

# MEASURING IMPACT OF CAPITAL STRUCTURE ON FINANCIAL PERFORMANCE OF VIETNAMESE SOES

Do Xuan Quang\*, Wu Zhong Xin

<sup>1</sup>Business School, Hunan University, Hunan, China

## ARTICLE INFO

### Corresponding Author:

Do Xuan Quang  
Business School, Hunan  
University, Hunan, China

**Key Words** Non-linear model;  
Vietnamese SOEs; capital structure;  
financial performance.



DOI:<http://dx.doi.org/10.15520/ijbm.vol4.iss6.37.pp114-117>

## ABSTRACT

This research uses the non-linear model to measure the impact of capital structure on financial performance of Vietnamese state-owned enterprises (SOEs). The study results show that there are different relations between capital structure and financial performance at different thresholds. For example, in the range of (0.040; 0.703), capital structure (measured by the ratio of long-term debt on equity) is positively related to financial performance (measured by the ratio of profitability on equity), outside that range, the relation is negative. In this study, we find out that quadratic and cubic non-linear models have a significant in measuring the relationship between capital structure and financial performance.

©2015, IJBM, All Right Reserved

## INTRODUCTION

Researches on the relationship between capital structure and financial performance are conducted by a great number of researchers using linear model or threshold model. Because the researchers state that it is impossible to exist various relationships between capital structure and financial performance, meaning that there is only one form of relationship between capital structure and financial performance, either negative (see Titman and Wessels, 1988; Rajan and Zingales, 1995; Wiwattanakantang, 1999; Gleason et al., 2000; Fama and French, 2002; Zeitun and Tian, 2007) or positive (see Abor, 2005; Berger and Bonaccoris di Pitti, 2006; and Pasillaki Margaritis, 2009 and others).

Meanwhile, some researches using non-linear models prove that there cannot be a single relationship between capital structure and financial performance. Masulis (1983) shows that in a certain range, capital structure is positively related to financial performance, outside that range the relationship is in reverse. That is, the range of 0.23 to 0.45 is the ratio of debt to effectively impact business performance. Optimizing this rate will be beneficial to firms. Wei Xu et al. (2005) shows that a solid relationship on the effectiveness of business operations for financial structure: (i) performance business has positive relationship to debt ratio; (ii) the debt ratio in the range of 24.52% and 51.13%, the performance business has relationship under non-linear function level 2 and level 3 to debt.

The purpose of this study is to measure the relationship between capital structure and financial performance of firms using non-linear model, because we assume that in different certain ranges, relations between

capital structure and financial performance are different. The rest of the article is organized as follows: Section 2 presents a literature review of the capital structure and corporate performance, ownership structure and corporate performance. Section 3 introduces methodology and measurement of variables. Section 4 presents research results and discussion, and finally conclusions are presented in Section 5.

## LITERATURE REVIEW

Viewed from a negative-positive relationship, Ebaid (2009) summarize from previous theoretical and empirical researches and state that the selection of capital structure of a firm is influenced by many factors, and a financial theory with it unique assumptions cannot give comprehensive explanations for the capital structure selection. Therefore, it is easy to understand that financial theories offer different perspectives on the relationship between capital structure and financial performance of firm. Empirical evidences also divide results by the different directions to support various theoretical predictions. First, according to trade-off theory, there exists a positive relationship between capital structure selection and financial performance. Firms with higher profitability tend to have higher debt to benefit from the tax shield (Miller, 1977). Supporting this argument, Jensen (1986) takes the view that debt level in increased capital structure may have positive effects on financial performance of a firm by reducing agency problem between shareholders and managers. Relating to benefit trade-offs between managers and shareholders, Harris and Raviv (1991) suggest that the firm can increase debt in capital structure to reduce agency cost between

managers and shareholders, which is considered appropriate. Empirical researches support this school of thought are Abor (2005), Berger and Udell (2004), Margaritis and Pasiakos (2009) and others.

Contrary to the above mentioned viewpoint that capital structure negatively relates to firm's financial performance, Myers (1984) points out the existence of information asymmetry problem between insiders (managers) and outside investors on the fact that business pricing relating to the issuance of new shares – a transferring step from old to new shareholders – may be harmful to the existing shareholders (see Myers and Majluf, 1984). To avoid that negative impact, managers will prioritize using endogenous sources (such as retained earnings), then debts and finally equities issued. Accordingly, the higher firms' profitability is, the more they tend to prioritize using endogenous funds than debts compared with firms with lower profitability. With this, it can be concluded that debt level in the capital structure of a firm is inversely related to financial performance (ie profitability). In another study, Ross (1977) states that share capital is less favored by investors because they think that managers will take advantage of the issuance of new shares to make higher pricing of the firms. As a result, investors believe that it is a good sign to decide to use internal funds instead of issuing equities. Empirical evidences of a negative relationship between capital structure and financial performance can be found in Titman and Wessels (1988), Rajan and Zingales (1995), Wiwattanantang (1999), Gleason et al. (2000), Fama and French (2002), and Zeitun and Tian (2007). Besides, a number of empirical studies provides mixed and contradict results among measured variables of capital structure and those of firm's financial performance with representative meaning (e.x: Ebaid, 2009; Nguyen and Ramachandran, 2006).

**RESEARCH MODEL AND MEASUREMENT OF VARIABLES**

**Building model**

The multiple regression method applied on the cross-table data continues to be the choice in this research. The model is as follows:

$$Y = \alpha_0 + \alpha_1 X_0 + \sum \beta_k X_k + u \quad (1)$$

$$Y = \alpha_0 + \alpha_1 X_0 + \alpha_2 X_0^2 + \sum \beta_k X_k + u \quad (2)$$

$$Y = \alpha_0 + \alpha_1 X_0 + \alpha_2 X_0^2 + \alpha_3 X_0^3 + \sum \beta_k X_k + u \quad (3)$$

Where

Y is the dependent variable – financial performance. X<sub>0</sub> is the explanatory variable – capital structure, the main variable of the research in examining its correlation with the dependent variable – financial performance.

X<sub>k</sub> (k = 1÷7) is financial variables, specifically, X<sub>1</sub> is the risky business variable, X<sub>2</sub> is the tangible variable, X<sub>3</sub> is the growth opportunity variable, X<sub>4</sub> is the firm size variable, X<sub>5</sub> is the liquidity variable, X<sub>6</sub> is the cost of debt variable, X<sub>7</sub> is the cost of capital variable.

α<sub>0</sub> is the constant (slope), α<sub>1</sub>, α<sub>2</sub>, α<sub>3</sub>, β<sub>k</sub> is the coefficient of the explanatory variables, u = μ + ε, ε is the random error with E(ε) = 0 and Var(ε) = δ<sup>2</sup> and μ is the table data error.

**Explanation of the research model**

Model (1) is the model studying the effect of capital structure and financial variables to financial performance of enterprises. The model is in the form of a linear function level 1. Model (2) is in the form of a non-linear function level 2 of the capital structure variable. With the assumption that the capital structure has two-dimensional

impact on corporate financial performance, meaning that debt initially has good impact on corporate financial performance, yet when it exceeds a certain threshold, it will enable negative response of the corporate financial performance. Therefore, we assume that the non-linear relationship between capital structure and financial performance of enterprises is in the form of a convex function level 2, the coefficient α<sub>2</sub> > 0 and α<sub>2</sub> being statistically significant.

Model (3) is in the form of a non-linear function level 3 of the capital structure variable. Given that capital structure, in certain thresholds, in certain areas, may increase corporate financial performance, whereas in other areas, it reduces the financial performance of the business, we assume that the capital structure has a non-linear relationship in the form of the level 3 function with corporate financial performance. That is, at least in that coefficient α<sub>3</sub> must be statistically significant.

To facilitate the study, the capital structure variable is calculated to have a linear relationship with financial performance when inserted into estimated regression model. The multiple regression method with the cross-tabular data to be and adaptive option for our study for all three models, with statistical significance levels of 1%, 5% and 10% respectively.

**Testing of the panel data model**

*The Durbin-Watson testing*

This test aims at determining there is whether or not the phenomenon of autocorrelation in the model. Conclusion for the autocorrelation phenomenon is as follows:

If the value of d in Durbin - Watson:

1 < d < 3: no autocorrelation phenomenon.

0 < d < 1: model has the phenomenon of positive autocorrelation.

3 < d < 4: model has the phenomenon of negative autocorrelation.

*The Wald testing*

For the purpose of determining whether the original y-axis coefficients among variables are equal or not, this means the similarity among original y-axis coefficients of the model.

H<sub>0</sub>: original ordinates are equal among variables

H<sub>1</sub>: original ordinates are not equal among variables

If α > p-value, the hypothesis H<sub>0</sub> is rejected and it can be concluded that original ordinates are not equal among variables

*The Hausman testing*

Testing coefficients of explanatory variables (α, β)

H<sub>0</sub>: the coefficients are not statistically significant

H<sub>1</sub>: the coefficients are statistically significant

If α > p-value, the hypothesis H<sub>0</sub> is rejected, or in other words, the tested variables affect the capital structure in a statistically meaningful way.

**Definition of variables**

*Financial performance (Y)*, measured based on book values calculated from financial statements represented by Return on Equity ratio.

*Capital Structure (X<sub>0</sub>)*, measured by Long-term Debt on Equity ratio.

*Business risk (X<sub>1</sub>)*, measured by standard deviation of Earnings Before Interest and Taxes.

*Tangibility (X<sub>2</sub>)*, calculated by Tangible Assets on Total Assets ratio.

*Growth opportunity (X<sub>3</sub>)*, measured by the percentage of change in total assets.

Firm size ( $X_4$ ), measured by the logarithm of total assets (unit 10 billions Vietnamese Dong).

Liquidity ( $X_5$ ), calculated by book value of short-term assets on short-term debt.

Cost of debt ( $X_6$ ), measured by paid interest on total debt.

Cost of equity ( $X_7$ ), measured by actually paid dividends to equity.

This study uses data base from financial statements of listed Vietnamese SOEs on Ho Chi Minh Stock Exchange and Hanoi Stock Exchange for the period of 2006-2012. Due to different characteristics, financial institutions (banks, insurance companies, securities firms and other financial institutions) are excluded from the samples. Together with the screening of financial data availability for sampled companies for survey period (2006-2012), finally, sample of 300 non-financial SOEs was selected.

**ANALYSIS OF RESEARCH RESULTS**

We conduct testing each model respectively, the empirical analysis results are respectively as follows:

**Table 1. The impact of capital structure on financial performance of Vietnamese SOEs (linear model)**

Variables	Coefficients	Std. Error	t-value	Sig.
X <sub>0</sub> (long-term debt to equity)	-.203*	.005	-6.851	.000
X <sub>1</sub> (business risk)	.057**	.000	2.048	.041
X <sub>2</sub> (tangibility)	-.100*	.022	-3.699	.000
X <sub>3</sub> (growth opportunity)	.113*	.009	4.415	.000
X <sub>4</sub> ( firm size)	.104*	.003	3.986	.000
X <sub>5</sub> (liquidity)	-.002	.002	-.061	.952
X <sub>6</sub> (cost of debt)	-.124*	.100	-4.822	.000
X <sub>7</sub> (cost of capital)	.288*	.072	11.345	.000

R=0.434; R<sup>2</sup>=0.188; Durbin-Watson=1.403; F=33.506; F\_sig.=0.000  
 Note: \*, \*\*, \*\*\* as statistical significance levels of 1%, 5% and 10%

Table 1 shows that model (1) is appropriate when the Durbin-Watson testing value is 1.419 € (1; 3) and F-statistic = 36.347 with F-sig. = 0.000, indicating that there is no phenomenon of autocorrelation in the model, multi-linearity and the slope value do not change when explanatory variables change.

Table 1 show that capital structure is inversely correlated with statistical significance with financial performance, meaning that when SOEs increase their debt, financial performance decreases. Tangibility and cost of debt are both negatively related with statistical significance to financial performance. In contrast, growth opportunity, firm size and capital cost have positive relationship with statistical significance with financial performance. Especially, regarding the risk variable, our data set is not yet sufficient to explain the relationship of risk to financial performance when the coefficient of risk estimation reflects the approximate value of zero.

**Table 2. The impact of capital structure on financial performance of Vietnamese SOEs (non-linear model level 2)**

Variables	Coefficients	Std. Error	t-value	Sig.
(Constant)	.085*	.024	3.507	.000
X <sub>0</sub> (long-term debt to equity)	-.342*	.010	-6.210	.000
X <sub>0</sub> <sup>2</sup> (long-term debt to equity)	.142*	.001	2.999	.003
X <sub>1</sub> (business risk)	.088*	.000	2.992	.003
X <sub>2</sub> (tangibility)	-.071**	.023	-2.491	.013
X <sub>3</sub> (growth opportunity)	.117*	.009	4.585	.000
X <sub>4</sub> ( firm size)	.127*	.004	4.700	.000
X <sub>5</sub> (liquidity)	-.007	.002	-.268	.789
X <sub>6</sub> (cost of debt)	-.126*	.100	-4.906	.000

X <sub>7</sub> (cost of capital)	.285*	.072	11.238	.000
----------------------------------	-------	------	--------	------

R=0.434; R<sup>2</sup>=0.188; Durbin-Watson=1.403; F=33.506; F\_sig.=0.000

Note: \*, \*\*, \*\*\* as statistical significance levels of 1%, 5% and 10%

**Table 3. The impact of capital structure on financial performance of Vietnamese SOEs (non-linear model level 3)**

Variables	Coefficients	Std. Error	t-value	Sig.
(Constant)	.100*	.023	4.264	.000
X <sub>0</sub> (long-term debt to equity)	.141***	.013	1.909	.057
X <sub>0</sub> <sup>2</sup> (long-term debt to equity)	-1.851*	.003	-8.615	.000
X <sub>0</sub> <sup>3</sup> (long-term debt to equity)	1.659*	.000	9.490	.000
X <sub>1</sub> (business risk)	.091*	.000	3.180	.002
X <sub>2</sub> (tangibility)	-.090*	.022	-3.239	.001
X <sub>3</sub> (growth opportunity)	.104*	.008	4.219	.000
X <sub>4</sub> ( firm size)	.090*	.003	3.413	.001
X <sub>5</sub> (liquidity)	-.003	.002	-.101	.919
X <sub>6</sub> (cost of debt)	-.131*	.097	-5.277	.000
X <sub>7</sub> (cost of capital)	.296*	.070	12.076	.000

R=0.491; R<sup>2</sup>=0.241; Durbin-Watson=1.435; F=41.230; F\_sig.=0.000  
 Note: \*, \*\*, \*\*\* as statistical significance levels of 1%, 5% and 10%

Table 2 and 3 show that capital structure has a non-linear relationship in the form of the function level 2 and level 3 to financial performance, when the estimated coefficients of capital structure variables ( $\alpha_1, \alpha_2, \alpha_3$ ) show values with statistical significance.

Model (2) is rewritten when examining the relationship of the level 2 function of capital structure with financial performance of the enterprises, in the form of:

$$Y = f(X_0) = \alpha_0 + \alpha_1 X_0 + \alpha_2 X_0^2 = 0.085 - 0.342X_0 + 0.142X_0^2 \quad (4)$$

The coefficient  $\alpha_2 = 0.142 > 0$ , showing that the level 2 function is in a parapol convex form. The maximum value of the level 2 function can be reached at the point  $f'(X_0) = 2\alpha_2 X_0 + \alpha_1 = 0$ , meaning that  $X_0 = -\alpha_1 / 2\alpha_2 = -(-0.342) / 2(0.142) = 1.204$ . This indicates that when the rate of long-term debt on equity is in the range of (0; 1.204), the financial performance of the enterprises is efficient, while the value is beyond 1.204, the debt increase will reduce financial performance, this result is somewhat contradict to that of the model (1) when long-term capital structure is inversely related to financial performance.

Model (3) is rewritten when examining the relationship of the level 3 function of capital structure with financial performance of the enterprises, in the form of:

$$Y = f(X_0) = \alpha_0 + \alpha_1 X_0 + \alpha_2 X_0^2 + \alpha_3 X_0^3 = 0.100 + 0.141X_0 - 1.851X_0^2 + 1.659X_0^3 \quad (5)$$

Equation (5) reach its maximum value when  $f'(X_0) = \alpha_1 + 2\alpha_2 X_0 + 3\alpha_3 X_0^2 = 0$ , with respective solutions of 0.040 experience and 0.703, meaning that equation (5) reach its maximum value at 0.040 and 0.703. This also means that when the rate of long-term debt on equity in the range (0.040; 0.703), financial performance of the business is inversely associated to capital structure, and in the range (0.040; 0.703), the long-term capital structure is positively related to financial performance. This is consistent with studies of Masulis (1983) and Wei Xu et al. (2005).

In fact, the rate of long-term debt over equity of Vietnamese SOEs is approximately 44.69%. Therefore, it can be preliminarily concluded that with the current rate of long-term debt on equity, increase in long-term capital structure will create decrease in financial performance of the enterprises. SOEs should pay attention to maximize

equity rather than take advantage of long-term debt mobilizing.

## CONCLUSION

Long-term capital structure, to some certain extends, improves the development of enterprises, but also reduces corporate financial performance. By the assumption of three models the relationship between capital structure and financial performance, we believe that the long-term capital structure have a certain threshold in which financial performance is efficient when the long-term financial leverage is increases. In contrast, the excessive increase in financial leverage will cause reduction in financial performance, meaning that the profitability of the business in terms of equity is reduced. In this study, the use of long-term leverage will create significant impact to the financial performance of the enterprises; on the other hand, the ratio of long-term debt over equity will be inefficient when it goes beyond a certain threshold, which is 4% to 70.3% as presented in our study.

## REFERENCES

1. Abor J. (2005). The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana. *Journal of Risk Finance* 6, 438-47.
2. Berger A. & Udell G. (2006). Capital structure and firm performance: a new approach to testing agency theory and an application to the banking industry. *Journal of Banking and Finance* 30(4), 1065-1102.
3. Ebaid I.E. (2009). The impact of capital-structure choice on firm performance: Empirical evidence from Egypt. *Journal of Risk Finance* 10(5), 477-487.
4. Fama E.F. & French K.R. (2002). Testing tradeoff and pecking order predictions about dividends and debt. *Review of Financial Studies* 15: 1-33.
5. Gleason K., Mathur L. & Mathur I. (2000). The interrelationship between culture, capital structure, and performance: evidence from European retailers. *Journal of Business Research* 50, 185-191.
6. Harris M. & Raviv A. (1991). The theory of capital structure. *Journal of Finance* 46: 297-355.
7. Jensen M. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review* 76, 323-339.
8. Jensen M. & Meckling W.H. (1976). Theory of the firms: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3, 305-360.
9. Margaritis D. & Psillaki M. (2010). Capital structure, equity ownership and firm performance. *Journal of Banking and Finance* 34(3): 621-632.
10. Masulis R.W. (1983). The Impact of Capital Structure Change on Firm Value: Some Estimates. *Journal of Finance* 38, 107-126.
11. Miller M.H. (1977). Debt and taxes. *Journal of Finance* 32, 61-275.
12. Myers S.C. (1984). The capital structure puzzle. *Journal of Finance* 34(3): 575-592.
13. Myers S.C. & Majluf N.S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics* 13: 187-221.
14. Nguyen T.D.K. & Ramachandran N. (2006). Capital structure in Small and Mediumsized Enterprises: The case of Vietnam. *ASEAN Economic Bulletin* 23(2), 192-211.
15. Rajan G.R. & Zingales L. (1995). What do we know about capital structure? Some evidence from international data. *Journal of Finance* 50: 1421-1460.
16. Ross S.A. (1977). The Determination of Financial Structure: the Incentive-Signaling Approach. *Bell Journal of Economics* 8, 23-40.
17. Titman S. & Wessels R. (1988). The determinants of capital structure choice. *Journal of Finance* 43, 1-19.
18. Wei Xu, Xiangzhen Xu, Shoufeng Zhang. (2005). An empirical study on relationship between corporation performance and capital structure. *China-USA Business Review* 4.
19. Wiwattanakantang Y. (1999). An empirical study on the determinants of the capital structure of Thai firms. *Pacific-Basin Finance Journal* 7, 371-403.
20. Zeitun R. & Tian, G. (2007). Capital structure and corporate performance: evidence from Jordan. *Australasian Accounting Business and Finance Journal* 1, 40-53.

**How to cite this article:** QUANG, Do Xuan. Measuring Impact Of Capital Structure On Financial Performance Of Vietnamese Soes. *Innovative Journal of Business and Management*, [S.l.], v. 4, n. 6, p. 114-117, dec. 2015. ISSN 2277-4947. Available at: <http://innovativejournal.in/ijbm/index.php/ijbm/article/view/37>>. Date accessed: 30 Dec. 2016. doi:10.15520/ijbm.vol4.iss6.37.pp114-117.