

THE EFFECTS OF FINANCIAL LEVERAGE AND FINANCIAL DISTRESS ON FIRM VALUE - A STUDY IN VIETNAM

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Abstract: *This study aims to assess the impact of financial leverage and financial distress on the enterprise value of Vietnamese listed firms from 2014 to 2023. The data source for this study is financial statements from 525 Vietnamese-listed firms. The study utilizes Stata 17 data analysis software, the regression is estimated using the ordinary least squares model (OLS), fixed effects model (FEM), and random effects model (REM). The Hausman test is used to select the most appropriate model, and tests for autocorrelation and heteroscedasticity are conducted. If these phenomena are present, they are corrected using the generalized least squares model (GLS). The study results indicate that financial leverage, enterprise size, and profitability positively impact enterprise value (measured by Tobin's Q). However, the financial distress factor (measured by Altman's Z-score (1968)) has a negative impact on firm value. These findings are important for managers, shareholders, and creditors when making decisions related to management, capital structure, funding sources, and future investments and credit decisions.*

• Keywords: *financial leverage, firm value, financial distress, z-score, Vietnamese-listed firms.*

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1. Introduction

In the constantly changing global economy, Vietnamese enterprises are facing numerous challenges in maintaining and enhancing their value in the market. One crucial factor that determines the sustainable development of enterprises is the effective use of financial leverage. When used correctly, financial leverage can bring significant benefits by increasing returns on equity. However, if abused, it can lead to financial exhaustion and push the enterprise to the brink of bankruptcy. In recent years, there have been several cases in Vietnam where enterprises have experienced financial exhaustion due to unreasonable financial leverage strategies. According to Altman's financial distress theory (1968), excessive use of debt can increase the risk of bankruptcy and financial costs, ultimately reducing business performance and enterprise value. Similarly, the Static Trade-Off Theory by Kraus and Litzenberger (1973) emphasizes the importance of considering the benefits of borrowing (tax shield) and the potential costs of financial distress in determining the optimal level of financial leverage. This study aims to clarify how listed Vietnamese enterprises are utilizing financial leverage to maximize enterprise value while also limiting financial risks and avoiding bankruptcy to increase enterprise value.

2. Theoretical framework of the experimental research

The Static Trade-off Theory, first developed by (Kraus & Litzenberger, 1973), who pioneered the introduction

of the theory, models the benefits of tax shields on interest expenses and the costs of financial distress. Krause and Litzenberger proposed that a company could optimize its capital structure by balancing these two factors. James Scott (1976) further expanded on this theory by using a mathematical model to describe the trade-off between these two factors. He suggested that there is an optimal capital structure where the value of the firm is maximized. The theory suggests that there is an optimal level of financial leverage at which tax benefits are maximized while minimizing the costs of financial distress, ultimately increasing the overall value of the firm.

Financial Distress Theory, developed by Edward I. Altman in 1968, is based on his Z-Score model. This theory states that a company is in financial distress when it struggles to meet its debt obligations, potentially leading to bankruptcy or the need for financial restructuring. The main contributing factors to financial distress are typically poor liquidity, high levels of debt, ineffective management, and declining operational efficiency. Altman also suggests that financial distress can result in suboptimal management decisions, increased borrowing costs, and a decrease in firm value. By using static equilibrium theory and financial distress theory as a foundation for studying the impact of financial leverage and distress on enterprise value, managers, investors, and financial analysts can better assess and predict the financial health of a company. This can help them make informed decisions

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to mitigate the risk of bankruptcy and assist managers in finding a balance between the benefits and costs of debt, ultimately determining the optimal capital structure.

At the present, in Vietnam and worldwide, many scholars have studied the impact of financial leverage and financial distress on company value. Notable studies include:

The group of studies on the impact of financial leverage on firm value

Financial leverage is an important indicator for investors and managers as it provides a clear understanding of the amount of debt a business has used to finance its operations. In simpler terms, it shows how much a business has borrowed to potentially increase its profits. Numerous quantitative studies have shown an inverse relationship between financial leverage and firm value, which can be attributed to various financial and economic factors. This relationship has been supported by empirical studies conducted by authors such as Nguyen Thi Nhien (2023), Hermuningsih et al. (2022), Kristi et al. (2020), Dang et al. (2020), Nguyen et al. (2020), Ibrahim et al. (2020), Al-Slehat et al. (2020). These studies have consistently found a negative impact of financial leverage on enterprise value, with higher levels of financial leverage leading to a decrease in the market value of the business.

In addition, there have been several published empirical studies by authors such as Aprilyani et al. (2021), Ibrahim and Isiaka (2021), and Gill et al. (2012) that have demonstrated a positive correlation between financial leverage and enterprise value.

The group of studies on the impact of financial distress on firm value

Financial distress is typically measured by Altman's (1968) Z-score, which reflects the impact of financial risk on market expectations and the overall financial health of a firm. A low Z-score indicates a higher risk of bankruptcy. As the Z-score decreases, it signals that the firm may face financial distress, making it more difficult to pay debts and maintain stable operations. Several studies (Bhimavarapu et al., 2023; Aminu et al., 2023; Utami et al., 2022; Dewi et al., 2021; Goetz, 2020; Witjaksono, 2020; Tan, 2012) have found a negative relationship between Z-score and firm value, indicating that higher financial risk can lead to a decline in firm value and uncertainty about its future prospects and business performance.

3. Hypotheses, data and research method

Research hypotheses

The theory of static trade-off highlights the potential benefits of using debt, as it allows for a tax deduction on interest and ultimately reduces the weighted average

cost of capital (WACC). Empirical studies conducted by Aprilyani et al. (2021), Ibrahim and Isiaka (2021), Jihadi et al. (2021), and Gill et al. (2012) have all demonstrated a positive correlation between financial leverage and corporate value. Based on these findings, the author propose the following hypothesis:

H₁: Financial leverage (FL) has a positively impact on firm value (FV)

Several studies, including those by Bhimavarapu et al. (2023), Aminu et al. (2023), Utami et al. (2022), Dewi et al. (2021), Goetz et al. (2020), Witjaksono (2020), and Tan (2012), have demonstrated a negative relationship between financial distress and business value. Based on this, the author proposes the following hypothesis:

H₂: Financial distress (FD) has a negative impact on firm value (FV)

Several studies, including those by Hardi et al. (2023), Jihadi et al. (2021), Al-Slehat et al. (2020), and Gill et al. (2012), have found a positive correlation between corporate size and corporate value. Based on this evidence, the author's hypothesis (H₃) is as follows:

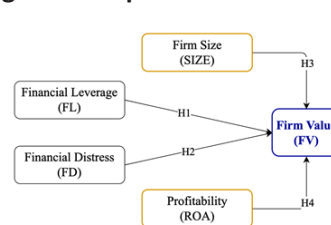
H₃: Firm size (SIZE) has a positive effect on firm value (FV)

Empirically, it has been shown that businesses with high profitability often reflect the excellent management ability of the board of directors in allocating and using financial resources, which creates confidence for investors and shareholders, thereby increasing the market value of the business. Studies by et Jihadi et al. (2021), Gill et al. (2012) have found a positive impact of profitability on business value. Thus, the author proposed the last hypothesis (H₄) as:

H₄: Firm's profitability (ROA) has a positively effect on firm value (FV)

Data, research model, and research method

Figure 1: Proposed Research Model



The research sample comprises 525 companies with 5,250 observations spanning 10 years from 2014 to 2023. The data is extracted from the financial reports of publicly listed companies on the Vietnam stock exchange through the FiiPro-X database.

According to Figure 1, the dependent variable is firm value (FV), with two independent variables: financial leverage (FL) and financial distress (FD). The

control variables include company size (SIZE) and profitability (ROA).

Table 1: Measurement of independent variables and control variables

Abbreviation	Variable	Defined Formula	Source
Dependent Variable			
FV	Firm value	Tobin's Q = (Liability Market Value + Equity Market Value) / Total Asset Replacement Value	(Tan, 2012) (Gill & Obradovich, 2012) (Ibrahim & Isiaka, 2020) (Dewi et al., n.d.) (Jihadi et al., 2021)
Independent Variables			
FL	Financial leverage	FL = Total Liabilities / Total Assets	(Gill & Obradovich, 2012) (Jihadi et al., 2021)
FD	Financial distress measured by the Z-score indicator (Altman (1968))	$Z\text{-score} = 1.2 X_1 + 1.4 X_2 + 3.3 X_3 + 0.6 X_4 + 1 X_5$ X_1 = Working Capital / Total Assets X_2 = Retained Earnings / Total Assets X_3 = EBIT / Total Assets X_4 = Market Capitalization / Book Value of Liabilities X_5 = Revenue / Total Assets The implication of Z-score indicator: $Z\text{-score} < 1.81$: The enterprise has a severe financial crisis and is at high risk of bankruptcy. $1.81 \leq Z\text{-score} \leq 2.99$: The enterprise is in the warning zone and is potentially at risk of bankruptcy. $Z\text{-score} > 2.99$: The enterprise is in the safe zone and has no risk of insolvency. The lower the Z-score of an enterprise, the more likelihood of its financial distress.	(Dewi et al., n.d.) (Altman, 1968) (Goetz, 2020; Witjaksono, 2020)
Control Variables			
SIZE	Firm size	Logarithm to the base e of total assets, $\ln(\text{total assets})$	(Gill & Obradovich, 2012) (Jihadi et al., 2021)
ROA	Profitability	ROA = Net Profit / Total Assets	(Gill & Obradovich, 2012) (Jihadi et al., 2021)

Source: The author research compilation

Given that the input is balance sheet data, the author performed estimation using the Ordinary Least Squares (OLS) model, the Fixed Effects Model (FEM), and the Random Effects Model (REM), employing the Hausman test to select the appropriate model. The authors tested for autocorrelation and heteroscedasticity and address these issues using the Generalized Least Squares (GLS) model.

4. Results and discussion

The authors performed descriptive statistics of the variables based on the mean, maximum, minimum, standard deviation, and the number of observations, summarized in Table 2 below.

Table 2. Descriptive statistics of the variables

Variables	Mean	Max	Min	Standard Deviation	Observations
FV	1.1544	17.1733	0.0040	0.6974	5,250
FL	0.4664	1.2949	0.0026	0.2261	5,250
FD	4.5984	241.8405	-0.8209	8.0036	5,250
SIZE	27.6078	34.1347	23.3303	1.6421	5,250
ROA	0.062	0.8391	-0.5172	0.0771	5,250

Source: The author calculation using STATA 17 software

Table 2 shows that: The enterprise value is measured by the Tobin's Q index, with the largest value being 17.1733 and the smallest value being 0.0040. The average value of Tobin's Q is 1.1544, indicating that the average enterprise in the data sample has a Tobin's Q value greater than 1. This suggests that the market has high expectations for the future prospects of these

enterprises.

Upon analyzing the data in Table 2, it is evident that there is a significant variation in the level of financial leverage among enterprises. The largest value of financial leverage is 1.2949, while the smallest value is 0.0026. The average value of financial leverage shows that the enterprises in the sample have a relatively moderate debt-to-asset ratio of approximately 46.64%. This indicates a reasonable level of debt utilization in the overall financial structure of the enterprises.

Financial distress is typically measured by the Z-score, as proposed by Altman in 1968. Upon analyzing the data presented in Table 2, it is evident that there is a significant variation in the financial situations of the enterprises included in the sample. While some enterprises exhibit strong financial stability, others may be at a higher risk of experiencing financial distress. The lowest Z-score recorded in the sample is -0.8209, indicating that there are indeed some enterprises with a negative Z-score, placing them at a high risk of financial distress. However, the average Z-score suggests that the majority of enterprises have a stable or even favorable financial situation, with a Z-score greater than 3.

The average firm size is 27.6078, with the largest being 34.1347 and the smallest being 23.3330. Profitability is measured by the ROA index, with an average value of 0.062. This indicates that, on average, enterprises have modest profitability, with profits accounting for only 6.2% of asset value.

The results of the correlation coefficient and multicollinearity tests (shown in Table 3) indicate a statistically significant difference between the independent variables, control variables, and dependent variables of the model. This is sufficient to proceed with the regression analysis.

Table 3: Correlation and multicollinearity test between variables

	EV	FL	Z-SCORE	SIZE	ROA	VIF
EV	1.0000					
FL	-0.0920	1.0000				1.43
ZSCORE	0.3383	-0.3878	1.0000			1.19
SIZE	0.0781	0.3486	-0.1736	1.0000		1.15
ROA	0.3922	-0.3480	0.2144	-0.0616	1.0000	1.15

Source: The author calculation using STATA 17 software

Table 4 presents the regression results of three models, including the Ordinary Least Squares (OLS), the Fixed Effects Model (FEM), and the Random Effects Model (REM). The results show specific differences among these three methods. Thus, to determine the most appropriate model, the authors have further conducted the Hausman Test to decide whether the fixed or random effects estimator should be used. The Hausman Test results with a p-value of 0.000 indicates that the FEM model is the most fit.

Table 4: Regressions Results

	Constant	FL	FD	SIZE	ROA	R - Squared
OLS	-0.7057 (0.000)	0.3835 (0.000)	0.0284 (0.000)	0.0485 (0.000)	3.3680 (0.000)	25.4 %
FEM	2.5282 (0.000)	0.5424 (0.000)	0.0304 (0.000)	-0.0652 (0.000)	0.5725 (0.000)	14.89 %
REM	0.2707 (0.274)	0.3820 (0.000)	0.0301 (0.000)	0.0177 (0.053)	1.2581 (0.000)	13.79 %

In particular: The values in the first row are the coefficients.

The values in the parentheses are the corresponding p-values of the variables

Source: The author calculation using STATA 17 software

Assessing the Fixed Effects Model (FEM), following (Susmel, 2015), (Greene, 2000), and (Hair et al., 2010), this model does not expose to serial correlation because FEM only considers individual-specific differences that contribute to the model.

The author conducted the Wald test on the FEM estimation results to examine the presence of heteroscedasticity. The P-value is 0.0000, concluding that heteroscedasticity exists in the model. Thus, the authors have applied the GLS estimation to address this issue (according to (Susmel, 2015) and (Greene, 2000)).

The regression results after addressing heteroscedasticity using the GLS model are presented in Table 5 as follows:

Table 5: GLS model result after addressing heteroskedasticity issue

	Constant	FL	FD	SIZE	ROA
GLS	-0.3014 (0.000)	0.3753 (0.000)	0.0329 (0.000)	0.0323 (0.000)	2.5887 (0.000)

Source: The author calculation using STATA 17 software

Given the result table, the proposed hypotheses H1, H2, H3, and H4 are accepted.

The regression results show that financial leverage has a positive impact on the enterprise value of listed companies on the Vietnam stock market during the period of 2014-2023. Vietnamese listed companies have effectively utilized financial leverage, optimizing capital costs and taking advantage of debt to increase profits and ultimately increase enterprise value. Additionally, the regression results also demonstrate the significant impact of financial distress on the value of listed companies on the Vietnam stock market during the period of 2014-2023. The results also support hypothesis H2 (with a positive β_2 coefficient), indicating that the Z-score of a company has a positive relationship with its enterprise value. A higher Z-score reflects a stable and healthy financial situation, indicating the company's ability to withstand economic fluctuations and a lower risk of bankruptcy. On the other hand, a lower Z-score suggests a higher financial risk, including the possibility of defaulting on debt or lacking sufficient working capital to sustain operations. This not only decreases investor confidence, leading to a decrease in stock prices and market capitalization, but also affects the company's ability to access capital. The experimental results also show that larger companies

have a competitive advantage in terms of economies of scale, leading to lower production costs and easier access to capital and markets, ultimately increasing profitability and firm value.

5. Conclusion: The study's findings indicate that financial leverage, company size, and profitability all have a positive impact on enterprise value. It is important for enterprises to avoid financial distress and maintain financial health in order to increase their value in the market. Based on these results, the authors recommend that enterprises utilize financial leverage to optimize their capital structure. This can be achieved by implementing a clear risk management strategy, particularly in regards to controlling interest costs and maintaining solvency. When considering borrowing, enterprises should carefully assess whether the benefits of using borrowed capital outweigh the associated costs. Additionally, enterprises should actively seek opportunities to expand their scale in order to reduce production costs, improve operational efficiency, and ultimately increase their overall value.

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