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## The Effect of Capital Structure on Financial Performance of Vietnamese Listing Pharmaceutical Enterprises

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#### **Abstract**

This study investigates the effect of capital structure on the financial performance of pharmaceutical enterprises which are listing on Vietnam's stock market. The study builds the regression using ROE as dependent variable and four independent variables, including self-financing, financial leverage, long-term asset and debt to assets ratios. In addition, we use other variables as controlling ones, such as firm size, fixed asset rate and growth. We collect data for the period from 2015 to 2019 of all 30 pharmaceutical enterprises which are currently listing on Vietnam's stock market. The least square regression (OLS) is used to test the effect of capital structure to the firms' financial performance. The analysis results show that the financial leverage ratio (LR), long-term asset ratio (LAR) and debt-to-assets ratio (DR) have positive relationship with firm performance, meanwhile the self-financing (E/C) affects negatively to the return on equity (ROE). Upon the findings we suggest that the Vietnamese government should focus on stabilizing macro environment to create favorable environment for enterprises. And the pharmaceutical enterprises should build more reasonable capital structure with higher debt proportion than equity, diversifying loan mobilization channels such as issuing long-term bonds. Additionally, the firms should expand the scale appropriately to maintain development and ability to pay debts.

Keywords: Capital Structure, Financial Performance, Pharmaceutical Enterprises, Vietnam

JEL Classification Code: G30, M40, M41

#### 1. Introduction

Financial performance is a fundamental issue in the economic entities and all businesses must try to get the highest financial performance. There are many factors that affect the financial performance of a business. These factors may be either internal factors or external ones. Currently, there have been many studies proving the impact of capital structure on the financial performance of businesses, however the results are not the same. In addition, each business sector has its own characteristics as well as capital management, so the impact

level is also very diversified. This research aims to explore the effect of capital structure on the financial performance of pharmaceutical companies which are listing on the stock market of Vietnam. Based on literature review we build the model with data from pharmaceutical companies listing on Vietnam's stock exchange from 2015 to 2019. The results will help firms to enhance performance and government to improve business environment.

## 2. Literature Review

There has been various research about firm performance. It should be starting with Krishnan and Moyer (1997) who provided an empirical study of corporate performance and capital structure from large companies in four Asian economies. The research sample consisted of 81 companies from Hong Kong, Singapore, South Korea expanding period from 1992 to 1997. The study used 4 dependent variables to measure the firm's performance, including ROE, ROIC, PTM and RETURN. The two measures of leverage used are debt on the market value of equity and long-term debt on the market value of equity. The result showed that both

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financial performance and capital structure are influenced by the country of origin. Specifically, companies in Hong Kong will have a higher ROE and the effect of different foreign companies is not statistically significant. The study also reports that companies from South Korean have higher financial leverage than companies which come from other countries. The results seem that the leverage does not affect company's financial performance.

Majumdar and Chhibber (1999) examined relationship between the debt level of capital structure and the performance of a businesses in India between 1988 and 1994. The result reports the statistically significant evidence of an inverse relationship between capital structure and financial performance of Indian companies. The author points out that the capital market structure in India where both shortterm and long-term lending institutions are governmentowned and confirm that corporate governance mechanisms in Western will not be effective in the Indian context. The study of Gleason, Mathur, and Mathur (2000) was about the relationship between capital structure and performance. That study used data from 198 retail companies in 14 European countries grouped into four research clusters. The dependent variable used was ROA and the independent variable used was Debt-to-assets ratio. The result showed that the debt to total assets has a negative effect on the ROA. In addition, the firm size also has a positive relationship with business performance.

Arbor (2005) studied the effect of capital structure on the profitability of 20 companies listed on the Ghana Stock Exchange. Abor used ROE as the dependent variable and debt-to-assets, the short-term debt to total assets and the long-term debt to total assets as independent variables. The author used the regression analysis method in estimating the relationship between ROE and capital structure. The results showed that debt-to-assets and the short-term debt to total assets have a positive impact on the ROE. However, the longterm debt is negatively related to the ROE. The research also shows that the profitability of companies positively depends on debt. Berger and Patti (2006) studied the relationship between capital structure and firm performance. The sample was the retailers in the United States in the period of 1990 to 1995. The study proposed a new method using a simultaneous model of two equations to show causal relationship. The research result showed that the higher the leverage is, the higher the company's profit.

Amjed (2007) investigated the relationship between capital structure and financial performance of enterprises. The sample consisted of 100 companies in the textile industry of Pakistan and are listing on the Karachi Stock Exchange from 1999 to 2004. The dependent variable was the ROE, and the independent variables were short-term debt, long-term debt and total debt. The result found a positive and significant relationship between short-term

debt and profit and a negative and significant relationship between long-term debt and profit. The use of short-term debt reduces the cost of capital, so using more short-term debt in the capital structure increases profits. However, because the long-term debt increases costs so the higher the long-term debt one firm has, the lower the level of return that firm gets. Zeitun, Tian, and Keen (2007) examined the relationship between capital structure and business performance of 167 companies in Jordan between 1989 and 2003. The dependent variable was the ROA, ROE, and Tobin's Q. The independent variables were Debt-to-assets, the short-term debt to total assets and the long-term debt to total assets. The result showed that capital structure has an opposite effect to firm performance measured by ROA and ROE. In addition, the short-term debt to total assets, the long-term debt to total assets and the total debt to total assets have the opposite effect on the Tobin's Q.

Gill, Biger, and Mathur (2011) researched on the effect of capital structure on the profits of 272 services and manufacturing companies on the New York Stock Exchange between 2005 and 2007. The study used the ROE as dependent variable and the independent variables include short-term debt to total assets, debt-to-assets and the longterm debt to total assets. The research showed a positive relationship between debt and ROE and the long-term debt is inversely related to the ROE. Moradi and Salehi (2011) used panel data with samples of 320 companies listed on the Tehran stock market between 2002 and 2009. Firm's financial performance was measured by ROA, ROE, EPS and Tobin's Q. Independent variables included short-term debt, long-term debt and total debt. The research result showed that EPS and Tobin's Q are positively correlated with capital structure but having a negative correlation between capital structure and ROA and it is not statistically significant between capital structure and ROE.

Pratheepkanth (2011) studied 30 companies in Sri Lanka traded on the Colombo Stock exchange market in the 2005-2009 stage. The result showed a negative relationship between capital structure and firm performance. The research evidenced that most of companies in Sri Lanka depend on debt and they pay quite a lot for the cost of using the debt. Khan (2012) studied the relationship between financial leverage and financial performance of enterprises. The sample consisted of 36 companies in Pakistan from 2003 to 2009. The study used the dependent variables including ROA, gross margin and Tobin's Q. The independent variables were short-term debt to total assets and total debt to total assets. Khan (2012) used the OLS regression model and the research showed that financial leverage is inversely related to financial performance measured by dependent variables. Additionally, firm sized measured by asset is insignificantly statistical with ROA and gross margin but opposite effect to Tobin's Q and it is statistically significant.

Ong and Heng (2012) studied the relationship between capital structure and firm performance before and during the financial crisis. The study focused on 49 listed construction companies in Bursa Malaysia from 2005 to 2008. The ROA was used as the dependent variable. The independent variables were the debt to equity market capitalization, EPS and the long-term debt to equity. The result showed a relationship between capital structure and firm performance. Specifically, for large companies, there is a positive relationship between ROA and debt on equity market capitalization, between EPS and long-term debt to equity. However, the smaller companies have an inverse relationship between EPS and debt to total assets. Qayyum and Noreen (2019) take a sample of ten banks was taken over the period 2006-2016. The results showed that the capital structure of both types of banks was similar except for bank size. In addition, ROA was negatively correlated to the capital structure of both conventional and Islamic banks. In contrast, ROE was positively correlated to the capital structure of both conventional and Islamic banks. This result is also contributing to the literature; however, it focuses on the financial sector other than the normal business.

Gul and Cho (2019) suggest that the rise in short-term debt to assets leads to increase the risk of default whereas the increase in long-term debt to assets leads to decrease the default risk. Authors also report that the size, tangibility and interest coverage are also the important determinants of default risk. For Vietnam, about this topic, there have been numerous researches from Vietnamese authors, and they have been contributing to the literature. In general aspect, Pham and Hoang (2019) explore the relationship between organizational learning capability and business performance of Vietnamese firms by collecting data from MBA students who work separately in different firms. The results confirmed that organizational learning capability has positive effect on business performance. Obviously, the paper contributes significantly to the literature. However, this study is not very closed to the relationship between capital structure and firm financial performance.

Phan (2019) collected from a survey of 266 firms in Vietnam. The author finds that the innovation in business practices and the innovation in workplace organization are significantly positively associated with firm performance. However, there was no evidence to support the relationship between firm performance and the organizational innovation in external relations. The author also reports that the interaction terms among three aspects of organizational innovation do not have significant impacts on firm performance.

In more focused aspect of capital structure, Tran and Tran (2008) studied the relationship between capital structure and firms' operating performance. The research sample consists of 50 non-financial companies listing on Ho Chi Minh

Stock Exchange. The author uses OLS model to investigate the relationship between capital structure measured by the ratio of short-term debt to total assets, long- term debt to total assets and total debt on equity and performance of the company measured by ROA and ROE. The research results show that there is a positive relationship between debt ratio and ROA, ROE.

Doan (2014) studied the impact of capital structure on the financial results of enterprises after privatization. The data includes 217 companies listing on Vietnam stock exchanges in the period of 2007-2012. The independent variables used in this study include short-term debt, long-term debt, total debt and dependent variables measuring performance including ROA and ROE. The research shows that the negative relationship between capital structure and business results with significance level of 1%. The regression results show that long-term debt has a positive impact on ROA and ROE while short-term debt and total debt have a statistically negative impact on the business performance of enterprises after equitization measured by ROA and ROE.

Phan (2016) also studied the impact of capital structure on the business results of industrial enterprises. The author uses ROA and ROE as a dependent variable representing business results, the independent variables are capital structure, firm size, growth rate, structure of tangible fixed assets, risks in firm's business, state ownership and Tobin's Q. First of all, the research uses least squares OLS method to estimate the model. Next, with panel data, the estimation method is used for FEM and REM. The study then used the Hausman appropriate model and draw conclusions. Estimated results show that the opposite effect of capital structure factor on business results of enterprises is very solid and statistically significant. This result is consistent with many other studies such as Zeitun, Tian, and Keen (2007), Trinh and Nguyen (2013). This means that enterprises in the sample observed that the increase in debt will reduce the performance.

Le (2017) studied the impact of capital structure on financial performance by using audited financial statements of 219 listed industry companies on Vietnam stock market from 2010-2015. The study applied two research methods: Correlation analysis and regression analysis on panel data. The author chooses the dependent variable as the ROE, the independent variable is the size, capital structure, solvency, asset structure, growth rates. The research results show that capital structure for all production groups has a positive impact on firm performance. Bui (2017) studied the effect of capital structure and working capital on the financial performance of small and medium-sized enterprises. The author used data collected from 1,032 small and mediumsized enterprises in Ho Chi Minh City in the period of 2006-2014. Using ROA and ROE as dependent variables and various independent variables including the average debt on average total assets; the average total short-term debt on

average total assets SDA) and the average total long-term liabilities on average assets (LDA), account receivable days (ACR); the inventory days (ICP), the payable days (APP) and the cash cycle (CCC=ACR + ICP - APP). The author uses GMM regression method with appropriate tool variables. According to the regression results, the DA variable positively affected to ROE and ROA. In more detail, the SDA variable has a positive impact on ROA and ROE. The results show that using short-term debt in capital structure has an impact on increasing the financial performance of enterprises. For the LDA variable, the regression results show that there is no evidence of the LDA impact on ROE and ROA.

Dao and Lai (2018) focuses on those structural models with an endogenous default barrier where firms optimally choose a default boundary to maximize the equity value. The authors suggest that bigger firms are likely to finance more via debts thanks to their flexibility in financing sources and their ability to solve temporary liquidity problems. In contrast, small firms, with low cash flows level, are discouraged to take on debts for fear of failure to service due obligations. Dao and Ta (2020) aim to investigate the relationship between capital structure and performance of the firm by employing meta-analytical approach. The authors confirm that corporate performance is negatively related to capital decisions, which inclines toward trade-off model with agency costs and pecking order theory. Nguyen and Nguyen (2020) use the panel data of research sample includes 488 non-financial listed companies on the Vietnam stock market for a period of six years, from 2013 to 2018. The result also shows this effect is stronger in state-owned enterprises than non-state enterprises in Vietnam.

#### 3. Theoretical Framework

# 3.1. Definition of Capital Structure and Financial Performance

The concept of capital structure has many different views. According to Stephen, Westerfield, and Jordan (2003) the firm's capital structure is the combination of the use of debt and equity in a certain proportion to finance production and business activities of the enterprise. In other words, the capital structure refers to the mix of debt and equity that an enterprise uses to fund its operations. In other words, the enterprise capital structure is a correlation between long-term debt and equity. Thus, it is common that the structure of the correlation ratio is proportional between the debt and equity of a business.

About the firm financial performance, it is widely accepted that the financial performance is the effect of mobilizing, using and managing capital in an enterprise. Business performance of enterprises is an aggregate economic indicator reflecting the level of use of factors of

the production process. Therefore, business efficiency is an integrated economic indicator to reflect the level of the use of material and financial resources of the enterprise to achieve the highest efficiency.

Assessing and measuring corporate financial performance is one of the most controversial and discussed issues in financial management. The use of any tool to assess the enterprise financial performance is important. There are many indicators of measuring the financial performance of enterprises, but the most commonly used criteria in studies can be divided into two main groups: (i) Using accounting tools used by many authors used in previous studies, it is the ratio between the results achieved and the inputs like ROA, ROE; (ii) Use economic models based on market value such as Marris coefficient (MBRV) and Tobin's Q.

#### 3.2. Background Theories

#### 3.2.1. Modigliani – Miller Theory (M&M)

The development of modern financial theory is based on the study of the financial structure of two Nobel Prizewinning economists Modigliani and Miller (M&M theory). The theory of modern capital structure begins with the paper of Modigliani and Miller in 1958. According to the M&M theory, the choice between equity and debt is not related to the value of enterprises. The optimal capital structure is the one that balances risks and profits and thus maximizes the company's share price. Initially, in the study in 1958, without considering the impact of corporate income tax, M&M theory said that there is no optimal capital structure for businesses. In a follow-up study in 1963, when taking into account corporate income tax, Modigliani and Miller (1963) showed that the value of the company with debt is greater than the value of the company without debt by the tax rate multiplied by the value of debt, so M&M theory says that increasing the use of financial leverage will enhance the value of businesses. Thus, according to the M&M theory and the optimal capital structure theory, we can see how the choice and use of capital will have an impact on the business performance and financial performance of enterprises.

### 3.2.2. The Trade-Offs Theory

The trade-off theory initiated by Kraus and Litzenberger (1973) and then developed in Myers and Majluf (1984) and other studies afterward. The trade-offs theory was originally created to counter Modigliani and Miller (1958), because in many cases the benefits of using debt will be zero or negative. For example, when an enterprise is inefficient and becomes insolvent (or bankrupt). The ability of an enterprise to go into bankruptcy depends in part on its business risks, but the other part depends on its policy of mobilizing, managing,

operating and using capital. Kraus and Litzenberger (1973) commented that optimal financial leverage reflects a trade-off between the tax benefits of debt and the cost of bankruptcy.

### 3.2.3. The Pecking Order Theory

Myers and Majluf (1984) state that there is no optimal capital structure for a company and explanation of the priority between internal capital and borrowed capital when enterprises raise capital. They classify funding into internal capital (retained earnings) and external capital (equity and debt issues). The decision on capital structure is not based on the optimal debt/total assets ratio but on the priority of capital use in the following order: Internal financial resources (especially using retained earnings), followed by debt and final and equity capital. This theory is based on the problem of information asymmetry between managers, investors and creditors. Comparing to investors outside the enterprise, managers know more about the real value and risks of enterprises.

However, managers cannot convey reliable information about the quality of existing assets as well as the enterprise's existing investment opportunities to potential outside investors. It is impossible to distinguish good projects from bad ones. Investors will think that enterprises only issue more shares when their shares are being valued higher than the market value. Therefore, when an enterprise announces information to issue additional shares, it means that it sends a bad message about its business prospects to investors, so the stock price will fall.

## 4. Research Methodology

#### 4.1. Models and Research Hypotheses

Upon the literature review we build the following research model (Figure 1). Theoretically, there are many indicators measuring the financial performance of businesses such as MBVR, Tobin's Q, ROA, ROE. The MBVR and Tobin's Q coefficients are calculated by market value, however, in this

paper we could not collect market data so that Tobin's Q will not be used. ROA is also a measure to assess the financial performance of businesses and is a common measure used by financial analysts and researchers. However, the ultimate goal of financial managers is to maximize the owners' interests, so the authors uses the ROE to represent efficiency finance of businesses. ROE are the result indicators for current business results and reflect the profitability that businesses have achieved in the past accounting periods. This measure is consistent with the studies of Arbor (2005), Gill, Biger, and Mathur (2011), Trinh and Nguyen (2013), Chu, Nguyen and Ngo (2015), and Le (2017).

The author uses 4 coefficients to represent the capital structure of the business: Self-financing ratio (E/C), financial leverage ratio (LR), long-term asset ratio (LAR) and Debt-to-assets ratio (DR).

- Self-financing coefficient (E/C): This is calculated by owners' equity over total assets and this indicator is consistent with the research of Trinh and Nguyen (2013).
- Financial leverage ratio (LR): The leverage ratio shows the financial autonomy of the enterprise. The study of Chu, Nguyen and Ngo (2015) said this measurement for their study.
- Long-term asset ratio (LAR): This is calculated by long-term assets over total assets, and this indicator represents the capital structure of enterprises. There are studies in the world that use long-term asset to represent capital structure such as those of Berger and Patti (2006), Tran and Tran (2008), Moradi and Salehi (2011).
- Debt-to-assets ratio (DR): The debt-to-assets is one of the indexes commonly used by researchers to represent the capital structure of businesses. Studies using this measurement are Gleason, Mathur, and Mathur (2000); Arbor (2005); Berger and Patti (2006); Zeitun, Tian, and Keen (2007); Tran and Tran (2008); Gill, Biger, and Mathur (2011); Doan (2014).

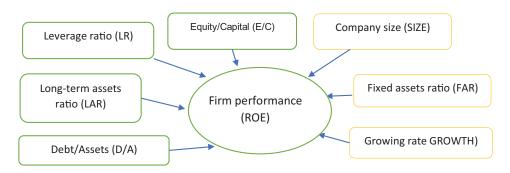


Figure 1: The proposed research model

No	Variable symbol	The name of influence factors	Measurement criteria and how to define	Previous authors used
	Dependent variab	ole		
1	1 ROE Return		ROE = (Profit after tax/ Equity) * 100%	Majumdar and Chhibber (1999), Arbor (2005), Gill, Biger, and Mathur (2011), Trinh and Nguyen (2013)
	Independent varia	ables		
2	E/C	Self-financing	E/C= Equity/Total assets	Trinh and Nguyen (2013)
3	LR	Leverage ratio	LR= Assets/Equity	Chu, Nguyen, and Ngo (2015)
4	LAR	Long-term asset	LAR= Non-current asset/Total assets	Berger and Patti (2006), Moradi and Salehi (2011), Doan (2014)
5	DR	Debt ratio	DR= (Liabilities/Total assets) x100%	Abor (2005), Gill, Biger, and Mathur (2011), Gleason, Mathur, and Mathur (2000), Zeitun, Tian, and Keen (2007)
	Control variables			
6	SIZE		Revenue, Total assets	Phan (2016), Bui (2017),
7	FAR	Fixed assets rate	FAR = Fixed assets/Equity	Le (2017)
8	GROWTH	Growth rate	Growth rate of revenue	Phan (2016), Le (2017)

Table 1: Description of independent variables in the model

In order to better comment on the effect of capital structure on financial performance, the author uses additional control variables such as firm size (SIZE- logarithm of total asset), Fixed Asset Ratio (FAR- fixed assets over total assets) and Growth rate (GROWTH- sale growth) (see Table 1).

The authors make the following hypotheses for the research model:

 $H_0$ : There is no relationship between capital structure and financial performance of pharmaceutical enterprises in Vietnam's stock market.

**H**<sub>1</sub>: Is there any relationship between capital structure and financial performance of pharmaceutical enterprises in Vietnam's stock market.

Based on the hypotheses, the authors proposed a model:

$$\begin{aligned} \text{ROE} = & \beta_0 + \beta_1 \text{*E/ C} + \beta_2 \text{*LR} + \beta_3 \text{*LAR} + \beta_4 \text{*DR} + \\ & \beta_5 \text{*SIZE} + \beta_6 \text{*FAR} + \beta_7 \text{*GROWTH} + \varepsilon \end{aligned}$$

Where:

ROE – Return on equity E/C – Self-financing ratio LR – financial leverage LAR – long-term assets proportion

DR – Debt to Asset ratio SIZE – Company size FAR – Fixed Asset Ratio GROWTH – Growth rate  $\beta_0$ ,  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$ ,  $\beta_4$ : Estimation factor  $\varepsilon$ : Random error

## 4.2. Data Collection and Processing

- Data collected from the audited financial statements of 30 pharmaceutical companies listed on Vietnam's stock market for a period of 5 years from 2015 to 2019.

After collecting company data and calculating research variables, the data is processed through the following steps:

- Step 1: Conduct statistical description to understanding the basic characteristics of the data collected through the average values, median values, maximum values, minimum values, standard deviations of the variables in the model.
- Step 2: Analyze the correlation between independent variables.
  - Step 3: Verify the compliance of regression assumptions
  - Step 4: Check the reliability of the variables.
- Step 5: Perform regression analysis according to the research model given by the OLS.

## 5. Results and Discussion

## 5.1. Statistical Description

The results of running SPSS software for data give the statistical results of the variables as follows (see Table 2):

Table 2: Rusults of Descriptive Statistics analysis

	N	Minimum	Maximum	Mean	Std. Deviation
ROE	150	670	2.421	.180	.258
E/C	150	013	7.352	.573	.599
LR	150	183	11.275	2.173	1.395
LAR	150	.031	3.480	.591	.381
DR	150	.151	1.013	.466	.216
SIZE	150	24.638	29.722	26.966	1.062
FAR	150	-26.964	14.183	.294	2.981
GROWTH	150	999	1.558	.081	.216

Table 3: Result of correlation analysis

		ROE	E/C	LR	LAR	DR	SIZE	FAR	GROWTH
DOE	Pearson Correlation	1	125 <sup>*</sup>	.102**	.297**	.138 <sup>*</sup>	.046*	.005**	.065*
ROE	Sig. (2-tailed)		.126	.215	.000	.093	.578	.949	.426
F/C	Pearson Correlation	125	1	340**	336**	424**	.078	.036	038
E/C	Sig. (2-tailed)	.126		.000	.000	.000	.343	.665	.648
	Pearson Correlation	.102	340**	1	.273**	.642**	081	.134	.045
LR	Sig. (2-tailed)	.215	.000		.001	.000	.325	.103	.585
LAD	Pearson Correlation	.297**	336**	.273**	1	.469**	254**	226**	.098
LAR	Sig. (2-tailed)	.000	.000	.001		.000	.002	.005	.233
DD	Pearson Correlation	.138	424**	.642**	.469**	1	267**	139	.030
DR	Sig. (2-tailed)	.093	.000	.000	.000		.001	.090	.715
0175	Pearson Correlation	.046	.078	081	254**	267**	1	003	016
SIZE	Sig. (2-tailed)	.578	.343	.325	.002	.001		.976	.843
EAD	Pearson Correlation	.005	.036	.134	226**	139	003	1	145
FAR	Sig. (2-tailed)	.949	.665	.103	.005	.090	.976		.077
CDOWTH	Pearson Correlation	.065	038	.045	.098	.030	016	145	1
GROWTH	Sig. (2-tailed)	.426	.648	.585	.233	.715	.843	.077	

<sup>\*.</sup> Correlation is significant at the 5% level (2-tailed).

### 5.2. Correlation Analysis

From table 3, it is shown that all variables have an impact on the Return on Equity (ROE) variable. ROE is inversely related to the Self-financing (E/C) with significance level of 5%. Therefore, if the coefficient of self-financing increases or the financial autonomy of the enterprise is high, ROE or financial performance of the enterprise decreases and vice versa. The gearing ratio LR is positively related to the ROE with significance level of 1%. The positive relationship between the leverage ratio and the ROE shows the positive impact of borrowing on ROE or the financial performance

of businesses. However, if the business is abusing loans, the financial risk increases.

ROE has a positive relationship with the long-term Asset Coefficient (LAR) with significance level of 1%. The ratio of long-term assets shows how much stable assets the company uses its stable capital to finance. Therefore, in order to increase financial performance, enterprises should increase long-term asset ratio or use stable capital sources such as equity and long-term debt to invest in long-term assets. ROE has a positive relationship with the Debt-to-assets ratio (DR) with a significant level of 5%. The positive relationship shows that the higher the ratio of total

<sup>\*\*.</sup> Correlation is significant at the 1% level (2-tailed).

debt to total assets, the better the financial performance of enterprises. The control variables SIZE and GROWTH also have a positive relationship with the ROE with significance level of 5%, and the FAR variable is positively related to ROE with significance level of 1%.

In summary, in order to increase the ROE from business and production activities, businesses can increase borrowing, make good use of capital mobilized by debt, and use rational capital, long-term stability, good exploitation of financial leverage and reasonable capital structure. However, when borrowing, businesses should have a reasonable calculation, to avoid abuse, to borrow capital with a safe debt ratio to achieve the best financial performance.

#### 5.3. Regression Analysis

The above correlation analysis is not a reliable basis to make a judgment about the relationship between capital structure and financial performance of the company. Therefore, the author has checked the reliability of the variables and then performed regression analysis to test these relationships. Using SPSS software, the author conducted regression according to OLS method for the model.

$$\begin{aligned} \text{ROE} = & \beta_0 + \beta_1 * \text{ E/C} + \beta_2 * \text{LR} + \beta_3 * \text{LAR} + \beta_4 * \text{DR} + \\ & \beta_5 * \text{SIZE} + \beta_6 * \text{FAR} + \beta_7 * \text{GROWTH} + \varepsilon \end{aligned}$$

Based on collected and processed data, the author uses SPSS software to calculate the parameters such as adjusted R-square, Durbin Watson, VIF value, Sig, non-standardized coefficient of the E/C, LR, LAR, DR, SIZE, FAR, GROWTH variables. These are presented in the following tables (see Table 4 and 5): The results of Table 4 show that, with Durbin Watson index of 1.540, there is no autocorrelation phenomenon in the model. The model has an adjusted R-value of 0.208, which means that the model can explain 20.8% of the change in ROE.

The independent variables will have multi-collinear phenomena when the Tolerance coefficient is less than 0.1 or VIF is greater than 10. In Table 5, the value of the Tolerance coefficient of the independent variables are greater than 0.1. VIF values of variable are all less than 10. These evidence that there is no multicollinearity phenomenon between variables.

The results show that the independent variables statistically significant at 5% level, none of the variables are excluded from the model. Since then, the regression model has been rewritten based on the non-standardized regression coefficients of variables with value sig <0.05 as follows:

$$ROE = -0.890 - 0.082*E/C + 0.045*LR + 0.225*LAR + 0.047*DR + 0.034*SIZE + 0.008*FAR + 0.058*GROWTH$$

Table 4: Summary of the model

Model	1	R-square	Adjusted R-square coefficient	Standard deviation of estimate	Durbin – Watson	ANOVAd	
1	.482ª	.232	.208	.0405956	1.540	9.669	.000b

Independent variable: ROE

Forecast variables: E/C, LR, LAR, DR, SIZE FAR, GROWTH

Table 5: Model regression result

Model		Non-standardized coefficient		Standardized coefficient Beta	Т	Sig.	Collinearity Statistics		
		B Standard deviation				(significance level)	Tolerance	VIF	
1	Constant	890	.572		-1.555	0.01			
	E/C	082	.038	018	202	.044	.784	1.276	
	LR	.045	.020	024	218	.042	.518	1.930	
	LAR	.225	.064	.332	3.532	.001	.705	1.419	
	DR	.047	.144	.039	.324	.044	.426	2.348	
	SIZE	.034	.020	.141	1.676	0.01	.880	1.136	
	FAR	.008	.007	.097	1.125	0.03	.837	1.195	
	GROWTH	.058	.096	.048	.603	.034	.968	1.033	

Dependent variable: ROE

From the regression results, we find that the Self-financing factor (E/C) has a negative effect on ROE. From the regression model, we see that when the self-financing coefficient increases by 1 unit, the ROE decreases by 0.082 units, other factors assumed constant. The model results show that the higher the proportion of equity in the total capital or the more independent and financially autonomous the enterprise is, the lower the financial performance of the enterprise is.

The leverage ratio (LR) has a positive effect on ROE-when the financial leverage ratio increases by 1 unit, the equity ratio increases by 0.045 units. Financial leverage ratio shows the relationship between borrowed capital and equity in the entire period of the enterprise. From the model shows that when the ratio of the average total assets and equity increases or the financial autonomy of enterprises decreases, the financial performance of enterprises increases.

The long-term asset ratio (LAR) has a positive relationship with the ROE. When the ratio of long-term assets increases by 1 unit, the ROE increases by 0.225 units. The long-term asset ratio shows how much the long-term stable capital is used by equity and long-term debt to finance its long-term assets. From the model shows that, the ability of businesses to cover long-term assets with stable long-term capital increases, the financial performance of enterprises increases.

The debt-to-assets ratio (DR) has a positive impact on the ROE. We see that when the ratio of debt to assets increases by 1 unit, the return to equity increases by 0.047 units. The debt to asset ratio shows how much of the company's assets come from borrowing. Businesses borrowing less proves that their financial autonomy is good. From the model, the less the enterprise is borrowing or the higher its financial autonomy will be, the higher the financial performance of the enterprise is.

The self-financing ratio (E/C), financial leverage ratio (LR), long-term assets ratio (LAR) and debt-to-Asset ratio (DR) independent variables all have impacts on ROE. Therefore, we see that the capital structure has an impact on the financial performance of businesses.

The firm size (SIZE), the ratio of fixed assets (FAR) and the growth rate (GROWTH) control variables all have positive relationships to ROE. In particular, the Growth Rate (GROWTH) has the highest level of influence with the regression coefficient, + 0.058 meaning that when the Growth Rate increases by 1 unit, the return on equity increases by 0.058 units. When the revenue of the following year is higher than the revenue of the previous year, it can be understood that goods on the market are turned faster, the demand of the market for products is larger than the previous year, the business trend of enterprises is better.

#### 5.4. Discussion

The purpose of the study is to understand the impact of capital structure on the financial performance of listed pharmaceutical enterprises on Vietnam's stock market. According to the results of correlation analysis and regression analysis, rejecting the  $\rm H_0$  hypothesis, accepting the  $\rm H_1$  hypothesis, means that there is a relationship between capital structure and financial performance of listed pharmaceutical enterprises in Vietnam stock exchange. The results of the study are similar to those of Krishnan and Moyer (1997), Arbor (2005), Zeitun, Tian, and Keen (2007), Gill, Biger, and Mathur (2011), Doan (2014), and Le (2017).

According to the results of regression analysis, the relationship between the coefficient of self-financing and the financial performance of the sector enterprises is the opposite relationship. This negative relationship means that when reducing the coefficient of self-financing or reducing the ratio of equity accounted for the total capital, the financial performance of the enterprise increases. This conclusion is similar to the studies of Trinh and Nguyen (2013).

The relationship between the coefficient of financial leverage and financial performance is a positive relationship. This relationship means that by increasing the leverage ratio or reducing the average equity and increasing the average total assets, the financial performance of the enterprise increases. The results of the study are similar to those of Berger and Patti (2006), Chu, Nguyen, and Ngo (2015).

The regression analysis results show that the long-term assets and financial performance of enterprises is a positive relationship. This means that when the long-term asset ratio increases or enterprises pay for long-term assets with stable capital resources, the financial performance of pharmaceutical enterprises will increase. Berger and Patti (2006), Doan (2014) have the same results.

The relationship between the debt to asset ratio and financial performance is a positive relationship. That means that when the debt to assets increases or the enterprise borrows more, the financial performance of the enterprise will increase. The studies of Tran and Tran (2008), Arbor (2005), Gill, Biger, and Mathur (2011), and Berger and Patti (2006) gave similar results.

The control variables firm size (SIZE), fixed asset ratio (FAR) and growth rate (GROWTH) are positively related to the return on equity (ROE). This conclusion of the author is in the same opinion with the research of Bui (2017).

Based on the results, to increase the financial performance of the enterprise, it is necessary to reduce the coefficient of self-financing, increase the leverage ratio, the ratio of long-term assets and the ratio of debt to assets or the enterprise should borrow more.

## 6. Suggestions and Implications

From the research results about the influence of capital structure to financial performance of the pharmaceutical industry, the following recommendations are given:

#### For state agencies:

## Stabilizing macro environment to create favorable environment for enterprises:

One of the causes creating risks for the pharmaceutical enterprises in particular in Vietnam is the unstable macro environment. The balance of trade deficits continuously, which puts pressure on the exchange rate. National debt increases, budget balance deficits and the recurrent expenditure of the budget increases sharply, which lead to reducing the resources for development investment. To address this issue, the government needs to maintain a flexible and responsive response to macro changes. Macropolicymaking must be based on the micro basis, especially the impacts and interactions on the main actors in the economy, especially enterprises. Therefore, stable macroeconomic environment is an important factor to ensure the success of the existence and development of enterprises.

## For pharmaceutical enterprises listed on Vietnam's stock market:

The financial performance analysis occupies an important position in the process of production and business activities of enterprises. It is an effective management tool that businesses have used so far to help businesses to self-assess, examine how the economic targets are being implemented and then devise measures to take full advantage of enterprises' strength. That means that analyzing the impact of factors on financial performance not only is the end of one business cycle but also is the start of the next business cycle. In addition, financial performance also makes sense for those who are interested in businesses, especially investors, suppliers, banks, etc. Because financial performance help them having the information to make decisions more accurate and timely.

- The self-financing level has an adverse effect on the financial performance of pharmaceutical enterprises listed on Vietnam's stock market. Therefore, in order to increase financial performance, pharmaceutical companies can reduce the coefficient of self-financing or reduce the shareholders capital and increase the liability proportion.
- Financial leverage has a positive impact on the financial performance of pharmaceutical enterprises.
  Therefore, in order to increase the financial performance of pharmaceutical enterprises, they

- should increase the financial leverage by adjusting the debt and equity ratio. However, it should be considered to suit with the operational capacity of enterprises. If the ROA is higher than the lending interest rate, businesses should borrow money to invest effectively.
- Return on equity is affected in the same direction with long-term assets. To increase financial performance, enterprises need to increase long-term assets ratio by using long-term and stable capital sources such as equity and long-term loans to invest long-current assets.
- The debt to assets has the positive impact on the financial performance of pharmaceutical enterprises.
  Therefore, these companies should increase borrowing both short-term debt and long-term debt. Enterprises need to determine the debt ratio appropriately to increase financial performance without creating too much burden on debts leading to insolvency.

In addition, control variables such as company size, tangible asset ratio and growth rate also need to be increased, which means that the size of total assets of businesses increases. Businesses should increase their assets by borrowing. Enterprises should increase the use of equity to invest in tangible assets and the net revenue growth rate should be maintained at a level higher than the current level.

From the results of the analysis and the models, the authors made below recommendations:

- *Increasing borrowing*: Pharmaceutical companies can mobilize loans in many ways such as borrowing from banks, borrowing employees by issuing bonds. Therefore, it is advisable to issue history debt profile, transparent financial statements, good transaction history, credit information which does not have overdue debts, the clear purpose of borrowing to be able to borrow capital with reasonable interest rates.
- Use debt appropriately: The loan capital of enterprises includes short-term debt and long-term debt with different interest rates. Due to the nature of short-term debt and long-term debt, pharmaceutical enterprises need to have plans to use these funds appropriately. Businesses need to pay attention to short-term debts because of the short repayment time, if enterprises invest too much in long-term assets with low liquidity, businesses are likely to be insolvent. Therefore, high business risks can lead to bankruptcy.
- Building reasonable capital structure: To ensure that enterprises have capital structure that balances risks and capital costs and can meet the capital needs of enterprises. Building a reasonable capital structure helps businesses use capital more effectively and

- increase the financial performance of businesses. Therefore, enterprises need to estimate their business needs to calculate the break-even point, credit risk points, the interest rates of commercial banks, etc. to calculate the appropriate debt ratio.
- Diversifying loan mobilization channels such as considering capital mobilization in the form of bonds: The debt mobilization channel of joint stock companies is traditionally borrowed from bank credit. However, the cost of credit is higher than borrowing by issuing bonds. On the other hand, when businesses borrow money from banks, they will be controlled and must have collaterals for that loan. Therefore, pharmaceutical companies should diversify loans such as bond issuance.

#### 7. Conclusion

Research on the impact of capital structure on the financial performance of listed pharmaceutical enterprises on the Vietnam stock market has the equity of the enterprise's owner's equity, the ratio of the equity, the long - term equity, and the debt ratio to the effective financial structure of the author, the owner's equity, the long - term equity, and the debt rate on the assets to the author. However, the research model has yet to explain the change in financial performance. Therefore, it is necessary to add some other control variables to the model to explain the change in financial performance such as financial assets on total assets, liquidity, growth rate of the economy, changes in the state's macro policy.

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