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Capital Structure and Trade-Off Theory: Evidence from Vietnam

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Abstract

The capital structure is one of the hot financial topics among researchers and scholars. Its importance comes from the fact that capital structure is closely related to companies' ability to meet different stakeholders' needs. A suitable capital structure will boost the business and create a competitive advantage in the context of fierce competition. Many companies choose an optimal debt level based on the trade-off between interest and debt costs. This study aimed to test the existence of trade-off theory in capital structure, the case of Vietnam's real estate companies, which are growing very fast recently. Instead of considering constant optimal leverage to test the trade-off model, we take advantage of the dynamic capital structure determined by growth opportunities, profitability, tax incentives, tangibility, liquidity, and firm size. The dynamic panel data regression was estimated by the system Generalized Method of Moment (Sys-GMM). The empirical evidence showed that real estate companies listed in the Vietnamese stock market might change their leverage toward a target capital structure determined by influential factors in a long-term perspective. In particular, the debt-to-asset ratio will change by approximately 14 percent, positively, in response to the difference between the current debt-to-asset ratio and the dynamic target debt-to-asset ratio.

Keywords: Capital Structure, Dynamic Panel Data, Sys-GMM, Trade-Off Theory

JEL Classification Code: G17, G31, G41

1. Introduction

Vietnam's economic growth has recovered with the global economy (Nguyen & Khoa, 2020). Historical data from the World Bank shows the trend of Vietnam's GDP growth from a low of 5.2% in 2012 to 7.1% in 2018 (ceicdata.com, 2019). The development of fields such as e-commerce (Nguyen & Khoa, 2019a, 2019b), education (Khoa & Khanh, 2020), science and technology (Khoa, Nguyen, Tran, & Nguyen, 2020), real estate business is a good premise for the development of Vietnam's economy. Undoubtedly, Vietnam is still witnessing superior economic growth amid slow global recovery after the financial collapse in 2007-2008. The economic recovery facilitates the demand for housing real estate, especially in big cities. According to Savills (2018), Vietnam's urbanization rate is 2.6%, the highest in ASEAN. Strong residential demand can be seen in both the large cities as Hanoi and Ho Chi Minh City. Also, policies to support the real estates market, such as direct financing, taxes, and interest rates, were implemented during this period due to the real estate market's previous real estate session.

The development of demand for real estate creates opportunities for real estate companies to enjoy extraordinary growth and profitability. In an emerging market like Vietnam, the real estate market creates noticeable impacts on the entire economy. Since 2010, half of the richest Vietnamese are owners of real estate companies, such as Vin Group, FLC, and Novaland. This period is the Golden Age of Vietnam's real estate industry. Before this time, according to Ho Chi Minh City Real Estate Association, the real estate market has experienced a complete business cycle, including growth, boom, slowdown, recession, recovery, and increase and grown slowly during the past 20 years. The market overgrew from 2003 to 2006, before collapsing in 2008, and the recession lasted from 2011 to 2013. After 2013, Vietnam's

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real estate market recovered slowly and soared from 2016. Every stage of the real estate market often leads to the cooperation of the stock market and the banking system and capital flows. The booming of the real estate market in Vietnam can affect macroeconomic activities by impacting urbanization, infrastructure development, fiscal policy, monetary policy, and even the legal system. Thus, research on the real estate industry fulfills theoretical and empirical insights into the Vietnamese economy, an emerging and potential market for international investors.

The capital structure is one of the hot financial topics among researchers and scholars. Its importance comes from the fact that capital structure is closely related to companies' ability to meet different stakeholders' needs. The capital structure represents the main requirements for a group asset. It includes different types of equity and liabilities (Riahi-Belkaoui, 1999). The theory of the capital structure was presented by Modigliani and Miller (1958). Significant theoretical and empirical extensions followed and a broad consensus model, at least until recently, were companies choosing an optimal debt level based on the trade-off between interest and debt costs (Krishnan & Moyer, 1997). According to the trade-off theory, the target capital structure is the point at which the benefits from increasing debt are eliminated by the additional costs of financial bankruptcy. Capital structure trade-off theory aims to explain why businesses are often financed partly by debt, partly by equity. A financial bankruptcy occurs when a business cannot afford to fulfill its commitments to creditors because EBIT is lower than interest payments. It is also argued that profitable companies are less likely to depend on debt than lower-profit companies, and high-growth companies have a higher debt to equity ratio (Tian & Zeitun, 2007). There is no doubt that many benefits of using debt in the capital structure of companies. The benefit of debt financing is the tax deduction of interest rates, resulting in lower capital costs (Krishnan & Moyer, 1997). If debt financing always increases shareholders' income, every company will be financed 100% of the debt. However, there are individual costs related to debt financing. Therefore, a specific debt-capital mix will be decided between the two extremes of total capital financing and full debt financing.

The next part will summarize the related literature. After that, the research method and the results will be presented. Last, but not least, the conclusion will discuss the finding, as well as the limitation and suggestions for further research.

2. Literature Review

2.1. Capital Structure

Modigliani and Miller (1958) stated that financial decision was not relevant to the firm's value. That declaration was called MM proposition, one of the keystones in modern corporate finance theory. However, to justify their announcement, those authors also gave some of the primary conditions, including free-cost arbitrage opportunities, no tax, and a perfectly competitive market while "other things are equal." Practically, there is a big gap between MM theorem's perfect world and the real world where tax, cost of financial distress, managerial problems, asymmetric information, and effects of the implied signal after news revelation to the market. As a result, a more relaxed version of MM proposition was mentioned and led to an establishment of the optimal capital structure, which implied that by employing the market conditions such as cost and benefit of borrowing, the management could achieve the shareholder's aim's value maximization. Consequently, the change of corporate leverage can be explained as a deliberate response to the debt ratio's current deviation from an optimal level. This pattern has been theoretically justified by the trade-off model in the capital structure.

2.2. The Theoretical Background

Frank and Goyal [12] discussed the Trade-off model derived from its name, "Trade-off." The concept of cost and benefit consideration was introduced as soon as the suggestion for MM theorem relaxation (Khoa, 2020). Miller (1988) believed that, while tax saving from interest expense benefited the borrowers, the foreseen risk of bankruptcy would offset the tax gain because of higher direct and indirect borrowing costs. Therefore, there would be the equilibrium at which cost and a tax benefit of debt could cancel-out each other, and value to equity investors would be the most significant (Myers, 1984). In other words, economic benefit in dollar amount was the primary motivation for any financing decision under the assumption that the management aimed to attain the shareholders' asset maximization. Each firm would determine its owned target level of debt ratio as the optimal according to some factors suggested by prior works like characteristics of the industry in which the firm was operating its business (Schwartz & Aronson, 1967), R&D expenditure (Long & Malitz, 1985), and opportunities to get positive NPV investment (Smith Jr & Watts, 1992). The Trade-off model assumed that any variation in the gearing for each year would be adjusted towards the optimal level of leverage with a specific target debt ratio. However, Chirinko and Singha (2000) doubted that the target debt ratio also changed over time, rather than being a constant figure. Therefore, we employed the target debt ratio as a function of determinants from a long-term perspective. The determinants of capital structure are discussed in the next section.

2.3. Determinants of Capital Structure

2.3.1. Market-to-Book Ratio

Market-to-Book ratio (MTB) measures market expectations for the value of investment opportunities and growth of the company. The increase in the probability of success of the positive NPV investment opportunities will enlarge MTB because investors will prefer higher quality projects. Johnson (1997) emphasizes the issue of asset replacement in this association because the growth opportunities related to MBR are deemed intangibles in the sense that companies with proportionately more collateralizable tangible assets for secured debt would experience some difficulties when switching to risk projects. Rajan and Zingales (1995) pointed out that the two main reasons for the negative relationship between MTB and leverage. First, there is an expectation that the cost of financial distress will increase when MTB increases. Second, companies like to issue equity when the stock is overvalued. Besides, Myers (1977) argues that companies with growth opportunities should use less debt to minimize agency problems. Therefore, MTB has a negative impact on the debt ratio. Companies use less debt to finance in the period of rapid growth because of increased risks for creditors incurred when exploiting when (1) managers take higher risks to increase return on equity and lead to an interest rate increase and (2) prescribe restrictions on the ability of managers to participate in new investment projects in debt contracts.

2.3.2. Profitability

The effect of profit on leverage is not consistent in most empirical studies. Companies with higher profit should have higher leverage in the trade-off theory because they have more income to tax shields. Free cash flow theory will suggest that more profitable companies should use more debt to discipline managers, to make them pay cash instead of spending money on inefficient projects (Bauer, 2004). Ab Wahab and Ramli (2014); Tomak (2013) recommended a negative relationship between leverage and profitability. Many companies prefer to use internal capital rather than outside. Bauer (2004) mentioned that companies with good business results would have less need to use external capital to lower leverage.

2.3.3. Firm Size

According to Warner (1977), an enterprise's bankruptcy cost has an inverse relationship with its market value, implying that large companies may not face significant difficulties in raising an external loan. Assuming that an enterprise's size is inversely proportional to the probability of bankruptcy, these arguments can explain the positive relationship between firm size and market leverage.

Much research has mentioned that the leverage ratio is related to firm size. However, there are many contrary results on the relationship between the size and leverage of the company. The trade-off theory predicts that a large company is more diversified, less risky, and less bankrupt. Thus, it may prefer debt rather than equity financing for control. Control considerations support a positive correlation between size and leverage. Therefore, large companies should be better utilized (Gaud, Jani, Hoesli, & Bender, 2005; Tomak, 2013). However, Ab Wahab and Ramli (2014) realized the negative impact of firm size on debt ratios. Non-significance is another result of the relationship between firm size and debt ratios (Ghazouani, 2013).

2.3.4. Tangibility

Previous studies predicted the positive impact of tangibility and the negative influence of intangibility on leverage (Antonious, Gune, & Paudyal, 2002; Titman & Wessels, 1988). As discussed by Paudyal et al. [28], tangible assets can be used as collateral for bank loans. Therefore, the more tangible the company is, the company can obtain more debt financing. However, according to Acaravci (2015); Öztekin (2015), asymmetric information makes equity financing less costly for mature and more tangible companies, and adverse-selection problems may motivate small and less tangible firms to borrow. Therefore, the impact of tangibility on leverage is ambiguous and dependent on the nature of the sample.

2.3.5. Liquidity

According to Antonious et al. (2002), internal funding is the priority in pecking order theory, although we do not aim at testing that theory in this paper. A high level of liquid assets enables the company to raise funds sustainably without significantly depending on external sources of finance. Accordingly, liquidity is expected to have a negative impact on the company's leverage.

2.3.6. Tax-related Incentives

Modigliani and Miller (1958) argued the tax incentives for corporate debt financing. Interest expense arising from financial liabilities is tax-deductible. For that reason, debt is considered a tax shield that reduces taxable income, and thus, corporate tax liabilities. Undoubtedly, companies with

a high corporate tax rate may have more incentive to use debt as a tax shield. However, there is no significant impact on firm leverage's effective corporate tax rate (Antonious et al., 2002; Titman & Wessels, 1988). Antonious et al. (2002) justify their finding by discussing the positive effect of the high corporate tax rate on the cost of capital, which, in turn, reduces the demand for external funds. The impact of the effective tax rate on debt financing, therefore, is under controversy.

Another aspect of tax-related incentives is a non-debt tax shield created by depreciation expenses and other non-cash charges. DeAngelo and Masulis (1980) explained that a non-debt tax shield reduces the tax-related incentive of using debt financing, resulting in less leverage. Many previous studies have found the negative impact of a non-debt tax shield (Acaravci, 2015; Kim & Sorensen, 1986; Titman & Wessels, 1988). We predict the impact of a non-debt tax shield on leverage is negative.

3. Research Methods and Materials

Deriving from the above theoretical framework and empirical evidence, we specify the research model in the following steps to achieve this study's objective. By employing the trade-off theory to explain the motivation of capital structure changes, we assume that the annual change in debt ratio depends on how far the current debt ratio diverts from the target debt ratio, and this change will occur in a pre-determined adjustment rate. Equation (1) illustrates the trade-off theory.

$$\mathrm{DTA}_{i,t} - \mathrm{DTA}_{i,t-1} = \theta(\mathrm{DTA}*_{i,t} - \mathrm{DTA}_{i,t-1}) \qquad \text{(Eq.1)}$$

Where:

$DTA_{i,t}$: Debt ratio of company i in year t

$DTA_{i,t-1}$: Debt ratio of company i in the year (t-1)

$DTA*_{i,t}$: Target debt ratio of company i in year t

$DTA_{i,t} - DTA_{i,t-1}$: the annual change of debt ratio in year t

$DTA*_{i,t} - DTA_{i,t-1}$: the movement of current debt ratio toward target debt ratio.

The target debt ratio is determined as a function of factors discussed by Antonious *et al.* (2002). We can summarize the determination of the long-term target debt ratio in Equation (2) below.

$$\mathrm{Debt}^{*}_{i,t} = \sum_{k=1}^{n} \alpha_k X_{k,i,t} + v_{i,t} \qquad \text{(Eq.2)}$$

Where:

$DTA*_{i,t}$: Target debt ratio of company i in year t

$X_{k,i,t}$: factor kth influencing the capital structure of company i in year t

α_k: long-term co-efficient of factor kth influencing the company's capital structure

$v_{i,t}$: error of the model

Replacing the target debt ratio in (Eq.1) by the function in (Eq.2), we have the ultimate model in which the current debt ratio is the function of the previous debt ratio and determining factors of the target debt ratio.

$$\mathrm{DTA}_{i,t} = (1-\theta)\mathrm{Debt}_{i,t} - 1 + \sum_{k=1}^{n} \beta_k X_{k,i,t} + \varepsilon_{i,t} \qquad \text{(Eq.3)}$$

The empirical research model is specified in the form of a linear regression model on panel data. The lagged dependent variable's existence as an explanatory variable makes the model a dynamic panel regression that potentially contains endogeneity.

The system Generalized Method of Moments (Sys-GMM) is proposed to solve endogeneity in dynamic panel data (Antonious et al., 2002; Arellano & Bond, 1991; Öztekin, 2015). The summary of dependent and independent variables is displayed in Table 1. The data set includes indicators of 38 real-estate enterprises, which are listed in the Ho Chi Minh City Stock Exchange (HOSE) in Vietnam. The time allocation of data is the period from 2010 to 2018. The real estate market in Ho Chi Minh City in the period from 2006 to 2015 despite experiencing ups and downs, but after every five years, the market size has nearly doubled, specific In the 2006-2010 period, the growth rate was 0.9 times, but in the 2011-2015 period, the growth rate was 1.6 times, contributing to boosting the city's socio-economic development. In 2016 and the first eight months of 2017, the real estate market has shown signs of slowing down, especially in the segment of high-end real estate apartments from three bedrooms or more, real estate for tourism, though, the real estate market still maintains relatively stable development (Chau, 2017). The data is processed by Stata 15 software.

The mean of DTA in 2010-2017 is 56 percent, with the standard deviation being 16 percent. On the other hand, the mean of ROA of Vietnamese real estate companies is small (3 percent), while the standard deviation is 6 percent, reflecting the real estate industry's risky nature. The low standard deviation of SIZE implies that the companies in the sample are relatively comparable. The GROWTH is affected by extreme value because of the variance in the business cycle of each firm. However, the positive and negative outliers have offset each other; the mean of GROWTHA overall may not be too distorted. Negative growth existed between 2011 and 2013 when the real estate market decreased due to the post-crisis recession. The value of the minimum and maximum value and the number of observations are shown in Table 2.

Table 1: The summary of variables

Variable	Formula	Expected signs	Previous studies	Data sources
Dependent variable				
DTA	$\frac{\text{Total Debt}}{\text{Total Asset}}$		Antonious *et al.* (2002); Frank and Goyal (2008); Öztekin (2015)	Calculated from financial data
Independent variable				
L.DTA	Lagged DTA	+	Acaravci (2015); Antonious *et al.* (2002)	Calculated from financial data
MTB	$\frac{\text{Market Capitalization}}{\text{Total Equity}}$	-	Rajan and Zingales (1995)	
ROA	$\frac{\text{Return}}{\text{Total Asset}}$	-	Acaravci (2015); Öztekin (2015)	
TANG	$\frac{\text{Net fixed Tangible Asset}}{\text{Total Asset}}$	+/-	Frank and Goyal (2008); Öztekin (2015)	
SIZE	Natural logarithm of Total Asset	+/-	Antonious *et al.* (2002)	
GROWTHA	$\frac{\text{Total Asset}_t}{\text{Total Asset}_{t-1}} - 1$	-	Titman and Wessels (1988)	
NDTS	$\frac{\text{Depreciation}}{\text{Total Asset}}$	-	Acaravci (2015); DeAngelo and Masulis (1980); Titman and Wessels (1988)	
TAX	$\frac{\text{Corporate Taxes}}{\text{Taxable Income}}$	+/-	Antonious *et al.* (2002)	
LIQ	$\frac{\text{Current asset}}{\text{Current Liabilities}}$	-	Antonious *et al.* (2002)	

Table 2: Descriptive Statistic

Variable	Mean	Std.Dev	Min	Max
DTA	0.56	0.16	0.11	0.86
DTE	1.66	1.24	0.13	8.01
MTB	0.66	0.45	0.08	3.21
GROWTHA	0.15	0.31	(0.59)	2.86
ROA	0.03	0.06	(0.47)	0.35
TANG	0.08	0.10	0.00	0.68
SIZE	14.87	1.25	12.31	19.48
NDTS	0.00	0.02	(0.15)	0.11
TAX	0.18	0.27	(1.42)	2.92
LIQ	2.22	1.47	0.23	10.16

4. Results and Discussion

The empirical result is achieved by employing the system GMM method to estimate the coefficients of independent variables. Statistical evidence in Table 2 shows that the model is significant in explaining the impacts of determinants on the debt-to-asset ratio, which is the proxy representing the level of leverage. The test of autocorrelation proposed by Arellano and Bond (1991) proved that the model has first-order serial correlation (AR(1)), but rejected the hypothesis for a second-order serial correlation. With the first-order lagged term of the dependent variable, AR(1) is expected and solved using system GMM. Therefore, we can conclude that the autocorrelation problem is insignificant. Besides, the test of overidentification based on Hansen (1982); Sargan (1958) cannot reject the exogenous instrument variable's null hypothesis. Consequently, the estimated coefficients are reliable and robust.

Table 3: Results of the dynamic panel regression with System GMM (Debt-to-Asset as the dependent variable)

Variable	Expected sign	System GMM
L.DTA	+	0.862*** (31.630)
MTB	-	0.0110* (2.550)
GROWTHA	-	0.120*** (13.930)
ROA	-	-0.380*** (-4.50)
TANG	+/-	-0.0714*** (-5.19)
SIZE	+/-	-0.001 (-0.29)
NDTS	-	-0.213** (-3.07)
TAX	+/-	0.0154*** (3.790)
LIQ	-	-0.00867*** (-3.65)
_cons		0.105*** (4.020)
Prob > chi-squared		0.000
Sargan test (Prob > Chi-squared)		0.726
Hansen test (Prob > Chi-squared)		0.912
Arellano-Bond test for AR(1)		0.000
Arellano-Bond test for AR(2)		0.243

Note: * p<0.05, ** p<0.01, *** p<0.001.

According to Table 3, the debt-to-asset ratio's impact in a one-year lagged term on the current debt-to-asset ratio is statistically significant at 0.1 percent, implying that the debt ratio level will change annually in a dynamic pattern. The speed of change in the debt ratio depends on the deviation of the previous debt ratio compared to the target debt ratio, as being shown in (Eq1) and (Eq3). Accordingly, the debt-to-asset ratio will adjust approximately 13.8 percent (=1-0.862) of the difference between the 1st lagged term and the debt-to-asset ratio's target level.

Also, factors representing growth opportunities, including Market-to-Book ratio and annual growth of total assets, have a significant negative relationship with debt ratio, confirming the previous empirical evidence from Myers (1977); Rajan and Zingales (1995). The profitability of companies in the sample also reduces the motivation of obtaining more debt because the internal source of funding is sufficient to finance new projects, as being stated by Ab Wahab and Ramli (2014); Tomak (2013).

Although most of the previous studies on trade-off theory believed in a positive relationship between tangibility and leverage, agency theory infers the opposite correlation because asymmetric information on the Vietnamese stock market creates incentives for highly tangible firms to exploit equity issuance rather than debt financing.

The fact that firm size does not affect the leverage decision reflects previous studies' mixed empirical results. On the one hand, large firms are believed to be more reliable, more diversified, and less risky than the others, thus enjoying a lower cost of debt and having more incentive to use debt financing. However, because most debt financing in Vietnam is bank loans, the debt issuance may be made depending on discrete real estate projects, relatively irrelevant to firm size.

The impacts of tax-related factors, including non-debt tax shield and effective tax rate, can be theoretically justified. According to DeAngelo and Masulis (1980), a non-debt tax shield discourages the intention of debt usage, and this behavior is confirmed in our empirical results. With high tangibility, depreciation expense is significant for real estate companies to take advantage of the depreciation tax shield, thus reducing their motivation to employ debts for their tax-deductible advantage. Furthermore, companies with high effective corporate tax rates reasonably use debt as a tax shield and improve operating cash flows.

Antonious et al. (2002) discussed the role of liquidity with the motivation of debt financing. They argued that liquid companies were less likely to raise external funding to meet due financial obligations. The same situation can be observed in the Vietnamese real estate field, where companies with significant liquid assets may be less levered than their more illiquid rivals.

5. Conclusion

Using the sys-GMM method, this research solved the endogeneity issue in the dynamic panel regression to examine the validity of the trade-off model in Vietnamese listed real estate companies' capital structure. The empirical result confirms the significant impacts of growth opportunities, profitability, tangibility, liquidity, and tax-related incentives on the capital structure proxied by debt to asset ratio. Furthermore, the factor representing the "trade-off" element in the model is statistically significant, implying a positive co-movement of current debt ratio and previous debt ratio at one-period lag towards dynamic target leverage. The speed of changing the annual debt ratio is estimated at 14 percent of the previous debt ratio's diversion from the target debt ratio determined by the mentioned factors. Further studies should be performed to test the trade-off model in other industries for more careful consideration.

The research is conducted on a sample of companies in the real estate industry, a growing business in an emerging country like Vietnam. In such a rapidly moving environment, the economic relationship may not be consistent in the long-term. Therefore, the empirical result obtained from this study needs to be re-examined in a longer prospect. Although this paper has solved the endogeneity problem raised by Frank and Goyal (2008), the research scope is limited to a specific sector without comparison with other industries such as manufacturing, utilities, trading, or transportation.

Further research on the same topic with more comprehensive and multi-industrial data should be conducted to derive a more general conclusion. On the other hand, the study lacks some determinants mentioned by previous research, such as company uniqueness (Titman and Wessels, 1988), earning volatility, and market-related factors because of the database limitation. We would like to consider applying the trade-off model in light of new input data, gaining more valid empirical evidence.

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