FIRM- SPECIFIC DETERMINANTS OF CAPITAL STRUCTURE: EVIDENCE FROM VIETNAM DURING THE PERIOD OF 2007- 2011

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Abstract

We analyse the relationship between four key firm- specific indicators of capital structure of 85 Vietnamese non- financial listed firms during the period from 2007 to 2011, and the extent to which the Financial Crisis between 2008 and 2009 affects them. The regression results of OLS estimation point out that the level of long- term debt and total debt increase as Vietnamese firms have higher growth opportunities, larger size as well as more tangibility. In contrast, companies which gain more profits are likely to use their retained earnings to fund their operation activities, rather than issuing more debt. These findings are generally consistent with most of previous literature. When dummy variable is added into our model to examine the effect of Financial Crisis, we see that the relationship between determinants and the leverage of Vietnamese firms unchanged, except for the case that companies with higher market-to-book value tend to reduce their long- term debt from 2008 to 2009.

Key words: *capital structure, leverage, trade- off theory, pecking order theory.*

1. INTRODUCTION

Capital structure which is determined as the mixture of debt and equity owned by a company initially departures from Modigliani and Miller (1958). They proposed the irrelevant theorem in which the firm value is always unchanged under different capital structure approaches. However, in 1963, they revised their conclusion when taking corporate tax into consideration. They claims that as corporate tax create tax shield for a firm so that the more debt they issue, the more value the firm possess. Propositions of Modigliani and Miller drew the path for other economists to follow, but raised many great controversies between them. Then, they have proposed many different theories. There exit two

famous theories referring to capital structure: trade-off and pecking order theory. It should be noted that trade- off theory is considered as a benchmark theory. It refers to the idea that

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the company has to decide to issue bond or equity or in other word, balance between tax advantage of debt (tax shields) and many costs relating to leverage such as bankruptcy costs, financial distress. The pecking order theory was first proposed by Myers (1984) who claims that "a firm is said to follow a pecking order if it prefers internal to external financing and debt to equity if external financing is used" (cited from Frank and Goyal, 2007, pp. 17).

Under different theories of capital structure, various economists, for example, Rajan and Zingales (1995) and Bevan and Danbolt (2002) state that the important determinants affected the firm's debt-equity choice are growth, size of firm, profitability and tangibility. Nevertheless, most empirical papers concentrate on the relationship between capital structure and its contributors in industrialized countries. The lack of literature examined these issues in emerging countries motivates us to investigate the Vietnam market, a developing country in South East Asia.

Since 1986, Vietnam implemented a reform known as "Doi Moi", a new policy which transform a centrally-planned economy into a market-oriented economy. According to this new policy, the Government encouraged the equitization program by shifting State-Owned Enterprises (hereafter SOEs) into joint stock firms in the early 1990s. A large number of joint stock companies were established in order to operate their businesses more efficiently. However, the Government still control the important industries such as electricity, telecommunications, oil exploiting, and airlines by holding more than 50% shares of these companies. They, therefore, continue to be regarded as state-owned firms.

Associated with the equitization program, the Vietnam financial market launched two stock markets, namely Ho Chi Minh Stock Exchange (HOSE) in 2000 and Hanoi Stock Exchange (HNX) in 2005. These two stock markets have developed dramatically from only 5 listed firms in 2000 to 649 firms in 2010. They gradually become a major channel of seeking financing for listed companies with the total market capitalization of nearly US$ 35 billion (45% GDP in equivalent) in 2010 (Nguyen *et al.*, 2012). The more important alternative source of funds is bank loans. Vietnam economy bases on banking system in which state-owned commercial banks (hereafter SOCBs) provide 78% of total loans for the whole economy (Soo, 1999). Soo (1999) also report that half of these loans are funded for SOEs whereas small and medium enterprises as well as private firms find them more difficult to access bank loans.

The Financial Crisis started from August of 2007 due to the defaults in the subprime mortgage market in the U.S. Since then, the Crisis spreads throughout the world, affecting almost sectors of the economy, for example, stock markets and banking sector. Emerging market countries like Vietnam was also devastated by the Financial Crisis; however, there was a time lag in its impacts. In Vietnam, the effects of global economic turmoil became apparent in 2008 when a wave of foreign investors withdrew their investment in both HNX and HOSE, loosening their market values. After achieving the overheating period in 2007, VN Index fell dramatically and reached the bottom in 2009. The stock market began to recover from 2010 onwards.

Our aim is to release in-depth research about important factors namely growth opportunities, firm size, tangibility and profitability driving leverage of the Vietnamese firms.

With respect to growth opportunities, researchers show the contradict results. The agency costs claims a negative effect of firm's growth on debt ratio (Miller, 1977) as financial covenants and restrictions proposed by investors prevent firms from obtaining investment opportunities. As a result, enterprises with high growth expectations tend to limit debt level. The pecking order theory, in contrast, believes that high growth firms are likely to exhaust internal financing so they will issue more debt. In some empirical studies like Rajan and Zingales (1995), when they studied about developed countries, the negative relationship between growth opportunities and leverage was proposed. However, as analysing developing countries like Vietnam, Nguyen and Ramachandran (2006), Biger *et al.* (2008) and Nguyen *et al.* (2012) indicate that Vietnamese firms often finance their potential investment with debt, especially bank loans because of the weak equity market. Hence, we hypothesize that:

H1: The level of debt is positively related to growth opportunities

In general, most empirical studies support for the same direction movement between firm size and its capital structure (Rajan and Zingales, 1995; Chittenden *et al.*, 1996; and Michaelas *et al.*, 1999). In Vietnam market, it should be noted that SMEs with inadequate and unreliable financial statement could cause severe adverse selection and moral hazard between owners and investors. This fact means that firms with small size seem to deal with more difficulties in seeking loans. On the contrary, larger companies pronounce less information asymmetry so they find them easier to get debt from outsiders. Previous studies about Vietnamese' firm capital structure by Nguyen and Ramachandran (2006) and Nguyen *et al.* (2012) also suggest a positive relationship between firm size and leverage. Thus, we suggest that:

H2: Firm size is positively related to debt level

In terms of tangibility, both theories and empirical research across developed countries mostly acknowledge that enterprises with high fixed assets ratio are highly leveraged (Titman and Wessels, 1988; Rajan and Zingales, 1995; Michaelas *et al.*, 1999; Bevan and Danbolt, 2002). In the context of Vietnam, the legal system is rather weak and borrowings depend on collateral or relationships (Nguyen *et al*, 2012). Furthermore, the agency problem and information asymmetry between owners and outsiders require companies to have more collateral as guarantee when they want to access to debt. Therefore, if companies possess high fixed assets ratio (*i.e.* high value of collateral), they are likely to be easier to issue debt (Nguyen and Ramachandran, 2006). We pronounce the hypothesis as follows:

H3: Tangibility is positively related to the level of leverage.

The effect of profitability on leverage is inconsistent in both theoretical models and economists' work. While the pecking order theory supports that profitable firms prefer internal funds to debts to finance their projects, trade off model reports the opposite result. However, in the context of Vietnam, as Nguyen and Ramachandran (2006) investigate the capital structure of 558 SMEs from 1998 to 2001 and Nguyen *et al.* (2012)

explore 116 non- financial firms listed on HNX and HOSE between 2007 and 2010, both of them indicate the negative correlation between debt ratio and profitability. As reported by the previous empirical research in Vietnam, the final hypothesis is suggested that:

H4: The level of leverage is reversely related to profitability.

2. DATA AND METHODOLOGY

2.1. Data selection

In this study, Datastream 5.0 is used to collect data in Vietnam market. Datastream is a comprehensive database and very helpful for academic research. It is provided by Thomson Financial in the U.K. and covers the data of over 200 countries throughout the world. Most of data series needed such as total assets, EBIT and depreciation, net sales or revenue are on the company accounts that can be easily found in Datastream service. Some papers relating to capital structure of firms, for instance, Bevan and Danbolt (2002), Benito (2003) also utilize this database.

As stated in the previous part, Vietnam stock market including HOSE and HNX was established in 2000 and 2005 respectively. According to Nguyen *et al.* (2012), the numbers of listed firms in both two exchanges are only 41 in 2005 and 193 in 2006. Hence, the time period is chosen from 2007 to 2011 so that more data are available for research. Financial firms such as banks, venture capital firms and insurance companies are deleted from our dataset because these companies are likely to have the different financial behaviour and are substantially regulated by the government.

2.2. Measurement of variables

In the context of emerging country like Vietnam, the reliable market values of debt or equity are difficult to be taken due to bank-based financial system, low liquidity bond market and highly volatile equity market (Nguyen *et al.*, 2012). Therefore, book value is employed to compute the leverage of firms. Due to the limitations of dataset, our research defines leverage by two simple ratios:

$$\text{Total debt ratio} = \frac{Total debts}{Total\ assets} \quad \text{(Equation 1)}$$

$$\text{Long- term debt ratio} = \frac{Long-term\ debts}{Total\ assets} \quad \text{(Equation 2)}$$

With respect to explanatory variables, the choices of measurement for four key determinants growth opportunities, firm size, tangibility and profitability as follows:

$$\text{Growth opportunities} = \frac{Market\ value\ of\ total\ assets}{Book\ value\ of\ total\ of\ assets} \quad \text{(Equation 3)}$$

$$\text{Size} = Ln\ (Sales) \quad \text{(Equation 4)}$$

$$\text{Tangibility} = \frac{Fixed\ assets}{Total\ assets} \quad \text{(Equation 5)}$$

$$\text{Profitability} = \frac{BBIT\ and\ depreciation}{Total\ assets} \quad \text{(Equation 6)}$$

2.3. Econometric models

With the purpose to clarify the research question: What is the impact of the independent variables (i.e. growth opportunities, size, tangibility, profitability) on the leverage of Vietnamese firms during the period of 2007-2011? We construct the regression model as follows:

$$\textbf{Leverage} = \alpha + \beta_1 * MTB_{it} + \beta_2 * SIZE_{it} + \beta_3 * Tang_{it} + \beta_4 * PROF + \varepsilon_t \quad \textbf{(Model 1)}$$

Furthermore, to investigate the impact of the Financial Crisis on these relations, we add a dummy variable in our regression model. The dummy vector, D_t, $D_{t'}$ take the value 1 for the financial turmoil period (2008- 2009),

and 0 otherwise. Hence, our model may be represented as:

Leverage = $\alpha + \beta_1 * MTB_{it} + D_t + \beta_2 * MTB_{it} * (1- D_t) + \beta_3 * SIZE_{it} * D_t + \beta_4 * SIZE_{it} (1- D_1) + \beta_5 * Tang_{it} * D_t + \beta_6 * Tang_{it} * (1- D_t) + \beta_7 * PROF_{it} * D_t + \beta_8 * PROF_{it} * (1- Dt) + \varepsilon_t$ (Model 2)

Where α is the constant

MTB_{it} is the variable which measures growth opportunities of firm i at time t (t is ranged from 2007 to 2011)

$SIZE_{it}$ is the variable which measures the size of firm i at time t

$Tang_{it}$ is the variable which measures the tangibility of firm i at time t

$PROF_{it}$ is the variable which measures the profitability of firm i at time t

D_t is the dummy variable in which $D_t = 1$ if t= 2008, 2009 (The Financial Crisis period)

$D_t = 0$ if t= 2007, 2010 or 2011 (before and after the Financial Crisis period)

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$ are the coefficients between explanatory variables and leverage that we need to estimate

ε_t is the random error

Eviews 7.0 is employed for ordinary least squares (OLS) to estimate the coefficients. Our study will use multiple regression analysis to investigate the above testable hypotheses.

3. RESULT ANALYSIS

3.1 The results of the model without dummy variables (Model 1)

MTB as a measure of growth opportunities: As forecasted by Hypoth esis 1, the results show a positive effect of growth opportunities on leverage, implying that Vietnamese companies with strong potential expansions are likely to

Table 1: OLS analysis of leverage in Vietnam from 2007 to 2011

	Total Debt Ratio	Long- term Debt Ratio
Constant	-0.622742***	-0.158168**
	(0.118206)	(0.07381)
MTB	0.005011	0.002195
	(0.004801)	(0.002998)
SIZE	0.041902***	0.0059*
	(0.005911)	(0.003691)
TANG	0.187783***	0.365781***
	(0.03979)	(0.024846)
PROF	-0.35608***	-0.15581**
	(0.081837)	(0.0511)
R- Square	0.180105	0.358203
F	23.06521***	58.60302***
N	425	425

Notes: MTB = market- to- book ratio of total assets, SIZE= natural logarithm of sales, TANG= fixed assets over total assets and PROF= earnings before interest, taxes and depreciation over total assets.

, ** and * indicate significance at the 10, 5 and 1% level respectively, using a two- tailed t-test. Standard errors are illustrated in parentheses.*

take more debts. The signs of coefficients are in line with the pecking order theory and the research of Chittenden et al. (1996), Barclay and Smith (1999) as well as Michaelas et al. (1999). Michaelas et al. (1999) explain that a company with fast growth opportunities spends much on research and development expenditures, hence, tends to obtain high level of leverage. In the case of Vietnam, we can suggest that due to the uncompleted development of equity markets, high growth firms are still depending heavily on bank debts, other than financing their expansion through share issuance like developed countries. In comparison with the previous studies about capital structure of Vietnamese firms (Nguyen and Ramachandran, 2006; Nguyen, 2012), our results are similar.

However, when using T-tests to measure the significance of individual determinants (i.e. the level of significance is normally set at 1%, 5% and 10%), we observe that our regression coefficients are small and insignificant for both of leverage measures.

Firm size: Size variable shows a positive correlation with the leverage. This indicates that larger firms issue more debt than smaller ones to finance operations. As supported by Hypothesis 2, the results are consistent with the trade-off theory, the findings of Rajan and Zingales (1995), Michaelas et al. (1999), Bevan and Danbolt (2002).

When leverage is measured by total debts over total assets, the coefficient is 0.041902 and universally significant at 1% level. It can be interpreted that when firm size grows by 1%, a firm tends to borrow more debt by 0.041902%. Nevertheless, the coefficient is much smaller (0.0059) and significant at 10% level of error as leverage is measured by long- term debt.

One potential explanation for the impact of firm size on leverage is that greater enterprises in Vietnam are likely to provide more information about their operations to their lenders such as banks, suppliers through audited financial statements. Therefore, the asymmetric information is lessened if lenders issue debt to larger companies. Furthermore, one can believe that larger firms possess greater bargaining power than smaller ones as negotiating with outside lenders. Consequently, larger firms tend to get more chance so as to access to bank loans or trade credits. (Nguyen and Ramachandran, 2006).

Tangibility: The strong positive relationship between tangibility and all measures of leverage shown in Table 1 support for Hypothesis 3. This result is also agreed by both international findings such as Bradley et al (1999), Rajan and Zingales (1995), Bevan and Danbolt (2002) and Vietnam research like Nguyen et al. (2012). As calculated by fixed assets over total assets, a high tangibility ratio means the greater collateral which lessens asymmetric information and agency costs and guarantee for it to get more debts easily.

The regression coefficients which are large in magnitude and statistically significant at 1% level emphasize a relatively strong influence of tangibility on leverage among all determinants. That means fixed assets ratio has an important impact on the way a firm finance its investments. Higher fixed assets ratio indicates higher value of collaterals so that firm s are likely to take more debt.

However, our results contrast with the report of Nguyen and Ramachandran (2006) who insist that tangibility is inversely related to all measures of leverage. We can explain the

difference in results because of the sample data selected. While Nguyen and Ramachandran choose Vietnamese SMEs, we focus on listed firms. It should be noted that SMEs in Vietnam require high demand of short-term debts (24.6% out of 43.91%) for their operation which does not need collaterals and very low level of long-term debt (1.93%) (Nguyen and Ramachandran, 2006). However, Vietnamese listed firms demand a higher proportion of long-term debt (8% out of 22.8%) which require collaterals. As a result, a positive correlation between tangibility and leverage is proper in our case of Vietnamese listed firms.

Profitability: It can be found that profitability variable represents the greatest explanatory power among all determinants because of the highest coefficient (-0.356080) as leverage is measured by total debt. Profitability of Vietnamese firms is universally significant and negatively correlated with leverage. We can interpret that if a firm gains more profits by 1%,

Table 2: OLS analysis of leverage in Vietnam from 2007 to 2011 (Model 2 with dummy variable)

	Total Debt Ratio	Long- term Debt Ratio
Constant	-0.619414***	-0.167038**
	(0.119256)	(0.074364)
MTB 2008- 2009	0.011898	-0.004591
	(0.013656)	(0.008515)
MTB 2007, 2010-2011	0.003989	0.003562
	(0.005295)	(0.003302)
SIZE 2008- 2009	0.041424***	0.006259*
	(0.006117)	(0.003815)
SIZE 2007, 2010-2011	0.041861***	0.006611*
	(0.006069)	(0.003784)
TANG 2008- 2009	0.167797*	0.366378***
	(0.065404)	(0.040783)
TANG 2007, 2010-2011	0.197288***	0.366378***
	(0.050056)	(0.031213)
PROF 2008- 2009	-0.340054**	-0.093267**
	(0.119010)	(0.074210)
PROF 2007, 2010-2011	-0.373001**	-0.207981**
	(0.114655)	(0.071495)
R- Square	0.181251	0.360845
F	11.51153***	29.35748***
N	425	425

Notes: MTB = market- to- book ratio of total assets, SIZE= natural logarithm of sales, TANG= fixed assets over total assets and PROF= earnings before interest, taxes and depreciation over total assets

, ** and * indicate significance at the 10, 5 and 1% level respectively, using a two- tailed t-test. Standard errors are illustrated in parentheses.*

it is likely to reduce its debt by about 0.35% in response.

This outcome is approved by the pecking order theory, Rajan and Zingales (1995), Bevan and Danbolt (2002), Benito (2003). There exist some explanations for this empirical result. First, if firms do not change their leverage target, more profitability associated with more retained earnings can decrease the debt ratio. Second, under the agency costs, if moral hazard and adverse selection reduce equity issues of firms, dividends and investment opportunities are constant, then more profitability will help companies have more money to undertake their projects and lower the debts needed. Hence, the regression results are consistent with Hypothesis 4.

3.2 The results of the model with dummy variables (Model 2)

From the table above, we observe that in general, the Financial Crisis did not present much impact on the relationship between Vietnamese firms' capital structure and its determinants.

As leverage is total debt divided by total assets, the findings in both two sub- periods support our hypotheses 1, 2, 3, 4. While growth opportunities show the stronger impact during 2008- 2009, tangibility and profitability represent the more significant relations against leverage over the non-Financial Crisis period. The regression coefficients of size variable in both sub-periods are significantly positive nearly similar (about 0.041), implying that whether credit recession happened or not, greater firms seem to have more opportunities to access debt. In terms of profitability, it is still the most powerful explanatory variable and universally significant at a 5% level of error.

However, our findings indicate some differences when leverage is given by long- term debt over total assets. It is so interesting that while market- to- book value is insignificantly positively related to leverage over non-financial crisis period (0.003562), the negative correlation exits during the period of 2008- 2009 (-0.004591). The inverse relationship between growth opportunities and leverage contrasts our Hypothesis 1, but is consistent with Rajan and Zingales (1995), Bevan and Danbolt (2002). This result suggests that due to the impact of Financial Crisis, high growth Vietnamese listed firms find them difficult to borrow from banks or suppliers so they use equity financing rather than issuing debt in order to fund their operations. In terms of other explanatory variables, size and tangibility still show the positive relation with leverage whereas profitability reflects the opposite correlation as proposed by our Hypothesis 2, 3, 4. In addition, the regression coefficients of tangibility which are 0.366378 in both sub-periods have the strongest influence among all determinants.

4. CONCLUSION

Our regression findings, in general, are consistent with most of previous studies. We find that growth opportunities (market- to- book ratio of total assets), firm size (natural logarithm of sales) and tangibility (the ratio of fixed assets over total assets) are all positively related to leverage of Vietnamese firms. In contrast, the coefficients between profitability (earnings before interest, taxes and depreciation to total assets ratio) and leverage are positive.

Over the period of 2007-2011, Vietnam economy is suffered from the Financial Crisis from 2008 to 2009. Hence, we split our time period into two sub-periods, including the Financial Crisis period and non-Financial Crisis period. To see what would change in the relationships between determinants and leverage during the Financial Crisis period, a dummy variable is added in our econometric

model. Finally, our findings indicate that the Financial Crisis did not affect the signs of coefficients, except for the reverse sign of coefficient between market-to-book value and leverage as Vietnamese firms' leverage is measured by long-term debt ratio.

Although the study contributes to the research line on capital structure in an emerging market like Vietnam, it is by no means without limitations. First, we concern that our dataset contains only Vietnamese listed firms, so what will happen if unlisted firms are included is not clear yet. Second, due to the case of developing financial markets, the measurement of both dependent and independent variables rely on book values, other than market values. Therefore, further research is needed.❑

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