J. Basic. Appl. Sci. Res., 3(6)535-545, 2013
© 2013, TextRoad Publication

ISSN 2090-4304
Journal of Basic and Applied Scientific Research
www.textroad.com

Default risk and the earnings response coefficient. Evidence from Malaysia

Nor Balkish Zakaria, Mohamad Azwan bin Md Isa and Rabiatul Alawiyah Zainal Abidin

Accounting Research Institute and Universiti Teknologi MARA

ABSTRACT

This study examines whether default risk has any effect on the earnings response coefficient (ERC) while controlling for the established determinants of ERC — beta, growth, earnings persistence and size. A sample of 2172 firm-years comprising 362 firms listed on the Bursa Malaysia over a six year period from 2006 to 2011 were examined by using reverse regression method. The study confirms that beta is negatively related to ERC and that growth, earnings persistence and size are positively related to ERC. Default risk is found to be negatively related to ERC thus confirming that beta is only a partial measure of risk relevant to ERC. The results of the study hold both for the pooled sample of 2172 firm-year observations and on a year by year basis for the 362 firms in the sample. The results are also found to be robust to various sensitivity tests including to alternative measures of default risk. The study thus provides systematic and comprehensive additional evidence on the determinants of ERC. - Of itself this is an important contribution to the literature but especially so given that the evidence comes from Malaysia — an emerging economy — whereas the existing empirical literature relates mainly to developed countries.

KEYWORDS: Earnings response coefficient, default risk, audit committee expertise, audit committee independence

1. INTRODUCTION

The pioneering work of Ball and Brown (1968) has led the intellectual discourse on stock price reactions to unexpected changes in accounting earnings. Following their lead, Beaver, Clarke and Wright (1979), Collins and Kothari (1989), Cho and Jung (1991), Dhaliwal, Lee and Fargher (1991), Dhaliwal and Reynolds (1994), Billings (1999), Kim (2005), Shangguan (2007), and Cheng and Nasir (2010) have made significant contributions to the body of knowledge concerning this phenomenon.

ERC is the effect of a dollar of unexpected earnings on stock returns and, in principle, can be measured as the slope coefficient in the regression of abnormal stock returns on unexpected earnings (e.g. Cho and Jung, 1991). The ERC is therefore the estimated relationship between equity returns and the unexpected portion of a firm's earnings. Shangguan (2007) defines ERC as the measure of the extent to which stock prices react to earnings surprises. Among the factors identified as being significant in determining ERC, the most commonly cited are: systematic risk (Lipe, 1990), growth (Collins and Kothari, 1989; Billings, 1999), earnings persistence (Kormendi and Lipe, 1987; Collins and Kothari, 1989) and size (Collins, Kothari and Rayburn, 1987). The construct validity of the theoretical determinants of ERC and the relationship among empirical proxies are not fully known. It remains important therefore to keep testing and analysing the determinants of ERC under different settings and in different environments. Emerging markets seem to experience earnings fluctuations and market volatility as often and severely, if not more than developed countries. However, there is a relative paucity of research on ERC determinants in emerging markets. The drivers of ERC and their relative influence in such markets are little known and the literature on the subject is not well developed. It is the aim of this study to fill the gap in part, at least as it pertains to Malaysia.

Of the four ERC determinants listed above, the effect of systematic risk (beta) has been found to be negative and significant (Collins and Kothari, 1989). The risk measured by beta, reflects investors' estimates of the stock's future return volatility in relation to that of the market. Equity beta alone, however, does not appear to adequately capture all the dimensions of risk associated with equity (Fama and French, 1992). Dhaliwal and Reynolds (1994) point out that default risk could provide the dimension not captured by beta. They suggest that the default risk of debt reduces ERC, on the grounds that accounting earnings provide information about the value of the entire firm, not just the value of equity. Moreover, default risk is the mechanism that determines the transfer of wealth from unexpected earnings between shareholders and bondholders. Kai (2002) provides evidence from the Japanese market that default risk has a negative effect on ERC. Based on Chinese commercial banks, Cheng and Nasir (2010) provide evidence that the credit risk factor of financial institutions contributes significantly to the ERC. Thus, it is possible that default risk could have the same negative effect on ERC in a less developed market.

*Corresponding Author: Nor Balkish Zakaria, Accounting Research Institute and Universiti Teknologi MARA.

1.2 Motivation and significance of the study

Research on determinants of ERC and corporate governance has been dominated by studies on developed countries. There is an increasing awareness that theories corroborated by research on developed countries such as the USA and the UK may have limited applicability to emerging markets. Emerging markets have different characteristics such as different political, economic and institutional conditions, which may limit the application of theoretical models used to explain behaviour in developed markets. Malaysian firms rely heavily on banks for both short and long-term capital requirements. The total volume of credit provided to the private sector as a percentage of GDP in Malaysia was 100.57 in 2008 (World Bank). The high degree of reliance on debt financing, while favoured on the ground of faster processing and easier access for smaller firms, creates a contractual obligation on the part of the borrowing firm to service the debt in the form of regular interest and principal payments. This in turn introduces default risk. As debt is of high significance to the Malaysian market, default risk is closely monitored by market participants. Both lender and borrower are impacted by high risk of the borrower. The lender suffers increased risk over the life of the loan and the borrower from high interest rates (Demerjian and Ross, 2007). The debt contracting literature suggests that contracts between debt holders and owner-managers contain covenants that restrict management behaviour because owner-managers have incentives to take actions that may negatively affect the debt holders' wealth position.

The remainder of the paper is organised as follows. The following section provides a review of prior studies about the determinants of ERC and shows how default risk emerges as an additional risk factor in explaining ERC. Section three develops the research hypotheses and describes the research methods employed in the study. Section four reports and discusses the findings of the study and finally the last section concludes the study by summarising the findings and discussing the contribution of the study to the literature. It also identifies limitations of the study and provides suggestions for future research.

2. LITERATURE REVIEW

The study of ERC has led to a better appreciation of the nature of earnings information and the role of accounting information within the market's overall information structure. Earnings-returns studies tend to start with a valuation model that links dividend, cash flows or earnings, to value. Cho and Jung (1991), for instance, suggest that all earnings-returns studies use a valuation model that discounts future dividends or cash flows. In explaining ERC it is assumed that accounting earnings are closely related to future dividends. Hence, any unexpected earnings may cause investors to revise their expectations of future dividends thus leading to security price changes (Collins and Kothari, 1989; and Dhaliwal and Reynolds, 1994).

2.1 ERC and determinants

Capital market researchers have consistently found the following factors to be significant determinants of ERC: beta, growth, earnings persistence, size and some non-financial variables such as industry (see Bernard and Ruland, 1987; Easton and Zmijewski, 1989; Collins and Kothari, 1989; Biddle and Seow, 1991; Cho and Jung, 1991; Dhaliwal and Reynolds, 1994; Kai, 2002; Kim, 2005; Cheng and Nasir, 2010).

ERC declines with increasing expected rate of return. That is, given the common association of higher risk with higher expected return, ERC declines with increasing risk. Consistent with Collins and Kothari (1989), Easton and Zmijewski (1989) find that ERC is negatively related to beta. Subsequent studies that have tested various capital market phenomena using ERC have included beta as a control variable and found a negative relationship (for example, Vafeas, 2000; Shangguan, 2007; and Cheng, Crabtree and Smith, 2008). The study by Martikainen (1997) shows that losses which can be expected to be temporary, that is those that have low persistence, have greatest impact on firms with high growth opportunities. That is, ERC is positively related to growth. Skinner and Sloan (2002) provide evidence to show that the inferior returns to growth stocks relative to value stocks is due to the asymmetrically larger negative price response to negative earnings surprises for growth stocks. Ghosh, Gu and Jain (2005) find that ERCs are higher for firms with earnings growth resulting from revenue growth.Kormendi and Lipe (1987) and Park and Pincus (2000) find firms differ in their ERCs because of differences in their degrees of earnings persistence. Subramanyam and Wild (1996) deduce that the expected length of revision horizon is directly related to an entity's going concern status and show empirically that the ERC, as a measure of earnings informativeness, declines markedly as the probability of termination of a firm increases. That is, ERC is positively related to earnings persistence. Aston and Zmijewski (1989) find firm size to be positively related to ERC but the association is not consistently significant and size may just proxy for other sources of cross-sectional variation in ERC. Brown (1994) summaries the role of size by stating that size itself is unlikely to be a determining variable of ERC but tends to be related to other variables that do determine ERC. Industry is a non financial variable that may impact ERC. Bernard and Ruland (1987) find a significant cross-industry variation in ERC. ERC varies considerably across industries and that ERCs are positively related to growth, product type and barriers to entry, and negatively related to financial and operating leverage (Biddle and Seow, 1991). The quality of audit too may affect ERC. Teoh and Wong (1993) find that the ERCs of Big 8

client firms are significantly higher than those for non-Big 8 clients. Kwon, Lim and Tan (2007) provide evidence that clients of industry specialist auditors have a higher ERC. They suggest the earnings quality of firms is strengthened when firms are audited by a specialist auditor. Their evidence also suggests that the incremental impact on ERC from having industry specialist auditors decreases as the legal environment strengthens.A firm's monopoly power may also affect ERC. Lee, Jin and Huh (2005) examine the effect of a firm's monopoly power on ERC. They define firms designated as market-dominant enterprises by the Monopoly Regulation and Fair Trade Act as firms with monopoly power. They compare the ERCs of firms designated as market-dominant enterprises with non-designated ones. Their results show that the ERC is positively related to a firm's monopoly power.

2.2 Default risk

Default risk is the probability the firm's assets will be less than the book value of its liabilities (Vassalou and Xing, 2004) The higher the default probability the higher the spread (i.e., the higher the interest rate the lender is likely to charge the borrower as compensation for bearing higher default risk).Default risk has a role in explaining ERC as beta may not fully capture the relevant risk of particular securities or portfolios (Fama and French, 1992). Beta may be an inadequate measure of risk. The firm's debt to equity ratio can act as a more natural proxy for the risk to common equity of a firm (Laxmi, 1988).Dhaliwal, Lee and Fargher (1991) show that ERC is larger for all-equity and low-leverage firms. Dhaliwal and Reynolds (1994) find that the effect of default risk is negative and significant to ERC. They also find that the results are sufficiently robust to withstand a validity test using the debt-to-equity ratio as an alternative proxy for default risk. Shangguan (2007) documents evidence that the negative marginal effect of default risk on ERC is mitigated by illiquid growth opportunities. Cheng and Nasir (2010) find that banks have a strong earnings-return relationship but of the seven financial risk factors only liquidity risk is significantly related to ERC.

Total risk can be decomposed into systematic risk and unsystematic risk. Systematic risk arises from factors common to all securities whereas unsystematic risk reflects variations in factors unique to a given security. According to the CAPM of Sharpe (1964), Lintner (1965) and Black (1972), beta is the sole determinant of systematic risk — it reflects sensitivity to variations in return on the market portfolios of all risky assets. In mathematical terms, the systematic risk, SR_j, in portfolio (or security) $_j$ is given by $SR_j = \beta_j^2 \sigma^2_m$, where β_j is the beta of the portfolio and σ^2_m is the variance of return on the market portfolio. Despite these theoretical links, empirical studies have found either no link or weak links between beta and return. In particular, as reported above, Fama and French (1992) find weak links. However, the results of the empirical studies are subject to the difficulty of conducting tests with proxies for the market portfolio of risky assets rather than the true market portfolios and therefore inconclusive (Roll, 1977; and Roll and Ross, 1994). Nevertheless, Dhaliwal et al. (1991) find that default risk appears to complement beta in explaining return. Market-perceived equity risk of a firm increases as the default risk of its debt increases (Bhamra, Kuehn and Strebulaev, 2010). Moreover, Chambers, Freeman and Koch (2004) suggest that ERCs increase with both systematic and specific risks because risk is positively associated with the sensitivity of dividend expectations to firm-specific news. Additional debt reduces ERC by introducing higher equity and default risks (Kai, 2002; and Kim, 2005). Thus,

H1 *Ceteris paribus, default risk has a significant negative relationship with ERC*

In order to test the hypotheses, it is necessary to control for other variables which also determine ERC. These control variables are beta, growth, earnings persistence, and size.

3. METHODOLOGY

If ERC is determined by the n variables $X_1, X_2, \ldots X_n$, then

$$UR = f(X_1, X_2, \ldots, X_n) * (UX/P) \quad (2.1)$$

Thus the coefficient of $X_i * (UX/P)$ in a regression of *UR* on $\{X_i * (UX/P)\}$ can indicate the effect of X_i on ERC. However, *UX* is likely to be subject to significant measurement errors and thus, instead of a direct regression, reverse regression should be used as the method of estimation (Collins and Kothari (1989) and the later studies, e.g., Cho and Jung (1991), Dhaliwal and Reynolds (1994), Cready, Hurtt and Seida (2000), and Gunny, Jacob and Jorgensen (2009)). That is, the effect of $\{X_i\}$ is tested by a regression based on:

$$UX/P = [1/f(X_1, X_2, \ldots, X_n)]/UR$$

that is, the regression equation

$$UX/P = a_0 + a_1 UR + a_2 UR * X_1 + a_3 UR * X_2 + \ldots + a_{n+1} UR * X_n + \varepsilon \quad (2.2)$$

It is important to note that in this form, the test on the coefficients actually relates to the inverse of the ERC, the Return Response Coefficient (RRC). Therefore, if the coefficient on $UR * X_i$ is found to be significant and negative, that should indicate that X_i is positively related to ERC.

To test for the impact of default risk the following regression equation is estimated:

$$UX/P = a_0 + a_1 UR + a_2 UR * DER + a_3 UR * BETA + a_4 UR * GROWTH + a_5 UR * EPERS + a_6 UR * SIZE + \varepsilon \quad (2.1)$$

and $\hat{a}_2 > 0$ and significant would indicate that default risk has a negative impact on ERC while controlling for beta, growth earnings persistence and size. This study is based on firm-specific accounting and market data for a period of 6 years from 2006 to 2011. The data for the individual companies is combined to conduct tests both on a pooled basis for the whole six year period and on a year by year basis.

3.1 Study period and sample selection

The population for this study comprises firms listed on Bursa Malaysia during the period 2006 to 2011. From 786 Malaysian firms listed on Bursa Malaysia according to Thomson Datastream 3.5 in 2006, 89 high tech firms from the ACE market were identified and excluded as they were subject to different market regulations. A further 97 firms belonging to the financial services sector (banks and insurance) and REITS were also excluded because of: (i) their unique economic characteristics — most notably, high leverage; and (ii) the different compliance and regulatory environments under which they operate (they were subject to the Malaysia Banking and Financial Institutions Act 1989). And finally, a further 147 firms were excluded because they were restructured, classified as PN17 (financially distressed) by Bursa Malaysia, experienced distortions in their business operations due to suspension of trading, or otherwise ceased to exist during the study period. Further grounds for exclusion arose from the study's data requirements. A further 91 firms were excluded from the sample on the ground that there was not insufficient data to allow computation of CAR and earnings persistence for these companies. The selection process thus resulted in data on 362 firms with a total of 2172 firm years.

3.2 Measurements of variables

i)Unexpected earnings

The present study assumes a random walk and hence unexpected earnings is calculated as the change in annual EPS (current year EPS minus previous year EPS). The unexpected earnings are then deflated by the previous year stock price.

ii) Unexpected Returns

Unexpected return is estimated by annual Cumulative Abnormal Return (CAR). Abnormal return is the difference between actual return and expected return where expected return is estimated by use of Sharpe's (1963) market model. Monthly share prices and monthly Kuala Lumpur Composite Index (KLCI) data from Thomson Datastream was used to calculate monthly returns using the formula Ln (month $_t$/ month $_{t-1}$) and the market model was then estimated for each company using 60 monthly returns:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (2.4)$$

where:

R_{it} = rate of return on firm *i* for month *t*, and

R_{mt} = rate of return of KLCI for month *t*

Thus, for example, for 2006 the market model was estimated using monthly returns calculated for January 2001 to December 2005. The resulting estimates of the regression coefficients, $\hat{\alpha}_i$ and $\widehat{\beta}_i$ are then used to calculate monthly abnormal returns (AR_{it}) for 2006 as:

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \widehat{\beta}_i R_{mt}) \quad (2.5)$$

The CAR for 2006 is then calculated by cumulating the AR for the 12 months of 2006.

iii) Default risk (DER)

Two variables have been widely used in the literature as measures of default risk. They are the debt to equity ratio and bond ratings. This study uses the debt to equity ratio as the main measure of default risk. Bond ratings were available for only 241 firms traded on the Bursa Malaysia over the study period. However, the debt to equity ratio of these 241 firms and their bond ratings was found to be significantly negatively correlated (-.615), thus adding confidence to use of the debt to equity ratio as the measures of default risk for the study.

iv) Control variables

The control variables in this study are the established determinants of ERC: beta, growth, earnings persistence and size.

a)Equity beta (BETA)

Equity beta indicates the tendency of a security's returns to respond to variation in market returns and is estimated in this study as the slope coefficient in the market model. Thus estimates of beta were obtained simultaneously with estimation of CAR.

b)Growth opportunity (GROWTH)

Growth is measured as the market to book ratio. This measure has been widely used in prior studies and has been found to be significantly related to ERC (e.g., Vafeas, 2000; Kim, 2005; and Shangguan, 2007). In this study growth opportunity is measured by market value of the firm to the book value of its equity.

c)Earnings persistence (EPERS)

Earnings persistence can be generated by using a forecasting model such as autoregressive integrated moving average (ARIMA). The model is generally referred to as the ARIMA (*p*, *d*, *q*) model where *p* is the order of the autoregressive component, *q* is the order of the moving average component and *d* is the degree of consecutive differencing. In this study, firms' EPS for twenty consecutive quarters prior to the test period were collected and used to estimate ARIMA (0,1,1,) to forecast earnings persistence. These quarterly EPS were used to generate the moving average parameter estimate (*q*). 1- *q* represents the earnings persistence.

d)Firm size (SIZE)

The present study used firms' total assets as the measure of size.

4. Analysis of results

4.1 Descriptive analysis

Table 1 shows the descriptive statistics of the determinants of ERC and the continuous corporate governance variables. The ratio of long term debt to equity (DER) indicates that for each unit of equity, Malaysian firms on average have almost 1.5 units of long term debt. This high value is consistent with the earlier discussion of the high reliance of Malaysian businesses on debt finance — perhaps due to the attractive and stable BLR. The mean (median) of beta is 1.097 (1.049) indicates that the firms in the sample are not unusually highly geared.

Table 1: Descriptive statistics of the ERC determinants and corporate governance continuous variables

	UXP	CAR	DER	BETA	GROWTH	EPERS	SIZE
Mean	.006	.007	1.531	1.097	.900	.024	412.073
Median	.004	-.002	1.567	1.049	.850	.027	392.042
Std. Deviation	.014	.231	.722	.595	.389	.016	86.194
Minimum	-.052	-.558	.080	-.870	.190	.000	301.902
Maximum	.426	.564	2.840	2.860	1.840	.061	608.676

UXP is ratio of changes in annual EPS (unexpected earnings) to previous year equity price. **CAR** is cumulative abnormal return derived from the market model using Kuala Lumpur Composite Index (KLCI). **DER** is ratio of book value of long term debt to market value of equity. **BETA** is systematic risk from market model using Kuala Lumpur Composite Index (KLCI). **GROWTH** is ratio of market to book value of equity. **EPERS** is square root of earnings persistence factor. **SIZE** is total assets in million (RM).

Table 2 reports the negative relationships between ratio of changes in annual EPS (unexpected earnings) to previous year equity price and EPERS and DER. The result suggest that a significant relationship exists between default risk and earning persistence with the UXP although the relationship are not obviously strong as evidenced by the correlation coefficients of -0.197 and -0.015 and -0.055.

Table 2: Correlation matrix of the market model and ERC determinants variables

	UXP	CAR	BETA	GROWTH	EPERS	SIZE
CAR	**.283****					
BETA		**.051***	**-.009**			
GROWTH	**.068****	**-.241****	**-.036**			
EPERS		**-.197****	**-.055****	**-.018**	**-.122***	
SIZE	**.136***	**-.028**	**.224****	**-.010**	**-.018**	
DER	**-.015**	**-.049***	**- .013**	**-.048***	**-.016**	**-.005**

The sample consists of 2172 firm-year observations from 2006-2011. The correlation coefficients are based on Pearson Correlation. **UXP** is ratio of changes in annual EPS (unexpected earnings) to previous year equity price. **CAR** is cumulative abnormal return derived from the market model using Kuala Lumpur Composite Index (KLCI). **DER** is ratio of book value of long term debt to market value of equity. **BETA** is systematic risk from market model using Kuala Lumpur Composite Index (KLCI). **GROWTH** is ratio of market to book value of equity. **EPERS** is square root of earnings persistence factor. **SIZE** is total assets in million (RM). ** Correlation is significant at the 0.01 level (1-tailed) and * Correlation is significant at the 0.05 level (1-tailed).

Having a basic functional form for the abnormal returns-unexpected earnings relationship, for which 2172 firm-year observations covering a 6-year period were available for the estimation, it was recognised that other specifications might also hold (Kim, 2005). A linktest procedure was thus carried out to perform the model specification test. The linktest result shows a non-significant result of _hatsq evidenced by a *p* value of 0.311 (p > 0.05). This result suggests that the ERC determinants model used in this study is specified correctly. This evidence suggests that the model is free from omitted variables or other specification errors.

It was also acknowledged that there was a possibility of correlations between unobserved effects and independent variables. By using a Fixed Effects Model (FEM) with dummies for years, these possible correlations are taken into account. Other possible choices were to ignore the problem and use Ordinary Least Square (OLS) or to use a Random Effects Model (REM). The Larangian Multiplier (LM) test showed that OLS was unsatisfactory (Chi-Square 561.74, p <0.001) and the Hausman test (Chi-Square 122.11, p<0.001) showed that the FEM was superior to the REM. Two regression equations were then estimated as follows.

$$UX_{it}/P_{it} = \alpha_0 + a_1CAR_{it} + a_2CAR*BETA_{it} + a_3CAR*GROWTH_{it} + a_4CAR*EPERS_{it} + a_5CAR*SIZE_{it} + year\ fixed\ effect + \varepsilon_{it} \quad (1)$$

$$UX_{it}/P_{it} = \alpha_0 + a_1CAR_{it} + a_2CAR*DER_{it} + f\ (control\ variables) + year\ fixed\ effect + \varepsilon_{it} \quad (2$$

Both regressions above were run for the pooled dataset and for each of the years 2006 through 2011. The regressions examined the ERC determinants, and how default risk explains ERC. The results from the regressions are reported in the following sub-sections. The predictions outlined in the hypotheses are in terms of the relationship between ERC and equity beta (-), growth (+), earnings persistence (+), and size (+). In reverse regressions, these relations are inverted as it estimates the abnormal return response coefficient (RRC). Predictions for the RRC are thus the converse of ERC.

Table 3 presents the results of regressing UX/P on CAR, the interactions of CAR with beta, growth, earnings persistence and size in the estimation of ERC determinants. The result shows that the coefficient of the interaction of CAR with beta is significant and positive in all the regressions, both pooled and year wise indicates that beta has a significant negative relationship with ERC. This result is consistent with prior research (e.g., Dhaliwal et al., 1991; Dhaliwal and Reynolds, 1994; Billings, 1999; Shangguan, 2007). These prior studies suggest that systematic risk is negatively related to ERC.

Similarly, the coefficient of the interaction of CAR with growth shows that growth has a significant positive relationship with ERC. This is consistent with the results found in the earlier studies (see Collins and Kothari, 1989; Martikainen, 1997; Billings, 1999; Park and Pincus, 2000; Kim, 2005; Ghosh et al., 2005; Shangguan, 2007). The coefficient of the interaction of CAR with earnings persistence shows that earnings persistence is also positive and significant in explaining ERC. This also confirms the findings of previous researchers (Kormendi and Lipe, 1987, Collins and Kothari, 1989; and Dhaliwal and Reynolds, 1994). Similarly the coefficient of CAR and size shows that size is positive and significant in explaining ERC. This result is consistent with Billings (1999) and Vafeas (2000). However, the result contradicts Martikainen (1997), who found that firm size is not a significant determinant of ERC; similarly for the UK study by Donelly and Walker (1995). Shangguan (2007) finds a significant result for the interaction of CAR with size but its significance decreased from 1% to 10% when fiscal year-end observations are used compared to those of December year-end.

4.2 The effect of default risk on ERC

Table 4 shows the effect of default risk, as measured by DER, on ERC. The coefficient of the interaction between CAR and DER is significant and positive in both the pooled and year by year regressions and thus DER has a significant negative relationship with ERC. The results for beta, growth, earnings persistence and size remain as in the base model. This applies to both the pooled and year by year regressions. The result for DER is consistent with the previous studies (for example, Dhaliwal et al., 1991; Dhaliwal and Reynolds, 1994; Shangguan, 2007; and Cheng and Nasir, 2010). The significant negative relationship between DER and ERC is consistent with the expectation that default risk adds to the explanation for the risk relevant to ERC. A plausible interpretation of this finding is that the market-perceived equity risk of a firm increases as the default risk goes up in an emerging market. Thus, this result supports the hypothesis: default risk has a significant negative relationship with ERC.

4.3 Robustness of results

A number of tests were carried out to ensure that the results obtained were robust. This involved tests on the statistical assumptions, multicollinearity, heteroscedasticity, and also sensitivity analyses. The normal P-Ps for all the regressions indicate that the points lie in reasonably straight diagonal lines, suggesting no major deviations from normality. The variance inflation factor (VIF) for each variable entering the regressions was checked and the results show no multicollinearity problem. The results of the Breusch–Pagan test for both regressions show small values of chi square (0.12 and 0.14) indicating the absence of serious heteroscedasticity.

To test the robustness of the results, two alternative measures of default risk — change in financial leverage (FINLEV) and Altman's Z score were tested. FINLEV was measured as the ranked deciles of the change in the ratio of total long-term debt to total assets from the previous year to the current year. The second measure uses Altman's (2002) revised Z score model used for bankruptcy prediction in emerging markets. Both

measures show the same results as when the debt to equity ratio is used to proxy default risk. Default risk has a negative effect on ERC.

5. CONCLUSION

The results conform the expected significant negative relationship between beta and ERC and a significant positive relationship between each of earnings persistence, growth and size with ERC. These results are similar to those found in prior studies (Kormendi and Lipe, 1987; Collins and Kothari, 1989; Dhaliwal and Reynolds, 1994; Billings, 1999; Kim, 2005; and Shangguan, 2007). The results of this study provide evidence that default risk in emerging markets has a significant negative impact on ERC. These findings are consistent with those of previous studies in developed markets (see Dhaliwal et al. 1991; Dhaliwal and Reynolds, 1994; Shangguan, 2007) and emerging markets (see Kai, 2002; and Cheng and Nasir, 2010).Consistent with Liu and Thomas (2000) the results from regressions (1) and (2) indicate a consistent pattern from pooled to year by year analyses. The findings of this study could highlight some ideas to other researchers in capital market especially in the area of ERC and default risk.

For future, similar comprehensive studies should be carried out for other emerging economies. Wherever feasible the studies on other countries should cover a longer period of time and a larger number of companies. Future studies should also consider a wider range of measures for the key variables to provide additional comfort on the robustness of the results obtained.

TABLE 3: Results of the ERC determinants

$UX_{it}/P_{it} = \alpha_0 + a_1CAR_{it} + a_2CAR*BETA_{it} + a_3CAR*GROWTH_{it} + a_4CAR*EPERS_{it} + a_5CAR*SIZE_{it} + year\ fixed\ effect + \varepsilon_{it}$ **(1)**

Independent Variables	**Pooled** Estimate (t-stat)	**2006** Estimate (t-stat)	**2007** Estimate (t-stat)	**2008** Estimate (t-stat)	**2009** Estimate (t-stat)	**2010** Estimate (t-stat)	**2011** Estimate (t-stat)
CAR	.032 (7.57)**	.031 (7.33)**	.031 (7.34)**	.032 (7.59)**	.030 (7.09)**	.031 (7.32)**	.030 (7.10)**
CAR*BETA	.007 (3.38)**	.007 (3.37)**	.007 (3.40)**	.007 (3.36)**	.007 (3.40)**	.007 (3.37)**	.007 (3.39)**
CAR*GROWTH	-.010 (-4.14)**	-.010 (-4.08)**	-.011 (-4.55)**	-.011 (-4.61)**	-.011 (-4.58)**	-.010 (-4.16)**	-.011 (-4.56)**
CAR*EPERS	-.389 (-6.67)**	-.386 (-6.62)**	-.375 (-6.43)**	-.387 (-6.64)**	-.385 (-6.60)**	-.379 (-6.50)**	-381 (-6.53)**
CAR*SIZE	-1.743E (-2.46)**	-1.737E (-2.45)**	-1.750E (-2.47)**	-1.741E (-2.46)**	-1.747E (-2.47)**	-1.745E (-2.46)**	-1.748E (-2.47)**
Constant	.005 (16.09)**	.005 (16.10)**	.005 (16.08)**	.005 (16.08)**	.005 (16.07)**	.005 (16.08)**	.005 (16.08)**
Observations	2172	362	362	362	362	362	362
Year fixed effect	included	included	included	included	included	included	included
Adj.R^2	.151	.149	.151	.150	.149	.148	.150

Note: ** Significant at $p < 0.01$ (1-tailed) and * Significant at $p < 0.05$ (1-tailed).

TABLE 4: Results of the ERC determinants with default risk (DER)

$UX_{it}/P_{it} = \alpha_0 + a_1 CAR_{it} + \mathbf{a_2 CAR*DER_{it}} + f$ *(control variables) + year fixed effect +* ε_{it} **(2)**

Independent Variables	**Pooled** Estimate (t-stat)	**2006** Estimate (t-stat)	**2007** Estimate (t-stat)	**2008** Estimate (t-stat)	**2009** Estimate (t-stat)	**2010** Estimate (t-stat)	**2011** Estimate (t-stat)
CAR	.023 (5.44)**	.022 (5.20)**	.020 (4.73)**	.021 (4.96)**	.020 (4.71)**	.019 (4.49)**	.019 (4.51)**
CAR*DER	**.011** **(7.09)****	**.011** **(7.06) ****	**.011** **(7.11)****	**.011** **(7.07)****	**.011** **(7.10)****	**.011** **(7.07)****	**.011** **(7.06)****
CAR*BETA	.006 (3.09)**	.006 (3.12)**	.006 (3.12)*	.006 (3.09)**	.006 (3.10)**	.006 (3.07)**	.006 (3.13)*
CAR*GROWTH	-.014 (-5.60)**	-.014 (-5.53)**	-.013 (-5.20)**	-.014 (-5.57)**	-.015 (-5.99)**	-.013 (-5.22)**	-.014 (-5.61)**
CAR*EPERS	-.474 (-8.06)**	-.376 (-6.39)**	-.362 (-6.15)**	-.372 (-6.33)**	-.486 (-8.26)**	-469 (-7.97)**	-.375 (-6.37)**
CAR*SIZE	-1.922E (-2.75)**	-1.911E (-2.73)**	-1.918E (-2.74)**	-1.923E (-2.75)**	-1.914E (-2.74)**	-1.912E (-2.74)**	-1.920E (-2.74)**
Constant	.005 (16.80)**	.005 (16.78)**	.005 (16.75)**	.005 (16.76)**	.005 (16.83)**	.005 (16.89)**	.005 (16.75)**
Observations	2172	362	362	362	362	362	362
Year fixed effect	included	included	included	included	included	included	included
Adj.R^2	.172	.169	.167	.169	.172	.166	.167

Note: ** Significant at $p < 0.01$ (1-tailed) and * Significant at $p < 0.05$ (1-tailed).

Acknowledgement: Authors would like to acknowledge the supports from Accounting Research Institute and Universiti Teknologi MARA, Malaysia.

REFERENCES

Altman, E.I. (2002), ***"****Revisiting credit scoring models in a Basel 2 environment. Prepared for credit rating: Methodologies, rationale, and default risk*". London Risk Book

Ball, R. and Brown, P. (1968), "An empirical evaluation of accounting income numbers", *Journal of Accounting Research*, Vol. 6 No. 2, pp. 159-178.

Beaver, W. H., Clarke, R. and Wright, W. F. (1979), "The association between unsystematic security returns and the magnitude of earnings forecast errors", *Journal of Accounting Research*, Vol. 17 No. 2, pp. 316-340.

Bernard, V. L. and Ruland, R. G. (1987), "The incremental information content of historical cost and current cost income numbers: Time-Series Analyses for 1962-1980', *The Accounting Review*, Vol. 62 No. 4, pp. 707-722.

Bhamra, H. S., Kuehn, L.A. and Strebulaev, I. A. (2010), "The levered equity risk premium and credit spreads: A unified framework", *Review of Financial Studies*, Vol. 23 No 2, pp. 645-703.

Biddle, G. C. and Seow, G.-S. (1991), "The estimation and determinants of associations between returns and earnings: Evidence from cross-industry comparisons", *Journal of Accounting, Auditing and Finance*, Vol. 6 No.2, pp. 183-232.

Billings, B. (1999), "Revisiting the relation between the default risk of debt and the earnings response coefficient", *The Accounting Review*, Vol. 74 No. 4, pp. 509-522.

Black, F. (1972), "Capital market equilibrium with restricted borrowing", *Journal of Business*, Vol. 4 No. 3, pp. 414 - 455.

Brown, P. (1994), "*Capital market-based research in accounting: An introduction"*, Australia : Coopers & Lybrand.

Chambers, D. J., Freeman, R.N. and Koch, A. S. (2004), "The effect of risk on price responses to unexpected earnings", Retrieved June 5, 2010 from http://papers.ssrn.com/sol3/ papers.cfm? abstract_id=15656.9

Cheng, F.F. and Nasir, A. (2010), "Earning response coefficients and the financial risks of China commercial banks", International *Review of Business Research Papers*, Vol. 6 No. 3, pp. 178 – 188.

Cheng, X., Crabtree, A.D. and Smith, D.B. (2008), "*The effects of backdating on earnings response coefficient",*. (University of Nebraska-Lincoln Working Paper). Retrieved April 1, 2011 from http://ssrn.com/abstract=1094976

Cho, J.Y. and Jung, K. (1991), "Earnings response coefficients: A synthesis of theory and empirical evidence", *Journal of Accounting Literature*, Vol. 10, pp.85-116.

Collins, D. W. and Kothari, S. P. (1989), "An analysis of intertemporal and cross-sectional determinants of earnings response coefficients", *Journal of Accounting and Economics*, Vol. 11 No. 2-3), pp.143-181.

Collins, D.W., Kothari, S.P. and Rayburn, J.D. (1987), "Firm size and the information content of prices with respect to earnings", *Journal of Accounting and Economics*, Vol. 9 No. 2, pp.111-138.

Cready, W. M., Hurtt, D. N. and Seida, J. A. (2000), "Applying reverse regression techniques in earnings-return analyses", *Journal of Accounting and Economics*, Vol. 30 No. 2, pp. 227-240.

Demerjian, P. R. and Ross, S. (2007,." *Financial ratios and credit risk: The selection of financial ratio covenants in debt contracts"* (AAA 2007 Financial Accounting & Reporting Section Meeting Report). Retrieved June 15, 2010, from http://ssrn.com/abstract=929907.

Dhaliwal, D., Lee, K. and Fargher, N. (1991), "The association between unexpected earnings and abnormal security returns in the presence of financial leverage", *Contemporary Accounting Research*, Vol. 8 No. 1, pp. 20-41.

Dhaliwal, D. and Reynolds, S. (1994), "The effect of the default risk of debt on the earnings response coefficient' *The Accounting Review*, Vol. 69 No. 2, pp.412-419.

Donnelly, R. and Walker, M. (1995), "Share price anticipation of earnings and the effect of earnings persistence and firm size", *Journal of Business Finance & Accounting*, Vol. 22 No. 1, pp. 5-18.

Easton, P. D. and Zmijewski, M. E. (1989), "Cross-sectional variation in the stock market response to accounting earnings announcements" *Journal of Accounting and Economics*, Vol. 11 No. 2-3, pp. 117-141.

Fama, E.F. and French, K. (1992), "The cross-section of expected stock returns", The *Journal of Finance*, Vol. 47, No. 2, pp. 427-465.

Ghosh, A., Gu, Z. and Jain, P.C. (2005), "Sustained earnings and revenue growth, earnings quality, and earnings response coefficients" *Review of Accounting Studies*, Vol. 10 No. 1, pp. 33–57.

Gunny, K., Jacob, J. and Jorgensen, B. N. (2009), "Earnings attributes of alternate annual reporting periods", *Working Paper*. Retrieved March 24, 2010 from http://papers.ssrn.com/sol3/ papers.cfm?abstract_id=1365039

Kai, H. (2002). *Earning response coefficient and default risk in Japanese stock market*. Japan: Nigata University Working Paper.

Kim, Y. H. (2005), "*Default risk as a factor affecting the earnings response coefficient: Evidence from the South Korean stock market"*, Melbourne: AFFANZ Proceeding.

Kormendi, R. and Lipe, R. (1987), "Earnings innovations, earnings persistence, and stock returns", *The Journal of Business*, Vol. 60 No.3, pp. 323-345.

Kwon,S.Y., Lim, C.Y. and Tan, P.M. (2007), "Legal systems and earnings quality: The role of auditor industry specialization", *Auditing: A Journal of Practice & Theory*, Vol. 26 No. 2, pp. 25–55.

Laxmi C. B. (1988), "Debt/equity ratio and expected common stock returns: Empirical evidence", *The Journal of Finance*, Vol. 43 No. 2, pp. 507-528.

Lee, K.J., Jin, J. and Huh, S.K. (2005), "The effect of the firm's monopoly power on the earnings response coefficient", *Academy of Accounting and Financial Studies Journal*, Vol. 9 No. 3, pp. 65-71.

Lintner, J. (1965), "Security prices, risk, and maximal gains from diversification", *The Journal of Finance*, Vol. 20 No. 4, pp. 587-615.

Lipe, R. (1990), "The relation between stock returns and accounting earnings given alternative information", *The Accounting Review*, Vol. 65 No. 1, pp. 49-71.

Liu, J. and Thomas, J. (2000), "Stock returns and accounting earnings" *Journal of Accounting Research*, Vol. 38 No. 1, pp. 71-101.

Martikainen, M. (1997), "Accounting losses and earnings response coefficients: The impact of leverage and growth opportunities" *Journal of Business Finance & Accounting*, Vol. 24 No. 2, pp.277-292.

Narayanamoorthy, G. (2006), "Conservatism and cross-sectional variation in the post–earnings announcement drift", *Journal of Accounting Research*, Vol. 44 No. 4, pp.763-789.

Park, C. W. and Pincus, M. (2000), "*Market reactions to changes in analyst consensus recommendations following quarterly earnings announcements"* (Hong Kong University Working Paper). Retrieved April 17, 2010, from http://tippie.uiowa.edu/accounting/ mcgladrey/workingpapers /00-10.pdf

Roll, R. (1977), "A critique of the asset pricing theory's tests Part I: On past and potential testability of the theory", *Journal of Financial Economics*, Vol. 4 No. 2, pp. 129-176.

Roll, R. and Ross, S. A. (1994), "On the cross-sectional relation between expected returns and betas", *The Journal of Finance*, Vol. 49 No. 1, pp. 101-121

Shangguan, Z. (2007), "Risky debt and the earnings response coefficient: A re-examination in the presence of illiquid growth opportunities", *International Journal of Business Innovation and Research*, Vol. 1 No. 4, pp. 404-424.

Sharpe, W. F. (1964), "Capital asset prices: A theory of market equilibrium under conditions of risk" *The Journal of Finance*, Vol. 19 No. 3, pp. 425-442.

Skinner, D. and Sloan, R. (2002), "Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio", *Review of Accounting Studies*, Vol. 7 No. 2, pp. 289-312.

Subramanyam, K. R. and Wild, J. J. (1996), "Going-concern status, earnings persistence, and informativeness of earnings", *Contemporary Accounting Research*, Vol. 13 No. 1, pp. 251-273.

Teoh, S. H. and Wong, T. J. (1993), "Perceived auditor quality and the earnings response coefficient", *The Accounting Review*, Vol. 68 No. 2, pp. 346-366.

Vafeas, N. (2000), "Board structure and the informativeness of earnings", *Journal of Accounting and Public Policy*, Vol. 19 No. 2, pp. 139-160.

Vassalou, M. and Xing, Y. (2004), "Default risk in equity returns", *Journal of Finance*, Vol. 59 No. 2, pp. 831-868.

World Bank. (n.d.). Retrieved January 12, 2010, from http://data.worldbank.org/country/ malaysia.