IMPACTS OF FINANCIAL LEVERAGE ON STOCK RETURNS: EVIDENCE FROM VIETNAM LISTED FIRMS

Nguyen Thi Hoa Hong[*], Nguyen Tuan Dung
Foreign Trade University, Vietnam

ARTICLE INFO		ABSTRACT
Received:	16/4/2021	The paper examined the effects of financial leverage on the stock return of listed firms in Vietnam during 2014-2019. The paper employed regression models including Pooled Ordinary Least Squared, Random-effect Model and Fixed-effect Model at first, and then applied The Breusch Pagan Lagrangian multiplier test, Modified Ward test and Hausman test to select the suitable model among the three, finally used Robust test to fix the defect in model. The finding shows that leverage in total had a negative and significant impact on the return of stock, but the two factors of total leverage which are short-term debt and long-term debt both resulted in positive effect to stock return. In addition, the firm performance variables such as growth and return on assets delivered good signal to stock return, while the size of firm showed the opposite. From these results, listed firms in Vietnam know how to bring value to investors and stock investors also have a wide view of company basis to make decisions. Other stakeholders such as stock market entities or the government gain suggestions to improve trading market.
Revised:	17/5/2021	
Published:	20/5/2021	
KEYWORDS		
Capital structure		
Financial leverage		
Firm performance		
Fixed-effect model (FEM)		
Stock return		

ẢNH HƯỞNG CỦA ĐÒN BẨY TÀI CHÍNH ĐẾN LỢI NHUẬN KHI GIAO DỊCH CỔ PHIẾU: BẰNG CHỨNG TỪ CÁC CÔNG TY NIÊM YẾT TẠI VIỆT NAM

Nguyễn Thị Hoa Hồng[*], Nguyễn Tuấn Dũng
Trường Đại học Ngoại thương, Việt Nam

THÔNG TIN BÀI BÁO		TÓM TẮT
Ngày nhận bài:	16/4/2021	Bài viết nghiên cứu ảnh hưởng của đòn bẩy tài chính đến lợi nhuận khi giao dịch cổ phiếu trong các doanh nghiệp niêm yết tại Việt Nam giai đoạn 2014-2019. Nghiên cứu ban đầu sử dụng các mô hình hồi quy bao gồm bình phương thông thường nhỏ nhất, tác động ngẫu nhiên, tác động cố định, sau đó tiếp tục áp dụng các kiểm tra Breusch Pagan Lagrangian, Modified Ward và Hausman để lựa chọn mô hình phù hợp, cuối cùng kiểm định Robust để khắc phục phương sai sai số thay đổi trong mô hình. Kết quả nghiên cứu cho thấy đòn bẩy tài chính tổng thể có tác động tiêu cực và đáng kể đến lợi nhuận khi giao dịch cổ phiếu, tuy nhiên hai yếu tố trong tổng đòn bẩy tài chính bao gồm nợ ngắn hạn và nợ dài hạn lại tác động tích cực đến lợi nhuận khi giao dịch cổ phiếu. Bên cạnh đó, các nhân tố liên quan đến hoạt động doanh nghiệp như mức độ tăng trưởng và tỷ suất sinh lời trên tài sản mang lại tín hiệu tốt cho lợi nhuận của cổ phiếu, trong khi quy mô của doanh nghiệp lại cho thấy tác động ngược chiều. Qua những kết quả này, các doanh nghiệp niêm yết tại Việt Nam sẽ biết cách mang lại giá trị cho nhà đầu tư và các nhà đầu tư cổ phiếu cũng có cái nhìn bao quát hơn về nền tảng và hoạt động của doanh nghiệp để đưa ra quyết định. Các bên liên quan khác như các tổ chức thị trường chứng khoán hay chính phủ sẽ có được những đề xuất để cải thiện thị trường giao dịch.
Ngày hoàn thiện:	17/5/2021	
Ngày đăng:	20/5/2021	
TỪ KHÓA		
Cấu trúc vốn		
Đòn bẩy tài chính		
Hiệu quả hoạt động kinh doanh		
Mô hình tác động cố định		
Lợi nhuận giao dịch cổ phiếu		

[*] Corresponding author. *Email: hongnth@ftu.edu.vn*

1. Introduction

There is a long-known fact about businesses. No matter what field the company is operating in, how big it is, or who owns it, there is one particular thing that applies to every one of them – they need fund, financing, or money to operate. Leverage, or debt, plays a vital role on any form of organization, even to the smallest firm. One way to maximize profit is to raise leverage, and utterly companies would like to do this with the least cost arisen. Companies can be leveraged by a certain number of ways, while the most common is to borrow. A loan from the bank, capital from issuing bonds, or to sell shares. One way or another, this means giving up either control or ownership of the company. However, there are more options. For instant, convertible debt or prefered stock (hybrid securities) can be issued. A strong component of different types of capital is denoted by the firm's capital structure [1].

Since financial leverage can be the key to operating a business, it has become a topic of discussion. Many questions surrounding its necessity were brought to the table. What is the perfect leveraging recipe to maximize company's profit? Is an ideal proportion for successfully use of debt? Can you find a combination where the biggest return is expected? Without a doubt, many famous theories have been developed regarding the famous topic. Modigliani and Miller theorem [2] suggested that debt and future stock return come in positive relationship. They reasoned that the higher the debt a company possess, the higher the risk to buy its stock.

Some studies examine how leverage, size, growth rates, and share returns relate to each other, such as Acheampong et al. [3], Chiang and Zheng [4]. Some research the effect of leverage in terms of capital structure, liquidity, stock size (e.g. [5] - [8]). However, few studies of the relation between stock returns and the financial leverage and its impact on financial decisions have been undertaken in Vietnam. Therefore, the relationship of firm leverage with stock returns is necessary to examine in Vietnam. This study could deliver useful insights and knowledge for managers to determine the best debts and equity proportion that maximizes the value of the company, and eventually lead to attracting investors. On the other hand, share holders can also benefit, because it give them a critical view of determinants regarding their own investments.

2. Research method

2.1. Data and research model

The research model in this paper was built based on previous studies [5], [9] as well as the situation of collecting data to analyzing the effects of leverage (capital structure) on the return of stocks in Vietnam.

Due to the lack of data in some years regarding a number of companies, and some companies which are referred to as Financial firm, the paper only used the data of 504/765 companies which had been listed in the HNX and HOSE stock exchange in Vietnam from 2014-2019 to avoid cases of zero in any model value. The amount of these 504 companies account for 78% of the total revenue recorded of both stock exchanges.

The regression model is as follows:

$$RETURN_{it} = \beta_0 + \beta_1 TDTE_{it} + \beta_2 LDTE_{it} + \beta_3 SDTA_{it} + \beta_4 SIZE_{it} \qquad (1)$$
$$+ \beta_5 GROWTH_{it} + \beta_6 SOLV_{it} + \beta_7 ROA_{it} + \mu_i + \varepsilon_{it}$$

In which:

Dependent variable:

RETURN: The stock return of stock 'i' in year 't' (rate), calculated as formula below:

$$R_t = \frac{AP_t - AP_{t-1}}{AP_{t-1}} \qquad (2)$$

Where R_t is the Stock Return of the listed firm in year t, AP_t is the Adjusted Closing Price of stock for the last trading day of year t and AP_{t-1} is the Adjusted Closing Price of stock for the

last trading day of year t-1.

Adjusting Price is use to make sure the dividend is evenly distributed within the stock price, because there are many ways to pay the dividend without cash, such as by share or bonds. The last trading day of the year is taken into account for its long known use in stock trade, which are commonly mark the annual value of a certain stock on the market.

Independent variables:
- **TDTE:** The Total Debt to Total Equity ratio (rate)
- **LDTE**: the Long-term Debt to Total Equity ratio (rate)
- **SDTA**: the Short-term Debt to Total Asset ratio (rate)
- **SIZE**: the size of firms (= natural logarithm of total asset)
- **GROWTH**: Growth rate of firm (= rate of total sales volatility)
- **SOLV**: Firm's solvency (= after-tax net operating income/ total debt)
- **ROA**: The Return on Assets (= net income/ total assets)

2.2. Research method

To analyze the impacts of financial leverage on stock return in Vietnam listed firms, the regression methods were used to analyze panel data including Pooled Ordinary Least Square (POLS), Fixed-Effect Model (FEM) and Random Effect Model (REM). Then, the paper applied Breusch and Pagan Lagrange multiplier test to see whether POLS was suitable or not and Hausman test to choose between REM and FEM.

3. Results and discussion

Table 1. *Descriptive statistic*

Variable	Number of Observations	Mean	Standard Deviation	Min	Max
RETURN	3024	0.210	0.650	-0.910	14.374
TDTE	3024	1.719	3.522	-16.144	140.033
LDTE	3024	0.321	0.996	-7.148	37.134
SDTA	3024	0.400	0.220	0.003	1.991
SIZE	3024	27.263	1.555	23.330	33.632
GROWTH	3024	0.982	37.408	-0.997	2038.040
SOLV	3024	0.246	0.880	-14.154	27.311
ROA	3024	0.055	0.085	-1.693	0.784

Source: Author's calculation on Stata15

Table 1 summarized descriptive statistics of all variables in the model. **RETURN** had the minimum value of -0.91, maximum of 14.374 and the standard deviation was 0.65. This indicated that there was big fluctuation among stock return. It was reasonable because even though the whole batch tended to rise, there were some stocks that had achieved outstanding performance, while some others failed to do so. **TDTE** had the minimum value of -16.144 and maximum of 140.003. The minimum was negative suggesting that some companies had bigger amount of debt than their total assets, while their equity was relatively humble. The maximum value of more than 140 revealed that there were risk takers in the market, which they mostly funded their firms using only debt. **LDTE** on the other hand, showed results about the firms' long-term debt usage. Much different from the total debt to equity ratio, the data showed more secured result. With 3024 observations, Long-term debt to Equity ratio had a minimum of -7.148 and a maximum of 37.134. These were still very risky indicators to look at, especially considering long-term debt was a more strategic finance. The mean value, however, was acceptably low, at 0.321. It was clear evidence that most listed companies were funding more by short-term debt than long-term debt, and it delivered certain signs of financial stability. The standard deviation was 0.996, which

proved that these firms had a severely wide range for long-term debt using, from incredibly big loans to zero debt. **SDTA** was used to illustrate the significant relationship between short-term funding and asset. According to the summary of 3024 observation, mimimum value was nearly nothing, at 0.003, while the maximum of 1.991 showed that there were companies which was willing to borrow twice as much as what they owned totally. The mean value and the standard deviation was 0.4 and 0.22 respectively, giving the investors a safer feeling about short-term debt. The majority of businesses were careful with there one-year obligations, thus provided shareholders with good liquidity and solvency. Even though they were not on a same scale, the Long-term debt to Equity ratio and the Short-term debt to Asset ratio definitely gave the author a general look about how leveraged Vietnamese firms were. **SIZE** in 3024 observations, came with the standard deviation of 1.555, the minimum and maximum value of 23.33 and 33.632 respectively, suggesting that there were small gap between listed companies in Vietnam. **GROWTH** had the minimum of -0.997, having a vague meaning because it showed that there were firms who did not generate any sales throughout the year. Meanwhile, the maximum of 2038.04 was unbelievable as it demonstrated such an incredible growth rate. The mean value was very promising and root for the investing potential to Vietnam market, with a 98% growth rate. This could partly explain the constant development in stock return. However, the standard deviation was too good to be true, at 37.408. Again, it showed the unstability of the stock market, hence making investing decisions much more difficult. **SOLV** had quite a variation between the maximum and the minimum values, at 27.311 and -14.154 in order. 0.246 was the mean value of solvency, bringing clear evidence about the general profitibility comparing to the debt, thus provided investors with the firms' business efficiency, which was rather low. However, due to the low use of long-term debt in comparison with short-term debt (20-80 proportion), the shareholders could have certainty about companies' finance. **ROA** gave a more in-depth view about firms' profitibility, with the mean value of 0.055. The 0.085 standard deviation gave thoughts that business margin was kept at a low ratio. The maximum and minimum value did not bring much meaning, however, it showed the possible limit that companies could get, both in good and bad way.

Table 2. *Testing for Multi-collinearity defects*

Variable	VIF	1/VIF
TDTE	3.30	0.303333
LDTE	2.89	0.346090
SDTA	1.81	0.551467
ROA	1.37	0.728180
SOLV	1.32	0.756529
SIZE	1.07	0.936946
GROWTH	1.01	0.994510
Mean VIF	1.82	

Source: Author's calculation on Stata15

Table 3. *Correlation matrix among the variables in the model*

	RETURN	TDTE	LDTE	SDTA	SIZE	GROWTH	SOLV	ROA
RETURN	1.0000							
TDTE	-0.0239	1.0000						
LDTE	-0.0097	0.7136	1.0000					
SDTA	0.0121	0.3989	-0.0396	1.0000				
SIZE	-0.0581	0.1572	0.2039	0.0947	1.0000			
GROWTH	0.0057	0.0050	0.0003	0.0096	-0.0056	1.0000		
SOLV	0.0329	-0.1088	-0.0736	-0.2677	-0.0987	-0.0125	1.0000	1.0000
ROA	0.1698	-0.2124	-0.1352	-0.3126	-0.0225	-0.0694	0.4611	

Source: Author's calculation on Stata15

To test for multi-collinearity between variables, variation inflation factor (VIF) was used as shown in Table 2. The mean VIF was 1.82 < 10 so there was no multi-collinearity.

Table 3 described the degree of correlation between the independent variables and the dependent variable in the model. The results showed that total debt to total equity (TDTE), long-term debt to total equity (LDTE), SIZE were significantly inversely correlated with stock return while short-term debt to total assets (SDTA), GROWTH, SOLV and ROA were all positively correlated with stock return variable. All variables were correlated with each other but the coefficients were relatively low with the largest correlation coefficient between the independent variable and the dependent variable 0.1698 between RETURN and ROA. Additionally, the correlation coefficients between the independent variables were less than 0.8, showing that the possibility of the phenomenon of multi-collinearity was not high in the research model.

The regression model results to analyze the impact of financial leverage on stock return in Vietnam listed firms were shown in Table 4.

Table 4. *Regression results*

Independent Variables	RETURN		
	Pooled OLS	FEM	REM
TDTE	0.009 (-2.62)**	0.000 (-3.90)***	0.009 (-2.62)**
LDTE	0.001 (3.20)***	0.000 (4.07)***	0.001 (3.20)***
SDTA	0.000 (4.72)***	0.000 (5.95)***	0.000 (4.72)***
SIZE	0.000 (-4.08)***	0.000 (-8.84)***	0.000 (-4.08)***
GROWTH	0.276 (1.09)	0.167 (1.38)	0.276 (1.09)
SOLV	0.018 (-2.37)**	0.213 (-1.25)	0.018 (-2.37)**
ROA	0.000 (10.65)***	0,000 (10.62)***	0.000 (10.65)***
Cons	0.000 (4.10)***	0.000 (8.68)***	0.000 (4.10)***
R²	0.0431	0.0150	0.0431
P-value	0.0000	0.0000	0.0000
Breusch and Pagan Lagrange multiplier test		0.0000	
Hausman Test		0.0000	

Note: The values in ( ) is the t-statistic. (*), (**), (***): statistically significant at 10%, 5%, 1%.

Source: Author's calculation on Stata15

After applying Breusch and Pagan Lagrange multiplier test, the P-value = 0.0000 meant that Pooled OLS was not the suitable option for the panel. Meanwhile, p-value = 0.0000 < 0.05 in Hausman test also pointed out that FEM should be used.

The paper used ROBUST regression to solve heteroskedasticity in panel data in Table 5. As seen in Table 5, the value of R^2 was 0.0150. That meant the model can be used to explain 1.5% of the change in the stock returns. A low r-squared value did not automatically mean that the regression model was inadequate as long as the results were statistically significant [10].

Moreover, 6/7 independent variables were statistically significant including: **TDTE, LDTE, SDTA, SIZE, GROWTH & ROA**. Moreover, the coefficients of **ALL 6** variables were statistically significant at 1%. The remaining variable **SOLV** was not statistically significant.

The following equation illustrated the FEM model:

$$RETURN = 9.471647 - 0.0455854TDTE_{it} + 0.170335LDTE_{it} \quad (3)$$
$$+ 1.100152SDTA_{it} - 0.3594398SIZE_{it} + 0.000474GROWTH_{it}$$
$$- 0.024991SOLV_{it} + 2.318677ROA_{it} + \mu_i + \varepsilon_{it}$$

Table 5. *Fixed-effect Model results with Robust*

Independent variables	Coefficients
TDTE	-0.0455854 (-2.93)***
LDTE	0.170335 (3.21)***
SDTA	1.100152 (3.91)***
SIZE	-0.3594398 (-3.94)***
GROWTH	0.000474 (4.90)***
SOLV	-0.024991 (-1.61)
ROA	2.318677 (5.15)***
_cons	9.471647 (3.85)***
Number of observations	3024
R-squared	0.015

Note: (*), (**), (***): statistically significant at 10%, 5%, 1%.

Source: Author's calculation on Stata15

❖ *The Total Debt to Equity ratio*

The proportion of debt to equity had a negative effect on stock return and it was statistically significant at 1%. It meant that if the D/E increase by 1 unit, the return on stock would decrease about 0.05 point ceteris paribus. Though it was quite a humble effect, the result had a meaning at pretty high confidence level. The result then supported theories which assumed the increasing the liabilities of the corporate capital structure through borrowing sent a negative message to its investors that the corporation borrowed money to cover for their expenses. Then the default risk would rise and cause expected return to increase as well. This result certified the previous findings of Acheampong et al. [3], which indicated a statistically significant negative relationship between financial leverage and stock return. Nonetheless, the result went against empirical findings in studies of Ahmad et al. [6].

❖ *The Long-term Debt to Equity ratio*

The proportion of debt to equity came with a positive effect on stock return and its statistical significance was also confident, at 1%. The meanning offered the same as the Total Debt to Equity, but was on the contrary. An increase of 1 unit on the long-term debt proportion to total equity (adding an amount of long-term debt equal to total equity) would result in approximately 0.17 or 17% rise in stock return. This finding was quite noticeable, since long-term funding had not been taken seriously based on the results as seen by the population of data. It made perfectly logical sense, since the long-term debt was a strategic fund and in order to earn that fund, a company should present many advantages, such as profitibility, stable income, vision, future plans, etc. Also the company must make very good use of the debt, for operation, profit generating, or investing so that it can gain the shareholders credit.

❖ *The Short-term Debt to Asset ratio*

At 1% statistical significance, the Short-term Debt to Asset ratio had a coefficient of 1.100152. This finding was critical because it was converse to the author's expectation that the relationship would be negative. Based on theoretical framework, the short-term funding was a risk-avoider, thus should be keeping the stock from its fluctuation. Nevertheless, it seemed like it meant the opposite. For each amount of total asset added to the short-term debt, the return would most certainly rise by an amount equal to last period price. The short-term debt was generated, used to operate business and paid within a year, and this was something investors would not know, thus making stock trade decision more flexible and raising the stock price.

❖ *Size*

The results showed a statistically negative effect of the size of the firm on the return on stock with a coefficient of -0.3594398. Again, this pattern was not expected by the author. In the case of Vietnam, investors may predict that smaller listed companies tended to be more potential in the future, hence making the return go up. This result was incompatible with the results of Acheampong et al. [3] and Ahmad et al. [6].

❖ *Growth*

Growth, however, showed a positive impact on stock return. With a coefficient of 0.000474 at confidence level of 1%, it illustrated a slightly upward trend. The number suggested that if the Growth ratio was raised by 1, a 0.005% would be added to the return on stock. The reason this result differed from Size variable was because Size focused on the asset, while growth relied on the gross sales of the company. The signal was too small to be notice, however it brought a promising vision, in which company development returned in the profitibility of its stock.

❖ *Return on Asset*

The findings displayed a extremely statically significant positive impact of the return on assets - ROA on the return on stock with a coefficient of 2.318677. This was an impressive outcome, imposing that 1 unit increased in the return on assets (ROA) would have an increase of about 2.3 point in the return on shares. It was clear that profitibility meant something to the investors' trade on stock market. Corporate perfomances had proved to always be a crucial determinant in many aspects of company value, including its stock price. Buyers kept their stock and expected a high rate of return if they wanted to sell it because improved profitability led to a decrease in default risk for future buyers.

❖ *Solvency*

The insignificant estimated coefficient for solvency value, which suggested that there was no clear relationship between stock returns and companies' solvency. Moreover, the negative coefficient did not give an overview of how solvency can affect stock return, because solvency was a proof of profitibility and growth, and since both values showed undeniable results, it was bias to make the same conclusion on solvency

4. Conclusion

Financial leverage plays one of the many roles in the making of stock return in the exchange market. Using both theoretical and practical analysis, this paper has illustrated the effects of certain determinants of leverage on the result of stock effieciency. The findings showed that there were three financial leverage factors that affected the stock return of listed firms in Vietnam comprising The Total Debt to Total Equity ratio, the Long-term Debt to Total Equity ratio and the Short-term Debt to Total Asset ratio. Other three factors including the size of firms, growth rate of firms, and Return on Asset ratio were also crucial to the outcome of stock. Meanwhile, the solvency factor was proved to have no effect on the dependent variable. Therefore, it can be conclude: (1) The higher the Debt comparing to equity, the less profitable the stock got. (2) The greater the Long-term debt comparing to Equity, the more profitable the stock got. (3) The higher the Short-term debt comparing to total amount of asset, the more profitable the stock got. (4)

Companies' with good growth and better profitability tended to have more return in stock. And (5) Businesses with smaller scale tended to bring better stock return.

From these results, some suggestions are proposed to contribute to the stock market of Vietnam. Firstly, recommendations to the listed companies are made, suggesting the firms to have suitable adjustment upon their capital structures deteminants to acquire desired return on stock. Moreover, the author will claim the importance of corporate expansion, as well as creating internal values, in terms of correlation with stock return. Secondly, the thesis shall advise investors to take different perspective towards the financial reports issued by enterprises, especially with debt-related factors, which fluctuate in as many ways as possible. Last but not least, changes and potential to grow for the stock market and stock companies will be mentioned, refering to alternative options that can be made in order to promote the attractiveness of stock trade, without affecting the benefit of stakeholders.

REFERENCES

[1] R. Brealey, S. C. Myers, and F. Allen, "Brealey, Myers, and Allen on Valuation, Capital Structure, and Agency Issues", *Journal of Applied Corporate Finance*, vol. 20, no. 4, pp. 49-57, 2008.

[2] F. Modigliani, and M. Miller, "The Cost of Capital, Corporation Finance, and the Theory of Investment", *American Economic Review*, vol. 48, no. 3, pp. 261-297, 1958.

[3] P. Acheampong, E. Agalega, and A. Shibu, "The Effect of Financial Leverage and Market Size on Stock Returns on the Ghana Stock Exchange: Evidence from Selected Stocks in the Manufacturing Sector," *International Journal of Financial Research*, vol. 5, no. 1, pp. 125-134, 2014.

[4] T. Chiang, and D. Zheng, "Liquidity and stock returns: Evidence from international markets," *Global Finance Journal*, vol. 27, pp. 73-97, 2015.

[5] C. Yang, C. Lee, Y. Gu, and Y. Lee, "Co-determination of capital structure and stock returns - A LISREL approach: An empirial test of Taiwan stock market," *The quarterly review of economics and finance,* vol. 50, pp. 222-233, 2012.

[6] H. Ahmad, B. Fida, and M. Zararia, "The Co-determinancts of Capital Structure and Stock Returns: Evidence from the Karachi Stock Exchange," *The Lahore Journal of Economics*, vol. 18, no. 1, pp. 81-92, 2013.

[7] A. Olowoniyi, and J. Ojenike, "Capital structure and stock returns in Nigeria: A panel Co-integration Approach," *The International Journal of Applied Economics and Finance*, vol. 7, no. 1, pp. 49-53, 2013.

[8] R. Tahmoorespour, M. Ali-Abbar, and E. Randjbaran, "The Impact of Capital Structure on Stock Returns: International Evidence," *Hyperion Economic Journal*, vol. 1, no. 3, pp. 56-78, 2015.

[9] I, Welch, "Capital Structure and Stock Returns," *Journal of Political Economy*, vol. 112, no. 1, pp. 106-131, 2004.

[10] C. Dougherty, *Introduction to Econometrics*, 4th edition, Oxford University Press, New York, 2019.