



Article

Relationship between Capital Structure and Firm Profitability: Evidence from Vietnamese Listed Companies

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Abstract: This research focused on exploring capital structure that would have an impact on the Vietnamese company's profitability. Theoretically, we apply agency theory which mentions the separation of ownership and management, which leads to the problem when the managers act in their own interests rather than the owner's interest. We built a research model, and the quantitative data was clarified thanks to the regression model with the data given by 300 Vietnamese firms for the period from 2012 to 2018. The findings indicated that firm profitability, represented by Return on Equity (ROE) and Return on Assets (ROA), was associated with liquidity and debt. In detail, it was indicated that there would be a positive relationship between liquidity and profitability of Vietnamese entrepreneurs, while there was a negative relationship between long-term debt and profit maximization. Moreover, the short-term loan also has a positive impact on the firm's profitability in the context of Vietnam. These preliminary outcomes negated some previous research, confirming that the higher the leverage, the better the firm's profitability. The difference in findings may provide information about a dynamic Vietnam market as well as the financial environment that require changes in the capital structure to gain the optimal profit.

Keywords: capital structure; firm profitability; agency theory; Vietnam



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1. Introduction to the Research

To date, the mechanisms behind the positive relationship between capital structure and business performance have received great attention from various scholars. This shows the necessity of exploring the association between capital structure and a firm's profitability in order to benefit corporate governance. Particularly, the ideal capital structure results in better company performance and then maximizes the company value. However, the concerning problem is how to gain the aforementioned results without clarifying the relationship between capital structure and a firm's performance. As a matter of fact, despite its popularity in other countries, capital structure in Vietnam settings has been an unclear issue with limited studies in terms of both quality and quantity. Specific problems with those works might cover barriers to the company's performance calculation, research method limitations, small research sample size, etc. Based on that background, this research was carried out to investigate the role of leverage as a main factor in driving a firm's profitability.

Research on the capital structure and profitability of the firms is in line with research investigating the firm's performance. Regarding the latter topic, a firm's profitability may be impacted by capital structure in both direct and indirect ways (Agnihotri 2014). In detail, decreasing the cost of capital achieves funds through debt while indirectly increasing the cost of capital influences a firm's profitability. As a result, capital structure plays an important role in all facets of business, especially financial performance. Hence, it is urgent to find out the significance of capital structure and its associations to help financial managers have better knowledge to achieve company objectives. The task of configuring capital structure would be essential in various strategic decisions that support the board of directors,

especially the financial manager, to increase future business efficiency. Consequently, this situation makes it more favorable for entrepreneurs in Vietnam and other jurisdictions to lower the risks and gain a higher level of profitability. Moreover, an important aspect of this understanding is to benefit investors and creditors, who are provided with more appropriate data and analysis of the company's performance. On top of that, the stock screening process would be operated more efficiently and accurately. This certainly brings about opportunities for shareholders and potential investors to be fully aware of investment decisions in developing countries.

2. The Literature Review and Hypothesis Development

2.1. The Literature Review

The concept of capital structure has been well-established for many decades. One of the oldest theories suggested that capital structure should be the most critical concern of finance specialists to guarantee the firm's survival and growth in the future (Morton 1954). Later, in one study, Brigham et al. (2016) posited that in the current circumstances, where tax was always inclusive, the growth of leverage degree would consequently increase the company's value by tax expansion.

In a broader view, past financial theories showed the relationship between capital structure and a firm's profitability. In his research, Jensen and William (1976) combined the dimension of agency theory and property rights theory with finance theory and then created the customized theory of ownership structure for the company. Importantly, researchers have created a new definition of a company and demonstrated the influence of their analysis on the existence of debt and equity in the company. Gleason et al. (2000) indicated that capital structure has a significant impact on a firm's performance.

It has been theorized in the literature that capital structure plays an important role in the company due to the two different dimensions. On the one hand, the theory suggested by Modigliani and Miller (1958) provided evidence of information asymmetries. On the other hand, with the incentive-signaling approach, Ross (1977) claimed in this theory that the firm's value would increase by leverage because the expansion of leverage brought about the market's perception of value. In this context, the researcher predicts, based on the incentive-signaling theory, that the negative market reaction significantly impacts the leverage-decreasing transaction and vice versa. At the same time, information asymmetry also implied the informational differences between borrowers and lenders in the financial market, according to Scholes et al. (1976). This research found a positive association between a firm's performance and leverage. Moreover, the outstanding results recommended a higher cost of capital generated from poor project quality. That would cause the existence of substantial information asymmetries. From another perspective, the significant association between the leverage index and a firm's profitability was also identified by the usage of agency cost theory (Jensen and William 1976).

While the demonstration of agency cost has a significant impact on a firm's performance, a few studies argue that in order to maximize a firm's performance, firms are able to utilize the capital structure by using a set of agency cost adjustments. Jensen and William (1976) extended his studies to confirm that issuing debt might reduce agency costs and gain better firm performance by disciplining the board of directors to satisfy the shareholder's interests. Furthermore, most of the previous research examined the use of debt to encourage the manager to go for cash rather than put their risk on capital cost. Taking the relationship between the level of debt and efficiency into consideration, Abor (2005) indicated that it was not long-term debt, but the level of short-term debt would significantly have positive impacts on total assets and ROE. In general, the findings showed a significant relationship between the rate of total debt toward the total asset and the firm's profitability also. Furthermore, at a huge level of pressure of cash limitation, the availability of debt would provoke the engagement of the agents in the cost structure. Thus, that limited pressure would stimulate the motivation of agencies, making them cautious about allocating the company's cash flow to optimize their profitability. Another point was that in the case

of a higher debt structure, the attraction of acquisition would be lower. Hence, financial leaders might find it easier to alternate the merging and transactional theories in order to ensure their status in safe conditions. Consequently, this was an additional motivation for managers to deploy the firm's debt to ensure their current position.

To provide the basis for the complicated relationship between capital structure and a firm's profitability, the authors strongly refer to the theory of agency cost. However, there are some existing concerns about the proportion of debt that add up to the firm's capital structure. This makes the boundary unclearly defined. Additionally, when the influence occurs both positively and negatively, this would lead to a deeper investigation into which direction would be stronger. Despite various research on this topic, the phenomenon is still unclear. For instance, [Majumdar and Chhibber \(1999\)](#) reported a significant association between the debt level, capital structure, and firm's performance in the context of Indian companies. Similarly, by analyzing Ethiopian companies, [Negasa \(2016\)](#) found a positive connection between a firm's profitability and the level of debt that would help in identifying capital structure. [Zeitun and Tian \(2014\)](#) examined the influence of capital structure on a firm's performance in 167 Jordanian firms during 14 consecutive years (1989–2003). Moreover, [Ebaid \(2009\)](#) investigated capital structure by applying three accounting-based measurements of a firm's performance, namely ROE, ROA, and gross profit margin (GM) in the context of Egyptian between 1997 and 2005. [Hung and Eddie \(2002\)](#) carried out research in the context of property developers and contractors in Hong Kong to find out the interconnection between a firm's performance and capital structure. [Nenu et al. \(2018\)](#) also evidenced that the capital structure has a different impact on corporate performance, whether this is calculated on accounting measures or seen as market share price. In a recent study, [Dao and Ta \(2020\)](#) and [Homapour et al. \(2022\)](#) provided evidence that financial leverage was positively related to stock market performance but negatively associated with the business cycle.

In Vietnam, [Nguyen et al. \(2014\)](#) provided evidence that a firm's profitability would highly depend on the level of external debt. Similarly, [Le and Phan \(2017\)](#) demonstrated the positive association between a company's performance and capital structure in general by using Vietnamese-listed companies between 2007 and 2011. This research could be applied to other emerging and transition markets such as India, Brazil, or Vietnam. Therefore, the result would remain unchanged if the effects of external economic factors were eliminated. On the other side, however, the research by [Le and Phan \(2017\)](#) and [Nguyen et al. \(2014\)](#) was carried out by using a short timeframe, only one year, 2012. Taking the timeframe into consideration, 2012 was the hardest time in Vietnam since the interest rate was considerably higher than in the previous years. Therefore, the empirical research from [Pham and Nguyen \(2015\)](#) utilized the wider timeframe from 2008 to 2013 and found the different outcomes between static panel framework and dynamic estimators. The researcher argued that during the period of 2008–2013, Vietnamese companies operated in favorable market environments due to the economy booming in Vietnam; then, there were more chances of converting capital into a firm's profit.

Even though previous studies have enriched the literature in several ways, there are still two main problems possibly causing misleading among scholars. The first concern is the relationship between capital structure and a firm's performance, that is varied between developed and emerging economies regarding relationship direction. In the case of Vietnam, a new emerging market, a socialist country with typical characteristics, experienced a period of stable development with a high growth rate compared to other countries of about 6%, that relationship, which still remains unclear in the research's outcomes. This means that it is impossible to generalize the case of Vietnam to other emerging nations. Moreover, as mentioned before, the conflicts in the results are partly caused by different choices of the short timeframe and small sample. More importantly, the critical role of agency cost theory, resulting in the relationship between capital structure and a firm's profitability, is urgent to be investigated to find out the direction of contribution in the case of an emerging market such as Vietnam. Assuming that the positive influence is detected, it is necessary to answer

a further question about the degree of sufficiency to achieve such a desired outcome. Thus, the research question of the current paper is formulated as follows:

Which are the main drivers of capital structure on profitability for listed companies on the Vietnam Stock Exchange?

The remaining part of this paper is structured as follows. The second section analyzes how the research focus regarding capital structure has evolved within the literature, the mutual implications of the main research paths, and highlights the results of previous studies. The third section provides a short review of the research methodology, which describes the research sample, along with selected variables, and the methods used for the data process. The next section reveals the descriptive statistics, correlation analysis, and the outcome of panel data regression estimations. The last section concludes the study and proposes some instructive recommendations.

2.2. Hypotheses Development

Short-term debt: As mentioned before, short-term debt has a significant association with a firm's profitability in many past pieces of research. First, it was indicated that short-term debt would have a positive influence on profit, according to [Abor \(2005\)](#) and [Nguyen et al. \(2014\)](#). This means that the better the level of short-term debt, the higher the firm's profitability. On the other hand, the results by [Negasa \(2016\)](#) showed a negative relationship between short-term debt and a firm's profitability. Moreover, [Kester \(1986\)](#) also reported the negative connection in the context of the US. Additionally, [Gleason et al. \(2000\)](#) demonstrated similar findings in the case of EU entrepreneurs. As a result, it is very important to identify the role of short-term debt in terms of changing a firm's performance in specific settings, namely, Vietnam. The current research used the measurement of short-term debt, from short-term debt to total assets, as suggested by [Nguyen et al. \(2014\)](#). In fact, adopting similar measurements would help the researcher to easily make a comparison in the final step.

Hypothesis 1. *The short-term debt will positively influence the firm's profitability.*

Long-term debt: The connection between long-term debt and a firm's profitability is quite similar to the relationship between short-term debt, as discussed. Some studies demonstrate both positive and negative impacts of long-term debt on business performance. [Abor \(2005, 2007\)](#) suggested that this relationship tended to be negative regarding long-term debt. On the one hand, while previous evidence showed that the firm's performance would increase if margins leave was lower, the interest of shareholders should be matched with the board of directors' interest in long-term development. Similarly, some studies reported that shareholders who desired to keep their shares for a short-time period would face lower risk. On the other hand, in the context of Vietnam, it was shown in the research by [Nguyen et al. \(2014\)](#) that if the interest rate dropped dramatically while a loan contract had a long-term effect, the more maturity the permanent interest rates had, the more risky the firm's cost structure would be. In fact, the possibility of gaining or losing a profit would be equal. The growth of interest rates in the future led to extra expenses for the company. On the contrary, with the falling interest rate, the company would gain an economic advantage. [Negasa \(2016\)](#) reconfirmed the significant relationship with both positive and negative directions. It was undeniable that long-maturity debt would have different influences. As a consequence, that calls for urgency to demonstrate the association between long-term debt and a firm's profitability to draw overview insights into capital structure. Similarly, the authors also adopted the measurement of long-term debt by [Nguyen et al. \(2014\)](#).

Hypothesis 2. *The long-term debt will negatively influence the firm's profitability.*

3. Research Methodology

The research used panel data methodology to carry out the analysis as it took into the effect of the time period in many observations. For the sake of comparison, in the end, this method was suggested by [Ferri and Jones \(1979\)](#) and [Dawar \(2014\)](#). Under the panel data methodology, researchers were able to perform a multi-dimension analysis with a wider scope. This model also took into account the respective limitation ([Nathaniel 2008](#)). On the other hand, the question was whether the current research concentrated on time series alone provided the radical changes in a single entity. In the meantime, the panel data methodology was theoretically not enough to perform the level of influence of the company's strategic decision on financial ratios over a long timeframe. As a consequence, to get rid of these limitations of each approach, the combination would be an optimal solution. In fact, even when there were many further obstacles statistically, namely, heterogeneity or autocorrelation, the strengths of that combination overpowered the drawbacks. All in all, the proposed methodology was well-matched with research objectives that investigated the change of entrepreneurs year by year to intensively seek the effects of capital structure on a firm's performance.

To reflect the association between capital structure and a firm's profitability, we formulated the following research model, which was adopted by [Dawar \(2014\)](#). The model captured the leverage from mentioned variables, consisting of control variables: liquidity; long-term debt; short-term debt; firm size; firm age; and tangible assets. We also got rid of advertisement because a few of company in our sample invests in advertising. The regression was the following:

$$ROA_{i,t} = \beta_0 + \beta_1 LLIQ_{i,t} + \beta_2 AGE_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 TANG_{i,t} + \beta_5 LLTD_{i,t} + \beta_6 LSTD_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$ROE_{i,t} = \beta_0 + \beta_1 LLIQ_{i,t} + \beta_2 AGE_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 TANG_{i,t} + \beta_5 LLTD_{i,t} + \beta_6 LSTD_{i,t} + \varepsilon_{i,t} \quad (2)$$

where:

$ROA_{i,t}$ = Return on assets of firm i at time t ;

$ROE_{i,t}$ = Return on equity of firm i at time t ;

$LLIQ_{i,t}$ = Log of quick ratio of firm i at time t ;

$LLTD_{i,t}$ = Log of long-term debt to total assets of firm i at time t ;

$LSTD_{i,t}$ = Log of short-term debt to total assets of firm i at time t ;

$AGE_{i,t}$ = Age of firm i at time t ;

$SIZE_{i,t}$ = Size of firm i at time t ;

$TANG_{i,t}$ = Tangibility of firm i at time t ;

β_0 = common y -intercept;

β_1 – β_6 = Coefficient of explanatory variables;

$\varepsilon_{i,t}$ = stochastic Error efficient of Firm i at time t .

To test the relationship of capital structure with a firm's performance, the present research heavily depended on the availability of secondary data that presented the financial ratios from the company. As a result, the range of financial indicators was requested for the data collection stage. Initially, we intended to exploit the data from the Bloomberg database for data collection. However, based on the collected data, we still lacked some important indicators. Therefore, we decided to collect the data based on the official annual reports of a company.

[Naval \(2011\)](#) demonstrated that having the right sample would be the most important task in creating research quality generally. In fact, it is undeniable that the strategic sampling method and size determination would have a huge impact on the reliability and creditability of any research. This study used the list of Vietnam corporations as its samples due to the context related. We used the list of HoSE and HNX (Stock Exchange of Ho Chi Minh and Ha Noi) with 300 corporations as a representative for Vietnam in general. By accessing the database between 2012 and 2018 as longitudinal research, the collected data was a total of 180 observations. The reaching number was sufficient to process the data under the normal statistical distribution ([Naval 2011](#)). We also well noted an exclusion

of bank and non-banking finance firms due to the fact that their company's personalities and financial practices were distinguished from other industrial sectors (Dawar 2014). As a result, the final major sectors of Vietnam's economy consisted of Telecommunication, FMCG, Healthcare, Oil & Gas, Construction, Textile, and Chemical & Petrochemical.

The data analysis processed and tested the data collected from the database. The study used qualitative analysis to process the data as it took into effect three different techniques, namely, descriptive statistics, correlation analysis, and regression analysis, among a variety of analysis methods. The following are the details and justifications and an explanation of how they are applied.

Firstly, the descriptive statistical analysis offered an overview of the dataset in the research. Via this analysis, a general understanding of the personalities of variables would be developed, for example, mean, standard deviation, and the maximum and minimum value of variables. This created an overview of data presentation so that the later stages of analysis would be performed conveniently.

Secondly, correlation analysis was useful to demonstrate the association between each variable regarding interactional magnitudes and the level of influence. The rule of thumb was that the association among variables would be significant in case of a magnitude higher than 0.5 (the range is between 0 and 1). In the meantime, the correlation was indicated from -1 to 1 , which meant that the negative and positive association was shown. In general, the use of correlation analysis made it possible to calculate the relationship between variables.

Lastly, regression analysis was utilized to see if there was a statistically significant relationship between variables in a systematic way. The regression analysis encircled three different sub-techniques: Pooled OLS; Random Effect Method; and Fixed Effect Method. All of these methods were used in the present study because of their own advantage in research analysis. The Pooled OLS offers a very simple demonstration of panel data, therefore eliminating all the details of each effect. In addition, using Pooled OLS simultaneously violates the major assumption regarding error terms. As a result, the present research employed Random Effect Method to deal with this statistical issue. Moreover, the Fixed Effect Method has its own strengths that is the most consistent estimation because of the fact that it is able to solve the endogenous issue. The only drawback was that the technique was less accurate than the others in some circumstances. The rule of thumb in regression is R-square which is the coefficient of determination. Consequently, the research optimized the accuracy level by applying all three techniques as discussed.

The study used qualitative research to conduct a time-series cross-sectional (TSCS) analysis as it would reflect optimal research validity. The sample size covered the list of HOSE and HNX 300 listed companies for six financial years from 2012 to 2018 for analysis. As mentioned before, under the data regression methodology, there were three sub-techniques of Pooled OLS, Fixed Effect Model, and Random Effect Model, which were taken into consideration with the expectation of generating the most accurate outcomes from the dataset.

4. Findings and Discussion

This section discusses how the collected dataset was analyzed and how the outcomes were explained with descriptive analysis and correlation analysis. The research software—STATA was utilized to process the data analysis in order to provide empirical findings. Moreover, we also tested the model validity by R-squared value, as mentioned in the previous chapter. Finally, the regression analysis is used in different approaches: Pooled OLS; Fixed Effect Model; and Random Effect Model in order to produce the final significant results.

The descriptive analysis provided the summary of the statistic of dependent and independent variables at the concerned time. The Table 1 displays the various estimation descriptive statistics of variables. Firstly, the liquidity of Vietnam firms was in healthy status with a standard deviation of 1.8035 in the acceptable range. On the other hand, as

shown in the table, the log of liquidity changed significantly between the maximum of 4.0631 and the minimum of -5.2306 in the timeframe. The mean score was 0.1504.

Table 1. Descriptive Analysis.

Variables	N	Mean	Standard Deviation	Min	Max
LLTD	1800	-2.5811	1.2151	-6.1059	-0.4446
LSTD	1800	-2.4363	1.0602	-5.0637	-0.7362
LLIQ	1800	0.1504	1.8035	-5.2306	4.0631
AGE	1800	21.3	11.2983	4	54
SIZE	1800	15.4874	1.5748	11.5628	19.0109
TANG	1800	0.2799	0.1882	0.0053	0.7646
ROE	1800	18.2118	16.1434	-83.46	91.92
ROA	1800	9.3083	9.2661	-14.68	72.19

In terms of debt structure, the mean of long-term and short-term debt was not very different, around -2.5811 for LTD and -2.4364 for STD. Moreover, the standard deviation of LTD and STD was estimated at approximately 1.2151 and 1.0602, respectively. In addition, the log of the percentage of LTD and STD demonstrated the high gap between the minimum and maximum point, which was -6.1059 and -5.0637 for the minimum level in comparison to -0.4446 and -0.7362 for the maximum level.

The table also shows the general value of the tangible asset. The standard deviation was quite low at 0.1882, with a mean score of 0.2799. In the meantime, according to the dataset, the total asset had a dramatic change in the year 2012–2018 from VND492 billion to VND 180,450 billion. There are some arguments behind that number. Firstly, the corporates which were chosen in the dataset consisted of all levels: small, medium, and large. Therefore, the dataset could become more general and representative of the whole Vietnam corporate. Secondly, corporates themselves might witness significant changes in their operation and performance, which led to the fluctuation of a total asset over the research timeframe of 2012–2018.

According to the table, the firm age has a remarkable number, with the average firm age of 21 years. Moreover, the statistic showed that the oldest firm was 54 years old in 2017, and the youngest firm was only 4 years old by 2011. It might be concluded that the observations were mature and experienced enough to executive smoothly and beneficially. This section discusses how the collected dataset was analyzed and how the outcomes were explained with descriptive analysis and correlation analysis. The research software—STATA—was utilized to process the data analysis in order to provide empirical findings. Moreover, we also tested the model validity by R-squared value, as mentioned in the previous chapter. Finally, the regression analysis is used in different approaches: Pooled OLS; Fixed Effect Model; and Random Effect Model in order to produce the final significant results.

The result analysis of the average total asset of Vietnam corporates between 2012–2018 show a dramatical change between 2012–2018; however, the number of total assets increased during the research period. In fact, we might conclude that the average total assets of Vietnam corporates doubled between 2012–2018.

Additionally, the analysis result also revealed changes in the ROA and ROE of Vietnam firms over the years. In general, it is noticeable that there was a similarity in the trend happening with both ROA and ROE ratios. Between 2012 and 2013, the percentage of ROE decreased gradually, partly because of the economic recession in Vietnam. After that, the ROE witnessed a significant recovery trend until 2017 before dropping to 15% in 2018. Similarly, although there was fluctuation within the percentage of ROA, its change was smaller compared with the percentage change of ROE. Finally, it ended up at under 10% in 2018 due to the effort of the country's government to control the whole national economy.

4.1. Results from the Correlation Analysis

The results shown in the Table 2 below indicate the strong correlation between LLIQ and the firm's profitability measurement (ROE and ROA) with a degree of correlation of 0.3096 and 0.5181, respectively. The number also suggests that higher LLIQ was related to a higher firm's profitability. The negative number of the correlation degree between tangible assets and the firm's profitability indicates that the higher tangible assets would affect the firm's profitability. Lastly, both long-term debt and short-term debt show a negative index toward the firm's profitability as ROE and ROA. These outcomes suggest that the company with greater debt (long-term and short-term) would relate to lower ROE and ROA. This result also follows the conclusion of Berger and di Patti (2006), who showed that a greater degree of liabilities becomes an obstacle for a firm to achieve a better level of profit. On the other hand, the firm size and firm age also play a positive role in generating a firm's profitability. As a result, we can conclude that the larger and more mature the firm is, the better it is at gaining a higher profit.

Table 2. Correlation Matrix.

	LLIQ	LLTD	LSTD	AGE	SIZE	TANG	ROE	ROA
LLIQ	1.0000							
LLTD	−0.3661	1.0000						
LSTD	−0.813	0.2569	1.0000					
AGE	0.2965	−0.4068	−0.265	1.0000				
SIZE	0.2579	−0.0139	−0.2155	0.0715	1.0000			
TANG	−0.0105	0.4279	0.011	−0.1299	0.3949	1.0000		
ROE	0.3096	−0.3438	−0.1126	0.1468	0.2049	−0.0018	1.0000	
ROA	0.5181	−0.5561	−0.334	0.3323	0.1352	−0.0719	0.7959	1.0000

4.2. Result from the Regression Analysis

Table 3 shows the results of regression using three techniques, namely, Pooled OLS, Fixed Effect Model, and Random Effect Model, to examine the association between capital structure and a firm's profitability calculated by ROA and ROE ratio.

Table 3. Regression Results.

Dependent Variable	ROE			ROA		
	Pooled OLS	FEM	REM	Pooled OLS	FEM	REM
R-Squared	0.2418		0.0633	0.4573	0.3979	0.4496
F-Value	5.23		1.99	19.82	4.03	
Wald-Test		24.75				63.07
p-Value	0.0001	0.0004	0.0708	0.0000	0.0009	0.0000

As demonstrated in the table, it is possible to decide the firm's profitability by relying on the R-square score that explains how relevant the research framework is. Based on the results of the R-square from all three techniques, the R-square index was less than 50%, hence, it can be stated that the model was not reasonable enough to explain the trend of profit-making. In fact, Pooled OLS technique had the highest R-square, about 24% in term of ROE ratio, compared with approximately 46% of the ROA ratio. On the other hand, the *t*-values of almost less than 0.05 for both ROA and ROE ratio indicated that some dependent variables could predict the firm's profitability. Consequently, it was suggested that though the model could be used to predict a firm's profitability, it was necessary to be revised by adding/removing variables to get a better prediction.

Based on the result of the F-test analysis, we reject the null hypothesis that $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6 = 0$ with a significant level less than 0.001. It means that the LLIQ, LLTD, LSTD, AGE, SIZE, and TANG have a significant association with predicting a firm's profitability.

As shown in the above table, the results demonstrate a significant association between LLIQ, LLTD, LSTD, AGE, SIZE, and TANG, and the firm's profitability (measured by ROA and ROE). An overview of the statistical results presents the variation of significant degree among the three techniques.

Regarding long-term debt (LLTD), the negative numbers of beta and p -value indicate a significant negative association between LLTD and a firm's profitability. This means that the greater the long-term loan was, the lower the ROE ratio would be, and vice versa. In fact, we can find the insignificance in term of the FEM technique (p -value > 0.05), in contrast to REM and Pooled OLS technique (p -value < 0.05). In the meantime, the study detected a significant negative relationship between LLTD and ROA ratio consistently within all three techniques. Put in a nutshell, long-term debt plays an important role in a firm's profitability. This means that the company should take it into account to optimize its profitability. Hence, H1 is fully supported.

Regarding short-term debt (LSTD), the results indicate that there was no significant influence of LSTD on a firm's profitability (in the case of both ROA and ROE) with the FEM and REM techniques. However, the Pool PLS technique could detect the significant relationship between LSTD and the firm's profitability with a p -value less than 0.001. As a result, short-term debt partly has a positive association with generating a firm's profitability. Hence, H2 is partly supported. It means that an increase in LSTD is associated with an increase in the firm's profitability. Our findings are also similar to other empirical research of [Abor \(2007\)](#) in the context of South African firms and [Nguyen et al. \(2014\)](#) in the context of Vietnam firms.

Table 4 also presents the result of control variables toward dependent variables. Firstly, the degree of liquidity has a positive impact on ROE within three techniques. On the other hand, the result derived from the FEM technique shows no association between ROA and liquidity, even though there is a significant relationship between utilizing the REM and Pooled OLS (p -values are less than 0.01). This evidence implies that liquidity is one of the major factors in pushing the firm's profitability forward.

Table 4. Regression Analysis.

Dependent Variable	ROE			ROA		
	Pooled OLS	FEM	REM	Pooled OLS	FEM	REM
LLTD	−4.035 *** (−3.41)	−2.592 (−1.51)	−3.385 * (−2.51)	−3.487 *** (−4.94)	−2.478 ** (−3.07)	−3.080 ** (−4.77)
LLSTD	5.698 *** (3.76)	2.026 (0.72)	3.976 (1.84)	1.802 * (2.48)	−0.555 (−0.42)	0.689 (0.66)
LLIQ	4.254 *** (4.46)	3.188 * (1.99)	3.783 ** (3.02)	2.586 *** (6.05)	1.017 (1.35)	1.807 ** (3.01)
AGE	−0.0257 (−0.28)	−0.794 (−1.08)	−0.0578 (−0.34)	0.0588 (1.30)	0.0827 (0.24)	0.0813 (0.97)
SIZE	1.336 (1.71)	5.239 (1.12)	1.508 (1.21)	−0.107 (−0.33)	0.86 (0.39)	0.111 (0.18)
TANG	6.457 (1.03)	−9.347 (−0.59)	1.492 (0.15)	7.057 ** (2.77)	1.295 (0.17)	5.234 (1.09)
Beta	−0.914 (−0.08)	−45.63 (−0.73)	−3.941 (−0.21)	2.742 (0.58)	−14.04 (−0.48)	−2.147 (−0.23)
N	180	180	180	180	180	180

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The result shown in the table also indicates the same relationship trend for firm size and firm age, which had no linkage with the firm's profitability. The statistical numbers present that the p -value was higher than 0.1 within all three regression techniques. Therefore, unlike other control variables, firm size and firm age had no influence on generating a firm's profitability.

Lastly, regarding the tangible asset, the outcome indicates that there is no significant influence of tangible assets on a firm's profitability (with both ROA and ROE) by using FEM and REM techniques. However, since the p -value is less than 0.01 according to the Pooled OLS technique, the tangible assets would still be in relation to ROE and ROA. Therefore, it is difficult to conclude the relationship between tangible assets and a firm's profitability at the same time.

5. Research Discussion and Conclusions

A vast majority of research has examined the association between capital structure and a firm's performance (Berger and di Patti 2006; Hung and Eddie 2002; Margaritis and Psillaki 2010; Pandey 2004; Nenu et al. 2018; Le and Phan 2017; Dao and Ta 2020). However, the current literature lacks such implications in the context of the emerging economy, particularly in Vietnam. The present study explored the relationship between capital structure and a firm's profitability in Vietnam between 2012 and 2018 by utilizing three regression techniques, called Pooled OLS, Fixed Effect Model, and Random Effect Model.

Generally, the findings indicated the significant impact of capital structure on the financial performance of the firm (in the case of ROA and ROE). Based on a sample of 300 Vietnam corporate, the study concluded that long-term debt had a negative influence on a firm's performance while short-term debt had a positive influence. This conclusion is also aligned with the research by Le and Phan (2017) in the Vietnam setting.

It was found that long-term debt and short-term debt would play important roles in a firm's financial performance (measured by ROE and ROE). In terms of the control variable effect, liquidity had a significant impact on the firm's performance. This finding also reconfirmed the seminal work by Berger and di Patti (2006), suggesting that the greater firm liquidity, the better profit can be achieved. This is a meaningful factor to the board of directors of the company when they propose financial strategies in an effort to maximize profit. However, it also revealed that the firm's age, size, and tangible assets did not influence the firm's performance in Vietnam. Another point was that this finding was against the conclusion of Nguyen et al. (2014) and Negasa (2016), in the view that lower liquidity would drive more profit to the company. Consequently, this further brought about an important viewpoint to the research sampling based on the timeframe. In fact, the study by Nguyen et al. (2014) selected the years that Vietnam's economy boomed, resulting in a high conversion rate from debt and fixed assets to profit. As a result, lower liquidity led to a positive trend of firm profitability in the short term. On the other hand, it was undeniable that the low degree of liquidity resulted in difficulty in gaining new finance to get better investments in the future; hence, the corporations cannot ensure sustainable profitability. In fact, the truth is that firms' profitability is an essential factor for the survival of any firm for a long time. Therefore, it would be dangerous if firms were operating under a high probability of insolvency (Baum et al. 2006). In accordance with the perspective of agency theory, the study implied that the board of directors should be flexible in planning the capital structure so that firms could be able to control the degree of liquidity and solvency. In the short run, it is possible that liquidity might change to get aligned perfectly with company strategies, but the firm should be as liquid as possible to make sure profit maximization in the future. Regarding tangible assets, it was reconfirmed that this indicator was not related to the firm's performance (ROA and ROE), with an insignificant association found. This is due to the fact that tangible assets have an influence on manufacturing companies, except service-based companies. As a result, the board of directors, corporate investors, or creditors should not depend on this kind of variable to maximize the efficiency of their decisions.

Given the maturity of debt, the relationship between the maturity of debt and the firm's profitability was also reported. In detail, a negative relationship found between long-term debt and the firm's profitability indicates the firm's engagement in controlling long-term debt to optimize margin. This evidence was similar to the finding by [Abor \(2007\)](#) in the context of emerging economies in the fact that long-term debt was prevalent in corporate operations. However, a too high percentage of them would harm business. In terms of short-term debt, the finding indicates the significant influence of short-term debt on making a profit in firms. Due to the high relevancy of taking short-term debt into account to maximize capital structure, the study's finding was aligned with the past research ([Baum et al. 2006](#)). In the Vietnam setting, one of the explanations for the effect of short-term debt is due to the stable interest rate in Vietnam's economy within the research timeframe. Moreover, with the addition of high liability, the finding became more controversial regarding the positive relationship to the firm's performance. From another viewpoint, along with the capital structure by debt, it would be better if firms put their efforts into investing more in equity capital, which would result in sustainable financial growth in the short run and long run. [Abor \(2005\)](#) suggested that equity capital helps to create more motivation to drive a firm's performance with minimalizing financial distress. It is also proven that firms relying more on equity might help their cost structure become less heavy; as a result, the board of directors can achieve an expectation of corporate shareholders easily.

However, the study implied the insignificant role of firm size, firm age, and tangible assets. These findings are aligned with the conclusion by [Dawar \(2014\)](#) and [Nenu et al. \(2018\)](#) in the viewpoint that both size and age of the corporation had nothing to do with the profit-making process in business operation. One obvious reason is that the possibility of gaining profit in the big firm with the big investment was equal to the high possibility of lost profit.

Even due to the economy of scale, larger companies were able to generate more profit, but it would be lower than small companies in the short time period. Moreover, it is possible that many big companies had a higher level of negotiation position in the money market; then, they might take advantage of this strength to decrease the interest rate. Additionally, the participation in large debt to run the long-time investment would consequently bring about a high level of credit risk for the big companies. Hence, with the firm size, companies might gain a comparative advantage in the market to support them in generating greater profit in their own way.

Last but not least, tangible assets presented no significant relationship with the firm's profitability (or performance). Even though tangible assets accounted for the majority of the total asset in manufacturing companies, it was found to be insignificantly related to making a profit in the non-manufacturing sector. From the perspective of the management, in general, the board of directors should not keep many tangible assets in the company. In some situations where there is a shortage of long-term assets, tasks could be outsourced. In an alternative way, [Kupiec and Lee \(2012\)](#) implied that corporate should always balance the connection between current and fixed tangible assets. From another point of view, this current-noncurrent asset was out of the study's framework and should be investigated in future study.

In summary, the quantitative research based on the sample of Vietnam entrepreneurs from 2012 and 2018 investigated the effect of capital structure choice on a firm's financial performance (measured by ROA, ROE). The results indicated that liquidity had a positive impact on the profitability of Vietnam firms. The above empirical evidence also suggested that the company should divide its capital structure into more liquid liabilities, hence, increasing the firm's solvencies. In the meantime, it is obvious that the degree of leverage would be managed at a suitable level; therefore, the financial risks would impact the firm's performance as little as possible and enhance the firm's profitability. Noticeably, this finding was not totally in accordance with the studies discussed in the previous session, as higher leverage cost was commonly accepted and encouraged in developed

and emerging nations. However, in a new emerging market such as Vietnam, the main focus would still be the trend and market environment. Consequently, it is necessary for companies to put their effort into changing their capital structure. From a different perspective, the research also represented the viewpoint that long-term debt minimalization would begin from high liability structure and expense structure, while the firms should exploit short-term debt instead. Other indicators, such as firm age, firm size, and tangible assets, were demonstrated to have insignificant influence on the firm's performance.

Despite the fact that the present research was deployed carefully, it still has several limitations that need to be addressed. Future research sectoral analysis can be designed to deal with the gaps with more accuracy in the future. First and foremost, postulates of agency cost theory must be reported with the significance of leverage and, given the uncertainty in case of a higher level of leverage, drives more profit to the business. For future research, the equity structure should be inclusive of a list of indicators for better reference and analysis. Another possible limitation of the study is the low goodness of fit that is demonstrated by the low R-square index. This means that the model was not reasonable enough to explain the dependent variables (ROA and ROE). Moreover, the control variables in this research, such as firm age, firm size, or tangible assets, should be developed more effectively. Lastly, one practical limitation of this study stems from its own context of Vietnam. The authors explored some important inconsistencies between the study and past studies in the environment of Vietnam. In fact, the research concentrated on the macro environment in this country. However, it got rid of external influences for the simplicity of this study. Thus, it is expected that future findings will become more convincing by including external indicators to profoundly contribute to the literature on capital structure in the emerging market.

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