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Determinants of Capital Structure of the Listed Companies on Vietnam Stock Market

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Abstract:
Capital structure decisions are highly important to any firms as the firms constantly make investment decisions for their sustenance and growth. In the same line, the objective of this study is to identify determinants of capital structure of listed firms on Vietnamese stock exchanges. The study has used panel data from 420 non-financial publicly traded firms during 2010-2014. Multiple regression analysis was employed to examine the relationship between the firm's capital structure and the nine related explanatory variables (business risk, profitability, firm size, firm growth, asset tangibility, liquidity, effective tax rate, non-debt tax shields, and lending interest rate). The study reveals that financial leverage of Vietnamese listed firms decrease with profitability, business risk, non-debt tax shields, liquidity and increase with firm growth, firm size. Besides, asset tangibility and liquidity have significant and negative impact on total debt ratio and long-term debt ratio but having positive relationship with short-term debt ratio. This study not only contributes to the literature on the determinants of firm's capital structure but also is useful for financial managers, investors, and financial management consultants.

Keywords: Determinants of capital structure, financial leverage, Vietnamese listed firms

1. Introduction

The capital structure is the way a company finances itself by combining long-term debt, short-term debt and equity (Abor, 2005). Capital structure decisions are very important for any business not only by the demand of maximizing the benefits from individuals and organizations related to the firm's operating, but also by the impact of that decision on the business capacity within competitive market (Phi Anh, 2010) . The trade-off theory suggests an optimal mix of debt and equity for a firm to achieve the minimum cost of capital structure (Kraus & Litzenberger, 1973). Therefore, chief financial officers need to consider before making financing decisions: firstly, is it advisable to return the excess cash to shareholders or invest it? secondly, should they finance their new projects by borrowing from the debt market or using equity? Several companies focus on the traditional tax benefit of debt because interest is often a tax-deductible expense. However, other theorists argued debt brings with itself risk in the firm and impairs the competitive edge (Gill & Mathur, 2011; Stiglitz, 1969). Equity financing is less risky, however, the disadvantage of equity financing is that shareholders will be involved in decision making of the firm. Firms make effort to select the best financing combination, which can maximize company value and work best with the projects they are investing in. A false decision about the capital structure could cause financial distress or worse bankruptcy as the company fails to cover the interest paid on debt. Therefore, it is necessary to find out what factors influence capital structure.

The determinants of capital structure have been a popular topic of research during the last decades. Many researches about capital structure theories have been conducted around the world since Modigliani and Miller introduced their theory in 1958. Modigliani & Miller (1958) indicated that in the absence of taxes, bankruptcy costs, agency costs, asymmetry information, and in an efficient market, the value of a firm is unaffected by how the firm is financed (Modigliani & Miller, 1958). However, Modigliani & Miller (1963) showed that with presence of taxes and ignoring other elements, there is positively relationship between the value of a firm and the use level of debt financing, because the more debt used, the higher the value of tax shields. Moreover, Trade-off theory, which was developed by Kraus & Litzenberger (1973), identified that optimal capital structure is equating interest tax shield in opposition to financial distress cost. Jensen & Meckling (1976) also proposed that the optimal capital structure is obtained by trading off the agency cost of debt against the benefit of debt. Here, Jensen and Meckling first identified disputes between shareholders and managers because of management's ownership being less than 100% of the equity. Nevertheless, pecking-order theory supposes that there is no optimal capital structure. Firms tend to finance new investment by an internal fund rather than the external fund (Myers & Majluf, 1984).

Following capital structure theories, several empirical studies have been conducted on the determinants of corporate capital structure at the firm level across different economies. In the beginning, the majority of studies focused on the listed companies in developed countries such as the US, UK and Western Europe including studies (Gill & Mathur, 2011; Ooi, 1999; Gill, et al. 2009; Titman & Wessels, 1988; Wald, 1999; Rajan & Zingales, 1995; Nunkoo & Boateng, 2010; Frank & Goyal, 2009). Soon after, empirical studies on capital structure determinants have been extended to other developed and developing countries including China (Chen, 2004; Huang & Song, 2002; Huang & Song, 2006) India (Handoo & Sharma, 2014) Thailand (Thippayana, 2014; Wiwattanakantang, 1999). Previous researches indicate that determinants of capital structure do not always hold similarly across different contexts. The most commonly identified capital structure determinants include profitability, firm size, firm growth, assets tangibility, business rick, effective tax rate, industry condition, debt market conditions, inflation and other macroeconomic factors.

Understanding the factors influencing the financing decision of Vietnamese firms is important. In recent year, there are some researches about capital structure of Vietnamese businesses, which were studied in many angles. These included a study by San (2002) on the determinants of capital structure in a single industry in Thua Thien Hue Province; on the other hand, Nguyen & Ramachandran (2006) focused only on small and medium-sized enterprises (SMEs) in Vietnam for the period 1998-2001. Following this, studies (Biger et al. 2008; Anh & Yen, 2014) conducted only on firms on the Ho Chi Minh Stock Exchange (HOSE). Chi (2013), Phi Anh (2010), Tran (2015) conducted a study on a broad set of Vietnamese listed firms.

Although previous studies on capital structure of Vietnamese firms have contributed to our understanding of capital structure decisions in Vietnam, they are still conflicts among research results. Moreover, these studies possess certain limitations such as limited time the horizon, and small sample size. Specially, rarely previous studies on the capital structure of Vietnamese firms have included volatility, liquidity, lending interest rate in model study. Most studies used cross-sectional data and an Ordinary Least Square (OSL) regression model to estimate the factors that influence financial leverage of firms. According to, the Breusch and Pagan Lagrangian multiplier (LM test) shows that the Pooled OLS model is unsuitable.

The negative impacts of the global financial crisis starting from 2008 have been the cause of the economic slowdown in Vietnam. Up to the now, the situation has not completely got over, evidenced by high inventories and difficulties in raising funds of the companies. This is the time that companies should have a comprehensive evaluation of their financial policy, including the financing policy.

For some mentioned reasons above, this is necessary to employ determinants of capital structure of the Vietnamese companies. The purpose of the study is to identify factors considered by firms before making financing decisions. This study not only contributes to the literature on this subject but also is useful for financial managers, investors, and financial management consultants. Based on the effect of each determinant, the firms can adjust and implement their funding decisions in order to achieve the most optimal capital structure through each stage of development.

This research distinguishes itself from other previous capital structure researches of Vietnamese companies with the introduction of key variables such as business risk, liquidity, lending interest rate, that have never or rarely ever been examined by previous researches. Further, this study uses a large dataset in a long time with big sample size. Specifically, the dataset covers a five-year period (2010-2014) of 420 non-financial listed firms on both Vietnamese stock exchanges. Finally, estimation methods for panel data are chosen thoroughly by analyze and test three different models (Pooled OLS model, Fixed effect model and Random effects model).

2. Literature Review

2.1. International Studies on Capital Structure

Studies took on U.S. firms include those provided by Titman & Wessels (1988) who examined a much broader set of capital structure theories after that analyzed measures of short-term, long-term, and total debt rather than an aggregate measure of total debt. Their results showed that uniqueness, transaction costs, and firm sizes influence financial leverage, while non-debt tax shields, volatility and collateral value do not influence financial leverage.

Gill et al. (2009) collected data from 158 American service industry firms during the period 2004-2005. Study found that collateralized assets, income tax, non-debt tax shield, corporate profitability, firm size, and growth opportunities influence capital structure choices of the firm.

Frank & Goyal (2009) examined larger set of factors that the potential to affect capital structure decision of publicly traded American firms from 1950 to 2003, including profitability, firm size, growth, industry conditions, nature of assets, taxes, risk, supply-side factors, stock market conditions, debt market conditions, and macroeconomic conditions. The most reliable factors for explaining market leverage are: median industry leverage (+), market-to-book assets ratio (-), tangibility (+), profits (-), log of assets (+), and expected inflation (+).

Abor (2005) collected data from listed firms in Ghana and found a positive relationship between profitability and leverage.

Study the determinants of capital structure in Nigeria using panel data. Secondary data were obtained from 66 firms listed on the Nigerian stock Exchange during the period 1999-2007. The study analyzed six potential determinants of capital structure namely size, profitability, growth, tangibility, business environment, and liquidity. Using regression analysis, the study reported a negative relationship between leverage (dependent variable) and each of growth, profitability, and tangibility of assets. However, a positive relationship was reported between leverage (dependent variable) and each of firm size and liquidity (Akinlo, 2011).

Serghiescu & Văidean (2014) investigated the relative importance of five factors upon the capital structure decisions of Romanian firms listed at the Bucharest Stock Exchange and operating in the construction sector of the industry. The analysis was based on panel

data estimations on a sample of 20 companies, observed during three years (2009-2011). Traditional explanatory variables were adopted in the study, including profitability, company size, tangibility of assets, liquidity, and asset turnover. By employing the ordinary least squares method and the fixed effects model, simple and multiple linear regressions are obtained. The results show that profitability and liquidity ratios are negatively affecting the total debt ratio of Romanian companies. The tangibility of assets is also having a negative impact on leverage, strengthening the findings of previous empirical studies which claim that this indicator moves in opposite direction with the debt ratio of companies located in developing countries. On the other hand, the size of a company and its asset turnover have a positive correlation with leverage. The explanatory variable which has the highest impact on the capital structure choices is profitability.

Chen (2004) employed the determinants of capital structure of 88 Chinese public-listed companies for the period 1995-2000. Six main factors of profitability, growth opportunities, size, asset structure, cost of financial distress, and tax shield were investigated. The data were subjected to correlation and regression analysis. The results of the study revealed a negative relationship with profitability, growth opportunity, and firm's size; meanwhile a positive relationship was found with tangibility. The study further disclosed that firm-specific factors when correlated with leverage has shown that neither the trade-off model nor the pecking order hypothesis derived from the developed economies has strong explanatory power in elucidating the capital structure preference of firms in China.

Huang & Song (2002) employed a database that contained the market and accounting data from more than 1000 Chinese listed companies up to the year 2000. Authors found that leverage in Chinese firms increases with firm size, non-debt tax shields and fixed assets, and decreases with profitability and correlates with industries.

In Canada, Nunkoo & Boateng (2010) studied empirical determinants of capital structure of Canadian firms listed on the Toronto stock exchange during the period from 1996 to 2004. The results showed a significant and positive impact of profitability and tangibility, and a negative influence of growth opportunities and size on the leverage of Canadian firms.

Thippayana (2014) examined the determinants of capital structure of 144 listed firms on the Thailand Stock Exchange for the twelve years from 2000 to 2011 were collected from the audited annual accounts. Multiple regression analysis was employed to examine the relationship between the firm capital structure and the related explanatory variables. After controlling for industry, the results revealed that leverage ratios have a significant relationship with the level of profitability, firm size. Negative relationship was observed between profitability and debt ratio; showing that companies with high profitability issue less debt. Positive relationship was observed between size and debt ratio; exhibiting that large companies issue high level of debt. Nonetheless, there are no significant relationships between tangibility, growth opportunity, business risk and leverage ratios.

Handoo & Sharma (2014) identified the most important determinants of capital structure of 870 listed Indian firms comprising both private sector companies and government companies for the period 2001-2010. This study used multiple regression analysis to test the impact of each independent variable (profitability, growth, asset tangibility, size, cost of debt, liquidity, financial distress, tax rate, debt serving capacity and age) on each dependent variable (short term debt ratio, long term debt ratio and total debt ratio). It has been concluded that factors such as profitability, growth, asset tangibility, size, cost of debt, tax rate, and debt serving capacity have significant impact on the leverage chosen by firms in the Indian context.

2.2. Vietnamese Studies on Capital Structure

In Vietnam, comparatively few studies have been done so far on capital structure. An early study on the capital structure of Vietnamese firms done by Nguyen & Ramachandran (2006), on a sample consisting of 558 Small and Medium Enterprises (SMEs) study the capital structure of Vietnamese firms for the period from 1998 to 2001. The results illustrate that firm growth opportunity has a positive relationship with short-term leverage because the high-growth firms have a high requirement for working capital. Moreover, tangibility asset is negatively associated with firm leverage because most of the Vietnamese firms tend to use short-term debt, which unnecessarily needs collateral.

Biger et al. (2008) used data from 3778 mostly unlisted firms for a period from 2002 to 2003 to study the capital structure of Vietnamese firms. Through correlation analysis, they found that financial leverage in Vietnamese firms has positive relationship with firm size, and negative relationship with profitability and with non-debt tax shield. Financial leverage also correlated with industry characteristics. They also found that firm's leverage increase with fixed assets and decrease with growth opportunities and on one hand corporate income tax has a negative albeit small effect on firm's financial leverage.

Phi Anh (2010) tested the determinants of capital structure and its effect on financial performance, using 428 listed companies on Vietnamese stock exchanges, the largest sample size in Vietnam's capital structure literature. This paper employed a different technique-path analysis-and pointed out that profitability, business risk, asset structure, and firm size are factors influencing a firm's debt ratio. This study only agrees with that of Chi (2013) regarding the inverse relationship between profitability and leverage.

Chi (2013) examined on a sample consisting of 178 non-financial companies listed on the Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX) from 2007 to 2010. The study used the Bayesian Model Averaging (BMA) method for factor selection and regression with pooling model on a sample. They found that there are six factors affecting the capital structure decisions of firms, including macroeconomics factors (tax rate, inflation), internal factors (market to book ratio, profitability), and industry factors (industry leverage), and behavior of managers.

In a more recent study, Anh & Yen (2014) used the fixed effect estimation method to identify the factors affecting capital structure decision of firms listed on the Ho Chi Minh Stock Exchange (HOSE). Ten factors that potentially affect capital structure decision are examined including firm size, profitability, taxes, growth, liquidity, stock market condition, asset tangibility, uniqueness of assets, debt market condition. Data is collected from 180 non-financial companies for the period from 2010-2013. The study pointed out three main determinants of leverage, including firm size, profitability, and taxes. Despite the fact that this study was conducted on only

HOSE, whereas Chi (2013) studied both HOSE and HNX, both papers conclude that profitability and taxes have an influence on leverage; however, they disagree over the direction of the relationship. Chi (2013) asserted that return on assets, as a proxy for profitability, has a negative relationship with leverage consistent with the pecking order theory, and tax rate has a positive relationship with leverage, following the trade-off theory. Meanwhile, the result of (Anh & Yen, 2014) found a positive correlation between profitability and financial leverage and a negative correlation between taxes and financial leverage. Similar to the results presented by Phi Anh (2010) the findings of Anh & Yen (2014) show the positive influence of profitability and firm size on leverage.

Additionally, Tran (2015) examined factors that potentially affect the financial leverage of listed firms on Vietnamese stock exchanges, and identified the key determinants of the capital structure of these firms. This study used the estimation method with fixed-effects model (FEM) to deliver reliable factors, and a pooled OLS method to determine the impacts of industry classification on a sample of 183 non-financial publicly traded firms from 2009 to 2013. (Tran, 2015) considered a larger set of factors with the potential to affect capital structure decision, including business risk, profitability, firm size, growth opportunities, tangibility of assets, uniqueness of assets, taxes, non-debt tax shields, industry condition, stock market condition, debt market condition, and macroeconomic condition. This study identified that firm size, inflation rate, tangibility of assets, business risk, stock market returns, profitability, growth opportunities, industry mean leverage, average lending rate, and uniqueness of assets have significant impact on the leverage structure chosen by firms in the Vietnamese context.

3. Methodology

3.1. Proxy Variables Definition
Theoretical and empirical studies have shown that profitability, tangibility, tax, size, non-debt tax shields, growth opportunities, volatility, liquidity, industry condition, stock market condition, debt market condition, and macroeconomic condition, and so on affect capital structure decisions. Based on the existing literature and data availability, this study applies three different capital structure measures (total debt ratio, long-term ratio, and short-term debt ratio) and examines nine potential factors that can affect the Vietnamese firms' capital structure (profitability, asset tangibility, effective tax rate, firm size, non-debt tax shields, firm growth, business risk, liquidity, lending interest rate). Table 1 below summarizes definitions and symbols of variables in this study.

Proxy Variables	Definitions
Profitability	Earnings before interest, tax, depreciation divided by total assets, lagged one-year period
Business risk	Standard deviation of ROA
Firm size	Natural logarithm of firm sales, lagged one-year period
Firm growth	Percentage change in total assets
Asset tangibility	Ratio of fixed assets to total assets
Non-debt tax shields	Depreciation and amortization expenses divided by total assets
Effective tax rate	Income tax divided by earnings before tax
Liquidity	Current asset/current liabilities
Lending interest rate	Average lending interest rate
Total debt ratio	Total debt divides by the book value of total assets
Long-term ratio	Long-term debt divides by the book value of total assets
Short-term debt ratio	Short-term debt divides by the book value of total assets

Table 1: Proxy Variables Definition and Predicted Relationship

3.2. Sample Selection and Data Collection
This research has been conducted on companies listed on two stock exchanges in Vietnam including Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX), during the five-year period from 2010 to 2014. At the end 2015, there are 689 listed firms on both stock exchanges. The sample was selected based on the following criteria: Firms are operating in the non-financial services sector, except to be listed on Vietnam stock market after 2010 and stopped listing on the two stock exchanges in any years during the period under review. Moreover, firms with data missing on relevant variables for any year of the period under review are excluded as this affects the process of data analysis. Finally, firms with outliers, extreme and unique observations of any variables are eliminated because that may cause bias the results. As a result, the sample contains 420 companies listed on both stock exchanges.

The study utilized panel data from chosen samples during 2010-2014. Annually financial data were collected from published financial statements and annual reports of firms through company websites, Vietnamese securities company websites such as CafeF, Vietstock, Cophieu68, VnDirect etc.

3.3. Data Analysis
This study employed Stata 12 software to test for impact of the above-mentioned factors on the capital structure of Vietnamese listed companies. First, descriptive statistics are utilized to demonstrate features of capital structure and the financing activities of non-financial listed firms in Vietnam. After that, correlation analysis is conducted to examine the relationship between each pair of variables. Finally, multiple regression analysis is performed as the main analysis to identify reliable factors to explain capital structure decisions of Vietnamese listed firms.

Choosing the estimated model for panel data by using the Breusch-Pagan Lagrange Multiplier test, Hausman test three different

models (Pooled OLS model, Fixed effects model, and Random effects model). The regressions are run with Driscoll-Kraay robust standard errors to overcome estimation biases caused by heteroskedasticity, autocorrelation, cross-sectional dependence.

4. Results of the Study

4.1. Descriptive Statistics
Table 2 presents descriptive statistics of debt ratios and independent variables of 420 non-financial companies in Vietnamese stock exchanges from 2010 to 2014. Statistics show that, compared to listed companies around the world, Vietnamese listed companies use relatively high debt ratio with total liabilities account for 51.42% of the firm's total assets, of which long-term debt ratio approximate to 41.86 % and short-term debt ratio account for 9.56% . It should be noted that most of the debt used by non-financial companies are long-term debt. While the mean total debt ratio of Thailand firms is about 47.52% (Thippayana, 2014), and that of Malaysian listed firms is 30.34% (Ab Wahab & Ramli, 2013).

Variables	Obs	Mean	Std. Dev.	Min	Max
Profitability	2100	0.0940	0.0810	-0.4786	0.5596
Business risk	2100	0.0277	0.0287	0.0003	0.2479
Firm size	2100	11.611	0.6490	8.3400	13.540
Firm growth	2100	0.1023	0.2056	-0.6870	0.9484
Asset tangibility	2100	0.2654	0.2055	0.0000	0.8945
Non-debt tax shields	2100	0.0275	0.0312	-0.193	0.2225
Effective tax rate	2100	0.1981	0.1863	-3.166	1.7839
Liquidity	2100	1.9017	1.4569	0.2171	15.531
Lending interest rate	2100	12.540	2.8450	8.700	17.000
Total debt ratio	2100	0.5142	0.2081	0.0266	0.9132
Long-term debt ratio	2100	0.4186	0.1946	0.0260	0.8891
Short-term debt ratio	2100	0.0956	0.1290	0.0020	0.6509

Table 2: Descriptive Statistics

4.2. Correlation Analysis Results
Table 3 indicates that financial leverage is negatively correlated with profitability, business risk, liquidity and positively correlated with firm growth, firm size. Asset tangibility, non-debt tax shields have negative relationships with total debt ratio and long-term debt ratio. However, they have positively correlated with the short-term ratio. Effective tax rate does not have a statistically significant relationship with short-term debt radio and has weak positive correlations with total debt ratio and long-term debt ratio. Lending interest rate does not have statistically significant relationships with all of three debt radios. Therefore, lending interest rate is eliminated regression model.
In addition, table 3 also demonstrates that independent variables are correlated each other. Most of the correlation coefficients are small, less than 0.4, not sufficiently large to cause collinearity problems among explanatory variables. Thus, we can do multiple regression analysis to build up the model of capital structure.

4.3. Regression Results

	PROF	RISK	SIZE	GROW	TANG	NDTS	TAXR	LIQ	LENDIR	TDR	LTDR	STDR
PROF	1.000											
RISK	-0.025	1.000										
SIZE	0.201*	-0.186*	1.000									
GROW	0.243*	-0.031	0.190*	1.000								
TANG	0.005	0.052*	0.033	-0.065*	1.000							
NDTS	0.178*	-0.058*	0.134*	-0.055*	0.500*	1.0000						
TAXR	0.059*	-0.108*	0.044	0.030	-0.058*	-0.009	1.000					
LIQ	0.267*	0.107*	-0.217*	-0.080*	-0.168*	-0.032	-0.014	1.000				
LENDIR	0.135*	0.063*	-0.007	0.109*	0.035	0.027	-0.024	-0.032	1.000			
TDR	-0.339*	-0.267*	0.311*	0.153*	-0.074*	-0.059*	0.090*	-0.613*	0.012	1.000		
LTDR	-0.231*	-0.222*	0.240*	0.138*	-0.331*	-0.116*	0.072*	-0.589*	-0.005	0.796*	1.000	
STDR	-0.197*	-0.094*	0.140*	0.068*	0.381*	0.128*	0.037	-0.100*	0.029	0.410*	-0.345*	1.000
PROF: Profitability; RISK: Business risk; SIZE: Firm size; GROW: Firm growth; TANG: Assets tangibility; LIQ: Liquidity; NDTS: Non-debt tax shields; TAXR: Effective Tax rate; LENDIR: Lending interest rate; LTDR: Long-term ratio; STDR: Short-term debt ratio; TDR: Total debt ratio. * Significant at α=0.05												

Table 3: Correlation Matrix of variables

4.3.1. The Selected Estimation Method

> Random Effects Test Results

Table 4 shows Breusch-Pagan Lagrange Multiplier (LM) test results help specify which of the two methods, the pooled ordinary least squares model (POLS) and the random effects (REM) is appropriate for this study. Results demonstrate that Prob $>\chi^2$ = 0.000 < 0.05, this means null hypothesis that there are no random effects is rejected, in another word random is appropriate in all of three cases. After that, we still need to test for the random effects versus the fixed effects by Hausman test.

	Total debt ratio	Long-term debt ratio	Short-term debt ratio
Chibar2	2428.42	2368.90	2462.69
Prob > χ^2	0.0000	0.0000	0.0000
Selected model	RFM	RFM	RFM

Table 4: Breusch-Pagan Lagrange Multiplier (LM) Test Results

> Hausman test results

Table 5 presents Hausman test results to decide the fixed effects model versus the random effects model. The results show that Prob $>\chi^2$ = 0.000 < 0.05, so reject the null hypothesis that individual effect are random and that FFM provides consistent estimates in three cases.

	Total debt ratio	Long-term debt ratio	Short-term debt ratio
Chi2	248.57	188.75	70.69
Prob > $\chi2$	0.0000	0.0000	0.0000
Selected model	FFM	FFM	FFM

Table 5: Hausman Test Results

4.3.2. Regression Results and Discussions

To ensure validity of the statistical results, the Driscoll and Kraay (1998) standard error estimates (by fixing the model misspecification problems) for the fixed effect models with dependent variables of total debt ratio, long-term debt ratio and short-term debt ratio are employed. The fixed-effect regressions with Driscoll-Kraay standard errors provide the same coefficients but different standard errors, absolute values of critical value (t), and confidence interval of each variable, in comparison to the regression results using the fixed-effects model. These estimation methods can provide a more reliable estimation that overcomes the detected issues.

Within R-squared of the total debt ratio model and long-term debt ratio model are 0.5427, 0.5623 respectively, meaning that selected factors including profitability, business risk, firm size, firm growth, asset tangibility, non-debt tax shields, effective tax rate and liquidity can explain 54.27 percent of the variability of total debt ratio and 56.23 percent of the variability of long-term debt ratio. (See Table 6)

Within R-squared of the short-term debt ratio model is 0.1614, meaning that 16.14 percent of the variation in short-term debt ratio can be explained by the degree of profitability, business risk, firm size, firm growth, asset tangibility, non-debt tax shields and liquidity. (See Table 6)

Table 6 also summarizes the main findings of the study "the determinants of capital structure of Vietnamese companies". This study identifies factors influencing the capital structure of Vietnamese listed firms at a high significance level (α = 0.01 or 0.05) and irrelevant factors on the financial leverage of Vietnamese listed firms. The findings are specified in more detail below.

Profitability: this study reveals that profitability has a negative and significant impact on capital structure of Vietnamese listed firms. In order word, when profitability increases, firms will borrow less. This result is inconsistent with the trade-off theory that predicted a positive relationship with leverage. They argued that firms can gain benefit from debt. However, this result is consistent with pecking order theory. They predicted that a firm that has more profitability tends to use less debt; firms prefer internal financing to external financing. Moreover, when the company has good profitability, and retains earning becomes a source of financing which reduce the employment of external debt.

This outcome is similarly to the majority of previous empirical findings for example Titman & Wessels (1988), Frank & Goyal (2009) and Gill et al. (2009) for U.S. firms, Huang & Song (2002), Chen (2004) for Chinese firms, Handoo & Sharman (2014) for Indian firms, Serghiescu & Văidean (2014) for Romanian firms, Thippayana (2014) for Thailand firms. This finding is also consistent with Chi (2013), Biger et al. (2008), Phi Anh (2010), and Tran (2015) for Vietnamese firms. They indicated that there is a negative relationship between profitability and leverage. In contrast, Nunkoo & Boateng (2010) for Canadian firm, Abor (2005) listed firms in Ghana, Akinyomi & Olagunju (2013) Nigeria firms, and especially Anh & Yen (2014) for Vietnamese firms. They found a positive relationship between profitability and leverage.

Business risk: This study finds that business risk has a negative influence on capital structure of Vietnamese listed firms. This suggests that firms borrow less when business risk increases due to higher expected costs of financial distress. This finding is similar to the findings of trade-off theory and previous empirical studies Phi (2010), Serghiescu & Văidean (2014) but contradict with the findings of Huang & Song (2002), Nguyen & Ramachandran (2006) and Tran (2015) that indicated business risk has a positive influence on leverage of Vietnamese listed firms.

Firm size: This study indicates that firm size has a positive effect on the capital structure measured by total debt ratio and long-term debt ratio of Vietnamese listed firms. However, the relationship between firm size and short-term debt is insignificant.

This result is consistent with trade-off theory showing large firms will have more debt capability than that of small firms. Moreover, larger companies will have more benefits in comparison with smaller ones such as easy to borrow money as well as more creditworthy with investors or banks. The result also supports for previous empirical studies such as Huang and Song (2002), Nguyen & Ramachandran (2006), Biger *et al.* (2008), Frank & Goyal (2009), Phi Anh (2010), Serghiescu & Văidean (2014), Thippayana (2014), Anh & Yen (2014).

On the other hand, this finding does not follow the prediction provided by pecking order theory that larger firm might have clearly information about the investment projects thus the risk of financial distress cost will be lower than smaller firms. Accordingly, large firm may be easy to issuing new equity securities to the market than small firm. Similarly, the result of (Titman & Wessels, 1988; Chen, 2004; Handoo & Sharma, 2014; Nunkoo & Boateng, 2010; Akinyomi & Olagunju, 2013) found that financial leverage is negatively related to firm size.

Firm growth: this study shows firm growth measured by percentage change in total assets is moderately and positively associated with capital structure of Vietnamese listed firms. The results imply that firms with higher Firm growth need more funds to finance their projects and when internal financing cannot meet capital needs; these firms will need more external financing, particularly debt, according to the order of preference. This is a disappointment to policy market in Vietnam since most of listed firm with high growth rate in developed countries finance their expansion through the equity issuance (Rajan & Zingales, 1995; Wald, 1999). This finding demonstrates that high growth firms in Vietnam still depend on bank loan. For that reason, Vietnam's equity market has been limited in the intervening period.

The positive relationship matches the direction predicted by pecking order theory and empirical researches such as (Biger et al., 2008; Chen, 2004; Nguyen & Ramachandran, 2006; Akinyomi & Olagunju, 2013). In contrast, this result is inconsistent with trade-off theory and agency theory that firms having more growth have higher expected costs of financial distress and bear more agency costs, so they prefer equity financing to debts. They found that there is a positive relationship between firm growth and firm's capital structure that was also found in studies (Frank & Goyal, 2009; Nunkoo & Boateng, 2010; Titman & Wessels, 1988).

Asset tangibility: The findings of this study point out that firm's asset tangibility affects its debt ratios in both positive and negative ways. Asset tangibility has a significant and negative impact on total debt ratio and long-term debt ratio but having a positive relationship with short-term debt ratio. This implies that in short time, Vietnamese listed firms invest in heavily tangible assets by using short-term debt, then under pressure from bank and lender firms issue equity as a better choice for firms with large tangible assets because of low information asymmetry.

Asset tangibility has a significant and negative impact on total debt ratio and long-term debt ratio does not follow the prediction provided by trade-off theory pecking order theory, and agency theory. Firms having more tangible assets can borrow more easily on the market, as they have lower costs of financial distress and fewer debt-related agency problems, thus having higher debt ratios. The result is consistent with previous studies on Vietnamese firms (Biger et al., 2008; Nguyen & Ramachandran, 2006). Moreover, a negative relationship was observed in studies (Chen, 2004; Serghiescu & Văidean, 2014). On the other hand, a positive relationship between tangibility and leverage is also found in some studies such as (Frank & Goyal, 2009; Huang & Song, 2002; Nunkoo & Boateng, 2010; Akinyomi & Olagunju, 2013; Handoo & Sharma, 2014; Tran, 2015).

Non-debt tax shields: This study finds that non-debt tax shields have a moderate and negative influence with short-term debt ratio. This suggests that when taxes increase, Vietnamese listed firms use different tools instead of debt financing to receive benefit from the debt-tax shields such as depreciation or investment tax credit. A negative relationship between non-debt tax shields and short-term debt ratio is consistent with previous studies (DeAngelo & Masulis, 1980; Huang & Song, 2002). However, total debt ratio and long-term debt ratio are insignificant relationship with non-debt tax shields.

Liquidity: Liquidity is negatively associated with total debt ratio, long-term debt ratio, which implies Vietnamese firms are able to use their current assets to finance their operation and high liquidity firms tend to borrow less for their future growth. This finding totally supports for pecking order theory as well as previous research done by (Ab Wahab & Ramli, 2013; De Jong, Kabir, & Nguyen, 2008; Serghiescu & Văidean, 2014). Conversely, it is positive associated with short-term debt. An explanation for a difference between short-term debt and long-term debt is related to policy intervention over the period of economic downturn. A stimulus package, issued by State, included 4% interest rate subsidies for short-term debt from banks loans (IMF, 2010). Therefore, Vietnamese firms are likely to issues short-term debt rather than long-term debt.

Effective tax rate: The study also concludes that effective tax rate does not have a statistically significant relationship with capital structure for Vietnamese listed firms. This indicates that when taxes increase, Vietnamese listed firms do not necessarily borrow more to benefit from the debt-tax shields.

This finding is in disagreement with the empirical findings of (Akinyomi & Olagunju, 2013; Anh & Yen, 2014; Gill & Mathur, 2011; Handoo & Sharma, 2014); they identified a negative relationship between debt ratios and tax rate. Besides, those of (Bauer, 2004; Chi, 2013) found that taxes have a positive influence on the use of debt.

Variables	Total debt ratio			Long-term debt ratio			Short-term debt ratio		
	Coef.	t	Prob.	Coef.	t	Prob	Coef.	t	Prob.
PROF	-.4524**	-16.91	0.000	-.3203**	-21.55	0.000	-.1326**	-6.48	0.003
RISK	-.1854**	-7.50	0.002	-.0868	-2.10	0.103	-.0944*	-2.91	0.044
SIZE	.0625**	8.13	0.001	.0701**	9.73	0.001	-.0080	-1.26	0.278
GROW	.0010**	10.84	0.000	.0005**	4.19	0.010	.0005**	16.49	0.000
TANG	-.1802*	-3.50	0.025	-.3499**	-17.98	0.000	.2691**	33.15	0.000
NDTS	-.0440	-0.48	0.659	.1995	1.48	0.068	-.2418**	-10.43	0.000
TAXR	-.0123	-2.70	0.054	-.0034	-1.60	0.185			
LIQ	-.0376**	-20.01	0.000	-.0506**	-17.07	0.000	.0131**	7.81	0.001
C	-.0774	-0.87	0.043	-.1836*	-2.36	0.048	.1089*	2.47	0.021
R^2	0.5427			0.5623			0.1614		
Prob(F_statistic)	0.0000			0.000000			0.000000		

Table 6: Summary of Fixed Effects Regression with Driscoll and Kraay Standard Errors

PROF: Profitability; RISK: Business risk; SIZE: Firm size; GROW: Firm growth; TANG: Assets tangibility; LIQ: Liquidity; Effective tax rate: TAXR; NDTS: Non-debt tax shields.
** Significant at 0.01;   * Significant at 0.05

5. Conclusion
Capital structure always is an important factor to determining the growth of all businesses, not only in Vietnam but also around the world. In the same line, this study investigated the determinants that influence the capital structure of Vietnamese listed firm (exclude financial firms and banks) over the period 2010-2014. The sample consists of 420 firms on two stock exchanges (Hanoi Stock Exchange and Ho Chi Minh Stock Exchange). This study applies three different capital structure measures (total debt ratio, long-term ratio, and short-term debt ratio) and examines nine potential factors that can affect the Vietnamese firms' capital structure (profitability, asset tangibility, effective tax rate, firm size, non-debt tax shields, firm growth, business risk, liquidity, lending interest rate). By using penal data and the estimation method with fixed effects model (FEM) to point out reliable factors. This study identifies the factors influencing the capital structure of Vietnamese listed firms including profitability (-), business risk (-), asset tangibility (+/-), non-debt tax shields (-), firm growth (+), firm size (+), and liquidity (+/-). Lending interest rate and effective tax rate seem to have no significant impact on the capital structure of Vietnamese.
In conclusion, this study distinguishes itself from previous research with the introduction of key variables such as business risk, liquidity, effective tax rate, and lending interest rate that have never or rarely ever been examined by previously in papers related specifically to Vietnamese firms, utilizing larger sample size and a longer period, making for a much larger set of observations. The study is highly relevant in for Vietnamese firms, because it uses updated data in the most recent time especially after financial crisis in 2008 and during the economic downturn in Vietnam. Therefore, this study not only contributes to the literature on the determinants of firm's capital structure but also may be useful for financial managers, investors, and financial management consultants.

6. Limitation
Due to the limitation of data collection, this thesis measures the company's capital structure using accounting based value of the capital components rather than a market based value. Besides, there could be other factors that can affect the capital structure of the companies but are still not accounted for in the model. Although the five-year period provides a longer time series than other Vietnamese firms' capital structure researches but this is still a short time with many notable changes in macroeconomics and business environments during 2010-2014 to point out the reliability of the results.

7. Future Research
For future research, the author plan to study several internal and macro-economic factors that may influence capital structure decisions. This will include factors such as ownership structure, dividend, economic growth, industry effect, stock market condition, debt market condition, and macroeconomic condition, direct foreign investment, and so on. Research with longer timeline datasets covering many notable changes in macroeconomics and business environments find the reliability of the results. By using more proper penal data estimation methods to compare and find appropriate findings.

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