abor (2007), in a study on SMEs in Ghana and South Africa, states that how leverage affects firm performance depends on which measures are used as proxies for performance. When the gross profit margin is used, a rise in long-term debt ratio leads to better performance. However, short-term and total debt ratios inversely influence performance. When ROA is employed, all debt ratios are inversely associated with Ghanaian firms' performance. Regarding the South African sample, there is a positive relation between short-term debt and performance while long-term debt and total debt negatively affect ROA. Finally, the link between short-term debt and Tobin's Q is positive, while long-term debt and total debt are inversely related to Tobin's Q of the South African listed firms.

Zeitun and Tian (2007) examine the influence of leverage on the performance of 167 Jordanian listed non-financial firms from 1989 to 2003 by employing various measures for the performance. In this study, leverage negatively affects both the accounting-based and

market-based measures of performance, except for Tobin's Q, which is positively influenced by short-term debt ratio.

Lin and Chang (2011) employ a threshold regression model to determine whether there are threshold leverage levels for a sample of 196 listed Taiwanese firms from 1993 to 2005. The results can be summarized that when leverage is less than 33.33%, there is a positive relation between leverage and Tobin's Q, however, when leverage is more than 33.33%, it does not affect Tobin's Q.

San and Heng (2011) utilize a pooled regression method to investigate the leverage-performance relationship of 49 firms in Malaysia construction industry from 2005 to 2008. The results show that, for the large construction firms, only return on capital and EPS have a positive relationship with capital structure. The ratios of debt to market value of equity, long-term debt to capital and debt to capital directly affect the performance of large firms, but other independent variables do not influence the dependent variables. Operating margin of medium firms is positively affected by the ratio of long-term debt to equity. For small firms, only debt to capital ratio has an inverse effect on EPS.

Salim and Yadav (2012) exploit Malaysia listed firms' data from 1995 to 2011 to examine how leverage level affects firm performance. The findings show that short-term debt and total debt ratio have adverse effects on ROE. This result is consistent with Ebaid (2009)'s results. Long-term debt and total debt ratio inversely influence ROA that supports the results of Abor (2007) and Zeitun and Tian (2007). The study also reveals that all ratios of capital structure (including short-term, long-term, and total debt ratio) positively affect Tobin's Q.

The research of Olokoyo (2013) presents the empirical results about the influence of leverage on the performance of 101 Nigerian listed firms in the period 2003-2007. Briefly, leverage inversely affects ROA (an accounting-based measure of performance) while it positively influences Tobin's Q (a market-based measure of performance).

2.4 EMPIRICAL EVIDENCE ON THE REVERSE CAUSALITY

Berger and Patti (2006) posit that not taking into account the possibility of reverse causality of leverage and firm performance when investigating the determinants of capital structure may lead to simultaneous equation bias. They then introduce two suppositions (i.e. the "efficiency-risk hypothesis" and the "franchise-value hypothesis") to explain how firms' performance affect their leverage choices.

The “efficiency-risk hypothesis” supposes that firms with better performance employ more debt than other firms since higher effectiveness decreases the potential bankruptcy and financial distress costs, all else equal. According to this hypothesis, at any given capital structure, more efficient firms create higher expected returns which can protect them from financial distress, thereby allowing them to employ more debt (Berger & Patti, 2006). Empirically, Berger and Mester (1997) find evidence that supports the positive relationship between profit efficiency and expected returns. In particular, using data of the U.S. banks from 1990 to 1995, Berger and Mester affirm that profit efficiency is positively related to two accounting measures of performance, including ROE and ROA. Higher returns, in turn, substitute for equity to protect firms from portfolio risk. Therefore, firms that are more efficient are in a better situation to exploit more debt instead of equity.

The franchise-value hypothesis pays attention to the income effect of the economic rents created by profit efficiency of firms when they determine debt level. According to this hypothesis, firms that are more efficient use less debt (i.e., higher equity ratio) than other firms, *ceteris paribus*, to protect the economic rents or franchise value yielded by high efficiency from insolvency threat. Firms with greater profit efficiency possibly yield economic rents if the efficiency is expected to maintain in the future. These firms tend to keep additional equity capital to defend their potential income or franchise value (Berger & Patti, 2006). Keeley (1990) finds that the slackening of the chartering rules in the U.S. banking sector in the early 1980s seems to result in using less equity capital in banks as they have less franchise value to protect. This finding is corresponding to the franchise-value hypothesis that firms retain extra equity to guard franchise value.

Faulkender, Thakor, and Milbourn (2006) confirm that better firm performance leads to a higher consensus between managers and investors and this higher agreement in turn results in lower leverage level. They argue that if a firm performs better, the investors will be more confident about the decision-making ability of managers. This confidence, in turn, reduces the possibility that investors disagree with the investment decisions of managers; thus, the managers’ decisions relating to the firm financial policies are less costly. Consequently, the control of managers when making investment decisions increases and the probability that investors block such investment choices decreases. They then conclude that firm performance does influence capital structure.

The findings of Margaritis and Psillaki (2007)'s study empirically support the efficiency-risk and franchise-value hypothesis introduced in the study of Berger and Patti (2006). By using a quantile regression analysis, they find that efficiency positively affects debt level when debt level is low or medium but negatively at high debt level. Profitability positively affects financial leverage of firms with low and high leverage quantiles.

The study of Margaritis and Psillaki (2010) not only examines the relation among leverage level, equity ownership and firm performance but also equally analyses the reverse causality based on the efficiency-risk and franchise-value hypothesis. They apply the same approach used in their previous study in 2007 to estimate the leverage model and the results present that the impact of profit efficiency on capital structure is positive. This means that the efficiency-risk effect dominates the franchise-value effect.

The study of Al-Sakran (2001) confirms the positive effect of performance, measured by profitability and ROA, on capital structure. However, it is likely that empirical evidence tends to support the franchise-value hypothesis rather than the efficiency-risk hypothesis. For example, the work of Wiwattanakantang (1999) provides a negative impact of ROA on leverage level. The result from Al-Najjar and Taylor (2008)'s study shows that ROE has a significantly adverse impact on debt ratios. Biger, Nguyen, and Hoang (2007), Okuda and Nhung (2010), Nguyen, Diaz-Rainey, and Gregoriou (2012), Balios, Daskalakis, Eriotis, and Vasiliou (2016) also find an inverse relationship between profitability and debt level.

In summary, the impacts of performance on leverage from the prediction of the efficiency-risk and franchise-value hypothesis are opposite. The "substitute effect" of the former indicates a positive relation while the "income effect" of the latter anticipates an inverse association. Margaritis and Psillaki (2010) claim that researchers cannot separate substitute and income effects, but they are able to check which effect dominates the other. Hence, the results are considered as the "net" effect of the two hypotheses.

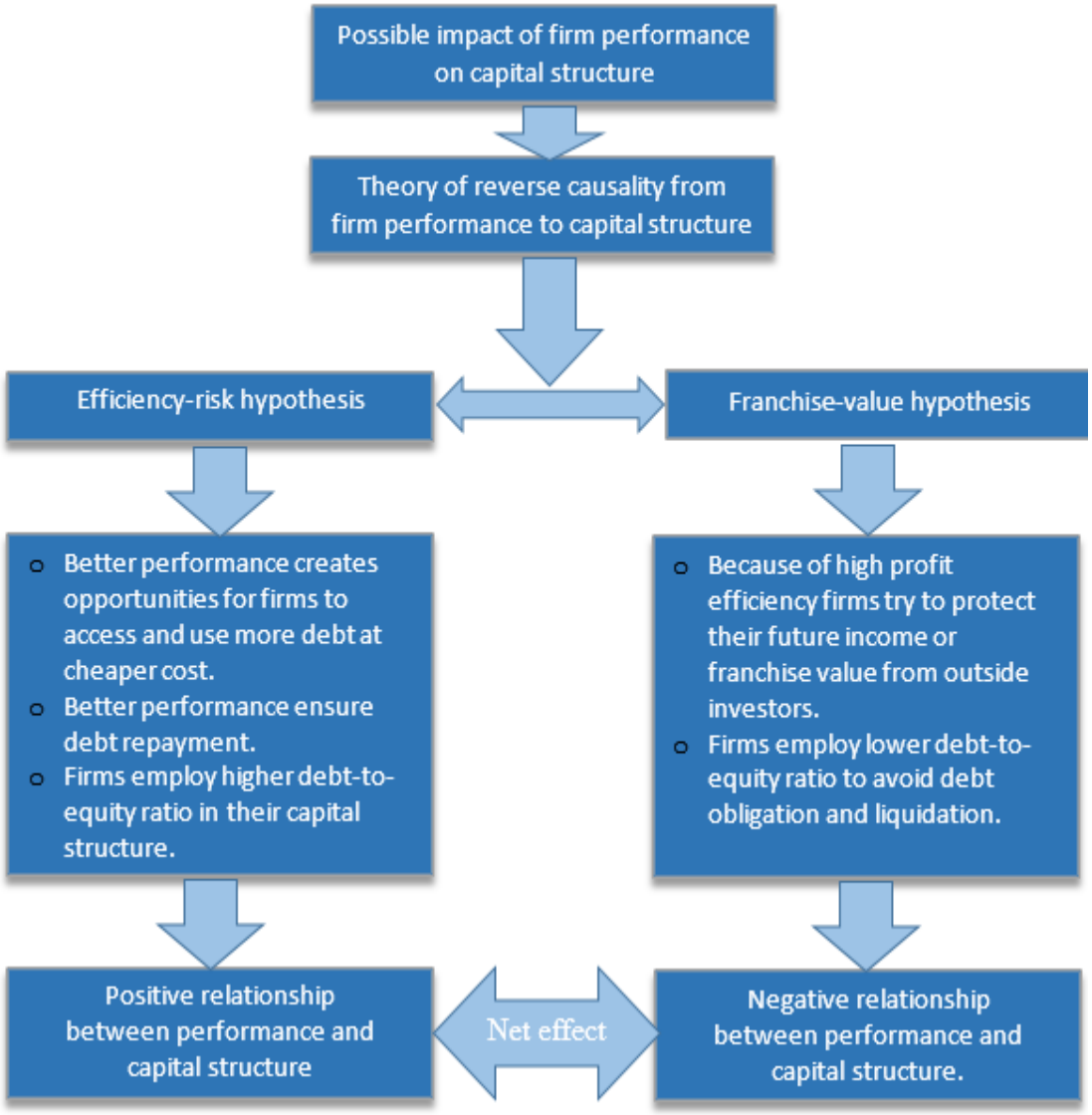

Figure 2.2: The efficiency-risk and franchise value hypothesis

2.5 OTHER DETERMINANTS OF CAPITAL STRUCTURE

In addition to the influence of firm performance on financing decisions as mentioned in Section 2.3, firms' leverage choices may be also affected by many other factors that can be separated into two broad groups: firm-specific characteristics and country-level variables. The first group reflects the features of firms, while the second relates to the surrounding environment where firms operate. Section 2.5.1 focuses on empirical results of the effects of firm-specific characteristics on leverage decisions, while the effects of country-level factors, including institutional environment and macroeconomic conditions on financial leverage are presented in Section 2.5.2.

2.5.1 Effect of firm-specific characteristics on capital structure

The findings of Taub (1975) indicate that the effect of the uncertainty variable[5] (i.e. volatility) on capital structure is consistently inverse, though not always statistically significant. Total assets used as a proxy for firm size and long-term interest rate have a positive effect on the ratio of debt to equity.

The research of Marsh (1982) analyzes the issuance of debt and equity of 748 UK firms during the period 1959-1970. The results reveal that leverage decisions are strongly affected by market conditions (see Marsh, 1982, for detail) and past security prices. Furthermore, the author argues that financial leverage level is influenced by operating risk, firm size, and asset composition. Specifically, firms, which have higher operating risk, likely utilize less debt; smaller firms are prone to short-term debt other than long-term debt; and firms with a higher ratio of fixed assets appear to employ more long-term debt.

Bradley et al. (1984) show that debt ratios are strongly associated with industry classification and earnings volatility, intensity of R&D, and advertising expenses negatively affect leverage level.

Kim and Sorensen (1986)'s results reveal that insider ownership positively affects leverage. Besides, firms with higher growth rate use less debt; firms with higher operating risk employ more debt. Surprisingly, firm size is not correlated with debt level.

Comparative research of Kester (1986) finds that factors such as growth, profitability, risk, firm size and industry classification influence the market value measure of leverage of both the U.S. and Japanese firms. After controlling for such factors, no difference in leverage between the U.S. and Japanese firms is found. When the book value measure of leverage is employed, the leverage level of Japanese firms is considerably higher than that of the U.S. counterparts. Nevertheless, these results only appear in mature, heavy industries, not in other Japanese manufacturing industries.

By comparing the benefits of debt with the costs of liquidation, Myers (1977), Williamson (1988), and Shleifer and Vishny (1992) find a relation between asset characteristics and capital structure of firms. These authors document that liquid assets are a good indicator for financing debt because financial distress for firms with such assets is relatively inexpensive.

[5] See Taub (1975, p. 412) for the definitions of the uncertainty variable.

In other words, if the assets of firms are more easily liquidated, firms tend to employ more debt. The findings of Alderson and Betker (1995) are consistent with prior empirical results. Alderson and Betker confirm that liquidation cost is an important determinant of unsecured public debt and equity choice of firms when they are reorganising. By contrast, firm size and non-debt tax shield are not important in determining the debt level of firms during this process.

Titman and Wessels (1988)'s findings reveal that growth opportunities, non-debt tax shield, volatility, the collateral value of assets do not affect convertible debt ratios while past profitability and transaction costs are crucial factors in making capital structure decisions. Firm size and firm uniqueness are negatively associated with short-term debt, and smaller firms are likely to utilize more short-term debt than larger firms.

Harris and Raviv (1991), in their well-known paper, report that firm size, non-debt tax shield, fixed assets, and investment opportunities have positive effects on leverage while business risk, advertising costs, uniqueness of the product, profitability and bankruptcy probability are inversely associated with firms' leverage.

The renowned article of Rajan and Zingales (1995) pays attention to variables such as tangible assets, market-to-book ratio (usually considered as an indicator for firms' investment opportunities), profitability, and firm size. They explain theoretically how these factors may affect capital structure. Particularly, if tangible assets of a firm account for a majority of its total assets, they can serve as mortgages, reducing the risk for lenders. The lenders thus are more likely to provide loans. Consequently, the debt ratios of this firm may be higher. Since firms with high leverage level tend to underinvest (Myers, 1977), the firms which expect high growth rates in the future possibly use more equity rather than debt. The effect of firm size on leverage level is vague. On the one hand, larger firms appear to be more diversified, thus having a lower possibility of going into liquidation. Hence, firm size may positively affect leverage. On the other hand, large firms seem to confront fewer problems of asymmetric information among managers, existing stockholders and outside investors than small ones. Thus, large firms may possess more capability to issue securities with more informational sensitivity like equity and hence may use less debt. The predictions about the impact of profitability on leverage are theoretically controversial. Myers and Majluf (1984) suggest a negative association. Jensen (1986) argues that the direction of the

effect of profitability on leverage depends on whether or not the market for corporate control is effective. If it is effective, the relation is positive and vice versa. On the supply side, lenders may be more willing to provide loans to firms which have more free cash flow (a proxy for profitability).

The results from Hovakimian, Hovakimian, and Tehranian (2004)'s research present that ROA, stock returns, firm size, and industry leverage significantly positively influence leverage (the effect of firm size is insignificant in some regressions) whereas tangible assets, selling costs and R&D expenses are negatively correlated with the debt ratios.

Schmid (2013) pays attention to the control considerations of major shareholders, and creditor monitoring as determinants of leverage level and the findings show that family firms in Germany have lower leverage level than firms in other countries. Intensive creditor monitoring affects debt policy of German family firms. Hence, these firms tend not to invoke debt.

The study of Wiwattanakantang (1999) is one of the first studies that consider both firm-specific and country-specific factors as determinants of firms' debt level in the setting of a developing country. The sample includes 270 listed firms on the Thailand Stock Exchange in 1996. The findings point out that market-to-book ratio and non-debt tax shield have an inverse effect on debt ratios. Firm size positively influences leverage. Tangible assets, measured by the ratio of fixed assets to total assets, is also significantly and positively associated with the market value of leverage. When using the book value of leverage as the dependent variable, the sign of the estimated coefficient of business risk, proxied by the fluctuation of operating income, is positive. When the market value of leverage is used, the sign turns to negative. However, this result is insignificant in all the regressions. Also, the author investigates the effects of the agency variables on leverage. The regression coefficients of tangibility, business risk and market-to-book ratio are not statistically significant. The family variable has a significant and positive impact on both market and book leverage. The estimated coefficients of other factors such as firm age, conglomerate, government, foreign, board size and CEO[6] are not statistically significant except for the director variable with a positive sign. Wiwattanakantang's study also investigates the impact

[6] *Family*, *conglomerate*, *government* and *foreign* are dummy variables that represent various kinds of major stockholders of firms. *Director* and *ceo* variables are proxies for managerial ownership measured by the proportion of stocks held by directors and CEOs, respectively.

of managerial ownership on the leverage of single-family-owned firms. The results reveal that the director and CEO variables of these firms have positive effects on leverage. The author indicates that ownership concentration measured by individual-largest, corporate-largest and five-largest have a negative impact on debt ratios while the estimated coefficient of the financial institutions-largest variable is also inverse but statistically insignificant.

Al-Sakran (2001) shows that growth opportunities positively influence debt ratios, but firm size and state ownership are negatively correlated with the leverage level of firms in Saudi Arabi.

Keister (2004) investigates Chinese state-owned unlisted firms and points out that retained earnings are the main determinant of capital structure because those firms may use retained earnings as a sign for their financial capacity to borrow from banks.

From the findings of Chen (2004), Huang and Song (2006), Qian, Tian, and Wirjanto (2009), and Zou and Xiao (2006), it can be summarised that firm size, non-debt tax shield, profitability, tangible assets, growth opportunities, earnings volatility, and industry classification are the important variables that drive financing decisions of firms in China. Zou and Xiao (2006) report that ownership structure does not affect capital structure whereas Li, Yue, and Zhao (2009) present empirical evidence that ownership and governance structure are the most important determinants of leverage level.

The study of Nguyen and Ramachandran (2006) is one of the first studies examining the determinants of financial leverage of firms in Vietnam. They use data taken from financial statements and interviews with the financial officers of 558 Vietnamese SMEs. The results show that firm size, growth opportunities, and risk have a positive impact on capital structure, while tangible assets ratio is inversely related to all debt ratios. However, profitability does not affect leverage. In the meantime, privately owned firms use less debt than state-owned firms. Furthermore, the authors find that firms with strong relationships with commercial banks may access bank loans more easily.

The findings from Biger et al. (2007) are quite similar to those of Nguyen and Ramachandran (2006), although they exploit a different sample. Specifically, the debt level of Vietnamese firms is positively affected by growth opportunities, managerial ownership and firm size, but it is inversely associated with tangible assets and non-debt tax shield. The industry classification also has an impact on firms' leverage choices.

Al-Najjar and Taylor (2008) use a sample of 88 listed firms in Jordan to examine the determinants of capital structure. The findings indicate that dividend policy has no impact on leverage. ROE negatively affects debt ratios. This implies that the Jordanian firms may prefer retained earnings for financing that is corresponding to the pecking-order theory. The business risk variable strongly and negatively affects leverage. Since using debt involves engagement of periodic payment, firms with higher debt level are likely to have higher bankruptcy and financial distress costs. Consequently, firms with fickle earnings may use less debt. This relationship is consistent with the trade-off theory. A finding consistent with the agency theory is the positive relation between tangible assets and leverage. Besides, both growth rate and firm size positively influence leverage. The positive relation between growth rate and leverage is contradictory with the negative sign anticipated by the agency theory. However, the relation of size and debt ratios is in line with the bankruptcy theory.

Abor and Biekpe (2009) based on their research on Ghanaian SMEs report that leverage is influenced by firm size, asset structure, profitability, growth opportunities, and firm age. Several studies exploiting data of Nigerian firms find similar results. In most cases, the popular firm-specific factors influencing leverage choices consist of firm size, firm age, tangible assets, growth opportunities, profitability, liquidity (for example, see Akinlo, 2011; Chandrasekharan, 2012; Salawu & Agboola, 2008; Salawu & Ile-Ife, 2007).

Using a sample of Vietnamese listed firms, Okuda and Nhung (2010) point out that firm size, taxes positively affect debt level. They indicate that state-owned firms face less risk than other firms, and state-owned firms have lower incentives to use debt for tax saving purpose in comparison with non-state-owned firms.

Using data of non-financial firms listed on Ho Chi Minh and Hanoi Stock Exchange (Vietnam) from 2007 to 2010, Nguyen et al. (2012) indicate that growth has a positive influence on debt level, whereas there is a negative relation between liquidity ratio and debt level. The signs of the regression coefficients of firm size and tangible assets depend on which leverage ratios are used. Specifically, they inversely influence short-term debt but positively affect long-term debt ratio. The authors also find that firms with higher governmental ownership tend to employ more debt.

Sheikh and Wang (2013) document that in the context of Pakistan, firm size, profitability, non-debt tax shield, tangible assets, growth opportunities, earnings volatility and liquidity

are important firm-level variables factors that affect leverage choices. The study of Chakraborty (2010) for Indian listed firms reveal similar results to those of Ahmed Sheikh and Wang (2013). The author argues that the findings are in accordance with the static trade-off and pecking-order theory. Nonetheless, the findings seem not to support agency theory.

Xuan-Quang and Zhong-Xin (2013) exploit the data of listed firms on Ho Chi Minh Stock Exchange (Vietnam) from 2009 to 2012. They find that corporate governance has an influence on leverage choices. However, ownership structure does not reveal statistical evidence to prove that it has an effect on capital structure, except for the only case in which managerial ownership has an inverse effect on the debt level of state-owned firms. Also, typical firm-level variables such as profitability, growth opportunities, firm size have statistically significant effects on leverage choices of firms.

Balios et al. (2016) explore the determinants of the leverage of Greek SMEs from 2009 to 2012 (the crisis period). Using panel data of 8052 firms, they document that the impact of debt determinants on debt level does not change in the economic crisis period. Growth rates and firm size positively relate to debt level, while the relation between tangibility and debt ratios is negative.

The findings of Vo (2017) reveal that the impacts of growth opportunities on short-term and long-term debt are positive but statistically insignificant. Tangible assets and firm size are positively related to long-term debt but negatively associated with short-term debt. Profitability has a significant negative effect on short-term debt. When the ratio of long-term to short-term debt is used as the dependent variable, the regression coefficient of profitability is still negative. This result implies that more profitable firms tend to substitute long-term debt for short-term debt. When short-term debt ratio is used as the regressand, the estimated coefficient of liquidity is negative and statistically significant, but it is positive and statistically insignificant in the regression of long-term debt.

In conclusion, the empirical findings of firm-level variables which affect financial leverage are mixed and inconclusive. Some support the trade-off theory while others are in accordance with the pecking-order theory or the agency theory. The different results from one study to another may come from the different macroeconomic conditions of each country, or the selections of samples, variable measurements, and estimation approaches.

2.5.2 Country-specific factors as determinants of capital structure

Because of the differences in the legal institutions and economic environment where firms operate, the factors from the surrounding environment of firms may be determinants of corporate capital structure. This raises the issue of whether and how these external factors influence firms' leverage. Several studies have examined the institutional and macroeconomic factors, along with firm-specific characteristics with respect to their impacts on financing decisions.

The pioneering study of Rajan and Zingales (1995) is the first work which considers the direct effects of institutional characteristics on capital structure. They use data of the U.S. and the G7 countries' firms to explore the effects of both firm-specific and institutional factors on financing decisions. They find that factors influencing leverage choices of firms in the U.S. and the G7 countries are similar. Although an investigation is deeply undertaken in their study, the theoretical foundation of the observed correlations has not been mainly resolved yet. They suggest that it is essential to reinforce the link between theories and their empirical models to comprehend the impacts of institutional characteristics on firms' leverage choices profoundly.

Demirgüç-Kunt and Maksimovic (1996) analyse four aspects including the development of financial markets, macroeconomic factors, the tax treatment of corporate debt and equity, and firm-level characteristics that may affect leverage choices of firms in thirty developed and developing economies within 1980-1991. When they consider all the countries as a whole, the regression results reveal a significantly positive linkage between the development of banking sector and firms' leverage, but an insignificantly negative relation between the development of stock markets and debt level. Nonetheless, when dividing the whole sample into subsamples, they find that in the developed stock markets, further improvement of stock markets induces a replacement of equity for debt in the capital structure of firms. In contrast, in immature stock markets, more development of stock market results in higher leverage level of large firms, while stock market development does not seem to significantly influence small firms' capital structure choices.

Caprio and Demirguc-Kunt (1997) pay attention to the variables that affect the ability of firms to access long-term loans in developing countries. Their results show that both the financial market development and legal effectiveness are important for firms to access long-

term debt and then boost their growth. There is also evidence that institutional factors, banking sector and capital market are crucial factors that strongly influence leverage choices of firms. Similarly, Hirota (1999) confirm that institutional and regulatory features are factors that drive leverage choices of Japanese firms.

Demirgüç-Kunt and Maksimovic (1999), in another study on debt maturity of firms in thirty countries from 1980 to 1991, state that when a country has an effective legal system, large firms have a higher long-term debt to assets ratio, lower short-term debt to assets ratio, and longer debt maturity. However, the effectiveness of the legal system does not affect leverage level of small firms regardless of short-term, long-term or total debt ratio. The size of stock markets is unlikely to affect the financing pattern of large firms, but the level of activity of stock markets influences leverage choices of those firms. Specifically, in countries with active stock markets, large firms employ more long-term debt, and their debt has longer maturities. Small firms' leverage is not correlated with both the size and the active level of stock markets. The size of the banking industry does not influence the debt ratios of large firms but negatively affects small firms' short-term debt. Inflation has an inverse impact on long-term debt.

Booth, Aivazian, Demirguc-Kunt, and Maksimovic (2001) find that despite the substantial differences in institutional features between developing and developed countries, leverage choices of firms in developing economies are influenced by the identical firm-level variables as firms in developed countries. Nonetheless, there are differences in the pattern that firms' leverage choices is influenced by country-level variables such as inflation, economic growth, and the development of capital markets.

Nejadmalayeri (2001) analyzes some macroeconomic factors as determinants of firms' financing decisions but focus mainly on the term structure of interest rates. The findings show that there exists an impact of short-term rate, corporate bond yield and volatility of the yield curve on financial leverage of firms. Inflation, cyclicality, collateral rates, and personal tax rates also have statistically significant impacts on firms' leverage choices. For example, the short-term rate is positively related to debt ratios while long-term rate and inflation have a negative effect on debt level.

Giannetti (2003) explores the effects of firm-specific factors, legal systems and financial development on leverage choices of 33,885 firms in eight European nations. The findings

indicate that high level of creditor's right protection may lead to more financing opportunities for unlisted firms. Therefore, the author points out that the low quality of law enforcement in Italy mainly accounts for the very short debt maturity of Italian firms, and the low quality of creditor's right protection in France makes firms difficult to invest in intangible assets to acquire finance from debt.

Deesomsak, Paudyal, and Pescetto (2004) examine the influence of the 1997 Asian financial crisis on leverage choices of listed firms in Australia, Malaysia, Singapore and Thailand. The empirical evidence reveals a negative effect of the financial activity of stock markets on firms' debt level. Interest rate is positively associated with leverage but statistically insignificant in the period before the crisis and the whole sample period. Nevertheless, the regression coefficient of interest rate variable is positive and statistically significant for the after-crisis period. The creditor's right positively affects leverage over the whole and the after-crisis period. In the before-crisis period, this effect is negative. The authors state that in general firms tend to use more debt when lenders are well-protected by law. In the whole and after-crisis period, the ownership concentration[7] is significant and positive associated with debt ratios. In the before-crisis period, the association is also significant but negative. From the findings of the analysis about the effect of Asian financial crisis in 1997 on the leverage choices of firms, this study confirms this crisis has effects on the capital structure at both firm-specific and country levels.

De Jong, Kabir, and Nguyen (2008) argue that country-level variables possibly affect capital structure via two channels: direct and indirect channels. The former means that country characteristics directly affect firm leverage while the latter implies that country features influence the importance of firm-specific factors as determinants of financing choices. The direct impact of country-level variables shows that economic growth, creditor's right protection, and bond market development have considerable explanatory power for firms' capital structure across countries. Furthermore, in comparison with firm-specific factors, country-level variables have a stronger power in explaining the variation of financial leverage level of firms in all the countries in the sample. The authors also posit that there exists indirect influence because country-level factors have a significant effect on capital structure through firm-specific factors.

[7] The ownership concentration in the study of Deesomsak et al. (2004) is measured by the ownership of the three largest shareholders of the ten largest non-financial domestic firms.

Psillaki and Daskalakis (2009) analyze the differences in debt levels, firm-level factors (including asset composition, profitability, firm size, business risk, growth opportunities), and country-level variables as potential leverage determinants of Greek, French, Italian, and Portuguese SMEs. They also examine how these factors affect leverage choices. The results of this study are similar to those of Rajan and Zingales (1995) that SMEs in Greece, France, Italia, and Portugal decide their leverage level in similar ways. Regarding firm-specific factors, the findings are as follows: tangible assets, profitability inversely impact debt ratios, whereas the relation between firm size and debt level is positive. They do not find a statistically significant impact of firms' growth on leverage level in all the four countries. They finally conclude that firm characteristics rather than country factors are the main determinants of leverage decisions of SMEs.

Bokpin (2009) investigates the impact of macroeconomic and firm characteristics on the capital structure of firms in 34 emerging economies over the period 1990-2006. GDP per capita is found to negatively affect debt ratios. Inflation and the size of banking sector (bank credit) positively affect short-term debt to equity ratio, but the effect of inflation is statistically insignificant. Interest rate is significantly and positively associated with the ratio of short-term debt to equity but insignificantly when other measures of financial leverage are used. The effect of stock market development (measured by the ratio of stock market capitalization to GDP) on firms' leverage choices is not statistically significant.

Vasiliou and Daskalakis (2009) confirm that the differences in investor protection, creditor's rights enforcement, capital market development and financial intermediaries between Greece and the U.S. as well as European developed countries do not appear to influence leverage decisions of firms.

A more recent study of Jõeveer (2013) focuses on firms in Eastern European transition economies (including Bulgaria, Czech, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia). The author indicates that firm-level variables are the major determinants of financial leverage choices for both listed firms and large unlisted firms, but not for small unlisted firms. Meanwhile, country-level variables mainly account for the changes in debt ratios of small unlisted firms. Generally, the results of Jõeveer's study show that around 50% of the fluctuation of debt level associated with the country-level factors is explained by known institutional and macroeconomic variables. The author emphasizes that

country-level factors have significant effects on leverage choices, especially for unlisted firms.

Belkhir, Maghyereh, and Awartani (2016) consider the importance of institutional factors when firms decide their debt levels. The results indicate that the speed of leverage adjustment of firms is different from country to country in the sample. The authors posit that this is possibly due to the differences in institutional characteristics across MENA countries. Specifically, more developed financial systems, stronger law enforcement, and higher regulatory effectiveness of countries in which firms operate lead to higher firm leverage level. Also, higher corruption index results in higher debt ratios. Generally, country institutional quality does affect capital structure choices of firms.

Some studies including those of Kim and Wu (1988), Cebenoyan, Fischer, and Papaioannou (1995), Hatzinikolaou, Katsimbris, and Noulas (2002), focus on the inflation-leverage relationship. The results of Kim and Wu (1988) show that higher inflation rate leads to the increase in firm leverage. Cebenoyan et al. (1995) find that in the U.S. and Canada, current inflation significantly and negatively affects both total debt ratios and debt maturity of firms, contrary to the expected positive relationship. Similar results are found for the Greek firms. Nevertheless, in the case of Turkish firms, inflation has a positive impact on leverage as well as debt maturity. Hatzinikolaou et al. (2002) consider inflation as an important macroeconomic factor that affects firm leverage. They indicate that inflation uncertainty, expected interest rates and capital intensity negatively influence debt to equity ratio. These effects are statistically significant. These results suggest that firms should pay attention to not only institutional features but also macroeconomic factors such as inflation when deciding their leverage level.

Huong (2017) focuses on macroeconomic factors as determinants of leverage choices of listed non-financial firms in Vietnam. The findings reveal that financial development, institutional quality and macroeconomic conditions have impacts on leverage. Specifically, the corporate income tax rate has an inverse effect on debt ratios, but inflation is positively associated with financial leverage. However, the study does not find any evidence about the influence of economic growth and interest rate on capital structure. Financial size is negatively related to leverage, while financial efficiency has a positive effect[8]. Capital

[8] See Huong (2017, p. 33) for the definitions of financial size and financial efficiency variables.

structure is positively influenced by legal quality. Besides, firm-specific variables, including firm size, profitability, and payment capacity have significant impacts on leverage choices.

Tai (2017) examines the effects of the development of financial markets on leverage decisions of 116 listed firms in Vietnam from 2009 to 2015. The author finds that the ratio of stock market capitalization to GDP (used as a proxy for the development of stock markets) is positively associated with debt ratios, while the number of shares traded has an inverse effect on debt level. The size of the banking sector and credit growth rate are negatively associated with capital structure. Finally, interest rates do not statistically significantly affect capital structure.

2.6 SUMMARY

Predictions about the potential impacts of firms' capital structure on their performance differ from theory to theory. Modigliani and Miller (1958)'s model posits that capital structure does not influence firm value. However, this theory relies on strict assumptions about perfect capital markets without taxes, bankruptcy costs, agency costs and asymmetric information. Modigliani and Miller (1963) indicate that when corporate income tax is involved, the advantages from debt tax shield make the use of debt positively influence firm value. With the assumptions that there are no compensating costs (bankruptcy costs, for example) when using debt, the theory of Modigliani and Miller (1963) implies that firms may utilize debt as much as possible in their capital structure.

While the trade-off theory concentrates on the comparison between benefits (tax advantages) and costs of using debt (financial distress costs), the agency theory relies on the agency problems relating to the conflict between shareholders and managers, and that between shareholders and debtholders. Nonetheless, both of these theories explicitly state that each firm has an optimal debt ratio at which the firm's value is maximized. In contrast, the pecking-order theory posits that firms follow a so-called "pecking order" when employing financing sources. According to this theory, internal funds are the first choice, and when external financing sources are invoked, the order of choice is debt, then hybrid securities, and at last, outside equity. An optimal debt level does not exist in the pecking-order theory since equity is the first and also the last choice.

Empirical evidence reveals inconclusive results. Some studies find no impact of leverage on performance; some report a positive relation while others present an inverse association.

Regarding the impact of firm-specific and country-specific factors on leverage choice of firms, empirical findings also vary. Some findings are in accordance with the trade-off theory and the agency theory, while others are corresponding to the pecking-order theory.

CHAPTER THREE
DATA AND METHODOLOGY

3.1 OUTLINE

Chapter 3 presents the data and research method utilized in this thesis. The chapter's structure is as follows. Section 3.2 describes the criteria for data collection, the sources from which the data are collected, and an overall description of the selected samples. Subsection 3.3.1 and 3.3.2 mention the regressands and regressors used in the regressions of the causal relationship and the reverse causality, respectively. The hypotheses are then proposed, along with the introduction of the variables in this subsection. Model specifications for causal relationship and reverse causality are presented in Subsection 3.3.3. Estimation approaches are discussed in Subsection 3.3.4. Section 3.4 summarizes the chapter.

3.2 DATA

3.2.1 The criteria for data collection

The selection of the samples of firms in this study relies on the following criteria. First, the listed firms in the sectors of financials and real estate as classified by the Global Industry Classification Standard are dropped out of the samples. The exclusion of such firms is consistent with previous studies in corporate finance since those firms are significantly unlike non-financial firms (Lin & Shiu, 2003). Financial firms and banks operate under different and stricter regulations that affect differently on their management mechanism, which in turn may have an impact on their capital structure. For instance, non-financial firms in Vietnam are controlled by "Law on Enterprises of Vietnam 2014"; while financial institutions and banks are monitored by both "Law on Enterprises of Vietnam 2014" and "Law on Credit Institutions of Vietnam 2010". Additionally, commercial banks in Vietnam are controlled by the State Bank of Vietnam. Moreover, financial institutions and banks not only conform to the rules that do not apply for other firms (Krivogorsky, 2006; Laing & Weir, 1999) but also comply with particular accounting regulations that make the computation of performance difficult (Rose, 2007). Furthermore, some financial ratios of financial firms and banks are not able to compare with those of non-financial firms (Liljeblom & Löflund, 2005). Since many previous studies do not include financial

institutions and banks, excluding these types of firms from the samples makes the results of this study comparable.

Second, the listed firms are incorporated locally. Since there are no foreign firms listed on HOSE (Vietnam), and SET (Thailand), this criterion only applies to the SGX Mainboard (Singapore). Foreign firms listed on the SGX Mainboard are taken away from the sample because these firms apply different corporate governance practices compared to domestic firms. The institutional environment in which those foreign firms operate is also different from that of local firms. Hence, the elimination of foreign firms in the sample facilitates the comparison among the three countries' domestic firms.

Third, the period of the sample is from 2010 to 2017. The global financial crisis 2007-2009 causes large fluctuations in macroeconomic indicators; for example, the rate of economic growth declined significantly in 2008, 2009[9], while the inflation in 2008 increased sharply[10] in all three countries. These unusual variations may affect the performance of firms unexpectedly and then influence regression results. Since 2010, macroeconomic conditions seem to be more stable. The year 2010 thus is chosen as the first year of the sample period to mitigate the influence of the crisis on the analysis. The year 2017 is the last year as it is the latest year that the data required is fully available.

Four, in order to obtain a balanced panel dataset, the listed firms selected in Singapore, Thailand, and Vietnam must be listed at least before 2009 and continuously operate until the end of 2017[11]. Furthermore, the necessary data must be fully available for the eight-year consecutive period (2010-2017). Because of the existence of endogenous variables in the research models, balanced panel datasets help to facilitate the estimations of the empirical models. Flannery and Hankins (2013) state that the simultaneous existence of endogeneity and panel imbalance may make estimating and inferring extremely difficult. Flannery and Hankins (2013) also present that the root mean squared errors of the endogenous regressors when using unbalanced panel datasets are so excessively large that reliable inferences would

[9] GDP growth rate of Singapore decreases significantly from 9.112% in 2007 to 1.788% in 2008 and -0.603% in 2009. GDP growth rate of Thailand is 5.435% in 2007, 1.726% in 2008, and 0.691% in 2009. GDP growth rate of Vietnam drops slightly from 7.13% in 2007 to 5.66% in 2008, and 5.398% in 2009 (Source: the World Bank).

[10] Inflation rate of Singapore, Thailand, and Vietnam in 2007 is 2.105%, 2.242%, and 8.304%, respectively. In 2008, it increases to 6.628%, 5.468%, and 23.116%, respectively (Source: the World Bank).

[11] The time span is from 2010 to 2017 but the firms must be listed at least before 2009 in order to calculate the annual growth rate of total assets for year 2010.

be impossible to be drawn. In other words, constructing balanced panel datasets reduces the sample size, thereby decreasing the sample representativeness, but it helps to increase the effectiveness of estimating and inferring.

Finally, firms whose their fiscal year ends on December 31 and remains unchanged in the whole sample period are included; otherwise, they are removed from the samples.

3.2.2 Data sources

The list of firms listed on Ho Chi Minh Stock Exchange is from the official website of HOSE. The financial and ownership data of Vietnamese listed firms is commercially provided by Stoxplus Corporation[12], a leading provider of financial and business information in Vietnam. The year of establishment of the firms is manually gathered from the website of Surperformance SAS[13]. When necessary, the data is collated with the firms' annual reports and audited financial statements.

For Singapore and Thailand, the lists of listed firms are obtained from the SGX website[14] and the SET website[15], respectively. The financial data is downloaded from the Compustat database. The year of firm establishment is manually gathered from the website of Surperformance SAS mentioned above.

The country governance quality is made up of three indexes of the Worldwide Governance Indicators introduced by Kaufmann, Kraay, and Mastruzzi (2011). These indicators are available on the website of the World Bank[16]. The macroeconomic indicators such as annual GDP growth, inflation rates, and the development of stock markets are also taken from the website of the World Bank[17].

3.2.3 Sample description

Table 3.1 shows the number of listed firms in Singapore, Thailand, and Vietnam at the end of May 2018. At that time, in the case of Singapore, there are 789 firms listed on the SGX Mainboard. The number of firms listed on the Stock Exchange of Thailand (SET) is 607, and the total number of listed firms on Ho Chi Minh Stock Exchange is 374.

[12] https://stoxplus.com/
[13] https://www.marketscreener.com/
[14] http://www.sgx.com/wps/portal/sgxweb/home/company_disclosure/stock_indiceslist
[15] https://www.set.or.th/en/company/companylist.html
[16] http://info.worldbank.org/governance/wgi/#home
[17] https://data.worldbank.org/indicator?tab=all

Table 3.1: The number of listed firms in Singapore, Thailand, and Vietnam

Singapore		**Thailand**		**Vietnam**	
The number of the listed firms					
SGX Mainboard	789	SET	607	HOSE	374
The number of firms included in the samples					
SGX Mainboard	157	SET	246	HOSE	171

Source: This table is based on the data available on the SGX, SET, and HOSE[18] websites at the end of May 2018.

Among the publicly listed firms, there are 157 firms in Singapore, 246 firms in Thailand, and 171 firms in Vietnam that satisfy the selection criteria specified above. They constitute a whole sample that comprises 574 firms with 4592 firm-year observations.

3.3 RESEARCH METHOD

3.3.1 Variables and hypotheses of the causal relationship

3.3.1.1 Dependent variable

This thesis utilizes Tobin's Q as a proxy for firm performance. It is defined as "the ratio of the market value of a firm to the replacement cost of its assets" (Chung & Pruitt, 1994, p. 70). It is used to determine how effectively a firm exploits its scarce resources. Specifically, firms that have a higher-than-one ratio are considered as efficient firms. To put it differently, these firms are employing their resources efficiently. On the contrary, firms with a ratio that is less than one are using their assets ineffectively (Lewellen & Badrinath, 1997).

This ratio is largely employed as a forward-looking market-based indicator for firms' financial performance. However, calculating the replacement cost of a firm's assets is difficult since the firm's data is unavailable in many cases (Lewellen & Badrinath, 1997). Some approximations of Tobin's Q (for example, see Lindenberg & Ross, 1981) are too complex thus requiring much time and computational effort. Therefore, Chung and Pruitt (1994) introduce a simplified formula that only needs the data from firms' financial statements to calculate an approximation for Tobin's Q. According to Chung and Pruitt (1994), the approximation of Tobin's Q obtained from their simplified formula are highly correlated with those acquired from other more complicated estimations. Following Chung and Pruitt (1994), the following formula is used to calculate an approximation for Tobin's Q.

[18] https://www.hsx.vn/Modules/Listed/Web/Symbols?fid=9ac914fbe9434adca2801e30593d0ae2

$$Tobin's\ Q = \frac{Market\ value\ of\ equity + Book\ value\ of\ debt}{Book\ value\ of\ total\ assets}$$

3.3.1.2 Independent variables

- **Lagged dependent variable**

The one-year lag of the regressand is employed as a regressor to account for the influences of unobserved previous events on the current value of the regressand. Wooldridge (2009) indicates that including the lagged regressand in the model specifications as an independent variable reduces omitted-variable biases. Flannery and Hankins (2013), and Wintoki et al. (2012) also state that the appearance of the lags of dependent variable assists to deal with potential "dynamic panel bias". Bond (2002, p. 142) emphasizes that even "when coefficients on lagged dependent variables are not of direct interest, allowing for dynamics in the underlying process may be crucial for recovering consistent estimates of other parameters". The hypothesis is stated as follows.

H_{C1}: The current performance of firms is likely to be affected by their past performance.

- **Capital structure**

As denoted in the literature section, conflict between shareholders and managers (i.e. principal-agent problem) occurs due to opportunistic behavior of managers. Among many mechanisms, leverage can be utilized as a control channel to mitigate agency problems. Thus, leverage may positively affect firm performance. A large amount of empirical studies finds evidence supporting the positive relation between leverage and performance of firms (for example, Grossman & Hart, 1982; Margaritis & Psillaki, 2010; Taub, 1975; Williams, 1987). However, using more debt can result in higher financial distress and bankruptcy costs. Consequently, the impact of financial leverage on total agency costs is nonmonotonic (Jensen & Meckling, 1976). When leverage is at a low level, employing more debt mitigates agency problems by creating positive incentives for managers. When financial distress and bankruptcy become more likely, a further increase in debt may induce higher total agency costs, hence leading to a negative influence on firm performance. Kraus and Litzenberger (1973) indicate that firm value is a concave function of leverage. The slope of this function is positive at low levels of debt but decreases when leverage increases, and finally turns into negative when debt level is excessive. Margaritis and Psillaki (2007) find empirical evidence of New Zealand firms that supports the inverted U-shaped relationship. Specifically, leverage

positively affects firm efficiency at low and medium levels of leverage, but this relationship becomes negative at high levels of leverage. From the viewpoint of the agency theory, the hypotheses relating to the leverage-performance association are stated as follows.

H_{C2a}: Leverage is likely to have an effect on firm performance.

H_{C2b}: There should be an inverted U-shaped relation between leverage and performance.

This study uses two proxies for capital structure including book leverage and market leverage[19]. The former is used for the main regression while the latter is for robustness check. It is worth noting that the ratio of total liabilities to total assets is not utilized in the current study because it comprises items (accounts payable, for example) which are mostly employed for transaction objectives other than for financing purposes. Hence, this measure tends to exaggerate leverage level of firms (Rajan & Zingales, 1995).

- **Tangibility**

Tangibility or capital intensity, an industry-related factor is considered as one of the determinants of firm performance. Following Titman and Wessels (1988), and Frank and Goyal (2003), in this study, tangibility is computed by dividing tangible fixed assets by total assets. Margaritis and Psillaki (2010) posit that a high level of capital intensity in a firm usually reflects that this firm possesses better technology and hence, more efficient. In addition, more advanced technology forces firms to employ their tangible assets more effectively in order to cover investment costs. Koch and McGrath (1996) confirm that in such firms, higher labor productivity becomes striking. Therefore, the hypothesis is formulated as follows.

H_{C3}: There should be a positive relation between firms' tangibility and performance.

- **Growth opportunities**

Many studies in corporate finance consider growth opportunities of a firm as an important factor affecting its performance. The authors argue that high growth rates are good signals for investors about the performance of firms, and those firms may be able to yield more income from their investment opportunities. Most empirical studies reveal a positive relation between growth opportunities and performance. Capon, Farley, and Hoenig (1990) through

[19] Book leverage is calculated by dividing total debt by book value of total assets, while market leverage is the ratio of total debt to the market value of total assets

their meta-analysis about determinants of the financial performance of 320 studies published from 1921 to 1987 show that growth opportunities examined in 88 studies consistently reveal a positive influence on performance at firm level as well as industry level. Although employing different measures as proxies for firm performance (for example, Gleason et al. (2000), Zeitun and Tian (2007) use ROA, Margaritis and Psillaki (2010) utilize firm efficiency), the authors find a positive relation between growth opportunities and performance. King and Santor (2008) confirm that firms' revenue growth, which is employed as an indicator for growth opportunities, positively affects firm performance. In accordance with Banerjee et al. (1999), Frank and Goyal (2009), and Titman and Wessels (1988), in this thesis the annual percentage changes of total assets are utilized as an indicator for firms' growth opportunities. The hypothesis for the growth opportunities-performance association is denoted as follows.

H_{C4}: There should be a positive relation between firms' growth opportunities and performance.

- **Cash flow**

Jensen (1986) indicates that when cash of a firm exceeds the amount needed to finance all potentially profitable projects, the conflicts of interests and incentives between managers and owners become severe. Particularly, in such a case, managers have motives to make the firm grow beyond the optimal size by using free cash flow to finance inefficient investment projects. This kind of opportunistic behavior is likely to impair performance of firms. If this is the case, debt can be exploited to lessen "the agency costs of free cash flow" since debt payments can decrease excess cash flow that managers can spend at their discretion. The empirical findings from Chung, Firth, and Kim (2005) confirm the idea of Jensen (1986) that large cash flow rises opportunistic behavior of managers. Managers of firms with free cash flow have incentives and good conditions to extend their power. Consequently, it results in overinvestment problems and decreases both firm performance and shareholders' wealth.

By contrast, Gregory (2005), and Chang, Chen, Hsing, and Huang (2007) find evidence that does not support the free cash flow hypothesis of Jensen (1986). They find a positive influence of cash flow on firm performance and explain that large amount of cash flow facilitates firms to invest in potentially profitable projects without invoking outside financing

sources with high cost of capital. The hypothesis for the cash flow-performance relation is denoted as follows.

H_{C5}: There should be a positive relation between firms' cash flow and performance.

In this study, the following formula is used to calculate the ratio of cash flow.

$$Cash\ flow = \frac{Income\ after\ tax + Depreciation + Amortisation}{Book\ value\ of\ total\ assets}$$

- **Liquidity**

A variable considered as an industry-related and business cycle factor is liquidity. According to Hill and Sartoris (1992), there are three causes that adequate liquidity would enrich the value of firms. First, it helps firms to avoid sudden changes in their operations; second, firms with sufficient liquidity can take advantage of chances that generate value for stockholders; and those firms have more flexible financing options and hence can acquire cheaper financing. Cho (1998) posits that liquidity is a signal, among others, of firm performance and prospects. High level of liquidity of firms is expected to enhance firm performance, create more investment opportunities, and lessen financial distress problems. Therefore, the author predicts a positive link between liquidity and performance. However, managers need to seek for an optimal level of liquidity. This means that the liquidity of a firm should not be excessive or insufficient. Excessive liquidity implies that the firm is wasting its idle funds that do not bring any returns for the firm while insufficient liquidity decreases the firm's ability to pay out the current liabilities, thus possibly leading to a potential liquidation of assets or even the insolvency of the firm.

This study uses the ratio of cash plus cash equivalents to total assets as a proxy for firm liquidity. The hypotheses are expressed as follows.

H_{C6a}: Liquidity is likely to have an effect on firm performance.

H_{C6b}: There should be an inverted U-shaped relation between liquidity and performance.

- **Firm size**

Penrose (1959) documents that bigger firms have both diverse capabilities and economies of scale that can positively influence performance. Also, larger firms can take advantage of their market power in both product markets and factor markets (Shepherd, 1986). Kumar (2004) confirms that firm size positively affect performance due to economies of scale,

skilled managers and employees, and market power while Ghosh (1998) states that bigger firms have better performance because they are able to diversify risk. Many studies, for example, those of Gleason et al. (2000), Aljifri and Moustafa (2007), Zeitun and Tian (2007), reveal a positive influence of firm size on performance.

By contrast, Williamson (1967) posits that bigger firms face the problems of distortion in communicating across hierarchical levels and if the goals are different among hierarchical levels, the control loss may be so severe that it can negatively affect firm performance. Sun, Tong, and Tong (2002) state that bigger firms may confront more redundancy, more government bureaucracy, and more agency problems, hence they operate less efficiently than smaller ones, especially in case of SOEs. The results of Forbes (2002), and Haniffa and Hudaib (2006) support these arguments: firm size negatively influences performance.

Himmelberg, Hubbard, and Palia (1999), Ghosh (2008) and Fosu (2013) contend that the influence of firm size on performance is unlikely to be linear. Thus, they include the squared term of firm size in their regression models. Their empirical results support the nonlinear relationship. They explain that while the benefits from diversification, economies of scale, etc. of large firms may enhance their performance, extravagant expansion of firms may generate more spreading of moral hazard that may harm firm efficiency.

This study uses the natural logarithm of total assets as an indicator for firm size since it is largely employed in corporate finance studies (Fan, Titman, & Twite, 2012; Ferri & Jones, 1979; Flannery & Rangan, 2006; Frank & Goyal, 2009; Pandey, 2004, etc.). The testable hypotheses for this variable are:

H_{C7a}: Firm size is likely to have an influence on firm performance.

H_{C7b}: There should be an inverted U-shaped relation between firm size and performance.

- **Foreign ownership**

Foreign ownership may benefit firms in some ways, especially for firms in developing countries. Foreign investors usually have good managerial abilities that could help firms improve their corporate governance if they become board members or outside large shareholders. Foreign investors in a firm may help the firm to monitor and control the firm's managers in order to deter the managers from opportunistic activities that likely impair the wealth of other shareholders (Choi, Sul, & Kee Min, 2012). The participation of foreign

investors in a firm may benefit the firm in some facets. For example, when investing in a firm foreign shareholders necessitate high standards of disclosing information and complying with accounting regulations, thereby reducing the firm's problem of asymmetric information. In addition, foreign investors can transfer new, advanced knowledge, and useful firm-specific assets such as technology and equipment. Moreover, foreign ownership may support firms in accessing to the network of foreign markets (Kimura & Kiyota, 2007). However, when foreign ownership is at a high level, firm performance may be negatively affected. Choi et al. (2012) argue that when the level of foreign ownership increases, foreign investors may exert their controlling power to adjust decisions of managers, thereby benefiting themselves. In other words, when foreign ownership is at reasonable level, it can enhance firm efficiency through monitoring role in internal corporate governance; when too high, it may harm firm efficiency because of overly controlling.

Many empirical studies reveal a positive effect of foreign ownership on performance. The results from Khanna and Palepu (1999) show that whereas foreign institutional investors enhance performance of Indian firms; high proportion of domestically institutional ownership inversely affects firm performance. They conclude that foreign institutional investors are good monitors in the context of a developing country. Douma, George, and Kabir (2006) confirm that foreign ownership positively influences the performance of Indian firms. Kimura and Kiyota (2007) examine firms located in Japan and point out that foreign-owned firms outperform domestically-owned counterparts since advanced firm-specific assets from foreign investors help to improve firm performance. A study on firms in Taiwan again shows a positive influence of foreign ownership level on performance (Huang & Shiu, 2009). The authors contend that this effect is due to the monitoring role of foreign ownership. Ongore (2011) uses the data of the Kenyan listed firms to analyze the relation of different types of ownership and performance. The findings reveal that state ownership negatively affects performance while foreign ownership positively influences performance. The author states that foreign shareholders support firms to improve their governance systems as well as expand their product markets and access international resources markets. The study of Pervan, Pervan, and Todoric (2012) on Croatian listed firms and that of Wellalage and Locke (2012) on Sri Lankan listed firms again proves a positive influence of foreign ownership on performance.

On the other hand, there have been many empirical studies showing a non-monotonic link between these two variables, thereby supporting the arguments that too high level of foreign

ownership may negatively affect performance. For example, the studies of Gurbuz and Aybars (2010) on Turkish firms during 2005-2007, Choi et al. (2012) on Korean listed firms from 2004 to 2007, Azzam, Fouad, and Ghosh (2013) on Egyptian firms within 2006-2010, and Greenaway, Guariglia, and Yu (2014) on a large sample of 21582 unlisted companies in China from 2000 to 2005 indicate that firm performance initially increases along with foreign ownership, but it starts decreasing when foreign ownership level reaches a certain level (64% in the study of Greenaway, Guariglia, and Yu, for example).

The foreign ownership variable in this study is calculated by the percentage of common stocks seized by foreign investors. The hypothesis for the foreign ownership-performance relation is described as follows.

H_{C8a}: Foreign ownership is likely to have an impact on firm performance.

H_{C8b}: There should be an inverted U-shaped link between foreign ownership and performance.

- **State ownership**

The property rights theory predicts that firms without state ownership perform better than SOEs when they operate in a competitive economy, and SOEs do not take externalities (Alchian & Demsetz, 1972). Shleifer (1998) argues that SOEs suffer from high agency cost, due to low quality of corporate governance; hence, this kind of ownership has an inverse impact on the performance of SOEs. Additionally, the governmental investment may have some objectives that are different from the goal of wealth maximization of other shareholders. They may concentrate on social (e.g. increasing employment) or political goals (e.g. protecting domestic sectors of the economy). Shleifer and Vishny (1994) find that firms controlled by the state tend to employ additional labor and produce goods which satisfy the desire of the state rather than the need of markets. In other words, state investors may have non-profitable goals, which could conflict with other shareholders' aims (Mak & Li, 2001). There has been empirical evidence supporting these arguments. Boardman and Vining (1989) report that private-owned firms perform better than their state-owned counterparts. Thomsen and Pedersen (2000), using the data of 435 largest European firms to analyze the relationship between many types of ownership and performance indicate that state ownership inversely influences firm performance. Alfaraih, Alanezi, and Almujamed (2012) using a

sample of 134 listed firms on the Kuwait Stock Exchange in 2010 find a similar result about an inverse influence of firms' governmental ownership on performance.

Apart from the negative effects due to agency problems, firms with governmental shareholders may have some advantages that may enhance their performance. Firth, Lin, and Wong (2008) posit that state ownership helps firms approach loans from banks easily. Moreover, firms with state ownership may receive favours and privilege such as tax preferences from the government. For example, Le and Buck (2011) find a positive relation between governmental ownership and performance. These authors explain that governmental ownership might help firms to control managers, and the government may implement policies that favour firms with state ownership such as tax preferences.

A positive relation between partial state ownership and performance is found in the study of Sun et al. (2002). Their further examination reveals that state ownership-performance relationship has an inverted U-shaped form. State ownership seems to be "optimal" at a certain proportion. Too low level of state ownership means too little support from the government while too much state ownership implies too much control and interfere in operations of firms. Both two extreme states may harm firm performance (Sun et al., 2002). Wei and Varela (2003), Tian and Estrin (2008), Ng, Yuce, and Chen (2009), Gunasekarage, Hess, and Hu (2007), Yu (2013) carry out studies using data of Chinese firms and they find a U-shaped relation between these two variables. They then posited that firms with a high proportion of governmental ownership increase their performance due to government support and political linkages.

The state ownership variable in this study is defined by the percentage of common stocks seized by the government. The hypothesis for the state ownership-performance relation is presented as follows.

H_{C9a}: State ownership is likely to have an effect on firm performance.

H_{C9b}: There should be an inverted U-shaped relation between state ownership and performance.

- **Firm age**

Age of a firm may also affect firm performance. Stinchcombe (1965) suggests that through learning and training, older firms have more experiences and may avoid the "liabilities of newness". Conversely, Marshall (1920) argues that older firms may be more inertial and

rigid. Hence, they are unlikely to have the flexibility to adjust to the changes in the surrounding environment rapidly. Szulanski (1996) and Boeker (1997) posit that older firms tolerate rigidities of their routines, blindness and conservatism. Therefore, older firms are likely to perform worse than younger and more agile counterparts. The studies of Majumdar (1997) and Majumdar and Chhibber (1999) confirm the opinion of Marshall (1920) that age of firm is inversely associated with performance. As mentioned above, firm age may influence firm performance, but the question of whether the impact of firm age on firm performance is positive or negative has been unanswered in previous empirical studies. Thus, the hypothesis for the firm age-performance relation is proposed as follows.

H_{C10}: There should be a relation between the age of a firm and its performance.

In this study, firm age is used as a control variable and considered as an exogenous variable.

- **Year dummies**

Year dummies are employed in all the regression models as control variables to capture any time-related events such as market fluctuations or macroeconomic conditions (e.g. demand shocks, inflation, stock crash, and other macroeconomic factors) that are not included in the models. These time-related effects are common for all firms and can vary over time. In accordance with Wintoki et al. (2012), year dummies are treated as exogenous variables.

Table 3.2 presents the definitions and abbreviations of the dependent and independent variables used for the causal relation between leverage and firm performance.

Table 3.2: Definitions of the variables for the causal relationship

Variables	Abbreviations	Definitions
Dependent variables		
Tobin's Q	*tobinq*	The ratio of the sum of market value of equity and book value of debt to book value of total assets.
Independent variables		
Lagged dependent variable		
Lag of tobinq	*l.tobinq*	One-year lag of Tobin's Q.
Capital structure variables		
Book value of leverage	*bktdta*	The ratio of book value of total debt to book value of total assets.
Market value of leverage	*mktdta*	The ratio of book value of total debt to market value of total assets. This ratio is used for robustness check.
Firm-specific variables		
Tangibility	*tang*	The ratio of tangible fixed assets to book value of total assets.
Growth opportunities	*growth*	Annual percentage changes of book value of total assets.
Cash flow	*cashflow*	The ratio of earnings after tax plus depreciation and amortization to book value of total assets.
Liquidity	*liquid*	The ratio of cash and cash equivalents to book value of total assets.
Firm size	*size*	Natural logarithm of book value of total assets.
Foreign ownership[20]	*foreign*	Percentage of common stocks held by foreign investors.
State ownership[21]	*state*	Percentage of common stocks belongs to the government.
Control variables		
Firm age	*lnage*	Natural logarithm of the number of years since the establishment of the firm to the observed year.
Year dummies	*year*	Year dummies for eight years from 2010 to 2017.

[20] Due to the unavailability of the data, the foreign ownership variable is only included in the model specifications of Vietnamese firms.
[21] Similarly, the state ownership variable is only applied in the model specifications of Vietnamese firms.

3.3.2 Variables and hypotheses of the reverse causality

3.3.2.1 Dependent variables

Several measures are employed as proxies for firms' financial leverage in the corporate finance literature. Some studies utilize the ratio of total liabilities to total assets as an indicator for capital structure. However, Rajan and Zingales (1995) claim that this measure tends to exaggerate leverage level because it includes accounts payable, which are usually exploited for trading transaction other than for funding. Hence, they suggest that total debt to total assets ratio could be a better indicator for financial leverage of firms.

Additionally, another issue relating to the measures of financial leverage is the choice between book leverage or market leverage. Myers (1977) indicates that managers pay more attention to book leverage because assets in place of firms support debt better than their growth opportunities do. On the contrary, market leverage is unfavoured since its value depends greatly on the fluctuation of financial markets; thus, it is believed by managers that market leverage is not reliable enough to be considered as guidance for financing policies of firms. According to the findings from the study of Graham and Harvey (2001), almost all managers state that they do not adjust financial leverage as a reaction to the fluctuation of stock markets. This thesis uses both book and market leverage as measures for firms' financial leverage. Book leverage (including total, short-term, and long-term book leverage) is mainly employed as measures for debt level while market leverage is used for robustness check.

3.3.2.2 Independent variables

- **Firm-specific regressors**
  - **Lagged dependent variable**

As stated by Wooldridge (2009), including lagged regressand as a regressor helps to decline omitted-variable biases. Additionally, Flannery and Hankins (2013), and Wintoki et al. (2012) indicate that the appearance of the lag of the regressand in regression models also supports to deal with potential "dynamic panel bias". Bond (2002, p. 142) points out that even "when coefficients on lagged dependent variables are not of direct interest, allowing for dynamics in the underlying process may be crucial for recovering consistent estimates of other parameters".

In this study, the one-year lagged leverage is employed as a regressor for some purposes. First, it is employed to account for the dynamic process of financing decisions. Second, the inclusion of the lagged regressand supports to determine whether there are optimal leverage levels for firms in Singapore, Thailand and Vietnam. Finally, in the case that there is optimal leverage, at which speed those firms adjust their leverage to target. The hypothesis is as follows.

H_{R1}: There is target leverage and firms adjust their debt level to the target.

- **Firm performance**

This thesis employs Tobin's Q as a measure for firm performance to check whether firms' performance affects their capital structure. The theoretical prediction about the impact of firms' performance on capital structure is ambiguous. According to the trade-off theory, higher profitable firms confront lower financial distress and bankruptcy costs. In addition, debt tax shield in those firms is more valuable. Those firms possibly have more ability to issue debt and more taxable income to shelter. Additionally, using debt as a monitoring tool may lessen the problems of excess cash flow (Jensen, 1986). From this viewpoint, a positive link between performance and debt level is expected. As mentioned in Section 2.3, the efficiency-risk hypothesis supposes that firms with higher performance use more debt than other firms because higher efficiency declines the potential financial distress costs. According to this hypothesis, at any given leverage level, more efficient firms create higher expected returns. (Berger & Patti, 2006). Higher returns, in turn, replace for equity capital to protect firms from portfolio risk. Consequently, higher efficient firms are in a more favorable situation to employ more debt instead of equity.

Conversely, the pecking order theory suggests that firms prioritize inside financing sources over outside sources. Firms that are more profitable possibly borrow less because they can internally generate funds. Hence, an inverse influence of performance on debt level is predicted. Additionally, the franchise-value hypothesis introduced by Berger and Patti (2006) also anticipates an inverse relationship since it posits that high-performance firms tend to retain more earnings to protect their future income or franchise value.

Empirical studies reveal mixed findings but in general, most of them find an inverse influence of firm performance on debt ratios (for example, see Booth et al., 2001; Chen, 2004; Kester, 1986; Michaelas, Chittenden, & Poutziouris, 1999; Rajan & Zingales, 1995;

Titman & Wessels, 1988; Wald, 1999; Wiwattanakantang, 1999). Therefore, the hypothesis for this relationship is proposed as follows.

H_{R2}: There should be a negative effect of firm performance on financial leverage.

- **Tangibility**

Tangible assets of firms are intimately correlated with agency costs of debt and financial distress costs (Myers, 1977). Due to the existence of asymmetric information, lenders usually necessitate collateral to guarantee their loans. Tangible assets can be considered as an indicator for the availability of collateral because they are easily collateralized and lose small value in the case firms go into financial difficulties. Moreover, in the case of liquidation or bankruptcy, tangible assets usually have a higher value than intangible assets. Thus, lenders generally require a lower risk premium. In other words, it is more advantageous for firms with large investment in the form of tangible assets (for example, land, and equipment) because these firms bear lower financial distress costs than firms that rely heavily on intangible assets. Also, firms with higher tangibility ratio confront fewer agency costs of debt because it is not easy for stockholders to substitute highly risky assets (e.g. intangible assets) for low-risk ones (e.g. tangible fixed assets). Consequently, a positive impact of tangibility on leverage is predicted. Prior empirical studies generally have revealed results supporting the trade-off theory and the agency theory that tangibility positively influences firms' financial leverage (for example, see Akhtar, 2005; Akhtar & Oliver, 2009; Deesomsak et al., 2004; Marsh, 1982; Rajan & Zingales, 1995; Titman & Wessels, 1988).

By contrast, the pecking order theory anticipates an inverse relationship. Harris and Raviv (1991) argue that firms with lower tangibility ratio may have a higher level of asymmetric information. Hence, those firms are likely to raise their debt over time. In other words, firms with larger tangible assets suffer less from the problem of asymmetric information. Employing equity in such firms as a financing source is less costly, thus leading to a positive (negative) relation between tangibility and equity (debt). Several studies support the negative impact of tangibility on leverage (for example, see Bauer, 2004; Ferri & Jones, 1979; Mazur, 2007). However, the common prediction about this relationship is positive. Frank and Goyal (2007b) confirm that a positive relation is reliable. Thus, the hypothesis for the tangibility-leverage relation is proposed as follows.

H_{R3}: There should be a positive relation between firms' tangibility and financial leverage.

- **Growth opportunities**

The pecking order theory argues that firms with more investment opportunities – keeping profitability constant – may increase their debt level over time. It is because when the internal funding sources from profit remain unchanged, firms need to invoke outside sources to finance their increasing investment opportunities. If this is the case, debt is the second-best choice after retained earnings. Therefore, growth opportunities are predicted to put a positive impact on leverage. Some empirical findings show a positive relation between firm growth and debt ratios (for example, see Baskin, 1989; Chen, 2004; Viviani, 2008).

Conversely, the trade-off theory posits that growth opportunities negatively influence leverage because in the case of going into financial distress, firms with more growth opportunities will lose their value more. The agency theory also suggests a negative association between growth and debt due to several reasons. First, the problems of underinvestment are likely to be more severe for firms with more investment opportunities. Specifically, firms financed by risky debt have motives to ignore positive-NPV projects which may positively contribute to firms' market value since the shareholders bear all costs of those projects but not receive the entire increasing value of firms; some of this value goes to debtholders (Myers, 1977). Second, in firms with high growth rate, the issues of "asset substitute" become more frequent. In other words, shareholders easily raise investment risk, but it is not easy for debtholders to recognize the changes. Hence, using debt is more costly for those firms. From the viewpoint of the free cash flow theory, Jensen (1986) indicates that high growth firms confront fewer agency costs of free cash flow, thus resulting in an expectation that those firms employ less debt.

Theoretically, both the trade-off theory and the agency theory anticipate an inverse relation between growth opportunities and leverage level. The empirical findings from Akhtar and Oliver (2009), Barclay, Smith, and Morellec (2006), Buferna, Bangassa, and Hodgkinson (2005), Flannery and Rangan (2006), Frank and Goyal (2003), Goyal, Lehn, and Racic (2002), Myers (1977), Rajan and Zingales (1995), and Smith Jr and Watts (1992) reveal an inverse influence of growth opportunities on firms' financial leverage. The hypothesis, hence, is formulated as follows.

H_{R4}: There should be an inverse relation between firms' growth opportunities and financial leverage.

- **Cash flow**

Managers of firms with excessively free cash flow may decide to finance for inefficient projects or spend on organizational inefficiency such as management perquisites (Jensen, 1986). Debt, in this case, is an effective solution to mitigate the over-investment problems and hence, reduce the so-called "agency costs of free cash flow". Consequently, it is expected that firms with more free cash flow may have a higher debt level.

According to the pecking order theory, firms preferentially utilize internally generated financing resources over debt. Consistent with this theory, the association between the ability of firms to create financial resources and financial leverage is inverse (Baskin, 1989; Bathala, Moon, & Rao, 1994; Jensen, Solberg, & Zorn, 1992; John, 1993). Although profit is often used as an indicator for firms' ability to produce internal financing resources, De Miguel and Pindado (2001) suggest that cash inflow is the most appropriate variable. The hypothesis for the cash flow-leverage relation is as follows.

H_{R5}: There should be a relation between firms' cash flow and debt level.

- **Liquidity**

The pecking order theory indicates that there are two reasons that could explain why firms with more liquid assets are likely to borrow less. First, those firms have more inside financial sources available to fund their projects. Second, since high liquidity implies less asymmetric information, they are in a more favorable position to issue shares if they require outside financing sources.

However, the trade-off theory and the agency theory anticipate a positive influence of liquidity on leverage level. Specifically, firms with more liquid assets suffer less from liquidation costs, thus allowing them to borrow more. From the viewpoint of the agency theory, more liquid assets, especially in the form of free cash flow, are likely to result in the agency problems as denoted above. Thus, those firms tend to utilize more debt to reduce managers' opportunistic activities. Because the theoretical predictions about the impact of liquidity on debt level are opposite, the hypothesis is presented as follows.

H_{R6}: Liquidity is expected to have an effect on debt level.

- **Non-debt tax shield**

Non-debt tax shield can be considered as a good substitute for debt in respect of avoiding taxation (DeAngelo & Masulis, 1980). In other words, non-debt tax shield is a reverse proxy for the effect of tax on firms' debt ratios (Frank & Goyal, 2009). Kim and Sorensen (1986) find that an increase in depreciation expenses reduces the requirement of debt tax shield. According to Bradley et al. (1984), Fama and French (2002), and Titman and Wessels (1988), non-debt tax shield is measured by the ratio of annual depreciation plus amortization expenses to total assets. This variable is predicted to have an adverse effect on leverage.

H_{R7}: There should be an inverse influence of firms' non-debt tax shield on financial leverage.

- **Firm size**

According to the trade-off theory, firm size is anticipated to positively affect leverage since bigger firms are more likely to benefit from their higher level of diversification, lower liquidation risk, more stable cash flow, higher reputation and creditworthiness. Consequently, those firms suffer fewer agency costs of debt in comparison with smaller ones. Frank and Goyal (2007b) indicate that cross-sectional studies of the effect of size on debt level find a robustly positive relationship. They conclude that bigger firms tend to employ more debt. Empirical findings supporting the positive relationship include those of Akhtar and Oliver (2009), Booth et al. (2001), Deesomsak et al. (2004), Fama and French (2002), Huang and Song (2006), Taub (1975), and Wald (1999) among others.

The pecking order theory anticipates that firm size and debt level should be inversely associated since bigger firms are also mature firms and are better recognized. Therefore, these firms bear lower adverse selection and may more easily raise funds by issuing equity in comparison with smaller firms in which the problems of adverse selection are severe. Rajan and Zingales (1995) suggest an inverse relation between firm size and debt level by arguing that size may be considered as an information proxy for outside investors and bigger firms have lower asymmetric information. Consequently, larger firms may be in a better situation to issue equity, which is more informationally sensitive, in comparison with their smaller counterparts. The studies of Chen (2004), Ebel Ezeoha (2008) show the results that support the negative firm size-leverage association.

Since the theoretical predictions and previous empirical results about the influence of firm size on debt levels are contradictory, the hypothesis is proposed as follows.

H_{R8}: There should be a relation between firm size and debt level.

❖ **Country-level variables**

Demirgüç-Kunt and Maksimovic (1998) and De Jong et al. (2008) corroborate that country-level characteristics, along with firm-specific factors, are important determinants of leverage. While Cheng and Shiu (2007) state that institutional variables are at least as relevant as firm-specific factors in explaining debt level of firms in developing countries, Frank and Goyal (2003) emphasize that firm-specific factors can account only for about 30% of factors that determine the financial leverage of firms. This is supported by Bokpin (2009), who argue that country-level factors and their interaction with firm-specific characteristics also explain the financing decisions of firms. Specifically, both institutional quality and macroeconomic conditions are external factors of firms and can influence firm leverage. For example, firms operating in economies with poor institutional quality are likely to have more agency-related problems, which force them to utilize more debt in order to lessen the opportunistic behavior of managers. If the institutional quality is poor and cannot protect the rights of creditors, creditors tend to charge higher interest rates as compensation for risk. The higher interest rates, in turn, restrain firms from using debt sufficiently to reduce agency problems and opportunistic actions of managers. Unstable and unfavorable macroeconomic conditions such as wide variation in GDP growth, inflation, etc. may also affect firms' leverage choices. For instance, firms may adjust their debt level more easily since their adjustment costs are likely to be lower in good macroeconomic states than in bad states (Frank & Goyal, 2009). Hackbarth, Miao, and Morellec (2006) affirm that macroeconomic states may strongly affect firms' debt ratios.

As indicated by the trade-off theory, firms compare the tax-saving benefits of debt and financial distress and bankruptcy costs when deciding their leverage. In the meantime, both advantages and costs of debt adhere to macroeconomic conditions. Specifically, the tax benefits of debt are affected by cash flow level that in turn, may depend on whether the economy is in a growth state or a decline stage. Potential bankruptcy costs are influenced by the possibility of default, which may also be subject to a specific state of the economy. Consequently, fluctuations in macroeconomic conditions may lead to variations in optimal debt ratios.

- **GDP growth**

Growth of a country's economy has been commonly considered as a proxy for firm growth, which in turn becomes an indicator for firms' investment opportunities, and hence their

financing needs (Demirgüç-Kunt & Maksimovic, 1998; Smith Jr & Watts, 1992). However, there has been no consensus on whether the influence of economic growth on firms' debt level is positive or negative in both theory and empirical findings. Some authors (for example, see Booth et al., 2001; Dang, 2013; De Jong et al., 2008; Demirgüç-Kunt & Maksimovic, 1996; Frank & Goyal, 2009) find that economic growth positively influences debt ratios. This positive relationship is explained that increases in gross domestic products reflect a favorable business environment, which may improve the borrowing ability of firms in the future. In other words, firms in countries with higher economic growth rates may borrow more to fund their future investment opportunities (De Jong et al., 2008). Dang (2013) contends that in an economic downturn, firms employ less debt because of the decline of their net worth and collateral value, i.e. pro-cyclical.

By contrast, some authors claim that there is a negative relation between economic growth and firms' leverage level. The reason is that economic growth is an indicator of the availability of growth opportunities of firms, which may increase firm earnings and free cash flow (Demirguc-Kunt & Maksimovic, 1996). As suggested by the pecking order theory, firms prefer inside financial sources to debt. Therefore, economic growth is inversely related to firms' debt level. Frank and Goyal (2009) affirm the inverse relationship and also indicate that in the expansion stage of an economy if firm profits increase, conflicts between shareholders and managers decreases. Thus, firms are likely to reduce their leverage level.

Following Frank and Goyal (2009), and Dang (2013), the current study uses the annual growth rate of real GDP as a barometer for economic growth. The expected sign of the relation between GDP growth rate and leverage of firms is hypothesized as follows.

H_{R9}: There should be an inverse effect of economic growth on firms' financial leverage.

- **Inflation**

The relationship between inflation and firm leverage has been one of the central concerns in the recent corporate finance literature (Kim & Wu, 1988). Inflation rate is often employed as an indication for the capacity of government to govern a country's economy; it also conveys information about the long-term stability of a currency system (Demirgüç-Kunt & Maksimovic, 1999). Feldstein, Green, and Sheshinski (1978), DeAngelo and Masulis (1980), and Hochman and Palmon (1985) theoretically present that in general, inflation

positively influences firms' debt level since the real interest rate (i.e. the real cost of debt) decreases when the economy undergoes an inflationary period.

By contrast, Schall (1984) contends that because of the impact of inflation, the net returns of both bonds and shares decline but the real after-tax returns on debt (and bonds) are relatively lower than those on shares. Consequently, investors tend to replace bonds by shares; thus, the aggregate debt level is likely to decrease.

The empirical results are different. Some researchers find a positive effect of inflation on leverage while others observe negative or no relationship. For example, the studies of Frank and Goyal (2009), Sett and Sarkhel (2010), Hanousek and Shamshur (2011), Lemma and Negash (2013) reveal positive association. Conversely, Booth et al. (2001) show that higher inflation rate results in a decline of both long-term and total debt ratios. Gajurel (2006) find that inflation inversely affects total and short-term debt ratios, but positively impacts long-term leverage. Bokpin (2009) and Camara (2012) obtain an inverse relationship, and they argue that high inflation increases the cost of using external financing sources. Hence, firms invoke internal funds. Among others, Bastos, Nakamura, and Basso (2009) document that inflation does not affect firm leverage.

The hypothesis for the relation between inflation and leverage of firms is stated as follows.

H_{R10}: There should be an association between inflation rate and firms' financial leverage.

- **Stock market development**

Demirgüç-Kunt and Maksimovic (1998) state that it is more favorable for firms to access outside long-term financing sources when financial markets and intermediaries are well-developed and active. Demirgüç-Kunt and Maksimovic (1996) examine the association between the development of financial markets and financial leverage of firms in 30 countries during the 1980-1991 period and report a negative relationship. They then argue that the development of stock markets supports firms to issue shares more easily. Additionally, it is easier for investors to buy shares and become owners of firms when the liquidity of stock markets increases. This leads to the use of more equity than debt of firms.

Nonetheless, they mark that in some transitional economies, the impact of the development of stock markets on leverage is not direct and unlike that in developed economies. These authors find that the development of stock markets in developing economies positively

affects debt ratios due to the diversification of business risk and the reduction of asymmetric information. This results in a tendency that firms borrow more because the cost of debt is lower than that of equity.

Other studies examining the impact of stock market development on debt level find different results. For example, while Gajurel (2006), Dincergok and Yalciner (2011) find a positive relation, Sett and Sarkhel (2010) report a negative association, and Bokpin (2009) shows no relationship between these two variables.

In this study, the ratio of stock market capitalization to GDP is used as a measure for the development of stock markets. This indicator is most commonly employed in previous studies (for example, Demirguc-Kunt & Levine, 1996; Pagano, 1993; Lemma & Negash, 2013). It is also considered as a measure for the capacity of stock markets in allocating financial capital and providing considerable chances to diversify risks for investors (Demirgüç-Kunt & Maksimovic, 1996). The hypothesis for the relation between stock market development and leverage of firms is described as follows.

H_{R11}: There should be a relation between the development of stock markets and firms' financial leverage level.

- **Country governance quality variables**

The agency problem is one of major factors that affect leverage decisions of firms as suggested by corporate finance theory. However, firms' agency-related costs are not only subject to firm-specific characteristics but also to the institutional environment where firms operate. Since institutional environment differs among countries, firms' leverage in a cross-country study may vary across both countries and firms (Demirgüç-Kunt & Maksimovic, 1999). Intuitively, a higher level of country's governance quality may results in a lower level of agency problem that, in turn, influences firms' financial leverage.

In order to account for the potential influence of country governance quality on firms' debt level, this study employs several indicators largely used in cross-country comparative studies. They are the Worldwide Governance Indicators, which are introduced by Kaufmann et al. (2011). These indicators measure six facets of country-level governance of 212 countries and territories from 1996. Kaufmann et al. (2011) posit that these indicators make cross-country comparisons more meaningful. This thesis, adapting the approaches of Knudsen (2011) and Essen, Engelen, and Carney (2013), utilizes three indices (i.e. Government Effectiveness,

Regulatory Quality, and Rule of Law) which appear to be closely related to firm operations. These indexes are standard normal variables with zero mean, unit standard deviation, and range from –2.5 to 2.5 where a higher figure means better country governance quality.

Following Knudsen (2011), the three indices mentioned above are summed to generate an aggregate indicator (abbreviated as *cgindex1*)[22] for the country governance quality. Additionally, the other two indicators are used for the robustness check of the study's main results. First, in line with Globerman and Shapiro (2002), Öztekin and Flannery (2012), the current study applies a factor analysis to create another aggregate indicator (abbreviated as *cgindex2*) by calculating the first principal component of the three indexes. Second, following Van Essen, Engelen, and Carney (2013), the Strength of Investor Protection Index[23] (denoted as *cgindex3*) is employed as another proxy for country governance quality.

Consistent with Aslan and Kumar (2014), the country governance quality variables are considered as exogenous factors. The hypothesis is stated as follows.

H_{R12}: Country governance quality is likely to have an inverse effect on firm leverage.

❖ **Other control variables**

This study uses firm age and year dummies as control variables when analyzing the reverse causality. Similarly, as in Subsection 3.3.1.2, both of them are treated as exogenous factors.

- **Firm age**

Financing sources of firms have linkage with business life cycles (Berger & Udell, 1998). This means that in different stages of a business life cycle (e.g. developing or maturing stages), the main sources of funds of firms are different. For instance, while mature firms tend to employ more debt, developing firms usually depend on equity because it is difficult for them to raise debt. Kimhi (1997) posits that in the early stages of firms, their abilities to raise debt is limited. Hence, those firms mostly rely on financing sources from personal savings, loans from families, relatives, or friends. Nonetheless, debt becomes important funding sources as firms grow until they are sufficiently mature to be able to access the

[22] Specifically, *cgindex1* = government effectiveness index + regulatory quality index + rule of law index.
[23] This index is constructed by Doing Business Project (the World Bank) and it presents the strength of investor protection by law in terms of restraining misbehavior of inside managers and major shareholders for their self-interests. The scale is from zero (worst) to ten (best).
https://tcdata360.worldbank.org/indicators/h2e15b0d6?indicator=647&viz=line_chart&years=2007,2017

public issue market (Berger & Udell, 1998). Giannetti (2003) also indicates that mature firms with good credit records and performance are likely to utilize more debt.

Following Michaelas et al. (1999), among others, firm age is measured by the natural logarithm of the number of years since the firm's establishment to the observation date. The following hypothesis is proposed.

H_{R13}: There should be a positive effect of the age of a firm on its financial leverage level.

Table 3.3 summarizes the definitions and the abbreviations of the variables used in the analysis of the reverse causality from performance to debt ratios.

Table 3.3: Definitions of the variables for the reverse causal relationship

Variables	Abbreviations	Definitions
Dependent variables		
Book value of leverage	*bktdta*	The ratio of book value of total debt to book value of total assets.
	bkstdta	The ratio of book value of short-term debt to book value of total assets.
	bkltdta	The ratio of book value of long-term debt to book value of total assets.
Market value of leverage. The three ratios of market leverage are used for robustness check	*mktdta*	The ratio of book value of total debt to market value of total assets.
	mkstdta	The ratio of book value of short-term debt to market value of total assets.
	mkltdta	The ratio of book value of long-term debt to market value of total assets.
Independent variables		
Lagged dependent variable		
Lag of book leverage	*l.bktdta*	One-year lagged book leverage ratio.
Lag of market leverage	*l.mktdta*	One-year lagged market leverage ratio.
Firm performance variable		
Tobin's Q	*tobinq*	*See Table 3.2*
Firm-specific variables		
Tangibility	*tang*	*See Table 3.2*
Growth opportunities	*growth*	*See Table 3.2*
Cash flow	*cashflow*	*See Table 3.2*
Liquidity	*liquid*	*See Table 3.2*
Non-debt tax shield	*ndts*	The ratio of depreciation plus amortization to book value of total assets.
Firm size	*size*	*See Table 3.2*
Country-level variables		
Country governance quality	*cgindex1*	cgindex1 is the sum of the three indexes (i.e. Government Effectiveness, Regulatory Quality, and Rule of Law).
	cgindex2	cgindex2 is the first principal component of three indexes extracted from the factor analysis technique.
	cgindex3	cgindex3 is the Strength of Investor Protection Index. The last two indexes are used for robustness check.
GDP growth	*gdpgrowth*	Annual growth rate of real GDP.
Inflation rate	*inflation*	Annual percentage changes in consumer price index.
Stock market development	*smd*	Market capitalization value of listed domestic companies (% of GDP).
Control variables		
Firm age	*lnage*	*See Table 3.2*
Year dummies	*year*	*See Table 3.2*

3.3.3 Model specifications

3.3.3.1 Model specifications for the causal relationship

Endogeneity is a serious issue in corporate finance empirical research since it is hard to find exogenous variables or to conduct natural experiments when analyzing the relation between capital structure and performance. Roberts and Whited (2013, p. 494) state that "Endogeneity leads to biased and inconsistent parameter estimates that make reliable inference virtually impossible." Omitted variables, simultaneity, and measurement errors are three potential sources of endogeneity that are widely acknowledged in empirical corporate finance studies. Another source that may result in endogeneity problem is the possibility that current financial leverage may be a function of historical performance (as indicated explicitly in the pecking order theory). Wintoki et al. (2012) claim that ignoring this kind of endogeneity can lead to unreliable implications when inferring regression results[24]. They also emphasize that although the fixed-effects estimator possibly mitigates the bias caused by unobservable heterogeneity (omitted-variables problem), it relies on a strict assumption of exogeneity of regressors. Specifically, the fixed-effects estimator presumes that current values of regressors (e.g. capital structure) do not depend on past values of regressand (e.g. performance). This assumption is highly likely to be unrealistic, especially in corporate finance research (Wintoki et al., 2012).

In order to deal with "dynamic endogeneity" issue, the appropriate empirical model specification should not be in a "static" form, but a dynamic form. In such a dynamic model, the lagged dependent variable (firm performance in this case) is used as a regressor. Additionally, in terms of statistical evidence, if there exists a first-order serial correlation in the idiosyncratic disturbance term of the "static" model (i.e. a model without lagged values of the regressand on the right-hand side of the regression equation), this static model is likely to be misspecified, and its estimates are inefficient. Therefore, the general model specification used to examine the leverage-performance relationship can be considered as an autoregressive model and illustrated by the following equation:

$$FP_{it} = \alpha_0 + \alpha_1 FP_{i,t-1} + \alpha_2 LEV_{it} + \sum_{k=1} \beta_k X_{k,it} + \mu_i + \eta_t + \varepsilon_{it} \qquad (3.1)$$

[24] Although Wintoki et al. (2012) focus on the relation between board of directors (i.e. corporate governance variables) and firm performance, they also find that other firm-specific factors including growth opportunities, risk, diversification, and leverage are dynamically endogenous.

Where FP_{it} stands for performance (measured by *tobinq*) of firm *i* in year *t*; $FP_{i,t-1}$ is the one-year lag of firm performance; LEV_{it} is the leverage level of firm *i* in year *t*; *X* is a vector of the regressors as described in Subsection 3.3.1.2 and summarized in Table 3.2; α_0 is the constant term; α_1, α_2, and β_k are unknown coefficients to be estimated; μ_i denotes time-invariant unobserved firm-specific effects (for example, managerial ability, reputation, etc.); η_t is time-specific effects (for example, changes in macroeconomic policies, supply or demand shocks, etc.), which are the same for all firms but can vary over time; ε_{it} is the i.d.d random error term.

3.3.3.2 Model specifications for the reverse causality

According to the trade-off theory and the agency theory, firm has a target leverage ratio, and the firm's managers attempt to adjust debt ratios toward target. The target debt level, LEV_{it}^{*}, is assumed to be a function of a vector of firm-specific, country-level and time-variant variables as displayed in the following equation:

$$LEV_{it}^{*} = \sum_{k=1} \delta_k X_{k,it} + \mu_i + \eta_t + \epsilon_{it} \qquad (3.2)$$

Where *X* is a vector of *k* regressors as mentioned in Subsection 3.3.2.2; δ_k is unknown estimated coefficients, μ_i is time-invariant unobserved firm-specific effects; η_t is time-specific effects, which are the same for all firms but can vary from time to time; and ϵ_{it} is the i.d.d random error term.

Since factors determining the optimal debt ratio of a firm may change from time to time, the optimal debt ratio of this firm is likely to vary. Under ideal conditions (i.e. without transaction costs), the actual debt ratio of firm *i* at time *t* (LEV_{it}), should equal to its optimal leverage (i.e. $LEV_{it} = LEV_{it}^{*}$). Thus, the increase (or decrease) in the observed debt ratio from the preceding period to the current period should be precisely equivalent to the change that this firm needs to perform so that it reaches to the optimal leverage at time *t* (i.e. $LEV_{it} - LEV_{it-1} = LEV_{it}^{*} - LEV_{it-1}$). Nevertheless, as there exist adjustment costs, firms cannot adjust their debt ratios continuously. In other words, they may not adjust entirely but partially. Leary and Roberts (2005) confirm that on average, firms adjust their leverage once a year. This implies that firms may compare the costs of standing off the target with the adjustment costs when deciding whether or not to adjust their leverage (Hovakimian, Opler, & Titman,

2001; Ju, Parrino, Poteshman, & Weisbach, 2005). Consequently, firms adjust their leverage level with a specific adjustment magnitude, λ, to achieve the optimal leverage as represented in the following equation:

$$LEV_{it} - LEV_{it-1} = \lambda(LEV_{it}^{*} - LEV_{it-1}) \qquad (3.3)$$

If λ is higher than one, firms do not have target leverage. If λ equals one, the actual adjustment in leverage level exactly equal to the required adjustment, implying that there are no transaction costs of adjustment. If λ equals zero, firms do not change their debt level. This case may occur if adjustment costs are too high, or they are greatly higher than the costs of being off the target, thus firms keep their current leverage equal to the previous one (LEV_{it-1}). If λ is positive but less than one, firms have target leverage, and they modify their debt level over time.

Equation 3.3 equals the following equation:

$$LEV_{it} = (1 - \lambda)LEV_{it-1} + \lambda LEV_{it}^{*} \qquad (3.4)$$

The general model specification for the reverse causal relationship is obtained by substituting equation (3.2) into equation (3.4).

$$LEV_{it} = (1 - \lambda)LEV_{it-1} + \sum_{k=1} \lambda\delta_k X_{k,it} + \lambda\mu_i + \lambda\eta_t + \lambda\epsilon_{it} \qquad (3.5)$$

This general model specification is used to check (1) whether firms have a target capital structure; (2) how quickly they adjust their debt level to target; (3) how firms' performance affects their leverage choices, and (4) which firm-specific characteristics and country-level variables are the determinants of firms' capital structure.

3.3.4 Estimation approaches

As mentioned in Subsection 3.3.3.1 and 3.3.3.2, the relation between firms' financial leverage and performance should be examined in a dynamic context. Considering a dynamic panel model presented in the following equation:

$$Y_{it} = \alpha_0 + \alpha_1 Y_{i,t-1} + \sum_{k=1} \beta_k X_{k,it} + \mu_i + \eta_t + \varepsilon_{it} \qquad (3.6)$$

Hsiao (1985) states that estimating such a dynamic panel model using OLS estimation produces biased regression coefficients because μ_i is unobserved and could be correlated with other regressors in the models. Moreover, the correlation between the lagged regressand

and time-invariant unobserved firm-specific effects (μ_i) may lead to inconsistent estimates. Those effects can be eliminated by first-differencing, but the OLS estimation is still inefficient because $\Delta\varepsilon_{it}$ and $\Delta Y_{i,t-1}$ are correlated due to the correlation between $\varepsilon_{i,t-1}$ and $Y_{i,t-1}$. Additionally, the OLS technique relies on a strict exogenous assumption of all the regressors that are unrealistic in the case of financial leverage-performance relationship.

Bond (2002), and Wooldridge (2015) indicates that estimates produced by the fixed-effects estimator are also biased and inconsistent. Although the time-invariant effects (μ_i) are wiped out by the within-transformation of fixed effect approach, there exists correlation between the transformed lagged regressand ($Y_{i,t-1} - \bar{Y}_i$ where $\bar{Y}_i = \sum_{t=2}^{T} \frac{Y_{i,t-1}}{T-1}$) and the transformed error term ($\varepsilon_{it} - \bar{\varepsilon}_i$), and between the lagged regressand ($Y_{i,t-1}$) and the lagged value of the disturbance term ($\varepsilon_{i,t-1}$). Consequently, the fixed-effects estimator is inconsistent.

In order to cope with the issue of endogenous regressors (specifically, regressors that are correlated with the error term), instrumental variable (IV) methods are suggested. However, one problem arising when employing IV estimators is that it is difficult to find appropriate variables that can be employed as valid instruments[25]. With poor or invalid instruments[26], IV estimators also produce biased estimates, and they have no improvement over the OLS technique.

The different GMM estimator introduced by Arellano and Bond (1991) (henceforth referred to as the AB different GMM estimator) can rectify the inconsistency caused by the first-order process and endogenous regressors by using lagged values of both endogenous and exogenous variables as instruments. Nonetheless, Arellano and Bover (1995), and Blundell and Bond (1998), in their later studies, point out a possible weakness of the AB different GMM estimator that lagged levels are usually weak instruments for first differenced variables, thus inducing serious bias for finite samples, especially in the case when the variables are close to a random walk. They then introduce the system GMM estimator (henceforth referred to as the BB system GMM estimator), which utilizes a system including two equations: an equation in levels and another equation in differences. In the BB system GMM estimator, lagged differences are instruments for levels equation, and lagged levels

[25] Variables that are correlated with endogenous regressors but are not correlated with the error term.
[26] Variables that are exogenous, but weakly correlated with endogenous regressors.

are instruments for first differences equation[27]. Hence, the estimation may be more efficient as a consequence of the combination of moment conditions of both level equations and differenced equations (Roodman, 2009a).

Flannery and Hankins (2013) use simulation analyses to assess seven econometrics techniques[28], which are utilized to estimate dynamic panel models on datasets with various features. The results show that the BB system GMM estimator emerges to be the most appropriate choice when there is the presence of endogeneity. They conclude that the BB system GMM estimation is "reliable regardless of the level of endogeneity or dependent variable persistence and should be the default choice under these conditions, particularly if the lag coefficient is of interest" (Flannery & Hankins, 2013, p. 16).

Windmeijer (2005, p. 25) states that "estimated asymptotic standard errors of the efficient two-step system GMM estimator can be severely downward biased in small samples". The author thus suggests a finite-sample corrected estimate of variance to resolve the issue mentioned above. With Windmeijer's correction, the downward-biased issue is greatly reduced; the two-step system GMM estimator produces more accurate standard errors that make it slightly better than the cluster-robust one-step counterpart.

Since the BB two-step system GMM estimator have many strengths when compared to other estimators, this thesis applies the BB two-step system GMM estimation along with Windmeijer's bias correction to mitigate the problems relating to Nickell's bias, simultaneity, and time-invariant unobservable heterogeneity. Moreover, this estimator can deal with the autocorrelation of errors, heteroscedasticity in the error term, and measurement errors (Antoniou, Guney, & Paudyal, 2006).

In the BB system GMM estimation, instrumental variables are invalid if there exist second-order serial correlation (Flannery & Hankins, 2013). Therefore, it is important to conduct the Arellano-Bond test for autocorrelation of differenced errors (i.e. $E(\Delta\varepsilon_{it}\Delta\varepsilon_{i,t-2}) = 0$). The test is under the null hypothesis of no autocorrelation. In order to affirm the validity of the system GMM estimation, the null hypothesis of no first-order serial correlation in the first-

[27] The system GMM estimator relies on the assumption that first differences of instrumental variables for equation in levels are uncorrelated with unobservable firm-specific effects, implying that the differences of predetermined variables can serve as instrumental variables for equation in levels.
[28] They include OLS, fixed effects, different GMM, system GMM, four-period long differencing, longest differencing, and least squares dummy variable correction estimator.

differenced errors is expected to be rejected, while the null hypothesis of no second-order serial correlation should not be rejected at any significance levels. The underlying idea for this test is that bygone values of the regressand beyond certain lags, which are used to cope with the dynamic relation, are valid instruments since they are exogenous to the current value of the regressand (Wintoki et al., 2012).

Another issue relating to the validity of instrumental variables is that they should not correlate with the disturbance term (i.e. the instruments must be exogenous). If the instruments are endogenous, they then are invalid. To examine the joint validity of the instrumental variables (i.e. their exogeneity), the Hansen-J test is employed since it is usually considered as a standard test after using the system GMM estimator (Baum & Christopher, 2006; Roodman, 2009a). Additionally, the difference-in-Hansen test is also utilized to check the validity of instrument subsets.

3.4 SUMMARY

Based on the five criteria of the sample selection, a balanced panel dataset including 574 firms during the period from 2010 to 2017 with 4592 firm-year observations is collected. In the regressions of performance on leverage, six firm-specific variables, which are largely utilized in the corporate finance literature, are employed (except for Vietnamese sample where there is an inclusion of the foreign and state ownership variable). Meanwhile, for the reverse causal relationship, there are seven firm-level variables and four country-level factors being used to investigate the impacts of firm-level factors, macroeconomic conditions, as well as institutional environment on firm leverage. Besides, some alternative variables are used for the robustness check of the empirical results. In order to apprehend the "dynamic nature" of the leverage-performance association, all model specifications include the one-year lagged regressand on the right-hand side of the regression equations.

Among many estimation methods, the two-step system GMM estimator is employed since it can deal with Nickell's bias, simultaneity, time-invariant unobservable heterogeneity, the endogeneity of regressors, and the persistence of dependent variables. Additionally, this estimator can control for heteroscedasticity in the error term, measurement errors, and the autocorrelation of errors.

CHAPTER FOUR
CAUSALITY: CAPITAL STRUCTURE AS A DETERMINANT OF FIRM PERFORMANCE

4.1 OUTLINE

This chapter aims to test the hypotheses (denoted by H_{C1}-H_{C10}) by providing empirical evidence on the impacts of leverage and other firm-specific factors on the performance of Singaporean, Thai, and Vietnamese listed firms. In other words, the empirical results from this chapter answer the first and second research question of this study, thereby contributing to the knowledge relating to the causal relation between financial leverage level and performance of firms in Singapore, Thailand, and Vietnam.

In addition to the outline section, Chapter 4 consists of three sections. Section 4.2 preliminarily analyses the data to provide an overall understanding concerning the descriptive statistics of the datasets, the correlation between each pair of the regressors, and the issue of multicollinearity among independent variables. Section 4.3 reports the results from the regressions of performance on capital structure and other firm-specific variables. This section also checks whether the system GMM estimation is valid by undertaking four tests mentioned in Subsection 3.3.4. Particularly, they include the Arellano-Bond tests of first-order and second-order serial correlation, the Hansen-J test of overidentifying restrictions, and the difference-in-Hansen test of the exogeneity of instrument subsets. Robustness checks are carried out in this Section by analyzing the sensitivity of the regression results when instrumental variables are reduced, and when the book leverage is substituted by the market one. All the empirical findings are summarized in Section 4.4.

4.2 PRELIMINARY DATA ANALYSIS

4.2.1 Descriptive statistics

Table 4.1 presents the descriptive statistics of the variables employed in this study for both the causal relationship and reverse causality for the sample period 2010–2017.

The mean values of *tobinq* variable of listed firms in Singapore, Thailand, and Vietnam are 1.141, 1.555, and 1.086, respectively. All these figures are greater than one, implying that on average, those firms created value for their stockholders during the sample period. The

mean of *tobinq* of Thai firms is the highest, and the standard deviation of this ratio is the largest (1.064) when compared to those of Singaporean and Vietnamese firms (0.754 and 0.560, respectively). These mean values of *tobinq* are similar to that in Korea (1.21) (Choi et al., 2012), while relatively lower than those in the U.S. (2.10) (Coles, Lemmon, & Meschke, 2012), and in Japan (2,71) (Ferris & Park, 2005).

The book leverage (*bktdta*) and market leverage (*mktdta*) of listed firms in Singapore and Thailand are approximately 20% while the ratios of Vietnamese firms are around 27%. The figures for Singapore and Thailand are similar to that of Japanese firms (18.6%) (Ferris & Park, 2005). Nonetheless, all of them are much lower than those in Korea (42%) (Choi et al., 2012), and in China (47%) (Zou & Xiao, 2006).

The mean percentage of tangible assets of Thai firms is the highest (37.5%) while that of Singaporean firms is the second highest (27.1%), and that of Vietnamese firms is the lowest (20.9%). The figures show that the level of the capital intensity of firms in Vietnam is lower than that in Singapore and Thailand. This result could be due to the labor-intensive characteristic of younger firms in the early stage of development. On average, the rate used as an indicator for growth opportunities of firms in Singapore, Thailand, and Vietnam is 7.5%, 12.2% and 13.5%, respectively. The figures relating to the mean value of cashflow ratio have a similar pattern to those of tangible ratio. Specifically, Vietnamese firms have the highest ratio of 9.6%, followed by Thai firms (8.7%) and then Singaporean firms (4.5%). Concerning liquidity ratio, the mean value is 18.8% for firms in Singapore, 7.6% for Thai counterparts, and 10.6% for Vietnamese ones. With respect to non-debt tax shield ratio, the average value is almost the same for firms in three countries (3% for Singaporean and Vietnamese firms, and 3.9% for firms in Thailand). On an average basis, firms in Singapore are bigger than those in Thailand and Vietnam. Specifically, the average size of firms in Singaporean sample is about $228 million; those of Thailand and Vietnam are about $150 million and $54 million, respectively. In the meantime, the age of firms in Singapore and Thailand is nearly the same (31 years), but approximately five years older than Vietnamese firms (26 years).

As for country-level indicator, the average annual GDP growth rate of Singapore, Thailand, and Vietnam in the sample period is 5.4%, 3.7% and 6.1%, respectively. However, there is a wide fluctuation of this rate in Singapore (from 2.2% to 15.2%, and a standard deviation of 3.9%). The variation in Thailand is from 0.8% to 7.5%, and the standard deviation is 2.4%.

The economy of Vietnam is relatively stable over the period 2010–2017 in terms of economic growth (the lowest rate is 5.3% whereas the highest is 6.8%; the standard deviation is 0.5%). In the sample period, the inflation rate of Singapore and Thailand is almost the same, 1.9% and 1.8%, respectively, while the rate of Vietnam at the same time is much higher (6.9%). The standard deviations of the inflation rate reveal that inflation fluctuates most in Vietnam (5.2%), followed by Singapore (2.1%), and then Thailand (1.5%). The ratios reflecting the development of stock markets display the fact that Singaporean stock market develops far beyond when compared to those of Thailand and Vietnam. The market capitalization value of all Singaporean listed firms is 2.375 times as much as Singaporean GDP, while the figures in Thailand and Vietnam are 0.947 and 0.278, respectively. The country governance indexes show that the country governance quality in Singapore is much better than Thailand and Vietnam. Specifically, while the score of Singapore is 5.976, that of Thailand is 0.379, and Vietnamese score is even negative (-1.031).

Table 4.2 presents the mean of firm performance, capital structure (including book and market leverage), and country governance indexes calculated for each year. Performance indicator of listed firms in three countries fluctuates slightly over the period, but it does not show any specific trends. The least value of *tobinq* in Singapore is 1.030 (in 2011) when the highest value is 1.233 (in 2010). *tobinq* of Thai firms is higher than those of Singaporean and Vietnamese firms; the lowest is 1.367 (in 2011), and the highest is 1.716 (in 2012). Meanwhile, *tobinq* of Vietnamese firms varies between 0.880 (in 2011) and 1.235 (in 2017); and there are two years when the ratio is less than one (0.880 and 0.935 in 2011 and 2012, respectively).

There is no specific pattern for the change of book leverage and market leverage. In Singapore and Thailand, both book and market leverage hover around 20%, while in Vietnam, the range of book leverage is from 24.9% (in 2010) to 27.5% (in 2013), and market debt ratio has a wider variation from 23.7% to 32.2% (in 2010 and 2011, respectively).

There is a rising trend of the country governance indexes in all three countries. The increase in these indexes indicates that the quality of country governance has been improved over time. However, when compared among the three countries, the data shows that the business environment in Singapore is much better than that in Thailand and Vietnam. When the lowest index in Singapore is 5.614 (in 2011), the highest index in Thailand is less than one (0.569 in 2017); and the figures of Vietnam is even worse (they are negative in all years over the period and reach -0.326 in 2017).

Table 4.1: Descriptive statistics

Variables	Singapore					Thailand					Vietnam				
	Obs	**Mean**	**Std. Dev.**	**Min**	**Max**	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
tobinq	1256	1.141	0.754	0.215	8.175	1968	1.555	1.064	0.334	13.409	1368	1.086	0.560	0.101	9.044
bktdta	1256	0.201	0.201	0	2.029	1968	0.236	0.203	0	1.648	1368	0.264	0.199	0	0.758
mktdta	1256	0.208	0.193	0	0.881	1968	0.196	0.186	0	0.798	1368	0.278	0.218	0	0.842
tang	1256	0.271	0.215	0	0.948	1968	0.375	0.225	0.002	0.974	1368	0.209	0.198	0	0.962
growth	1256	0.075	0.544	-0.942	16.134	1968	0.122	0.812	-0.710	30.882	1368	0.135	0.323	-0.701	3.656
cashflow	1256	0.045	0.153	-1.578	0.953	1968	0.087	0.103	-0.953	0.827	1368	0.096	0.102	-1.748	0.790
liquid	1256	0.188	0.154	0.000	0.957	1968	0.076	0.081	0.000	0.650	1368	0.106	0.115	0.000	0.865
ndts	1256	0.030	0.027	0.000	0.281	1968	0.039	0.029	0.000	0.526	1368	0.030	0.028	0.000	0.383
size	1256	12.338	1.553	8.025	17.662	1968	11.919	1.494	8.452	18.042	1368	10.889	1.180	8.640	14.989
age	1256	31.691	19.481	3	130	1968	31.305	14.452	5	141	1368	26.687	14.153	3	109
gdpgrowth	1256	0.054	0.039	0.022	0.152	1968	0.037	0.024	0.008	0.075	1368	0.061	0.005	0.053	0.068
inflation	1256	0.019	0.021	-0.005	0.053	1968	0.018	0.015	-0.009	0.038	1368	0.069	0.052	0.009	0.187
smd	1256	2.375	0.229	2.067	2.738	1968	0.947	0.145	0.724	1.206	1368	0.278	0.102	0.159	0.521
cgindex1	1256	5.976	0.265	5.614	6.311	1968	0.379	0.139	0.157	0.569	1368	-1.031	0.454	-1.490	-0.326
foreign	-	-	-	-	-	-	-	-	-	-	1368	0.142	0.161	0	0.872
state	-	-	-	-	-	-	-	-	-	-	1368	0.229	0.244	0	0.914

Note: The variables are defined as in Table 3.2 and 3.3. For interpreting, the descriptive statistics of firm age are presented on normal number instead of logarithm form. For comparative purpose, in this table, total assets, whose natural logarithm is used as a measure for firm size, are measured in USD.

Table 4.2: Mean of firm performance, leverage, and country governance quality – separated by year

Year	Singapore				Thailand				Vietnam			
	tobinq	***bktdta***	***mktdta***	***cgindex1***	***tobinq***	***bktdta***	***mktdta***	***cgindex1***	***tobinq***	***bktdta***	***mktdta***	***cgindex1***
2010	1.233	0.180	0.168	5.653	1.403	0.223	0.199	0.157	1.176	0.249	0.237	-1.467
2011	1.030	0.194	0.214	5.614	1.367	0.236	0.219	0.204	0.880	0.271	0.322	-1.376
2012	1.183	0.199	0.200	5.863	1.716	0.235	0.192	0.317	0.935	0.270	0.311	-1.490
2013	1.179	0.199	0.203	5.765	1.507	0.234	0.197	0.354	1.045	0.275	0.294	-1.422
2014	1.129	0.205	0.212	6.241	1.701	0.236	0.180	0.420	1.114	0.261	0.261	-1.018
2015	1.067	0.214	0.230	6.311	1.528	0.234	0.197	0.495	1.143	0.272	0.278	-0.755
2016	1.090	0.214	0.227	6.221	1.600	0.239	0.186	0.516	1.159	0.262	0.270	-0.396
2017	1.215	0.201	0.205	6.143	1.619	0.247	0.197	0.569	1.235	0.252	0.251	-0.326

Note: The variables are defined as in Table 3.2. Tobin's Q (*tobinq*) is used as an indicator for firm performance; capital structure is measured by book leverage (*bktdta*) and market leverage (*mktdta*); *cgindex1* is used to reflect the country governance quality.

4.2.2 Correlation matrix and multicollinearity diagnostic

Correlation matrix is the result of a bivariate analysis, which estimates the relationship between two variables. In terms of the strength of association, the absolute value of the correlation coefficient varies from zero (0) to one (1). An absolute value of one (1) reveals a perfect relationship between the two variables. When the correlation coefficient comes down to zero, the relationship becomes weaker. The sign of the correlation coefficient shows the direction of the relationship. Specifically, a plus sign (+) reflects a positive relation while a minus sign (–) reveals an inverse link.

The pair-wise correlation matrix in Table 4.3; Table 4.4 and Table 4.5 shows the correlation between key variables examined in regression.

In the case of Singapore, five out of eight regressors have a statistically significant relation with the regressand including *l.tobinq*, *growth, cashflow*, *liquid,* and *lnage.* While *l.tobinq*, *growth, cashflow* and *liquid* have a positive correlation with *tobinq*, *lnage* and *tobinq* are negatively correlated at the 1% significance level. The correlation coefficient of *tang* and *bktdta* is 0.344 and significant[29] at the 1% level. This result may be inferred that firms with more tangible assets are likely to borrow more debt. The plus sign of the correlation coefficient of *size* and *bktdta* implies that bigger firms possibly have a higher debt level (the coefficient is 0.298 and significant at the 1% level). In the meantime, *liquid* has a negative association with *bktdta* (-0.483 at the 1% level). Noticeably, the coefficient between the one-year lagged *tobinq* and the current *tobinq* is 0.794 and significant at the level of 1%, meaning that the performance of firms in the past is positively correlated with the present performance. This result assists the proposition that past performance may have an impact on current performance, thereby confirming that dynamic models are appropriate when regressing firm performance on leverage.

Regarding Thai firms, Table 4.4 displays that the regressand (*tobinq*) has a statistically significant relation with almost all the regressors except for *tang*, *size*, and *lnage*. The relationship between *bktdta* and *tobinq* is negative (-0.219). Other independent variables have a positive association with *tobinq*. As for the book leverage (*bktdta*), there are three variables including *tang*, *growth*, and *size* that are positively correlated with it (the

[29] In order to conserve space and avoid repetition, the term "significant" in this thesis is used in the sense of "statistically significant".

coefficients are 0.195, 0.039, and 0.358, correspondingly). The coefficients of *cashflow*, *liquid*, and *lnage* are negative (-0.250, -0.409, and -0.144, respectively), and all of them are significant at the level of 1%.

The figures relating to the correlation coefficients of the variables of Vietnamese firms are presented in Table 4.6. As indicated in the second column of Table 4.6, eight regressors have a statistically significant association with *tobinq* (except for *tang* and *state*). Among them, similar to the Thai case, *bktdta* is the only variable that negatively associated with *tobinq* (-0.192). When considering the relationship between *bktdta* and other regressors, it is worth noting that there is the same pattern between Singaporean and Vietnamese case. Specifically, *growth* and *lnage* are not correlated with *bktdta*; *tang* and *size* have a positive relationship with *bktdta* while the sign of correlation coefficients of *cashflow* and *liquid* is negative. Additionally, while foreign ownership is strongly positively correlated with *tobinq* (the correlation coefficient is 0.315 and significant at the level of 1%), state ownership does not correlate with *tobinq*. It may be inferred that higher rate of foreign ownership leads to better performance.

In a similar way, as compared to Singaporean firms, the correlation coefficients of the one-year lagged *tobinq* and the current *tobinq* of Thai and Vietnamese samples are 0.825 and 0.824, correspondingly. They are both significant at the 1% level. The figures again consolidate the expectation about the effect of past performance on current one.

As shown in Table 4.3, among significant correlation coefficients of independent variables, the largest absolute value is 0.483 (between *liquid* and *bktdta*), which is far below the threshold of 0.8 proposed by Gujarati (2004). This indicates that the issue of multicollinearity may not be a severe problem in the regressions conducted in this chapter. Besides, Table 4.3 also shows that the values of VIF of all the regressors are much lower than the threshold of 10. Both correlation coefficients and VIF values affirm that there is no multicollinearity among the regressors in the case of Singaporean firms.

Similarly, the highest absolute values of the correlation coefficients between independent variables of Thai firms and Vietnamese firms, as presented in Table 4.4 and 4.5 are 0.409 and 0.459, respectively. Moreover, the low VIF values (well below 10) of all the regressors result in a conclusion that there does not exist multicollinearity issue among them.

Table 4.3: Correlation matrix and VIFs – Singapore

	tobinq	*l.tobinq*	*bktdta*	*tang*	*growth*	*cashflow*	*liquid*	*size*	*lnage*	VIF
tobinq	1									
l.tobinq	0.794***	1								1.14
bktdta	0.011	-0.006	1							1.46
tang	0.031	0.039	0.344***	1						1.22
growth	0.054*	0.291***	0.004	-0.029	1					1.12
cashflow	0.113***	0.144***	-0.172***	0.027	0.087***	1				1.16
liquid	0.127***	0.095***	-0.483***	-0.336***	-0.036	0.126***	1			1.47
size	-0.046	0.015	0.298***	0.179***	0.096***	0.184***	-0.323***	1		1.28
lnage	-0.100***	-0.099***	-0.044	-0.033	-0.068**	0.058**	0.029	0.121***	1	1.04

Note: This table reports the pair-wise correlation coefficients of each pair of variables. The variables' definitions are as in Table 3.2. VIFs in the case of Singaporean sample are based on 1099 firm-year observations. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***).

Table 4.4: Correlation matrix and VIFs – Thailand

	tobinq	*l.tobinq*	*bktdta*	*tang*	*growth*	*cashflow*	*liquid*	*size*	*lnage*	VIF
tobinq	1									
l.tobinq	0.825***	1								1.21
bktdta	-0.129***	-0.110***	1							1.51
tang	-0.004	-0.0001	0.195***	1						1.09
growth	0.057**	0.178***	0.039*	0.017	1					1.04
cashflow	0.379***	0.357***	-0.250***	0.035	0.019	1				1.25
liquid	0.196***	0.176***	-0.409***	-0.224***	-0.006	0.197***	1			1.27
size	0.016	0.048**	0.358***	0.152***	0.035	0.069***	-0.048**	1		1.21
lnage	0.001	-0.0003	-0.144***	-0.036	-0.056**	0.032	0.0004	-0.023	1	1.03

Note: This table reports the pair-wise correlation coefficients of each pair of variables. The variables' definitions are as in Table 3.2. VIFs in the case of Thai sample are based on 1722 firm-year observations. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***).

Table 4.5: Correlation matrix and VIFs – Vietnam

	tobinq	*l.tobinq*	*bktdta*	*tang*	*growth*	*cashflow*	*liquid*	*size*	*lnage*	*foreign*	*state*	VIF
tobinq	1											
l.tobinq	0.824***	1										1.40
bktdta	-0.192***	-0.180***	1									1.56
tang	-0.008	-0.014	0.175***	1								1.27
growth	0.089***	0.109***	0.041	-0.130***	1							1.06
cashflow	0.466***	0.459***	-0.332***	0.174***	0.086***	1						1.57
liquid	0.183***	0.182***	-0.354***	-0.162***	0.036	0.300***	1					1.23
size	0.170***	0.186***	0.329***	0.065**	0.129***	-0.040	-0.092***	1				1.48
lnage	0.099***	0.094***	0.025	-0.040	-0.069**	0.038	0.004	-0.007	1			1.05
foreign	0.315***	0.298***	-0.217***	0.055**	0.022	0.244***	0.126***	0.345***	0.034	1		1.52
state	0.035	0.036	-0.028	0.248***	-0.123***	0.138***	0.071***	-0.018	0.157***	-0.183***	1	1.23

Note: This table reports the pair-wise correlation coefficients of each pair of variables. The variables' definitions are as in Table 3.2. VIFs in the case of Vietnamese sample are based on 1197 firm-year observations. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). There are no foreign ownership and state ownership variable in the sample of Singapore and Thailand due to the unavailability of data.

4.3 MULTIPLE REGRESSION

4.3.1 Empirical findings from the system GMM estimation

As denoted in Section 3.3.4, the system GMM estimation is used in this study to implement the regressions based on equation (3.1) and (3.5). However, both the OLS and fixed-effects estimation are also exploited in order to reveal whether the system GMM estimation is consistent. Nickell (1981) indicates that the OLS estimator is inconsistent and upwards biased when it is applied in a first-order autoregressive model due to the correlation between the time-invariant component of the disturbance term and the lagged dependent variable. In the meantime, the negative correlation between the transformed disturbance term and the transformed lagged regressand of the fixed-effects (within-groups) estimation makes the fixed-effects estimator is inconsistent and biased downwards. The biases in opposite directions of the two estimators suggest that a consistent estimator should produce the regression coefficient of the lagged regressand that lies in the range between the lower and upper bounds (Bond, 2002). Therefore, it is reasonable to compare the estimated coefficients generated from the system GMM estimation with those of the OLS estimator and the fixed-effects estimator, thereby confirming the consistency of the system GMM estimator.

As shown in Table 4.6, the regression coefficient of the one-year lag of Tobin's Q (*l.tobinq*) generated by the system GMM estimator is significant at the 1% level. These coefficients are positive (0.820, 0.599 and 0.817 for Singapore, Thailand and Vietnam, respectively) and lie between those gained from the OLS and the FE estimator[30]. Therefore, the estimates of the system GMM are likely to be reasonable, as mentioned earlier. These results support hypothesis H_{C1} that firms' past performance has effects on firms' current performance, intimating that past performance may help to capture the effects of unobservable historical events when examining the relation between firms' capital structure and performance. These results strongly encourage the use of dynamic models as indicated in Subsection 3.3.3.1. Additionally, it should be noted that the magnitude of the impact of past performance on contemporary one in Singaporean and Vietnamese cases are almost the same (0.820 and 0.817, respectively), while that in Thailand is relatively lower (0.599).

[30] Since the bias of the regression coefficient of the lagged regressand induces the inconsistency of the other estimated parameters when using the OLS estimator or the FE estimator (Flannery & Hankins, 2013), this study does not interpret the results gained from the OLS and the FE estimator. However, their regression results are presented to check the consistency of those from the system GMM estimator.

Table 4.6: The effects of book leverage on firm performance

Regressand: *tobinq*									
	Singapore			Thailand			Vietnam		
Regressors	**OLS**	**FE**	**GMM**	**OLS**	**FE**	**GMM**	**OLS**	**FE**	**GMM**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
l.tobinq	0.895***	0.479***	0.820***	0.841***	0.424***	0.599***	0.930***	0.519***	0.817***
	(0.026)	(0.062)	(0.059)	(0.029)	(0.069)	(0.086)	(0.109)	(0.121)	(0.134)
bktdta	0.214	0.483**	0.369	0.071	-0.143	0.461	-0.058	-0.053	0.187
	(0.133)	(0.199)	(0.299)	(0.083)	(0.262)	(0.440)	(0.061)	(0.124)	(0.206)
tang	-0.010	-0.036	0.280	0.059	0.179	-0.926*	-0.014	-0.062	-0.112
	(0.046)	(0.332)	(0.236)	(0.068)	(0.298)	(0.524)	(0.051)	(0.096)	(0.183)
growth	-0.250***	-0.094***	-0.238***	-0.111***	-0.035	-0.115	-0.033	-0.002	-0.213*
	(0.044)	(0.031)	(0.040)	(0.021)	(0.023)	(0.110)	(0.041)	(0.029)	(0.112)
cashflow	0.067	0.526*	0.351	0.764***	0.700***	3.237**	0.459	0.296	1.758**
	(0.227)	(0.316)	(0.443)	(0.225)	(0.263)	(1.441)	(0.309)	(0.264)	(0.814)
liquid	0.170	0.465*	0.530	0.620**	0.781	-0.284	0.008	0.081	-0.174
	(0.178)	(0.254)	(0.350)	(0.280)	(0.514)	(2.044)	(0.130)	(0.126)	(0.283)
size	-0.028*	-0.363***	-0.132**	-0.029***	-0.381***	-0.152	0.016	0.022	0.051
	(0.017)	(0.114)	(0.067)	(0.009)	(0.062)	(0.097)	(0.010)	(0.041)	(0.038)
lnage	-0.045**	0.365*	-0.020	0.001	0.195	-0.084	0.025	-0.072	0.028
	(0.018)	(0.197)	(0.044)	(0.055)	(0.681)	(0.103)	(0.018)	(0.145)	(0.021)
Observations	1,099	1,099	1,099	1,722	1,722	1,722	1,197	1,197	1,197
R-squared	0.688	0.319		0.721	0.275		0.734	0.344	
F statistic	106.3	31.92		172.1	18.82		48.38	22.14	
Number of groups		157	157		246	246		171	171
Number of instruments			147			61			110
Wald chi2			637.2			268.7			479.7
Prob > chi2			0.000			0.000			0.000
AR(1)			0.014			0.000			0.019
AR(2)			0.249			0.176			0.478
Hansen-J test			0.327			0.325			0.255

Note: The variables' definitions are as in Table 3.2; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses for the system GMM estimation. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

As documented in Section 2.2, among a large number of studies on the relation between firm performance and capital structure, some studies find either statistically significant positive or negative influence of financial leverage level on firm performance (see Fosu, 2013; Gill et al., 2011; Gleason et al., 2000; Margaritis & Psillaki, 2010; Nhung & Okuda, 2015; Schiantarelli & Srivastava, 1997, for example). However, the results reported in column (3), (6), (9) expose that the regression coefficients of book leverage are not significant at any conventional significance levels, implying that there is no impact of leverage on performance. This result is consistent with that of Krishnan and Moyer (1997), Phillips and Sipahioglu (2004), and Schultz, Tan, and Walsh (2010), among others; thus not supporting hypothesis H_{C2a}.

The result that leverage does not affect performance can be explained by the "substitute hypothesis" between leverage and corporate governance proposed by Jiraporn, Kim, Kim, and Kitsabunnarat (2012). According to this hypothesis, debt and corporate governance share the same purpose to mitigate the agency problem, thereby raising firm performance. With this respect, they can substitute for each other. In other words, firms with low quality of governance need to employ debt as a mechanism to alleviate agency costs and vice versa. Based on this argument, it is possible to infer that the likely impact of debt level on performance in Singaporean, Thai and Vietnamese firms may be substituted by the effects of corporate governance. As a result of that, the regression coefficients of leverage (*bktdta*) are not statistically significant at any conventional levels.

In a similar fashion, González (2013) argues that the "net effect" of firms' debt level on performance is the result of two opposite effects of using debt: first, financial distress costs, and second, the disciplinary role of debt[31]. Specifically, if the former is stronger than the latter, leverage has an inverse effect on performance. On the contrary, debt level is positively related to performance when the former has a weaker effect than the latter. In the case that neither of these two opposite effects dominates each other, the influence of leverage on performance may be eliminated.

[31] See González (2013) for more details about the direct and indirect financial distress costs, and the disciplinary advantages of using debt.

Regarding other firm-specific factors, the effect of tangible assets on the performance of Thai listed firms is negative (-0.926) but significant at 10%. Although *tang* has an impact on performance, it does not support hypothesis H_{C3}, which proposes a positive effect.

Growth opportunities inversely influence the firms' performance in Singapore and Vietnam; the coefficients are -0.238 and -0.213, and significant at 1% and 10%, respectively. These results are opposite to those from the studies of Gleason et al. (2000), King and Santor (2008), and Zeitun and Tian (2007) that reveal a positive association between growth opportunities and performance. Thus, the empirical findings of this study do not support hypothesis H_{C4}.

Cash flow variable has a positive influence on the performance of Thai and Vietnamese firms. The coefficients are 3.237 (significant at 1%) and 1.758 (significant at 5%), respectively. The finding supports hypothesis H_{C5}, and is consistent with those of Chang et al. (2007), and Gregory (2005) as they also find a positive relation between these two variables.

A statistically significant impact of firm size on performance is only found in Singapore, but not in Thailand and Vietnam. The regression coefficient is negative (-0.132 and significant at 5%), implying that in Singapore, smaller firms seem to perform more efficiently than larger ones. Meanwhile, the performance of firms in Thailand and Vietnam is not affected by their size as reflected by the statistically insignificant coefficients. Thus, hypothesis H_{C7a} is only supported by the data of Singaporean firms.

Other firm-specific factors appear not to have any impacts on firm performance since their estimated coefficients are not significant at any conventional levels of significance.

Table 4.7 presents the impact of foreign and state ownership on the performance of Vietnamese firms. In column (3), the estimated coefficient of the one-year lagged *tobinq* is 0.801 (significant at 1%), still lying between the upper and lower bound created by the OLS estimator (0.922) and the FE estimator (0.513), thereby again confirming that the system GMM estimator is consistent. When foreign and state ownership variables are excluded from the regression model, the coefficient of *l.tobinq* is 0.817 (column (9) in Table 4.6); once these two variables are added, this coefficient decreases a small amount to 0.801. The other estimated results are not affected much by the appearance of foreign and state ownership variable. Specifically, growth has a negative impact (-0.225, *p-value*=0.015), and cashflow has a positive impact on performance (1.587, *p-value*=0.060). These results are alike to those

presented in column (9) of Table 4.6. There is no relation between state ownership and performance while foreign ownership positively affects performance (0.506, *p-value*=0.054). Interestingly, when foreign ownership is included (column (5) in Table 4.7), the impact of book leverage (*bktdta*) on performance (*tobinq*) becomes significant at the 10% level (*p-value*=0.082). In order to take into account a possible influence of foreign ownership on the leverage-performance relation, the interaction term of leverage and foreign is added to the regression of firm performance. The coefficients of *bktdta*, *foreign* and the interaction term are significantly distinguishable from zero at the 5% level. Though foreign ownership positively (and directly) affects firm performance, it has an inverse influence on the relation between *bktdta* and *tobinq* since the estimated coefficient of the interaction term is negative (-3.386). This means that the lower the foreign ownership a firm has, the stronger the impact of leverage on its performance is. It can be explained that the appearance of foreign ownership with advanced management knowledge in Vietnamese firms helps to mitigate agency problems, thus reducing the effect of leverage on performance.

The system GMM regressions undertaken and reported in column (5), (6) are used to identify the sensitivity of the estimated coefficients and significance levels to the reduction of instrumental variables[32]. Generally, as shown in column (3), (4), (5), and (6), the decline of instruments, *firstly,* slightly changes the value of coefficients (for example, the coefficient of *l.tobinq* decreases from 0.801 to 0.797; that of *bktdta* increases from 0.311 to 0.405; that of *growth* drop from -0.225 to -0.230; that of *cashflow* rises from 1.587 to 1.700; that of *foreign* variable increases from 0.506 to 0.558); *secondly,* does not affect the signs of the estimated coefficients; and *finally*, does not change the significant levels of coefficients (except for *growth* whose confidence level decreases from 95% to 90%).

Arellano–Bond test, a specification test of the models under the null hypothesis of no autocorrelation, shows that while all *p-values* of AR(1) are less than 0.05, those of AR(2) are higher than 0.10 (0.489, 0.470, 0.483, and 0.489 in column (3), (4), (5), and (6), respectively). These results confirm that the null hypothesis of no first-order autocorrelation is rejected at least at the 5% significance level, while the null hypothesis of no second-order autocorrelation cannot be rejected at any significance levels. Thus, the model is well-specified.

[32] The number of instruments of the regressions in column (3), (4) is 126 while number of instruments of the regressions in column (5), (6) is 114. The figures in column (3) are compared to those in column (5). Similarly, each coefficient in column (4) is collated with the corresponding one in column (6).

Hansen test of over-identifying restrictions, a test to verify the joint validity of instrumental variables under the null hypothesis of joint validity of the instruments, reveals that *p-value* of each regression in column (3), (4), (5), and (6) is 0.287, 0.323, 0.357, and 0.376, respectively. Therefore, the null hypothesis cannot be rejected. In other words, the instruments as a group are valid.

In order to capture the non-monotonic effects of leverage, liquidity, firm size, foreign ownership, and state ownership on firm performance, the quadratic terms of these variables are supplemented in the model specification. As documented in Table 4.8 and Table 4.9, none of these variables has effects on firm performance except for firm size in the case of Singapore where the estimated coefficients of *size* and the squared term of *size* are -2.034 and 0.079, correspondingly, and both of them are significant at 5%. Surprisingly, the positive coefficient of the squared term of size points out that there is a U-shaped relation between size and performance of firms in Singapore. It is opposite to the expectation that performance is a concave function of size as proposed in hypothesis H_{C7b}. The inflexion is at the value of 12.873. In other words, on average, *ceteris paribus*, Singaporean firms with total assets of about $390 million perform the worst in comparison with either smaller or larger firms. Firms in Singapore seem to be in a similar situation like firms in the U.S. retailing industries where Amato and Amato (2004) find evidence about the so-called "stuck in the middle" proposed by Porter (1985). Specifically, Porter (1985) posits that both small and large firms have strategic advantages. While small firms can exploit niche markets effectively, large firms gain the advantages relating to reputation, brand recognition, and economies of scale. In the meantime, middle-size firms are likely to be too big to fit niche market segmentation, but not big enough to approach the size that they can benefit from economies of scale like large firms can.

It is worth noting that the appearance of the squared terms in the regression models does not influence the signs of the other variables' estimated coefficients. Although it changes the magnitude of the effects of other variables to some extent, the variables that are statistically significant in the models without the squared terms are still significant in the models with the squared terms. Particularly, the coefficient of *growth* in the original regression for Singaporean firms is -0.238 (column (3) in Table 4.6), and it is -0.180 in the regression with the squared terms (column (3) in Table 4.8); both of them are significant at 1% level. Correspondingly, the coefficient of *tang* of Thai firms is -0.926 (column (6) in Table 4.6),

and -1.193 (column (6) in Table 4.8), and their significance level is 10%. That of *cashflow* in Thailand decreases from 3.237 to 2.789 and the significance level change from 5% to 10% (column (6) in Table 4.6 and Table 4.8, respectively). The estimated coefficients of *growth* variable of Vietnamese firms are -0.213 (*p-value*=0.057) in the regression without the squared terms, -0.209 (*p-value*=0.057) in the regression with the squared terms of *bktdta*, *liquid*, and *size*), and -0.222 (*p-value*=0.013) in the regression with the squared terms of *bktdta*, *liquid*, *size*, *foreign*, and *state*). Similarly, those of cashflow are 1.758 (*p-value*= 0.031), 1.780 (*p-value*= 0.024), and 1.549 (*p-value*= 0.027).

Table 4.7: The effects of foreign and state ownership on firm performance - Vietnam

Regressors	Regressand: *tobinq*					
	OLS	**FE**	**GMM**	**GMM**	**GMM**	**GMM**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
l.tobinq	0.922***	0.513***	0.801***	0.788***	0.797***	0.772***
	(0.110)	(0.120)	(0.151)	(0.146)	(0.150)	(0.154)
bktdta	-0.007	-0.039	0.311*	0.625**	0.405*	0.666**
	(0.060)	(0.124)	(0.179)	(0.247)	(0.231)	(0.312)
tang	-0.028	-0.070	-0.089	-0.126	-0.116	-0.114
	(0.052)	(0.097)	(0.205)	(0.191)	(0.189)	(0.201)
growth	-0.030	0.004	-0.225**	-0.215**	-0.230*	-0.241*
	(0.040)	(0.028)	(0.093)	(0.092)	(0.124)	(0.132)
cashflow	0.431	0.293	1.587*	1.400*	1.700*	1.562*
	(0.305)	(0.263)	(0.842)	(0.723)	(0.871)	(0.842)
liquid	0.001	0.074	-0.114	-0.064	-0.155	-0.088
	(0.130)	(0.124)	(0.315)	(0.298)	(0.343)	(0.356)
size	0.005	0.010	0.026	0.020	0.006	0.001
	(0.010)	(0.044)	(0.030)	(0.031)	(0.042)	(0.045)
lnage	0.024	-0.109	0.018	0.021	0.009	0.014
	(0.018)	(0.157)	(0.022)	(0.025)	(0.029)	(0.035)
foreign	0.198***	0.244*	0.506*	1.220**	0.558*	1.278**
	(0.072)	(0.136)	(0.262)	(0.504)	(0.297)	(0.589)
state	0.006	0.030	0.078	-0.028	0.108	0.006
	(0.036)	(0.084)	(0.130)	(0.145)	(0.143)	(0.167)
*bktdta*foreign*				-3.386**		-3.348**
				(1.500)		(1.648)
Observations	1,197	1,197	1,197	1,197	1,197	1,197
R-squared	0.736	0.346				
F statistic	43.95	18.76				
Number of groups		171	171	171	171	171
Number of instruments			126	126	114	114
Wald chi2			11676	8253	9281	412
Prob > chi2			0.000	0.000	0.000	0.000
AR(1)			0.022	0.022	0.020	0.019
AR(2)			0.489	0.470	0.483	0.489
Hansen-J test			0.287	0.323	0.357	0.376

Note: The variables' definitions as in Table 3.2; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses for the system GMM estimation. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). In column (4), the interaction between book leverage and foreign ownership is added. The instruments of the regressions in column (5), (6) are reduced to check the sensitivity of the regression results of the original regressions in column (3), (4), respectively. The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

Table 4.8: The non-monotonic effects of leverage, liquidity, firm size on firm performance – Singapore and Thailand

Regressand: *tobinq*						
Regressors	**Singapore**			**Thailand**		
	OLS	**FE**	**GMM**	**OLS**	**FE**	**GMM**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
l.tobinq	0.879***	0.459***	0.752***	0.839***	0.415***	0.567***
	(0.027)	(0.066)	(0.075)	(0.030)	(0.069)	(0.099)
bktdta	-0.332**	-0.060	-0.671	-0.260	-0.806*	-1.168
	(0.155)	(0.296)	(0.635)	(0.184)	(0.410)	(1.958)
bktdta2	0.560***	0.405**	0.824*	0.527**	0.821***	2.238
	(0.185)	(0.194)	(0.441)	(0.240)	(0.312)	(2.453)
tang	0.024	-0.001	0.586**	0.064	0.213	-1.193*
	(0.047)	(0.309)	(0.243)	(0.068)	(0.307)	(0.724)
growth	-0.236***	-0.093***	-0.180***	-0.110***	-0.035	-0.126
	(0.047)	(0.029)	(0.062)	(0.020)	(0.022)	(0.135)
cashflow	0.159	0.547*	0.479	0.850***	0.751***	2.789*
	(0.239)	(0.277)	(0.408)	(0.228)	(0.277)	(1.440)
liquid	-0.281	0.675	-0.020	0.406	0.644	3.340
	(0.447)	(0.662)	(0.805)	(0.555)	(0.758)	(4.492)
liquid2	0.489	-0.436	0.923	0.375	0.021	-14.356
	(0.608)	(0.917)	(1.204)	(1.716)	(2.215)	(12.872)
size	-0.391*	-1.928***	-2.034**	-0.159	0.383	2.640
	(0.223)	(0.698)	(0.881)	(0.112)	(0.784)	(1.800)
size2	0.014*	0.068**	0.079**	0.005	-0.031	-0.113
	(0.008)	(0.026)	(0.034)	(0.004)	(0.032)	(0.075)
lnage	-0.039*	0.111	-0.004	0.003	0.189	-0.161
	(0.020)	(0.172)	(0.067)	(0.055)	(0.680)	(0.223)
Observations	1,099	1,099	1,099	1,722	1,722	1,722
R-squared	0.699	0.345		0.722	0.280	
F statistic	97.03	28.31		144.7	16.73	
Number of groups		157	157		246	246
Number of instruments			146			61
Wald chi2			3257			202.2
Prob > chi2			0.000			0.000
AR(1)			0.028			0.000
AR(2)			0.435			0.436
Hansen-J test			0.421			0.641

Note: The variables' definitions are as in Table 3.2; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses for the system GMM estimation in column (3), and (6). Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

Table 4.9: The non-monotonic effects of leverage, liquidity, firm size, foreign ownership, and state ownership on firm performance – Vietnam

Regressand: *tobinq*						
	Vietnam					
Regressors	**OLS**	**FE**	**GMM**	**OLS**	**FE**	**GMM**
	(7)	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
L.tobinq	0.922***	0.523***	0.788***	0.899***	0.517***	0.775***
	(0.105)	(0.120)	(0.131)	(0.102)	(0.119)	(0.132)
bktdta	-0.198	-0.345	-0.483	-0.118	-0.335	0.053
	(0.143)	(0.266)	(0.660)	(0.134)	(0.268)	(0.614)
bktdta2	0.230	0.480	1.137	0.167	0.470	0.148
	(0.182)	(0.321)	(0.932)	(0.173)	(0.323)	(0.915)
tang	-0.018	-0.067	-0.056	-0.034	-0.076	-0.145
	(0.051)	(0.098)	(0.216)	(0.053)	(0.099)	(0.182)
growth	-0.029	0.012	-0.209*	-0.024	0.014	-0.222**
	(0.040)	(0.027)	(0.110)	(0.039)	(0.027)	(0.089)
cashflow	0.473	0.303	1.780**	0.491	0.310	1.549**
	(0.311)	(0.264)	(0.788)	(0.318)	(0.269)	(0.699)
liquid	-0.192	-0.180	-0.594	-0.237	-0.175	-0.144
	(0.232)	(0.273)	(0.525)	(0.227)	(0.271)	(0.539)
liquid2	0.365	0.460	0.882	0.511	0.449	0.287
	(0.464)	(0.411)	(1.004)	(0.476)	(0.411)	(1.130)
size	-0.127	-0.458	0.100	-0.157	-0.431	0.103
	(0.163)	(0.580)	(0.480)	(0.160)	(0.572)	(0.396)
size2	0.006	0.022	-0.002	0.008	0.020	-0.002
	(0.007)	(0.026)	(0.021)	(0.007)	(0.026)	(0.017)
lnage	0.029	-0.082	0.034	0.020	-0.108	0.006
	(0.020)	(0.141)	(0.031)	(0.018)	(0.154)	(0.028)
foreign				-0.303	-0.152	-0.906
				(0.315)	(0.383)	(0.705)
foreign2				1.008	0.707	2.928*
				(0.648)	(0.737)	(1.614)
state				0.324**	0.080	0.629
				(0.133)	(0.192)	(0.641)
state2				-0.528**	-0.127	-1.079
				(0.206)	(0.294)	(1.147)
Observations	1,197	1,197	1,197	1,197	1,197	1,197
R-squared	0.735	0.347		0.741	0.351	
F statistic	43.66	20.12		43.06	15.96	
Number of groups		171	171		171	171
Number of instruments			110			116
Wald chi2			12546			11617
Prob > chi2			0.000			0.000
AR(1)			0.019			0.017
AR(2)			0.512			0.473
Hansen-J test			0.194			0.367

Note: The variables' definitions are as in Table 3.2; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses for the system GMM estimation. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

4.3.2 The system GMM estimator's validity

It should be paid attention that the validity of instrumental variables significantly influences the consistency of the system GMM estimator. Hence, it is essential to identify whether the instrumental variables are valid. To do so, this study employs three tests, including the Arellano-Bond tests for second-order autocorrelation, the Hansen-J test of over-identifying restrictions[33], and the difference-in-Hansen test of exogeneity of instrument subsets (henceforth referred to as AR(2), the Hansen-J test, and the difference-in-Hansen test, respectively). The null hypothesis of the AR(2) test is that there is no second-order serial correlation in levels. If the test result indicates that the null cannot be rejected, the model specification thus is well-specified (however, because of the inclusion of the one-year lagged dependent variable on the right-hand side of the regression models, the null hypothesis of no first-order serial correlation should be rejected. This test, henceforth, is abbreviated by AR(1). The second test is a test for the joint validity of instrumental variables under the null hypothesis that instrumental variables are valid as a group (i.e. the selected sets of lags of the explanatory variables in level and first-differenced equation used as instrumental variables are exogenous). The last one checks the exogeneity of instrument subsets under the null hypothesis that the subsets of instruments are valid.

The last three rows in column (3), (6), (9) of Table 4.6 report the *p-values* of AR(1), AR(2), and Hansen-J test. Specifically, *p-values* of AR(1) test for Singapore, Thailand and Vietnam is 0.014, 0.000 and 0.019, respectively, suggesting that the null hypothesis of no first-order serial correlation is rejected at least at 5% level. In the meantime, AR(2) test gives a *p-value* of 0.249 for Singapore, 0.176 for Thailand, and 0.478 for Vietnam, proving that the null hypothesis cannot be rejected. As mentioned earlier, the results of both AR(1) and AR(2) test confirm that the regression model is well-specified. Moreover, Hansen-J test also yields the results that support the system GMM estimator. Specifically, for all three countries, Singapore, Thailand and Vietnam, the *p-values* are 0.327, 0.325, and 0.255, respectively, thus the null hypothesis cannot be rejected thereby demonstrating that the instruments employed in the system GMM estimation are valid (as a group)[34].

[33] It is worth considering the "rule of thumb" when the system GMM estimator is employed: the number of instruments should not exceed the number of groups (Roodman, 2009a). If this criterion is not satisfied, the Hansen tests are weak in almost all cases, and cannot be relied on.

[34] The results of AR(1), AR(2), and Hansen-J test documented in Table 4.7, Table 4.8, and Table 4.9 also lead to the same conclusion about the validity of model specification and instruments. Additionally, in all the system

Table 4.10, Table 4.11, and Table 4.12 present the results of the difference-in-Hansen test for the subsets of the system GMM-type instruments (including instruments for the levels equation and instruments for the first differences equation), and the standard instruments for the levels equation. All the findings indicate that the null hypothesis cannot be rejected, implying that each specific subset of instruments is exogenous.

In conclusion, the Wald-test statistics for the overall significance of the regressions, the results of AR(1), AR(2), the Hansen-J tests, and the difference-in-Hansen tests all provide statistical evidence that the system GMM models are well-specified.

Table 4.10: The results of the difference-in-Hansen tests – Singapore

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	4.46	7	0.726
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(tobinq bktdta tang growth cashflow liquid size)*	52.21	44	0.185
Instruments for equation in first differences			
L(2/3).tobinq	12.02	11	0.362
L(2/3).bktdta	16.98	18	0.524
L(2/4).(tang growth cashflow liquid size)	119.66	110	0.249

Note: The variables are defined as in Table 3.2. Year dummy 2010 is dropped due to the use of the one-year lagged regressand as a regressor. Year dummy 2012 is eliminated to avoid collinearity.

GMM regressions, the number of instruments is less than the number of groups. For the cases in which *foreign*, *state*, and the squared term of *bktdta*, *liquid*, and *size* are included, all difference-in-Hansen tests yield *p-values* that we cannot reject the null hypothesis at any conventional significance levels. However, to save space, they are not reported in this study.

Table 4.11: The results of the difference-in-Hansen tests – Thailand

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	1.58	7	0.980
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(tobinq bktdta)* *ΔL2.(tang growth cashflow liquid size) collapse*	20.09	18	0.328
GMM-type instruments for equation in first differences			
L2.tobinq	7.78	11	0.733
L(2/4).bktdta	18.80	22	0.658
L(3/5).(tang growth cashflow liquid size) collapse	12.41	20	0.901

Note: The variables are defined as in Table 3.2. Year dummy 2010 is dropped due to the use of the one-year lagged regressand as a regressor. Year dummy 2017 is eliminated to avoid collinearity.

Table 4.12: The results of the difference-in-Hansen tests – Vietnam

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	4.48	7	0.723
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(tobinq bktdta tang growth cashflow liquid size)*	40.65	45	0.656
GMM-type instruments for equation in first differences			
L2.tobinq	2.66	6	0.851
L(2/4).(bktdta growth)	36.49	44	0.782
L2.(tang cashflow liquid size)	45.68	52	0.719

Note: The variables are defined as in Table 3.2. Year dummy 2010 is dropped due to the use of the one-year lagged regressand as a regressor. Year dummy 2015 is eliminated to avoid collinearity.

4.3.3 Robustness checks

4.3.3.1 Instrumental variable reduction

Employing the system GMM estimator usually induces the proliferation of instruments. A large number of instruments may over-fit endogenous variables and are likely to make estimated coefficients generated by the system GMM estimator biased towards those of non-instrumental-variables regressions (the OLS estimator, for example). It can weaken the power of the Hansen-J test and even yield an implausible perfect p-value of 1.000 (Roodman, 2009b). Hence, it is necessary to diagnose to what extent the regression results vary when the number of instruments is declined.

As shown in Table 4.13, when the number of instruments is reduced, the regression results generally remained unchanged, indicating that they are not sensitive to the reduction of instruments. Regarding Singaporean case, the figures in column (1), (2) reveal that when the number of instruments is declined from 147 to 133, the estimated coefficients of *l.tobinq*, *growth*, and *size* are almost unchanged (0.817 and 0.820; -0.245 and -0.238; -0.133 and -0.132, respectively), and there is no variation in the significance levels of these variables. Similarly, the regression coefficients and the significance level in the case of Thailand are stable with the reduction of instruments (from 61 to 56) as presented in column (4), (5). *l.tobinq*, *tang*, *cashflow* are the three variables that still have statistically significant impacts on *tobinq*; they also remain their significance level and have a slight variation in their coefficient. Likewise, the coefficient of *l.tobinq* of Vietnamese firms is almost the same (0.818 and 0.817, both of them are significant at 1% level); that of *growth* decreases from -0.213 (significant at 10%) to -0.217 (significant at 5%). That of *cashflow* reduces from 1.758 to 1.641 (they both have a significance level of 5%). *Size* becomes significant at 10% level when the instruments are declined from 110 to 92.

To further challenge the robustness of the regression results, the one-step system GMM estimation is employed along with the reduction of instruments. Again, the figures in column (3), (6), (9) of Table 4.13 exhibit the robustness of regression results.

It is noteworthy that when we reduce the number of instruments and then apply the one-step system GMM estimator (instead of the two-step system GMM estimator), the results from the Arellano-Bond tests including AR(1), AR(2), and Hansen-J test still support the validity of the model specification as documented in the last three rows of Table 4.13[35].

[35] Difference-in-Hansen tests also reveal that instrument subsets are exogenous.

Table 4.13: The effects of the instruments' reduction on the regression results

Regressand: *tobinq*									
	Singapore			**Thailand**			**Vietnam**		
Regressors	**Original**	**Reduced**	**One-step**	**Original**	**Reduced**	**One-step**	**Original**	**Reduced**	**One-step**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
l.tobinq	0.820***	0.817***	0.813***	0.599***	0.607***	0.511***	0.817***	0.818***	0.810***
	(0.059)	(0.056)	(0.059)	(0.086)	(0.090)	(0.086)	(0.134)	(0.121)	(0.136)
bktdta	0.369	0.291	0.229	0.461	0.460	0.640	0.187	0.177	0.245
	(0.299)	(0.281)	(0.350)	(0.440)	(0.472)	(0.488)	(0.206)	(0.208)	(0.270)
tang	0.280	0.203	0.251	-0.926*	-1.027*	-1.161*	-0.112	-0.053	-0.052
	(0.236)	(0.255)	(0.267)	(0.524)	(0.538)	(0.603)	(0.183)	(0.212)	(0.231)
growth	-0.238***	-0.245***	-0.248***	-0.115	-0.159	-0.101	-0.213*	-0.217**	-0.231**
	(0.040)	(0.040)	(0.039)	(0.110)	(0.133)	(0.108)	(0.112)	(0.103)	(0.107)
cashflow	0.351	0.289	0.284	3.237**	3.194**	4.448**	1.758**	1.641**	1.965**
	(0.443)	(0.467)	(0.507)	(1.441)	(1.481)	(1.769)	(0.814)	(0.733)	(0.945)
liquid	0.530	0.446	0.493	-0.284	-0.457	1.483	-0.174	-0.040	-0.375
	(0.350)	(0.326)	(0.350)	(2.044)	(2.583)	(3.514)	(0.283)	(0.255)	(0.493)
size	-0.132**	-0.133**	-0.138*	-0.152	-0.139	-0.141	0.051	0.060*	0.058
	(0.067)	(0.065)	(0.073)	(0.097)	(0.105)	(0.141)	(0.038)	(0.036)	(0.042)
lnage	-0.020	-0.003	-0.025	-0.084	-0.078	-0.072	0.028	0.033	0.013
	(0.044)	(0.050)	(0.044)	(0.103)	(0.100)	(0.125)	(0.021)	(0.026)	(0.023)
Observations	1,099	1,099	1,099	1,722	1,722	1,722	1,197	1,197	1,197
Number of groups	157	157	157	246	246	246	171	171	171
Number of instruments	147	133	133	61	56	56	110	92	92
Wald chi2	637.2	585.1	3825	268.7	255.7	453.4	479.7	11295	487
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(1)	0.014	0.013	0.003	0.000	0.000	0.000	0.019	0.020	0.009
AR(2)	0.249	0.234	0.263	0.176	0.175	0.403	0.478	0.486	0.452
Hansen-J test	0.327	0.417	0.417	0.325	0.295	0.295	0.255	0.128	0.128

Note: The variables' definitions are as in Table 3.2; year dummies are included in all regressions but unreported. Asterisks illustrate the significance at 10% (*), 5% (**), and 1% (***). Windmeijer-corrected standard errors are reported in parentheses except for the one-step system GMM regression in column (3), (6), (9). However, the standard errors of the one-step system GMM estimation are still robust to heteroscedasticity and arbitrary patterns of serial correlation within individuals. Column (2), (5), (8) show the regression results from the two-step system GMM estimation with reduced instruments. Column (3), (6), (9) exhibit the regression results from the one-step system GMM estimation with reduced instruments. Column (1), (4), (7) present the regression results already reported in Subsection 4.3.1 to facilitate the comparison. The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

4.3.3.2 Robustness checks with alternative variable

In this subsection, market leverage (*mktdta*) is substituted for book leverage (*bktdta*) to check the robustness of the regression results. In order to facilitate the comparison, the estimated results of *bktdta* and *mktdta* are put together in all the tables in this subsection[36]. Column (1) and (2) in Table 4.14 report the results of Singaporean firms. The regression results of the original regression and the robustness one are alike in terms of sign, magnitude of the coefficients and their significance levels, and even the results of AR(1), AR(2), and Hansen-J test. However, when *mktdta* is used, the coefficient of *l.tobinq* reduces from 0.820 to 0.772; and the significance level of *size* changes from 5% to 10%. In the case of Thailand (column (3) and (4) in Table 4.14), the replacement of *mktdta* for *bktdta* does not affect the coefficient of *l.tobinq* considerably, but it makes the effects of *tang* and *cashflow* statistically insignificant. Like those of Singapore, the regression results of Vietnamese firms vary slightly with regards to the magnitude, but the sign of the coefficients and the significance levels remain unchanged when *bktdta* is replaced by *mktdta* as reported in column (1) and (2) of Table 4.15. To be specific, *l.tobinq*, *growth* and *cashflow* still have statistically significant impacts on firm performance. Their coefficients are 0.836, -0.176, and 1.511 compared to those from the original regression that are 0.817, -0.213, and 1.758, respectively. In all the regressions for Singaporean, Thai, and Vietnamese firms, the main concern of this study is leverage variable appearing not to have any impact on firm performance regardless of *bktdta* or *mktdta* is employed.

As shown in column (3) and (4) of Table 4.15, *foreign* has a positive effect on *tobinq* in both the original and robustness regression since its coefficients are significantly distinguishable from zero at the 10% level. It is noteworthy that when *foreign* is included in the regression of Vietnamese firms, it makes the impact of *bktdta* on *tobinq* significant at the 10% level, but it does not happen to *mktdta*. However, when the interaction term between *foreign* and *leverage* is included in the regression model to check whether there is an impact of foreign ownership on the relation between leverage and performance (column (5) and (6) in Table 4.15), all the coefficients of *leverage*, *foreign* and interaction term are significant at the 5% level for the original model and at the 1% level for the robustness model. While *leverage* and *foreign* have positive impacts on *tobinq*, the effect of *foreign* on the relation between *leverage* (including

[36] Hereafter, The regressions of *tobinq* on *bktdta* (and other variables) are called "original regressions", and those on *mktdta* (and other variables) are named "robustness regressions"

bktdta and *mktdta*) and *tobinq* is negative. Besides, state ownership has no effect on the performance of firms.

Table 4.14: Market leverage as an alternative for robustness check – Singapore and Thailand

Regressand: *tobinq*				
Regressors	**Singapore**		**Thailand**	
	bktdta	***mktdta***	***bktdta***	***mktdta***
	(1)	**(2)**	**(3)**	**(4)**
l.tobinq	0.820***	0.772***	0.599***	0.586***
	(0.059)	(0.098)	(0.086)	(0.086)
leverage	0.369	-0.129	0.461	-0.055
	(0.299)	(0.300)	(0.440)	(0.436)
tang	0.280	0.458	-0.926*	-0.444
	(0.236)	(0.282)	(0.524)	(0.486)
growth	-0.238***	-0.226***	-0.115	-0.074
	(0.040)	(0.047)	(0.110)	(0.096)
cashflow	0.351	0.290	3.237**	2.336
	(0.443)	(0.470)	(1.441)	(1.444)
liquid	0.530	0.295	-0.284	0.567
	(0.350)	(0.365)	(2.044)	(1.983)
size	-0.132**	-0.120*	-0.152	-0.034
	(0.067)	(0.071)	(0.097)	(0.091)
lnage	-0.020	-0.021	-0.084	-0.122
	(0.044)	(0.049)	(0.103)	(0.083)
Observations	1,099	1,099	1,722	1,722
Number of groups	157	157	246	246
Number of instruments	147	146	61	61
Wald chi2	637.2	480.8	268.7	334.4
Prob > chi2	0.000	0.000	0.000	0.000
AR(1)	0.014	0.017	0.000	0.000
AR(2)	0.249	0.264	0.176	0.110
Hansen-J test	0.327	0.343	0.325	0.227

Note: The variables' definitions are as in Table 3.2; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance at 10% (*), 5% (**), and 1% (***). The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

Table 4.15: Market leverage as an alternative for robustness check – Vietnam

Regressors	Regressand: *tobinq*					
	bktdta	***mktdta***	***bktdta***	***mktdta***	***bktdta***	***mktdta***
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
L.tobinq	0.817***	0.836***	0.801***	0.810***	0.788***	0.758***
	(0.134)	(0.131)	(0.151)	(0.159)	(0.146)	(0.158)
leverage	0.187	0.078	0.311*	0.164	0.625**	0.550***
	(0.206)	(0.131)	(0.179)	(0.130)	(0.247)	(0.195)
tang	-0.112	-0.098	-0.089	-0.108	-0.126	-0.147
	(0.183)	(0.170)	(0.205)	(0.187)	(0.191)	(0.178)
growth	-0.213*	-0.176*	-0.225**	-0.207**	-0.215**	-0.189**
	(0.112)	(0.101)	(0.093)	(0.093)	(0.092)	(0.082)
cashflow	1.758**	1.511**	1.587*	1.458*	1.400*	1.220*
	(0.814)	(0.743)	(0.842)	(0.808)	(0.723)	(0.681)
liquid	-0.174	-0.179	-0.114	-0.125	-0.064	-0.008
	(0.283)	(0.315)	(0.315)	(0.311)	(0.298)	(0.307)
size	0.051	0.047	0.026	0.031	0.020	0.019
	(0.038)	(0.041)	(0.030)	(0.035)	(0.031)	(0.034)
lnage	0.028	0.032	0.018	0.026	0.021	0.017
	(0.021)	(0.023)	(0.022)	(0.024)	(0.025)	(0.026)
foreign			0.506*	0.456*	1.220**	1.411***
			(0.262)	(0.253)	(0.504)	(0.527)
state			0.078	0.043	-0.028	-0.056
			(0.130)	(0.153)	(0.145)	(0.146)
*leverage*foreign*					-3.386**	-4.076***
					(1.500)	(1.547)
Observations	1,197	1,197	1,197	1,197	1,197	1,197
Number of groups	171	171	171	171	171	171
Number of instruments	110	110	126	126	126	126
Wald chi2	479.7	14606	11676	477.6	8253	396.6
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
AR(1)	0.019	0.022	0.022	0.023	0.022	0.027
AR(2)	0.478	0.476	0.489	0.508	0.470	0.503
Hansen-J test	0.255	0.226	0.287	0.342	0.323	0.381

Note: The variables' definitions are as in Table 3.2; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance at 10% (*), 5% (**), and 1% (***). The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

Table 4.16 and 4.17 present the results when the quadratic terms of *leverage*, *liquid*, and *size* are added in the model specifications to check the non-monotonic relation between these variables and firm performance. Except for *size* that has a convex relationship with *tobinq* in Singaporean case only, all these three variables do not have any influences on performance. These outcomes are relatively stable when they are compared to those of the original regressions, especially in the case of Singapore, where there is no variation in the signs and the significance levels of coefficients. On the other hand, the participation of the squared terms and the substitute of *mktdta* for *bktdta* lead to the loss of significance level of *tang* for Thai firms and *growth* for Vietnamese firms. However, the signs and the significance levels of other coefficients remain unchanged.

As presented in column (3) and (4) of Table 4.17, in the case of Vietnam, foreign and state ownership do not have a non-monotonic relation with firm performance[37]. Regarding the stability of the estimated coefficients, the results of the regression with alternative variable are similar to those of the original one. Specifically, *l.tobinq*'s coefficient in the original regression is 0.755 and increases to 0.760 in the robustness regression. That of *growth* is nearly the same (-0,222 and -0,223); and *cashflow*'s coefficient decreases from 1.549 to 1.401.

Table 4.16: Market leverage as an alternative for robustness check (with the inclusion of squared terms of leverage, liquid, and size) – Singapore and Thailand

Regressand: *tobinq*				
Regressors	**Singapore**		**Thailand**	
	bktdta	***mktdta***	***bktdta***	***mktdta***
	(1)	**(2)**	**(3)**	**(4)**
l.tobinq	0.752***	0.704***	0.567***	0.631***
	(0.075)	(0.095)	(0.099)	(0.083)
leverage	-0.671	-0.563	-1.168	-2.050
	(0.635)	(1.079)	(1.958)	(1.885)
leverage2	0.824*	0.315	2.238	3.863
	(0.441)	(1.288)	(2.453)	(3.347)
tang	0.586**	0.678**	-1.193*	0.096
	(0.243)	(0.306)	(0.724)	(0.372)
growth	-0.180***	-0.160***	-0.126	0.068
	(0.062)	(0.053)	(0.135)	(0.230)
cashflow	0.479	0.559	2.789*	2.288**
	(0.408)	(0.470)	(1.440)	(1.109)
liquid	-0.020	-0.250	3.340	2.818
	(0.805)	(0.810)	(4.492)	(3.856)
liquid2	0.923	1.161	-14.356	-13.294
	(1.204)	(1.202)	(12.872)	(10.887)
size	-2.034**	-2.304**	2.640	0.102
	(0.881)	(0.966)	(1.800)	(1.015)
size2	0.079**	0.089**	-0.113	-0.008
	(0.034)	(0.038)	(0.075)	(0.041)
lnage	-0.004	0.000	-0.161	-0.090
	(0.067)	(0.063)	(0.223)	(0.096)
Observations	1,099	1,099	1,722	1,722
Number of groups	157	157	246	246
Number of instruments	146	146	61	60
Wald chi2	3257	3141	202.2	3588
Prob > chi2	0.000	0.000	0.000	0.000
AR(1)	0.028	0.027	0.000	0.000
AR(2)	0.435	0.435	0.436	0.446
Hansen-J test	0.421	0.421	0.641	0.438

Note: The variables' definitions are as in Table 3.2; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance at 10% (*), 5% (**), and 1% (***). The quadratic terms of *leverage*, *liquid*, and *size* are included in the regressions. The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

[37] Foreign ownership positively affects firm performance as stated in column (3), (4), (5) and (6) in Table 4.15.

Table 4.17: Market leverage as an alternative for robustness check (with the inclusion of squared terms of leverage, liquid, size, foreign, and state) – Vietnam

Regressors	Regressand: *tobinq*			
	bktdta	**mktdta**	**bktdta**	**mktdta**
	(1)	**(2)**	**(3)**	**(4)**
L.tobinq	0.788***	0.755***	0.775***	0.760***
	(0.131)	(0.144)	(0.132)	(0.152)
leverage	-0.483	-0.704	0.053	-0.746
	(0.660)	(0.600)	(0.614)	(0.538)
leverage2	1.137	1.025	0.148	1.181
	(0.932)	(0.885)	(0.915)	(0.757)
tang	-0.056	-0.146	-0.145	-0.062
	(0.216)	(0.198)	(0.182)	(0.222)
growth	-0.209*	-0.242	-0.222**	-0.223**
	(0.110)	(0.154)	(0.089)	(0.097)
cashflow	1.780**	1.751**	1.549**	1.401**
	(0.788)	(0.720)	(0.699)	(0.695)
liquid	-0.594	-1.140	-0.144	-0.488
	(0.525)	(0.765)	(0.539)	(0.452)
liquid2	0.882	1.934	0.287	0.837
	(1.004)	(1.459)	(1.130)	(0.939)
size	0.100	0.357	0.103	0.329
	(0.480)	(0.650)	(0.396)	(0.499)
size2	-0.002	-0.013	-0.002	-0.012
	(0.021)	(0.028)	(0.017)	(0.022)
lnage	0.034	0.027	0.006	0.017
	(0.031)	(0.040)	(0.028)	(0.032)
foreign			-0.906	-0.599
			(0.705)	(0.666)
foreign2			2.928*	2.078
			(1.614)	(1.425)
state			0.629	0.609
			(0.641)	(0.658)
state2			-1.079	-1.078
			(1.147)	(1.235)
Observations	1,197	1,197	1,197	1,197
Number of groups	171	171	171	171
Number of instruments	110	86	116	116
Wald chi2	12546	9328	11617	529.5
Prob > chi2	0.000	0.000	0.000	0.000
AR(1)	0.019	0.019	0.017	0.020
AR(2)	0.512	0.576	0.473	0.579
Hansen-J test	0.194	0.188	0.367	0.273

Note: The variables' definitions are as in Table 3.2; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance at 10% (*), 5% (**), and 1% (***). The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

4.4 SUMMARY

Chapter 4 explores the relation between capital structure and performance of firms in Singapore, Thailand, and Vietnam by employing the panel data from 2010 to 2017. After controlling for the endogeneity problems that are likely to exist in this relationship by employing dynamic model specifications in form of autoregressive models, the findings reveal that past firm performance does influence current one, but capital structure does not affect firm performance in all the three countries. Some firm-specific factors have impacts on firm performance, but they vary from country to country. Specifically, growth opportunities and firm size are inversely associated performance of listed firms in Singapore, while tangibility and cashflow are two factors that affect performance of those in Thailand. In the meantime, Vietnamese listed firms' performance is influenced by growth opportunities and cash flow. There is no statistical evidence to indicate the impact of other factors such as liquidity and firm age on firm performance. For Vietnamese firms, a positive relation between foreign ownership and performance is found, suggesting that firms with higher foreign ownership are likely to perform better in terms of Tobin's Q since it is used as a measure for firm performance. Noticeably, when foreign ownership is added in the regression model, book leverage turns to positively influence performance (significant at the 10% level). Foreign ownership appears to have an effect on the capital structure-performance relation. In order to check this effect, an interaction between *bktdta* and *foreign* is added. The estimated coefficient of book leverage remains positive and significant at the 5% level; that of the interaction term is negative but also has a statistical significance of the 5% level.

Additionally, when the quadratic terms of leverage, liquidity, size are supplemented in the regressions, the results reveal that none of these factors has a non-monotonic relationship with performance, except for firm size of Singaporean listed firms that shows a U-shaped association with performance. In the case of Vietnam, although foreign ownership positively affects performance, it does not have a non-monotonic link with performance. Besides, state ownership appears not to have any impact on performance in the form of a linear or a quadratic function.

It is noteworthy that although various approaches are employed (for example, reducing instrumental variables, running the one-step system GMM estimation, replacing market leverage for book leverage), the regression results are consistent, especially for the main concern of this study relating to the impacts of past performance and leverage on contemporaneous performance. All the results from AR(1), AR(2), Hansen-J test, and difference-in Hansen test support the validity and well-specification of the regression models.

Table 4.18: Summary of the empirical findings

Hypotheses	Tested relations	Singapore		Thailand		Vietnam				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
HC1	Past performance-current performance	(+)***	(+)***	(+)***	(+)***	(+)***	(+)***	(+)***	(+)***	(+)***
HC2a	Leverage-performance	Ø	Ø	Ø	Ø	Ø	(+)*	(+)**	Ø	Ø
HC2b	Inverted U-shaped relation of leverage and performance	-	Ø	-	Ø	-	-	-	Ø	Ø
HC3	Tangibility-performance	Ø	(+)**	(–)*	(–)*	Ø	Ø	Ø	Ø	Ø
HC4	Growth opportunities-performance	(–)***	(–)***	Ø	Ø	(–)*	(–)**	(–)**	(–)*	(–)**
HC5	Cashflow-performance	Ø	Ø	(+)**	(+)*	(+)**	(+)*	(+)*	(+)**	(+)**
HC6a	Liquidity-performance	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
HC6b	Inverted U-shaped relation of liquidity and performance	-	Ø	-	Ø	-	-	-	Ø	Ø
HC7a	Firm size-performance	(–)**	(yes)**	Ø	Ø	Ø	Ø	Ø	Ø	Ø
HC7b	Inverted U-shaped relation of firm size and performance	-	(yes)**	-	Ø	-	-	-	Ø	Ø
HC8a	Foreign ownership-performance	-	-	-	-	-	(+)*	(+)*	-	Ø
HC8b	Inverted U-shaped relation of foreign ownership and performance	-	-	-	-	-	-	-	-	Ø
HC9a	State ownership-performance	-	-	-	-	-	Ø	Ø	-	Ø
HC9b	Inverted U-shaped relation of state ownership and performance	-	-	-	-	-	-	-	-	Ø
HC10	Firm age-performance	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø

Note: This table summarizes the empirical results relating to the hypotheses developed in Subsection 3.3.1.2. Signs (+), (–) and (Ø) indicate positive, negative, and no statistically significant relation, correspondingly. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). (yes)** in column (2) means that there is a non-monotonic relationship between *size* and *tobinq* at the 5% level of significance. The equations for the regressions are shown as follows.

The regression equation for column (1), (3), (5):

$$tobinq_{it} = \alpha_0 + \alpha_1 tobinq_{i,t-1} + \alpha_2 bktdta_{it} + \beta_1 tang_{it} + \beta_2 growth_{it} + \beta_3 cashflow_{it} + \beta_4 liquid_{it} + \beta_5 size_{it} + \beta_6 age_{it} + +\mu_i + \eta_t + \varepsilon_{it} \quad (5.1)$$

For column (6): the following equation is only applied in the case of Vietnam due to the unavailability of the data about foreign and state ownership of Singaporean and Thai firms:

$$tobinq_{it} = \alpha_0 + \alpha_1 tobinq_{i,t-1} + \alpha_2 bktdta_{it} + \beta_1 tang_{it} + \beta_2 growth_{it} + \beta_3 cashflow_{it} + \beta_4 liquid_{it} + \beta_5 size_{it} + \beta_6 foreign_{it} + \beta_7 state_{it} + \beta_8 age_{it} + +\mu_i + \eta_t + \varepsilon_{it} \quad (5.2)$$

For column (7): the interaction between foreign and bktdta is added in the equation (5.2) to check the effect of foreign ownership on the relation between capital structure and performance:

$$tobinq_{it} = \alpha_0 + \alpha_1 tobinq_{i,t-1} + \alpha_2 bktdta_{it} + \beta_1 tang_{it} + \beta_2 growth_{it} + \beta_3 cashflow_{it} + \beta_4 liquid_{it} + \beta_5 size_{it} + \beta_6 foreign_{it} + \beta_7 state_{it} + \beta_8 age_{it} + \beta_9 bktdta * foreign_{it} + \mu_i + \eta_t + \varepsilon_{it} \quad (5.3)$$

For column (2), (4), (8): the squared terms of bktdta, liquid, and size are included in the equation to check the non-monotonic relationship between these variables with performance:

$$tobinq_{it} = \alpha_0 + \alpha_1 tobinq_{i,t-1} + \alpha_2 bktdta_{it} + \alpha_3 bktdta2_{it} + \beta_1 tang_{it} + \beta_2 growth_{it} + \beta_3 cashflow_{it} + \beta_4 liquid_{it} + \beta_5 liquid2_{it} + \beta_6 size_{it} + \beta_7 size2_{it} + \beta_8 age_{it} + \mu_i + \eta_t + \varepsilon_{it} \quad (5.4)$$

For column (9): the squared terms of foreign and state are implemented in equation (5.4); the following equation is only employed for Vietnamese firms:

$$tobinq_{it} = \alpha_0 + \alpha_1 tobinq_{i,t-1} + \alpha_2 bktdta_{it} + \alpha_3 bktdta2_{it} + \beta_1 tang_{it} + \beta_2 growth_{it} + \beta_3 cashflow_{it} + \beta_4 liquid_{it} + \beta_5 liquid2_{it} + \beta_6 size_{it} + \beta_7 size2_{it} + \beta_8 foreign_{it} + \beta_9 foreign2_{it} + \beta_{10} state_{it} + \beta_{11} state2_{it} + \beta_{12} age_{it} + \mu_i + \eta_t + \varepsilon_{it} \quad (5.5)$$

CHAPTER FIVE

REVERSE CAUSALITY: FIRM PERFORMANCE AS A DETERMINANT OF CAPITAL STRUCTURE

5.1 OUTLINE

The objective of this chapter is to test the hypotheses from H_{R1} to H_{R13} thereby providing empirical results about the impacts of firm performance, other firm-specific characteristics, and country-level variables on leverage choices of Singaporean, Thai, and Vietnamese listed firms. To put it differently, the empirical findings of this chapter answer the third, fourth, and fifth research question of this study, thus clarifying the empirical evidence on the reverse causality from performance to financial leverage, also the association of firm-specific and country-level variables with financing decision in the context of the Southeast Asian countries.

This chapter is organized as follows. Section 5.2 presents initial data analyses, including correlation matrix and multicollinearity diagnostic, to provide an overall assessment of the data[38]. Section 5.3 reports the regression results of various model specifications, starting with the combined dataset of the three countries, and then the separate sample of each country. This section also provides the statistical evidence on the validity of the system GMM estimator via the Arellano-Bond tests of serial correlation, the Hansen-J test of over-identifying restrictions, and the difference-in-Hansen test of the exogeneity of instrument subsets. The results of the robustness checks are presented at the end of Section 5.3. The robustness checks are carried out by examining the sensitivity of the estimated results when instrumental variables are declined, and when some key explanatory variables are substituted by others. Section 5.4 summarizes all the empirical results of Chapter 5.

5.2 PRELIMINARY DATA ANALYSIS

Table 5.1 presents the pair-wise correlation matrix between key variables considered in the regressions for the pooled dataset of Singapore, Thailand, and Vietnam. As presented in this table, all the firm-specific factors including *tang*, *growth*, *cashflow*, *liquid*, *ndts*, *size*, and

[38] Since the regression models in Chapter 4 and Chapter 5 share many common variables, and the descriptive statistics of all the variables are reported in Chapter 4, in order to avoid repetition and conserve space, the descriptive statistics are not re-reported in this chapter.

lnage are statistically significantly associated with *bktdta* at the 1% significance level (except for *growth* that is significant at the 5% level). While *tang*, *growth*, *ndts* and *size* are positively correlated with the dependent variable, *cashflow*, *liquid* and *age* have an inverse correlation with *bktdta*. These statistically significant correlation coefficients suggest that the firm-specific characteristics are likely to have impacts on firm leverage, and including them in the regression models may reduce bias caused by omitted variables. Additionally, the correlation coefficient between *tobinq* and *bktdta* is significant at the 1% level that appears to support the reverse causal relation between performance and debt level. Importantly, the correlation coefficient between the dependent variable (*bktdta*) and its one-year lag (*l.bktdta*) which is positive (0.886) and statistically significant supports the argument that firms tune their leverage to target over time.

Regarding country-level factors, except for GDP growth (*gdpgrowth*) that is not correlated with *bktdta*, other three variables including annual inflation rate (*inflation*), stock market development (*smd*), and country governance index (*cgindex1*) have statistically significant correlation coefficients with the dependent variable, implying that capital structure of firms may be affected by macroeconomic environment.

Concerning the correlation among the independent variables, the largest absolute value is 0.969 (between *smd* and *cgindex1*) that is higher than the threshold of 0.8 (Gujarati, 2004), indicating that the issue of multicollinearity may be a severe problem if these two variables are simultaneously included in the regression. The values of VIF for *smd* (19.22) and *cgindex1* (18.85) in the last column of Table 5.1 that are higher than the threshold of 10 confirm multicollinearity problem. When *smd* is excluded from the regression, the value of VIF for *cgindex1* decreases to 1.55; and when *cgindex1* is removed, that for *smd* is 1.58. In each case (when *smd* or *cgindex1* is dropped out), the values of VIF for all independent variables are much lower than the cut-off value of 10. This result, as well as the correlation coefficients among the other regressors that are far below 0.8, affirms that multicollinearity may no longer be a severe problem as long as *smd* and *cgindex1* do not appear in regression at the same time.

When the data samples of Singapore, Thailand, and Vietnam are considered separately, they reveal some similar characteristics. First, the correlation coefficients of the dependent variable (*bktdta*) with its one-year lag are all relatively high and significant at the 1% level

(0.826, 0.914, and 0.894 for Singapore, Thailand, and Vietnam, respectively). Second, regarding the signs of the coefficients between the regressors and the regressand, each of them shows the same direction of correlation when compared among the three samples. Specifically, *tang*, *growth*, *ndts*, and *size* are positively correlated with *bktdta*; meanwhile, *tobinq*, *cashflow*, and *liquid* have negative associations with the dependent variable. Third, as reported in Table 5.2, 5.3, and 5.4, multicollinearity is unlikely to be a severe problem since the correlation coefficients of each pair of the explanatory variables are much lower than 0.8[39], and the values of VIF for all of the regressors are far below the threshold of 10.

Nonetheless, there are some differences between the three samples with respect to the significance levels and the magnitude of the correlation coefficients. While the coefficient between *bktdta* and *tobinq* of Thai and Vietnamese samples are -0.129 and -0.192, correspondingly, and significant at the 1% level, that of Singapore sample is -0.011 but not significant at any conventional significance levels, indicating that performance of Singaporean firms may not affect their capital structure. *Liquid* has the strongest correlation with the regressand compared to other regressors (-0.483 for Singapore, -0.409 for Thailand, and -0.354 for Vietnam). *Growth* appears not to have an association with *bktdta* since their coefficients are not statistically significant in Singapore and Vietnam. In the case of Thailand, although this variable correlates with *bktdta*, it is only significant at the 10% level with a low coefficient of 0.040. For non-debt tax shield (*ndts*), it is considered as a good substitute for debt in terms of avoiding taxation thus being predicted that it may have a negative relationship with leverage. However, the correlation between *ndts* and *bktdta* is positive (in all the three samples) but only significant (at the 1% level) in Singapore. Other independent variables such as *tang*, *cashflow*, and *size* are all significantly associated with the dependent variable at the 1% level. The signs of the coefficients of *tang* and *size* suggest that in Singapore, Thailand and Vietnam, bigger firms and firms with higher level of capital intensity tend to employ more debt. Meanwhile, firms with larger cash flow may have lower debt level that is in agreement with the prediction of the pecking order theory. Firm age (*lnage*) is negatively correlated with *bktdta* but significant at the 1% level only in Thailand.

[39] Except for the correlation between *ndts* and *tang* of Vietnamese sample where their coefficient is 0.701 and significant at the 1% level. However, this value is still lower than 0.8, and the values of VIF for *ndts* and *tang* are just 2.27 and 2.48, respectively.

Table 5.1: Correlation matrix and VIFs – Pooled dataset

	bktdta	*l.bktdta*	*tobinq*	*tang*	*growth*	*cashflow*	*liquid*	*ndts*	*size*	*lnage*	*gdpgrowth*	*inflation*	*smd*	*cgindex1*	VIF
bktdta	1														
l.bktdta	0.886***	1													1.31
tobinq	-0.101***	-0.096***	1												1.21
tang	0.207***	0.190***	0.080***	1											1.57
growth	0.034**	-0.051***	0.060***	-0.015	1										1.03
cashflow	-0.214***	-0.101***	0.287***	0.062***	0.053***	1									1.22
liquid	-0.404***	-0.368***	0.073***	-0.266***	-0.020	0.115***	1								1.43
ndts	0.052***	0.062***	0.184***	0.492***	-0.094***	0.178***	-0.072***	1							1.45
size	0.264***	0.251***	0.057***	0.192***	0.045***	0.031**	-0.085***	-0.036**	1						1.36
lnage	-0.066***	-0.064***	0.030**	0.019	-0.056***	0.036**	-0.001	-0.039***	0.080***	1					1.07
gdpgrowth	-0.013	0.046***	-0.071***	-0.119***	0.009	0.091***	0.097***	-0.055***	-0.093***	-0.137***	1				1.26
inflation	0.051***	0.037**	-0.145***	-0.154***	0.038**	0.102***	-0.009	-0.056***	-0.246***	-0.206***	0.271***	1			1.43
smd	-0.116***	-0.116***	-0.011	0.038***	-0.040***	-0.161***	0.291***	-0.039***	0.329***	0.073***	0.053***	-0.413***	1		19.22
cgindex1	-0.111***	-0.112***	-0.057***	-0.006	-0.042***	-0.179***	0.323***	-0.061***	0.303***	0.062***	0.005	-0.388***	0.969***	1	18.85

Note: This table reports the pair-wise correlation coefficients of each pair of variables. The variables' definitions are as in Table 3.3. VIFs in the case of the pooled sample are based on 4018 firm-year observations. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***).

Table 5.2: Correlation matrix and VIFs – Singapore

	bktdta	*L.bktdta*	*tobinq*	*tang*	*growth*	*cashflow*	*liquid*	*ndts*	*size*	*lnage*	VIF
bktdta	1										
L.bktdta	0.826***	1									1.32
tobinq	-0.011	0.032	1								1.10
tang	0.344***	0.310***	0.031	1							1.56
growth	0.004	-0.045	0.054*	-0.029	1						1.05
cashflow	-0.172***	0.021	0.113***	0.027	0.087***	1					1.11
liquid	-0.483***	-0.420***	0.127***	-0.336***	-0.036	0.126***	1				1.45
ndts	0.138***	0.096***	0.205***	0.480***	-0.116***	0.042	-0.060**	1			1.46
size	0.298***	0.282***	-0.046	0.179***	0.096***	0.184***	-0.323***	-0.081***	1		1.29
lnage	-0.044	-0.039	-0.100***	-0.033	-0.068**	0.058**	0.029	-0.128***	0.121***	1	1.06

Note: This table reports the pair-wise correlation coefficients of each pair of variables. The variables' definitions are as in Table 3.3. VIFs in the case of Singaporean sample are based on 1099 firm-year observations. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***).

Table 5.3: Correlation matrix and VIFs – Thailand

	bktdta	*L.bktdta*	*tobinq*	*tang*	*growth*	*cashflow*	*liquid*	*ndts*	*size*	*lnage*	VIF
bktdta	1										
L.bktdta	0.914***	1									1.39
tobinq	-0.129***	-0.128***	1								1.21
tang	0.195***	0.172***	-0.004	1							1.24
growth	0.040*	-0.049**	0.057**	0.017	1						1.03
cashflow	-0.250***	-0.164***	0.379***	0.035	0.019	1					1.23
liquid	-0.409***	-0.357***	0.196***	-0.224***	-0.006	0.197***	1				1.25
ndts	0.012	0.035	0.160***	0.338***	-0.085***	0.166***	0.021	1			1.22
size	0.358***	0.352***	0.016	0.152***	0.035	0.069***	-0.050**	-0.054**	1		1.21
lnage	-0.144***	-0.141***	0.001	-0.036	-0.056**	0.032	0.000	-0.050**	-0.023	1	1.03

Note: This table reports the pair-wise correlation coefficients of each pair of variables. The variables' definitions are as in Table 3.3. VIFs in the case of Thai sample are based on 1722 firm-year observations. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***).

Table 5.4: Correlation matrix and VIFs – Vietnam

	bktdta	*L.bktdta*	*tobinq*	*tang*	*growth*	*cashflow*	*liquid*	*ndts*	*size*	*lnage*	VIF
bktdta	1										
L.bktdta	0.894***	1									1.42
tobinq	-0.192***	-0.181***	1								1.37
tang	0.175***	0.193***	-0.008	1							2.27
growth	0.041	-0.115***	0.089***	-0.130***	1						1.07
cashflow	-0.332***	-0.278***	0.466***	0.174***	0.086***	1					1.65
liquid	-0.354***	-0.365***	0.183***	-0.162***	0.036	0.300***	1				1.24
ndts	0.036	0.078***	0.075***	0.701***	-0.152***	0.368***	-0.045*	1			2.48
size	0.329***	0.310***	0.170***	0.065**	0.129***	-0.04	-0.092***	-0.039	1		1.23
lnage	0.025	0.031	0.099***	-0.040	-0.069**	0.038	0.004	-0.020	-0.007	1	1.03

Note: This table reports the pair-wise correlation coefficients of each pair of variables. The variables' definitions are as in Table 3.3. VIFs in the case of Vietnamese sample are based on 1197 firm-year observations. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***).

5.3 MULTIPLE REGRESSION

5.3.1 Empirical results from the system GMM estimation

5.3.1.1 Determinants of leverage: pooled data for all the three countries

In this subsection, the data of the three countries are combined, and two country dummy variables (denoted by *Dummy Singapore* and *Dummy Thailand*) are included in equation 3.5. As presented in column (3) of Table 5.5, the coefficients of both country dummies are significantly different from zero at the 1% level, implying that there may exist country-level factors affecting firms' capital structure. After controlling for country-level conditions, the regression results reveal that firms with a higher level of capital intensity are likely to borrow more. Specifically, the coefficient of *tang* is 0.076 and significant at the 5% level. This positive association between tangible assets and debt is in agreement with both the trade-off and agency theory. It is also in accordance with the findings from empirical studies of Flannery and Rangan (2006), Marsh (1982), Rajan and Zingales (1995), and Titman and Wessels (1988), among others. Nonetheless, this result does not support the pecking-order theory, which proposes an inverse effect of tangibility on leverage.

Firm size has a positive impact on leverage level (0.024 and at the 1% level of significance). In other words, larger firms are likely to borrow more debt than smaller ones. These empirical results are in agreement with those of Booth et al. (2001), Frank and Goyal (2007b), Huang and Song (2006), Marsh (1982), and Taub (1975). Again, the positive linkage between firm size and leverage does not support the pecking-order theory, but the trade-off theory.

The estimated coefficient of *cashflow* is negative (-0.227) and has a statistical significance level of 1%, indicating that cash flow[40] of firms has an inverse relationship with debt level. This finding is not in agreement with the agency theory, which proposes that firms with more free cash flow may employ more debt to mitigate the over-investment problems, thereby decreasing the agency costs of free cash flow. However, the inverse relationship is in accordance with the pecking-order theory as it claims that firms preferentially utilize internally-generated financing sources rather than outside sources. Empirical findings which

[40] Although profit is often used as an indicator for firms' ability to produce internal financing sources, cashflow is the most appropriate variable (De Miguel & Pindado, 2001). Besides, in this study, the correlation coefficient between cashflow and profit (measured by return on assets ratio or the ratio of EBIT to total assets) is extremely high (at least 0.95). Hence, *cashflow* and *profitability* variables should not include in a regression model simultaneously to avoid the problem of multicollinearity.

are as per the pecking-order theory include those of Baskin (1989), Bathala et al. (1994), Jensen et al. (1992), among others.

Although the trade-off theory, the agency theory, and the pecking-order theory suggest that growth opportunities, liquidity, non-debt tax shield, and firm age possibly have impacts on leverage (positive or negative), the empirical results presented in Table 5.5 reveal no statistical evidence about the relationship between abovementioned variables with firms' leverage. Their regression coefficients are not distinguishable from zero at any conventional levels.

Contrary to the expectation of a reverse causal relation between performance and debt level as indicated in Section 2.4, firm performance appears not to have any effects on leverage since its regression coefficient is almost equal to zero (0.000) and statistically insignificant. In the case of Singaporean, Thai, and Vietnamese firms, it is possible that the "substitute effect" of the efficiency-risk hypothesis and the "income effect" from the franchise-value hypothesis equal to each other in terms of their magnitude. Since none of them dominates the other, the "net" effect is equal to zero. In other words, performance does not affect capital structure.

Noticeably, the estimated coefficient of the one-year lagged regressand is significant at the 1% level, thereby confirming that firms in Singapore, Thailand, and Vietnam have target leverage. Nonetheless, those firms do not completely adjust their debt level to target. This finding is in line with those of Antoniou et al. (2008), Frank and Goyal (2004), Ju et al. (2005), and De Miguel and Pindado (2001), among others.

Regarding the validity of the system GMM estimator, the coefficient of the one-year lagged regressand (0.781) lies between those produced by the OLS estimator (0.840) and the FE estimator (0.490). Besides, the number of instruments is 179, much smaller than the number of groups (574), showing that the regression results do not suffer from the problem of instruments' proliferation. The last three rows in column (3) of Table 5.5 report the *p-values* of AR(1), AR(2), and the Hansen-J test. Specifically, the *p-values* of AR(1) test is 0.000, indicating that the null hypothesis is rejected at the 1% significance level. Meanwhile, the *p-value* of AR(2) test is 0.773, showing that the null hypothesis cannot be rejected. The results of both AR(1) and AR(2) tests prove that the regression model is well-specified. Additionally, Hansen-J test generates a *p-value* of 0.234 that again supports the system GMM estimator. Since the null hypothesis cannot be rejected, it can be inferred that the instruments utilized in the system GMM estimation are valid (as a group).

Table 5.5: Determinants of capital structure: a pooled dataset of Singapore, Thailand, and Vietnam

Regressand: Book leverage *(bktdta)*			
Regressors	**OLS**	**FE**	**GMM**
	(1)	**(2)**	**(3)**
l.bktdta	0.840***	0.490***	0.781***
	(0.027)	(0.047)	(0.057)
tobinq	0.005**	0.005	0.000
	(0.002)	(0.005)	(0.006)
tang	0.036***	0.144***	0.076**
	(0.010)	(0.031)	(0.033)
growth	0.023***	0.011**	0.019
	(0.008)	(0.005)	(0.012)
cashflow	-0.234***	-0.293***	-0.227***
	(0.051)	(0.052)	(0.075)
liquid	-0.090***	-0.156***	-0.101
	(0.027)	(0.040)	(0.063)
ndts	0.097	0.126	-0.193
	(0.110)	(0.259)	(0.181)
size	0.009***	0.059***	0.024***
	(0.002)	(0.012)	(0.006)
lnage	-0.000	0.001	-0.007
	(0.003)	(0.037)	(0.005)
Dummy Singapore	-0.027***		-0.062***
	(0.007)		(0.022)
Dummy Thailand	-0.025***		-0.040**
	(0.006)		(0.017)
Constant	-0.024	-0.570***	-0.149***
	(0.016)	(0.184)	(0.057)
Observations	4,018	4,018	4,018
R-squared	0.815	0.402	
F statistic	626.9	61.73	
Number of groups		574	574
Number of instruments			179
Wald chi2			1882
Prob > chi2			0.000
AR(1)			0.000
AR(2)			0.773
Hansen-J test			0.234

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses for the system GMM estimation. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

Table 5.6 presents the results of the difference-in-Hansen test. All the *p-values* higher than 0.25 indicate that the null hypothesis cannot be rejected, revealing that each specific subset of instruments is exogenous. To sum up, the Wald-test statistic that shows the overall significance of the regression, the results of the Arellano-Bond tests, the Hansen-J test, and the difference-in-Hansen tests all provide statistical evidence that the model specification is well-specified.

Table 5.6: The results of the difference-in-Hansen tests for the regression model in Table 5.5

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	3.53	7	0.832
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(bktdta tobinq tang growth cashflow liquid ndts size)*	44.38	50	0.697
Instruments for equation in first differences			
L(2/5).bktdta	20.36	17	0.256
L(2/4).tobinq	20.90	22	0.527
L(2/4).(tang growth cashflow liquid ndts size)	142.12	132	0.258

Note: The variables are defined as in Table 3.3. Year dummy 2010 is dropped due to the use of the one-year lagged regressand as a regressor. Year dummy 2011 is eliminated to avoid collinearity.

Again, it is noteworthy that both of the estimated coefficients of the country dummies are statistically different from zero, indicating that there may be effects of country-level variables on firms' debt level. Subsequently, four country-level variables including annual GDP growth rate (*gdpgrowth*), annual inflation rate (*inflation*), stock market development (*smd*), and country governance quality (*cgindex1*) are added to the right-hand side of equation 3.5 to further examine the influences of country-level variables on firms' leverage choices.

Since *cgindex1* and *smd* are strongly correlated (0.969) and the values of VIF of these two variables are higher than 10 if they are included in a regression simultaneously, to avoid the problem of multicollinearity among country-level variables, country governance quality (*cgindex1*) and stock market development (*smd*) are added separately in the model specifications as displayed in Table 5.7.

As reported in Table 5.7, when country-level factors are incorporated in the model specification, the estimated results are alike to those in Table 5.5. Particularly, the sign, magnitude and significance level of the regression coefficient of the one-year lagged regressand (*l.bktdta*),

tangible assets (*tang*), cashflow (*cashflow*), firm size (*size*) remain almost unchanged; firm performance (*tobinq*), non-debt tax shield (*ndts*), and firm age (*lnage*) still have no effect on leverage. However, growth opportunities (*growth*) and liquidity (*liquid*) appear to be correlated with leverage at the 10% significance level. The values of the coefficient of *growth* (0.023) and *liquid* (-0.118) are alike those reported in Table 5.5 (0.019, and -0.101, respectively). The positive impact of *growth* on debt level is in agreement with the expectation of the pecking-order theory and the empirical findings of Baskin (1989), Chen (2004), Tong and Green (2005), and Viviani (2008). However, it does not assist the expectation of the trade-off theory and the agency theory that proposes an inverse relation between growth opportunities and debt. Similarly, the inverse association between liquidity and leverage also support the pecking-order theory other than the trade-off theory and agency theory.

Concerning country-level factors, the estimated coefficients affirm that these variables have statistically significant impacts on the financing decision of firms operating in Singapore, Thailand, and Vietnam. The three macroeconomic variables including GDP growth, inflation and stock market development do influence firms' debt ratios but in the opposite direction. While *gdpgrowth* and *inflation* positively affect leverage, *smd* is negatively related to debt level. The effects of *gdpgrowth* and *inflation* on leverage are much stronger than that of *smd* since the coefficients of *gdpgrowth* and *inflation* are 0.304 and 0.276, respectively, meanwhile the absolute value of *smd*'s coefficient is only 0.012. Although there has been no consensus on whether the impacts of economic growth, inflation, and stock market development on firm leverage are positive or negative in both theoretical and empirical literature, the empirical results of this thesis confirm that macroeconomic conditions, along with firm-specific factors, are important determinants of firm leverage as stated by Cheng and Shiu (2007), and Frank and Goyal (2003).

Country governance quality, an aggregate indicator of the government effectiveness index, the regulatory quality index, and the rule of law index, negatively affects firm leverage (-0.003), suggesting that a higher level of agency problem caused by a lower level of country governance quality may inversely influence firm leverage. In other words, firms operating in an economy with poor institutional quality are likely to have more agency-related problems, which force them to employ more debt in order to mitigate the opportunistic behavior of managers.

Table 5.7: Determinants of capital structure:
Do country-level factors affect leverage?

Regressand: Book leverage (*bktdta*)				
Regressors	**OLS**	**FE**	**GMM**	**GMM**
	(1)	**(2)**	**(3)**	**(4)**
l.bktdta	0.843***	0.489***	0.788***	0.787***
	(0.026)	(0.047)	(0.056)	(0.057)
tobinq	0.004*	0.005	-0.003	-0.002
	(0.002)	(0.005)	(0.005)	(0.005)
tang	0.033***	0.143***	0.061**	0.066**
	(0.010)	(0.031)	(0.029)	(0.030)
growth	0.023***	0.012**	0.023*	0.022*
	(0.008)	(0.005)	(0.012)	(0.012)
cashflow	-0.233***	-0.292***	-0.204***	-0.206***
	(0.050)	(0.052)	(0.069)	(0.074)
liquid	-0.087***	-0.157***	-0.118*	-0.120**
	(0.026)	(0.040)	(0.061)	(0.057)
ndts	0.101	0.137	-0.098	-0.102
	(0.110)	(0.259)	(0.170)	(0.174)
size	0.008***	0.060***	0.022***	0.023***
	(0.002)	(0.012)	(0.006)	(0.006)
lnage	-0.001	0.016	-0.008	-0.007
	(0.003)	(0.037)	(0.005)	(0.005)
gdpgrowth	0.196**	-0.027	0.304**	0.290**
	(0.092)	(0.088)	(0.119)	(0.120)
inflation	0.234***	0.086	0.276***	0.267***
	(0.063)	(0.077)	(0.080)	(0.079)
cgindex1	-0.001	-0.019**	-0.003*	-
	(0.001)	(0.008)	(0.002)	-
smd	-	-	-	-0.012**
	-	-	-	(0.006)
Constant	-0.063***	-0.616***	-0.190***	-0.188***
	(0.020)	(0.186)	(0.060)	(0.062)
Observations	4,018	4,018	4,018	4,018
R-squared	0.815	0.404		
F statistic	582.3	54.63		
Number of groups		574	574	574
Number of instruments			199	199
Wald chi2			2179	2171
Prob > chi2			0.000	0.000
AR(1)			0.000	0.000
AR(2)			0.793	0.782
Hansen-J test			0.299	0.249

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses for the system GMM estimation. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

Table 5.8: The results of the difference-in-Hansen tests for the regression model in Table 5.7

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, *lnage*, *gdpgrowth*, *inflation*, and *cgindex1*	5.35	10	0.867
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(bktdta tobinq tang growth cashflow liquid ndts size)*	48.84	52	0.599
Instruments for equation in first differences			
L(2/6).bktdta	17.86	19	0.532
L(2/6).(tobinq tang growth)	77.58	81	0.587
L(2/4).(cashflow liquid ndts size)	83.73	88	0.609

Note: The variables are defined as in Table 3.3. Year dummy 2010 is dropped due to the use of the one-year lagged regressand as a regressor. Year dummy 2011 is eliminated to avoid collinearity.

Again, it is essential to present the system GMM estimator's validity when estimating coefficients of the equation in which the country-level variables are included. First, the estimated coefficient of the lagged regressand generated by the system GMM estimator (0.788 and 0.787 in column (3) and (4) of Table 5.7) is higher than that of the FE estimator (0.489) but less than that from the OLS estimator (0.843). Second, the number of instrumental variables is 199, well below the number of groups (574). Third, the *p-values* of AR(1) test is 0.000, suggesting that the appearance of the one-year lagged regressand in the regression model is appropriate; the *p-values* of AR(2) test are 0.793 and 0.782, indicating that the null hypothesis cannot be rejected or in other words, there is no second-order serial correlation in the idiosyncratic disturbance term. Fourth, the Hansen-J test produces *p-values* of 0.299 and 0.249 that affirm the joint validity of the instruments. Finally, all the *p-values* of the difference-in-Hansen test (presented in the last column of Table 5.8) indicate that each subset of instruments is exogenous. Briefly, all the statistical evidence mentioned above proves the validity and consistency of the system GMM estimation.

Since each country has different macroeconomic conditions and institutional characteristics as indicated by the coefficients of the country dummy variables (Table 5.5) and the country-level factors (Table 5.7) that are statistically significantly different from zero, the determinants of debt levels of firms are expected to differ across countries. Thus, in the next subsection, the samples of Singaporean, Thai, and Vietnamese firms are analyzed separately

to find out the impacts of determinants of leverage in the institutional context of each country.

5.3.1.2 Determinants of leverage: a cross-country comparison

The results in Table 5.9 show that determinants of leverage in each country are different. A certain firm-specific factor can affect firms' debt level in one country but not in another. Within a country, determinants of short-term, long-term, and total debt ratio are not the same. Particularly, *tang* has a statistically significant and positive effect on *bktdta* and *bkltdta* of firms in Singapore and Thailand. In the meantime, it is not related to *bkstdta* in Singapore and Thailand, as well as all the three measures of book leverage in Vietnam.

Growth opportunities do not influence leverage choices of firms in Singapore, but it positively influences *bktdta* in Thailand, and *bktdta*, *bkltdta* in Vietnam. The effect of *growth* on *bktdta* is stronger in Vietnam than in Thailand since the estimated coefficients of growth in Vietnam and Thailand are 0.097 and 0.022, respectively.

Cashflow has an inverse relation with most measures of leverage, including *bktdta*, *bkstdta* in Singapore, *bktdta* in Thailand, and *bktdta*, *bkltdta* in Vietnam. The negative impact of *cashflow* on *bktdta* is the strongest in Thailand (-0.287), while the magnitude of this effect is almost the same in Singapore and Vietnam (-0.173, and -0.171, respectively).

Liquid appears to have a strong influence on leverage of Singaporean and Thai firms when compared to other firm-specific variables. However, it does not affect *bkltdta* in Thailand and financial leverage in the forms of short-term, long-term and total debt of firms in Vietnam.

Non-debt tax shield is predicted to inversely affect debt level since it is considered as a good substitute for debt in respect of mitigating tax burden (DeAngelo & Masulis, 1980). Nonetheless, this negative effect seems not to occur in the case of Singapore, Thailand, and Vietnam, except only for a strong negative impact of *ndts* on *bkltdta* in Thailand (with a regression coefficient of -0.553).

Theoretically, the impact of firm size on debt level is inconclusive. The trade-off theory supposes that bigger firms are likely to be in a more favorable position than smaller ones in terms of business diversification, steady cash flow, creditworthiness, etc., thus bigger firms confront lower agency costs of debt in comparison with smaller ones. Consequently, they are anticipated to have a higher debt level in their capital structure. By contrast, the pecking-

order theory recommends an inverse association between firm size and debt level. This theory posits that bigger firms are usually better recognized, confront less adverse selection, have lower asymmetric information and thus more easily raising fund by issuing equity. The empirical findings in this thesis support a positive relation as advocated by the trade-off theory. Specifically, firm size is positively related to *bktdta, bkltdta* in Thailand, and all the three ratios of leverage in Vietnam. However, leverage choice of Singaporean firms is not affected by their size.

As mentioned in Section 3.3.2, firm age is theoretically predicted to have a linkage with leverage. However, the estimated coefficients of *lnage* in Table 5.9 reveal that there is no association between the age of firms and their leverage. This result is in agreement with that from the pooled dataset of Singapore, Thailand, and Vietnam as reported in the previous subsection. However, there is an exception: older firms in Thailand are likely to borrow less short-term debt. In other words, firm age is inversely associated with short-term debt ratio of Thai firms.

Although there are variations in the determinants of leverage and the magnitude of the effects, the main concerns of this thesis about the reverse causality between performance and capital structure, and the effect of the past values of the regressand on the current one are consistently supported in all the model specifications. First, there is no impact of performance on leverage since the regression coefficients of *tobinq* are not statistically significant at any conventional levels[41]. Second, the one-year lagged regressand of leverage (including *bktdta, bkstdta,* and *bkltdta*) have the positive estimated coefficients, but they are less than one and statistically significant at the 1% level. This result indicates that the value of leverage in the past is an important explanatory variable that should be incorporated into the regression models of capital structure.

With regards to whether the system GMM estimator is valid in this subsection's regressions, all figures in the last seven rows of Table 5.9 and the *p-values* of the difference-in-Hansen tests displayed in the tables from 5.10 to 5.18 indicate that all the regression models presented in Table 5.9 are well-specified[42].

[41] Except only for the case of *bkltdta* in Thailand (column (6) in Table 5.9) where its estimated coefficient is statistically significant. However, the magnitude of the effect of *tobinq* on *bkltdta* in Thailand is relatively small (0.012), and only significant at the 10% level.

[42] Because all the figures are presented in the tables from 5.10 to 5.18, in order to avoid repeating and thus saving space, detailed discussion about this concern is not necessarily included.

Table 5.9: Determinants of capital structure: A cross-country comparison

Regressors	Singapore			Thailand			Vietnam		
	Regressand:			Regressand:			Regressand:		
	bktdta	***bkstdta***	***bkltdta***	***bktdta***	***bkstdta***	***bkltdta***	***bktdta***	***bkstdta***	***bkltdta***
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
l.bktdta	0.530***			0.808***			0.827***		
	(0.192)			(0.038)			(0.043)		
l.bkstdta		0.410***			0.620***			0.807***	
		(0.109)			(0.048)			(0.045)	
l.bkltdta			0.726***			0.728***			0.800***
			(0.101)			(0.044)			(0.075)
tobinq	-0.005	-0.008	0.010	0.004	-0.005	0.012*	-0.002	-0.003	0.001
	(0.011)	(0.008)	(0.006)	(0.005)	(0.008)	(0.006)	(0.008)	(0.007)	(0.004)
tang	0.167**	-0.036	0.188**	0.106***	-0.025	0.122***	0.048	-0.007	0.024
	(0.080)	(0.071)	(0.090)	(0.032)	(0.037)	(0.043)	(0.062)	(0.040)	(0.046)
growth	-0.020	-0.013	-0.008	0.022**	0.015	0.005	0.097***	0.037	0.054**
	(0.014)	(0.010)	(0.006)	(0.009)	(0.011)	(0.006)	(0.031)	(0.025)	(0.023)
cashflow	-0.173**	-0.135*	-0.031	-0.287***	-0.183	-0.078	-0.171**	-0.099	-0.135*
	(0.087)	(0.077)	(0.045)	(0.090)	(0.156)	(0.064)	(0.086)	(0.081)	(0.072)
liquid	-0.395***	-0.236***	-0.110**	-0.230**	-0.288***	-0.141	0.001	-0.000	0.046
	(0.141)	(0.091)	(0.052)	(0.090)	(0.103)	(0.119)	(0.046)	(0.048)	(0.038)
ndts	-0.122	1.122	-0.799	-0.242	0.045	-0.553*	-0.022	0.431	-0.169
	(0.362)	(0.885)	(0.606)	(0.193)	(0.281)	(0.307)	(0.448)	(0.350)	(0.311)
size	0.016	0.000	0.007	0.016***	-0.005	0.015**	0.017**	0.012**	0.011**
	(0.016)	(0.010)	(0.012)	(0.005)	(0.008)	(0.007)	(0.007)	(0.006)	(0.005)
lnage	-0.010	0.008	-0.006	-0.010	-0.025***	-0.000	0.005	0.009	-0.002
	(0.015)	(0.012)	(0.009)	(0.008)	(0.009)	(0.006)	(0.006)	(0.007)	(0.004)
Observations	1,099	1,099	1,099	1,722	1,722	1,722	1,197	1,197	1,197
Number of groups	157	157	157	246	246	246	171	171	171
Number of instruments	116	140	118	193	123	104	158	104	148
Wald chi2	266.8	238.3	648.2	1274	297.1	467.7	1723	645.7	793.6
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(1)	0.071	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.001
AR(2)	0.603	0.635	0.479	0.981	0.526	0.648	0.979	0.711	0.829
Hansen-J test	0.325	0.341	0.516	0.490	0.453	0.305	0.641	0.510	0.636

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

Table 5.10: The results of the difference-in-Hansen tests for the regression model in column (1) of Table 5.9

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	3.53	7	0.832
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(bktdta tobinq tang growth cashflow liquid ndts size)*	59.38	49	0.148
Instruments for equation in first differences			
L2.bktdta	5.41	6	0.492
L(2/5).tobinq	29.17	24	0.214
L2.(tang growth cashflow liquid ndts size)	87.98	78	0.206

Table 5.11: The results of the difference-in-Hansen tests for the regression model in column (2) of Table 5.9

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	8.09	7	0.325
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(bkstdta tobinq tang growth cashflow liquid ndts size)*	59.18	52	0.230
Instruments for equation in first differences			
L(2/4).bkstdta	7.49	14	0.914
L(2/4).(tobinq tang growth)	62.31	66	0.606
L2.(cashflow liquid ndts size)	55.71	52	0.337

Table 5.12: The results of the difference-in-Hansen tests for the regression model in column (3) of Table 5.9

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	2.14	7	0.952
GMM-type instruments			
Instruments for levels equation as a group *ΔL.(bkltdta tobinq tang growth cashflow liquid ndts size)*	49.58	50	0.490
Instruments for first differences equation			
L(2/4).bkltdta	20.87	14	0.105
L(2/3).(tobinq)	16.35	18	0.568
L2.(tang growth cashflow liquid ndts size)	73.22	78	0.632

Table 5.13: The results of the difference-in-Hansen tests for the regression model in column (4) of Table 5.9

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	7.56	7	0.373
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(bktdta tobinq tang growth cashflow liquid ndts size)*	37.94	49	0.874
Instruments for equation in first differences			
L2.bktdta	4.28	6	0.639
L(2/3).(tobinq)	12.09	17	0.795
L(2/6).(tang growth cashflow liquid ndts size)	158.00	162	0.574

Table 5.14: The results of the difference-in-Hansen tests for the regression model in column (5) of Table 5.9

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	9.47	7	0.221
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(bkstdta tobinq tang growth cashflow liquid ndts size)*	47.95	51	0.596
Instruments for equation in first differences			
L(2/3).(bkstdta tobinq)	24.00	28	0.682
L(2/4).tang	90.20	85	0.329
L2.(growth cashflow liquid ndts size)	65.24	65	0.468

Table 5.15: The results of the difference-in-Hansen tests for the regression model in column (6) of Table 5.9

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	4.74	7	0.692
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(bkltdta tobinq tang growth cashflow liquid ndts size)*	50.77	51	0.483
Instruments for equation in first differences			
L2.(bkltdta tobinq)	23.23	18	0.182
L2.tang	13.02	85	0.446
L2.(growth cashflow liquid ndts size)	67.38	65	0.396

Table 5.16: The results of the difference-in-Hansen tests for the regression model in column (7) of Table 5.9

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	4.28	7	0.747
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(bktdta tobinq tang growth cashflow liquid ndts size)*	42.20	49	0.743
Instruments for equation in first differences			
L2.bktdta	5.72	6	0.455
L2.tobinq	7.88	12	0.794
L(2/4).(tang growth cashflow liquid ndts size)	119.63	132	0.772

Table 5.17: The results of the difference-in-Hansen tests for the regression model in column (8) of Table 5.9

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	4.50	7	0.720
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(bkstdta tobinq tang growth cashflow liquid ndts size)*	40.90	50	0.817
Instruments for equation in first differences			
L2.bkstdta	5.18	6	0.521
L2.(tobinq tang)	25.72	25	0.423
L2.(growth cashflow liquid ndts size)	66.27	65	0.433

Table 5.18: The results of the difference-in-Hansen tests for the regression model in column (9) of Table 5.9

Subsets of instrumental variables	Test statistics	df	p-value
Instruments for equation in levels			
Standard instruments			
year dummies, and *lnage*	3.50	7	0.835
GMM-type instruments			
Instruments for equation in levels as a group *ΔL.(bkltdta tobinq tang growth cashflow liquid ndts size)*	55.96	52	0.329
Instruments for equation in first differences			
L(2/4).bkltdta	8.48	14	0.863
L(2/3).(tobinq liquid size)	44.70	54	0.812
L(2/3).(tang growth cashflow ndts)	70.85	72	0.516

Note for the tables from 5.10 to 5.18: The variables are defined as in Table 3.3. Year dummy 2010 is dropped due to the use of the one-year lagged regressand as a regressor. Year dummy 2011 is eliminated to avoid collinearity.

5.3.1.3 Target leverage and speed of adjustment

Previous empirical studies relating to the issues of target debt level and speed of financial leverage adjustment have provided different findings. For example, Fama and French (2002)'s study reveals that the magnitude of leverage adjustment is from 7% to 18% annually. Huang and Ritter (2009) document that the speed of adjustment is between 17% and 23% while Flannery and Rangan (2006) report a higher speed (more than 30%). On the contrary, Welch (2004) indicates that there is no target towards which firms adjust their leverage.

As reported in Table 5.5, Table 5.7, and Table 5.9, all the regression coefficients of the one-year lag of leverage are positive and significant at the 1% level. The positive effect of the past values of leverage on the current one is in agreement with the results from the studies of De Miguel and Pindado (2001), and Frank and Goyal (2004), among others. Moreover, the values of the regression coefficients are positive but less than one indicating that the estimated results are stable and debt ratios of firms converge to their target over time. To put it differently, there exists the dynamism of capital structure and firms tend to adjust their debt ratios towards the target level. Nevertheless, owing to the existence of adjustment cost, firms do not fully tune their debt level but partially per year.

When the data of firms in Singapore, Thailand, and Vietnam are combined, on average, the speed of adjustment of *bktdta* is about 21%. In other words, firms close approximately 21% of the distance between the current debt level and the target in one year, implying that firms close half of leverage gap in about three years[43].

Once the sample of each country is examined separately, the results reveal that the speed of adjustment differs from country to country (see Table 5.9). Regarding the ratio of total debt to book value of total assets (*bktdta*), the adjustment speed in Singapore is much higher than those in Thailand and Vietnam (47% in Singapore compared to 19% and 17% in Thailand and Vietnam, respectively). Since firms compare the costs of adjustment with the costs of being off the target when deciding whether or not to alter their debt level, the considerably higher speed found in Singapore implies that the gap between the costs of adjustment and

[43] Half-life is the time that a firm needs to close half of the gap between its current debt level and target level. For an AR(1) process, half-life is equal to $log(0.5)/log(1-\lambda)$, where λ is the estimated speed of adjustment mentioned in Subsection 3.3.3.2.

the costs of being off the target in Singapore is much lower than those in Thailand and Vietnam.

The adjustment speed of short-term debt in Singapore even higher (59%), more than double the adjustment speed of long-term leverage (27%). Although the adjustment speed in Thailand is lower, it has a similar pattern in comparison with that in Singapore in which the adjustment speed of short-term debt is much faster than that of long-term debt (38% and 27%, respectively). It is possible that firms in Singapore and Thailand find it easier to alter their short-term debt ratio than long-term debt. In Vietnam, the adjustment speed of short-term debt and long-term debt ratio are alike, 19% and 20%, respectively.

Generally, the findings prove the appearance of the dynamic process in leverage choices of firms in Singapore, Thailand and Vietnam. Firms compare adjustment costs with the costs of being off the target when deciding their debt level. Since the cost of adjustment is different among countries due to the differences in the development level of the financial systems and macroeconomic environment of each country, the speed of adjustment varies from country to country.

5.3.2 Robustness checks

5.3.2.1 Instrumental variable reduction

As documented in Subsection 4.3.3, the proliferation of instruments in the GMM estimators can make the regression coefficients biased and diminish the Hansen-J test's power. Thus, it is essential to examine how much the regression results change when instrumental variables are reduced.

Table 5.19 presents the regression results of the model specification for the pooled dataset with country dummy variables. When the number of instruments is reduced from 179 to 167, and then 128, the regression results remained almost unchanged, indicating that they are not sensitive to the decline of instruments. Specifically, *l.bktdta*, *tang*, *cashflow*, *size*, and country dummies still have statistically significant impacts on *bktdta*. The signs of their coefficients are unchanged, and there are only a few variations in the magnitude of the impacts. Although *growth*, *liquid*, and *ndts* appear to have impacts on *bktdta* in regression (3), their coefficients are only statistically significantly distinguishable from zero at the 10% level.

Similarly, Table 5.20 reports the estimated results of the regression model for the pooled dataset with the country-level factors, including *gdpgrowth*, *inflation*, *smd*, and *cgindex1*. In

regression (2), the number of instruments is reduced (from 199) to 187, and then to 139 in regression (3). Though the number of instruments is declined considerably, the variations in the coefficient values of independent variables are economically insignificant. The coefficient of *l.bktdta* increases from 0.788 to 0.802; that of *tang* rises from 0.061 to 0.080; that of *growth* increases from 0.023 to 0.033; *gdpgrowth*'s coefficient decreases from 0.304 to 0241; and that of *inflation* increases from 0.276 to 0.323; in the meantime, those of *cashflow*, *liquid*, and *size* are almost the same. The significance levels of these variables are steady. The regression coefficient of *tobinq* is still not significant at any levels of significance. There is an exception for *cgindex1*: in the original regression, its effect on *bktdta* is statistically significant at the 10% level; when the instruments are reduced to 139, it loses its significance level (however, the value of the coefficient is unchanged).

Generally, for the pooled dataset, the regression results are robust and consistent with the reduction of instruments. It is noteworthy that when the number of instruments is decreased, the results from the Arellano-Bond tests including AR(1), AR(2), and Hansen-J test still support the validity of the model specifications as presented in the last three rows of Table 5.19 and Table 5.20. Additionally, the difference-in-Hansen tests also reveal that instrument subsets are exogenous.

Table 5.19: The effects of the instruments' reduction on the regression results (pooled dataset with country dummy variables)

Regressand: Book leverage (*bktdta*)			
Regressors	**Regression (1)**	**Regression (2)**	**Regression (3)**
	(1)	**(2)**	**(3)**
l.bktdta	0.781***	0.785***	0.777***
	(0.057)	(0.056)	(0.059)
tobinq	0.000	0.006	0.001
	(0.006)	(0.008)	(0.007)
tang	0.076**	0.077**	0.111**
	(0.033)	(0.034)	(0.049)
growth	0.019	0.037**	0.024*
	(0.012)	(0.017)	(0.014)
cashflow	-0.227***	-0.236***	-0.219***
	(0.075)	(0.075)	(0.072)
liquid	-0.101	-0.111*	-0.112*
	(0.063)	(0.062)	(0.064)
ndts	-0.193	-0.203	-0.464*
	(0.181)	(0.212)	(0.244)
size	0.024***	0.023***	0.022***
	(0.006)	(0.006)	(0.008)
lnage	-0.007	-0.005	-0.003
	(0.005)	(0.005)	(0.007)
dummy Singapore	-0.062***	-0.059***	-0.097**
	(0.022)	(0.022)	(0.038)
dummy Thailand	-0.040**	-0.042**	-0.064**
	(0.017)	(0.017)	(0.029)
Constant	-0.149***	-0.152***	-0.121*
	(0.057)	(0.055)	(0.071)
Observations	4,018	4,018	4,018
Number of groups	574	574	574
Number of instruments	179	167	128
Wald chi2	1882	1805	1552
Prob > chi2	0.000	0.000	0.000
AR(1)	0.000	0.000	0.000
AR(2)	0.773	0.705	0.710
Hansen-J test	0.234	0.182	0.176

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). Regression (1) in column (1) is the original one with 179 instruments. In regression (2), and regression (3), the instrumental variables are reduced to 167 and 128, respectively. The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

Table 5.20: The effects of the instruments' reduction on the regression results (pooled dataset with country-level factors)

Regressand: Book leverage (*bktdta*)			
Regressors	**Regression (1)**	**Regression (2)**	**Regression (3)**
	(1)	**(2)**	**(3)**
L.bktdta	0.788***	0.757***	0.802***
	(0.056)	(0.045)	(0.049)
tobinq	-0.003	-0.006	-0.000
	(0.005)	(0.005)	(0.008)
tang	0.061**	0.067**	0.080**
	(0.029)	(0.029)	(0.038)
growth	0.023*	0.021*	0.033**
	(0.012)	(0.012)	(0.015)
cashflow	-0.204***	-0.182***	-0.195***
	(0.069)	(0.050)	(0.060)
liquid	-0.118*	-0.115**	-0.113*
	(0.061)	(0.054)	(0.061)
ndts	-0.098	-0.104	-0.339
	(0.170)	(0.154)	(0.208)
size	0.022***	0.024***	0.021***
	(0.006)	(0.005)	(0.007)
lnage	-0.008	-0.008*	-0.007
	(0.005)	(0.005)	(0.005)
gdpgrowth	0.304**	0.286***	0.241**
	(0.119)	(0.098)	(0.108)
inflation	0.276***	0.295***	0.323***
	(0.080)	(0.084)	(0.077)
cgindex1	-0.003*	-0.004**	-0.003
	(0.002)	(0.002)	(0.002)
Constant	-0.190***	-0.203***	-0.187***
	(0.060)	(0.062)	(0.064)
Observations	4,018	4,018	4,018
Number of groups	574	574	574
Number of instruments	199	187	139
Wald chi2	2179	1591	1821
Prob > chi2	0.000	0.000	0.000
AR(1)	0.000	0.000	0.000
AR(2)	0.793	0.767	0.725
Hansen-J test	0.299	0.253	0.320

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). Regression (1) is the original one with 199 instruments. In regression (2), and regression (3), the instruments are reduced to 187 and 139, respectively. The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

In the following section, we examine each sample separately. Regarding Singaporean case, for the regression of *bktdta*, the figures in column (1) and (2) of Table 5.21 point out that when the number of instruments is decreased from 116 to 107, the estimated coefficients of all variables that have statistically significant effects on *bktdta* (including *l.bktdta*, *tang*, *cashflow*, and *liquid*) change slightly (0.537 and 0.530; -0.146 and -0.167; -0.197 and -0.173; -0.391 and -0.395, respectively). The confidence level of *tang* decreases from 95% to 90%, while there is no variation in the significance levels of *l.bktdta*, *cashflow*, and *liquid*.

Similarly, the regression coefficients and the significance levels of the regressors in the case when *bkstdta* is the dependent variable are stable with the reduction of instruments (from 140 to 128) as presented in column (3) and (4) of Table 5.21. The coefficient of *l.bkstdta* changes from 0.410 to 0.396; that of *liquid* varies from -0.236 to -0.238. Both of them are still significant at the 1% level. However, *cashflow* loses its significance level.

As displayed in column (5) and (6) of Table 5.21, when the dependent variable is *bkltdta*, the reduction in the number of instruments (from 118 to 102) marginally changes the magnitude of the coefficients of *l.bkltdta*, *tang*, and *liquid*, but it does not influence the signs and the significance levels of these variables. Particularly, the estimate of *l.bkltdta* decreases from 0.726 to 0.708, significant at 1%; that of *tang* increases from 0.188 to 0.191, significant at 5%; that of *liquid* changes from -0.110 to -0.104, significant at 1%. Other independent variables' coefficients are still statistically indistinguishable from zero at any significance levels (including those of *tobinq*, *growth*, *cashflow*, *ndts*, *size*, and *lnage*).

Table 5.22 presents the regression results of firms in Thailand. In the *bktdta* regression, the number of instruments is cut down from 193 to 127, causing some changes in the size of the estimated coefficients. The coefficient of *cashflow* decreases from -0.287 to -0.327, the estimate of *liquid* increases from -0.230 to -0.196, while there are small variations in those of *l.bktdta*, *tang*, *growth*, and *size*. However, in general, there are no considerable changes: *tobinq*, *ndts*, and *lnage* still have no statistically significant effects on *bktdta*. Other explanatory variables retain their significance levels except for that of *liquid*, which changes from 5% to 10%.

When *bkstdta* is used as the dependent variable (column (3) and (4) of Table 5.22), the reduction from 123 to 104 in the number of instruments induces an increase in the coefficient of *liquid* from -0.288 to -0.193 and a decrease in its confidence level from 99% to 90%. All other parameters are almost unchanged (the coefficient of *l.bkstdta* increases slightly from 0.620 to 0.623, that of *lnage* rises marginally from -0.025 to -0.023); other independent variables are still not statistically significantly related to *bkstdta*).

Table 5.21: The effects of the instruments' reduction on the regression results – Singapore

Regressors	Regressand: *bktdta*		Regressand: *bkstdta*		Regressand: *bkltdta*	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
l.bktdta	0.530***	0.537***				
	(0.192)	(0.182)				
l.bkstdta			0.410***	0.396***		
			(0.109)	(0.115)		
l.bkltdta					0.726***	0.708***
					(0.101)	(0.110)
tobinq	-0.005	-0.001	-0.008	-0.012	0.010	0.011
	(0.011)	(0.017)	(0.008)	(0.008)	(0.006)	(0.007)
tang	0.167**	0.146*	-0.036	0.025	0.188**	0.191**
	(0.080)	(0.084)	(0.071)	(0.078)	(0.090)	(0.095)
growth	-0.020	-0.022	-0.013	-0.010	-0.008	-0.002
	(0.014)	(0.013)	(0.010)	(0.009)	(0.006)	(0.012)
cashflow	-0.173**	-0.197**	-0.135*	-0.113	-0.031	-0.033
	(0.087)	(0.085)	(0.077)	(0.076)	(0.045)	(0.058)
liquid	-0.395***	-0.391***	-0.236***	-0.238***	-0.110**	-0.104**
	(0.141)	(0.138)	(0.091)	(0.091)	(0.052)	(0.047)
ndts	-0.122	-0.262	1.122	1.007	-0.799	-0.875
	(0.362)	(0.314)	(0.885)	(0.794)	(0.606)	(0.702)
size	0.016	0.021	0.000	-0.004	0.007	0.007
	(0.016)	(0.014)	(0.010)	(0.012)	(0.012)	(0.014)
lnage	-0.010	-0.013	0.008	0.010	-0.006	-0.005
	(0.015)	(0.017)	(0.012)	(0.013)	(0.009)	(0.009)
Observations	1,099	1,099	1,099	1,099	1,099	1,099
Number of groups	157	157	157	157	157	157
Number of instruments	116	107	140	128	118	102
Wald chi2	266.8	339	238.3	219.4	648.2	613.6
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
AR(1)	0.071	0.071	0.045	0.044	0.000	0.001
AR(2)	0.603	0.646	0.635	0.606	0.479	0.419
Hansen-J test	0.325	0.455	0.341	0.339	0.516	0.606

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). Column (1), (3), and (5) shows the results of the original regressions; column (2), (4), and (6) presents the regression results when the number of instruments is reduced. The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

Concerning the regressions in which leverage is measured by *bkltdta*, although the estimate of *ndts* rises from -0.553 to -0.467, and *cashflow* has a statistically significant effect on *bkltdta* (at the 10% level) for the regression with reduced instruments, all other figures exhibit the robustness of regression results as presented in column (5) and (6) of Table 5.22. For example, the estimate of *l.bkltdta* decreases marginally from 0.728 to 0.701, that of

tobinq increases slightly from 0.012 to 0.016, the estimate of *size* rises from 0.015 to 0.021, and that of *tang* remains the same.

In the case of Vietnamese firms, regardless of short-term, long-term, or total debt ratio is utilized as a measure for leverage, the regression results are not sensitive to the decline of the instruments in terms of the direction of the effects, size of the coefficients, and their significance levels. There are only several small variations in the magnitude of the coefficients, and some variables change their significance level from 5% to 10% or vice versa. Specifically, as shown in Table 5.23, the decrease of instruments from 158 to 128 for *bktdta* regression, from 104 to 94 for *bkstdta* regression, and from 148 to 124 for *bkltdta* regression do not influence the signs of the coefficients of all variables that are statistically significantly associated with the dependent variables. Moreover, the values of the coefficients of *l.bktdta*, *l.bkstdta*, *growth*, *size* in all the three regressions, and that of *cashflow* in the *bktdta* regression are almost unchanged. There are some inconsiderable variations of *l.bkltdta*'s coefficient (from 0.800 to 0.769), and *cashflow*'s estimate of the *bkltdta* regression (from -0.135 to -0.183).

Overall, it can be concluded that regardless of *bktdta*, *bkstdta*, or *bkltdta* is employed as the regressand, the regression results of Singaporean, Thai, and Vietnamese firms are insensitive to the decline of the number of instrumental variables. In other words, the regression results are robust and consistent.

It is also necessary to clarify that all the regressions with reduced instruments pass the Arellano-Bond tests, the Hansen-J test, and the difference-in-Hansen tests. As exhibited in Table 5.21, Table 5.22, and Table 5.23, all the *p-values* of AR(1) test are less than 0.1, while those of AR(2) test, Hansen-J test are much higher than 0.1. Also, the *p-values* of difference-in-Hansen tests are well above 0.1, indicating that each specific instrument subset is exogenous. Again, all the figures provide statistical evidence that supports the validity and well-specification of the regression models.

Table 5.22: The effects of the instruments' reduction on the regression results – Thailand

Regressors	Regressand: *bktdta*		Regressand: *bkstdta*		Regressand: *bkltdta*	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
l.bktdta	0.808***	0.815***				
	(0.038)	(0.041)				
l.bkstdta			0.620***	0.623***		
			(0.048)	(0.064)		
l.bkltdta					0.728***	0.701***
					(0.044)	(0.059)
tobinq	0.004	0.005	-0.005	-0.008	0.012*	0.016**
	(0.005)	(0.005)	(0.008)	(0.010)	(0.006)	(0.007)
tang	0.106***	0.117***	-0.025	-0.040	0.122***	0.122**
	(0.032)	(0.037)	(0.037)	(0.047)	(0.043)	(0.050)
growth	0.022**	0.029**	0.015	0.017	0.005	0.008
	(0.009)	(0.012)	(0.011)	(0.012)	(0.006)	(0.007)
cashflow	-0.287***	-0.327***	-0.183	-0.204	-0.078	-0.116*
	(0.090)	(0.074)	(0.156)	(0.162)	(0.064)	(0.066)
liquid	-0.230**	-0.196*	-0.288***	-0.193*	-0.141	-0.056
	(0.090)	(0.101)	(0.103)	(0.111)	(0.119)	(0.101)
ndts	-0.242	0.061	0.045	0.197	-0.553*	-0.467*
	(0.193)	(0.305)	(0.281)	(0.306)	(0.307)	(0.280)
size	0.016***	0.020***	-0.005	-0.000	0.015**	0.021***
	(0.005)	(0.006)	(0.008)	(0.009)	(0.007)	(0.008)
lnage	-0.010	-0.006	-0.025***	-0.023**	-0.000	-0.002
	(0.008)	(0.010)	(0.009)	(0.010)	(0.006)	(0.008)
Observations	1,722	1,722	1,722	1,722	1,722	1,722
Number of groups	246	246	246	246	246	246
Number of instruments	193	127	123	104	104	74
Wald chi2	1274	1011	297.1	222	467.7	299.9
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
AR(1)	0.000	0.000	0.000	0.000	0.000	0.000
AR(2)	0.981	0.941	0.526	0.543	0.648	0.625
Hansen-J test	0.490	0.546	0.453	0.410	0.305	0.615

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***).(***). Column (1), (3), and (5) shows the results of the original regressions; column (2), (4), and (6) presents the regression results when the number of instruments is reduced. The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

Table 5.23: The effects of the instruments' reduction on the regression results – Vietnam

Regressors	Regressand: *bktdta*		Regressand: *bkstdta*		Regressand: *bkltdta*	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
l.bktdta	0.827***	0.828***				
	(0.043)	(0.042)				
l.bkstdta			0.807***	0.806***		
			(0.045)	(0.047)		
l.bkltdta					0.800***	0.769***
					(0.075)	(0.099)
tobinq	-0.002	-0.005	-0.003	-0.007	0.001	0.004
	(0.008)	(0.009)	(0.007)	(0.008)	(0.004)	(0.005)
tang	0.048	0.037	-0.007	-0.030	0.024	0.030
	(0.062)	(0.052)	(0.040)	(0.044)	(0.046)	(0.044)
growth	0.097***	0.100***	0.037	0.023	0.054**	0.058**
	(0.031)	(0.035)	(0.025)	(0.025)	(0.023)	(0.024)
cashflow	-0.171**	-0.178*	-0.099	-0.037	-0.135*	-0.183**
	(0.086)	(0.103)	(0.081)	(0.088)	(0.072)	(0.080)
liquid	0.001	0.025	-0.000	-0.021	0.046	0.038
	(0.046)	(0.054)	(0.048)	(0.059)	(0.038)	(0.046)
ndts	-0.022	0.098	0.431	0.406	-0.169	-0.157
	(0.448)	(0.386)	(0.350)	(0.304)	(0.311)	(0.355)
size	0.017**	0.021**	0.012**	0.018***	0.011**	0.010*
	(0.007)	(0.009)	(0.006)	(0.006)	(0.005)	(0.006)
lnage	0.005	0.004	0.009	0.008	-0.002	-0.002
	(0.006)	(0.007)	(0.007)	(0.007)	(0.004)	(0.005)
Observations	1,197	1,197	1,197	1,197	1,197	1,197
Number of groups	171	171	171	171	171	171
Number of instruments	158	128	104	94	148	124
Wald chi2	1723	1464	645.7	593.3	793.6	654.3
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
AR(1)	0.000	0.000	0.000	0.000	0.001	0.001
AR(2)	0.979	0.947	0.711	0.743	0.829	0.791
Hansen-J test	0.641	0.373	0.510	0.341	0.636	0.534

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). Column (1), (3), and (5) shows the results of the original regressions; column (2), (4), and (6) presents the regression results when the number of instruments is reduced. The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

5.3.2.2 Robustness checks with alternative variables

In the previous subsection, the robustness checks are undertaken by reducing the number of instrumental variables. In this subsection, alternative variables are used to examine the stability of regression results, thereby confirming the validity and consistency of the model specifications. First, for the pooled dataset with country-level factors, *cgindex1* is substituted by *cgindex2* then *cgindex3*[44]. Second, for each separate sample of Singapore, Thailand, and Vietnam, market leverage (including *mktdta, mkstdta,* and *mkltdta*) is employed to replace for book leverage.

Table 5.24 presents the regression results for the combined dataset. It is worth noting that *cgindex1*, *cgindex2,* and *cgindex3* all have statistically significant and negative impacts on leverage (*bktdta*). The estimated coefficients of them are -0.003 (at 10% of significance level); -0.017 (at 1%); and -0.007 (at 1%), respectively. When *cgindex2* and *cgindex3* are replaced for *cgindex1* in the regression models, *l.bktdta*, *tang*, *growth*, *size*, and *gdpgrowth* maintain their positive impacts on *bktdta*; meanwhile, *cashflow* retains its negative effect on leverage. The values of the coefficients of *l.bktdta* and *size* are almost unchanged. Additionally, their significance levels remain the same at 1%. Besides, *tobinq*, *ndts*, and *lnage* are always not associated with leverage.

Although there are several changes in the significance levels, they are inconsiderable. For example, *liquid* is statistically, significantly, and inversely related to *bktdta* in the regression with *cgindex1* and *cgindex3*, but its coefficient is not statistically significant when *cgindex2* is included in the regression. Similarly, *inflation* has a positive effect on *bktdta* in the model with *cgindex1* or *cgindex2*, but it loses its significance level in the model with *cgindex3*. Besides, the size of the estimated coefficients of several variables varies from regression to regression. For instance, that of *tang* changes from 0.061 to 0.096, then 0.070, respectively; that of *inflation* rises from 0.276 (in the regression with *cgindex1*) to 0.502 (in the regression with *cgindex2*).

Generally, the regression results in Table 5.24 reveal that the original regression appears to be robust in terms of the direction of effects, the significance levels, especially for the main concerns of this thesis relating to the effect of performance on capital structure and the speed of leverage adjustment.

[44] *cgindex1* is the sum of the Government Effectiveness, Regulatory Quality, and Rule of Law Index; *cgindex2* is the first principal component of the three abovementioned indexes extracted from the factor analysis technique; *cgindex3* is the Strength of Investor Protection Index.

Table 5.24: The sensitivity of the results to alternative variables for country governance quality

Regressand: ***bktdta***			
Regressors	**(1)**	**(2)**	**(3)**
l.bktdta	0.788***	0.796***	0.782***
	(0.056)	(0.061)	(0.057)
tobinq	-0.003	0.001	-0.002
	(0.005)	(0.007)	(0.005)
tang	0.061**	0.096***	0.070**
	(0.029)	(0.037)	(0.030)
growth	0.023*	0.034**	0.023*
	(0.012)	(0.016)	(0.013)
cashflow	-0.204***	-0.215**	-0.196***
	(0.069)	(0.105)	(0.067)
liquid	-0.118*	-0.108	-0.140**
	(0.061)	(0.092)	(0.059)
ndts	-0.098	-0.205	-0.097
	(0.170)	(0.280)	(0.172)
size	0.022***	0.022***	0.022***
	(0.006)	(0.007)	(0.006)
lnage	-0.008	-0.003	-0.006
	(0.005)	(0.006)	(0.005)
gdpgrowth	0.304**	0.336***	0.264**
	(0.119)	(0.119)	(0.122)
inflation	0.276***	0.502***	0.068
	(0.080)	(0.126)	(0.093)
cgindex1	-0.003*		
	(0.002)		
cgindex2		-0.017***	
		(0.005)	
cgindex3			-0.007***
			(0.002)
Constant	-0.190***	-0.254***	-0.132**
	(0.060)	(0.082)	(0.052)
Observations	4,018	4,018	4,018
Number of groups	574	574	574
Number of instruments	199	122	199
Wald chi2	2179	1555	2219
Prob > chi2	0.000	0.000	0.000
AR(1)	0.000	0.000	0.000
AR(2)	0.793	0.718	0.754
Hansen-J test	0.299	0.421	0.220

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

When market leverage is replaced for book leverage in the regressions, there are differences in the regression results such as the magnitude of the effects, the significance levels; some variables reveal significant effects on book leverage but display no effect on market leverage, and vice versa. To be more specific, some cases are illustrated. In Singapore, the estimate of *l.bktdta* is 0.530 while that of *l.mktdta* is 0.767; similarly, the figures for *l.bkstdta* and *l.mkstdta* are 0.410 and 0.585, respectively. The coefficients of *liquid* in the regression of *bktdta* and *mktdta* are -0.395 and -0.183; and the significance level of this variable is 1% and 5%, respectively. In the regression of *bktdta*, *tang* has a coefficient of 0.167, and significant at the 5% level; but when *mktdta* is utilized as the regressand, the effect of *tang* on market leverage is not statistically significant. By contrast, the impact of *size* on book leverage (*bktdta*) is statistically insignificant, but statistically significant when market leverage (*mktdta*) is utilized. Similar instances can be found in Table 5.26 and Table 5.27.

However, if an explanatory variable has effects on both book and market leverage, the direction of the effects (positive or negative) is always the same[45]. Another common result relating to our main concern is that the coefficients of the one-year lagged dependent variables are always positive but less than one, indicating that firms in Singapore, Thailand, and Vietnam partially adjust their leverage to target over time. In most cases, the impact of firm performance on leverage is not statistically significant at any levels[46].

Again, it should be reported that the results from the AR(1), AR(2) test of first- and second-order serial correlation[47], the Hansen-J test, and the difference-in-Hansen test confirm that (1) the model specifications are well-specified, (2) the instruments utilized are valid (as a group), and (3) each subset of instruments is exogenous (meaning that they are valid). All these results confirm that the system GMM estimator is appropriate, at least in the context of the three countries in Southeast Asia.

[45] For example, *cashflow*, and *liquid* in column (1) and (2) of Table 5.25; liquid in column (3) and (4) of Table 5.25; *tang*, and *liquid* in column (5) and (6) of Table 5.25; *tang*, and *cashflow* in column (1) and (2) of Table 5.25; *lnage* in column (3) and (4) of Table 5.26; *tang*, and *size* in column (5) and (6) of Table 5.26; *growth*, *cashflow*, and *size* in column (1) and (2) of Table 5.27; and *size* in column (5) and (6) of Table 5.27.

[46] Except only for *mkstdta* of Singaporean firms (column (4) of Table 5.25); and *bkltdta* of Thai firms (column (5) of Table 5.26).

[47] In the regressions of *mktdta* in Singapore and Thailand, since the *p-values* of AR(1), AR(2), and AR(3) are less than 0.1 (see column (2) of Table 5.25 and Table 5.26), lag 4 and deeper lags of variables are used as instruments.

Table 5.25: The sensitivity of the results to alternative leverage variable – Singapore

Regressors	Regressand:					
	bktdta	***mktdta***	***bkstdta***	***mkstdta***	***bkltdta***	***mkltdta***
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
l.bktdta	0.530***					
	(0.192)					
l.mktdta		0.767***				
		(0.048)				
l.bkstdta			0.410***			
			(0.109)			
l.mkstdta				0.585***		
				(0.063)		
l.bkltdta					0.726***	
					(0.101)	
l.mkltdta						0.659***
						(0.051)
tobinq	-0.005	-0.014	-0.008	-0.029***	0.010	0.006
	(0.011)	(0.009)	(0.008)	(0.009)	(0.006)	(0.006)
tang	0.167**	0.034	-0.036	0.012	0.188**	0.143**
	(0.080)	(0.078)	(0.071)	(0.056)	(0.090)	(0.065)
growth	-0.020	0.030	-0.013	0.001	-0.008	-0.008
	(0.014)	(0.027)	(0.010)	(0.004)	(0.006)	(0.006)
cashflow	-0.173**	-0.185***	-0.135*	-0.030	-0.031	-0.040
	(0.087)	(0.055)	(0.077)	(0.045)	(0.045)	(0.035)
liquid	-0.395***	-0.183**	-0.236***	-0.097**	-0.110**	-0.110**
	(0.141)	(0.083)	(0.091)	(0.043)	(0.052)	(0.045)
ndts	-0.122	0.452	1.122	0.643	-0.799	-0.840
	(0.362)	(0.435)	(0.885)	(0.465)	(0.606)	(0.550)
size	0.016	0.021**	0.000	0.001	0.007	0.014
	(0.016)	(0.010)	(0.010)	(0.005)	(0.012)	(0.009)
lnage	-0.010	-0.004	0.008	-0.000	-0.006	-0.009
	(0.015)	(0.010)	(0.012)	(0.008)	(0.009)	(0.007)
Constant	-0.023	-0.141	0.078	0.077	-0.054	-0.104
	(0.160)	(0.128)	(0.117)	(0.080)	(0.122)	(0.108)
Observations	1,099	1,099	1,099	1,099	1,099	1,099
Number of groups	157	157	157	157	157	157
Number of instruments	116	112	140	134	118	128
Wald chi2	266.8	1063	238.3	396.9	648.2	779.4
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
AR(1)	0.071	0.000	0.045	0.000	0.000	0.001
AR(2)	0.603	0.085	0.635	0.602	0.479	0.719
AR(3)	0.863	0.038	0.739	0.144	0.396	0.718
Hansen-J test	0.325	0.524	0.341	0.390	0.516	0.377

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). The last four rows present the *p-values* of AR(1), AR(2), AR(3), and Hansen-J test.

Table 5.26: The sensitivity of the results to alternative leverage variable – Thailand

Regressors	Regressand:					
	bktdta	***mktdta***	***bkstdta***	***mkstdta***	***bkltdta***	***mkltdta***
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
l.bktdta	0.808***					
	(0.038)					
l.mktdta		0.749***				
		(0.063)				
l.bkstdta			0.620***			
			(0.048)			
l.mkstdta				0.678***		
				(0.061)		
l.bkltdta					0.728***	
					(0.044)	
l.mkltdta						0.622***
						(0.096)
tobinq	0.004	-0.009	-0.005	-0.003	0.012*	0.002
	(0.005)	(0.010)	(0.008)	(0.004)	(0.006)	(0.004)
tang	0.106***	0.100*	-0.025	0.019	0.122***	0.110***
	(0.032)	(0.058)	(0.037)	(0.036)	(0.043)	(0.034)
growth	0.022**	0.024	0.015	0.006	0.005	0.008
	(0.009)	(0.029)	(0.011)	(0.006)	(0.006)	(0.006)
cashflow	-0.287***	-0.242*	-0.183	-0.170**	-0.078	-0.160***
	(0.090)	(0.124)	(0.156)	(0.069)	(0.064)	(0.049)
liquid	-0.230**	-0.142	-0.288***	-0.100	-0.141	-0.026
	(0.090)	(0.184)	(0.103)	(0.086)	(0.119)	(0.058)
ndts	-0.242	0.305	0.045	-0.324*	-0.553*	-0.393
	(0.193)	(0.521)	(0.281)	(0.174)	(0.307)	(0.260)
size	0.016***	0.013	-0.005	0.002	0.015**	0.021***
	(0.005)	(0.009)	(0.008)	(0.005)	(0.007)	(0.005)
lnage	-0.010	-0.004	-0.025***	-0.014*	-0.000	-0.001
	(0.008)	(0.007)	(0.009)	(0.008)	(0.006)	(0.007)
Constant	-0.094	-0.079	0.253**	0.102	-0.179*	-0.224***
	(0.076)	(0.137)	(0.120)	(0.089)	(0.098)	(0.073)
Observations	1,722	1,722	1,722	1,722	1,722	1,722
Number of groups	246	246	246	246	246	246
Number of instruments	193	59	123	93	104	90
Wald chi2	1274	840.5	297.1	405.4	467.7	256.1
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
AR(1)	0.000	0.000	0.000	0.000	0.000	0.001
AR(2)	0.981	0.048	0.526	0.547	0.648	0.573
AR(3)	0.527	0.017	0.342	0.351	0.537	0.749
Hansen-J test	0.490	0.760	0.453	0.280	0.305	0.467

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). The last four rows present the *p-values* of AR(1), AR(2), AR(3), and Hansen-J test.

Table 5.27: The sensitivity of the results to alternative leverage variable – Vietnam

Regressors	Regressand:					
	bktdta	***mktdta***	***bkstdta***	***mkstdta***	***bkltdta***	***mkltdta***
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
l.bktdta	0.827***					
	(0.043)					
l.mktdta		0.789***				
		(0.051)				
l.bkstdta			0.807***			
			(0.045)			
l.mkstdta				0.798***		
				(0.037)		
l.bkltdta					0.800***	
					(0.075)	
l.mkltdta						0.766***
						(0.065)
tobinq	-0.002	0.008	-0.003	0.002	0.001	-0.008
	(0.008)	(0.011)	(0.007)	(0.006)	(0.004)	(0.009)
tang	0.048	0.131*	-0.007	0.039	0.024	0.057
	(0.062)	(0.073)	(0.040)	(0.052)	(0.046)	(0.056)
growth	0.097***	0.083**	0.037	0.046**	0.054**	0.029
	(0.031)	(0.038)	(0.025)	(0.024)	(0.023)	(0.027)
cashflow	-0.171**	-0.394*	-0.099	-0.215**	-0.135*	-0.041
	(0.086)	(0.218)	(0.081)	(0.085)	(0.072)	(0.100)
liquid	0.001	0.076	-0.000	0.025	0.046	0.039
	(0.046)	(0.078)	(0.048)	(0.048)	(0.038)	(0.039)
ndts	-0.022	-0.071	0.431	0.435	-0.169	-0.514
	(0.448)	(0.649)	(0.350)	(0.402)	(0.311)	(0.407)
size	0.017**	0.015**	0.012**	0.006	0.011**	0.013**
	(0.007)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)
lnage	0.005	0.008	0.009	0.007	-0.002	-0.002
	(0.006)	(0.007)	(0.007)	(0.007)	(0.004)	(0.005)
Constant	-0.151**	-0.134*	-0.131**	-0.059	-0.095**	-0.109*
	(0.070)	(0.070)	(0.063)	(0.064)	(0.047)	(0.058)
Observations	1,197	1,197	1,197	1,197	1,197	1,197
Number of groups	171	171	171	171	171	171
Number of instruments	158	122	104	151	148	96
Wald chi2	1723	1608	645.7	1131	793.6	391.6
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
AR(1)	0.000	0.000	0.000	0.000	0.001	0.000
AR(2)	0.979	0.270	0.711	0.959	0.829	0.080
Hansen-J test	0.641	0.325	0.510	0.531	0.636	0.375

Note: The variables' definitions are as in Table 3.3; year dummies are included in all regressions but unreported. Windmeijer-corrected standard errors are reported in parentheses. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). The last three rows present the *p-values* of AR(1), AR(2), and Hansen-J test.

5.4 SUMMARY

Chapter 5 investigates the effects of firm performance, firm-specific characteristics, and country-level variables on leverage decisions by using panel data from 2010 to 2017 of Singaporean, Thai, and Vietnamese publicly listed firms. The two-step system GMM estimator is applied for dynamic panel-data models to control for endogeneity that is likely to exist in the relation between performance and leverage. The regression results reveal that past capital structure affects the current capital structure, implying that firms in Singapore, Thailand and Vietnam have optimal debt ratios and those firms change their leverage over time to reach the target level regardless of the regressions are undertaken with the pooled or separate dataset. However, the speed of adjustment is different among the three countries. Specifically, the fastest speed is found in Singapore, then Thailand, and Vietnam.

Although performance (measured by Tobin's Q) is theoretically anticipated to be related to capital structure, empirical results in this study reveal that it has no effect on leverage except for only two cases in which *mkstdta* is used as a measure for leverage of Singaporean firms and *bkltdta* is employed as an indicator for that of firms in Thailand.

Firm-specific factors have impacts on financing decisions, but they differ from country to country and depend on which debt ratios are used in the regression models. For example, tangibility significantly and positively affects total debt and long-term debt in Singapore, and Thailand. Liquidity is inversely associated with short-term, long-term, and total debt in Singapore, and short-term as well as total debt in Thailand. However, both tangibility and liquidity are not statistically significantly associated with any debt ratios of Vietnamese firms. Firm size and growth opportunities seem to have impacts on leverage only in Thailand and Vietnam. Particularly, Thai and Vietnamese firms with higher growth rates possibly have higher total debt ratio. The long-term debt ratio of Vietnamese firms is also positively influenced by growth opportunities. Meanwhile, bigger firms in Thailand and Vietnam tend to use less debt since the estimated coefficients of firm size in the regressions of long-term and total debt in Thailand, short-term, long-term and total debt in Vietnam are significant, at least, at the 5% level. The effect of cash flow on short-term and total debt in Singapore, total debt in Thailand, and long-term, as well as total debt in Vietnam, is inverse. Though non-debt tax shield is predicted to be inversely associated with leverage since it is considered as a substitute for debt tax shield, it appears not to have any effects on leverage as its

coefficients are statistically insignificant, except only for its effect on long-term debt in Thailand. However, the significance level of the estimate is only 10%. Similarly, the expected negative impact of firm age on leverage appears only in the case of long-term debt ratio in Thailand.

Concerning the impacts of country-level factors on firm leverage, all the four variables including GDP growth, inflation, stock market development, and country governance quality statistically significantly affect financing choices of firms in Singapore, Thailand, and Vietnam. GDP growth and inflation positively affect firm leverage while stock market development and country governance quality inversely influence firms' debt level. The effects of GDP growth and inflation are not only statistically significant (at the 1% and 5% level, respectively) but also economically significant since their coefficients, in turn, are 0.304 and 0.276. On the contrary, though the effects of stock market development and country governance quality are statistically significant, they are not economically significant with the regression coefficients of just -0.012 and -0.003, respectively.

Last but not least, it is necessary to reconfirm that although some different approaches are employed (for example, using the OLS and FE estimator to determine the lower and upper bound for the estimated coefficients of the one-year lagged regressand; reducing instrumental variables; using alternative variables), the regression results are consistent, especially for the main concern of this chapter relating to the effect of past leverage level on current one. Moreover, all results of the AR(1), AR(2), Hansen-J, and difference-in Hansen test assert that the regression models are valid and well-specified.

All the main empirical findings of this chapter are summarized in Table 5.28 as follows.

Table 5.28: Summary of the empirical findings

Hypo-theses	Tested relationships	Pooled dataset		Separate dataset								
				Singapore			Thailand			Vietnam		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
HR1	Past leverage-current leverage	(+)***	(+)***	(+)***	(+)***	(+)***	(+)***	(+)***	(+)***	(+)***	(+)***	(+)***
HR2	Performance-leverage	Ø	Ø	Ø	Ø	Ø	Ø	Ø	(+)*	Ø	Ø	Ø
HR3	Tangibility-leverage	(+)**	(+)**	(+)**	Ø	(+)**	(+)***	Ø	(+)***	Ø	Ø	Ø
HR4	Growth opportunities-leverage	Ø	(+)*	Ø	Ø	Ø	(+)**	Ø	Ø	(+)***	Ø	(+)**
HR5	Cashflow-leverage	(–)***	(–)***	(–)**	(–)*	Ø	(–)***	Ø	Ø	(–)**	Ø	(–)*
HR6	Liquidity-leverage	Ø	(–)**	(–)***	(–)***	(–)**	(–)**	(–)***	Ø	Ø	Ø	Ø
HR7	Non-debt tax shield-leverage	Ø	Ø	Ø	Ø	Ø	Ø	Ø	(–)*	Ø	Ø	Ø
HR8	Firm size-leverage	(+)***	(+)***	Ø	Ø	Ø	(–)***	Ø	(–)**	(–)**	(–)**	(–)**
HR9	GDP growth-leverage	-	(+)**	-	-	-	-	-	-	-	-	-
HR10	Inflation-leverage	-	(+)***	-	-	-	-	-	-	-	-	-
HR11	Stock market development-leverage	-	(–)**	-	-	-	-	-	-	-	-	-
HR12	Country governance quality-leverage	-	(–)*	-	-	-	-	-	-	-	-	-
HR13	Firm age-leverage	Ø	Ø	Ø	Ø	Ø	Ø	(–)***	Ø	Ø	Ø	Ø

Note: This table summarizes the empirical results relating to the hypotheses developed in Subsection 3.3.2.2. Signs (+), (–) and (Ø) indicate positive, negative, and no statistically significant relations, correspondingly. Asterisks illustrate the significance level at 10% (*), 5% (**), and 1% (***). The regressand in column (1) and (2) is *bktdta*. The regressand in column (3), (4), and (5) is *bktdta*; *bkstdta*, and *bkltdta*, respectively; and similarly for column (6), (7), and (8); and (9), (10), and (11).

CHAPTER SIX
CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

6.1 OUTLINE

Chapter 6 summarizes empirical findings, presented in Chapter 4 and Chapter 5, relating to the causal relationship and reverse causality between capital structure and performance of publicly listed firms in Singapore, Thailand and Vietnam. Section 6.2 presents relevant conclusions and policy implications. Sections 6.3 documents limitations of the thesis, thereby suggesting some recommendations for future research.

6.2 SUMMARY, IMPLICATIONS AND CONTRIBUTIONS OF THE THESIS

6.2.1 Summary of major empirical results and policy implications

6.2.1.1 Effect of capital structure on firm performance

Theories in corporate finance relating to the issue of firms' capital structure (for example, the agency theory), argue that capital structure may have an effect on firms' value owing to the imperfectness of markets such as asymmetric information. Nonetheless, empirical findings differ. Although this study uses the samples of Singapore, Thailand, and Vietnam in which these countries are much different in terms of economic development, institutional quality, and income per capita[48], the results reveal that capital structure has no effect on firm performance. This result is in agreement with those of Dessí and Robertson (2003), among others. Dessí and Robertson (2003), in their study, emphasize the importance of taking into consideration the dynamic nature and the endogeneity of capital structure decisions. When they carry out regressions of firm performance (Tobin's Q) with the appearance of the lagged regressand on the right-hand side of the equation along with the employment of instrumental variables to control for endogeneity problem, the influence of firms' capital structure on their performance is not statistically significant. Based on the proposition of Jiraporn et al. (2012) about the "substitute role" between leverage and corporate governance, it could be deduced

[48] Singapore is a high-income country with high country-governance quality. Thailand and Vietnam are developing countries. Thailand is ranked as an upper-middle-income country with medium country-governance quality, meanwhile Vietnam is an lower-middle-income country with low country-governance quality (The data of country classification is available at the following link: https://datahelpdesk.worldbank.org/knowledgebase/articles/378834-how-does-the-world-bank-classify-countries).

that in the case of Singapore, Thailand and Vietnam, the potential effect of leverage on performance is possibly substituted by the effect of firms' internal governance mechanism. If this is the case, firms in Singapore, Thailand, and Vietnam employ corporate governance mechanisms to optimize their performance other than exploiting the discipline role of capital structure, at least in the sampling period.

When quadratic term of leverage is included to check whether leverage has a non-monotonic effect on firms' performance, the result reveals that firms' capital structure does not influence their performance in either linear or non-linear forms.

It should be noted that when foreign ownership variable is added in the regression for Vietnamese firms, the effect of capital structure on performance becomes statistically significant and the interaction term between leverage and foreign ownership points out that more foreign capital tends to weaken the effect of leverage on performance. This result implies that foreign ownership, which can be considered as a mechanism of corporate governance among other types of ownership, may play a "substitute role" for leverage to some extent, whereby supporting the proposition of Jiraporn et al. (2012).

6.2.1.2 Effects of other factors on firm performance

The regression outcomes with regards to the effects of firms' capital structure and firms' performance in the past on firms' current performance are consistent in all the three countries. Particularly, firms' capital structure does not influence their performance, whereas firms' historical performance does affect firms' current performance. In the meantime, other factors relating to the agency theory affect firms' performance differently in terms of direction and magnitude of their effects. In general, tangible assets, growth opportunities, cash flow, firm size are firm-specific factors that influence firm performance. Other variables such as liquidity and firm age are not associated with firm performance. In addition, leverage, liquidity and firm size do not have a non-monotonic relationship with performance, except for only Singaporean firms in which firm size has a U-shaped relation with performance.

For Vietnamese firms, there is statistical evidence affirming that foreign ownership possibly has a positive relationship with performance. This result implies that encouraging the participation of foreign ownership may improve performance of Vietnamese firms. However, foreign ownership does not have a non-linear influence on firms' performance as suggested by theory. It is reasonable since the proportion of foreign ownership in

Vietnamese firms is relatively low (approximately 14.2% as presented in Table 4.1). In other words, this proportion is not too high to affect firms' performance negatively.

6.2.1.3 Effect of firm performance on capital structure

Contrary to the conjecture of hypothesis H_{R2}, empirical results show that there is no reverse causality regardless of the regressions are undertaken with the pooled or separate dataset. According to the theory about the reverse causal relationship proposed by Berger and Patti (2006), the regression coefficient of performance variable reflects the "net" effect of the two contradictory effects indicated by the efficiency-risk hypothesis and the franchise-value hypothesis[49]. Therefore, it is reasonable to conclude that in the case of Singaporean, Thai and Vietnamese firms, none of these two effects is more important than the other. Consequently, firm performance has no impact on capital structure.

6.2.1.4 Effects of other factors on capital structure

Almost all firm-specific factors have effects on capital structure, but their effects differ across countries in terms of the magnitude of the effect. Some of them support the trade-off theory and the agency theory, while others are consistent with the pecking-order theory. In general, tangibility and growth opportunities are positively associated with debt level; liquidity, cash flow, and firm size inversely affect leverage; while non-debt tax shield and firm age appear not to influence debt ratios of firms in Singapore, Thailand, and Vietnam.

Four country-level factors are included to check whether they have impacts on firm leverage. GDP growth and inflation reflect macroeconomic condition; stock market development is an indicator relating directly to one source of external financing for firms, and country governance quality is used as a proxy for institutional environment. Though there are differences in magnitude and direction of impacts, all of them affect firms' capital structure. Specifically, the first two factors positively influence leverage, while stock market development and country governance index inversely affect debt level of firms.

6.2.1.5 Adjustment speed of leverage

The regression results reveal that there exists the dynamism of financing decisions of firms in Singapore, Thailand, and Vietnam. Specifically, listed firms the three countries are likely

[49] The "efficiency-risk hypothesis" posits that better-performance firms are likely to borrow more debt, while under the "franchise-value hypothesis", more efficient firms employ less debt.

to adjust their debt ratios towards optimum ones. However, due to the existence of adjustment costs, they do not completely adjust their leverage level each year, but partially. On average, when the datasets are combined, the speed of adjustment is about 21%, implying that firms need nearly three years to close 50 percent of the distance between the present debt ratio and the target level. It is noteworthy that the speed of adjustment is much different among the three countries. Particularly, the fastest adjustment speed is found in Singapore (47%), then Thailand (19%), and Vietnam (17%), indicating that adjustment costs in Thailand and Vietnam are much higher than that in Singapore. It could be inferred that any improvements in country governance quality may help to reduce adjustment costs thereby encouraging firms to adjust their leverage to target faster and employ debt as a tool to reduce agency problems, especially for Thai and Vietnamese firms.

6.2.2 Contributions

As an empirical research, this thesis contributes to the capital structure literature in two facets. First, as denoted in Section 1.2, although theoretical, empirical, and statistical evidence suggests that relationship between firms' capital structure and their performance should be examined in a dynamic framework, most prior studies have applied static model specifications to investigate this relationship. Thus, the static models seem to be misspecified since performance and leverage of firms are path-dependent. This thesis, in order to control for the effects of historical values of the dependent variables on the current ones, re-examines this relationship by employing dynamic panel data models. The inclusion of the lagged regressand in the model specifications along with the use of the system GMM estimator help this study deal with endogeneity problems inherent in corporate finance research. Therefore, it is believed that this study provides more reliable empirical results on the causal and reverse causal association between firms' financial leverage decisions and their performance.

Second, to the best of the author's knowledge, this is the first study that examines the causal relationship and reverse causality between firms' financial leverage decisions and their performance simultaneously by employing dynamic panel data models with a dataset which include three Southeast Asian countries that are in different stages of economic development. Therefore, this research, through providing robust empirical findings from a comparative perspective, enriches the understanding relating to the connection between firms' financing decisions and their performance as well as the impacts of country-level factors on financial leverage choices of firms in Southeast Asian context.

6.3 LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Although this thesis has fully answered the research questions, it still has some limitations which can be summarized as follows.

First, like most prior empirical studies on capital structure, it is likely that this study could suffer, to some extent, from selection bias since the sample selection process relies mainly on the data availability. It is because firms with incomplete data in their annual reports (and/or financial statements), which are dropped out of the sample, are likely to be less transparent and not well-governed when compared to those selected into the sample. This bias may weaken the interpretation and generalization of the research results.

Second, owing to the unavailability of data concerning the corporate governance structure, this study focuses only on the relationship between leverage and performance. As presented in Section 4.3, the potential impact of leverage on performance of Singaporean, Thai and Vietnamese firms may be substituted by the influences of corporate governance mechanisms. Thus, it could be interesting to explore the connection between firms' internal governance and their performance in future research to check the substitute role of corporate governance mechanisms for the discipline role of debt.

Third, this study uses Tobin's Q, a forward-looking market-based indicator, as a proxy for firm performance since it has many advantages compared to accounting-based indicators (ROA and ROE, for example). It is wort noting that employing accounting-based measures could result in different conclusions; however, it helps to recheck the sensitivity of empirical findings. In this regards, it is useful to utilize accounting-based ratios as proxy for financial performance of firms. Besides, using some measures such as fixed-asset turnover ratio, sales revenue per employee, etc., to examine the likely effects of firms' financial leverage on their operating performance could be an interesting topic for future research.

Finally, this research does not distinguish firms in different industries since firms in all industries are examined as a whole due to the fact that in some industries, there are only several firms. It is reasonable that each industry has its own characteristics that may affect the capital structure-performance relationship. Thus, future research could focus on some specific industries to find further detailed results on this relationship as well as to check if there are any differences among firms in different industries.

REFERENCES

Abor, J. (2007). Debt policy and performance of SMEs: Evidence from Ghanaian and South African firms. *The journal of risk finance, 8*(4), 364-379.

Abor, J., & Biekpe, N. (2009). How do we explain the capital structure of SMEs in sub-Saharan Africa? Evidence from Ghana. *Journal of Economic Studies, 36*(1), 83-97.

Ahmed Sheikh, N., & Wang, Z. (2013). The impact of capital structure on performance: An empirical study of non-financial listed firms in Pakistan. *International Journal of Commerce and Management, 23*(4), 354-368.

Ahrens, T., Filatotchev, I., & Thomsen, S. (2011). The research frontier in corporate governance. *Journal of Management & Governance, 15*(3), 311-325.

Akhtar, S. (2005). The determinants of capital structure for Australian multinational and domestic corporations. *Australian journal of Management, 30*(2), 321-341.

Akhtar, S., & Oliver, B. (2009). Determinants of capital structure for Japanese multinational and domestic corporations. *International review of finance, 9*(1-2), 1-26.

Akinlo, O. (2011). Determinants of capital structure: Evidence from Nigerian panel data. *African Economic and Business Review, 9*(1), 1-16.

Al-Najjar, B., & Taylor, P. (2008). The relationship between capital structure and ownership structure: New evidence from Jordanian panel data. *Managerial Finance, 34*(12), 919-933.

Al-Sakran, S. A. (2001). Leverage determinants in the absence of corporate tax system: the case of non-financial publicly traded corporations in Saudi Arabia. *Managerial Finance, 27*(10/11), 58-86.

Alchian, A. A., & Demsetz, H. (1972). Production, information costs, and economic organization. *The American economic review, 62*(5), 777-795.

Alderson, M. J., & Betker, B. L. (1995). Liquidation costs and capital structure. *Journal of Financial Economics, 39*(1), 45-69.

Alfaraih, M., Alanezi, F., & Almujamed, H. (2012). The influence of institutional and government ownership on firm performance: evidence from Kuwait. *International Business Research, 5*(10), 192.

Aljifri, K., & Moustafa, M. (2007). The impact of corporate governance mechanisms on the performance of UAE firms: an empirical analysis. *Journal of Economic and Administrative Sciences, 23*(2), 71-93.

Alzharani, A. M., Che-Ahmad, A., & Aljaaidi, K. S. (2012). Factors associated with firm performance: empirical evidence from the Kingdom of Saudi Arabia. *Accounting & Taxation, 4*(2), 49.

Amato, L. H., & Amato, C. H. (2004). Firm size, strategic advantage, and profit rates in US retailing. *Journal of Retailing and Consumer Services, 11*(3), 181-193.

Antoniou, A., Guney, Y., & Paudyal, K. (2006). The determinants of debt maturity structure: evidence from France, Germany and the UK. *European Financial Management, 12*(2), 161-194.

Antoniou, A., Guney, Y., & Paudyal, K. (2008). The determinants of capital structure: capital market-oriented versus bank-oriented institutions. *Journal of financial and quantitative analysis, 43*(01), 59-92.

Ardalan, K. (2017). Capital structure theory: Reconsidered. *Research in International Business and Finance, 39*, 696-710.

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, 58*(2), 277-297.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of econometrics, 68*(1), 29-51.

Asimakopoulos, I., Samitas, A., & Papadogonas, T. (2009). Firm-specific and economy wide determinants of firm profitability: Greek evidence using panel data. *Managerial Finance, 35*(11), 930-939.

Azzam, I., Fouad, J., & Ghosh, D. K. (2013). Foreign ownership and financial performance: evidence from Egypt. *International Journal of Business, 18*(3).

Balios, D., Daskalakis, N., Eriotis, N., & Vasiliou, D. (2016). SMEs capital structure determinants during severe economic crisis: The case of Greece. *Cogent Economics & Finance, 4*(1), 1145535.

Banerjee, S., Heshmati, A., & Wihlborg, C. (1999). *The dynamics of capital structure*: New York University-Salomon Center-Leonard N. Stern School of Business.

Barclay, M. J., Smith, J., Clifford W, & Morellec, E. (2006). On the debt capacity of growth options. *The Journal of Business, 79*(1), 37-60.

Baskin, J. (1989). An empirical investigation of the pecking order hypothesis. *Financial management*, 26-35.

Bastos, D., Nakamura, W., & Basso, L. (2009). Determinants of capital structure of publicly-traded companies in Latin America: the role of institutional and macroeconomic factors. *Journal of international finance and economics, 9*(3), 24-39.

Bathala, C. T., Moon, K. P., & Rao, R. P. (1994). Managerial ownership, debt policy, and the impact of institutional holdings: An agency perspective. *Financial management, 23*(3), 38-50.

Bauer, P. (2004). Determinants of capital structure: empirical evidence from the Czech Republic. *Czech Journal of Economics and Finance (Finance a uver), 54*(1-2), 2-21.

Baum, C. F., & Christopher, F. (2006). *An introduction to modern econometrics using Stata*: Stata press.

Belkhir, M., Maghyereh, A., & Awartani, B. (2016). Institutions and corporate capital structure in the MENA region. *Emerging Markets Review, 26*, 99-129.

Berger, A. N., & Bonaccorsi di Patti, E. (2006). Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. *Journal of Banking & Finance, 30*(4), 1065-1102. doi: https://doi.org/10.1016/j.jbankfin.2005.05.015

Berger, A. N., & Di Patti, E. B. (2006). Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. *Journal of Banking & Finance, 30*(4), 1065-1102.

Berger, A. N., & Mester, L. J. (1997). Inside the black box: What explains differences in the efficiencies of financial institutions? *Journal of Banking & Finance, 21*(7), 895-947.

Berger, A. N., & Udell, G. F. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. *Journal of Banking & Finance, 22*(6-8), 613-673.

Berle, A., & Means, G. (1932). The modern corporation and private property. Brace & World: Harcourt, New York.

Bhagat, S., & Bolton, B. (2009). Corporate governance and firm performance: Recent evidence. *Electronic Copy Available at: http://ssrn.com/abstract, 1361815*, 1-57.

Biger, N., Nguyen, N. V., & Hoang, Q. X. (2007). The determinants of capital structure: evidence from Vietnam *Asia-Pacific Financial Markets: Integration, Innovation and Challenges* (pp. 307-326): Emerald Group Publishing Limited.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of econometrics, 87*(1), 115-143.

Boardman, A. E., & Vining, A. R. (1989). Ownership and performance in competitive environments: A comparison of the performance of private, mixed, and state-owned enterprises. *The journal of law and Economics, 32*(1), 1-33.

Boeker, W. (1997). Executive migration and strategic change: The effect of top manager movement on product-market entry. *Administrative science quarterly*, 213-236.

Bokpin, G. A. (2009). Macroeconomic development and capital structure decisions of firms: Evidence from emerging market economies. *Studies in economics and finance, 26*(2), 129-142.

Bond, S. R. (2002). Dynamic panel data models: a guide to micro data methods and practice. *Portuguese economic journal, 1*(2), 141-162.

Booth, L., Aivazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *The Journal of Finance, 56*(1), 87-130.

Bradley, M., Jarrell, G. A., & Kim, E. (1984). On the existence of an optimal capital structure: Theory and evidence. *The Journal of Finance, 39*(3), 857-878.

Brennan, M. J., & Schwartz, E. S. (1984). Optimal financial policy and firm valuation. *The Journal of Finance, 39*(3), 593-607.

Buferna, F. M., Bangassa, K., & Hodgkinson, L. (2005). *Determinants of capital structure: evidence from Libya* (Vol. 8): University of Liverpool.

Camara, O. (2012). Capital structure adjustment speed and macroeconomic conditions: US MNCs and DCs. *International research journal of finance and economics, 84*(1), 106-120.

Capon, N., Farley, J. U., & Hoenig, S. (1990). Determinants of financial performance: a meta-analysis. *Management science, 36*(10), 1143-1159.

Caprio, G., & Demirguc-Kunt, A. (1997). The role of long term finance: theory and evidence. *Policy, Research working paper; no. WPS 1746. Washington, DC: World Bank*.

Cebenoyan, A. S., Fischer, K. P., & Papaioannou, G. J. (1995). Corporate financial structure under inflation and financial repression: A comparative study of North American and emerging markets firms. *Global Finance Journal, 6*(1), 25-45.

Chadha, S., & Sharma, A. K. (2015). Capital structure and firm performance: Empirical evidence from India. *Vision, 19*(4), 295-302.

Chakraborty, I. (2010). Capital structure in an emerging stock market: The case of India. *Research in International Business and Finance, 24*(3), 295-314.

Chandrasekharan, C. (2012). Determinants of capital structure in the Nigerian listed firms. *International Journal of Advanced Research in Management and social sciences, 1*(2), 108-133.

Chang, S.-C., Chen, S.-S., Hsing, A., & Huang, C. W. (2007). Investment opportunities, free cash flow, and stock valuation effects of secured debt offerings. *Review of Quantitative Finance and Accounting, 28*(2), 123-145.

Chechet, I. L., & Olayiwola, A. B. (2014). Capital structure and profitability of Nigerian quoted firms: The agency cost theory perspective. *American International Journal of Social Science, 3*(1), 139-158.

Chen, J. J. (2004). Determinants of capital structure of Chinese-listed companies. *Journal of Business research, 57*(12), 1341-1351.
Cheng, S.-R., & Shiu, C.-Y. (2007). Investor protection and capital structure: International evidence. *Journal of multinational financial management, 17*(1), 30-44.
Cho, M.-H. (1998). Ownership structure, investment, and the corporate value: an empirical analysis. *Journal of Financial Economics, 47*(1), 103-121.
Choi, M. H., Sul, W., & Kee Min, S. (2012). Foreign board membership and firm value in Korea. *Management Decision, 50*(2), 207-233.
Chung, K. H., & Pruitt, S. W. (1994). A simple approximation of Tobin's q. *Financial management, 23*(3), 70-74. doi:10.2307/3665623
Chung, R., Firth, M., & Kim, J.-B. (2005). Earnings management, surplus free cash flow, and external monitoring. *Journal of Business research, 58*(6), 766-776.
Coles, J. L., Lemmon, M. L., & Meschke, J. F. (2012). Structural models and endogeneity in corporate finance: The link between managerial ownership and corporate performance. *Journal of Financial Economics, 103*(1), 149-168.
Dang, V. A. (2013). An empirical analysis of zero-leverage firms: New evidence from the UK. *International Review of Financial Analysis, 30*, 189-202.
Dawar, V. (2014). Agency theory, capital structure and firm performance: some Indian evidence. *Managerial Finance, 40*(12), 1190-1206.
De Jong, A., Kabir, R., & Nguyen, T. T. (2008). Capital structure around the world: The roles of firm-and country-specific determinants. *Journal of Banking & Finance, 32*(9), 1954-1969.
De Miguel, A., & Pindado, J. (2001). Determinants of capital structure: new evidence from Spanish panel data. *Journal of Corporate Finance, 7*(1), 77-99.
DeAngelo, H., & Masulis, R. W. (1980). Optimal capital structure under corporate and personal taxation. *Journal of Financial Economics, 8*(1), 3-29.
Deesomsak, R., Paudyal, K., & Pescetto, G. (2004). The determinants of capital structure: evidence from the Asia Pacific region. *Journal of multinational financial management, 14*(4-5), 387-405.
Demirguc-Kunt, A., & Levine, R. (1996). Stock market development and financial intermediaries: stylized facts. *World Bank Economic Review, 10*(2), 291-321.
Demirguc-Kunt, A., & Maksimovic, V. (1996). *Financial constraints, uses of funds, and firm growth: an international comparison*. Retrieved from
Demirgüç-Kunt, A., & Maksimovic, V. (1996). Stock market development and financing choices of firms. *The World Bank Economic Review, 10*(2), 341-369.
Demirgüç-Kunt, A., & Maksimovic, V. (1998). Law, finance, and firm growth. *The Journal of Finance, 53*(6), 2107-2137.
Demirgüç-Kunt, A., & Maksimovic, V. (1999). Institutions, financial markets, and firm debt maturity. *Journal of Financial Economics, 54*(3), 295-336.
Dessí, R., & Robertson, D. (2003). Debt, incentives and performance: Evidence from UK panel data. *The Economic Journal, 113*(490), 903-919.
Dincergok, B., & Yalciner, K. (2011). Capital structure decisions of manufacturing firms' in developing countries. *Middle Eastern finance and economics, 12*(7), 86-100.
Douma, S., George, R., & Kabir, R. (2006). Foreign and domestic ownership, business groups, and firm performance: Evidence from a large emerging market. *Strategic management journal, 27*(7), 637-657.
Dudley, E. (2007). Testing models of dynamic trade off theory.

Ebel Ezeoha, A. (2008). Firm size and corporate financial-leverage choice in a developing economy: Evidence from Nigeria. *The journal of risk finance, 9*(4), 351-364.
El-Sayed Ebaid, I. (2009). The impact of capital-structure choice on firm performance: empirical evidence from Egypt. *The journal of risk finance, 10*(5), 477-487.
Eldomiaty, T. I. (2007). Determinants of corporate capital structure: evidence from an emerging economy. *International Journal of Commerce and Management, 17*(1-2), 25-44.
Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *Review of financial studies, 15*(1), 1-33.
Fan, J. P., Titman, S., & Twite, G. (2012). An international comparison of capital structure and debt maturity choices. *Journal of financial and quantitative analysis, 47*(1), 23-56.
Faulkender, M. W., Thakor, A. V., & Milbourn, T. T. (2006). Does corporate performance determine capital structure and dividend policy?
Feldstein, M., Green, J., & Sheshinski, E. (1978). Inflation and taxes in a growing economy with debt and equity finance. *Journal of political economy, 86*(2, Part 2), S53-S70.
Ferri, M. G., & Jones, W. H. (1979). Determinants of financial structure: A new methodological approach. *The Journal of Finance, 34*(3), 631-644.
Ferris, S. P., & Park, K. (2005). Foreign ownership and firm value: Evidence from Japan *Corporate Governance* (pp. 1-29): Emerald Group Publishing Limited.
Firth, M., Lin, C., & Wong, S. M. (2008). Leverage and investment under a state-owned bank lending environment: Evidence from China. *Journal of Corporate Finance, 14*(5), 642-653.
Fischer, E. O., Heinkel, R., & Zechner, J. (1989). Dynamic capital structure choice: Theory and tests. *The Journal of Finance, 44*(1), 19-40.
Flannery, M. J., & Hankins, K. W. (2013). Estimating dynamic panel models in corporate finance. *Journal of Corporate Finance, 19*, 1-19.
Flannery, M. J., & Rangan, K. P. (2006). Partial adjustment toward target capital structures. *Journal of Financial Economics, 79*(3), 469-506.
Forbes, K. J. (2002). How do large depreciations affect firm performance? *IMF Staff Papers, 49*(1), 214-238.
Fosu, S. (2013). Capital structure, product market competition and firm performance: Evidence from South Africa. *The quarterly review of economics and finance, 53*(2), 140-151.
Frank, M. Z., & Goyal, V. K. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics, 67*(2), 217-248.
Frank, M. Z., & Goyal, V. K. (2004). The effect of market conditions on capital structure adjustment. *Finance Research Letters, 1*(1), 47-55.
Frank, M. Z., & Goyal, V. K. (2007a). Trade-off and pecking order theories of debt. *Handbook of Empirical Corporate Finance, 2*, 135-202.
Frank, M. Z., & Goyal, V. K. (2007b). Trade-off and pecking order theories of debt.
Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: which factors are reliably important? *Financial management, 38*(1), 1-37.
Gajurel, D. (2006). Macroeconomic influences on corporate capital structure.
Ghosh, A. (1998). Does accounting base performance really improve following corporate acquisitions? *Zicklin School of Business Working Paper*.
Ghosh, S. (2008). Leverage, foreign borrowing and corporate performance: firm-level evidence for India. *Applied Economics Letters, 15*(8), 607-616.

Giannetti, M. (2003). Do better institutions mitigate agency problems? Evidence from corporate finance choices. *Journal of financial and quantitative analysis, 38*(1), 185-212.

Gill, A., Biger, N., & Mathur, N. (2011). The effect of capital structure on profitability: Evidence from the United States. *International Journal of Management, 28*(4), 3.

Gleason, K. C., Mathur, L. K., & Mathur, I. (2000). The interrelationship between culture, capital structure, and performance: evidence from European retailers. *Journal of Business research, 50*(2), 185-191.

González, V. M. (2013). Leverage and corporate performance: International evidence. *International Review of Economics & Finance, 25*, 169-184.

Goyal, V. K., Lehn, K., & Racic, S. (2002). Growth opportunities and corporate debt policy: the case of the US defense industry. *Journal of Financial Economics, 64*(1), 35-59.

Graham, J. R. (2000). How big are the tax benefits of debt? *The Journal of Finance, 55*(5), 1901-1941.

Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics, 60*(2), 187-243.

Greenaway, D., Guariglia, A., & Yu, Z. (2014). The more the better? Foreign ownership and corporate performance in China. *The European Journal of Finance, 20*(7-9), 681-702.

Gregory, A. (2005). The long run abnormal performance of UK acquirers and the free cash flow hypothesis. *Journal of Business Finance & Accounting, 32*(5-6), 777-814.

Groß, K. (2007). *Equity ownership and performance: An empirical study of German traded companies*: Springer Science & Business Media.

Grossman, S. J., & Hart, O. D. (1982). Corporate financial structure and managerial incentives *The economics of information and uncertainty* (pp. 107-140): University of Chicago Press.

Gujarati, D. N. (2004). *Basic econometrics* (4th ed.). New York, USA: The McGrawHill Companies.

Gunasekarage, A., Hess, K., & Hu, A. J. (2007). The influence of the degree of state ownership and the ownership concentration on the performance of listed Chinese companies. *Research in International Business and Finance, 21*(3), 379-395.

Gurbuz, A. O., & Aybars, A. (2010). The impact of foreign ownership on firm performance, evidence from an emerging market: Turkey. *American Journal of Economics and Business Administration, 2*(4), 350-359.

Hackbarth, D., Miao, J., & Morellec, E. (2006). Capital structure, credit risk, and macroeconomic conditions. *Journal of Financial Economics, 82*(3), 519-550.

Haniffa, R., & Hudaib, M. (2006). Corporate governance structure and performance of Malaysian listed companies. *Journal of Business Finance & Accounting, 33*(7-8), 1034-1062.

Hanousek, J., & Shamshur, A. (2011). A stubborn persistence: Is the stability of leverage ratios determined by the stability of the economy? *Journal of Corporate Finance, 17*(5), 1360-1376.

Harris, M., & Raviv, A. (1991). The theory of capital structure. *The Journal of Finance, 46*(1), 297-355.

Harris, M., & Raviv, A. (2008). A theory of board control and size. *The Review of Financial Studies, 21*(4), 1797-1832.

Hasan, M. B., Ahsan, A. M., Rahaman, M. A., & Alam, M. N. (2014). Influence of capital structure on firm performance: Evidence from Bangladesh. *International Journal of Business and Management, 9*(5), 184.

Hatzinikolaou, D., Katsimbris, G. M., & Noulas, A. G. (2002). Inflation uncertainty and capital structure: Evidence from a pooled sample of the Dow-Jones industrial firms. *International Review of Economics & Finance, 11*(1), 45-55.

Hill, N. C., & Sartoris, W. L. (1992). *Short-term financial management: text and cases*: Macmillan Publishing Company.

Himmelberg, C. P., Hubbard, R. G., & Palia, D. (1999). Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of Financial Economics, 53*(3), 353-384.

Hirota, S. i. (1999). Are corporate financing decisions different in Japan? An empirical study on capital structure. *Journal of the Japanese and International economies, 13*(3), 201-229.

Hochman, S., & Palmon, O. (1985). The impact of inflation on the aggregate debt-asset ratio. *The Journal of Finance, 40*(4), 1115-1125.

Hovakimian, A., Hovakimian, G., & Tehranian, H. (2004). Determinants of target capital structure: The case of dual debt and equity issues. *Journal of Financial Economics, 71*(3), 517-540.

Hovakimian, A., Opler, T., & Titman, S. (2001). The debt-equity choice. *Journal of financial and quantitative analysis, 36*(1), 1-24.

Hsiao, C. (1985). Benefits and limitations of panel data. *Econometric Reviews, 4*(1), 121-174.

Huang, G., & Song, F. M. (2006). The determinants of capital structure: Evidence from China. *China economic review, 17*(1), 14-36. doi:https://doi.org/10.1016/j.chieco.2005.02.007

Huang, R., & Ritter, J. R. (2009). Testing theories of capital structure and estimating the speed of adjustment. *Journal of financial and quantitative analysis, 44*(02), 237-271.

Huang, R. D., & Shiu, C. Y. (2009). Local effects of foreign ownership in an emerging financial market: Evidence from qualified foreign institutional investors in Taiwan. *Financial management, 38*(3), 567-602.

Hunsaker, J. (1999). The role of debt and bankruptcy statutes in facilitating tacit collusion. *Managerial and Decision Economics*, 9-24.

Huong, P. T. Q. (2017). Macroeconomic factors and corporate capital structure: evidence from listed joint stock companies in Vietnam. *International Journal of Financial Research, 9*(1), 31.

Jensen, G. R., Solberg, D. P., & Zorn, T. S. (1992). Simultaneous determination of insider ownership, debt, and dividend policies. *Journal of financial and quantitative analysis, 27*(2), 247-263.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American economic review, 76*(2), 323-329.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305-360.

Jiraporn, P., Kim, J.-C., Kim, Y. S., & Kitsabunnarat, P. (2012). Capital structure and corporate governance quality: Evidence from the Institutional Shareholder Services (ISS). *International Review of Economics & Finance, 22*(1), 208-221.

Jõeveer, K. (2013). Firm, country and macroeconomic determinants of capital structure: Evidence from transition economies. *Journal of comparative economics, 41*(1), 294-308.
John, T. A. J. F. M. (1993). Accounting measures of corporate liquidity, leverage, and costs of financial distress. 91-100.
Ju, N., Parrino, R., Poteshman, A. M., & Weisbach, M. S. (2005). Horses and rabbits? Trade-off theory and optimal capital structure. *Journal of Financial Quantitative analysis, 40*(2), 259-281.
Kane, A., Marcus, A. J., & McDonald, R. L. (1984). How big is the tax advantage to debt? *The Journal of Finance, 39*(3), 841-853.
Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The worldwide governance indicators: methodology and analytical issues. *Hague Journal on the Rule of Law, 3*(02), 220-246.
Keeley, M. C. (1990). Deposit insurance, risk, and market power in banking. *The American economic review*, 1183-1200.
Keister, L. A. (2004). Capital structure in transition: the transformation of financial strategies in China's emerging economy. *Organization science, 15*(2), 145-158.
Kensinger, J. W., & Martin, J. D. (1986). *Royalty trusts, master partnerships, and other organizational means for" unfirming" the firm*: Department of Finance, College of Business Administration and Graduate School of Business, University of Texas at Austin.
Kester, W. C. (1986). Capital and ownership structure: A comparison of United States and Japanese manufacturing corporations. *Financial management*, 5-16.
Khanna, T., & Palepu, K. (1999). *Emerging market business groups, foreign investors, and corporate governance*. Retrieved from
Kim, E. H. (1978). A mean-variance theory of optimal capital structure and corporate debt capacity. *The Journal of Finance, 33*(1), 45-63.
Kim, M. K., & Wu, C. (1988). Effects of inflation on capital structure. *Financial Review, 23*(2), 183-200.
Kim, W. S., & Sorensen, E. H. (1986). Evidence on the impact of the agency costs of debt on corporate debt policy. *Journal of financial and quantitative analysis, 21*(2), 131-144.
Kimhi, A. (1997). Intergenerational succession in small family businesses: Borrowing constraints and optimal timing of succession. *Small Business Economics, 9*(4), 309-318.
Kimura, F., & Kiyota, K. (2007). Foreign-owned versus domestically-owned firms: economic performance in Japan. *Review of Development Economics, 11*(1), 31-48.
King, M. R., & Santor, E. (2008). Family values: ownership structure, performance and capital structure of Canadian firms. *Journal of Banking & Finance, 32*(11), 2423-2432.
Koch, M. J., & McGrath, R. G. (1996). Improving labor productivity: Human resource management policies do matter. *Strategic management journal, 17*(5), 335-354.
Korajczyk, R. A., Lucas, D. J., & McDonald, R. L. (1991). The effect of information releases on the pricing and timing of equity issues. *The Review of Financial Studies, 4*(4), 685-708.
Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance, 28*(4), 911-922.

Krishnan, V. S., & Moyer, R. C. (1997). Performance, capital structure and home country: An analysis of Asian corporations. *Global Finance Journal, 8*(1), 129-143.
Krivogorsky, V. (2006). Ownership, board structure, and performance in continental Europe. *The International Journal of Accounting, 41*(2), 176-197.
Kumar, N. (2004). *Marketing as strategy: Understanding the CEO's agenda for driving growth and innovation*: Harvard Business Review Press.
Laing, D., & Weir, C. M. (1999). Governance structures, size and corporate performance in UK firms. *Management Decision, 37*(5), 457-464.
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, 42*, 710-726.
Le, T. V., & Buck, T. (2011). State ownership and listed firm performance: a universally negative governance relationship? *Journal of Management & Governance, 15*(2), 227-248.
Leary, M. T., & Roberts, M. R. (2005). Do firms rebalance their capital structures? *The Journal of Finance, 60*(6), 2575-2619.
Lewellen, W. G., & Badrinath, S. G. (1997). On the measurement of Tobin's q. *Journal of Financial Economics, 44*(1), 77-122.
Li, K., Yue, H., & Zhao, L. (2009). Ownership, institutions, and capital structure: Evidence from China. *Journal of comparative economics, 37*(3), 471-490.
Liljeblom, E., & Löflund, A. (2005). Determinants of international portfolio investment flows to a small market: empirical evidence. *Journal of multinational financial management, 15*(3), 211-233.
Lin, C. H., & Shiu, C.-Y. (2003). Foreign ownership in the Taiwan stock market—an empirical analysis. *Journal of multinational financial management, 13*(1), 19-41.
Lin, F.-L., & Chang, T. (2011). Does debt affect firm value in Taiwan? A panel threshold regression analysis. *Applied Economics, 43*(1), 117-128.
Lindenberg, E. B., & Ross, S. A. (1981). Tobin's q Ratio and Industrial Organization. *The Journal of Business, 54*(1), 1-32.
Long, M. S., & Malitz, I. B. (1985). Investment patterns and financial leverage *Corporate capital structures in the United States* (pp. 325-352): University of Chicago Press.
Love, I. (2010). Corporate governance and performance around the world: What we know and what we don't. *The World Bank Research Observer, 26*(1), 42-70.
Majumdar, S. K. (1997). The impact of size and age on firm-level performance: some evidence from India. *Review of industrial organization, 12*(2), 231-241.
Majumdar, S. K., & Chhibber, P. (1999). Capital structure and performance: Evidence from a transition economy on an aspect of corporate governance. *Public Choice, 98*(3), 287-305.
Mak, Y. T., & Li, Y. (2001). Determinants of corporate ownership and board structure: evidence from Singapore. *Journal of Corporate Finance, 7*(3), 235-256.
Manawaduge, A., Zoysa, A. D., Chowdhury, K., & Chandarakumara, A. (2011). Capital structure and firm performance in emerging economies: an empirical analysis of Sri Lankan firms. *CORPORATE OWNERSHIP & CONTROL, 8*(4), 253-263.
Manos, R. (2001). *Capital structure and dividend policy: Evidence from emerging markets.* University of Birmingham.
Margaritis, D., & Psillaki, M. (2007). Capital structure and firm efficiency. *Journal of Business Finance & Accounting, 34*(9-10), 1447-1469.

Margaritis, D., & Psillaki, M. (2010). Capital structure, equity ownership and firm performance. *Journal of Banking & Finance, 34*(3), 621-632.
Marsh, P. (1982). The choice between equity and debt: An empirical study. *The Journal of Finance, 37*(1), 121-144.
Marshall, A. (1920). Principles of economics (8th Aufl.).(complete and unabridged). *London: Create Space Independent Publishing Platform. Google Scholar*.
Mazur, K. (2007). The determinants of capital structure choice: evidence from Polish companies. *International Advances in Economic Research, 13*(4), 495-514.
Michaelas, N., Chittenden, F., & Poutziouris, P. (1999). Financial policy and capital structure choice in UK SMEs: Empirical evidence from company panel data. *Small Business Economics, 12*(2), 113-130.
Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review, 48*(3), 261-297.
Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. *The American economic review, 53*(3), 433-443.
Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics, 5*(2), 147-175.
Myers, S. C. (1984). The capital structure puzzle. *The Journal of Finance, 39*(3), 574-592. doi:10.1111/j.1540-6261.1984.tb03646.x
Myers, S. C. (2003). Financing of corporations. *Handbook of the Economics of Finance, 1*, 215-253.
Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics, 13*(2), 187-221. doi: https://doi.org/10.1016/0304-405X(84)90023-0
Nejadmalayeri, A. (2001). On the effect of the term structure of interest rates on corporate capital structure: Theory and evidence.
Ng, A., Yuce, A., & Chen, E. (2009). Determinants of state equity ownership, and its effect on value/performance: China's privatized firms. *Pacific-Basin Finance Journal, 17*(4), 413-443.
Nguyen, D. T., Diaz-Rainey, I., & Gregoriou, A. (2012). Financial development and the determinants of capital structure in Vietnam.
Nguyen, T. D. K., & Ramachandran, N. (2006). Capital structure in small and medium-sized enterprises: the case of Vietnam. *ASEAN Economic bulletin, 23*(2), 192-211.
Nhung, L. T. P., & Okuda, H. (2015). Effects of state ownership on companies' capital structure and profitability: Estimation analysis before and after the Lehman shock. *Journal of Asian Economics, 38*, 64-78.
Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica: Journal of the Econometric Society*, 1417-1426.
Okuda, H., & Nhung, L. T. P. (2010). The determinants of the fundraising structure of listed companies in Vietnam: Estimation of the effects of government ownership.
Olokoyo, F. O. (2013). Capital structure and corporate performance of Nigerian quoted firms: A panel data approach. *African Development Review, 25*(3), 358-369.
Onayemi, M., Akindapo, A., Ojokuku, R., Adegboyega, A. I., & Abayomi, A. (2010). Capital structure and firm performance: evidence from Nigeria. *European Journal of Economics, Finance and Administrative Sciences, 10*, 7.
Ongore, V. O. (2011). The relationship between ownership structure and firm performance: An empirical analysis of listed companies in Kenya. *African Journal of Business Management, 5*(6), 2120-2128.

Pagano, M. (1993). Financial markets and growth: an overview. *European economic review, 37*(2-3), 613-622.

Pandey, I. (2004). Capital structure, profitability and market structure: Evidence from Malaysia. *Asia Pacific Journal of Economics and Business, 8*(2), 78.

Penrose, E. T. (1959). The theory of the growth of the firm. *New York: Sharpe*.

Pervan, M., Pervan, I., & Todoric, M. (2012). Firm ownership and performance: Evidence for Croatian listed firms. *World Academy of Science, Engineering and Technology, 61*(2012), 964-970.

Phillips, P. A., & Sipahioglu, M. A. (2004). Performance implications of capital structure: evidence from quoted UK organisations with hotel interests. *The Service Industries Journal, 24*(5), 31-51.

Phung, D. N., & Le, T. P. V. (2013). Foreign ownership, capital structure and firm performance: empirical evidence from Vietnamese listed firms. *IUP Journal of Corporate Governance, 12*(2), 40.

Phung, D. N., & Mishra, A. V. (2016). Ownership structure and firm performance: evidence from Vietnamese listed firms. *Australian Economic Papers, 55*(1), 63-98.

Porter, M. E. (1985). *Competitive Advantage: Creating and sustaining superior performance* (Vol. 167): Free Press, New York.

Psillaki, M., & Daskalakis, N. (2009). Are the determinants of capital structure country or firm specific? *Small Business Economics, 33*(3), 319-333.

Qian, Y., Tian, Y., & Wirjanto, T. S. (2009). Do Chinese publicly listed companies adjust their capital structure toward a target level? *China economic review, 20*(4), 662-676.

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance, 50*(5), 1421-1460.

Roberts, M. R., & Whited, T. M. (2013). Endogeneity in empirical corporate finance *Handbook of the Economics of Finance* (Vol. 2, pp. 493-572): Elsevier.

Roodman, D. (2009a). How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata Journal, 9*(1), 86-136.

Roodman, D. (2009b). A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics, 71*(1), 135-158.

Rose, C. (2007). Does female board representation influence firm performance? The Danish evidence. *Corporate Governance: An International Review, 15*(2), 404-413.

Salameh, H. M., Al-Zubi, K. A., & Al-Zu'Bi, B. (2012). Capital structure determinants and financial performance analytical study in Saudi Arabia market 2004-2009. *International Journal of Economic Perspectives, 6*(4), 18.

Salawu, R. O., & Agboola, A. A. (2008). The determinants of capital structure of large non-financial listed firms in Nigeria.

Salawu, R. O., & Ile-Ife, N. (2007). An empirical analysis of the capital structure of selected quoted companies in Nigeria. *The International Journal of Applied economics and finance, 1*(1), 16-28.

Salehi, A. K., & Moradi, M. (2015). The effect of capital structure and product market competition on the financial prformance among the companies listed in Tehran Stock Exchange. *European Online Journal of Natural and Social Sciences, 4*(1 (s)), 512.

Salim, M., & Yadav, R. (2012). Capital structure and firm performance: Evidence from Malaysian listed companies. *Procedia-Social and Behavioral Sciences, 65*, 156-166.

San, O. T., & Heng, T. B. (2011). Capital structure and corporate performance of Malaysian construction sector. *International Journal of Humanities and Social Science, 1*(2), 28-36.

Schall, L. (1984). Taxes, inflation and corporate financial policy. *The Journal of Finance, 39*(1), 105-126.
Schiantarelli, F., & Srivastava, V. (1997). *Debt maturity and firm performance: A panel study of Indian companies*: World Bank Publications.
Schmid, T. (2013). Control considerations, creditor monitoring, and the capital structure of family firms. *Journal of Banking & Finance, 37*(2), 257-272.
Schultz, E. L., Tan, D. T., & Walsh, K. D. (2010). Endogeneity and the corporate governance-performance relation. *Australian journal of Management, 35*(2), 145-163.
Scott Jr, J. H. (1976). A theory of optimal capital structure. *The bell journal of economics*, 33-54.
Sett, K., & Sarkhel, J. (2010). Macroeconomic variables, financial sector development and capital structure of Indian private corporate sector during the period 1981-2007. *IUP Journal of Applied Finance, 16*(1).
Shepherd, W. G. (1986). On the core concepts of industrial economics *Mainstreams in industrial organization* (pp. 23-67): Springer.
Shleifer, A. (1998). State versus private ownership. *Journal of economic perspectives, 12*(4), 133-150.
Shleifer, A., & Vishny, R. W. (1992). Liquidation values and debt capacity: A market equilibrium approach. *The Journal of Finance, 47*(4), 1343-1366.
Shleifer, A., & Vishny, R. W. (1994). Politicians and firms. *The Quarterly Journal of Economics, 109*(4), 995-1025.
Simerly, R. L., & Li, M. (2000). Environmental dynamism, capital structure and performance: a theoretical integration and an empirical test. *Strategic management journal*, 31-49.
Smith Jr, C. W., & Watts, R. L. (1992). The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics, 32*(3), 263-292.
Stinchcombe, A. L. (1965). Organizations and social structure. *Handbook of organizations, 44*(2), 142-193.
Sun, Q., Tong, W. H., & Tong, J. (2002). How does government ownership affect firm performance? Evidence from China's privatization experience. *Journal of Business Finance & Accounting, 29*(1-2), 1-27.
Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic management journal, 17*(S2), 27-43.
Taddese Lemma, T., & Negash, M. (2013). Institutional, macroeconomic and firm-specific determinants of capital structure: The African evidence. *Management Research Review, 36*(11), 1081-1122.
Tai, L. M. (2017). Impact of the financial markets development on capital structure of firms listed on Ho Chi Minh Stock Exchange. *International Journal of Economics and Financial Issues, 7*(3), 510-515.
Taub, A. J. (1975). Determinants of the firm's capital structure. *The Review of Economics and Statistics*, 410-416.
Thomsen, S., & Pedersen, T. (2000). Ownership structure and economic performance in the largest European companies. *Strategic management journal, 21*(6), 689-705.
Tian, L., & Estrin, S. (2008). Retained state shareholding in Chinese PLCs: does government ownership always reduce corporate value? *Journal of comparative economics, 36*(1), 74-89.

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance, 43*(1), 1-19.
Tong, G., & Green, C. J. (2005). Pecking order or trade-off hypothesis? Evidence on the capital structure of Chinese companies. *Applied Economics, 37*(19), 2179-2189.
Van Essen, M., Engelen, P. J., & Carney, M. (2013). Does "Good" Corporate Governance Help in a Crisis? The Impact of Country-and Firm-Level Governance Mechanisms in the E uropean Financial Crisis. *Corporate Governance: An International Review, 21*(3), 201-224.
Vasiliou, D., & Daskalakis, N. (2009). Institutional characteristics and capital structure: A cross-national comparison. *Global Finance Journal, 19*(3), 286-306.
Viviani, J.-L. (2008). Capital structure determinants: an empirical study of French companies in the wine industry. *International Journal of Wine Business Research, 20*(2), 171-194.
Vo, D., & Phan, T. (2013). Corporate governance and firm performance: empirical evidence from Vietnam. *Journal of Economic Development, 218*, 62-78.
Vo, X. V. (2017). Determinants of capital structure in emerging markets: Evidence from Vietnam. *Research in International Business and Finance, 40*, 105-113.
Wald, J. K. (1999). How firm characteristics affect capital structure: an international comparison. *Journal of Financial research, 22*(2), 161-187.
Warokka, A. (2008). Ownership structures, capital structure and firm performance: an analysis of post East Asian financial crisis.
Wei, Z., & Varela, O. (2003). State equity ownership and firm market performance: evidence from China's newly privatized firms. *Global Finance Journal, 14*(1), 65-82.
Welch, I. (2004). Capital structure and stock returns. *Journal of political economy, 112*(1), 106-131.
Wellalage, N. H., & Locke, S. (2012). Ownership structure and firm financial performance: evidence from panel data in Sri Lanka. *Journal of Business Systems, Governance & Ethics, 7*(1).
Williams, J. (1987). Perquisites, risk, and capital structure. *The Journal of Finance, 42*(1), 29-48.
Williamson, O. E. (1967). Hierarchical control and optimum firm size. *Journal of political economy, 75*(2), 123-138.
Williamson, O. E. (1988). Corporate finance and corporate governance. *The Journal of Finance, 43*(3), 567-591.
Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of econometrics, 126*(1), 25-51.
Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics, 105*(3), 581-606.
Wiwattanakantang, Y. (1999). An empirical study on the determinants of the capital structure of Thai firms. *Pacific-Basin Finance Journal, 7*(3-4), 371-403.
Wooldridge, J. M. (2009). Introductory econometrics: a modern approach (4ed.). *Mason, USA: South-Western Cengage Learning*.
Wooldridge, J. M. (2015). *Introductory econometrics: A modern approach*: South-Western Cengage Learning.
Xuan-Quang, D., & Zhong-Xin, W. (2013). Impact of ownership structure and corporate governance on capital structure: the case of Vietnamese firms. *Australian journal of Business and Management research, 3*(3), 11.

Yu, M. (2013). State ownership and firm performance: Empirical evidence from Chinese listed companies. *China Journal of Accounting Research, 6*(2), 75-87.
Zeitun, R. (2014). Corporate governance, capital structure and corporate performance: evidence from GCC countries. *Review of Middle East Economics and Finance Rev. Middle East Econ. Fin., 10*(1), 75-96.
Zeitun, R., & Tian, G. (2007). Capital structure and corporate performance: evidence from Jordan. *Australasian Accounting Business and Finance Journal, 1*, 4.
Zou, H., & Xiao, J. Z. (2006). The financing behaviour of listed Chinese firms. *The British Accounting Review, 38*(3), 239-258.