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Trade-off in Capital Structure Decision in Emerging economies

[1]Bui Thanh Khoa, [2]Duy Tung Thai

Abstract - *Accompanied by the rise of Real Estate transactions is the establishment, development, and competition among real estate businesses. The study aims to test the existence of trade-off theory in capital structure among real estate companies in the emerging economies stock market, case of Vietnam. 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. This approach requires a dynamic panel data regression, which is estimated by system Generalized Method of Moment (Sys- GMM). Our empirical evidence shows that real estate companies listed in the Vietnamese stock market may change their leverage toward a target capital structure, which is 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, system Generalized Method of Moments (Sys-GMM), Trade-Off Theory, Real Estate Company.*

I. INTRODUCTION

Vietnam's economic growth has recovered with the rise of the global economy [1]. 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 [2]. The development of fields such as e-commerce [3, 4], education [5], science and technology [6], real estate business is a good premise for the development of Vietnam's economy. Undoubtedly, Vietnam is still superior to 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 [7], Vietnam's urbanization rate is 2.6%, the highest rate 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 estate market, such as direct financing, taxes, interest rates, were implemented during this period as a result of the previous real estate session of the real estate market.

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 top rich Vietnamese are owners of real estate

[1] First author, Industrial University of Ho Chi Minh City, Vietnam. Email: buithanhkhoa@iuh.edu.vn, khoadhcn@gmail.com
[2] Corresponding author, Industrial University of Ho Chi Minh City, Vietnam. Email: thaiduytung@iuh.edu.vn

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companies, such as Vin Group, FLC, 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 in the period from 2003 to 2006, before going into collapse in 2008 and the recession lasted from 2011 to 2013. After 2013, Vietnam's 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, as well as capital flows. The booming of the real estate market in Vietnam can affect macroeconomic activities through impacts on urbanization, infrastructure development, fiscal policy, monetary policy, and even the legal system. Research on the real estate industry, thus fulfills both theoretical and empirical insights into the Vietnamese economy, an emerging and potential market for international investors.

The capital structure is one of the financial topics among researchers and scholars. Its importance comes from the fact that capital structure is closely related to the ability of companies to meet the needs of different stakeholders. The capital structure represents the main requirements for a group asset. It includes different types of equity and liabilities [8].

The theory of the capital structure presents by Modigliani and Miller [9]. 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 [10]. 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 [11]. 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 [10]. If debt financing always increases income for shareholders, every Company will be financed 100% of the debt. However, there are individual costs related to debt financing. Therefore, between the two extremes of total capital financing and full debt financing, a specific debt-capital mix will be decided.

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

II. LITERATURE REVIEW

Capital Structure

Modigliani and Miller [9] stated that financial decision was not relevant to the value of the firm. That declaration was called MM proposition, which has been one of the keystones in modern corporate finance theory. However, in order to satisfy 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 the perfect world of MM theorem 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 as well 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 aim of the shareholder's value maximization.

Consequently, the change of corporate leverage can be explained as a deliberate response to the current deviation of the debt ratio from an optimal level. This pattern has been theoretically justified by the trade-off model in the capital structure.

The theoretical background

As discussed by Frank and Goyal [12], the Trade-off model was derived from its name, "Trade-off." The concept of cost and benefit consideration was introduced as soon as the suggestion for MM theorem relaxation. Miller [13] 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 [14]. 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 [15], expenditure for R&D [16] and opportunities to get positive NPV investment [17]. The trade-off model assumed that with a specific target debt ratio, any variation in the gearing for each year would be adjusted towards the optimal level of leverage. However, Chirinko and Singha [18] 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.

Determinants of Captial Structure

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 [19] 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 [20] 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 [21] 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.

Profitability

The effect of profit on leverage is not consistent in most empirical studies. In the trade-off theory, companies with higher profit should have higher leverage 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 [22]. Tomak [23], Ab Wahab and Ramli [24]

recommended that there is a negative relationship between leverage and profitability. Many companies prefer to use internal capital rather than outside. Bauer [22] mentioned that companies with good business results would have less need to use external capital so that leverage will be lower.

Firm size

According to Warner [25], the bankruptcy cost of an enterprise has an inverse relationship with its market value, implying that large companies may not face significant difficulties in raising an external loan. Assuming that the size of an enterprise is inversely proportional to the probability of bankruptcy, these arguments can help explain the positive relationship between firm size and market leverage.

Much research has mentioned that leverage ratio 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 [23, 26]. However, Ab Wahab and Ramli [24] realized that the negative impact of firm size on debt ratios. The non-significance is another result of the relationship between firm size and debt ratios [27].

Tangibility

Previous studies predicted the positive impact of tangibility as well as the negative influence of intangibility on leverage [28, 29]. Tangible assets, as discussed by Paudyal, et al. [29], 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 [30], Öztekin [31], 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.

Liquidity

According to Paudyal, et al. [29], 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.

Tax-related incentives

Modigliani and Miller [9] 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 not a significant impact on the effective corporate tax rate on firm leverage [28, 29]). Paudyal, et al. [29] 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, which is created by depreciation

expenses and other non-cash charges. DeAngelo and Masulis [32] explained that a non-debt tax shield reduces the tax-related incentive of using debt financing, and therefore result in less leverage. The negative impact of a non-debt tax shield has been found by many previous studies [28, 30, 33]. We predict the impact of a non-debt tax shield on leverage is negative.

III. RESEARCH METHOD

Deriving from the above theoretical framework and empirical evidence, we specify the research model in the following steps to achieve the objective of this study. By employing the trade-off theory to explain the motivation of changes in capital structure, 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.

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

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 as being discussed by Paudyal, et al. [29]. We can summarize the determination of long-term target debt ratio in the Equation (2) below.

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

Where:

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

$X_{k,i,t}$: factor k^{th} influencing the capital structure of Company i in year t

α_k: long-term co-efficient of factor k^{th} 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.

$$DTA_{i,t} = (1-\theta)Debt_{i,t} - 1 + \sum_{k=1}^{n} \beta_k X_{k,i,t} + \varepsilon_{i,t} \text{ (Eq.3)}$$

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

In order to solve the problem of endogeneity in dynamic panel data, the system Generalized Method of Moments (Sys- GMM) is proposed [29, 31, 34]. 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 Hochiminh City Stock Exchange (HOSE) in Vietnam. The time allocation of data is the period of 2010 – 2018. The real estate market in Ho Chi Minh City in the period of 2006 - 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 03 bedrooms or more, real estate for tourism, though, the real estate market still maintains relatively stable development [35]. The data is processed by Stata 15 software.

Table 1. The summary of variables

Variable	**Formula**	**Expected signs**	**Previous studies**	**Data sources**
Dependent variable				
DTA	$\frac{\text{Total Debt}}{\text{Total Asset}}$		Frank and Goyal [12], Paudyal, et al. [29], Öztekin [31]	Calculated from financial data
Independent variable				
L.DTA	Lagged DTA	+	Paudyal, et al. [29], Acaravci [30]	Calculated from financial data
MTB	$\frac{\text{Market Capitalization}}{\text{Total Equity}}$	-	Rajan and Zingales [20]	Calculated from financial data
ROA	$\frac{\text{Return}}{\text{Total Asset}}$	-	Acaravci [30], Öztekin [31]	Calculated from financial data
TANG	$\frac{\text{Net fixed Tangible Asset}}{\text{Total Asset}}$	+/-	Frank and Goyal [12], Öztekin [31]	Calculated from financial data

Variable	Formula	Expected signs	Previous studies	Data sources
SIZE	Natural logarithm of Total Asset	+/-	Paudyal, et al. [29]	Calculated from financial data
GROWTHA	$\frac{\text{Total Asset}_t}{\text{Total Asset}_{t-1}} - 1$	-	Titman and Wessels [28]	Calculated from financial data
NDTS	$\frac{\text{Depreciation}}{\text{Total Asset}}$	-	Titman and Wessels [28], Acaravci [30], DeAngelo and Masulis [32]	Calculated from financial data
TAX	$\frac{\text{Corporate Taxes}}{\text{Taxable Income}}$	+/-	Paudyal, et al. [29]	Calculated from financial data
LIQ	$\frac{\text{Current asset}}{\text{Current Liabilities}}$	-	Paudyal, et al. [29]	Calculated from financial data

The mean of DTA in the period 2010-2017 is 56 percent, with the standard deviation is 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 risky nature of the real estate industry. 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 mainly in the period between 2011 and 2013 when the real estate market decreased as the result of the post-crisis recession. The value of the minimum and maximum value, as well as the number of observations, is showed in Table 2.

Table 2. Descriptive Statistic

Variable	Obs	Mean	Std.Dev	Min	Max
DTA	342	0.56	0.16	0.11	0.86
DTE	342	1.66	1.24	0.13	8.01
MTB	342	0.66	0.45	0.08	3.21
GROWTHA	342	0.15	0.31	(0.59)	2.86
ROA	342	0.03	0.06	(0.47)	0.35
TANG	342	0.08	0.10	0.00	0.68

SIZE	342	14.87	1.25	12.31	19.48
NDTS	342	0.00	0.02	(0.15)	0.11
TAX	342	0.18	0.27	(1.42)	2.92
LIQ	342	2.22	1.47	0.23	10.16

IV. RESULT AND DISCUSSION

The empirical result is achieved by employing the system GMM method to estimate the coefficients of independent variables. Statistical evidence in Table 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 [34] proved that the model has first-order serial correlation (AR(1)) but rejected the hypothesis for a second-order serial correlation. With the existence of the first-order lagged term of the dependent variable, the problem of AR(1) is expected and solved by the use of system GMM. Therefore, we can conclude that the autocorrelation problem is insignificant. Besides, the test of overidentification based on the approach of Sargan [36], Hansen [37] cannot reject the null hypothesis of the exogenous instrument variable. Consequently, the estimated coefficients are reliable and robust.

According to Table 3, the impact of debt-to-asset ratio in a one-year lagged term on the current debt-to-asset ratio is statistically significant at 0.1 percent, implying that the level of debt ratio 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 target level of the debt-to-asset ratio.

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)
Obs		304
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*

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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 Rajan and Zingales [20], Myers [21]. 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 Tomak [23], Ab Wahab and Ramli [24]

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 the mixed empirical results of previous studies. 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 [32], 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 depreciation tax shield, and thus, to reduce 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.

Paudyal, et al. [29] 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.

V. CONCLUSION

By using the system GMM method, we have solved the endogeneity issue in the dynamic panel regression to examine the validity of the trade-off model in the capital structure of Vietnamese listed real estate companies. 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 [12], the scope of research is limited in a specific sector without comparison with other industries such as manufacturing, utilities, trading, or transportation.

Further research on the same topic with a more comprehensive and multi-industrial data should be conducted in order to derive a more general conclusion. On the other hand, the study lacks some determinants mentioned by previous researches such as company uniqueness (Titman and Wessels, 1988), earning volatility, and market-related factors [29] because of the limitation of database. We would like to consider the application of the trade-off model in light of new input data, gaining more valid empirical evidence.

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