RESEARCH ARTICLE

The Impact of Corporate Income Tax on the Capital Structure of Listed Joint-Stock Companies

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ARTICLE INFO	ABSTRACT
	Capital structure plays a crucial role in determining the stability and sustainable development of enterprises. This study aims to analyze the impact of corporate income tax (CIT) on the capital structure of non-financial listed companies in Vietnam during the period 2019–2022. Data were collected from audited financial statements of non-financial firms listed on the stock exchanges and UPCOM, with the research sample comprising 5,004 observations from 1,251 non-financial companies. Using panel data regression methods, the study examines the relationship between CIT and capital structure indicators, including the total debt-to-equity ratio (LEV), the long-term debt-to-total equity ratio (LTD), and the short-term debt-to-total equity ratio (STD). The results indicate that CIT has a negative impact on the long-term debt ratio at a 1% significance level but does not significantly affect the total debt ratio or the short-term debt ratio. Additionally, control variables such as firm size, profitability, liquidity, fixed assets, and firm age significantly influence capital structure under various conditions.

INTRODUCTION

Capital structure is one of the key factors that determine the stability and development of an enterprise. The choice between debt and equity not only reflects the company's financial strategy but is also influenced by numerous external factors, among which corporate income tax (CIT) policy plays a prominent role. In Vietnam, CIT is not only an important source of government revenue but also a tool for economic regulation, deeply impacting the financial behavior of businesses. Especially in the context of a globalized and integrated economy, understanding the relationship between CIT and capital structure is crucial for supporting firms in optimizing their finances and achieving sustainable development.

Although numerous studies, both international and domestic, have focused on this topic, the results are often inconsistent due to differences in economic contexts, legal environments, and country-specific characteristics. In the case of Vietnam, an emerging economy with a frequently changing legal system and tax policies, research on the impact of CIT on capital structure remains relatively limited. This highlights the need for further in-depth studies to clarify the role of CIT in shaping corporate financial decisions.

This study is conducted with the aim of analyzing the impact of CIT on the capital structure of non-financial listed companies in Vietnam during the period 2019-2022. Additionally, the research examines the influence of other control factors such as firm size, profitability, liquidity, fixed assets,

growth rate, and firm age to provide a comprehensive view of the factors affecting capital structure within the economic context of Vietnam. With this approach, the study not only contributes to the existing body of knowledge but also offers practical policy recommendations for the government and businesses in managing finances and formulating sustainable development strategies.

LITERATURE REVIEW

Corporate income tax (CIT)

Corporate Income Tax (CIT) is a direct tax levied on the taxable income of business organizations, including domestic and foreign companies, cooperatives, and other entities engaged in production and business activities. CIT plays a crucial role not only as a primary revenue source for the state budget but also as a tool for economic regulation, supporting businesses, and attracting investment.

The CIT calculation is based on the formula:

CIT = Taxable Income × Tax Rate

Where taxable income is determined by subtracting allowable expenses, tax-exempt income, and carried-forward losses from total revenue. The current CIT rate in Vietnam is generally 20%. In the context of economic integration, CIT not only impacts after-tax profits but also affects corporate financial strategies, particularly decisions regarding capital structure. Companies often utilize debt to leverage the benefits of the tax shield, a crucial factor in optimizing capital costs.

Capital structure

Capital structure refers to the combination of debt and equity used by a company to finance its business operations and investments. Scholars and financial managers have provided various definitions of capital structure, but they all focus on the ratio of debt to equity in the company's total capital.

Common indicators used to measure capital structure include:

>Debt Ratio = Total Debt / Total Assets

>This ratio reflects the extent to which a company relies on debt to finance its assets.

>Equity Ratio = Equity / Total Assets

>This ratio indicates the level of financial independence or self-financing of the company.

>Debt to Equity Ratio = Total Debt / Equity

>This ratio shows the relative proportion of debt and equity used to finance the company's assets.

Theories related to capital structure: The selection of an optimal capital structure has been extensively studied based on the following theories:

Modigliani and miller (M&M) theorem: According to (Franco Modigliani, Merton H. Miller, 1958) in a perfect market, the capital structure does not affect the value of a firm. However, when taxes are considered, the use of debt can increase the firm's value due to the benefits of the tax shield.

Trade-off theory: This theory emphasizes the balance between the benefits of debt (tax shield) and the risks of financial distress (bankruptcy). Firms need to optimize their debt ratio to maximize value (Alan Kraus, 1973)

Pecking order theory: Firms prioritize internal financing first, followed by debt, and lastly, issuing equity. This is done to minimize information costs and issuance costs (Myers, S. C., & Majluf, N. S, 1984)

Market timing theory: This theory suggests that firms decide whether to raise capital through debt or equity based on market conditions. When stock prices are high, companies tend to issue equity rather than incur debt (Baker, M., & Wurgler, 2002); (Myers, 1984).

MODEL AND RESEARCH METHODOLOGY

To analyze the impact of corporate income tax (CIT) on the capital structure of non-financial listed joint-stock companies in Vietnam, this study employs three separate regression models corresponding to three indicators measuring capital structure: LEV, LTD, and STD. These models are not only derived from prior research but are also tailored to the characteristics of the data and the business context in Vietnam during the study period.

Model 1: $LEV_{it} = a_0 + a_1.TAX_{it} + a_2.SIZE_{it} + a_3.ROA_{it} + a_4.LIQ_{it} + a_5.TANG_{it} + a_6.GROW_{it} + a_7.AGE_{it} + \varepsilon_{it}$

Model 2: $LTD_{it} = b_0 + b_1.TAX_{it} + b_2.SIZE_{it} + b_3. ROA_{it} + b_4. LIQ_{it} + b_5.TANG_{it} + b_6. GROW_{it} + b_7. AGE_{it} + \varepsilon_{it}$

Model 3: $STD_{it} = c_0 + c_1.TAX_{it} + c_2.SIZE_{it} + c_3. ROA_{it} + c_4. LIQ_{it} + c_5.TANG_{it} + c_6. GROW_{it} + c_7. AGE_{it} + \varepsilon_{it}$

In the models above: i: represents the ith company, t: represents the tth observation year.

Capital structure variable LEV: The LEV variable, defined as the ratio of total debt to total capital, is widely used in capital structure research to measure a firm's capital structure. This measurement has been employed in numerous studies, including those by (Graham, 2022) and (Yoram C. Peles, Marshall Sarnat, 1979). Since a firm's capital structure consists of equity, liabilities, and the interrelationships between them, the ratio of total debt to total capital is highly suitable for a comprehensive assessment of a firm's capital structure.

In this study, the authors build upon prior research by delving deeper into the topic and incorporating two additional dependent variables to compare the effects of corporate income tax (CIT) on capital structure as measured by different indicators.

The formula for LEV is as follows:

$LEV_{it} = $ Total liability$_{it}$/Total assets$_{it}$

The values for total liabilities and total capital are collected from the financial statements of the firms, specifically from their balance sheets.

Capital structure variable LTD: The capital structure variable LTD (the ratio of long-term debt to total capital) is derived from the broader capital structure variable LEV. While LEV provides a comprehensive overview, the LTD variable focuses specifically on the impact of corporate income tax on capital structure as measured by long-term debt. The LTD variable has been used in previous studies (e.g., (Harry DeAngelo, Ronald W. Masulis, 1980), although it is less commonly used than LEV.

In this study, the authors employ the LTD variable to assess the impact of corporate income tax on capital structure because the ratio of long-term debt to total capital can provide more detailed insights into a firm's long-term solvency and the extent to which long-term debt influences its financial health.

The formula for LTD is as follows:

$LTD_{it} = $ Long $-$ term Debt$_{it}$/Total assets$_{it}$

The values for total liabilities and total capital are collected from the financial statements of the firms, specifically from their balance sheets.

Capital structure variable: STD

Similar to the capital structure variable LTD, the STD variable (the ratio of short-term debt to total capital) is employed to examine the impact of corporate income tax on capital structure as measured by short-term debt. Measuring capital structure using three distinct indicators- LEV, LTD, and STD- allows for a more nuanced analysis of how changes in corporate income tax affect both the aggregate measure of total debt and the more detailed measures of long-term and short-term debt (Eugene F. Fama, Kenneth R. French, 2022). Since the proportions of long-term and short-term debt are associated with higher levels of risk concerning a firm's future solvency, changes in corporate income tax may generate differing impacts on these components. This differentiation highlights the varying ways in which tax policy influences corporate financial decisions.

The formula for STD is as follows: $STD_{it} = $ Short $-$ term Debt$_{it}$/Total assets$_{it}$

Independent variable

ETR (Effective Tax Rate): Measured as the ratio of Corporate Income Tax (CIT) to Profit Before Tax:

$ETR = $ Corporate Income Tax/Profit Before Tax

This is the primary independent variable in the model, reflecting the impact of the effective tax rate on a firm's capital structure. Previous studies, such as those by (Mounther H. Barakat, Ramesh Rao, 2012), have demonstrated that the effective tax rate is positively correlated with the debt-to-asset ratio. Firms tend to increase borrowing to leverage tax-deductible interest expenses, particularly when the effective tax rate is high. In the context of Vietnam, where corporate tax policies have been refined and various tax incentives are applied to different industries, the effective tax rate becomes a critical factor influencing decisions about capital structure. Non-financial firms, in particular, often use debt as a tool to minimize capital costs under conditions of a high effective tax rate, thereby optimizing their capital structure.

Expected impact sign: Based on financial theories, particularly the Trade-off Theory, the effective tax rate is expected to have a positive relationship **(+)** with capital structure (measured by LEV). According to this theory, tax-deductible interest expenses motivate firms to increase borrowing, benefiting from the tax shield effect. This reduces the financial burden and maximizes the firm's value by lowering its overall cost of capital.

Control variables: In reality, capital structure is influenced not only by tax rates but also by various other factors. Therefore, adding control variables to the model is essential for robust analysis.

Firm size: The size of a company can have contrasting effects on the debt ratio within its capital structure. According to the **Pecking Order Theory**, larger firms typically have a longer business history and are well-regarded for their reputation and reliability. Such firms often prefer to use equity rather than debt to ensure the interests and control of their shareholders. Studies such as (Mounther H. Barakat, Ramesh Rao, 2012)and (Mondher Kouki, Moncef Guizani, 2019) measure firm size using the logarithm of total assets: Firm Size=log(Total Assets)

Profitability: The financial attractiveness of a company largely depends on its profitability. Profitability not only serves as an indicator of business performance but also plays a crucial role in attracting investments from investors. When a company demonstrates high profitability, it becomes more appealing to investors, enabling the firm to attract capital to expand its operations and achieve its desired growth.

In this study, profitability is measured in the same way as in the research by (Graham, 2022) and (Eugene F. Fama, Kenneth R. French, 2022) It is calculated using the Return on Assets (ROA**)** formula:

ROA=Net Income After Tax/Total Assets

Liquidity: Liquidity is crucial not only in financial management but also in business operations. It plays a vital role in determining a company's ability to meet its financial obligations and manage financial risks. This variable is measured following the studies by (Mounther H. Barakat, Ramesh Rao, 2012) and (Mondher Kouki, Moncef Guizani, 2019) using the formula:

Liquidity = Current Assets/ Current Liabilities

Fixed assets: Fixed assets play a significant role in creditors' lending decisions. A high proportion of fixed assets in a firm's capital structure indicates that the company possesses substantial collateral, facilitating borrowing. In this study, the fixed assets variable is measured according to the research by Huong (2017) as: Fixed Assets Ratio = Fixed Assets/Total Assets

Growth: Growth rate directly impacts a firm's capital structure through decisions regarding the choice of funding sources. In the studies by (Eugene F. Fama, Kenneth R. French, 2022), growth is measured using the formula:

$$\text{Growth Rate} = \frac{(\text{Net Revenue}_t - \text{Net Revenue}_{t-1})}{\text{Net Revenue}_{t-1}}$$

Age of the firm**:** The number of years a firm has been in operation (denoted as AGE) is used in the study by (Graham, 2022) (Eugene F. Fama, Kenneth R. French, 2022) and is calculated by taking the natural logarithm of the number of years from the observation year minus the firm's founding year.

Table 1: Summary of variables and measurements

No.	Symbol	Research Variable	Measurement	Expectation
Dependent Variables				
1	LEV	Capital Structure	T (Graham, 2022)otal debt / Total equity	(Graham, 2022) (Yoram C. Peles, Marshall Sarnat, 1979)
2	LTD	Capital Structure	Long-term debt / Total equity	(Harry DeAngelo, Ronald W. Masulis, 1980)
3	STD	Capital Structure	Short-term debt / Total equity	(Eugene F. Fama, Kenneth R. French, 2022)
Main Research Variable				

4	TAX	Corporate Income Tax Rate	Corporate Income Tax / Total pre-tax profit	(Mounther Barakat, Ramesh P. Rao, 2012)
Control Variables				
5	SIZE	Firm Size	Natural logarithm of Total Assets	(Mounther Barakat, Ramesh P. Rao, 2012) (Mondher Kouki, Moncef Guizani, 2019)
6	ROA	Profitability	Net income / Total assets	(Graham, 2022); (Eugene F. Fama, Kenneth R. French, 2022)
7	LIQ	Liquidity	Current assets / Current liabilities	(Mounther Barakat, Ramesh P. Rao, 2012)
8	TANG	Fixed Assets	Fixed Assets / Total assets	(Eugene F. Fama, Kenneth R. French, 2022)
9	GROW	Growth	[Net revenue in year t - Net revenue in year (t-1)] / Net revenue in year (t-1)	(Eugene F. Fama, Kenneth R. French, 2022)
10	AGE	Firm Age	Logarithm (Observation year - Founding year)	(Graham, 2022); (Eugene F. Fama, Kenneth R. French, 2022)

Source: Compiled from research results

The data is collected from the audited financial statements of non-financial firms listed on the stock exchange and the UPCOM market during the period from 2019 to 2022. The research sample includes 5004 observations from 1251 non-financial firms.

RESEARCH RESULTS

General description

The current situation of the capital structure of publicly listed non-financial joint-stock companies in Vietnam during the period from 2019 to 2022.
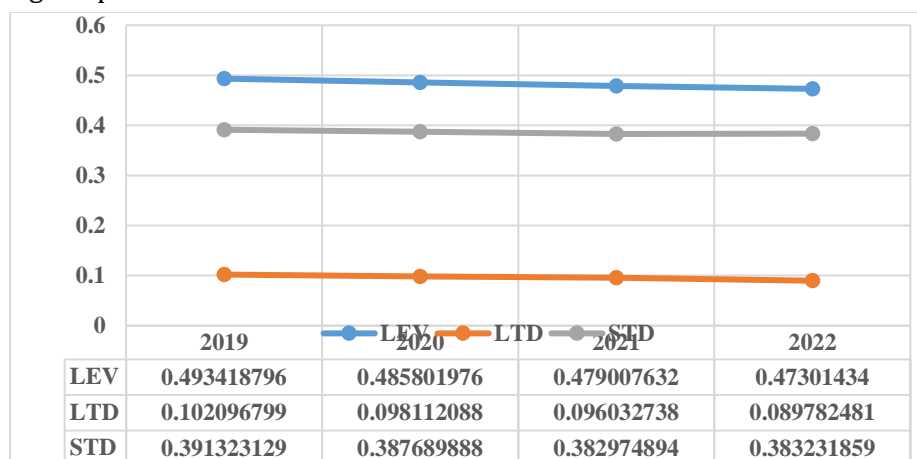

	2019	2020	2021	2022
LEV	0.493418796	0.485801976	0.479007632	0.47301434
LTD	0.102096799	0.098112088	0.096032738	0.089782481
STD	0.391323129	0.387689888	0.382974894	0.383231859

Chart 1: Capital structure status of firms during the period from 2019 to 2022

Source: Compiled from research results

According to the results from Chart 4.1, the capital structure of non-financial publicly listed firms in Vietnam during the period from 2019 to 2022 shows a relatively stable trend with slight changes between the years. The key indicators measuring the capital structure include LEV (total debt to total equity ratio), LTD (long-term debt to total equity ratio), and STD (short-term debt to total equity ratio), which maintain average levels of 0.485, 0.095, and 0.385, respectively.

LEV ratio (total debt to total equity): The LEV ratio maintains an average of 0.485, reflecting a relatively balanced capital structure. According to the Trade-off Theory, this ratio indicates that firms have benefited from the tax shield provided by interest deductions while avoiding high levels of financial risk. However, if this ratio increases significantly, financial risk will rise, especially under adverse economic conditions or fluctuating tax policies.

LTD ratio (long-term debt to total equity): On average, the LTD ratio reaches 0.095, indicating that most of the firm's debt comes from short-term borrowings. This is consistent with industry characteristics in Vietnam, where businesses often prioritize short-term borrowing due to lower interest costs and higher flexibility. However, a low LTD ratio could also lead to financial instability in the long term, especially when firms face long-term capital requirements for investment or expansion.

STD ratio (short-term debt to total equity): The STD ratio is at an average of 0.385, reflecting a high dependence on short-term debt. This creates short-term liquidity pressure, particularly in unfavorable business conditions. According to the study model, a high short-term debt ratio can reduce profitability and increase financial risk if not managed properly.

The Corporate Income Tax (CIT) policies during the period from 2019 to 2022 underwent significant adjustments to support businesses in overcoming difficulties caused by the COVID-19 pandemic. These policies include:

Extension of CIT payment deadlines: According to decrees from 2020 to 2022, businesses were granted an extension for CIT payments from 5 to 6 months. This helped businesses reduce liquidity pressure and optimize cash flow management in an uncertain environment.

Reduction of CIT rates: Tax reduction policies (a 30% reduction in CIT) were applied to businesses with revenue under 200 billion VND or those affected by COVID-19. This policy not only reduces financial costs but also encourages businesses to maintain their operations.

The impact of these tax policies on the capital structure is significant. The CIT extension and reduction policies helped businesses improve liquidity, thereby reducing pressure on short-term debt (STD). At the same time, the tax reduction encouraged businesses to rely more on equity, reducing the LEV ratio and enhancing financial stability in the long term.

Although the capital structure of firms in the study sample shows relative stability, the pressure from short-term debt (STD) remains a noteworthy issue. The use of sound financial strategies and the maximization of CIT incentives will be decisive factors in maintaining a balance between business efficiency and financial risk. This further underscores the importance of the study model in explaining the impact of CIT on the capital structure of businesses.

Table 2: Descriptive statistics of variables in the models

Variable	Observations	Mean	Standard Deviation	Minimum Value	Maximum Value
LEV	5728	0.6198597	1.932056	0.0006219	79.28045
LTD	5728	0.1049064	0.2339935	-0.0	7.166647
STD	5728	0.5149535	1.896138	0.0006219	79.21467
TAX	5726	0.1868026	1.076761	-31.3614	60.63612
SIZE	5728	11.7656	0.7261819	7.262062	14.76148
ROA	5728	0.0287778	0.3496964	-21.14306	2.873531
LIQ	5728	2.695535	6.543924	0	297.0152
TANG	5728	0.2504808	0.2317751	0	0.9855686
GROW	5728	63.40839	1,222.048	-7,947	67,642
AGE	5725	1.405785	0.265378	0	2.209515

Source: Compiled from research results

According to the results from the descriptive statistics table, during the period from 2019 to 2022, the capital structure of publicly listed joint-stock companies in Vietnam is reflected through the following key indicators:

LEV (Total debt to total equity ratio): The average is 0.62, indicating that firms use significant debt to finance business operations, posing financial risk if not carefully managed.

LTD (Long-term debt to total equity ratio): The average is 0.105, reflecting long-term commitments to capital, which helps stabilize finances.

STD (Short-term debt to total equity ratio): The average is 0.515, showing that firms rely heavily on short-term debt, increasing liquidity risk.

Other variables

ETR (Effective tax rate): The average is 18.68%, indicating that a significant portion of profits is paid as tax, impacting the ability to reinvest.

SIZE (Firm size): The average is 11.7656 (natural logarithm of total assets).

ROA (Return on assets): The average is 2.9%, indicating relatively low profitability.

LIQ (Liquidity): The average is 2.69, reflecting a relatively good ability to meet short-term debt obligations.

TANG (Fixed assets): The average constitutes 25% of total assets.

GROW (Growth rate): The average is 63%, with significant variation between firms.

AGE (Firm age): The average is 1.4 (logarithm of years in operation), ranging from 0 to 162 years.

The capital structure of these firms shows a heavy reliance on short-term debt and a high debt ratio, while tax rates, growth rates, and liquidity play important roles in financial management. This requires firms to balance between leveraging debt and controlling financial risk to ensure sustainable growth.

Correlation matrix of variables

Table 3: Correlation coefficient matrix of variables in the models

	LEV	LTD	STD	TAX	SIZE	ROA	LIQ	TANG	GROW	AGE	VIF
TAX	0.0263	-0.0130	0.0364*	1.0000							1.00
SIZE	0.2519*	0.3267*	0.0644*	0.0340*	1.0000						1.02
ROA	-0.3437*	-0.1249*	-0.2900*	-0.0258	-0.0082	1.0000					1.01
LIQ	-0.3050*	-0.0721*	-0.2817*	-0.0020	-0.1032*	0.0667*	1.0000				1.04
TANG	-0.0426*	0.3374*	-0.2583*	-0.0203	0.0357*	0.0595*	-0.1238*	1.0000			1.02
GROW	-0.0044	0.0083	-0.0099	0.0005	-0.0012	0.0016	0.0058	-0.0168	1.0000		1.00
AGE	0.0927*	-0.0368*	0.1227*	0.0061	-0.0598*	0.0172	-0.0580*	0.0083	-0.0123	1.0000	1.01

*Statistically significant at the 5% significance level

The results from the correlation matrix table at the 5% significance level show that corporate income tax has an impact on the short-term debt to total equity ratio (STD), but does not affect the total debt to total equity ratio (LEV) or the long-term debt to total equity ratio (LTD). Among the control variables, the growth variable is the only one that does not affect the capital structure at the 5% significance level. The SIZE and ROA variables are moderately correlated with LEV; SIZE and TANG are moderately correlated with LTD; and ROA and LIQ are moderately correlated with STD. The remaining variables have weak correlations with the dependent variables. Furthermore, among the control variables, there is either no correlation or weak correlation between them. The VIF test shows low values, around 1.00, indicating low or no multicollinearity among the variables

Regression results

To assess the impact of corporate income tax on the capital structure of publicly listed firms on the Vietnamese stock exchange, the authors employed three different regression methods: POLS (Simple Multivariate Regression Model), FEM (Fixed Effects Model), and REM (Random Effects Model). After performing various tests, the authors selected the most appropriate model and addressed any shortcomings of the chosen model to present the main results of the study.

Model 1

$LEV_{it} = a_0 + a_1.TAX_{it} + a_2.SIZE_{it} + a_3.ROA_{it} + a_4.LIQ_{it} + a_5.TANG_{it} + a_6.GROW_{it} + a_7.AGE_{it} + \varepsilon_{it}$

Table 4: Regression results of the models for Research Model 1

	OLS	FEM	REM	GLS
TAX	0.00173	0.00142	0.00186	0.000527
	[0.528]	[0.183]	[0.100]	[0.282]
SIZE	0.0854***	0.331***	0.157***	0.100***
	[0.000]	[0.000]	[0.000]	[0.000]
ROA	-1.098***	-0.363***	-0.405***	-0.717***
	[0.000]	[0.000]	[0.000]	[0.000]
LIQ	-0.0102***	-0.00267***	-0.00350***	-0.0131***
	[0.000]	[0.000]	[0.000]	[0.000]

TANG	-0.0757***	-0.00495	-0.0125	-0.0810***
	[0.000]	[0.787]	[0.437]	[0.000]
GROW	-0.000000446	0.00000198	0.00000280*	0.00000527***
	[0.871]	[0.057]	[0.011]	[0.000]
AGE	0.0945***	-0.537***	-0.0150	0.0824***
	[0.000]	[0.000]	[0.446]	[0.000]
Constant	-0.559***	-2.655***	-1.325***	-0.722***
	[0.000]	[0.000]	[0.000]	[0.000]
N	5004	5004	5004	5004
R^2	0.261	0.273		

*Note: p-values in [ ]; * p < 0.05, ** p < 0.01, *** p < 0.001*

Source: Compiled from research results

Model selection

Table 5: Results of model selection tests for Research Model 1

	P-value
Wald-test	0.0000
Hausman -test	0.0000

Source: Compiled from research results

After two tests, Wald-test and Hausman, the results indicate that in Model 1, the Fixed Effects Model (FEM) is more suitable than both the OLS and REM models. The FEM model was further tested using the Wooldridge test, and along with the results from the Wald-test, it was found that the FEM model suffers from autocorrelation and heteroscedasticity. Finally, the authors addressed the model's issues using the Generalized Least Squares (GLS) method.

The regression results from the GLS model shown in the table indicate that when the capital structure is measured by the Total Debt/Total Equity ratio, corporate income tax does not have statistical significance, or in other words, it does not affect the firm's capital structure. Furthermore, the results of the model show that, in this case, firm size, growth, and firm age have a positive impact on the total debt to total equity ratio. In contrast, profitability, liquidity, and fixed assets are inversely correlated with the total debt to total equity ratio.

Model 2

$$LTD_{it} = b_0 + b_1.TAX_{it} + b_2.SIZE_{it} + b_3. ROA_{it} + b_4. LIQ_{it} + b_5.TANG_{it} + b_6. GROW_{it} + b_7. AGE_{it} + \varepsilon_{it}$$

Table 6: Regression results of the models for Research Model 1

	OLS	FEM	REM	GLS
TAX	-0.00271	-0.000860	-0.000839	-0.000749**
	[0.099]	[0.229]	[0.242]	[0.003]
SIZE	0.0685***	0.137***	0.0859***	0.0668***
	[0.000]	[0.000]	[0.000]	[0.000]
ROA	-0.287***	-0.112***	-0.118***	-0.137***
	[0.000]	[0.000]	[0.000]	[0.000]
LIQ	0.000237	0.000131	0.0000332	0.0000616*
	[0.410]	[0.362]	[0.816]	[0.027]
TANG	0.230***	0.158***	0.187***	0.214***
	[0.000]	[0.000]	[0.000]	[0.000]
GROW	0.00000188	0.00000203**	0.00000228**	0.00000242***
	[0.251]	[0.004]	[0.001]	[0.000]
AGE	-0.00997	-0.184***	-0.0358**	-0.00590***
	[0.160]	[0.000]	[0.002]	[0.000]
Constant	-0.742***	-1.295***	-0.910***	-0.734***
	[0.000]	[0.000]	[0.000]	[0.000]
N	5004	5004	5004	5004
R^2	0.234	0.137		

Note: p-values in [ ]; * p < 0.05, ** p < 0.01, *** p < 0.001

Source: Compiled from research results

Model selection

Table 7: Results of model selection tests for Research Model *2*

	P-value
Wald-test	0.0000
Hausman -test	0.0000

Source: Compiled from research results

Similar to Model 1, the results show that the Fixed Effects Model (FEM) is more appropriate. After testing the FEM model, it was found that the model suffers from autocorrelation and heteroscedasticity. The authors addressed these issues using the Generalized Least Squares (GLS) method. The regression results from the GLS model shown in the table indicate that when the capital structure is measured by the Long-Term Debt/Total Equity ratio, corporate income tax has an inverse effect on the firm's capital structure. Furthermore, the model results show that, in this case, firm size, liquidity, fixed assets, and growth have a positive impact on the long-term debt to total equity ratio. In contrast, profitability and firm age are inversely correlated with the long-term debt to total equity ratio.

Model 3

$$STD_{it} = c_0 + c_1.TAX_{it} + c_2.SIZE_{it} + c_3.ROA_{it} + c_4.LIQ_{it} + c_5.TANG_{it} + c_6.GROW_{it} + c_7.AGE_{it} + \varepsilon_{it}$$

Table 8: Regression results of the models for research model 3

	OLS	FEM	REM	GLS
TAX	0.00444	0.00228*	0.00272*	-0.00139
	[0.086]	[0.036]	[0.016]	[0.079]
SIZE	0.0169***	0.194***	0.0637***	0.0208***
	[0.000]	[0.000]	[0.000]	[0.000]
ROA	-0.811***	-0.251***	-0.296***	-0.478***
	[0.000]	[0.000]	[0.000]	[0.000]
LIQ	-0.0104***	-0.00281***	-0.00363***	-0.0307***
	[0.000]	[0.000]	[0.000]	[0.000]
TANG	-0.306***	-0.163***	-0.204***	-0.363***
	[0.000]	[0.000]	[0.000]	[0.000]
GROW	-0.00000233	-5.43e-08	0.000000539	-0.000000905
	[0.367]	[0.959]	[0.627]	[0.195]
AGE	0.104***	-0.353***	0.0368*	0.0966***
	[0.000]	[0.000]	[0.046]	[0.000]
Constant	0.183***	-1.360***	-0.346***	0.180***
	[0.001]	[0.000]	[0.000]	[0.000]
N	5004	5004	5004	5004
R2	0.246	0.153		

Note: p-values in [ ]; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Compiled from research results

Model selection

Table 9: Results of model selection tests for Research Model *3*

	P-value
Wald-test	0.0000
Hausman -test	0.0000

Source: Compiled from research results

Similar to Models 1 and 2, the results indicate that the Fixed Effects Model (FEM) is more appropriate. After testing the FEM model, it was found that the model suffers from autocorrelation and heteroscedasticity. The authors addressed these issues using the Generalized Least Squares (GLS) method. The results from the GLS model show that when the capital structure is measured by the short-term debt to total equity ratio, corporate income tax does not have statistical significance, meaning it does not affect the firm's capital structure. Furthermore, firm size and age have a positive

impact on the short-term debt to total equity ratio, while profitability, liquidity, fixed assets, and growth have an inverse effect on the short-term debt to total equity ratio.

Summary of the results of the three models: Through the three models, we conclude that corporate income tax impacts the capital structure, showing an inverse relationship with the long-term debt ratio at a 1% significance level, but has no effect on the short-term debt ratio and total debt to equity ratio. Additionally, among the control variables, the growth variable does not impact the short-term debt ratio, while the remaining variables affect the capital structure of the firm in all three cases. Therefore, the results of this study reject the null hypothesis (H0) that corporate income tax is positively correlated with the firm's capital structure.

Table 10: Summary table of the effect signs of the variables.

Variable	Research Hypothesis	LEV	LTD	STD
TAX	(+)	∅	(-)	∅
SIZE		(+)	(+)	(+)
ROA		(-)	(-)	(-)
LIQ		(-)	(+)	(-)
TANG		(-)	(+)	(-)
GROW		(+)	(+)	∅
AGE		(+)	(-)	(+)

Source: Compiled from research results

The research results indicate that corporate income tax (CIT) affects the capital structure of firms, but this impact is not uniform across all capital structure indicators. Specifically, CIT has an inverse effect on the long-term debt ratio (LTD) at a 1% significance level, but does not have a significant impact on the short-term debt ratio (STD) or the total debt to equity ratio (LEV). At the same time, most of the control variables have an impact on the capital structure, except for the growth variable, which does not affect the short-term debt ratio. These findings provide important implications in both theory and practice.

Impact of corporate income tax

Total Debt to Equity Ratio (LEV): The research results indicate that CIT does not have a significant impact on LEV, which is consistent with previous studies by (Graham, 2022) and (Yoram C. Peles, Marshall Sarnat, 1979). Both studies suggest that the corporate tax rate may not significantly affect the overall debt structure in certain market conditions. This result, however, contrasts with the findings of (Yoram C. Peles, Marshall Sarnat, 1979) who concluded that CIT has a positive effect on the total debt ratio due to the tax shield. The discrepancy between these studies may stem from differences in sample characteristics, time periods, or the business environments in the respective regions.

Long-term Debt Ratio (LTD): CIT has an inverse effect on LTD at a 1% significance level. This result aligns with the findings of (Harry DeAngelo, Ronald W. Masulis, 1980)and (Eugene F. Fama, Kenneth R. French, 2022), who reported that an increase in tax rates often leads to a reduction in the use of long-term debt, as firms may seek to minimize the financial risk and interest costs associated with long-term borrowing. This finding suggests that when the tax rate increases, firms may avoid long-term debt in favor of other financing options to ease their financial pressure.

Short-term Debt Ratio (STD): CIT does not have a significant impact on STD, which is consistent with the results of (Eugene F. Fama, Kenneth R. French, 2022). The absence of a clear impact could reflect the short-term nature of loans, which are less influenced by tax rate factors compared to long-term debt.

Impact of control variables: Most of the control variables, such as size (SIZE), profitability (ROA), liquidity (LIQ), fixed assets (TANG), and firm age (AGE), significantly affect the capital structure, consistent with corporate finance theory and many prior studies. However, notably, the growth variable (GROW) does not impact STD, which may suggest that revenue growth is not closely related to the use of short-term debt for financing.

CONCLUSION AND RECOMMENDATIONS

The study has shown that corporate income tax (CIT) affects the capital structure of non-financial listed firms in Vietnam, particularly having an inverse effect on the long-term debt ratio (LTD) at a

1% significance level, while not having a significant effect on the short-term debt ratio (STD) and the total debt to equity ratio (LEV). These results highlight the need for firms to be cautious in managing their capital structure, especially in decisions related to long-term debt, in the context of changing tax policies. Additionally, other control factors such as firm size, profitability, fixed assets, and firm age significantly affect the capital structure in various cases. These findings provide valuable insights into the relationship between tax policy and financial structure in the Vietnamese business environment.

For government authorities, the study results suggest that adjustments to CIT policy are necessary to ensure competitiveness and support businesses. The government should consider reducing the tax burden on firms, especially small and medium-sized enterprises, to encourage long-term investments in fixed assets and the expansion of business operations. Implementing more flexible tax policies, such as tax incentives for strategic industries, could help promote sustainable economic growth and improve capital structure across the economy. Additionally, financial management training and consultancy programs should be implemented to enhance the capacity of businesses to manage capital, optimize financial structure, and respond to changes in tax policies.

For businesses, the study shows that it is necessary to adjust financial strategies to better manage capital structure. Firms should reassess their use of long-term debt as a proportion of total capital, reduce dependence on debt when tax rates are high, and effectively utilize internal capital or equity financing for business operations. Optimizing liquidity and managing fixed assets are essential to minimize financial risk and ensure stable development. Furthermore, improving business performance and profitability should also be considered a strategic goal. This not only helps firms increase financial autonomy but also reduces pressure from borrowing costs.

Moreover, strengthening financial risk management capabilities and developing contingency plans for tax policy and market fluctuations are crucial to ensure long-term stability. Firms need to proactively forecast and prepare for adverse situations, while also developing flexible financial strategies to make the most of opportunities arising from changes in the business environment. These measures will help firms not only maintain stability in their capital structure but also optimize their value in the long term.

In general, adjustments in policy by the government and financial strategies by firms are necessary to ensure the stability and sustainable development of the economy. Businesses need to balance their use of debt and equity financing, while the government should create a more favorable environment for firms through practical support measures, especially in the context of international economic integration and fluctuations in the global business environment.

Conflicts of interest: The authors declare no conflict of interest.

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