DETERMINANTS OF CORPORATE BOND YIELD: THE CASE OF MALAYSIAN BOND MARKET

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ABSTRACT

Default risk has been recognized as one of the key determinants of bond yield. Past studies argue that default risk can be reflected by issue characteristics, issuer characteristics and interest rate behaviors on riskless security. As default risk is believed to be higher in developing markets due to the issue of illiquidity, capital inadequacy and a developing lending system, more empirical works must be focused on these markets. The present study examines the association between selected determinants and corporate bond yield in Malaysian market. Instead of focusing on the aggregate market level as has widely been carried out in previous studies, the present study concentrates on the individual issue level. The results of cross-sectional multiple regression analyses based on 61 observations in 2012 indicate that bond maturity, coupon payment, trading frequency, issuer's rating, debt to equity ratio and return on equity ratio are the significant determinants of bond yield.

Keywords: Corporate Bond Yield; Malaysian Bond Market.

1. INTRODUCTION

Corporate bond markets have grown sizably in the developed markets and are developing considerably in many emerging markets including in the Asian continent. In Malaysia for instance, preceding the 1997 Asian financial crisis, a lack of well-balanced financial system has witnessed a heavy reliance on the financing from banks, which has resulted excessive losses suffered by corporations during the crisis period. Thus, it has alarmed the government to initiate an active utilization of bonds as a competitive alternative of long term financing that can better match the corporation's financial

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objective as well as an aid to minimize the possibility of excessive losses. The initiative is also meant to strengthen the financial system of a country (Fabella and Madhur, 2003). Nowadays, raising capital through bonds is a part of an important event in the financing decision of corporations (Kim, 2009). In the case of Malaysia, the issuing amount of corporate bond has reached to as high as of RM51 million in 2010 compared to only RM38 million in the previous year as shown in Table 1. As suggested by Ahmad, Muhammad and Masron (2009), one of the contributing indicators is the bonds, which claimed as more flexible than loans due to the regulations issue.

Table 1: Corporate Bonds Issue

Year	Number of Issue		Issue Size (RM '000)		Market share (%)
	Bonds	**PDS**	**Bonds**	**PDS**	
2001	33	114	20,930	45,688	45.81
2002	60	171	36,516	56,009	65.19
2003	50	118	34,395	47,347	72.64
2004	43	124	20,832	47,841	45.34
2005	39	126	22,336	60,662	36.82
2006	66	120	31,503	79,562	39.59
2007	47	120	34,420	158,802	21.67
2008	40	99	45,586	139,991	32.56
2009	15	34	38,266	57,485	66.56
2010	14	52	51,963	63,583	81.72
Total	*407*	*1078*	*336,747*	*756,970*	

Notes: PDS is private debt securities. Market share represent size of corporate bond issue over total of PDS issue size.
Sources: (1) Bursa Malaysia website, (2) Securities Commission website and, (3) Bank Negara Malaysia website.

A development on the issue size of corporate bonds in Malaysian market over the 10 years period that is from 2000 to 2010, can be captured in Table 1. The table displays that the issue size of corporate bonds appears to be on the uprising pattern since 2004 although it declines about RM7 million in 2009. Nevertheless, despite the reducing pattern in 2009, the corporate bond issuance has marked a significant growth whereby a total increase of 35.91percent market share is notified from 2000 to 2010. This is more prevalent when corporate bond issuance is fractioned 81.72 percent of the total private debt securities issuance in 2010 compared to 45.81 percent in 2001. The 35.91 percent increase can be an indication of the acceptance of corporate bonds as a suitable alternative mechanism of firms raising its capital and funding, particularly in Malaysian market.

In conjunction with the extensive increase in corporate bond issuance, the examination on the determinants of corporate bond yield has become an interesting area of academic research. It is important to assist the market participants to understand its behavior because the understanding is argued to be an aid for a better firm financing decision. As

clarified by Bhojraj and Sengupta (2003), the determinants influencing the price that debt holders (firm) charge on the borrowers is of immense economic significance as a small change in yield might lead to a large shift in capital allocation of a firm. Theoretically, an inverse shift in capital allocation is likely to increase the interest burden and reduce firm's cash availability and thus, distract the performance of the firms in overall. For that reason, firms definitely do not welcome the impacts. Besides that, study on determinant of bond yield is also vital as it is expected to increase the awareness and participation of the investors in bond market and help to increase the growth of the nation. Meanwhile, Lin, Wang and Wu (2011) advocates that the knowledge on how corporate bonds are priced is also essential to develop a unified theory of asset pricing. Due to these reasons, understanding determinants of corporate bond yield are not only of a paramount importance in many practical situations but also is significant for the academic purpose.

Since the initial work is carried out by Merton (1974), many studies have attempted to understand the determinants of corporate bond yield. Nevertheless, as far as the review of published works is concerned, almost all the studies focus largely at the aggregate market level. Less is relatively known about the behavior of corporate bond yield at the individual bond levels. Moreover, the focus of most of the studies is on the cases in developed bond markets and there is limited evidence about the behavior of corporate bond yield of the developing bond market including in Malaysia. Since default risk is contended to be higher in developing bond markets due to the issue of a thin market, illiquidity and a developing lending system (Chan, Ahmad and Wooldridge, 2007), yield of bonds is expected to be more sensitive. Thus, further empirical works that focus on this market are needed, and accordingly, it leaves a need to be fulfilled by the present study. The purpose of the study is therefore to examine the determinants of corporate bond yield in the Malaysian market at the individual issue level. In this study, a major focus is given to the level of default risk of the debt holders, which is represented by its characteristics. Based on the findings of this study, the present study is expected to understand whether similar significant relationship between the selected determinants and bond yield found in the developed markets also exists in Malaysia.

2. LITERATURE REVIEW

In contrast to the bank loan, shares and government security, the corporate bond market is still virtually nonexistent in the early 1980. The development of Malaysian corporate bond market begins in the mid 1980's. As suggested by Das (2005), there are two phases of development of the corporate bond market: pre and post Asian financial crisis 1997. Before the crisis, Korea is reported as a leader in creating a sound corporate bond market with a total of 32 percent market share in corporate financing. During the post crisis period, as bond markets become more important to fund long-term needs, there is

a significant increase in the issuance volume in Malaysian market. Thirty years of effort has succeeded when Malaysian corporate bond market is finally known as one of the most advanced corporate bond market in Asia, which contributes more than 37 percent of the national GDP in 2010. Meanwhile, another notable achievement in Malaysia is the successful promotion and development of the Islamic bond market.

The initial work by Merton (1974) proposes default risk as a major determinant of the corporate debt's value. Default risk is posited in several previous studies as being reflected by issue and issuer characteristics, while the interest rate behavior on riskless assets. The issuer leverage and profitability conditions have extensively been proven in the literature as the key indicator to the firm's default risk. For example, a positive significant relationship between the issuer leverage condition and bond yield is reported by Bhojraj and Sengupta (2003) and Nakashima and Saito (2009). According to the studies, the bond issued by a highly leveraged firm is riskier due to higher interest burden. The more debt injected in the firm capital structure, the greater is the firm interest obligation, thus resulting in the higher bond yield to offset for the risk.

Meanwhile, the effect of the issuer profitability condition on bond yield is evidence in some other studies (e.g., Ugurlu and Aksoy, 2006; Chen, Lesmond and Wei, 2007 and Liu and Jiraporn, 2010). These studies investigate the ability of the issuer in generating sufficient return from assets utilization to ensure a lower default probability. A sufficient return generated signals higher future earnings, which consequently reduces the default risk and the yield. Firm's rating is another measure to reflect the issuer default risk (Bhojraj and Sengupta, 2003; Elton, Gruber, Agrawal and Mann, 2004 and Liu and Jiraporn, 2010). Fama and French (1993) take a slightly different approach. Instead of examining the issuer's default risk, they suggest the utilization of the firm financial ratios such as market to book value ratio as an indication of the issuer's future growth. Firm would have higher probability of future growth when the equity market value increases. As a result, the growth lowers not only the business risk but also the yield of bond. This supposition is supported by Elton, Gruber, Agrawal and Mann (2001) and Liu, Shi, Wang and Wu (2009).

Liquidity risk is another significant determinant of bond yield reported in the literature (e,g, Helwege et al. 2014, Huang et al. 2015, Rossi 2014). For example, Gajalla (2006) suggests liquidity risk is replicated by the trading frequency. As highlighted by Tishchenko (2004), higher trading frequency is supposed to lead to higher liquidity position, which helps to a greater opportunity of price discovery, lessens the possibility of price distortions and reduces the yield. In short, we hypothesize that liquidity risk is inversely associated with bond yield. Meanwhile, maturity and coupon rate are the other important issue characteristics that discriminate the yield among the individual bond. The empirical studies by Amihud and Mendelson (1991) and Gajalla (2006) suggest that bond with an age more than three years are highly exposed to the interest rate risk and higher pricing risk. These studies indicate a positive association between the bond age

and the yield. Meanwhile, coupon payment reflects the level of taxes that should be paid by investors. Consistent with this argument, Chen et al. (2007), Liu and Jiraporn (2010) and Chen et al. (2010) find that higher coupon payment leads to a higher bond yield. Since bond with a higher coupon rate will be charged with more taxes, investors will have to be compensated with a higher yield in order to make the bond more attractive (Lu, Chen and Liao, 2010).

3. DATA AND METHODOLOGY

3.1. The Sample

Data on the issue characteristics are collected from Bond Pricing Agency Malaysia (BPAM, formerly known as Bondweb Malaysia Sdn. Bhd) database. BPAM is officially established as Malaysia's first bond pricing agency in 18 April 2006 and BPAM is one of the Securities Commission (SC) initiatives to enhance the bond trading activity and data transparency. BPAM is recognized as an official source for ringgit denominated bond prices evaluation in Malaysian bond market. In line with the effort to further enhance the trading transparency, BPAM is currently offering a new online bond data to a more detailed level. For 2012, the database provides information on 168 issues of 48 companies, which represents 724 trading transactions. The sample consists of all issues traded in the secondary market. All issues by the financial institutions and insurance companies are excluded due to the difference in their legislation framework and financial statement structure. Finally, all issues by private listed companies are also excluded due to the issue of data availability; resulting in a final sample of 61 issues. All issues information is then matched with the issuer characteristics collected from the DataStream. Several financial ratios are observed yearly during 2008-2011 and are then averaged to obtain a single parameter and to represent an average performance in the past 3 years.

3.2. Measure of Bond Yield

In this paper, the estimation of bond yield is based on the current yield data calculated by BPAM. The basic calculation of current yield is as follows:

$$CY_{it} = \frac{CP_i}{AP_i} \tag{1}$$

Where:
CP   =   coupon payment for the ith issue,
AP   =   average trading price for the ith issue, and
CY   =   current yield of the i th issue at time t.

Based on the current yield from each transaction, the individual bond yield (BY) is then calculated as the average current yield over N transactions throughout the year (2012).

$$BY_i = \sum_{t=1}^{N} CY_{it} / N \tag{2}$$

Where:
BY   =   bond yield for the *i* th issue, and
N   =   number of the issue transactions *t* where $t = 1,\ldots, N$

3.3.   *Measures of Determinants of Bond Yield*

All the predictors of bond yield including the issue characteristics and issuer characteristics are identified and selected as they have been normally used in the previous studies (Amihud and Mendelton, 1991; Collin-Dufresne, Goldstein and Martin, 2001, Batten et al. 2014, Bhojraj & Sengupta, 2003; Elton et al. 2001, 2004; Tishchenko, 2004; Chen et al., 2007; Chan et al., 2007; Ahmad et al., 2009; Nakashima and Saito, 2009; Liu and Jiraporn, 2010; Chen, Liao and Tsai, 2010 and Lu et al., 2010). The present study explains bond yield in terms of the issuer characteristics (representing default risk) and issue characteristics from the perspective of bond age, coupon rate and trading frequency (interest rate risk and liquidity risk).

(a)   Issuer Characteristics:

Debt to Equity (DTE) = Book value of long term debt divided by the market value of common equity at the end of year t. Firms with higher debt to equity ratios are predicted to have higher yields due to the higher debt obligation and higher possibility of excessive losses.

Return on Equity (ROE) = Net income at the end of year t divided by shareholder's equity. Firms with higher return on equity ratio indicate the stability and profitability of the debt holders and therefore are expected to offer lower yield.

EBITDA to Sales (ETS) = Earnings before tax and interest at the end of year t divided by total sales. Similar to ROE, firms with higher EBITDA to Sales ratio demonstrate a good sign of their profitability condition. Therefore, they are expected to enjoy lower yield.

Market to Book Value (MTBV) = Market value of common equity at the end of year t equity over the book value of common equity. MTBV is normally used to indicate the firm prospects. Firms with higher MTBV are indicated as high growth firms such that

could be associated with greater risk level. A positive association is expected between bond yield and MTBV.

Firm Rating (RAT) = Ratings are converted into a numerical score from 1 to 7 representing rating AAA, AA+, AA, AA-, A+, A and A-, respectively. A firm with poor rating indicates a higher default risk and accordingly, is expected to negatively associate with bond yield.

(b)   Issue Characteristics:

Trading Frequency (FREQ) = Trading frequency reflects the number of time that a given bond is traded in 2012. Trading frequency represents bond liquidity level. Bonds quoted more frequently are expected to produce a lower yield due to the lower liquidity risk. This suggests a negative relationship between bond yield and the number of trading quotation.

Maturity (MAT) = The holding period of bond and measured in years. A bond with longer maturity is expected to indicate a higher interest rate risk and as such, is predicted to offer a higher yield.

Coupon Rate (CR) = Periodic income paid semi-annually and measured in percentage. A bond with higher coupon payment is expected to pay a higher tax. To make the bond attractive, investor is offered with higher yield. This suggests a positive relationship between bond yield and coupon rate.

3.4.   Empirical Regression Model

Equation (3) below explains the relationship between corporate bond yield and issuer characteristics and issue characteristics:

$$BY_i = \alpha + \beta_1 ROE_i + \beta_2 RAT_i + \beta_3 MAT_i + \beta_4 ETS_i + \beta_5 MTBV_i + \beta_6 DTE_i$$
$$+ \beta_7 CR_i + \beta_8 FREQ_i + \varepsilon_i \quad\quad\quad (3)$$

Where:
α	=	constant term of the regression equation,
β	=	estimated coefficient of the factor variable,
i	=	the individual bond *i*, where $i = 1,\dots, 61$,
BY	=	average current yield
ROE	=	return on equity,
RAT	=	the issuer rating,
MAT	=	holding period of the individual bond,
ETS	=	EBITDA to sales,

MTBV   = market to book value ratio,
DTE   = debt to equity ratio,
CR   = coupon rate,
FREQ   = trading frequency, and
ε   = the error term

4.   RESULT AND DISCUSSION

4.1.   Descriptive Statistics

Descriptive statistics of the variables are presented in Table 2. According to Bank Negara Malaysia (2011), base lending rate (BLR) from commercial banks in 2011 is 5.62 percent. However, as shown in Table 2, an average yield of bond is only 4.61 percent. In comparison to the commercial bank loans, bond indicates a lower cost of borrowing for the corporation and consequently, a lower cost of borrowing possibly encourages corporations to increase the utilization of bond issuance. Return on equity (ROE) ranges from -25.3 percent to a maximum of 25.4 percent with an average return on equity of 8.93 percent for the 61 sample issues. This variable has the highest standard deviation of 12.39 among all the variables studied. The ratio of EBITDA to Sales (ETS) has the lowest standard deviation of only 0.3 with a value range from 0.016 percent to a maximum of 0.86 percent. Rating (RAT) ranges from AAA (value of 1) to A- (7) as this variable has initially been coded as 1 to 7 accordingly. The average RAT of 2.49 indicates that overall, the sample bond issues are within the AA1 and AA2 rating. Coupon rate (CR) is classed between coupons and zero coupon issues ranges from zero (from the zero coupon bonds) to a maximum of 9 percent. It is interesting to note that there are 31 zero coupon bonds in the sample.

Table 2: Descriptive statistic of the variables

Variables	Mean	Median	Minimum	Maximum	Std. Dev.
BY (%)	4.61	4.33	2.74	14.34	1.54
ROE (%)	8.93	12.73	-25	25.4	12.38
RAT	2.49	3.00	1.00	7.00	1.58
MTBV (%)	1.70	1.48	0.54	2.84	0.87
MAT	12.39	12.00	3.00	50.00	6.71
FREQ	4.44	2.00	1.00	41.00	6.24
ETS (%)	0.44	0.51	0.02	0.86	0.30
DTE (%)	1.65	1.11	0.14	3.52	1.35
CR (%)	2.80	0.00	0.00	9.00	3.22

Notes: BY = Bond yield, ROE = Return on equity ratio, RAT = Rating, MTBV = Market to book value ratio, Mat = Maturity,   FREQ = Trading Frequency, ETS = EBITDA to Sales ratio, DTE = Debt Ratio, CR = Coupon rate.

4.2. Regression Result

Table 3: Cross Sectional Regression Results

Variable	Coefficient	t-stats	*p*-value
ROE	-0.041	-5.697***	0.000
RAT	0.513	6.415***	0.000
MTBV	0.216	1.270	0.206
MAT	0.207	9.288***	0.000
FREQ	0.033	2.930***	0.005
ETS	-0.335	-0.661	0.506
DTE	-0.680	-4.971***	0.000
CR	-0.160	-3.412***	0.001
R-squared	0.865		
Adjusted R-squared	0.845		
F-statistic	41.891		
Prob(F-statistic)	0.000		

Regression equation: $BY_i = \alpha - 0.04ROE_i + 0.51RAT_i + 0.21MAT_i - 0.33ETS_i + 0.2MTBV_i - 0.68DTE_i - 0.16CR_i + 0.33FREQ_i + \varepsilon_i$

Notes: BY = Bond yield, ROE = Return on equity ratio, RAT = Rating, MTBV = Market to book value ratio, Mat = Maturity, FREQ = Trading Frequency, ETS = EBITDA to Sales ratio, DTE = Debt Ratio, CR = Coupon rate. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

The regression result in Table 3 shows that collectively, the selected independent variables have successfully explained the variation of the corporate bond yield. Specifically, the adjusted R-squared indicates that the regression model comprising company characteristics which are company rating, return on equity, EBITDA to sales, market to book value and debt to equity ratio, and issue specific characteristic which are maturity, coupon rate and a trading frequency could explain as high as 86 percent of the variation in the individual corporate bond yield traded in 2012.

The issue characteristics are the dominant determinant as trading frequency; bond maturity and coupon rate are reported to be greatly significantly associated with the bond yield. Nonetheless, trading frequency and coupon rate fails to give the predicted sign. The positive sign of trading frequency is of particular interest. In reference to Amihud and Mendelton (1991) and Tishchenko (2004), higher trading frequency should lead to a higher liquidity position as it is expected to improve the price discovery, reduce the possibility of price distortions, lower the liquidity risk and lower the yield. This proposition suggests that there should be a negative relationship between trading frequency and bond yield. Clearly, this study provides a contradictory result for the Malaysian market. The positive association reported in this study might be attributed to a higher pricing risk. The more frequent the individual bonds are traded, the more volatile the price would be. Consequently, a higher yield is required to compensate the investors or the lenders.

As emphasized by Lu et al. (2010), investors would be compensated with a higher yield for a high coupon bonds. Again, this argument is not supported in this study when a

negative significant relationship is shown between the coupon payment and bond yield. In reference to the issues traded in 2012, more than half of the issues in Malaysian corporate bond market are zero coupons. It might be the reason for this surprising result. To further verify the surprising result, the regression equation is again estimated after excluding the issues with zero coupon payment resulting in a final sample of 30 issues. Nevertheless, the same significant negative relationship is reported (The result is shown in the Appendix 1). Theoretically, zero coupon bonds are offered and bought with a price below the par value. Compared to coupon bond, zero coupon bonds are extremely exposed to the volatility in price due to the fluctuation in market interest rate, and the gain for zero coupon bonds is only realized at the time of maturity when the bond is expired and repaid. For the coupon bond, the more the interest rate fluctuates, the greater possibility of losses. Therefore, to compensate zero coupon bondholders with the higher pricing risk and interest rate risk, bondholders are expected to receive a higher yield. Therefore, it is not totally a surprise to exhibit that there is a negative association between coupon payment and bond yield in this market. Time to maturity may also play a significant influence in determining the negative relationship between coupon rate and bond yield. In reference to the mean of the issue's maturity, it shows an average of 14.44 years for zero coupon bonds compared to those coupon bonds with only 10.14 years. It further indicates the higher pricing risk and interest risk that the zero coupon bonds are exposed to due to the long duration of maturity and eventually result in a higher yield.

The regression result also shows rating as among the most significant determinants that represent the issuer characteristic influence on bond yield. Since rating is probably the best indication for the issuer's credit quality, it consistently and correctly shows that issuer with a good credit quality is able to offer bonds at lower yield. This finding suggests that bondholder believes the issuer will meet their obligations on timely basis due to the lower default probability. On a scale of 1 (higher rating) to 7 (lower rating), a lower rated issuer with a code greater than a value of four is perceived to be riskier by bondholders, and bondholders are more secured to invest in higher rated issuers. Therefore, the bond yield reduces as the credit quality increases. The result is consistent with the studies of the U.S corporate bond market by Bhojraj and Sengupta (2003), Elton et al. (2004) and Liu and Jiraporn (2010). Overall, our result shows the issuer rating is an important indicator when pricing the corporate in both the developed and the developing market.

Initially, DTE is expected to have a positive association to the yield; however, our result shows that it fails to meet the prediction. Conventionally, firms increase the leverage position when they are unable to meet a sufficient capital from the stock issuance. However, injecting more debt in the capital structure is not necessarily favorable as it increases the possibility of excessive losses in highly leveraged position. Firms are then required to generate sufficient return to meet their periodic interest for bondholders. As the higher leverage position indicates higher possibility of losses, it simply presents a

higher default probability and therefore transfers the risk to the bondholders if the default occurs. This is empirically evident in the US market (Collin-Dufresne et al., 2001, Bhojraj and Sengupta, 2003, Helwege et al. 2014; Psillaki, Tsolas and Margaritis, 2010). The same evidence has been shown in the study of Japan corporate bond market (Nakashima and Saito, 2009). However, Fabozzi (2006) emphasizes that firms would have a greater chance to grow in the future if they are sufficiently funded. Firms could not finance their growth if there is an insignificant restriction in their capital structure. As such, issuer's growth opportunities are found as a reason of a negative association between the yield and DTE in this study. In addition, firms also require sufficient long term financing to increase level of competitiveness. As such, a higher leverage is much considered to increase the possibility of growth and therefore reduce the bond yield. In support to this argument, Marsh (1982) emphasizes that firms with high growth will capture relatively higher debt ratio. In the case of small firms with more concentrated ownership, it is expected that high growth firms will require more external financing and should display higher leverage (Kim 2009).

With regard to profitability, the present study provides the importance of the issuer financial strengths in determining the bond yield. Investors regard a handsome ROE as a good future growth and as such consider that it can reduce the default probability. In other words, the higher the issuer future growth, thus the lower the default would be. In a sense, the significant negative relationship supports the risk-return trade off theory whereby the lower the default risk, the lower the return or yield required by investors. This result is evident and consistent with those of Ugurlu and Aksoy (2006) who study the financial distress among corporations in Turkey.

5. CONCLUSION

The present paper, which focuses mainly on the issuer and issue characteristics of Malaysian corporate bond, is set to examine the determinants of bond yield. Using a sample of 61 issues traded in 2012, the findings of the current study indicates that most of the determinants found in the developed markets are also important in understanding the behavior of bond yield in the developing market specifically Malaysia. In general, the evidence presented in this study suggests that the issuer leverage, profitability and the issuer rating quality are the major issuer characteristics that discriminate the bond yield from one another. Whereas, bond maturity is shown as a main issue characteristic that plays a major role in pricing the corporate bond in Malaysia. The four variables confirm the associations found in the previous researches. Bond's trading frequency and coupon payments are also significant issue characteristics but the importance of the two variables are not as high as the bond maturity. The present study suggests that bond with longer maturity and bond with a higher frequency of quotation tend to be exposed with

higher price volatility and thus, deserved to be compensated with a higher yield. Coupon payment is also reflected by the price volatility but it is negatively affected.

REFERENCES

Ahmad, N., Muhammad, J., & Masron, T. A. (2009). Factors Influencing Yield Spreads of the Malaysian Bonds. *Asian Academy of Management Journal, 14*(2), 95-114.

Amihud, Y., & Mendelson, H. (1991). Liquidity, Maturity, and the Yields on U.S. Treasury Securities. *Journal of Finance, 46*(4), 1411-1425.

Bank Negara Malaysia. (2011). *Bond Info Hub*. Retrieved 26 March, 2011, from http://bondinfo.bnm.gov.my.

Batten, J. A., Jacoby G., & Liao R. C. (2014). Corporate yield spreads and real interest rates. *International Review of Financial Analysis, 34*(July), 89 – 100.

Bhojraj, S., & Sengupta P. (2003). Effect of Corporate Governance on Bond Rating and Yields: The Role of Institutional Investors and Outside Directors. *Journal of Business, 76*(3), 455-475.

Chan, E., Ahmad, M. F. H., & Wooldridge, P. (2007). *Liquidity in an Emerging bond market: A Case Study of Corporate Bonds in Malaysia*. Paper presented at the Conference Paper on Bond Market Development in a Comparative Perspective: Asia, Europe, Latin America.

Chen, L., Lesmond, D. A., & Wei, J. (2007). Corporate Yield Spreads and Bond Liquidity. *Journal of Finance, 6*(1), 119-149.

Chen, T. K., Liao, H. H., & Tsai, L. P. (2010). Internal liquidity risk in corporate bond yield spreads. *Journal of Banking and Finance, 35*(4), 978-987.

Collin-Dufrense, P., Goldstein, R. S., & Martin, J. S. (2001). The Determinants of Credit Spread Changes. *Journal of Finance*, *56*(6), 2177-2207.

Das, D. K (2005). *Asian Economy and Finance: A Post Perspective*. Ontario: Springer.

Elton, E. J., Gruber, M. J., Agrawal, D., & Mann, C. (2001). Explaining the Rate Spread of Corporate Bonds. *Journal of Finance*, *56*(1), 247-277.

Elton, E. J., Gruber, M. J., Agrawal, D., & Mann, C. (2004). Factors Affecting the Valuation of Corporate Bonds. *Journal of Banking and Finance, 28*(11), 2747-2767.

Fabella, R., & Madhur, S. (2003). *Bond market development in East Asia: Issues and challenges*. ERD Working Paper No. 35.

Fabozzi, F. J (2006). *Bond Credit Analysis Framework and Case Studies*. New Hope, Pennsylvania: Frank J. Fabozzi Associates.

Fama, E. F., & French, K. R. (1993). Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics*, *33*, 3-56.

Gajjala, S. (2006). Pricing of Risk in the Indian Corporate Bond Market: Some Evidence. *Asian Academy of Management Journal of Accounting and Finance, 2*(2), 95-104.

Helwege. J., Huang, J-Z., & Wang, Y. (2014). Liquidity effects in corporate bond spreads. *Journal of Banking and Finance, 45*(August), 105 -116.

Huang, H. H., Huang, H., & Oxman, J. (2015). Stock Liquidity and Corporate Bond Yield Spreads: Theory and Evidence. *Journal of Financial Research, 38*(1), 59-91.

Kim, C. S. (2009). *Debt Securities Issuance in Malaysian: Its Determinants and Impacts towards Company Return, Systematic Risk and Total Risk.* Doctoral Dissertation. Universiti Utara Malaysia.

Lin, H., Wang, J., & Wu, C. (2011). Liquidity risk and Expected Corporate Bond Returns. *Journal of Financial Economics, 99*(3), 628-650.

Liu, S., Shi J., Wang J., & Wu, C. (2009). The Determinants of Corporate Bond Yields. *The Quarterly Review of Economics and Finance, 49*(1), 85-109.

Liu, Y., & Jiraporn, P. (2010). The Effect of CEO Power on Bond Ratings and Yield. *Journal of empirical Finance, 17*(4), 744-762.

Lu, W. C., Chen, K. T., & Liao, H. H. (2010). Information Uncertainty, Information Assymetry and Corporate Bond Yield Spreads. *Journal of Banking and Finance, 34*(9), 2265-2279.

Marsh, P. (1982). The Choice between Equity and Debt. An Empirical Study. *Journal of finance*, *37*(1), 121 – 144.

Merton, C. R. (1974). On the Pricing of Corporate Debt: The Risk Structure of Interest Rates". *Journal of Finance, 29*(2), 449-470.

Nakashima, K., & Saito, M. (2009). Credit Spreads on Corporate Bonds and the Macroeconomy in Japan. *Journal of Japanese International Economics*, *23*(3), 309-331.

Psillaki, M., Tsolas, I. E., & Margaritis, D. (2010). Evaluation of credit Risk Based on Firm Performance. *European Journal of Operational Research, 201*(3), 873-881.

Rossi, M. (2014). Realized Volatility, Liquidity, and Corporate Yield Spreads. *Quarterly Journal of Finance, 4*(1), 1450004

Tishchenko, I, S. (2004). Liquidity and Yield Spreads of Corporate Bonds. *Doctoral Dissertation*, Ohio University.

Ugurlu, M., & Aksoy, H. (2006). Prediction of Corporate Financial Distress in an Emerging Market: The Case of Turkey. *Cross Cultural Management: An International Journal, 13*(4), 277-295.

APPENDIX

Appendix 1: Regression Result for a Sample of Zero Coupon Bond

Variable	Coefficient	t-stat	*p*-value
ROE	-0.000	-0.015	0.988
RAT	0.461	5.910***	0.000
MTBV	-0.316	-1.474	0.155
MAT	0.170	6.336***	0.000
FREQ	-0.001	-0.095	0.925
ETS	-1.839	-1.892**	0.072
DTE	1.804	1.897**	0.071
CR	-0.263	-3.517***	0.002
R-squared	0.913		
Adjusted R-squared	0.880		
F-statistic	41.891		
Prob(F-statistic)	0.000		

Note **, **, and * indicate significance at 1%, 5%, and 10%, respectively.