

[DOI: 10.20472/EFC.2023.019.015](https://doi.org/10.20472/EFC.2023.019.015)

THARINEE PONGSUPATT

Faculty of Business Administration, Kasetsart University, Thailand

APICHAT PONGSUPATT

Faculty of Business Administration, Kasetsart University, Thailand

DETERMINANTS OF CAPITAL STRUCTURE ON BANKING SECTOR CASE STUDY: LISTED COMPANY IN THAILAND STOCK EXCHANGE

Abstract:

The objective of this paper is to examine factors affecting capital structure in the banking sector. Two categories of explanatory variables consist of internal and external factors. Internal factors were divided into six variables including profitability, owner, market value, size, tangible assets, and intangible assets. External factors are economic determinants which are made up of interest rate and gross domestic product. Capital structure is measured by debt ratio. The study employed multiple regressions and panel data analysis in the capital structure in the banking sector. The population are 11 banks listed in Thailand stock exchange. The data is collected quarterly from the period of 2012 – 2021 with total of 40 quarters. Secondary data was collected through Thailand Stock Exchange website and analyzed using multiple regression model with statistic testing at the significant level of 0.05. The result shows that the firm's market value, tangibility, firm's size and interest rate are positively associated with capital structure while firm's profitability and ownership are negatively associated with leverage. The study recommends the bank managers, financial analysts and policy maker should better understanding about the factors which may influence the capital structure of Thailand banking sector.

Keywords:

Capital Structure, Banking Sector, Leverage, Panel Data

JEL Classification: M19, M41, C12

1. Introduction

The expansion of economy in Thailand depends on the stability of the financial institutions since they play an important role in driving the sustainable economy. Because the bank has its main duty to accept deposits from the public repayable on demand and invests or lends the money. The bank is also an intermediary for transferring funds to public and private sectors in various forms of credit. Capital is the initial factor used in business operations, including companies that want to expand their business. An appropriate capital structure [Kraus & Litzenberger (1973); La Rocca et.al. (2009); Anarfo (2015)] which is the main goal that every company needs, must be able to create maximum profit for the shareholders. Atoniou et.al. (2008) stated that the capital structure of a firm is heavily influenced by the economic environment and its institutions, tax systems and exposure to capital markets for instance. The purpose of this paper is to examine the capital structure of banking sectors listed on the Stock Exchange of Thailand.

The content of this study has been separated into five sections. Section 2 presents the review of literature. Section 3 explains methodology used in the study. Section 4 provides empirical results and discussion. Finally, Section 5 represents the conclusion of the study.

2. Related concepts, theories, and literature review

2.1 Capital Structure theories

Companies can choose to use several types of funding sources such as blend of debt, equity or hybrid securities, but each source of funding has its own value. Therefore, there is an idea to find the appropriate level of capital structure (Optimal Capital Structure). Optimal capital structure means a minimum weighted average cost of capital and thus maximizes the value of organization (Saeed et.al.,2013). The renown theories that can explain about the debt-equity choice are pecking order theory, trade-off theory and agency theory [Titman and Wessels (1988); De Miguel and Pindado (2001); Güner, A. (2016)].

2.1.1 Pecking order theory

This theory insists that the firm will borrow, rather than issuing equity, when internal cash flow is not sufficient to fund capital expenditures. Since an announcement of new share issue is referred as negative signal which will lead to stock price drop. According to the pecking order, retained earnings or internal financing, low risk debt and external equity financing will be funded respectively.]

2.1.2 Trade-off theory

Trade-off theory mentions that firms seek optimal or target debt-to-firm value ratio that balance the benefits of debt and cost of debt and equity. Firm will borrow up to the point where marginal value of tax shields on additional debt is offset by the increase in the present value of possible costs of financial distress from possibility of bankruptcy or reorganization. In other words, the main benefit of debt is tax deductibility of interest, which is balanced against bankruptcy costs and agency costs. The tradeoff theory predicts moderate borrowing by tax-paying firms.

2.1.3 Agency theory

This theory asserts that by increasing the level of firm debt, shareholders will have more control over management. Shareholders may encourage a higher level of debt as it requires the firm to pay out cash to service the debt, reducing the funds available for managers to misuse. Agency theory claims that dangerously high debt levels will increase value despite the threat of financial distress. The free cash flow theory is designed for mature firms that are prone to overinvest but does not give a theoretical solution to the question of how much leverage is too much.

2.2 Literature review

Many studies explore factors influencing capital structures in the banking sector. The papers were found in different countries and dissimilar conclusions are found as the following selected examples.

Al-Shubiri, F.N. (2011) provides new insights into the way in which capital structure, market power, and profitability are related. The data of fourteen banks listed on the Amman Stock Exchange for the period from 2005 to 2008 was collected. The paper examines the dependent variables, which are expressed by total debt deflated by total assets, while the independent variables are Tobin Q, Growth, Profitability, Size, Ownership, Risk and Tangibility ratio. The results indicate that, at the lower and higher ranges of Tobin's Q, banks employ higher debt, and reduce their debt at intermediate range. This is due to the complex interaction of market conditions, agency costs, and bankruptcy costs. The paper also finds that size and tangibility variables have a positive influence both on capital structure while risk and ownership variables have a negative influence on capital structure.

Abbadi and Abu-Rub (2012) aims at finding the relationship between the market efficiency and capital structure of Palestinian financial institutions. The study establishes a model to measure the effect of capital structure on the bank efficiency measured by ROE, ROA, total deposit to assets, total loans to assets and total loans to deposits were used to measure capital structure. It is found that leverage has a negative effect on bank profits, an increase in each ROA and total deposit to assets increases bank efficiency. They tested the effect of the above variables on bank market value measured by Tobin's Q. It was also found that Leverage has a negative effect on the market value of the bank, a positive and strong relationship between market value and ROA and bank deposits to total deposits.

Aremu et.al. (2013) reveal that the main determinant factors which contribute to the bank leverage level of the Banking industry in Nigeria between the years 2006 to 2010 are mainly bank size, dividend payout, profitability, tangible assets, growth, business risk and tax charge factors with all of these factors conforming to sign expectations based on theoretical findings.

Anarfo (2015) indicates that the return on asset, size, asset tangibility, growth rate of banks and inflation rates are statistically significant in determining the capital structure of banks in Sub-Saharan Africa. However, corporate marginal tax rate, GDP growth rate and the interest rate on loans are not statistically significant in determining banks capital structure in Sub-Saharan Africa.

Řepková, I. (2015) examines determinants of efficiency in the Czech banking sector within 2001-2012. Determinants of banking efficiency were estimated using panel data analysis. The level of capitalization, liquidity risk and riskiness of portfolio had a positive impact on banking efficiency. ROA, interest rate and GDP had a negative impact on efficiency in CCR model. In BCC model, the liquidity risk and riskiness of portfolio had a positive impact on efficiency and GDP had a negative impact on efficiency.

Gohar and Rehman (2016) attempt to test the impact of capital structure on financial performance of banks listed on Karachi Stock Exchange. The study incorporated financial performance variables as dependent and capital structure (financial structure) as independent. The dependent variables are spread ratio, return on assets and earnings per share and independent variables are total debt to total equity, long-term debt to total equity and short-term debt to total equity. They found that all estimators are significantly related with performance.

2.3 Conceptual framework

According to literature reviewing, the conceptual framework is built as shown in Figure 1.

Figure 1: Conceptual Framework

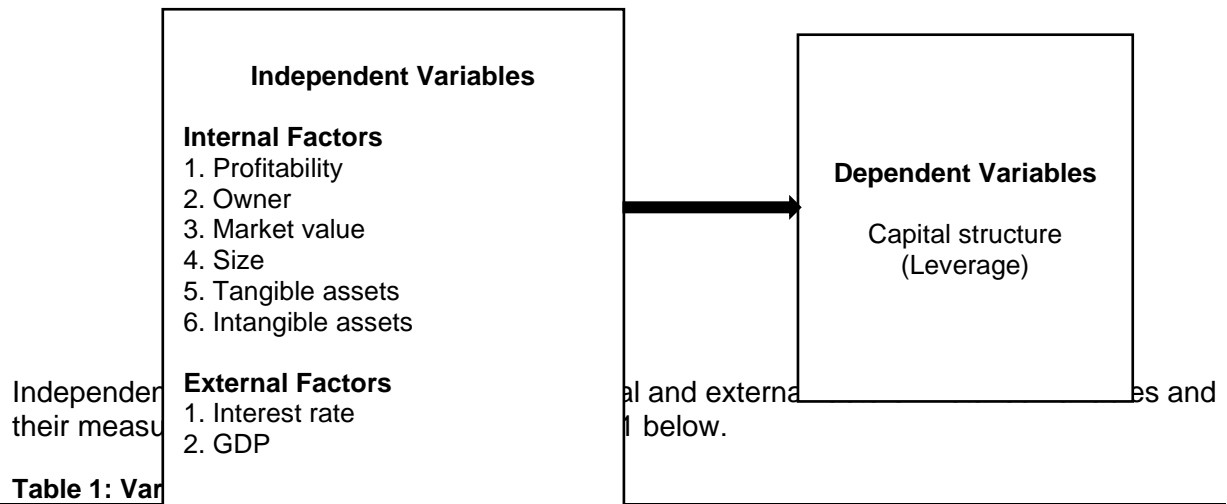


Table 1: Variables and their measurement

Variables	Symbol	Definitions
Independent variables		
<i>Internal factors</i>		
Profitability	PROF	$EBIT \div Total\ assets$
Owner	OWNER	$\log(\text{Number of paid-in capital})$
Market value	MV	$\frac{\text{Market value of Equity} + \text{Total debt}}{\text{Total assets}}$
Size	SIZE	$\log(\text{Total assets})$
Tangible assets	TANG	$\frac{\text{Net property, plants and equipments}}{\text{Total assets}}$
Intangible assets	INTANG	$\frac{\text{Intangible assets}}{\text{Total assets}}$
<i>External factors</i>		
Interest rate	INT	Central bank of Thailand tightens policy
Gross domestic product	GDP	Thailand GDP growth rate
Dependent variable		
Capital structure	LEV	$\text{Total debt} \div \text{Total assets}$

3. RESEARCH METHODOLOGY

3.1. Population and Sample

The population of this study is 11 banks listed on the Stock Exchange of Thailand. The data was collected every quarter for 10 years starting from 2012 to 2021. By gathering listed firms with complete financial information, we found qualified 440 samples.

3.2. Data collection method

Secondary data were derived from Thomson Reuters and Morningstar. Besides using the financial statements of secondary data, we also compiled financial information from the Stock Exchange of Thailand's website, the annual financial statements submitted by the Company

to the Office of the Securities and Exchange Commission (SEC) and the Stock Exchange of Thailand.

3.3. Data analysis methods

Descriptive analysis is used to describe the general characteristics of the sample by using mean, median, maximum, minimum, and standard deviation. Multiple regression analysis has been implemented to fulfill all assumptions such as the normality assumption Test, the linearity assumption test of each of the independent variables with the dependent variable, the Durbin Watson *d* statistic test for detecting serial correlation and the multicollinearity test in trying to understand the significant and the insignificant variables. The multicollinearity can be spotted through the correlation between the explanatory variables and the Variance Inflation Factor (VIF).

3.4 Model Specification

The general specification of the parameters of the model in present case is as follows:

$$\text{LEV} = \beta_0 + \beta_1 \text{OWNER}_{it} + \beta_2 \text{MV}_{it} + \beta_3 \text{PROF}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{TANG}_{it} + \beta_6 \text{INTANG}_{it} + \beta_7 \text{INT}_t + \beta_8 \text{GDP}_t + \varepsilon_{it}$$

Where β_0 = Constant, $\beta_1, \beta_2, \beta_3, \dots, \beta_8$ are coefficients of the corresponding variables. ε_{it} is the error term.

4. Empirical Results and Discussion

4.1 Descriptive statistics

Table 2 below presents the descriptive statistics for the determinants of capital structure in Thailand during 2012 to 2021. The table shows the mean, maximum, minimum, and standard deviation values for each variable. From the table, the average leverage for a ten- years period is 0.8961. The highest leverage is 0.9600 compared to the lowest leverage of 0.5909. Leverage has a standard deviation of 0.0320. The average profit measured by divided EBIT with total asset shows the maximum of 0.1458 times with 0.0090 standard deviation. Among 8 independent variables, GDP has the highest standard deviation of 3.09 which indicates that the value added created through the production of goods and services in Thailand during 2012 to 2021 is the most spread out over a wider range of values.

Table 2: Descriptive statistics of dependent and independent variables (2012-2021)

Variable	Minimum	Maximum	Mean	Std. Deviation
LEV (%)	0.5909	0.9600	0.8961	0.0320
PROF (times)	-0.0026	0.1458	0.0104	0.0090
MV (times)	0.8902	1.3731	1.0417	0.0620
TANG (times)	0.0011	0.0269	0.0118	0.0053
INTANG (times)	0	0.0247	0.0033	0.0036
LN (SIZE)	7.7252	9.5177	8.9000	0.4786
LN (OWNER)	5.7186	7.9839	6.6585	0.5941

INT (%)	1.25	3.50	1.98	0.62
GDP (%)	-4.00	15.50	3.67	3.09

Table 3 explains correlation matrix. The correlation between all the explanatory variables is given as the correlation matrix as shown in table 3. A very high correlation of 0.90 or above between the independent variables shows the presence of possible problematic multicollinearity. However, the current samples display no postulate for the multicollinearity.

Table 3 Correlation Matrix

	LEV	MV	PROF	SIZE	OWNER	TANG	INTANG	INT	GDP
LEV	1								
MV	0.1332	1							
PROF	-0.4419	0.0447	1						
SIZE	0.1386	-0.0971	0.0544	1					
OWNER	0.1047	0.0129	-0.3457	-0.0231	1				
TANG	0.1653	0.5172	-0.0255	0.5311	0.1380	1			
INTANG	0.0547	0.2284	0.0600	0.2803	-0.0760	0.4542	1		
INT	0.2370	0.2312	-0.0235	-0.0953	-0.0203	0.1108	0.1348	1	
GDP	0.0413	0.1509	-0.0766	-0.0624	-0.0136	0.0919	-0.0001	-0.1440	1

From the Correlated Random Effects test, which is a test of how the model's coefficients should be estimated. By applying Hausman model, it was found that the main hypothesis (H_0 : unobserved effect and independent variables in the model are not related) was not rejected at statistical significance at the confidence level of 0.05. This conclusion means that the most appropriate model is a Random Effect Regression Model. The result demonstrates in Table 4

Table 4 Multiple regression analysis results of Random Effect Regression Model (REM)

Variable	Random Effect Regression Model		
	Coefficient	Std. Error	Prob.
CONSTANT	0.834	0.104	0.000
MV	0.048	0.020	0.014*
PROF	-1.499	0.097	0.000*
Ln (SIZE)	0.050	0.009	0.000*
Ln (OWNER)	-0.088	0.012	0.000*
TANG	1.134	0.430	0.009*
INTANG	-0.672	0.394	0.089
INT	0.014	0.002	0.000*
GDP	0.000	0.000	0.077
Observation	440		
R-Square	0.5384		
Adjusted R-Square	0.5277		

The test results of Random Effect Regression Model (REM) in factor analysis shows seven variables influencing the capital structure of banking sectors listed on the Stock Exchange of Thailand. They are market value, profitability, size, ownership, tangible assets and interest rate. When considering the adjusted R-square value from the Random Effect Regression Model, it can explain the variation of variables at 52.77%. A multiple regression can be constructed as follows.

$$\text{LEV} = 0.834 - 0.088 \text{LN}(\text{OWNER}_{it}) + 0.048 \text{MV}_{it} - 1.499 \text{PROF}_{it} + 0.05 \text{LN}(\text{SIZE}_{it}) \\ + 1.134 \text{TANG}_{it} + 0.014 \text{INT}_{it} + \varepsilon_{it}$$

5. Conclusion

The purpose to this study is to examine what internal factors and external factors (macroeconomic determinants) affect capital structure in the banking sector in Thailand Stock Exchange. By analyzing statistical multiple regressions and panel least squares (OLS) using Random Effect Regression Model (REM), the finding shows three internal factors which are market value, size of firm and tangible assets that affect positive to capital structure. Whereas profit and ownership are two internal factors that have a negative relation to capital structure. Interest rate is the only external factor that shows a positive effect to capital structure. Intangible assets and gross domestic product have no effect on the leverage structure chosen by banks in Thailand context. The effect of other factors such as inflation rate, growth rate of total assets, corporate marginal tax rate or political factors may be enclosed in the model for future research.

6. References

- Abbadi, S. M., & Abu-Rub, N. (2012). The effect of capital structure on the performance of Palestinian financial institutions. *British Journal of Economics, Finance and Management Sciences*, 3(2), 92-101.
- Anarfo, E. B. (2015). Determinants of capital structure of banks: Evidence from Sub-Saharan Africa. *Asian Economic and Financial Review*, 5(4), 624-640.
- Antoniou, A., Guney, Y., & Paudyal, K. (2008). The determinants of capital structure: capital market-oriented versus bank-oriented institutions. *Journal of financial and quantitative analysis*, 43(1), 59-92.
- Al-Shubiri, F. N. (2011). Capital structure and market power: Evidence from Jordanian banks. *Managing Global Transitions*, 9(3), 289-310.
- Aremu, M. A., Ekpo, I. C., Mustapha, A. M., & Adedoyin, S. I. (2013). Determinants of capital structure in Nigerian banking sector. *International Journal of Academic Research in Economics and Management Sciences*, 2(4), 27.
- De Miguel, A., & Pindado, J. (2001). Determinants of capital structure: new evidence from Spanish panel data. *Journal of corporate finance*, 7(1), 77-99.
- Gohar, M., & Rehman, M. W. U. (2016). impact of capital structure on banks performance: empirical evidence from Pakistan. *Journal of Economics and Sustainable Development*, 7(1), 32-38.

- Güner, A. (2016). The determinants of capital structure decisions: New evidence from Turkish companies. *Procedia economics and finance*, 38, 84-89.
- Kraus, A., & Litztenberger, R. (1973). A state-preference model of optimal capital structure. *Journal of Finance*, 28(4), 911-922.
- La Rocca, M., La Rocca, T., Gerace, D., & Smark, C. (2009). Effect of diversification on capital structure. *Accounting & Finance*, 49(4), 799-826.
- Mazur, K. (2007). The determinants of capital structure choice: evidence from Polish companies. *International Advances in Economic Research*, 13(4), 495-514.
- Mujahid, M., Zuberi, M. A., Rafiq, M. Q., Sameen, S. N., & Shakoor, M. A. (2014). Impact of capital structure on banking performance. *Research Journal of Finance and Accounting*, 5(19), 99-104.
- Octavia, M., & Brown, R. (2010). Determinants of bank capital structure in developing countries: regulatory capital requirement versus the standard determinants of capital structure. *Journal of Emerging markets*, 15(1), 50.
- Pepur, S., Ćurak, M., & Poposki, K. (2016). Corporate capital structure: the case of large Croatian companies. *Economic research-Ekonomska istraživanja*, 29(1), 498-514.
- Pratheepan, T., & Yatiwella, W. B. (2016). The determinants of capital structure: Evidence from selected listed companies in Sri Lanka. *International Journal of Economics and Finance*, 8(2).
- Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The journal of Finance*, 50(5), 1421-1460.
- Řepková, I. (2015) Banking Efficiency Determinants in the Czech Banking Sector, 2nd Global Conference on Business, ECONOMICS, MANAGEMENT and TOURISM, 30-31 October 2014, Prague, Czech Republic
- Saeed, M. M., Gull, A. A., & Rasheed, M. Y. (2013). Impact of capital structure on banking performance (A case study of Pakistan). *Interdisciplinary journal of contemporary research in business*, 4(10), 393-403.
- Salim, M., & Yadav, R. (2012). Capital structure and firm performance: Evidence from Malaysian listed companies. *Procedia-Social and Behavioral Sciences*, 65, 156-166.
- Sangeetha, M., & Sivathaasan, N. (2013). Factors determining capital structure: a case study of listed companies in Sri Lanka. *Research Journal of Finance and Accounting*, 4(6), 236-247.
- Serghiescu, L., & Văidean, V. L. (2014). Determinant factors of the capital structure of a firm-an empirical analysis. *Procedia Economics and Finance*, 15, 1447-1457.
- Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of finance*, 43(1), 1-19.