

Financial Development and the Determinants of Capital Structure in Vietnam

Dzung T. Nguyen¹

Ivan Diaz-Rainey^{2*}

Andros Gregoriou³

¹ Banking- Insurance Department, Academy of Finance, Hanoi, Vietnam

² Department of Accounting and Finance, School of Business, University of Otago, Dunedin, New Zealand

³ Hull University Business School, University of Hull, Hull, HU6 7RX, UK.

* Corresponding author: Tel. + 64 3 479 8117 ; Fax: + 64 3 479 8171 ; Email: ivan.diaz-rainey@otago.ac.nz

Abstract: This paper explores the capital structure of listed Vietnamese companies in the broader context of financial development (the recent expansion of domestic equity and debt capital markets). Accordingly, the paper provides the first insights into the capital structure of listed companies in one of the most dynamic economies in the Asia-Pacific region and in an economy that has experienced rapid change in recent years. We employ a panel GMM (generalized method of moments) system estimator to analyse the determinants of the capital structure of 116 non-financial firms listed on either the Ho Chi Minh Stock Exchange or the Hanoi Stock Exchange for the period 2007-2010. From this analysis we conclude that despite the emergence in recent years of equity and (to a lesser extent) corporate debt capital markets, the capital structure of Vietnamese enterprises are still dominated by the use of short-term financing sources. Further, our results show that state controlled enterprises continue to have preferential access to finance and that high growth firms still rely principally on external debt rather than equity issuance. These results indicate that policymakers need to continue to pursue policies that will deepen capital markets and ensure that bank finance is allocated on a purely commercial basis.

Keywords: Capital structure; Financial development; Vietnam; GMM system estimator; *Doi Moi*; Emerging markets

JEL: G32; G38; N25; P34; O16

1. Introduction

This paper explores the capital structure of listed Vietnamese companies in the broader context of financial development (the recent expansion of domestic equity and debt capital markets). Previous research on the capital structure of Vietnamese enterprises is limited. Vietnam is absent in international analyses of capital structure in emerging markets (e.g. Booth *et al.*, 2001; Deesomsak *et al.*, 2004) and only two country specific peer-reviewed studies are discernible (Nguyen and Ramachandran, 2006 and Biger *et al.*, 2008). This paper enhances the understanding of capital structure in Vietnam relative to the extant literature in a number of ways; (1) it examines a large sample of listed companies whilst most prior work focused on unlisted companies and SMEs; (2) it provides a more up-to-date view with prior work examining the period up to 2003 - since then there have been major changes in Vietnam's financial system (see discussion below and Table 1) and (3) within this context we compare the financing policies between State-Owned Enterprises (SOEs) and private corporations. Accordingly, this paper provides up-to-date insights into the capital structure of companies in one of the most dynamic economies in the region and in an economy that has experienced rapid change in recent years.

In 1986 Vietnam implemented “*Doi Moi*”, a policy which set in motion transformation from a centrally-planned to a market-oriented economy. As part of this liberalization process the government promoted private ownership and, in 1992, launched a State-Owned Enterprises (SOEs) reform program. At the heart of this program is ‘equitization’ by transforming SOEs into joint stocks companies so as to enhance their financial autonomy and efficiency. Most SOEs were privatized with the government keeping control of key industries like airlines, electricity and telecommunication. Accordingly, joint stock firms with more than 50% shares held by government are still regarded as state-owned.¹ As a result of these changes two stock markets have been established. Ho Chi Minh Stock Exchange (HOSE) was founded in July 2000 while and the second exchange, the Hanoi Stock Exchange (HNX), was founded in March 2005. HNX is mainly for small and medium enterprises.

Two decades on, the impact of these reform processes are clearly evident both in terms of an increased role of private firms and private capital in the economy and in terms of the relative decline in the importance of SOEs. There has been an impressive reduction in number of SOEs (from around 12,000 in 1991 to 1,200 in 2010) as well as reduction in the public sector's share of total profit and investment (IMF, 2010; WB, 2012). The ‘equitization’ of the economy is apparent from Table 1. Starting with five listed stocks with market capitalization accounting for 0.2% GDP in 2000, the market has become an important channel of raising financing for 649 firms with a total market capitalization of approximately US\$ 35 billion (45% GDP) in 2010 (see Table 1).

[Insert Table 1, Table 2 and Figure 1 about here]

As they develop and mature these nascent equity markets (HOSE and HNX) have experienced high volatility (See Figure 1). For instance, in 2006-2007, the market

¹ Corporate Law of Vietnam 2005: Available from the electronic Portal of Vietnamese Government: www.chinhphu.vn/vanbanpq/lawdocs/L60QH.DOC?id=31574 (Accessed on 23 July 2011)

witnessed a spike due to ‘over exuberance’ about the prospects of the Vietnamese economy as it became a member of the World Trade Organization (WTO). In 2008, the impact of global financial crisis became apparent when foreign investors withdrew their investment in HOSE and HNX, contributing to the market losing around two-thirds of its value (IMF, 2009).

The volatility experienced in Vietnamese equity markets has been attributed to herding behavior by Vietnamese private investors and there have also been concerns about issues of information asymmetry (IMF, 2007; Leung, 2009). These issues highlight the need to improve investor education and to improve financial transparency through full compliance with market information disclosure rules. The latter in particular hints at the need to strengthen regulatory institutions so as to ensure a more robust enforcement of the market’s legal framework (See Leung, 2009; MUTRAP, 2011). Such measures should lead to deeper and more transparent markets, with lower cost of capital for firms wishing to raise new equity capital.

The bond market is at an even earlier stage of development in Vietnam than the equity market. Most local currency bond issuance is from the government or government sponsored institutions such as municipalities and the Vietnam Development Bank (see Table 2). Vuong and Tran (2010) note that the corporate bond market has been in existence since the early 1990s, however, its scale is such that only growth in recent years means that it registers in any meaningful way (currently 1.4% of GDP, See Table 1). Overall the bond market only accounts for about 15% of GDP which is well below the East Asian average of about 65% (see Leung, 2009 citing World Bank statistics).

Within this context, this paper will explore the determinants of capital structure of Vietnamese companies including the difference in financing policies between State-Owned Enterprise (SOEs) and private corporations. In order to do this, the paper is organized as follows. Section 2 reviews the theoretical and empirical literature on capital structure. Section 3 develops hypotheses, discusses the data employed and specifies the econometric model utilized. Section 4 presents the empirical results, while Section 5 discusses the results and provides related conclusions.

2. Literature Review

Research on capital structure originated from the irrelevance theory of Modigliani and Miller (1958) (Hence forth referred to as MM). Following from this work an intense theoretical and empirical debate has emerged that challenges the unrealistic assumption inherent in MM’s irrelevance theory.

2.1. Theories of Capital Structure

On the theoretical side two main strands to the literature are apparent: Optimal Capital Structure (Trade-Off Theory) and Financing Hierarchy (Pecking Order Theory).

Optimal Capital Structure Theories

Incorporating *financial distress* and *agency cost* into MM’s irrelevance model, Stiglitz (1969), Jensen and Meckling (1976) and Jensen (1986) demonstrate the existence of significant costs of high leverage. These costs may be direct (legal and administration

bankruptcy costs) or indirect costs (for instance loss of confidence by customers, suppliers and employees) (Altman, 1984; Stiglitz, 1969). *Agency cost* arises from an attempt to align interest of agent with the principal. In the Jensen (1986), debt is beneficial in mitigating conflicts between managers and owners; regular payment of interest leaves less free cash-flow for managers to misuse. In contrast, dealing with relationship between equity-holders and debt-holders, Jensen and Meckling (1976) recognize that lenders' imposition of high interest rate and strict debt covenants inhibit managers' flexibility in pursuing risky projects to increase shareholder value. Balancing the advantages and disadvantages of debt is central to *Trade-off theory*. In an extended form, the theory states that firms should pursue an optimum capital structure where the value of tax shields equates with rising interest rates, costs of financial distress and agency problems.

Financing Hierarchy Theories

In an attempt to tackle the unrealistic assumptions of *MM's irrelevance theorem*, the concepts of *information asymmetry* and *transaction costs* were introduced to explain preferences for financing sources. First, *information asymmetry* (referring to the information advantage about firms' performance of managers over external investors) favours debt over equity. In particular, according to Ross's (1977) *signalling theory*, debt issuance usually conveys managers' optimism about prospective performance while new equity issuance is perceived by investors as an indication of over-valuation. Second, research on *transaction costs* suggests a preference for internal funds. According to Myers (1984), retained earnings are most favoured owing to its low cost of transactions. Moreover, the explanation from Myers and Majluf (1984) that internal financing avoids communication and pricing issues with outsiders also comes to similar conclusion. Combining transaction cost and information asymmetry propositions, Myers (1984) put forward *Pecking Order Theory* that points out a financial hierarchy. Firms prefer internal to external funds, while among the two sources of external finance, debt ranks above equity.

Optimal Capital Structure and Finance Hierarchy Theories adopt competing approaches. The former suggests firms have a targeted gearing ratio at which the benefits of debt's tax-shield balance with agency and financial distress cost. By way of contrast, the latter rejects the existence of well-defined leverage with issues of information asymmetry and transactions costs determining a preference for internal equity followed by debt and with external equity being last in the pecking order (Myers, 1984).

2.2. Empirical Research

A wide range of empirical research has been undertaken to examine the validity of the Trade Off and Pecking Order Theories. The empirical literature tends to focus on testing theoretical prediction about the impact of firm-specific factors on leverage (these are discussed as part of *Section 3.1. Hypotheses*) and to explore the influence of external or contextual factors such as institutional characteristics. This section explores the latter factors and reviews past analyses of the capital structure of Vietnamese firms.

The Influence of External or Contextual Factors

Studies that explore the influence of external or contextual factors on capital structure usually take the form of international analyses. These international comparisons have highlighted the impact of country-specific factors on capital structure irrespective of whether those analyses are of developed countries, in developing economies generally and specifically in the Asia-Pacific region (See Booth *et al.*, 2001; Deesomsak *et al.* 2004; de Jong *et al.*, 2008). The contextual factors identified by the literature include GDP growth rate, the strength of the legal system and the related strength of creditor/shareholder protection/rights (de Jong *et al.*, 2008)

Other contextual factors that tend to impact results and that are particularly relevant to the Vietnamese context are the *level of capital market development* and *ownership structure*. For instance, in the former case evidence for the UK by Marsh (1982) and for the USA by Friend and Lang (1988) supports Pecking Order theory. In contrast, research in developing and transitioning economies such as China, Poland, Russia, Czech Republic and Slovakia find a “modified” Pecking Order (i.e. internal finance, equity and debt) (See Chen, 2004; Delcours, 2007). In these countries, under-developed bond markets drive firms to equity issuance for long-term financing.

Ownership structure is another factor that can influence capital structure. For example, in Asian-Pacific countries such as Indonesia and Thailand family-dominated listed firms are commonplace. Accordingly Witwattanakantang (1999) and Bunkanwanicha *et al.* (2008) attribute high leverage in Thai publicly listed firms partly to family controlling interests preferring debt over new equity in order to avoid ownership dilution. Another influence is state-ownership. Rajan and Zingales (1995) observe a positive impact of state-ownership on leverage when government serves as a debt guarantor. Similarly, Bradley *et al.* (1984) and Booth *et al.* (2001) acknowledge government influence on firms’ debt policy. In particular, the former recognizes that highly-g geared firms dominate state-regulated industries like electricity or airlines while the latter reports state credit programs granted to preferred sectors (i.e. agriculture in Thailand). Another example comes from China where most of the listed firms are ‘equitized’ state-owned enterprises or formerly state-owned enterprises. Chen (2004) using data from 1995 to 2000 concludes that these firms are protected from bankruptcy by the government, causing the pecking order and trade-off models to have limited explanatory power in China. However, Huang and Song (2006) report an insignificant relationship between leverage and state-ownership when analysing a much larger dataset spanning 1994 to 2003. This might imply that ‘equitized’ Chinese SOEs are gradually becoming more independent from government.

The Capital Structure of Vietnamese Firms

Despite the established nature of the empirical literature on capital structure a shortage of research in the Vietnamese context is apparent. Vietnam is absent in international analyses of capital structure in emerging markets (e.g. Booth *et al.*, 2001; Deesomsak *et al.*, 2004) and only two country specific peer-reviewed studies are discernible (Nguyen and Ramachandran, 2006 and Biger *et al.*, 2008).

Nguyen and Ramachandran (2006) explore the capital structure of 558 Small and Medium sized Enterprises (SMEs) for the period 1998-2001, while Biger *et al.* (2008) explored a larger sample of 3,778 mainly unlisted enterprises for 2002-2003.² This body of evidence indicates that Vietnamese firms relied mostly on short-term bank loan rather than equity since equity markets were nascent in the periods covered by the research. With respect to the determinants of capital structure, commonly-observed factors in the international empirical literature like size, profitability are applicable to Vietnam (see *Section 3.1. Hypotheses*). However, the impact of growth and tangibility raised some contrasting evidence. Nguyen and Ramachandran (2006) find that firm growth is positively associated with short-term debt as high growth firms have high demand for working capital. Further, tangibility had a negative relationship with gearing. According to Nguyen and Ramachandran (2006) this is due to the dominance of short-term debt in total debt, which does not necessarily require collateral. Biger *et al.* (2008), add that Vietnamese banks paid more attention to liquidity than tangibility because they were mainly granting short-term loans.

In addition to universally observed factors, these studies also research some Vietnam-specific factors. For instance, they consistently prove that state-owned firms (SOEs) have more debt than their private counterparts due to their good relationship with state-owned banks. More interestingly, when “networking” and “social relationship with banks” are included into regression model, profitability becomes insignificant (Nguyen and Ramachandran 2006). This might imply that some factors are far more important than profitability in helping firms access to bank loans in Vietnam.

Some limitations in these prior studies on Vietnamese capital structure highlight the need for further research. Firstly, most prior work focused on unlisted companies and SMEs. Second, as acknowledged by Nguyen and Ramachandran (2006), the reliability of data employed in previous studies is questionable as financial information was drawn from unaudited statements. Finally, with datasets dating back to 1998-2001 and 2002-2003 for Nguyen and Ramachandran (2006) and Biger *et al.* (2008) respectively, their findings reflect an outdated context. For instance, during 1998-2003, Vietnam was in the early stages of transition from command to a market economy; it is therefore understandable that distortions in financing activities (i.e social relationships with banks) should have still been dominant. Similarly, as state-owned firms dominated the economy, so close relationships between SOEs and leverage was understandable. However, the question remains whether the subsequent development of stock and bond markets, coupled with the continuing restructuring and equitization of SOEs has altered the nature capital structure in Vietnam enterprises (See *1. Introduction* and Table 1 for an overview of how the Vietnamese financial system has developed in recent years).

3. Methodology

This section addresses research design. Section 3.1. develops testable hypotheses, Section 3.2. introduces the dataset, while Section 3.3. outlines the econometric approach.

² Most, if not all, of these firms will have been unlisted since there were only 22 listed firms in 2003 (See Table 1)

3.1. Hypotheses

In this section we develop testable hypotheses on characteristics determining the debt ratios of Vietnamese firms. We do so by exploring universally observed and frequently researched determinants (i.e profitability, tangibility, size, growth opportunity and liquidity) (see Frank and Goyal 2009; Welch, 2011) and a country-specific factor (i.e state-ownership).

Theoretical predictions about relationship between *profitability* and leverage are inconsistent. For instance, according to trade-off theory, profitable firms should borrow more as they need to shield income from tax. Pecking order theory anticipates a negative relationship. As internal financing is the most favoured source of finance, profitable firms with available retained earnings will borrow less. Despite the theoretical dispute, most empirical evidence including Kester (1986) and Fama and French (2002) confirm the negative relationship between profitability and leverage. More notably, international studies such as Rajan and Zingales (1995) for the G7 economies and Wald (1999) for some developed economies confirm the negative impact of profitability across countries.

H1: There is an inverse relationship between profitability and leverage as profitable firms prefer internal fund to finance their business.

Both theoretical models and empirical analyses mostly confirm that companies with more *tangible* assets are highly geared. In developing countries, the agency issue and information asymmetry between firms and lenders can be pronounced (Booth *et al.*, 2001; Chen, 2004; Nguyen and Ramachandran, 2006). This is evident in the case of Vietnam where the legal system is still perceived as weak and as a result credit is extended principally on the basis of collateral or relationships (Leung, 2009; Nguyen and Ramachandran, 2006).

H2: Tangibility positively relates to leverage because collateralized assets significantly mitigates the information asymmetry and agency cost between lenders and borrowers.

Generally capital structure theories predict that large firms are more leveraged. For instance, large firms may have greater bargaining power with lenders thereby lowering their cost of debt. Further, larger firms are less likely to be adversely affected by information asymmetry problems than small ones as they are better-known and are willing or required to disclose more information to outsiders (Rajan and Zingales, 1995). Most international empirical research confirm theoretical propositions (for instance Friend and Lang, 1988; Frank and Goyal, 2009). This is also true for Vietnam where studies report a positive relationship between size and leverage (Nguyen and Ramachandran, 2006; Biger *et al.*, 2008).

H3: Size favorably influences leverage since large firms have less pronounced information asymmetry problems.

Capital structure theories disagree over the relationship between firm growth and gearing. According to the agency cost model, financial covenants and restrictions imposed by lenders leave less flexibility for firms to pursue investment opportunities;

thus firms with growth potential will avoid debt. In contrast in Pecking Order Theory, high growth firms often exhaust internal funds so they subsequently employ the second preferred source of finance; debt. On the empirical side, studies in developed economies find a negative relationship between growth and debt ratios (Rajan and Zingales, 1995; Wald, 1999). However, studies in developing countries including those for Vietnam indicate that firms finance their growth with debt (especially bank loans). (Chen, 2004; Nguyen and Ramachandran, 2006; Delcours, 2007; Biger *et al.*, 2008)

H4: Growth is positively related to leverage as found by the majority of empirical studies in developing countries.

Intuitively, creditors regard liquidity as an indicator of firm's ability to fulfill short-term debt obligations so high liquidity should enable better access to debt capital. However, according to Pecking Order Theory, firms with accumulated cash and liquid assets will prefer this available internal fund over borrowing. This negative relationship is consistently reported in empirical analyses (for instance Prowse, 1990; Deesomsak *et al.* 2004; de Jong *et al.*, 2008). There is limited evidence on *liquidity* in the Vietnamese context. This factor is important in understanding short-term source of finance, and is particularly relevant in developing countries like Vietnam where current liabilities tend to be dominant elements of the capital mix (Vuong and Tran, 2010).

H5: Liquidity has an adverse impact on leverage since high liquid firms have available internal funds to finance their business.

From the discussion in *Section 2.2*, it is evident that ownership structure is another factor that can influence capital structure and that related evidence in the Vietnamese context shows that state-controlled firms are more leveraged due to their relationship with state-owned commercial banks (SOCBs) (Nguyen and Ramachandran, 2006; Biger *et al.*, 2008). However, as noted earlier since these studies were undertaken considerable changes have been enacted in the Vietnamese economy including the development of equity and capital markets and the continued equitization and restructuring of SOEs (See *1. Introduction* and Table 1). Accordingly it is feasible that SOEs have become gradually more independent from state in their financing activities (IMF, 2010). Despite this possibility we hypothesise that there remains a positive relationship between SOEs and leverage since capital markets are still relatively undeveloped and the government still maintains control of key sectors, especially commercial bank system.

H6: There is a positive relationship between state-ownership and leverage.

3.2. Data

The data used is from the audited financial statements of listed firms through a database provided by FPT Securities Company. A stratified random sampling technique based on industry classification is employed since the nature of each industry also influences capital structure of firms (Titman and Wessel, 1988). Table 3 describes the sample in terms of industry classification and ownership. The sample consists of 116 non-financial firms listed on HOSE and HNX. Our data covers the

period 2007-2010. Twenty-one of the firms are among the top 50 companies as measured by market capitalization. Accordingly, the sample is broadly representative of non-financial listed Vietnamese stocks.

[Insert Table 3 and Table 4 about here]

Table 4 list the dependent and independent variables used to test the hypotheses developed in Section 3.1. With respect to the measurement of leverage there is considerable debate in the literature over the use of market leverage or book leverage. The arguments in favor of the former include that market values better reflect a firms current cost of capital (see Bradley, 1984; Frank and Goyal, 2009). Even if one accepts these arguments, they are largely immaterial in the context of a developing country like Vietnam. This is because reliable market values for debt and equity are difficult to obtain since the financial system is largely bank based, the corporate bond market has low liquidity and equity markets are highly volatile (See *1 Introduction*, Figure 1 and Vuong and Tran, 2010). Accordingly, we use only book values in our measures of total, short-term and long-term leverage (TLEV, SLEV and LLEV respectively see Tables 3 and 4). Further, due to Welch (2011)'s critique of gearing measures that ignore trade credit we use total liabilities in our measurement of TLEV and SLEV. This is particularly important in the context of Vietnam given the popularity of trade credit as a financing tool (Nguyen and Ramachandran, 2006).

With respect to the independent variables, measures that are standard in the literature generally or common in the past studies on Vietnam are employed for PROF, TANG SIZE, GROW and LIQ in order to maximize comparability (The column labeled 'references' in Table 4 lists prior studies using the equivalent measures). With respect to STATE, a dummy variable was constructed where firms with over 50% of state-owned shares were assigned a value of 1.

[Insert Table 5 about here]

Table 5 provides the Spearman Rho's correlation coefficients among the variables. For the dependent variables Table 5 also reports test for multicollinearity. Tolerance statistics for all dependent variables well above 0.2, while VIF values are well below 10, and the average VIF is very close to 1. From the above we define the model for our three measures of leverage (TLEV, SLEV and LLEV) as

$$LEV = \beta_0 + \beta_1 PROF + \beta_2 TANG + \beta_3 SIZE + \beta_4 GROW + \beta_5 LIQ + \beta_6 STATE + \varepsilon_i \quad (1)$$

As the sample contains data over time and across firms, we undertake a panel analysis to fully exploit the richness of the data.

3.3. Model Specification

We estimate a panel estimator, so in the econometric model we need to include a_i and b_t , where a_i captures the time-invariant unobserved firm-specific fixed effects, and b_t captures the unobservable individual-invariant time effects.

In order to evaluate the type of panel estimator that we implement, we formally test the explanatory variables for endogeneity, with the use of a Hausman test for the hypothesis that the explanatory variables are strictly exogenous. If the null hypothesis is rejected, it leads to the conclusion that the explanatory variables in our econometric specification are endogenously determined. In our empirical estimates, the Hausman test rejects the null hypothesis at all conventional significance levels. This leads to the conclusion that we need to tackle the econometric issue of endogeneity for our explanatory variables.

Initially, we embark upon the use of the single equation Generalized Method of Moments (GMM) panel estimator developed by Arellano and Bond (1991) to deal with the endogeneity of our explanatory variables. We implement the GMM single equation estimator instead of the Two Stage Least Squares method because, as mentioned in Biorn and Klette (1999), the GMM is asymptotically efficient under non-restrictive assumptions about error autocorrelation and heteroscedasticity. We test the validity of the instruments with the use of the Sargan test under the null hypothesis that the instruments used are valid. The Sargan test results in a p-value of zero confirming that the instruments used are not valid. The fact that the GMM single equation estimator yields invalid instruments suggests that the empirical findings in our analysis based on this estimator would be weakened. The results of the Sargan test of the GMM single equation estimator are not reported by the authors, but are available upon request.

A possible reason for the weak instruments in our study is that the time dimensions of the panels are very small (four time series observations). The single equation estimator suffers from the problem of weak instruments when the time series component of the panel is small. This implies that there is a weak correlation between the regressors and the instruments. As a result of this problem, the estimated coefficients suffer from poor precision (see, among others, Staiger and Stock (1997)). We can overcome this problem by using the panel GMM system estimator proposed by Blundell and Bond (1998), which radically reduces the imprecision associated with the single equation estimator.

A system of equations in first differences and levels is estimated by the GMM system estimator. The system estimator combines the standard set of transformed equations in first differences (used in the GMM single equation estimator) with an additional set of equations in levels. The first set of transformed equations continues to use the lag levels as instruments. The level equation, on the other hand, uses the lagged first differences as instruments. Their validity is based on the following two moment conditions:³

$$E \begin{bmatrix} (a_{it} + e_{it})\Delta Y_{i,t-z} \\ (a_{it} + e_{it})\Delta W_{i,t-z} \end{bmatrix} = 0 \quad \text{for } z \geq 1, \quad (2)$$

Where Y represents the dependent variables, W denotes the explanatory variables in our econometric specification and z represents the lag structure of the GMM

³ The time-varying matrix of instruments for the first difference GMM estimator can be observed in Blundell and Bond (1998).

estimator. In addition to reducing the poor precision of the GMM single equation estimators, the GMM system has the added advantage of dealing with explanatory variables being jointly determined with the independent variables.⁴

4. Results and Discussion

4.1. Descriptive results

In Table 4 it is reported that total leverage of Vietnamese firms is 48%, which is a slightly lower than 52% observed during 2002-2003 by Biger *et al.* (2008). This is possibly due to differences in the size of firms being analyzed or may reflect the increasing popularity of equity finance as attested by the rising number of listed firms (see Table 1). However, the still relatively underdeveloped nature of equity and bond capital markets is apparent in that, consistent with past research, firms continue to be heavily reliant on short term financing (SLEV= 37%; LLEV= 11%). Our sample had a higher profitability (PROF = 10%) and growth rate (GROW = 40%) over 2007-2010, than the unlisted sample in Biger *et al.* (2008) covering the period for 2002-2003 (PROF = 3% and GROW = 17%). This is most likely due to listing requirements that ensure firm profitable before coming to markets. With respect to size (13.33) and liquidity (2.65x) our sample is fairly similar to the Thai and Malaysian figures observed in Deesomsak *et al.* (2004).

Table 3 highlights the difference between state-owned and non-state-owned firms. Generally, the former have higher ratios in all three measurements of debt (TLEV=51.65%, SLEV=38.06%, LLEV=13.59%). Nevertheless, an independent t-test only confirms the statistical difference between two groups in TLEV ($p < .1$). Further, though there are no significant differences in profitability, size and liquidity, the two groups are divergent in their tangibility ($p < .10$) and growth ($p < .1$). State-owned firms possess more fixed tangible assets while non-state owned firms experience rapid growth rate. This it is understandable since state-owned firms tend to dominate fixed-asset intensive industries such as construction and public utilities. Private firms, by way of contrast dominate the high growth electronics-technology industry.

4.2. Econometric results

Table 6 presents the results of the econometric analysis. We need to mention that in all cases the fixed and time effects are significant, suggesting that the company and time-specific shocks differ significantly across the firms in our sample, justifying the use of the panel. In addition, all estimated models pass the diagnostic tests. The Jarque-Bera normality test indicates that the residuals of the models are normally distributed, implying that the empirical estimates obtained are not due to any outliers in the data. The Sargan tests confirm the validity of the instruments in all GMM system models.

⁴ The Three Stage Least Squares (3SLS) panel estimator also estimates a system of equations simultaneously and is regarded as an alternative to the GMM system estimator. However, we implement the GMM system estimator, given that it accommodates for the possibility of joint determination of an equation system with different instruments for different equations (Schmidt, 1990).

[Insert Table 6 and Table 7 about here]

The models for TLEV and SLEV have high explanatory power (R^2 of 0.56 and 0.55) respectively. The model for LLEV, however, had a good deal less explanatory power (R^2 of 0.43) hinting that a broader range of factors drive long-term finance decisions. With respect to the explanatory variables, Table 7 shows that the results are, in general, in line with the Hypotheses (Section 4.1.) and past studies on capital structure in the Vietnamese context. This noted, it is clear that there are differences between the three measures of leverage in term of determinants (Table 6). TLEV has a significant negative relationship with PROF, and LIQUID but a positive one with GROWTH and STATE. For the SLEV ratio, all four significant determinants (PROF, TANG, SIZE and LIQUID) are negatively associated. Three variables GROWTH, TANG and SIZE are positively associated LLEV while PROF is negatively associated.

From the above we can see that profitability (PROF) has a significant and negative relationship with all measures of leverage. This lends strong support for *Hypothesis 1* and Pecking Order Theory in that all other thing being equal firms prefer internal sources of finance. With respect to *Hypothesis 2* and the impact of tangibility the results are much more mixed. Tangibility is not a relevant determinant of total leverage (TLEV), however, it is significant in predicting short-term (SLEV) and long-term leverage (LLEV) but in opposite directions. Despite opposing direction of the relationship, both coefficients are high. Indeed, tangibility exerts the second largest effect on debt ratios just behind profitability.

The negative association of TANG to SLEV is consistent with prior Vietnamese studies (Nguyen and Ramachandran, 2006; Biger *et al.*, 2008). One interpretation of this relationship is that firms with few tangible assets tend to rely more on short-term liabilities such as trade credit (See earlier discussion in Section 3.2. related to trade credit and our definition of SLEV). Conversely, the positive association between TANG and LLEV reflects high information asymmetry and agency costs (Leung, 2009, MUTRAP, 2011) that make Vietnamese banks reliant on collateral as the primary credit risk tool. This evidence is in line with *Hypothesis 2* and is consistent with international findings (See Chen, 2004; Frank and Goyal, 2009).

The results for *Hypothesis 3* (the impact on SIZE on capital structure) are analogous to those of TANG. SIZE is negatively associated with SLEV and positively associated with LLEV. A positive relationship between size and leverage has consistently been found by in the Vietnamese case (See Table 7). The message is clear that firm size enhances long-term borrowing capacity from commercial banks. However, in the paper by Nguyen and Ramachandran (2006) the association between size and leverage held for short term measures of leverage also. This contrasts with our own results where SIZE is negatively associated with SLEV. Our findings in this respect are in line with evidence from the China by Chen (2004) whom also identified a negative relationship between size and short-term debt ratios. The difference may be explained by the fact that our sample was of listed firms while Nguyen and Ramachandran (2006) focused on SME's. This might imply that large listed firms can choose between short term and long term finance while larger SME will take leverage in whatever form is available.

As predicted by *Hypothesis 4* GROW is positively associated with TLEV and LLEV though the relationship with SLEV is not statistically significant. The latter is perhaps not surprising since short-term creditors are more concerned with liquidity than long term prospects. More generally the results with respect to GROW confirm previous findings for Vietnam (See Table 7) and in emerging market more generally. This should be a disappointment to policy makers in Vietnam since in developed countries with deep capital markets the relationship tends to go in the other direction since high growth enterprises finance their expansion through the equity issuance (Rajan and Zingales, 1995; Wald, 1999). Accordingly the fact that our research confirms the findings of previous research in Vietnam some ten years on indicates that the development of equity markets in Vietnam in the intervening period has been limited, with high growth firm still relying principally on bank debt (See *1. Introduction* and Table 1).

The results presented in Table 6 generally support *Hypothesis 5* since liquidity (LIQ) is negatively associated with TLEV and SLEV. There is, however, no statistically significant relationship between LIQ and LLEV. Unsurprisingly long-term lenders are more interested in growth (GROW) and tangibility (TANG) than liquidity. The negatively relationship between LIQ and TLEV and SLEV is, nevertheless, consistent with Pecking Order Theory in that it indicates that liquid firms prefer to use accumulated cash and liquid assets rather than to resort to external finance. Another explanation for the negative relationship relates to policy interventions over the period in question. As a result of the global economic downturn numerous Vietnamese firms experienced liquidity issues in 2008 (IMF, 2009). To assist the corporate sector, the government issued a stimulus package including 4% interest rate subsidy for short-term commercial loans (IMF, 2010). Accordingly, the leverage of low liquidity firms might have been materially boosted by this subsidy schemes. However, since previous studies on Vietnamese capital structure did not explore liquidity variables it is difficult to gauge to what extent the subsidy scheme had an impact, if any (See Table 7).

With respect to *Hypothesis 6* the empirical analysis finds that state ownership (STATE) positively influences TLEV and SLEV but has no impact on LLEV. This result is consistent with the Vietnamese literature where a positive relationship between state-ownership and leverage is consistent found (See Table 7). Unfortunately, neither Nguyen and Ramachandran (2006) or Biger *et al.* (2008) has an equivalent variable to our LLEV so it is difficult to know whether the absence of a relationship between STATE and LLEV can be attributed to the equitization of SOE's and the development of capital markets in Vietnam (See *1. Introduction* and Table 1).

Irrespective of what is driving the result with respect to LLEV, the overriding conclusion is that the state still plays an important role in overall leverage (TLEV) and short-term financing (SLEV). This finding puts the equitization program and the development of capital markets in context. Key sectors such as construction, public utilities and finance remain largely under actual or tacit government control. Further, the government can act as a tacit or actual debt guarantor for those firms it dominates leading to better access to credit for those firms thanks to lower bankruptcy and agency costs. The government can also grant financial support through industrial policy schemes (via the bank system) that prioritized specific industries. Finally, listed SOEs continue to benefit from having a close relationship with state-owned

commercial banks (SOCBs). This is understandable since the restructuring of SOCBs is in its early stages; among the five SOCBs, there are three equitized banks where the government still maintains a large controlling stake⁵. Further, the preponderance of Joint Stock Banks (JSBs) (purportedly private banks) in Vietnam were subject to considerable direct and indirect state influence since the state, SOEs and SOCBs all held substantial amounts of equity in these banks (see WB 2012). Hence, listed SOEs can take an advantage of their relationship with both SOCBs and JSBs to increase their borrowing capacity.

5. Conclusion

This paper explored the capital structure of listed Vietnamese firms. We employed a panel GMM (generalized method of moments) system estimator to analyse the determinants of the capital structure of 116 non-financial firms listed on either the Ho Chi Minh Stock Exchange or the Hanoi Stock Exchange for the period 2007-2010. The determinants of three different measures of leverage (total leverage, short-term leverage and long-term leverage) were explored relative to firm-specific factors (profitability, tangibility, size, growth opportunity and liquidity) and an economy-specific factor (state ownership).

From this analysis we concluded that despite the emergence in recent years of equity and (to a lesser extent) corporate debt capital markets, the capital structure of Vietnamese enterprises are still dominated by the use of short-term financing sources. The results indicate that profitability and liquidity negatively affect leverage while growth and state-ownership exert a positive impact. The influence of size and tangibility diverges across the different measures of leverage; they have a positive relationship with long-term leverage but a negative effect on short-term leverage. Determinants are also different in their extent of influence. Among studied factors, profitability and tangibility have the largest impact on leverage ratios. Some factors like size, tangibility and growth opportunity are more relevant to long-term debt while liquidity relates more short-term leverage.

From these results it is clear that Pecking Order Theory better explains financing decision in Vietnam than Trade Off Theory. Further, the significant impact of country-specific factors like state-ownership confirms the importance of institutional differences in understanding capital structure. Accordingly, our results show that state controlled enterprises continue to have preferential access finance and that high growth firms still rely principally on external debt rather than equity issuance. These results indicate that policymakers need to continue to pursue policies that will deepen capital markets and ensure that bank finance is allocated on a purely commercial basis.

The relative immaturity of capital markets in Vietnam should be an issue of concern to policymakers since Lee (2012) finds that financial system development is an important lead indicator or precursor to economic expansion whether not the financial

⁵ VIETCOMBANK (Bank for Foreign Trade of Vietnam) and VIETINTBANK (Vietnam Joint Stock Commercial banks for Industry and Trade), BIDV (Bank for Investment and Development of Vietnam) were equitized in 2007, 2008, 2011 respectively with government holding 91% of Vietcombank, 89% of Vietintbank and 78% of BIDV after equitization.

system is bank-based or market-based. Further, Lee (2012) finds that in nearly all cases the development of a banking system and the development capital markets is complementary. Accordingly, policymakers should ensure Vietnamese equity and corporate bond markets continue to develop even if the financial system is to remain principally bank-based (see Table 1). This will give Vietnamese corporations much greater flexibility in financing and will inevitable lower the cost of capital, resulting in capital structures governed by corporate needs and efficient allocation of capital rather than based on legacy relationships with the banking system. As Leung (2009, p.47) put it in her assessment of Vietnamese finance “*regulatory prejudices and the inability to address asymmetric information problems have resulted, either directly or indirectly, in discriminatory access to finance in favour of state-owned enterprises (SOEs), with adverse implications both for the development of the domestic private sector and macroeconomic stability.*”

References

- Altman, E.I., 1984. A further empirical investigation of the bankruptcy cost question. *Journal of Finance*. 39(4), 1067-1089.
- Arellano, M., Bond, S.R., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*. 58, 277-297.
- Biger, N., Nguyen, N.V., Hoang, Q.X., 2008. Chapter 15 - The determinants of capital structure: Evidence from Vietnam, in: Kim, S.J. and Mckenzie, M.D. (Eds.), *Asia-Pacific Financial Markets: Integration, Innovation and Challenges* (International Finance Review, Volume 8). Emerald Group Publishing Limited, pp. 307-326.
- Biorn, E., Klette, T.J., 1999. The labour input response to permanent changes in output: An errors-in-variables analysis based on panel data. *Scandinavian Journal of Economics*. 101, 379-404.
- Blundell, R., Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*. 87, 115-143.
- Booth, L., Aivazian, V., Demirguc-Kunt, A., Maksimovic, V., 2001. Capital structures in developing countries. *Journal of Finance*. 56 (1), 87 – 130.
- Bradley, M., Jarrell, G.A., Kim, E.H., 1984. On the existence of an optimal capital structure: Theory and Evidence. *Journal of Finance*. 39(3), 857-878.
- Bunkanwanicha, P., Gupta J., Rokhim, R., 2008. Debt and entrenchment: Evidence from Thailand and Indonesia. *European Journal of Operational Research*. 185(3), 1578–1595.
- Chen, J.J., 2004. Determinants of capital structure of Chinese-listed companies. *Journal of Business Research*. 57(12), 1341-1351.
- de Jong, A.D., Kabir, R., Nguyen, T.T., 2008. Capital structure around the world: The roles of firm- and country-specific determinants. *Journal of Banking and Finance*. 32(9), 1954-1969.
- 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.
- Delcours, N., 2007. The determinants of capital structure in transitional economies. *International Review of Economics and Finance*. 16(3), 400–415.
- 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.
- Frank, M.Z., Goyal, V.K., 2009. Capital structure decisions: Which factors are reliably important? *Financial Management*. 38(1), 1-37.
- Friend, I., Lang, L.H.P., 1988: An empirical test of the impact of managerial self-interest on corporate capital structure. *Journal of Finance*. 43(2), 271-281.
- Huang, G. and Song, F.M., 2006. The determinants of capital structure: Evidence from China. *China Economic Review*. 17, 14-36
- IMF(International Monetary Fund), 2007. IMF Country Report No. 07/38. www.imf.org/external/pubs/ft/scr/2007/cr07385.pdf (Accessed on 16 July, 2011)
- IMF (International Monetary Fund), 2009. IMF Country Report No. 09/110. <http://www.imf.org/external/pubs/ft/scr/2009/cr09110.pdf> (Accessed on 16 July, 2011)

- IMF (International Monetary Fund), 2010. IMF Country Report No. 10/281. <http://www.imf.org/external/pubs/ft/scr/2010/cr10281.pdf> (Accessed on 16 July, 2011)
- Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review*. 76(2), 323-329.
- Jensen, M.C., Meckling, W.H., 1976. Theory of the firm: Managerial behaviour, Agency costs and the ownership structure. *Journal of Financial Economics*. 3(4), 305 – 360
- Lee, S. B., 2012. Bank-based and market-based financial systems: Time-series evidence. *Pacific-Basin Finance Journal*. 20(2), 173-197.
- Kester, W.C., 1986. Capital and ownership structure: A comparison of United States and Japanese manufacturing corporations. *Financial Management*. 15(1), 5-16.
- Leung, S., 2009. Banking and financial sector reforms in Vietnam. *ASEAN Economic Bulletin*. 26(1), 44-57.
- Marsh, P., 1982. The choice between equity and debt: An empirical Study. *Journal of Finance*. 37(1), 121– 144.
- Modigliani, F., Miller, M.H., 1958. The cost of capital, corporation finance and the theory of investment. *American Economic Review*. 48(3), 261-297.
- MUTRAP (EU- Vietnam Multilateral Trade Assistance Project), 2011. Securities market liberalisation in Vietnam- Key issues for the securities regulator and the domestic securities companies. <http://www.mutrap.org.vn/en/default.aspx> (Accessed on 3 August 2011)
- Myers, S.C., 1984. The capital structure puzzle. *Journal of Finance*. 39(3), 575-592.
- 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.
- 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.
- Prowse, S.D., 1990. Institutional investment pattern and corporate financial behavior in the United State and Japan. *Journal of Financial Economics*. 27(1), 43-66.
- Rajan, R.G., Zingales, L., 1995. What do we know about capital structure? Some evidence from international data. *Journal of Finance*, 50(5), 1421–1460.
- Ross, S.A., 1977. The determination of financial structure: The incentive- signalling approach. *The Bell Journal of Economics*. 8(1), 23– 40.
- Schmidt, P., 1990. Three-stage least squares with different instruments for different equations. *Journal of Econometrics*. 43, 389-394.
- Staiger, D., Stock, J.H., 1997. Instrumental variables regression with weak instruments. *Econometrica*. 65, 557-586.
- Stiglitz, J.E., 1969. A re-examination of the Modigliani-Miller theorem. *American Economic Review*. 59(5), 784-793.
- Titman, S., Wessels, R., 1988. The determinants of capital structure choice. *Journal of Finance*. 43(1), 1– 19.
- Vuong, Q.H., Tran, T.D., 2010. Vietnam corporate bond market, 1990-2010: Some reflections. *Journal of Economic Policy and Research*. 6(1), 1-46.
- Wald, J.K., 1999. How firm characteristics affect capital Structure: An international comparison. *Journal of Financial Research*. 22(2), 161– 188.
- Welch, I., 2011. Two common problems in capital structure research: The financial-debt-to-asset ratio and issuing activity versus leverage changes. *International Review of Finance*. 11(1), 1-17.

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.

WB (World Bank), 2012. Vietnam development review 2012- Market economy for a middle- income Vietnam.
<http://web.worldbank.org/wbsite/external/countries/eastasia/pacificext/vietname>
xtn (Accessed on 14 Feb 2012)

Table 1: Vietnamese Indicators of Financial Development

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<i>Direct Finance: Equity and Bond Capital Markets</i>												
Listed firms ^a	5	11	20	22	26	41	193	253	338	457	649	700
Market/GDP (%) ^a	0.2	0.3	0.5	0.4	0.6	1.1	22.7	43.3	15.2	37.6	45	20
Bonds/GDP (%) ^b	0.3	0.6	0.8	2.2	3.5	5	8.3	13.8	15.6	13.3	15.4	15.6
Corp./GDP (%) ^b	0	0	0	0	0	0	0	0.5	0.7	1.2	1.8	1.4
<i>Intermediated Finance: The Banking System</i>												
Deposits/GDP(%) ^c			48	52	60	67	78	99	92			
Loans/GDP(%) ^c			45	52	61	70	75	93	93			

Source and explanation:

^a Number of listed firms on HOSE and HNX and market capitalization to GDP from MUTRAP (2011) and own calculations

^b Based on December figures for each year for total local currency bonds to GDP and total local currency corporate bonds to GDP. From Asian Development Bank 'Bonds online' database (accessed 6 January 2012)

^c Leung (2009) citing a World Bank report

Table 2: Vietnamese Bond Market between 1990-2010^a

Issuers	Proportion
Government	53%
Vietnam Development Bank	33%
Municipalities	4%
Corporations	10%
+ SOEs	49%
+ Listed firms	35%

^a Source: Vuong and Tran (2010)

Table 3: Sample Classified by Industry, Ownership and Measure of Leverage

Industry	Total		State-owned firms			TLEV			SLEV			LLEV	
	Number	%	Number	%	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD
Construction	25	21.6	18	15.5	1	0.63	0.11	1	0.52	0.16	3	0.11	0.14
Real Estate	16	13.8	3	2.6	2	0.53	0.19	3	0.34	0.17	2	0.19	0.14
Public Utilities	16	13.8	10	8.6	3	0.49	0.19	7	0.28	0.19	1	0.21	0.09
Electronics & Tech.	12	10.3	3	2.6	4	0.41	0.34	4	0.34	0.14	5	0.07	0.09
Food and Beverage	23	19.8	4	3.4	5	0.41	0.16	2	0.34	0.14	6	0.06	0.07
Natural resources	16	13.8	6	5.2	6	0.40	0.21	5	0.32	0.16	4	0.07	0.08
Drugs	8	6.9	0	0.0	7	0.34	0.18	6	0.31	0.16	7	0.04	0.04
Total	116	100.0	44	37.9									

Table 4: Variables and Descriptive Statistics

	Abr.	Variable	Measurement	References	Hypoth.	N	Mini.	Maxi.	Mean	SD
Dependent Variables	TLEV	Total leverage	= Total Liabilities / Total Assets	Welch (2011)	H1-H6	116	0.07	0.88	0.48	0.20
	SLEV	Short-term leverage	= Current Liabilities / Total Assets	Welch (2011)	H1-H6	116	0.06	0.81	0.37	0.18
	LLEV	Long-term leverage	= Non-Current Liab. / Total Assets		H1-H6	116	0.00	0.62	0.11	0.13
Independent Variables	PROF	Profitability	= Earnings before Tax / Total Assets	Nguyen and Ramachandran, (2006); Biger et al., (2008)	H1	116	-0.03	0.37	0.10	0.08
	TANG	Tangibility	= Tangible Fixed Assets / Total Assets	Rajan and Zingales, (1995); Biger <i>et al.</i> (2008)	H2	116	0.00	0.93	0.20	0.18
	SIZE*	Size	= Total Assets	Wald (1999); Chen (2004)	H3	116	10.07	16.21	13.33	1.31
	GROW	Growth	= Percentage change in Total Assets	Titman and Wessels, (1988); Nguyen and Ramachandran, (2006)	H4	116	-0.08	1.80	0.40	0.38
	LIQ	Liquidity	= Current Assets / Current Liabilities	Deesomsak <i>et al.</i> (2004); de Jong <i>et al.</i> (2008)	H5	116	0.16	26.59	2.65	3.23
	STATE	Ownership	1 = State-Owned; 0 = Not State Owned		H6	116	0.00	1.00	0.38	0.49

Note: *An alternative size variable used in the literature is Sales (e.g. Titman and Wessel, 1988; Biger *et al.*, 2008). Unreported analyses available upon request showed that both measures provided analogous results.

Table 5: Correlation Coefficients between Variables and VIF Coefficients

	TLEV	SLEV	LLEV	PROF	TANG	SIZE	LIQ	GROW	STATE	Tolerance	VIF
TLEV	1										
SLEV	0.734**	1									
LLEV	0.550**	-0.016	1								
PROF	-0.504**	-0.317**	-0.227*	1						0.976	1.025
TANG	0.077	-0.086	0.188*	-0.096	1					0.797	1.254
SIZE	0.028	-0.161	0.270**	0.036	-0.175	1				0.913	1.095
LIQ	-0.684**	-0.680**	-0.267**	0.299**	-0.284**	0.132	1			0.953	1.049
GROW	0.207*	0.233*	0.122	0.031	-0.471**	0.254**	-0.077	1		0.744	1.344
STATE	0.148	0.051	0.11	-0.024	0.353**	-0.149	-0.196*	-0.357**	1	0.831	1.204

Table 6: Econometric Results

	(1)	(2)	(3)
Dependent Variable	TLEV	SLEV	LLEV
Constant	0.50 (2.91)*	1.15 (6.85)*	-0.43 (-3.85)*
PROF	-1.33 (-5.92)*	-0.93 (-4.21)*	-0.38 (-2.77)*
TANG	-0.07 (-0.81)	-0.46 (-5.28)*	0.38 (5.88)*
SIZE	0.007 (0.58)	-0.04 (-3.47)*	0.03 (4.18)*
GROW	0.140 (2.93)*	0.05 (-1.16)	0.07 (2.51)*
LIQ	-0.027 (-6.43)*	-0.029 (-6.78)*	0.00 (0.09)
STATE	0.108 (3.31)*	0.07 (2.07)*	0.03 (1.14)
a_i	(0.00)	(0.00)	(0.00)
b_t	(0.00)	(0.00)	(0.00)
SE	0.131	0.129	0.105
NORM(2)	(0.68)	(0.48)	(0.19)
Diff Sargan	(0.64)	(0.52)	(0.58)
Hausman test	86.72	80.23	90.23
R^2	0.56	0.55	0.43
Observations	116	116	116

Notes: SE represents the standard error of the panel estimator. a_i and b_t are the fixed and time effects. Sargan tests follow a χ^2 distribution with r degrees of freedom under the null hypothesis of valid instruments. Note: the Difference-Sargan test is applicable to the GMM system estimator due to the transformations involved. To establish the validity of the instrument set. NORM(2) is the Jarque-Bera normality test. The Hausman test follows a χ^2 distribution with 6 degrees of freedom, resulting in a critical value of 12.59, at the 95% confidence level.

The endogenous explanatory variables in the panel are GMM instrumented setting, $z \geq 1$. (.) are p values, (.) are t statistics, * indicate significant at the 5% level.

Table 7: Findings Relative to Hypotheses and Previous Vietnamese Studies

Determinant	Findings	Hypotheses	Previous Studies
Profitability	Negatively associated with TLEV, SLEV and LLEV	Strongly supports H1	(a) insignificant (b) negative
Tangibility	Negatively assoc. with SLEV Positively assoc. with LLEV	Partly supports H2	(a) and (b): negative
Size	Negatively assoc. with SLEV Positively relates to LLEV	Partly supports H3	(a) and (b): positive
Growth	Positively assoc. with TLEV and LLEV	Supports H4	(a) and (b): positive
Liquidity	Negatively assoc. with TLEV and SLEV	Supports H5	(a) and (b): not studied
State Ownership	Positively assoc. with TLEV and SLEV	Supports H6	(a) and (b): positive

Key: (a) = Nguyen and Ramachandran (2006)
(b) = Biger *et al.* (2008)

Figure 1: VN-Index



Source: Reuters EcoWin