

**AN EMPIRICAL ANALYSIS OF CORPORATE DEBT MATURITY  
STRUCTURE:  
EVIDENCE FROM MALAYSIAN *SUKUK* ISSUES**

**Mohammad Badri Rozali**  
*Universiti Utara Malaysia*

**Mohd. Azmi Omar**  
*International Islamic University Malaysia*

**ABSTRACT**

Amidst vast literatures on the theoretical and empirical aspects of corporate capital structure, studies on debt maturity structure vis-à-vis debt-equity choice are scant and relatively new. This paper attempts to investigate the empirical determinants of the maturity of Malaysian corporate debt issues based on the incremental approach. This is done by testing several underpinning theoretical models of debt maturity structure using a cross-sectional data set of conventional bond and *sukuk* issues over the 1999-2007 period. The findings on conventional bonds lend considerable support to the agency cost hypotheses and signaling and asymmetric information hypotheses but provide no support for tax hypotheses. In the case of *sukuk* issues, the evidences in general offer limited support to all testable hypotheses. Only leverage ratio under the signaling and asymmetric information hypotheses and effective tax rate under the tax hypotheses are found to have significant effects on the maturity structure of *sukuk*.

*Keywords:* Debt maturity, incremental approach, *sukuk*.

## Introduction

Firms typically strive to achieve an optimal capital structure in order to minimize the cost of capital or to maximize the firm value via a mixture of debt and equity financing. Their main concerns are not only on how much future cash flows should be paid to debt holders vis-à-vis the amount of debt issued, but also on when future cash flows should be paid out to the debt holders. Financing projects with short-term debt can lead a firm to serious financial difficulty if the debt cannot be extended. While financing activities with long-term debt can mitigate the risk of liquidation, it can potentially create underinvestment problem and risk shifting. Selecting a right debt maturity mix is as equally important issue as opting for an appropriate debt-to-equity ratio. In essence, a firm's choice of debt maturity is an integral part of its capital structure decision.

Since the seminal work of Modigliani and Miller (1958), extensive studies have focused on the theoretical and empirical aspects of corporate capital structure. Amidst the intense scrutiny on the debt-equity mix and dividend policy choice over past five decades, less attention until recently has been devoted to debt maturity structure of firms. Several hypotheses on factors that determine corporate debt maturity have been developed based on the underlying theories of agency cost (Myers, 1977; Barnea, Haugen and Senbet, 1980), signaling and asymmetric information (Flannery, 1986), liquidation risk (Diamond, 1991a) and tax benefits (Brick and Ravid, 1985).

The empirical tests on the maturity of corporate bonds using the incremental approach, which defines debt maturity as the maturity of bonds at issuance, started in the US in early 1990s (Mitchell, 1991, 1993; Guedes and Opler, 1996) and the research continues (Elyasiani, Guo and Tang, 2002; Highfield, 2008). In the earlier studies, the authors cited the problem of data availability on bond maturities (e.g. maturities of medium-term notes). However, in recent years, the published bond maturity data are widely available in major developed markets. Outside the US, Cai,

Cheung and Goyal (1999) analyzed factors influencing the maturity structure of Japanese corporate debt issues. The empirical evidences on the maturity of corporate debt issues in developing countries are relatively scant. Addressing this gap in the literature, the objective of this study is, therefore, to examine the determinants of the maturity of corporate bonds issued by Malaysian firms over the 1999 - 2007 period. In particular, this study is envisaged to provide pioneering evidence on the test of existing debt maturity theories on *sukuk*<sup>1</sup> issues.

The Malaysian bond market has experienced a robust growth over a decade ago and it is now one of the most sophisticated bond markets in this region. The total outstanding debt securities significantly increased from RM157 billion as at end-1998 to RM557 billion as at end-2007. It was largely fueled by a steady increase in size of total bond approved, which has grown almost five fold from RM31.8 billion in 1998 to RM158.8 billion in 2007. The increasing demand for *sukuk* has contributed to the phenomenal growth in its issuance, rising from RM3.1 billion (9.7% of total bond issuance) in 1998 to RM122.9 billion (40.7% of total bond issuance) in 2007.<sup>2</sup> Malaysia has emerged as the world's largest *sukuk* market, accounting for 68.9% of the entire global *sukuk* market as at end-2007.<sup>3</sup> In terms of the application of shariah principles, the majority of *sukuk* issued in 2007 was based on *Musharakah* (58%), followed by *Murabahah* (19%), *Ijarah* (11%), *Istisna'* (9%), *Bai' Bithaman Ajil* (2%) and *Mudharabah* (1%).

Of significance to this study is the trend of extended maturity profile among the Malaysian private debt securities (PDS) where approximately 40% of total PDS issuances in 2007 had maturities of more than five years.<sup>4</sup> The bond market also appears to increasingly attract more companies to tap longer-term funds as reflected by the increase in issuance of PDS with more than 20-year tenure. In recent years,

---

<sup>1</sup> *Sukuk* are generally described as Islamic investment certificates. In this study, *sukuk* refer to the Islamic Private Debt Securities (IPDS) issued based on various shariah principles as approved by the Securities Commission.

<sup>2</sup> Quarterly Bulletin of Malaysian Islamic Capital Market, January 2008, p. 18.

<sup>3</sup> Bank Negara Malaysia – Annual Report 2007, p. 73.

<sup>4</sup> Bank Negara Malaysia – Financial Stability and Payment Systems Report 2007, p. 74.

Malaysia's bond market has indeed grown tremendously in terms of bond outstanding, market depth and types of bonds being offered. Looking forward, the *sukuk* market is expected to grow and strengthen even further due its relative cost competitiveness and vigorous promotion and development efforts by the government to turn the country into a hub of Islamic finance.

This paper is organized as follows. Section 2 presents literature review and testable hypotheses on the determinants of corporate debt maturity for Malaysian firms. Section 3 describes the data and variables used to examine our testable hypotheses. Section 4 presents our empirical results pertaining to the determinants of debt maturity. Section 5 concludes the paper.

### **Literature Review and Hypotheses**

Modigliani and Miller (1958) argue that in the presence of perfect capital markets, all financial decisions including debt maturity do not matter. Stiglitz (1974) has formalized and extended Modigliani and Miller's propositions to demonstrate that the debt maturity structure is irrelevant for firm value under perfect market assumptions. However, market imperfections, which are later introduced primarily based on the role of agency cost, signaling and asymmetric information, liquidation risk or taxes, have led to theories supporting the choice of debt maturity mix (i.e. short-, intermediate-, or long-term debt).

#### *Agency Cost*

Jensen and Meckling (1976) and Myers (1977) recognize that the agency cost of debt may influence corporate debt maturity. The agency cost of debt typically happens when management engages in projects or behaviors that benefit shareholders more than bondholders. We consider the growth opportunity and firm size as the proxy factors in the agency cost hypotheses as follows:

**Growth Opportunities:** Myers (1977) argues that if a firm is financed with risky debt, managers acting on behalf of shareholders may refuse to accept profitable investment (growth) opportunities when bondholders potentially derive more benefits from undertaking these investments. He argues that this underinvestment problem can be controlled by issuing short-term debt which matures before exercising the investment option. Barnea *et al.* (1980) further support Myers' argument that issuing short-term debt can eliminate agency related underinvestment problems. Therefore, in the underinvestment theory, debt maturity is expected to be inversely related to growth opportunities. Hart and Moore (1995) provide another explanation for the relationship between debt maturity and growth opportunities. They suggest that long-term debt is effective in limiting managerial discretion in financing unprofitable investment. In other words, long-term debt can help to mitigate the overinvestment behavior of management. The overinvestment theory implies that a positive association between debt maturity and growth opportunities. Therefore, the nature of the relationship between debt maturity and growth opportunities remains an empirical question.

**Firm Size:** Smith and Warner (1979) argue that smaller firms are more susceptible than larger firms to face agency problems between shareholders and bondholders, such as risk shifting and claim dilution. Barnea *et al.* (1980) assert that these agency conflicts can be alleviated by reducing the maturity of debt. Furthermore, Titman and Wessels (1988) suggest that small firms tend to use more short-term financing due to the high transaction costs for issuing long-term debt or equity. Thus, debt maturity is expected to be positively related to firm size.

#### *Signaling and Asymmetric Information*

The signaling model predicts that the choice of corporate debt maturity is related to the degree of asymmetric information between insiders and outside investors.

We consider the firm quality and leverage factors in the signaling and asymmetric information hypotheses as follows:

**Firm Quality:** Flannery (1986) postulates that debt maturity structure can be utilized as a signaling device when insiders are well informed about the quality of the firm than outside investors. He argues that good (high quality) firms prefer to issue short-term debt to indicate their good quality. On the contrary, bad (low quality) firms are more likely to issue long-term debt because they cannot afford the high rollover costs (transaction costs) of issuing short-term debts. Kale and Noe (1990) indicate that Flannery's argument still holds even in the absence of transaction costs. Hence, debt maturity is expected to be negatively related to firm quality.

**Leverage:** Morris (1992) suggests that high leverage firms tend to issue longer-term debt in order to delay their exposure to bankruptcy risk. Similarly, Stohs and Mauer (1996) indicate that a firm lengthens its debt maturity as leverage increases in order to offset the higher probability of liquidity risk and to delay exposure to bankruptcy risk. The leverage level relies on the debt maturity and firms with lower leverage level tend to be financed by short-term debt (Leland and Toft, 1996). Therefore, leverage is expected to be positively correlated with debt maturity.

#### *Liquidation Risk*

Diamond (1991a) examines the debt maturity structure for borrowing firms with the assumption that they have private information about their future credit ratings and are subject to liquidation risk. Liquidation risk refers to the risk that a firm is unable to pay back its debt and thus facing the risk of being liquidated by lenders. He suggests that a firm's optimal debt maturity structure can be achieved by trading off a preference for short-term maturity against liquidation risk. Borrowers with high credit ratings are expected to issue short-term debt due to the effect of a debt rating's upgrade at the time of refinancing outweighs the liquidation risk. Correspondingly,

borrowers with lower credit ratings are anticipated to choose long-term debt because the liquidation risk dominates the information effect. However, borrowers with very low credit ratings are able to borrow only short-term debt because they lack access to long-term debt market. Diamond's liquidation risk hypothesis argues that there is a non-monotonic relationship between debt maturity and borrower's credit rating. Thus, firms with very high and very low credit ratings tend to choose short-term debt and firms with intermediate or medium credit ratings prefer long-term debt.

### *Taxes*

Extant literatures suggest that the corporate tax rate, the term structure of interest rates and the volatility of interest rates interact to offer tax incentives in debt maturity structure.

We consider the effective tax rate, yield spread and interest rate volatility in the tax hypotheses as follows:

**Effective Tax Rate:** Kane *et al.* (1985) suggest that optimal debt maturity structure is determined by a trade-off between the per-period tax advantage of debt financing and bankruptcy and debt issue floatation cost. They show that debt maturity is positively related to the issuance floatation costs and inversely related to the tax shield advantage and the volatility of firm value. The tax shield advantage implies that a firm's debt maturity increases (decreases) as its effective tax rate decreases (increases). Therefore, debt maturity is expected to be inversely related to effective tax rate.

**Term Structure of Interest Rates:** Brick and Ravid (1985) provide a tax-based rationale for debt maturity choice. They show that when the term structure of interest rates is increasing (upward-sloping yield curve), the issuance of long-term debt is optimal. This is because the accelerated tax shield on long-term debt minimizes the firm's expected tax liabilities, and thus maximizes the firm value. On the contrary, if

the term structure of interest rates is decreasing (downward-sloping yield curve), it is beneficial for a firm to issue short-term debt. Hence, the expected relationship between debt maturity structure and term structure of interest rates is positive.

**Interest Rate Volatility:** Kim *et al.* (1995) argue that firms tend to issue long-term debt when interest rate volatility increases. The longer duration of long-term bond makes it more sensitive than a short-term bond to changes in interest rates. Since the tax-timing option value increases with the volatility of the underlying security, the set of tax trading opportunities for a long-term bond is greater than for an otherwise identical short-term bond. Thus, the relationship between debt maturity and interest rate volatility is predicted to be positive.

#### *Empirical Evidence*

Mitchell (1991) investigates the determinants of the term-to-maturity, call and sinking fund of corporate bonds on a sample of 438 fixed-rate, nonconvertible US bonds, issued by industrial firms during 1982-1986. Their estimation results reject the asset-liability maturity-matching hypothesis but support the asymmetric information hypothesis. Mitchell (1993) subsequently tests the agency cost, the asymmetric information and the tax hypotheses using the same data set. The empirical evidence strongly and weakly supports the agency cost hypothesis and the asymmetric information hypothesis respectively. The result, however, does not support the tax hypothesis.

Guedes and Opler (1996) examine the maturities of 6,348 debts and notes issued by publicly held US companies during 1982-1993. They document a significant relationship between debt maturity and growth opportunities (agency cost), credit quality, asset duration and utility dummy. The asymmetric information and tax hypotheses are not supported. Term premium unexpectedly has a significant negative relation with debt maturity.



Cai *et al.* (1999) analyze the maturity structure of 173 publicly secured straight debts issued by Japanese industrial firms during 1980-1993. Firm size, bank debt ratio, leverage and investment grade dummy are statistically significant while market-to-book ratio is inconsistent with previous studies. They do not find any support for tax-based hypotheses; the coefficients on term premiums and interest rate volatility are insignificant.

Elyasiani *et al.* (2002) adopt the incremental approach to test the determinants of corporate debt maturity using a sample of 1,632 US bond issues for the period of 1973-1994. Their single-equation regression results are consistent with the underinvestment hypothesis and provide mixed support for the asymmetric information hypothesis. However, the findings are inconsistent with the liquidation risk, tax and flotation costs hypotheses.

Recently, Highfield (2008) studies the maturity of 10,617 corporate debts placed by US corporations, including financial institutions, over the 1983-1999 period. Their main finding suggests that firm quality, as measured by credit rating, is directly related to debt maturity. Despite inconsistency with a non-monotonic structure in credit ratings and the signaling theory of debt, this finding does support the theory that risky firms are screened out of the long-term debt market. They also find evidence of that debt maturity is positively and negatively related to term structure and firm size respectively.

### **Data and Variable Description**

Data on debt issue date, issue size, maturity date, credit rating and type of debt instrument are obtained from RAM Holdings Berhad (RAM), Malaysian Rating Corporation Berhad (MARC) and Securities Commission for the 1999-2007 period. Firms' financial data including market value of assets, book value of assets, earnings,

stock prices, total debt, income tax expense and pre-tax profit are extracted from Datastream. The monthly yields on 20-year Malaysian Government Securities (MGS) and 6-month Treasury bills are acquired from Bank Negara Malaysia online database.

Our sample selection criteria on corporate bonds and notes issued by Malaysian public-listed companies exclude the following set of observations: bonds issued by financial institutions, insurance companies and securities firms, bond issuer with incomplete financial information, serial issues containing bonds maturing on various dates, convertible issues, loan stocks, floating rate issues and asset-backed securities.<sup>5</sup> For firms that have multiple bond issues in the same fiscal year, we keep the observation of the first issue and exclude other issues that occurred within the same fiscal year to mitigate potential problems of residual serial correlation.<sup>6</sup> Likewise, for few firms that issue both conventional bonds and *sukuk* in the same fiscal year, we pick the observation of the first type of debt instrument being issued. With the above exclusion criteria, we have the final sample consisting of 100 conventional bonds and 100 *sukuk* issues.

We measure the dependent variable as the natural log of term to maturity of bond issues (TTM). Growth opportunities (GROW) are proxied by the ratio of the market value of a firm's asset to the book value of its assets (Market-to-Book ratio). The market value of assets is defined as the book value of total assets minus the book value of equity plus the market value of equity. Firm size (SIZE) is measured by the natural log of total assets while firm quality (QUAL) is estimated as the ratio of changes of earnings per share between time  $t$  and time  $t + 1$ , scaled by the stock price at time  $t$ . Earnings change is considered as a signal of the firm's abnormal future earnings. Leverage (LEVER) is computed as the ratio of the book value of total debt to the book value of total assets.

---

<sup>5</sup> Elyasiani *et al.* (2002) highlight that convertible debt issues are excluded because they may have different behavior from non-convertible debt issues. Debt issues with floating coupon rates are also excluded because it is difficult to determine their maturity.

<sup>6</sup> Residual serial correlation makes least squares estimates inefficient.

Credit ratings by RAM and MARC are used as to proxy for a firm's liquidation risk. There are 7 ranks assigned for both RAM's and MARC's bond rating (AAA = 1 to C = 7). As suggested by Diamond (1991a), the non-monotonic relationship between a firm's liquidation risk and debt maturity should be captured by a positive coefficient on bond rating (RATE) and a negative coefficient on the square of bond rating (RATESQ).

The firm's effective tax rate (TAX) is proxied by the ratio of income tax expense to pre-tax profit. The slope of the term structure of interest rates or yield spread (SPREAD) is constructed by subtracting the yield on a six-month Treasury bill from the yield on a twenty-year MGS. This yield spread is then matched with the month of debt issues. The interest rate volatility (VOLA) is the standard deviation of monthly twenty-year MGS returns over a three-month pre-issue period.

Based on the dependent variable and explanatory variables described above, our empirical model using multivariate regression is estimated as follows:

$$\begin{aligned}
 TTM_i = & \alpha + \beta_1GROW_i + \beta_2SIZE_i + \beta_3QUAL_i + \beta_4LEVER_i + \beta_5RATE_i \\
 & + \\
 & \beta_6RATESQ_i + \beta_7TAX_i + \beta_8SPREAD_i + \beta_9VOLA_i + \varepsilon_i
 \end{aligned}$$

## Findings and Discussion

### *Descriptive Statistics*

Table 1 and Table 2 provide several stylized facts about the distribution of corporate debt issues by calendar year and bond ratings respectively. First, the number of *sukuk* issuance has been on the upward trend while the conventional bond has recorded a stable growth. Second, amidst the observed trend of extended maturity profile, the average tenure of *sukuk* is higher than that of its conventional peers. Third, the majority of the sample bonds are in the investment grade 'A rating'. All *sukuk* issues

are rated as investment grades while only 5% of conventional bonds are classified as speculative grades.

Table 1: Distribution of corporate debt issues by calendar year 1999-2007

Year	Conventional Bonds		<i>Sukuk</i>	
	Number of issues	Average maturity	Number of issues	Average maturity
1999	4	5.75	1	7.00
2000	14	5.93	4	7.50
2001	13	6.15	8	9.13
2002	8	5.88	9	7.67
2003	12	6.42	11	6.73
2004	12	7.25	16	8.13
2005	18	6.61	19	8.74
2006	8	7.38	19	9.16
2007	11	7.23	13	12.08
1999-2007	100	6.55	100	8.80

Table 2: Distribution of corporate debt issues by bond ratings: 1999 - 2007

Bond Ratings		Conventional Bonds		<i>Sukuk</i>	
Investment Grade	AAA	7	7%	11	11%
	AA	24	24%	27	27%
	A	55	55%	61	61%
	BBB	9	9%	1	1%
Speculative Grade	BB	2	2%		
	B	3	3%		
	C				
Default	D				

### Regression Results

Table 3 presents results from the multivariate regression that relates debt maturities to various explanatory variables for the sample of conventional bonds and *sukuk* issues respectively.

Table 3: Multivariate regression of debt maturity on explanatory variables for conventional bonds and Sukuk during 1999 – 2007

Explanatory Variables	Predicted Sign	Conventional Bonds	<i>Sukuk</i>
Constant		0.9140 (2.0999)**	1.4199 (2.3078)**
GROW (Market-to-book ratio)	- or +	0.0386 (2.5531)**	0.0014 (0.1245)
SIZE (Log of total assets)	+	0.0542 (2.0286)**	0.0469 (1.5919)
QUAL (Changes in EPS/Stock price)	-	-0.0229 (-2.2540)**	0.0578 (0.5854)
LEVER (Total debt/Total asset)	+	0.3770 (1.9063)*	0.5003 (2.2985)**
RATE (Bond rating)	+	0.1029 (1.2814)	0.2253 (0.6109)
RATESQ (Bond rating squared)	-	-0.0212 (-1.8522)*	-0.0797 (-0.9461)
TAX (Income tax expense/Pre-tax profit)	-	0.0473 (0.6371)	-0.1539 (-4.5756)***
SPREAD (Yield spread)	+	-0.0514 (-2.5807)**	-0.0871 (-2.8239)***
VOLA (Interest rate volatility)	+	0.0442 (0.1758)	0.0588 (0.2532)
Observations		100	100
Adjusted R <sup>2</sup>		0.1985	0.3713

The *t*-statistics corrected for heteroscedasticity using White's procedure are reported in parentheses.

\*\*\*Significant at the 1% level

\*\*Significant at the 5% level

\* Significant at the 10% level

We find that the coefficient on market-to-book ratio (GROW) for conventional bonds is positive and statistically significant. The same coefficient for *sukuk* is also positive but insignificant. This relationship is inconsistent with the underinvestment hypothesis as reported in Guedes and Opler (1996) and Elyasiani *et al.* (2002). Instead, the findings lend support to Hart and Moore (1985)'s overinvestment argument that firms tend to utilize long-term debt to control managers' incentives to invest in unprofitable projects. It is plausible that underinvestment problem is of less concern for Malaysian firms than overinvestment inefficiencies.

The positive coefficient on firm size (SIZE) variable for conventional bonds is also significant. This result is in line with Cai *et al.* (1999) who discover that larger firms on average issue longer maturity debts. Large firms also tend to issue longer maturity debt since reputational considerations can alleviate the incentive effects associated with risky debt (Diamond, 1991b). The SIZE variable for *sukuk* issues has positive but insignificant coefficient.

The test on firm quality (QUAL) variable for conventional bonds yields a negative and significant coefficient. This result is consistent with Flannery (1986)'s signaling and asymmetric information hypothesis which asserts that high-quality firms issue shorter-term debt. As for the *sukuk* issues, the coefficient on QUAL is insignificant.

The relationship between leverage ratio (LEVER) and debt maturity for both conventional bonds and *sukuk* is positive and significant. This result supports findings in Stohs and Mauer (1996) and Leland and Toft (1996) that firms with higher leverage level attempt to mitigate bankruptcy risk and the costs of financial distress by opting for longer debt maturity.

The bond rating (RATE) and the square of bond rating (RATESQ) variables are utilized to test the liquidation risk hypothesis. The hypothesis of non-monotonic relationship between a firm's liquidation risk and debt maturity denotes a positive coefficient on bond rating and a negative coefficient on the bond rating squared. The result shows that the coefficients on RATE for both conventional bonds and *sukuk* are positive and insignificant. The coefficient on RATESQ is significantly negative for conventional bonds but insignificant for *sukuk* issues. Despite the result for conventional bond is not entirely consistent with Diamond (1991a)'s liquidation risk hypothesis, the RATESQ's significant coefficient does imply albeit weakly that this effect is non-monotonic in nature (Elyasiani *et al.*, 2002).

The coefficient on effective tax rate (TAX) is negative and statistically significant for *sukuk*. This result is consistent with Kane *et al.* (1985)'s argument that debt maturity increases as the firm's effective tax rate decreases and vice-versa. Conversely, the coefficient for TAX variable is insignificant for conventional bonds. In addition, the coefficient on interest rate volatility (VOLA) for both types of bonds is insignificant, which echoes the findings in Guedes and Opler (1996) and Cai *et al.* (1999).

The relationship between the term structure of interest rates or yield spread (SPREAD) and debt maturity is negative and significant for both conventional bonds and *Sukuk*, which contradicts the Brick and Ravid (1985)'s tax hypothesis. Similar result is also reported in Guedes and Opler (1996). The potential explanations are that firms attempt to avoid term premium in long-term interest rates. Managers may issue short-term debt when the term premium is high because the expectations hypothesis does not hold (Campbell and Shiller, 1991). Another possible justification is that firms have difficulty borrowing long-term in high interest environment because the required rate of return creates an incentive to shift to risky projects (Guedes and Opler, 1996).

## Conclusion

This study examines the determinants of the maturity of conventional bonds and *sukuk* issued by Malaysian firms. We test the primary theories of debt maturity structure suggested in the literature. These include agency cost hypotheses, signaling and asymmetric information hypotheses, liquidation risk hypothesis and tax hypotheses. The results on conventional bonds appear to corroborate with the findings of previous studies in the US and Japan. We find considerable support for both the agency cost hypotheses and signaling and asymmetric information hypotheses. The hypothesized non-monotonic relation between a firm's liquidation risk and debt maturity is weakly implied in nature while the tax hypotheses are not supported.

In general, the empirical evidence on *sukuk* provides limited support to all testable hypotheses. Nonetheless, the findings reveal that leverage ratio under the signaling and asymmetric information hypotheses and effective tax rate under the tax hypotheses have significant relationship with the maturity structure of *sukuk* issues. The result on leverage implies that the tendency of firms with high leverage level to opt for issuing longer-term *sukuk* whilst delaying their exposure to bankruptcy risk. As for the impact of effective tax rate, there is evidence that issuing firms adjust their *Sukuk*'s maturity structures as a consequence of debt's tax shield.

Due to the unique nature of *sukuk* vis-à-vis conventional bonds, further research is needed to assess its idiosyncratic characteristics, underlying contracts based on various shariah precepts and risk-return profiles which may have implications on the maturity structure of *sukuk* issues.

## References

- Bank Negara Malaysia (2007). *Annual Report*. Kuala Lumpur.
- Bank Negara Malaysia (2007). *Financial Stability and Payment Systems Report*. Kuala Lumpur.
- Barnea, A.N., Haugen, R.A. & Senbet, L.W. (1980). A rationale for debt maturity structure and call provisions in the agency theoretic framework. *Journal of Finance*, 35: 1223–1234.
- Brick, I.E. & Ravid, S.A. (1985). On the relevance of debt maturity structure. *Journal of Finance*, 40: 1423–1437.
- Cai, J., Cheung, Y-L. & Goyal, V.K. (1999). Bank monitoring and the maturity of Japanese corporate debt issues. *Pacific-Basin Finance Journal*, 7: 229-250.
- Campbell, J.Y. & Shiller, R.J. (1991). Yield spreads and interest rate movements: A bird's eye view. *Review of Economic Studies*, 58: 495-514.
- Diamond, D.W. (1991a). Debt maturity structure and liquidity risk. *Quarterly Journal of Economics*, 106: 709–737.
- Diamond, D.W. (1991b). Monitoring and reputation: The choice between bank loans and directly placed debt. *Journal of Political Economy*, 99: 689-721.
- 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: 1809–1833.



- Harris, M. & Raviv, A. (1991). The theory of capital structure. *Journal of Finance*, 46: 297-355.
- Hart, O. & Moore, J. (1995). Debt and seniority: an analysis of the role of hard claims in constraining management. *American Economic Review*, 85: 567-585.
- Highfield, M.J. (2008). On the maturity of incremental corporate debt issues. *Quarterly Journal of Finance and Accounting*, 47: 59-81.
- Jensen, M.C. & Meckling, W.H. (1976). Theory of firm: Managerial behaviour, agency costs, and ownership structure. *Journal of Financial Economics*, 3: 305-360.
- Kale, J.R. & Noe, T.H. (1990). Risky debt maturity choice in a sequential game equilibrium. *Journal of Financial Research*, 13: 155-165.
- Kane, A., Marcus, A.J. & McDonald, R.L. (1985). Debt policy and the rate of return premium to leverage. *Journal of Financial and Quantitative Analysis*, 20: 479-499.
- 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.
- 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.
- Mitchell, K. (1991). The call, sinking fund, and term-to-maturity features of corporate bonds: An empirical investigation. *Journal of Financial and Quantitative Analysis*, 26: 201-222.
- Mitchell, K. (1993). The debt maturity choice: An empirical investigation. *Journal of Financial Research*, 16: 309-320.
- Modigliani, M. & Miller, M.H. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review*, 53: 261-297.
- Morris, J.R. (1992). *Factors Affecting the Maturity Structure of Corporate Debt*. Working paper. University of Colorado, Denver.
- Myers, S.C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, 5: 146-176.
- Securities Commission Malaysia (January 2008). *Quarterly Bulletin of Malaysian Islamic Capital Market*. Kuala Lumpur.
- Smith, C.W. & Warner, J.B. (1979). On financial contracting an analysis of bond covenants. *Journal of Financial Economics*, 7: 117-161.
- Stiglitz, J.E. (1974). On the irrelevance of corporate financial policy. *American Economic Review*, 64: 851-866.
- Titman, S. & Wessels, R. (1988). The determinants of capital structure choice. *Journal of Finance*, 43: 1-19.
- White, H. (1980). A heteroskedasticity –consistent covariance matrix estimator and a direct heteroskedasticity. *Econometrica*, 48: 817-830.

