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FINANCIAL FACTORS AFFECTING CAPITAL STRUCTURE. A DYNAMIC PANEL DATA APPROACH

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ABSTRACT

This study examines the financial factors that affect the capital structure. The analysis is based on listed rubber companies on the Vietnam Stock Exchange in the period of 2016 - 2024. The paper uses a regression model through the generalized method of moments SGMM along with tests of model suitability, testing for multicollinearity, autocorrelation, and heteroskedasticity. Quantitative research results show that financial factors (including company size, profitability, tangible fixed assets, growth rate, corporate income tax, non-debt tax shield, and liquidity) influence the capital structure (represented by debt ratio, long-term debt ratio, and short-term debt ratio) of rubber companies, but in different directions and to varying degrees. Based on this, the author proposes recommendations to help businesses achieve their target capital structure. The findings are valuable to help the research conclusions become focused and have specific meaning for rubber companies and other industry companies.

KEYWORDS: Financial Factors, Capital Structure, Dynamic Panel Data, SGMM.

1. INTRODUCTION

During the operation process, businesses have to face many important decisions, the first of which are financing policy decisions, investment policy decisions and dividend policy decisions (Chen J. & Strange R, 2006). In which, financing policy is very important in increasing the business value. With each financing policy that the business chooses, a separate capital structure will be formed. Thus, in each capital structure decision, the business will simultaneously affect the business value as well as the cost of using its own capital. Decisions related to capital structure are also a very important issue in corporate governance with the aim of maximizing corporate value (Frank M. and Goyal V., 2009). However, it is not an easy task because this involves the debt and equity's choice to balance benefits and costs. A wrong financial decision will lead to financial exhaustion and bankruptcy of the business. Therefore, studying the affection of financial factors on the enterprises's capital structure is not only a quite interesting but also equally complex topic in both theoretical research and practical application.

In recent times, there have been many different theoretical schools in the world referring to the capital structure of enterprises (Abor J., 2005). Different theoretical schools also determine the capital structure of enterprises differently. Empirical studies examining the capital structure of enterprises provide different evidence due to differences in space, time, industry characteristics and research methods. Previous capital structure studies often focused on studying the financing behavior of companies in developed countries. However, recently, research on capital structure and debt maturity structure has expanded strongly internationally by providing comparative evidence across countries as well as across industries. The studies had been conducted in developed and developing countries, typically the listed companies on the stock market such as Chen J. and Strange R (2006), Huang G. and Song F. (2006), Frank M. and Goyal V. (2009), Rouf A. (2015), Vijayakumaran S. and Vijayakumaran R. (2018), Almauaiter S. and Marzouk M. (2019), Silva M. et al. (2020),... and also studies for companies in different industries in the market such as cement industry (Khan et al., 2016), manufacturing industry (Prahalthan B., 2010; Nasution A.A. et al., 2017, Rosita H. & Huryaman N.,2025), trading industry (Nathaniel T. and Kingsley U., 2019).

Vietnam's rubber industry ranks fifth in area, third in natural rubber output in the world and leads in productivity in the Asian region with the export of

three groups of rubber products: natural rubber, wood and rubber wood products maintaining positive growth. Vietnam's natural rubber accounts for nearly 12% of the total global export volume, and is also exported to more than 80 markets. Currently, the world's largest tire manufacturers, which consume up to 65% of global natural rubber, have agreed on a policy of pursuing a sustainable development future. Therefore, the rubber industry has had many changes in development trends, when the market is increasingly competitive in the production of products in the rubber industry in general and industrial products supporting this industry in particular. Along with improving the ability to supply industrial products supporting high-tech enterprises, it is necessary to aim at the goal of constantly improving the quality of traditional rubber plastic products, planning the capital structure and debt term structure for enterprises is also a matter of great concern for administrators to balance and meet the urgent capital sources of enterprises. Most of the listed rubber companies on the Vietnamese stock market are predecessors of state-owned companies, although they have been equitized, the state still holds shares in these companies. The listed rubber companies on the Vietnamese stock market are all classified as large-scale enterprises. Most companies choose for themselves a business capital structure from 60% to 90% of equity to create autonomy as well as high financial independence in the situation of global crisis risk. However, there are also some companies that choose to take a more risky approach with liabilities accounting for 50% to 70% of total business capital to increase financial leverage and increase capital efficiency, although payment risks will also increase.

In Vietnam, there have been empirical studies which analyze the factors's influence on the capital structure of overall listed companies on the stock market (Tran D.K.N. et. al., 2006 Chi L. D., 2013; Anh D.T. and Yen Q.T., 2014; Nha B.D. et al., 2016; Nhung T.P et. al., 2017; Nhu N.T.Q et. al., 2020). Besides, studies on this issue also target companies in different industries such as the cement industry (Nguyen L.T.M, 2016), mineral industry (Lan D.TN & Hung N.N.,2017), seafood industry (Quynh P.X. and Trinh P.T.P, 2018), trade industry (Hanh N.T.T, 2019), logistics industry (Diem L.T.T, 2021), food industry (Duong L.T. et al. (2020)), cement industry (Nhung L.T, 2020), transportation industry (Diem L.T.T., 2021), food and beverage industry (Huong D.T.T.,2021), ... However, there is still a gap in this research area for the rubber industry. Therefore, the

paper focuses on the financial factors affecting the capital structure of rubber companies listed on the Stock Exchange. This is a capital-intensive industry, in which decisions on optimal capital structure are the foundation for increasing business efficiency and that explains the importance of this study.

2. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

2.1. Theoretical Framework

Capital structure can be simply understood as a combination of a company's equity and its debt (Miglo A., 2016). The enterprise's capital structure is formed from the relationship of each capital type in the total capital of the company and it is influenced by many different factors (Agarwal et al., 2015). Capital structure can also be understood as the ratio of debt in the form of financial leverage in the total capital increase of a business to finance the assets and operations of the business (Swanson et al., 2003). This ratio increases or decreases differently depending on business tradition, culture or management style. From capital structure theories such as Modigliani and Miller theory - M&M (Modigliani F. and Miller M., 1958), Trade-off Theory - TOT (Modigliani F. and Miller M., 1963), Agency Cost Theory (Fama E. and Miller M., 1972), Signaling Theory (Stephen A. R., 1977), Pecking Order Theory (Myers S. and Majluf N., 1984), it can be seen that the goal of a firm's capital structure decision is to determine the financial leverage or capital structure to maximize the company's value by minimizing the weighted average cost of capital. For private enterprises, equity capital is formed from personal capital. For joint stock companies, capital is formed from the issuance of shares. In addition, there are products with dual characteristics such as convertible bonds or preferred shares. These securities have both debt characteristics and capital structure characteristics that minimize the weighted average cost of capital and maximize the total value of the company's securities, this is called the optimal capital structure. The optimal capital structure changes over time and depends on the nature of the firm as well as external factors in the operating environment.

During their operations, especially with large-scale business plans that require large amounts of investment capital, enterprises must consider the reasonable use of accessible capital sources to achieve the most optimal efficiency. Enterprises will have to calculate whether they use loans from banks, capital from issuing bonds, stocks or the retained earnings of the enterprise. The optimal capital structure refers to the ratio between equity and liabilities so that it

minimizes the capital cost, minimizes business risk, and maximizes the enterprise value (Agarwal et al., 2015).

2.2. Hypothesis Development

- Firm Size

Most studies have shown that the business size has a positive relationship with the capital structure. Specifically, according to the trade-off theory, the enterprise size has a positive relationship with debt because large enterprises often have a lower risk of bankruptcy than small enterprises. On the other hand, according to agency theory, large firms are often easier to diversify with more transparent information, so the control costs and agency costs of debt are low, cash flows are also stable, therefore they have easier access to credit markets. Empirical studies by Deesomsak et al. (2004), Huang and Song (2006), Frank and Goyal (2009), M'ng et al. (2017), Francisco C. G and Franco C. C. (2017), Jędrzejczak-Gas (2018), Duong L.T. et al. (2020) have supported this view.

Hypothesis 1 (H₁): Firm size has a positive impact on the capital structure of Rubber companies listed on Vietnam Stock Exchange.

- Profitability

According to the pecking order theory, high profitable firms tend to finance more with internal funds, furthermore use external funds increases the financial burden and dilutes ownership. Chen J. & Strange R. (2006) presented empirical evidence about an inverse relationship between profitability and capital structure of listed companies on the Shanghai Stock Exchange (China). Deesomsak (2004) also found that profitability in Malaysian firms has a non-directional effect financial leverage. Frank and Goyal (2009) pointed out that profitability is one of the most reliable factors that have a negative reaction to capital structure in American companies. Similarly, M'ng J.C.P et al. (2017) demonstrated that profitability is not positively correlated with capital structure for Malaysian and Singaporean companies. Based on the pecking order theory, Jędrzejczak - Gas (2018) also argued that a company has less debt when it is more profitable because the profits earned can be used as a source of internal financing. More recently, Duong L.T. et al. (2020) also concluded that profitability and capital structure are negatively correlated.

Hypothesis 2 (H₂): Profitability has a negative impact on capital structure of Rubber companies listed on Vietnam Stock Exchange.

- Tangible Fixed Assets

Tangible fixed assets are one of the first and important factors that creditors need to consider when making a credit decision. A company with a higher ratio of tangible fixed assets means that it has more assets as collateral for its debts. From this, it can be seen that businesses use more debt in their financial structure, they have a higher ratio of tangible fixed assets to total assets (Jędrzejczak – Gas, 2018). Some empirical studies by Chen J & Strange R (2006), Deesomsak et al. (2004), Frank and Goyal (2009), M'ng et al. (2017), Vijayakumaran S. & Vijayakumaran R. (2018) have also shown that tangible fixed assets are directly proportional to financial leverage.

Hypothesis 3 (H₃): Tangible fixed assets have a positive impact on the capital structure of rubber companies listed on Vietnam Stock Exchange.

- Company Growth Rate

Chen J. & Strange R. (2006) found a positive correlation between a firm's growth rate and its capital structure. This is also the result found in many studies in Vietnam, such as Cuong N.T. (2008), Lan V.T.N. and Dung N.T. (2013), Duong L.T. et al. (2020). In general, these authors have the same opinion that, when faced with development opportunities and integration trends, businesses will try to find external sources of debt to invest and exploit favorable business opportunities. In addition, businesses with high growth rates also mean easier access to external loans, then a company's capital structure will change towards increasing debt ratio.

Hypothesis 4 (H₄): Growth rate has a positive impact on the capital structure of rubber companies listed on Vietnam Stock Exchange.

- Company Income Tax

According to the trade-off theory, the main motivation for using debt instead of equity is to save corporate income tax (Deesomsak R. et al., 2004). The tax deduction for interest expenses creates the benefit of a tax shield, which attracts companies to use more debt. M'ng et al. (2017) also pointed out that when the corporate income tax rate is high, companies will use more leverage because interest payments are tax deductible. In Vietnam, Diem L.T.T. et al. (2020) concluded that every unit increase in corporate income tax, the ratio of long-term debt to total assets will increase by 0.008 units.

Hypothesis H5: Corporate income tax has a positive impact on the capital structure of rubber companies listed on Vietnam Stock Exchange.

- Non-Debt Tax Shield

Many studies in the world such as Deesomsak et al. (2004), Huang G. and Song F. (2006) all agree that businesses often use debt to save taxes, but besides that, non-debt tax shields such as depreciation can also be used by companies to reduce corporate taxes. Therefore, the potential tax benefit of debt will be reduced due to the high non-debt tax shield, which in turn leads to a negative correlation with financial leverage. Nguyen L.T.M. (2016) also found that the debt ratio is negatively correlated with non-debt tax shield which measured by depreciation on total assets of Vietnamese cement enterprises.

Hypothesis 6 (H₆): Non-debt tax shields have a negative impact on the capital structure of rubber companies listed on Vietnam Stock Exchange.

- Liquidity

According to the pecking order theory, high liquidity firms will tend to borrow less. In addition, managers may act against the interests of creditors, manipulating short-term assets in favor of shareholders, thereby increasing the agency costs of debt (Deesomsak et al., 2004). Similarly, Jędrzejczak-Gas (2018) also argues that the better the ability to handle short-term debts, the less likely a firm is to borrow. Nguyen L.T.M. (2016) or Lan N.T.T. (2019) also concluded similarly that, when there is high liquidity, companies will prefer to use internal capital for new financial investments and tend to use less debt.

Hypothesis 7 (H₇): Liquidity has a negative impact on the capital structure of rubber companies listed on Vietnam Stock Exchange.

3. RESEARCH MODEL

This paper uses secondary data which collected from financial statements including balance sheets, income statements, cash flow statements and audited financial statements, ensuring the accuracy and transparency of data. The source of data on financial statements of companies in the research sample is taken from Vietnam Stock Exchange of 18 rubber companies from 2016 to 2024.

Based on the research of Chen J. & Strange R. (2006), Huang G. and Song F. (2006) built a model to consider the influence of financial factors on the capital structure of listed rubber companies. The reduced form equation in the following GMM model is as follows.

$$TDR_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 TANG_{it} + \beta_4 GROW_{it} + \beta_5 TAX_{it} + \beta_6 NDTs_{it} + \beta_7 LIQ_{it} + \varepsilon_{it} \quad (1)$$

$$SDR_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 TANG_{it} +$$

$$\beta_4 \text{GROW}_{it} + \beta_5 \text{TAX}_{it} + \beta_6 \text{NDTS}_{it} + \beta_7 \text{LIQ}_{it} + \varepsilon_{it} \quad (2)$$

$$\text{LDR}_{it} = \beta_0 + \beta_1 \text{SIZE}_{it} + \beta_2 \text{ROA}_{it} + \beta_3 \text{TANG}_{it} + \beta_4 \text{GROW}_{it} + \beta_5 \text{TAX}_{it} + \beta_6 \text{NDTS}_{it} + \beta_7 \text{LIQ}_{it} + \varepsilon_{it} \quad (3)$$

In which, i is the i -th company of the sample $t = 2016, 2024$ for the period 2016-2024; Capital structure here is determined by three dependent variables:

Total debt ratio (LEV), Long-term debt ratio (LTD), Short-term debt ratio (STD). Independent variables include Company size (SIZE); Profitability (ROA); Tangible fixed assets (TANG); Growth rate (GROW); Corporate income tax (TAX); Non-debt tax shield (NDTS); Liquidity (LIQ)

Table 1: Description of Variables Used In The Models.

Variables	Symbol	Measurement	Authors
<i>Dependent variable</i>			
Capital structure	TDR	$\frac{\text{Total Debt}}{\text{Total Asset}}$	Chen & Strange (2006), Prahalathan B. (2010), Khan et al. (2016), M'ng et al. (2017), Jedrzejczak - Gas (2018), Duong L.T. et al. (2020).
	SDR	$\frac{\text{Short - Term Debt}}{\text{Total Asset}}$	Abor J. (2005), Frank and Goyal (2009), Rouf A. (2015), Nguyen L.T.M. (2016), Almauaiter S. & Marzouk M. (2019).
	LDR	$\frac{\text{Long - Term Debt}}{\text{Total Asset}}$	Abor J. (2005), Chen & Strange (2006), Rouf A. (2015), Nasution A.A. et al. 2017, Silva M. et al. (2020).
<i>Independent variable</i>			
Firm size	SIZE	Log (Total Asset)	Chen & Strange (2006), Adland et al (2017), Francisco C. G and Franco C. C. (2017) Vijayakumaran (2018), Duong L.T et al. (2020)
Profitability	ROA	$\frac{\text{Profit after tax}}{\text{Total Asset}}$	Prahalathan B. (2010), Wahab và Ramli (2014), Chi L.D. (2013), Anh D.Q, Yen Q. T.H. (2014).
Tangible Fixed Assets	TANG	$\frac{\text{Residual Value of Tangible Fixed Assets}}{\text{Total Asset}}$	Chen (2004), Huang & Song (2006), Rouf A. (2015), M'ng et al. (2017), Almauaiter S. & Marzouk M. (2019).
Growth Rate	GROW	$\frac{(\text{Total Assets Year } t - \text{Total Assets Year } t - 1)}{\text{Total Assets Year } t - 1}$	Chen J. & Strange R. (2006), Shah et al. (2013), Khan et al. (2016), Jedrzejczak-Gas (2018).
Corporate Income Tax	TAX	$\frac{\text{Corporate income tax expense}}{\text{Profit before tax}}$	Huang & Song (2006), Khan et al., 2016, Jedrzejczak - Gas (2018), Silva M. et al. (2020).
Non-Debt Tax Shield	NDTS	$\frac{\text{Depreciation expense}}{\text{Total Asset}}$	Chen (2004), Prahalathan B. (2010), M'ng et al. (2017), Jedrzejczak-Gas (2018), Almauaiter S. and Marzouk M. (2019).
Liquidity	LIQ	$\frac{\text{Current Assets}}{\text{Short - Term Debt}}$	Chen (2004), Rouf A. (2015), M'ng et al. (2017), Jedrzejczak - Gas (2018), Silva M. et al. (2020)

Source: Suggested By the Authors.

4. RESULTS

4.1. Descriptive Statistics

The statistical results show that the average ratio of total debt to total assets of the companies in the sample is 40.38%, in which the company with the highest leverage ratio is 70.44% in 2016 (Hoang Anh Gia Lai International Agriculture Joint Stock Company - HNG), the company with the lowest leverage is 5.43% (Thong Nhat Rubber Joint Stock Company - TNC). The average ratio of short-term debt to total assets of the companies in the sample is 28.25%, in which the company with the highest short-

term debt is 73.55% and the lowest is 4.17%. The average ratio of long-term debt to total assets of the companies in the sample is 17.35%, in which the company with the highest long-term debt is 53.17% and there are cases where long-term debt is not used. The average size of rubber companies listed on the Ho Chi Minh City Stock Exchange in the research sample is 12.29, in which the largest company size is 11.40 and the smallest company size is 13.55. The average profitability on total assets of rubber companies in the observation is 4.7%, in which the company with the largest profitability is 17.21%, and there are even loss-making companies. The ratio of

tangible fixed assets to total assets of rubber companies listed on HOSE is 0.334 times, in which

the highest is 0.95 times and the lowest is 0.04 times.

Table 2: Descriptive Statistics of the Variables.

Variable	Obs.	Mean	Std. dev.	Min.	Max.
TDR	162	0,4038	0,1955	0,0543	0,7044
SDR	162	0,2825	0,1760	0,0417	0,6499
LDR	162	0,1735	0,1264	0,0000	0,5317
SIZE	162	122,890	0,5772	114,096	135,498
ROA	162	0,0476	0,0458	-0,1050	0,1721
TANG	162	0,3345	0,2484	0,0399	0,9526
GROW	162	0,0569	0,1434	-0,2375	0,7419
TAX	162	0,1527	0,0706	-0,0028	0,2379
NDTS	162	0,2789	0,2190	0,0331	0,8911
LIQ	162	25,683	25,345	0,4894	109,340

Source: Results From Stata Software

The average growth rate of rubber companies in the observation is 0.57 times, in which the highest growth rate is 0.74 times and the lowest is -0.24 times. The average corporate income tax of rubber companies listed on HOSE is 15.27%, in which the company paying the highest corporate income tax is 23.79% and the lowest is -0.28%. The average tax shield from depreciation of rubber companies in the observation is 0.28 times, in which the highest is 0.89 times and the lowest is 0.33 times. The average liquidity of rubber companies listed on HOSE is 2.57 times, in which the highest is 10.93 times and the

lowest is 0.49 times.

4.2. Variance Inflation Factor (Vif)

The results of checking table 3 show that the VIF coefficient has an average value of 1.98, the VIF value ranges from 1.38 to 2.65. This shows that the VIF index of all independent variables in the model is less than 10, meaning that it can be concluded that the possibility of multicollinearity between independent variables in the research model is insignificant.

Table 3: Variance Inflation Factor (VIF) Results.

Variable	VIF	1/VIF
TAX	2,65	0,377806
LIQ	2,09	0,478349
SIZE	2,04	0,490181
TANG	1,93	0,518154
ROA	1,91	0,522528
NDTS	1,85	0,541274
GROW	1,38	0,72476
Mean VIF	1,98	

Source: Results From Stata Software.

4.3. Estimated Results and Discussion

Breusch Pagan Lagrangian test is used to compare OLS and REM, accordingly, the hypothesis H0 when P-value < 5% then choose REM, H1 in case P-value > 5% then choose OLS.

The research results show that P-value < 5% so REM method is more suitable than OLS. F-test using Likelihood ratio is used to choose between FEM and Pooled OLS models.

The result of F-test has p-value < significance level α (5%) so FEM model is more suitable than Pooled OLS model; for Hausman Test, p-value has significance level α (5%) so REM model is more suitable than FEM model. Thus, REM estimation is more suitable than FEM and Pooled OLS in determining factors affecting capital structure of

rubber companies listed on HOSE.

The study performed a heteroskedasticity and autocorrelation defect test for the selected REM model.

The defect test results showed that: for the Heteroskedasticity test, the p-value < significance level α (5%) so the REM model suffered from heteroskedasticity, for the Wooldridge test, the p-value < significance level α (1%) so the REM model suffered from autocorrelation.

At that time, the study used the generalized least squares (GLS) method to handle the heteroskedasticity and autocorrelation phenomena. However, the Ramsey Reset test with Prob < 0.05 showed evidence to reject H0, or in other words, the hypothesis that the model has omitted variables is

accepted.

Table 4: Hausman Test Results and Other Tests.

Other Test/ Diagnostics	TDR		LDR		SDR	
	Chi	Prob.	Chi	Prob.	Chi	Prob.
Breusch-Pagan Lagrangian	22,72	0,0000	8,02	0,0023	49,89	0,0000
F test	62,37	0,0000	5,42	0,0000	26,08	0,0000
Hausman Test	10,24	0,1012	11,87	0,1048	9,13	0,2436
Heteroskedasticity Test	215,73	0,0000	518,21	0,0000	550,28	0,0000
Wooldridge Test for Autocorrelation	4,554	0,0031	162,33	0,0000	16,866	0,0026
Ramsey Reset Test	4,36	0,0007	2,88	0,0005	5,51	0,0000

Source: Results From Stata Software.

To handle all three defects of heteroscedasticity, autocorrelation and endogeneity, and for the dynamic panel model, the study applies the Generalized Method of Moments (GMM) estimation proposed by Arellano and Bond (1995) and Blundell and Bond (1998), which gives efficient and robust estimation results. Then, the final analysis is based on the regression results using the SGMM method.

Using panel regression using the Sys-GMM method in the model will lead to the problem of serial autocorrelation, so it is necessary to test serial autocorrelation for the model with the hypothesis H0: there is no serial autocorrelation in the model. The results in Table 4.5 show that the AR(1) test has a Prob value < 0.05, so the hypothesis H0 is rejected. AR(2) has a Prob value > 0.05, accepting the hypothesis H0, which implies that there is no serial correlation in the model.

By regressing with the lagged variable of the dependent variable acting as an independent variable in the research model, endogeneity is very likely to occur, so the Sargan/Hansen test is a test of the endogeneity limit of the model (overidentifying restrictions) with the hypothesis H0: no correlation with the errors in the model. The results of Sargan test with Prob value > 0.05 and Hansen test with Prob value > 0.05, so accept the hypothesis H0, meaning that the impact of endogenous variables has been eliminated, the model has no correlation with the error.

Through the results of AR(2) and Sargan/Hansen test, it is concluded that the model estimating factors affecting the capital structure of companies in the Vietnamese rubber industry with the Sys-GMM

method is appropriate.

Company size (SIZE) is positively correlated with all three debt ratio variables at a statistical significance level of 5%, long-term debt ratio and short-term debt ratio are statistically significant at 10%, this correlation is consistent with the trade-off theory of capital structure. This research result is similar to Chen J. and Strange R. (2006), Frank M. and Goyal V. (2009), Francisco C. G and Franco C. C. (2017), Jędrzejczak- Gas (2018). Larger companies have easier access to borrowed capital than smaller companies.

The profitability (ROA) of companies in the Rubber industry is negatively affected by the debt ratio, long-term debt ratio at a significance level of 5% and short-term debt ratio at a significance level of 1%. This coefficient shows that when the return on total assets of companies in the Rubber industry increases, it will affect the reduction of debt financing. This correlation can be explained by the pecking order theory. According to Myers and Majluf (1984), the financing decision of enterprises is based on asymmetric information. Asymmetric information affects the choice between internal and external financing, between new issuance of debt securities and equity securities. This theory proposes a priority order of financing first with internal funds (retained earnings) and then with external borrowing. This result is consistent with the research of Deesomsak et al. (2004), Prahalathan (2010), Nadeem A.S and Z.Wang (2011), Vijayakumaran S. & Vijayakumaran R. (2018), Silva M. et al. (2020), Rosita H. & Huryaman N. (2025).

Table 5: Estimation Results from the SGMM Model.

Variables	TDR	LDR	SDR
L1.TDR	0,809*** [0,214]		
L1.SDR		0,976** [0,809]	
L1.LDR			1,096*** [0,091]
SIZE	0,158**	0,080*	0,157*

	[-0,142]	[0,228]	[0,279]
ROA	-0,162**	-0,224**	-0,877***
	[-0,337]	[0,996]	[0,467]
TANG	-0,391**	0,569*	-0,297*
	[0,260]	[-0,897]	[0,307]
GROW	0,052	0,086**	-0,443***
	[0,083]	[0,114]	[0,062]
TAX	-0,156*	0,268*	-0,288**
	[0,291]	[0,791]	[0,916]
NDTS	0,188**	0,287**	-0,079*
	[0,151]	[0,347]	[0,199]
LIQ	-0,307***	-0,139**	-0,017*
	[0,015]	[0,025]	[0,034]
Cons	2,158**	1,449*	1,939*
	[1,753]	[2,901]	[3,49]
Number of observations	144	144	144
AR (1)	0,031	0,065	0,021
AR (2)	0,437	0,950	0,892
Sargan test	0,178	0,261	0,495
Hansen test	1,000	1,000	1,000

Note: Those In () Are Standard Errors; *, **, And *** Denote Significance At 10%, 5%, And 1% Levels.

Source: Results From Stata Software

Tangible fixed assets (TANG) also has an inverse effect on the short-term debt ratio but a positive effect on the long-term debt ratio at a statistical significance level of 10%. This is consistent with the research results of Nadeem A.S and Z.Wang (2011), Nasution et al. (2017), Almauaiter S. and Marzouk M. (2019) when analyzing the impact of fixed assets on total debt of low-leverage companies. We can also explain based on the theory of asymmetric information. The tangible fixed assets of companies in the rubber industry have low asymmetric information, which reduces the cost of equity, leading to a low debt ratio. The positive impact of tangible assets on the long-term debt ratio shows that companies in the rubber industry use long-term debt to finance investment in purchasing fixed assets for production and business. According to the equilibrium theory and the intermediate cost theory, the proportion of fixed assets has a positive relationship with financial leverage. Enterprises with more fixed assets mean they are more likely to mortgage their loans, so the opportunity to access loans will be higher.

Growth rate (GROW) is positively correlated with short-term debt ratio at 1% significance level and negatively correlated with long-term debt ratio at 5% significance level. Here, rubber companies will use short-term debt to supplement working capital when forecasting future growth opportunities. Research by Huang G. and Song F. (2006), Prahalathan B. (2010), Nasution et al. (2017) also agrees with this view. Meanwhile, agency cost theory suggests that business owners tend to compete for benefits with creditors. Companies with high growth rates often forecast positive business results, so shareholders do not want to share these benefits with creditors.

According to research by Jensen and Meckling (1976), a business with high growth opportunities often has many options for investment decisions, so the agency costs of this business are often higher than other businesses. Myers (1977) argues that this agency cost also decreases if long-term debt is replaced by short-term debt. This is also consistent with the Vietnamese Rubber industry and is in agreement with studies by Chen J. and Strange R. (2006), Prahalathan (2010), Nasution et al. (2017).

Corporate income tax (TAX) has a positive effect on the long-term debt ratio. According to the equilibrium principle, corporate income tax has a positive relationship with financial leverage. In fact, Vietnamese enterprises always take full advantage of the benefits from income tax, which is similar to some studies in Vietnam such as Nguyen L.T.M.(2016), Anh D.T.Q.and Yen Q.T.H. (2014). In addition, corporate income tax has a negative effect on the total debt ratio and short-term debt ratio. This contradicts the trade-off theory, the same research hypothesis, and shows that for rubber companies, the tax shield has not been adequately utilized. This means that when enjoying fewer corporate income tax incentives, the higher the corporate income tax payable, the less incentive rubber companies have to borrow to finance and expand their production and business operations.

Non-debt tax shield (NDTS) is positively correlated with short-term debt ratio at 10% significance level and negatively correlated with long-term debt ratio at 5% significance level. According to the study of Prahalathan (2010), non-debt tax shield is a substitute for tax benefits when enterprises do not use debt financing. A business with a large non-debt tax shield means using less

debt. In fact, companies in the rubber industry with high debt often use non-debt tax shields (ie accelerated depreciation costs and tax incentives) to reduce tax expenses. Meanwhile, long-term debt financing of rubber companies is very little. Fixed assets form a small part due to long-term debt financing, the rest is financed by other sources. The research results of Nadeem A.S and Z.Wang (2011), Vijayakumaran S. & Vijayakumaran R. (2018), Silva M. et al. (2020) suggest that the non-debt tax shield is a substitute for the tax benefits of debt, a company with high non-debt tax shield is expected to use less debt.

Liquidity (LIQ) is negatively correlated with debt ratio (in all three cases of total debt ratio, short-term debt ratio, long-term debt ratio). This is consistent with the pecking order theory, because companies with high liquidity prefer to use internal capital in new financial investments rather than using debt. This is also consistent with the expected hypothesis and the results of previous empirical studies in the world such as the research results of Chen J., & Strange, R. (2006), Nadeem A.S and Z.Wang (2011), Nasution et al. (2017), Almauaiter S. and Marzouk M. (2019) also concluded a negative correlation (-) between liquidity and financial leverage.

5. CONCLUSION AND POLICY IMPLICATIONS

Based on the financial statements of 18 rubber companies listed on the Vietnam stock exchange from 2016 to 2024, this study uses the generalized moment regression model SGMM to find out the factors affecting the capital structure of the rubber industry. The study has identified 7 factors: Company size (SIZE); Profitability (ROA); Tangible fixed assets (TANG); Growth rate (GROW); Corporate income tax (TAX); Non-debt tax shield (NDTS); Liquidity (LIQ) affecting the capital structure of rubber companies listed on the HOSE stock exchange with statistical significance levels: 1%; 5%; 10%. Company size is positively correlated with all three debt ratio variables, long-term debt ratio and short-term debt ratio, this correlation is consistent with the trade-off theory of capital structure and the hypothesis of the research model.

- Profitability has a negative relationship with debt ratio in all three cases of short-term debt ratio, long-term debt ratio and total debt ratio. This result is consistent with the initial hypothesis, consistent with the pecking order theory. This can be explained according to the pecking order theory as follows: the financing decision of enterprises often prioritizes the use

of internal capital rather than debt, meaning that enterprises will borrow less when profits are higher.

- Tangible fixed assets have an inverse impact on short-term debt ratio but a positive impact on long-term debt ratio. Thus, the hypothesis that tangible fixed assets have a positive impact on the capital structure of rubber companies listed on the Ho Chi Minh City Stock Exchange is true in the long run with the observed sample data.
- Growth rate has a positive correlation with short-term debt ratio and a negative correlation with long-term debt ratio. Therefore, the hypothesis that growth rate has a positive impact on capital structure is only true in the short term for rubber companies listed on the Ho Chi Minh City Stock Exchange.
- Corporate income tax has a positive impact on long-term debt ratio, but a negative impact on total debt ratio and short-term debt ratio. This result shows that the research hypothesis is only true in the case of long-term debt ratio.
- Non-debt tax shield is positively correlated with short-term debt ratio and a negative correlation with long-term debt ratio. This shows that the research hypothesis is true in the case of long-term debt ratio of companies in the sample.
- Liquidity has a negative impact on debt ratio (all three cases of total debt ratio, short-term debt ratio, long-term debt ratio). This is consistent with the pecking order theory, as highly liquid firms prefer to use internal funds in new financial investments rather than debt, and is also consistent with the expectations hypothesis.

From the results of analyzing financial factors affecting the capital structure of rubber enterprises, business administrators when making capital structure decisions need to rely on the conditions and assumptions of modern theories on capital structure. Specifically:

First, the size of the enterprise has a positive impact on capital structure and debt maturity structure. The larger the enterprise size, the more it tends to increase debt, which explains that once the enterprise grows well, the enterprise can easily access loans through the creditworthiness and trust of creditors based on the good financial indicators of the enterprise or increase in scale along with the increase in tangible fixed assets to ensure more debt. However, administrators should be careful in

increasing loans because it can lead to a situation of spreading loans and poor capital use efficiency.

Second, profitability has a negative impact on capital structure, which shows that rubber companies with efficient business operations tend to use profits earned to pay off debts and reduce debt leverage. This does not always have a positive impact if managers tend to operate the target capital structure in the direction of increasing the debt ratio to take advantage of favorable investment opportunities from macroeconomic factors, institutional factors, or from the business sector or from support from state management levels. In this case, if managers still follow the trend of increasing business efficiency and reducing the debt ratio, there will be good investment opportunities in the market. Therefore, a reasonable solution for rubber companies to improve business efficiency is to combine the factor of increasing business efficiency with investment opportunities in the market.

Third, although the empirical research results show that asset maturity does not affect capital structure. This shows that this factor has not been given due attention by rubber enterprises in Vietnam. However, according to the theory of suitability, this is an important factor in financial planning. Because most rubber enterprises use the value of tangible fixed assets to secure loans. Therefore, if rubber enterprises have many tangible

fixed assets, they will have more opportunities to access long-term loans easily compared to rubber industries with few tangible fixed assets. This is an advantage for rubber industries that meet this condition, so enterprises take advantage of this feature to build debt policies with long debt terms.

Fourth, rubber enterprises need to pay attention and choose appropriate capital sources with appropriate debt terms to contribute to unblocking capital sources, helping enterprises to operate more smoothly by using more long-term debt instead of using short-term debt in the capital structure. Fifth, liquidity (liquidity) has a negative impact on capital structure. This is a factor that reflects the characteristics of the financial situation of the enterprise. Enterprises with good financial situation will implement a debt policy with long terms, on the contrary, enterprises with poor financial situation tend to use short-term debt. Based on this trend, if managers want to operate the capital structure in the direction of reducing the short-term debt ratio, they need to make decisions on increasing liquidity including: promoting business activities, reducing inventory, strictly controlling and managing expenses that do not bring profit and revenue, regularly reviewing raw material consumption standards. These solutions also contribute to improving business efficiency and enhancing the management capacity of the enterprise.

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