

**THE JOINT DETERMINANTION OF LEVERAGE AND  
MATURITY:  
EMPIRICAL EVIDENCE FROM MALAYSIA**

A Thesis Submitted to the Postgraduate Studies Othman Yeop Abdullah Graduate

School of Business

Universiti Utara Malaysia

In Fulfillment of the Requirement

For the Degree of Master of Science in Finance

By

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## **DECLARATION**

I hereby declare that this thesis entitled “The Joint Determination of Leverage and Maturity: Empirical Evidence from Malaysia” is based on my original research except for quotations and citations that have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Utara Malaysia or other institutions.

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## ABSTRACT

This study empirically investigates the simultaneity between leverage and debt maturity policies and the factors that influence them by using a simultaneous equations framework in which leverage and debt maturity are endogenous variables. Based on a panel data of 788 non-financial firms listed on Bursa Malaysia from 1999 until 2010, this study estimates a single equation model on leverage and debt maturity using an Estimated Generalized Least Squares (EGLS) approach. The simultaneity between leverage and debt maturity is tested by utilizing a two-stage least squares (2SLS) regression model. The results of this study show that leverage and debt maturity policies have a negative simultaneous relationship which indicates that there are strategic complementarities between leverage and maturity. This study also documents different results among the exogenous variables in both equations, in which *growth opportunities*, *regulation*, *firm size*, *profitability* and *tangibility* lend considerable support to the proposed hypotheses on the leverage equation. Meanwhile, *firm size*, *regulation*, *abnormal earnings* and *tangibility* are found to have significant effects on the debt maturity equation.

**Keyword:** *Simultaneity, Capital Structure, Leverage, Debt Maturity*

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## LIST OF ABBREVIATIONS

ABNR	: Abnormal Earnings
ASMAT	: Assets Maturity
AR	: Autoregressive
BNM	: Bank Negara Malaysia
CAP	: Capitalization
DM	: Debt Maturity
EGLS	: Estimated Generalized Least-Square
EBIT	: Earnings before Interest and Taxes
EPS	: Earnings per Share
GDP	: Gross Domestic Products
GROW	: Growth Opportunities
LEV	: Leverage
MGS	: Malaysia Government Securities
NOL	: Net Operating Loss Carryforwards
OLS	: Ordinary Least Squares
REIT	: Real Estate Investment Trust
ROA	: Return on Asset (Profitability)
PPE	: Property, Plant and Equipment
REGUL	: Regulated Firm
SC	: Security Commission
SPREAD	: Term Structure
TANG	: Tangibility
T-bills	: Treasury Bills
TAX	: Effective Tax Rate
SIZE	: Firms Size

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 BACKGROUND OF THE STUDY**

In principle, every company needs funding and the fulfillment of these funds may come from internal sources or external sources. The selection of the financial structure is a matter which concerns the composition of funding that will be used by a company. This will then determine how much debt will be incurred to finance its assets.

Capital structure which forms the basis for permanent funding consists of long-term debt, preferred stock and shareholders' equity. The basic element of a corporate financial policy includes the choice of debt level and also the structure of debt maturity (Barclay, Marx, & Smith, 2003). Barclay and Smith (1995) suggest that when firms choose debt as a source of funding, they should also consider other financial factors such as debt maturity, priority and whether to use public debt or private debt. Barclay et al. (2003) further postulate that when it comes to funding, other factors often occur simultaneously.

Leverage and debt maturity are the twin dimensions that cannot be separated from the corporate capital structure, in other words, when a firm issues new debt, it needs to decide the period of maturity and the size of the debt level concurrently (Elyasiani, Guo, & Tang, 2002). In addition, Barclay and Smith (1995) assert that when firms choose debt as a source of funding, they also need to consider the maturity

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- Barclay, M.J., Smith, C.W., & Watts, R.L. (1995). The determinants of corporate leverage and dividend policies. *Journal of Applied Corporate Finance*, 7, 4-19.
- Barnea, A., Hougen, R.A., & Senbet, L.M. (1980). A rationale for debt maturity structure and call provisions in the agency theoretic framework. *The Journal of Finance*, 35 (5), 1223-1234.
- Bevan, A.A., & Danbolt, J. (2000). Capital structure and its determinants in the United Kingdom: a decompositional analysis. *Working Paper University of Glasgow*.
- Billet, M.T., King, T-H., & Mauer, D.C. (2007). Growth opportunities and the choice of leverage, debt maturity, and Covenants. *Journal of Finance*, 62 (2), 627-729.
- Bradley, M., Jarrell, G.A., & Kim, E.H. (1984). On the existence of an optimal capital structure: Theory and evidence. *Journal of Finance*, 39, 857-878.
- Brick, I.E., & Ravid, S.A. (1985). On the relevance of debt maturity structure. *Journal of Finance*, 40, 1423-1437.
- Booth, L., Aviazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *Journal of Finance*, 56, 87-130.
- Chen, J.J. (2004). Determinants of capital structure of Chinese listed companies. *Journal of Business Research*, 57, 1341-1351.
- Dang, V. A. (2011). Leverage, debt maturity and firm investment: An empirical analysis. *Journal of Business Finance and Accounting*, 225-258.

- De Jong, A., Kabir, R., & Nguyen, T. (2008). Capital structure around the world; The roles of firm and country specific determinants. *Journal of Banking and Finance*, 32, 1954-1969.
- Delcours, N. (2007). The determinants of capital structure in transitional economies. *International Review of Economics and Finance*, 16, 400-415.
- Demirguc-Kunt, A., & Maksimovic, V. (1999). Institutions, financial markets and firm debt maturity. *Journal of Financial Economics*, 54, 295-336.
- Diamond, D.W. (1991). Debt maturity structure and Liquidity Risk. *Quarterly Journal of Economics*, 106, 709-737.
- Diamond, D.W. (1993). Seniority and maturity of debt contracts. *Journal of Financial Economics*, 33, 341-68.
- Elyasiani, E., Guo, L., & Tang, L. (2002). The determinants of debt maturity at issuance: A system-based model. *Review of Quantitative Finance and Accounting*, 19, 351-377.
- Flannery, M. J. (1986). Asymmetric information and risky debt maturity choice, *Journal of Finance*, 41, 19-37.
- Guedes, J., & Opler, T. (1996). The determinants of the maturity of corporate debt issues. *Journal of Finance*, 51, 1809-183.
- Gujarati, D.N. (2007). *Dasar-dasar ekonometrika*. Jakarta: Erlangga
- Gujarati, D.N., & Porter, D.C (2009). *Basic econometric*. Fifth Edition, Singapore: Mc Graw Hill.

- Guney, Y., & Ozkan, A. (2005). New insights on the importance of agency costs for corporate debt maturity decisions. *Applied Financial Economics Letters*, 1, 233-238.
- Harris, M., & Raviv, A. (1991). The theory of capital structure. *Journal of Finance*, 46, 297-355.
- Jensen, M. (1986). Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review*, 76, 323-339.
- Jensen, M. C., & Meckling, W. (1976). Theory of the firm: Managerial Behavior, Agency costs and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- Johnson, S. A. (1997). An empirical analysis of the determinants of corporate debt ownership structure. *Journal of Financial and Quantitative Analysis*, 32(1), 47-69.
- Johnson, S. A. (2003). Debt maturity and the effects of growth opportunities and liquidity risk on leverage. *Review of Financial Studies*, 16(1), 209-236.
- Kim, C.S, Mauer, D.C., & Stohs, M.H. (1995). Corporate debt maturity policy and investor tax-timing options: Theory and evidence. *Financial Management*, 24, 33-45.
- Lang, L., Ofek, E., & Stulz, R.M. (1996). Leverage, investment and firm growth. *Journal Financial Economics*, 40, 3-29
- Leland, H.E., & Toft, K.B. (1996). Optimal capital structure, endogenous bankruptcy, and the term structure of credit spreads. *Journal of Finance*, 51, 987-1019.

- Meggison, W.L., (1997). *Corporate Finance Theory*. Addison Wesley Educational Publishers.
- Modigliani, F., & Miller, M.H. (1958). The cost of capital, corporate finance and the theory of investment. *American Economic Review*, 48, 201-97.
- Myers, S.C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, 5, 147–175.
- Myers, S.C. (1984). The capital structure puzzle. *Journal of Finance*, 39, 575-592.
- Mustapha, M., Ismail, H., & Minai, B. (2011). Determinants of debt structure: Empirical evidence from Malaysia, *2<sup>nd</sup> International Conference on Business and Economic Research Proceeding*.
- Ozkan, A. (2001). Determinants of capital structure and adjustment to long run target: Evidence from UK company panel data. *Journal of Business Finance and Accounting*, 28 (1), 175-198.
- Ozkan, A. (2002). The determinants of corporate debt maturity: evidence from UK Firms. *Applied Financial Economics*, 12 (1), 19-24.
- 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.
- Rozali, M.B., & Omar, M.A. (2011). An empirical analysis of corporate debt maturity structure: Evidence from Malaysian Sukuk Issues. *Journal of Muamalat and Islamic Finance Research*, Vol. 8/1.

- Ross, S. (1977). The determination of financial structure: The incentive signaling approach. *Bell Journal of Economics*, 8, 23-40.
- Sanyal, P., & Bulan, L.T. (2011). Regulatory risk, market uncertainties, and firm financing choice: Evidence from U.S. electricity market restructuring. *The Quarterly Review of Economics and Finance*, 51, 248-268.
- S, Gurcharan. (2010). A review of optimal capital structure determinant of Selected ASEAN Countries. *International Research Journal of Finance and Economics*, 47, 33-42.
- Smith, C. (1986). Investment banking and the capital acquisition process. *Journal of Financial Economics*, 15: 3-29.
- Spiegel, Yossef., & Daniel F. Spulber, (1994). The capital structure of a regulated firm. *Rand Journal of Economics*, 25, 424-440
- Stephan, A., Talavera, O., & Tsapin, A. (2011). Corporate debt maturity choice in emerging financial markets. *The Quarterly Review of Economics and Finance*, 51,141–151.
- Sunarsih. (2004). Analisis simultanitas kebijakan hutang dan kebijakan maturitas hutang serta faktor-faktor yang mempengaruhinya. *Jurnal Siasat Bisnis*, 9 (1), 65-84.
- Stohs, M. H., & Mauer, D. C. (1996). The determinants of corporate debt maturity structure. *Journal of Business*, 69, 279- 312.
- Stulz, R. (1990). Managerial discretion and optimal financing policies. *Journal of Finance Economics*, 26, 3-28.
- Titman, S., & Wessels, R. (1988). The determinants of capital structure choice.



*Journal of Finance*, 43, 1–19.

Wald, J.K. (1999). How firm characteristics affect capital structure: an international comparison. *The Journal of Financial Research*, 22, 161-187.