THE EXPECTED STOCK RETURNS OF MALAYSIAN FIRMS: A PANEL DATA ANALYSIS

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ABSTRACT

We used panel data set of 1729 observations (247 Malaysian companies listed on the Kuala Lumpur Stock Exchange for 1993-2000) to identify variables that could explain expected returns of Malaysian stocks. Our results are based on the fixed effects regression model as it performed better than the random effects model and OLS model without the firm effects. Results of the fixed-effect univariate regressions indicated that beta, size, book-to-market value (B/M) ratio, earnings-price (E/P) ratio and dividend yield individually played a significant role in explaining stock returns and payout and leverage had no effect. The explanatory power of size (natural log of market capitalisation) was the highest. The fixed-effect multivariate regression results showed that size was persistently a significant dominant variable together with other variables in explaining stock returns. Beta was found to have consistently a positive relation with stock returns by itself and together with other variables. But its explanatory power was less than size and other variables. Contrary to the results of Fama and French (1992), B/M ratio was not persistently a significant variable; its significance disappeared when we incorporated size and E/P ratio in regression.

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INTRODUCTION

A number of studies were conducted in the early 1970s to test the validity of the capital asset pricing models (CAPM) of Sharpe (1964), Lintner (1965) and Black (1972). Fama and MacBeth (1973) approached testing of the CAPM in two steps. First, time-series regressions were used to calculate each stock's beta. Second, cross-section regressions were employed to determine the relationship between cross-sectional return and beta of stocks. Most early tests found that the CAPM worked, and that systematic risk (market beta) was an efficient predictor of the expected stock returns. Subsequent studies found a number of anomalies in the CAPM.

A voluminous literature exists on the factors, other than systematic risk, that influence stock returns. A number of predictor variables have been identified in previous studies. This study tests the ability of beta, size, book-to-market value (B/M) ratio, earning-price (E/P) ratio, dividend yields, payout and leverage in predicting returns of stocks in the emerging Malaysian capital market. The motivation for using these variables has been provided by the findings of a large number of studies in the developed capital markets. Our results show that size (market capitalisation) plays a dominant role in the expected stock return. Size variable alone explains about one third of the expected stock returns in Malaysia. The significance of B/M ratio disappears in multivariate regressions that also include E/P ratio. It is also indicated that market beta with or without other variables has a positive relation with stock returns. The other significant variables include E/P ratio, dividend yield and leverage. Thus, we find that risk has multi-dimensions including beta, size, E/P ratio, dividend yield and leverage.

REVIEW OF PREVIOUS STUDIES

A vast body of empirical research points out many inconsistencies in the CAPM that prescribes that expected stock return is directly related to systematic risk (beta). The most noteworthy incongruity is the size effect on expected stock return. Banz (1981) and Reinganum (1981) were first to examine the relationship between size and stock returns. They found that size, measured as the market value of equity (ME), has a significant impact on the stock returns; the smaller (low ME) size firms earn higher return than the larger (high ME) firms given their market beta.

Rosenberg, Reid and Lanstein (1985) pointed out another anomaly in CAPM who found that B/M ratio was an important predictor of stock returns, and that there was a positive relationship between the two variables. A recent study by Pontiff and Schall (1998) has also established that B/M ratio of the Dow Jones Industrial Average was able to predict stock returns and small firms excess returns for the 1926-1994 period. Other variables such as interest yield spreads and dividend yields were found to be poor predictors of stock returns.

Small capitalization stocks outperforming large capitalization stocks appear to be a global experience. Ziemba (1991) in Japan, Levis (1985) in U. K. and Brown et. al. (1983) in Australia found that small capitalization stocks outperformed large capitalization stocks. The differential premium was highest in Australian stocks (5.73% per month from 1958 to 1981). Chan, Hamao and Lakonishok (1991) studied the effects of earnings yield, cash flow yield, size and book-to-market ratio on returns of Japanese stocks for the period 1971 to 1988. They found that book-to-market ratio and cash flow yield have the most significant positive impact on expected returns for Japanese stocks.

Basu (1975) found that high E/P (low P/E) ratio stocks perform better than the low E/P (high P/E) ratio stocks. As explained earlier, size has a dominant influence on stock returns. Thus, some researcher believed that it was size, and not P/E ratio that influenced the stock returns (Reinganum, 1981). However, subsequent studies showed that high E/P (low P/E) stocks still do better when size and market beta are included in the tests (Basu, 1983; Peavy and Goodman, 1983).

Bhandari (1988) pointed out yet another contradiction in the CAPM. He found that the expected stock return was positively related to leverage (debt-to-equity, D/E, ratio), given the firm's beta and size. Leverage is a proxy of financial risk, and therefore, it is conceivable that it is related to the expected stock return. But under the CAPM, the market beta would incorporate financial risk as well.

Fama and French (1992) provided a strong support to the relationship between size and B/M ratio and stock returns. In their univariate and multivariate tests, they found a significant positive relationship between B/M value and stock returns and a negative relation between size and stock returns. They, in fact, studied the *joint effects* of beta, size, E/P ratio, leverage and B/M ratio on the cross-sectional stock returns. Their results showed that both size and B/M ratio were significant when included together, and they dominated other variables. In their study, leverage and P/E ratio were significant by themselves or when considered with size, but they become insignificant when both size and B/M ratio were considered. A number of other researchers have examined these relationships using different measurement for beta and different time periods and intervals. Dennis, Perfect, Snow and Wiles (1995) confirmed Fama and French (1992) findings.

Daniel and Titman (1997), like Fama and French (1992), established that the cross-sectional stock returns could by explained by the firm characteristics such as the size, leverage, past returns, dividend-yield, earnings-to-price ratios, and book-to-market ratios. The result of their study showed that the market beta has no explanatory power for stock return even after controlling for size and book-to-market ratio. Lakonishok and Shapiro (1984) also found an insignificant relationship between beta and returns and significant relationship between returns and market capitalization values (size).

Contrary to the findings of Fama and French (1992) and other studies, Kothari, Shanken and Sloan (1995) found that the relationship between beta and expected return was much stronger. They used annual returns, instead of monthly returns as in the Fama and French (1992) study, to estimate betas. But like others, their results showed that size and B/M ratio were important determinants of expected returns.

There are some studies that cast doubt on the ability of size as a predictor of stock returns. A study by Brown, Kleidon and Marsh, (1983) concluded that size effect was not stable over different time periods. Chan, Chen and Hsich (1985) argued that in a multifactor model, the size-related returns could be explained by complete measures of risk. Chan and Chen (1988) attributed the size effect to large measurement errors in betas and suggested the use of long time periods to estimate the unconditional portfolio betas. After controlling for estimated betas, firm size was unable to explain the average returns across size-ranked portfolios. Handa, Kothari and Wasley (1989) argued that size effect was sensitive to the return measurement intervals used for beta estimation and presented result suggesting that it could be explained by betas estimated with annual returns.

The issue of cross-sectional stock returns has not been investigated in the context of emerging Malaysian capital market. One exception is the study of Isa and Jin (2000). They studied the effect of size and P/E ratio on returns of 125 to 150 stocks listed on the Kuala Lumpur Stock Exchange (KLSE) during 1978 to 1987. They found a weak relationship between E/P ratio and stock returns, but a significant size effect on stock returns. Our study includes 247 KLSE-listed stocks for the recent period of 1993 to 2000 and uses panel data-set regressions to analyse returns stocks. The Malaysian capital market witnessed the phases of growth, decline and recovery during our chosen period of study. Thus, our results are robust as our data cover all phases of the Malaysian capital market.

SAMPLE AND DATA

We obtained data for our study from Dynaquest Sdn Bhd's database[1]. We used financial data of 247 Malaysian companies out of 499 companies listed on the KLSE Main Board as at 31 December 2000. Thus, our sample represents about 50% of the total Main Board listed companies. Our selection of sample companies was based on several criteria. First, financial, trusts and closed-end funds companies are excluded. These companies are generally governed by different rules and practices with regard to financing, and also, their financial reporting differs from that of the non-financial firms. Second, we have covered eight-year period for our study. We used a balanced sample consisting of those companies that are continuously listed on the KLSE for eight years (1993 to 2000), and for which required financial data are available for all eight years. Third, we have excluded companies with negative shareholders' equity as they present difficulty in analysis.

As we shall explain later, we have used weekly share price data for calculating market beta. Period prior to 1993 was not covered owing to unavailability of weekly share prices. For the calculation of company beta, the KLSE Main Board All-Share Index (EMAS) has been used instead of the Composite Index. The EMAS index comprises all companies listed on the KLSE Main Board unlike the Composite Index, which comprises only 100 stocks on the Main Board. The EMAS index is used as the price movements in the very large market capitalization stocks less affect it. The EMAS index is a value-weighted index as its construction is based on the weighted average market value method. The formula for the computation of the EMAS index is current aggregate market value of all shares divided by the base aggregate market value of all shares (in 1984) multiplied by 100.

METHODOLOGY

To determine the relationship between stock return and explanatory variables, we have employed regression methodology using panel (pooled time-series cross-section) data set. Our data include 1729 observations (247 firms' data for eight years). The basic regression estimation model using pooled data is (Greene, 2000, 560):

$$Y_{i,t} = \alpha_i + \beta' X_{i,t} + \varepsilon_{it}$$

The panel data have multiple observations, viz., t = 1…T (time period) of each i=1… N cross-sectional observation unit in the sample. There are k regressors in $X_{i,t}$ (explanatory variables), not including the constant term. α_i is the individual effect, which is assumed as constant over time and specific to the individual cross-sectional unit in the fixed-effects model. $\varepsilon_{i,t}$ is a stochastic error term assumed to have mean zero and constant variance. In random-effect model, α_i is disturbance specific to cross-sectional unit.

Pooling of time-series cross-sectional data has several advantages. It provides more observations, more variability, less collinearity among variables, more degree of freedom and more efficiency (Baltagi, 1995, 3-6). More importantly, pooled data are more proficient to identify and measure effects that are undetectable in pure cross-sections or pure time-series data. Moreover, the measurement biases resulting from aggregation over firms or individuals and biases arising from omitted-variables are reduced (Pindyck and Rubinfeld, 1998, p.250). The merit of a panel data over cross-section data is the ease of modelling the differences in behaviour across individuals (Greene 2000).

There are three regression techniques in estimating models with panel data: pooled OLS, the fixed-effects model (least square dummy variable model, LSDV) and the random- effects model (error component model). The computed F-statistics tests revealed that the null hypothesis that the efficient estimator was the pooled OLS compared to the fixed-effects model was rejected. Further, the Hausman tests rejected the null hypothesis that random-effects model was appropriate as compared to the fixed effects model. Our presentation and analyses of results, therefore, are based of the fixed effects model.

Dependent and Independent Variables

In our study the dependent variable is annual stock return in year t, and the explanatory variables include beta, size, book-to-market (B/M) equity, earnings-to-price (E/P) ratio, dividend yield, leverage, and dividend payout in year t-1. Variables are defined as follows:

[1] We are thankful to Dr. Neoh Soon Kean, Chairman, Dynaquest Sdn. Bhd. for allowing us access to database maintained by his company.

Stock return: We have calculated annual stock return as dividend yield (gross DPS[2] in year t divided by closing share price in year t-1) plus change in share price in year t.

$$R_{i,t} = \frac{GDPS_t}{P_{t-1}} + \left(\frac{P_t - P_{t-1}}{P_{t-1}} \right)$$

Beta: Following Fama and MacBeth (1973), the following time-series regression model was used to estimate yearly market beta for each stock[3]. Weekly share prices (52 weeks) in calendar year, adjusted for bonus and rights issues, for the cross-section firms and the KLSE EMAS index were used to calculate stock return and market return.

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$$

where

$$R_{i,t} = \ln\left(\frac{P_t}{P_{t-1}} \right) \ \& \ R_{m,t} = \ln\left(\frac{I_t}{I_{t-1}} \right)$$

α_i = intercept of the regression

β_i = slope coefficient of regression

$R_{i,t}$ = stock i's week t return (based on weekly share price, P)

$R_{m,t}$ = the value-weighted index of EMAS stock's week t return (based on weekly index, I)

Size: Natural log of market capitalisation [ln (mcap)] is used as a proxy for size. Market capitalization (market value of equity) is the outstanding number of ordinary shares multiplied by the calendar year-end share price.

B/M ratio: Natural log of net tangible book value per share divided by market price per share [ln (B/M)] is used to measure book-to-market value ratio.

E/P ratio: Current earnings are considered as proxy for the future earnings. It is argued that 'high risk stocks with high expected returns will have low prices relative to their earnings' (Fama and French, 1992). It is not reasonable to assume that current negative earnings will proxy for the future earnings. Therefore, earnings-price (E^+/P) ratio is estimated as positive

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2 In Malaysia, companies pay net dividends to shareholders after withholding tax at prescribed rate. Gross dividends are before the deduction of withholding tax and represent total cash outflow.

3 Black, Jensen and Scholes (1972) suggested the following procedure for calculating beta:

$$\left(R_{i,t} - R_f\right) = \alpha_i + \beta_i (R_{m,t} - R_f) + \delta_{i,t}$$

The two approaches mostly obtain identical beta estimates (Grinblatt and Titman, 1999).

earnings in year t divided by market capitalization of equity in year t-1. E/P ratio is considered zero if earnings are zero or negative.

Dividend yield: Like earnings, dividends act as proxy for the future profitability. Dividend yield is measured as gross dividend in year t divided by the market value of equity in year t-1.

Payout: Payout is obtained as gross dividend per share (DPS) divided by earnings per share (EPS). The payout is limited to one when EPS is less than DPS, or when DPS is positive and EPS is negative.

Leverage: Leverage is a proxy for financial risk. It is expected to have an association with stock returns if beta is unable to capture it. Leverage is defined as total debt (sum of bonds, long-term debt and bank borrowings) divided by the book-value equity.

EMPIRICAL ANALYSES AND RESULTS

To better understand the empirical validity of the models described in the previous section, and the effect of beta and other factors, we considered first the correlations between stock returns and each of the explanatory variables. The correlations are described via univariate regressions, and later on, compared with multivariate regressions. The analyses help to gauge the incremental explanatory power of the various factors, and the extent to which overall explanatory power is improved by the inclusion of various variables.

It is desirable in panel data analyses to allow for the firm-specific stock return differences as stock returns vary considerably across firms. Therefore, we utilise our panel data set to estimate *fixed-effects models*. They control for the underlying time-variant heterogeneity among firms. The failure to control for firm effects when companies are included in the sample more than once – as is the case with our panel data – may cause potential overstatement of the t-statistics in the pooled regression.

Univariate Analyses

We begin with the estimates of univariate regressions of stock return (dependent variable) and each of the explanatory variables - beta, size, B/M ratio, E/P ratio, dividend yield, payout and leverage. Panel A of Table 1 gives results of the fixed-effects model. Results of univariate regressions show that the coefficient of size variable – log of market capitalisation – is highly significant (t-statistics 21.92) and has the highest explanatory power (R^2 = 33.3%). Thus, like the results of previous studies (Banz, 1981; Reinganum, 1981 and Fama and French, 1992), our results reveal that size has a significant impact on stock returns. The negative relationship indicates that the smaller (low capitalisation) size firms earn higher returns than the larger (high capitalisation) firms. Our results, like that of Rosenberg, Reid and Lanstein (1985), Dennis, Perfect, Snow and Wiles (1995) and Fama and French (1992), also show that B/M ratio has a significant simple positive relationship with stock returns (t-statistics 17.45), and it alone explains 23.8% variation in stock returns. We also find a significant positive relationship between E^+/P ratio and stock return, explaining 14.7% variation in stock returns. The positive relationship implies that high E/P (low P/E) ratio stocks perform better than the low E^+/P (high P/E) ratio stocks. Thus, our results are consistent with the findings of Basu (1975). Bhandari (1982) found a positive relation between leverage and stock return. In our univariate test leverage coefficient appears with a positive sign but it is not significantly different from zero. Further, the coefficient of beta is significant, and it explains 10.5% variation in stock returns. Our tests show that dividend yield is an important variable in predicting expected stock variation. It alone could explain 15.2% variation in stock returns. Thus, high dividend-yield stocks do better than the low dividend-yield stocks. Both leverage and payout variables are not significantly different from zero. All significant variables individually have explanatory power higher than market beta.

For comparison purposes, the univariate results of pooled OLS without firm effects are given in Panel B of Table 1. The coefficients of size, B/M ratio, E^+/P ratio and dividend yield are significantly different from zero at the 1% significance level. However, the coefficients of beta, leverage and payout are statistically not different from zero. The R-squared range from 0.01% to 9.2%. Comparison of OLS results (without firm effects) with fixed-effects models in Panel A shows that the explanatory power of regressions is considerably enhanced under the fixed-effects models. Both parameter coefficients and regression coefficients are larger than under the no-group effects OLS models. We conducted F-tests that favoured the fixed-effects models over OLS without group effects. We also estimated the random effects models (results not reported). The computed Hausman statistics rejected random-effects models in favour of the fixed-effects models.

<u>**Insert Table 1**</u>

Multivariate Analyses

We next employ the fixed-effects models to estimate multivariate regressions (i.e., using two or more than two factors as explanatory variables). We first investigate the effect of size and B/M ratio.

Size and B/M ratio: As discussed in the previous section, size and B/M ratio are individually significant variables in explaining stock returns. A joint test of size and B/M ratio reveals that they together explain 34% variation in stock returns and their coefficients are significantly different from zero at 1% significance level; t-statistics are, respectively, 12.50 and 2.70 (Table 2). It is noticeable that the coefficient and t-statistics of B/M ratio diminish significantly when size is included in the regression. Thus, size seems to be a more dominant variable than B/M ratio, and it captures the effect of B/M ratio in explaining stock returns.

E^+/P ratio: There is a simple positive relation between E^+/P ratio and stock returns. Our results, like that of Basu (1983) and Peavy and Goodman (1983) also show that high E^+/P (low P/E) stocks still do better when size is included in the regression (Table 2). Further, E^+/P ratio remains significant when we include B/M ratio or size in the regression. However, its coefficient decreases and R^2 is also lower (24.7%) when we include B/M ratio with E^+/P ratio as compared to the model that includes E^+/P ratio and size (R^2 = 34.7%). In the regression that includes both size and B/M ratio with E^+/P ratio, the coefficient of B/M ratio becomes insignificant. The results suggest that the significance of B/M ratio disappears when size and E^+/P ratio are included in regression. There is a simple positive relationship between B/M ratio and E^+/P ratio (R^2 = 0.354), negative relationship between B/M ratio and size (R^2 = - 0.363) and low negative relation between E/P ratio and size (R^2 = - 0.064). Thus, size and E^+/P ratio together capture most of the information contained in B/M ratio.

<u>Insert Table 2</u>

Dividend yield: The explanatory power of regression increases significantly when we include size with dividend yield; R^2 is 36.5%. A joint test of dividend yield and B/M ratio reveals that their coefficients are significant, and R^2 is 26.7%. One may suspect that dividend yield and E/P ratio would contain similar information. Two variables are positively correlated and R^2 is 33%. But a joint test of E^+/P ratio and dividend yield shows that both are significant variable, and they together explain more than 18% variation in stock return. When we include size and B/M ratio with dividend yield in regression, both size and dividend yield have coefficients that are significantly different from zero at 1% level, but the coefficient of B/M ratio becomes insignificant. Thus, like size and E/P ratio, size and dividend yield also capture the effect of B/M ratio. Our test, including three variables, E/P ratio, dividend yield and size, show that size and dividend yield are significant at 1% level of significance but E/P ratio turns out to be significant only at 5% level. All three variables together explain 36.8% variation in stock returns. In a joint test of E/P ratio, dividend yield, B/M ratio and size, both dividend yield and size remain significant while E/P ratio is significant at 5% level and B/M ratio is insignificant. It may be inferred from these results that along with size, dividend yield has higher explanatory power than E^+/P ratio and B/M ratio.

Insert Table 3

Leverage: In our univariate test, leverage coefficient is not significant. It is noteworthy that when we include size with leverage, its coefficient becomes significant and appears with a negative sign, and two variables together explain 33.9% of the stock returns variation (Table 4). It is implied that larger (high capitalisation) and high leveraged firms perform worse than smaller and low leveraged firms. The inclusion of leverage with size, however, makes a marginal contribution, i.e. 0.6%, to the explanatory power of the regression. The coefficient of leverage becomes insignificant when we incorporate B/M ratio in regression. Thus, it appears that B/M ratio pulls the effect of leverage (in the opposite direction) in explaining the stock return variation. Leverage remains a significant variable when we include one or several other variables in our estimates (Table 4).

Insert Table 4

Payout: Payout remains insignificant if we include size or B/M ratio or both in the regression estimates (Table 5). Payout also remains insignificant with the inclusion of dividend yield. However, its coefficient becomes significant with the inclusion of E/P ratio. In fact, E/P ratio seems to capture most of the effects of payout also. Without payout, E/P ratio explains 14.7% stock returns variation and with payout 15.2%. A joint test of payout, E/P ratio and dividend yield reveals that the explanatory power of regression improves as R^2 increases to 18.6%. The Wald test shows that these three variables are jointly significant.

Insert Table 5

Beta: Estimates of our fixed-effects regressions where with beta we include one more explanatory variable reveal that the coefficient of beta is always significantly different from zero at 1 per cent level of significance and t-statistics are large (Table 6). The coefficients of size, B/M ratio, E/P ratio and dividend yield are significant when each of them is included with market beta. The regression model including beta and size has the maximum explanatory power as compared to those models that include beta and any other variable. Beta and size together explain 34.7% variation in stock return. Payout and leverage are insignificant variables when individually incorporated in regression with beta. Inclusion of both size and B/M ratio with market beta improves explanatory power of regression by 1.3% (Table 6). All three variables are significantly different from zero at 1% level of significance. A Wald test shows that all three variables are also *jointly* significant. It may be noted that beta, size and B/M ratio individually explain, respectively, 10.5%, 33.3% and 23.8% of the stock return variation. Thus, the results suggest that size is a dominant variable in explaining stock returns.

Insert Table 6

We estimated a number of fixed-effects multiple regressions to test if market beta is able to consistently predict expected stock return with other variables and to determine the dominant variables together with beta that are robust in explaining stock return variations (Table 7). The estimate of the multiple regression including all explanatory variables – beta, size, B/M ratio, E^+/P ratio, dividend yield, payout and leverage – show that the model's explanatory power is 39.8% and coefficients of B/M ratio and payout are not significant. If we drop these two variables from our estimate, the explanatory power does not change significantly as R^2 reduces from 39.8% to 39.7%. Market beta is a significant variable in predicting stock returns but it does not capture entire risk. Other dimensions of risk include size, E^+/P ratio, dividend yield and leverage. Size variable consistently has large coefficient and t-statistics in all estimates and it continues to remain a dominant variable. B/M ratio and payout lose their significance as other variables capture their effects. It is noticeable that B/M ratio becomes insignificant in regression models that also include E^+/P ratio. Without E^+/P ratio, it is mostly significant, but its coefficient and t-statistics reduce significantly in regressions that also include size. Thus, as explained earlier, the effect of B/M ratio is captured by size and E/P ratio even in the regressions that include other variables.

Insert Table 7

In our multivariate analyses, like in uni-variate analyses, comparing the coefficients of the fixed-effects models with pooled OLS without group effects (results not reported), illustrates that controlling for the underlying time-invariant heterogeneity has significant effect on results. The explanatory power of fixed-effects models improves significantly. The computed F-tests of the null hypothesis that all coefficients are jointly equal to zero are rejected. A number of firm-specific constants are significantly different from zero. We also estimated a random-effects model allowing for a cross-section error component and a combined error component. The model estimated different effect than did the fixed-effects model, but the explanatory power of regressions was generally very low. The Hausman specification tests in all cases rejected the random-effects model in favour of the fixed effects model. Thus the fixed-effects model accurately characterised the relationship between the KLSE-listed stock returns and various explanatory variables.

A question that arises is the extent to which the results might be affected by collinearity among variables. The simple correlation among variables indicates the existence of low collinearity. We also calculated variance inflation factor (VIF). The maximum VIF is 1.555, which is much below the tolerance limit of 10. Thus, there does not seem to be a serious collinearity problem that could influence our results. Further, as an additional specification test, we performed checks for normality. A null hypothesis of normality could not be rejected at the 1% levels in all cases. To ensure that the inferences made are not affected by any inefficiency caused by the heteroscedasticity, we estimated t-statistics after correcting for the heteroscedasticity as suggested by White (1980).

CONCLUSION

We find that there is a positive simple relationship between the stock returns and the market beta using 1729 panel data observations (247 KLSE-listed stocks for the period from 1993 to 2000). The univariate relation between stock returns and size, B/M ratio, E/P ratio and dividend yield are significant and strong. Each of these variables has higher explanatory power than market beta. There does not exist a significant simple relation between stock returns and payout and leverage. In multivariate tests, the positive relationship between stock returns and market beta consistently persists to the inclusion of other variables. The negative relationship between stock returns and size is persistently strong and dominant. Similarly, the positive relationship between stock returns and E^+/P ratio and dividend yields continues to the inclusion of other variables. Size variable with the inclusion of other variables dampens the influence of B/M ratio. Unlike the findings of Fama and French (1992) who found that B/M ratio played a dominant role, in our study the significance of B/M ratio disappears to the inclusion of size together with E/P ratio or dividend yield. Our results establish that size is the most dominant variable that has a persistent effect on stock returns with or without other variables. In sum, our findings are: (a) market beta alone as well as jointly with other variables has a consistent ability to explain the cross-sectional stock returns; (b) size has the most dominant and persistent role in stock return as the inclusion of other variables adds marginally to the explanation of stock returns variation; (c) the combination of size and E/P ratio or size and dividend yield captures the effect of B/M ratio; (d) size, beta, E/P ratio, dividend yield and leverage jointly play a significant role in the expected stock returns. The implications of our results are that in the emerging capital market of Malaysia, risk is multidimensional. These dimensions of risk include beta, size, E/P ratio, dividend yields and leverage. The security analysts and investors, therefore, may not base their decisions on beta alone; rather they may like to consider multiple risk factors in their decisions of which size is the most dominant.

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Table 1: Univariate Analysis

$$R_{it} = \alpha_i + \beta' X_{i,t-1} + \varepsilon_{i,t}$$

	$Beta_{t-1}$	**ln $mcap_{t-1}$**	**ln B/M_{t-1}**	**E^+/P_{t-1}**	**$(DY)_{t-1}$**	**$Payout_{t-1}$**	**Lev_{t-1}**
Panel A: Fixed Effects							
Coefficient	0.213	-0.453	0.287	2.129	7.929	0.028	0.122
t-stat.	6.068	21.915	17.452	4.921	8.381	0.513	1.409
p-value	0.000	0.000	0.000	0.000	0.000	0.608	0.159
R^2	0.105	0.333	0.238	0.147	0.152	0.084	0.085
Panel B: No Effects							
Coefficient	0.031	-0.105	0.1719	1.864	4.856	0.052	-0.055
t-stat.	1.284	9.973	11.922	4.326	8.514	1.380	0.980
p-value	0.200	0.0000	0.0000	0.000	0.000	0.168	0.327
R^2	0.001	0.066	0.092	0.061	0.053	0.001	0.001
F-stat.	1.591	122.593	174.495	112.071	96.973	2.012	0.994
p-value	0.207	0.000	0.000	0.000	0.000	0.156	0.319

Table 2: Multivariate Analysis: Size, B/M Ratio and E/P Ratio

$$R_{i,t} = \alpha_i + \beta' X_{k,i,t-1} + \varepsilon_{i,t}$$

	ln mcap$_{t-1}$	**ln B/M$_{t-1}$**	**E$^+$/P$_{t-1}$**	**R^2**	**F-stat.**	**p-value**
Coefficient	-0.402	0.063		0.340	760.35	0.000
t-stat	12.518	2.639				
p-value	0.000	0.008				
Coefficient	-0.422		1.053	0.347	787.52	0.000
t-stat	19.205		3.304			
p-value	0.000		0.001			
Coefficient		0.255	0.878	0.247	485.86	0.000
t-stat		13.548	2.574			
p-value		0.000	0.010			
Coefficient	-0.406	0.025	0.969	0.350	398.42	0.000
t-stat	12.875	1.026	2.939			
p-value	0.000	0.305	0.003			

Table 3: Multivariate Analysis: Dividend Yield, E/P Ratio, Size and B/M Ratio

$$R_{it} = \alpha_i + \beta' X_{k,i,t-1} + \varepsilon_{i,t}$$

	ln $mcap_{t-1}$	**ln B/M_{t-1}**	**E^+/P_{t-1}**	**DY_{t-1}**	**R^2**	**F-stat.**	**p-value**
Coefficient	-0.425			5.481	0.365	848.48	0.000
t-stat	21.247			7.230			
p-value	0.000			0.000			
Coefficient		0.255		5.282	0.267	538.39	0.000
t-stat		15.530		6.738			
p-value		0.000		0.000			
Coefficient	-0.402	0.031		5.290	0.368	430.39	0.000
t-stat	12.973	1.321		6.943			
p-value	0.000	0.187		0.000			
Coefficient			1.580	6.109	0.183	331.67	0.000
t-stat			4.134	6.614			
p-value			0.000	0.000			
Coefficient	-0.405	0.0103	0.617	4.780	0.372	291.81	0.000
t-stat	-13.186	0.434	2.098	6.236			
p-value	0.000	0.664	0.036	0.000			

Table 4: Multivariate Analysis: Leverage Effect

$$R_{it} = \alpha_i + \beta' X_{k,i,t-1} + \varepsilon_{i,t}$$

	ln $mcap_{t-1}$	ln B/M_{t-1}	E^+/P_{t-1}	DY_{t-1}	Lev^{t-1}	R^2	F-stat.	p-value
Coefficient	-0.468				-0.315	0.339	758.57	0.000
t-stat	21.804				3.548			
p-value	0.000				0.000			
Coefficient		0.287			-0.040	0.239	463.34	0.000
t-stat		17.126			0.471			
p-value		0.000			0.638			
Coefficient	-0.417	0.060			-0.281	0.344	387.69	0.000
t-stat	12.572	2.478			3.260			
p-value	0.000	0.013			0.001			
Coefficient	-0.437		1.006		-0.279	0.352	401.37	0.000
t-stat	19.076		3.093		3.176			
p-value	0.000		0.002		0.002			
Coefficient	-0.418			5.327	-0.258	0.369	431.59	0.000
t-stat	21.076			7.111	3.000			
p-value	0.000			0.000	0.003			
Coefficient	-0.415	0.029		5.164	-0.232	0.371	290.54	0.000
t-stat	12.971	1.235		6.850	2.759			
p-value	0.000	0.217		0.000	0.006			
Coefficient	-0.420	0.024	0.932		-0.254	0.354	269.78	0.000
t-stat	12.914	0.963	2.768		2.962			
p-value	0.000	0.336	0.006		0.003			
Coefficient	-0.422		0.622	4.706	-0.242	0.373	293.19	0.000
t-stat	19.240		2.111	6.187	2.820			
p-value	0.000		0.035	0.000	0.005			

Table 5: Multivariate Analysis: Payout Effect

$$R_{it} = \alpha_i + \beta' X_{k,i,t-1} + \varepsilon_{i,t}$$

	ln $mcap_{t-1}$	ln B/M_{t-1}	E/P_{t-1}	DY_{t-1}	$Payout_{t-1}$	R^2	F-stat.	p-value
Coefficient	-0.454				0.062	0.334	741.72	0.000
t-stat	21.915				1.327			
p-value	0.000				0.185			
Coefficient		0.288			0.075	0.240	466.07	0.000
t-stat		17.493			1.521			
p-value		0.000			0.128			
Coefficient	-0.401	0.064			0.067	0.340	381.48	0.000
t-stat	12.496	2.698			1.445			
p-value	0.000	0.007			0.149			
Coefficient			2.262		0.156	0.152	264.50	0.000
t-stat			4.895		2.679			
p-value			0.000		0.008			
Coefficient			1.692	5.945	0.114	0.186	168.57	0.000
t-stat			4.114	6.396	1.986			
p-value			0.000	0.000	0.047			

Table 6: Multivariate Analysis: Beta and Other Explanatory Variables

$$R_{it} = \alpha_i + \beta' X_{k,i,t-1} + \varepsilon_{i,t}$$

	$Beta_{t-1}$	ln $mcap_{t-1}$	ln B/M_{t-1}	E^{+}/P_{t-1}	DY_{t-1}	$Payout_{t-1}$	Lev_{t-1}	R2	F-stat	p value
Coefficient	0.174	-0.447						0.347	787.35	0.000
t-test	5.449	21.551								
p-value	0.000	0.000								
Coefficient	0.192		0.283					0.256	507.61	0.000
t-test	5.644		17.088							
p-value	0.000		0.000							
Coefficient	0.221			2.154				0.170	302.20	0.000
t-test	6.398			4.938						
p-value	0.000			0.000						
Coefficient	0.275				8.761			0.187	339.33	0.000
t-test	7.951				8.603					
p-value	0.000				0.000					
Coefficient	0.213					0.007		0.105	173.73	0.000
t-test	6.048					0.127				
p-value	0.000					0.899				
Coefficient	0.211						0.062	0.105	174.15	0.000
t-test	5.945						0.737			
p-value	0.000						0.461			

Table 7: Multivariate Analysis: Beta and Other Explanatory Variables

$$R_{it} = \alpha_i + \beta' X_{k,i,t-1} + \varepsilon_{i,t}$$

	$Beta_{t-1}$	ln $mcap_{t-1}$	ln B/M_{t-1}	E/P_{t-1}	DY_{t-1}	Pay-out_{t-1}	Lev_{t-1}	R^2	F-stat	p value
Coefficient	0.169	-0.395	0.064					0.353	402.84	0.000
t-test	5.339	12.348	2.688							
p-value	0.000	0.000	0.007							
Coefficient	0.181	-0.415		1.091				0.363	420.62	0.000
t-test	5.707	-18.932		3.378						
p-value	0.000	0.000		0.000						
Coefficient	0.197		0.250	0.926				0.265	266.88	0.000
t-test	5.84		13.263	2.671						
p-value	0.000		0.000	0.008						
Coefficient	0.175	-0.399	0.025	1.010				0.364	282.32	0.000
t-test	5.566	12.695	1.010	3.017						
p-value	0.000	0.000	0.313	0.003						
Coefficient	0.237		0.246		6.093			0.292	305.33	0.000
t-test	6.976		14.846		7.154					
p-value	0.000		0.000		0.000					
Coefficient	0.221	-0.414			6.214			0.387	466.63	0.000
t-test	6.934	-20.712			7.558					
p-value	0.000	0.000			0.000					
Coefficient	0.214	-0.393	0.028		6.022			0.389	313.18	0.000
t-test	6.774	-12.803	1.196		7.278					
p-value	0.000	0.000	0.232		0.000					
Coefficient	0.172	-0.448				0.044		0.348	394.11	0.000
t-test	5.380	-21.537				0.965				
p-value	0.000	0.000				0.335				
Coefficient	0.189		0.284			0.056		0.256	254.50	0.000
t-test	5.563		17.091			1.149				
p-value	0.000		0.000			0.251				
Coefficient	0.167	-0.394	0.065			0.050		0.353	268.98	0.000
t-test	5.263	-12.334	2.731			1.100				
p-value	0.000	0.000	0.006			0.272				
Coefficient	0.186	-0.464					-0.364	0.355	406.87	0.000
t-test	5.856	-21.601					-4.169			
p-value	0.000	0.000					0.000			
Coefficient	0.195		0.285				-0.100	0.256	254.42	0.000
t-test	5.710		16.821				-1.171			
p-value	0.000		0.000				0.242			

Table 7 (contd.)

Coefficient	0.181	-0.412	0.060				-0.334	0.359	275.92	0.000
t-test	5.72	-12.49	2.50				-3.90			
p-value	0.000	0.000	0.013				0.000			
Coefficient	0.175	-0.399	0.025	1.010				0.364	282.32	0.000
t-test	5.566	12.695	1.010	3.017						
p-value	0.000	0.000	0.313	0.003						
Coefficient	0.214	-0.393	0.028		6.022			0.389	313.19	0.000
t-test	6.774	12.803	1.196		7.278					
p-value	0.000	0.000	0.232		0.000					
Coefficient	0.214	-0.395	0.007	0.613	5.514			0.393	238.74	0.000
t-test	6.777	13.001	0.316	2.091	6.617					
p-value	0.000	0.000	0.752	0.037	0.000					
Coefficient	0.228	-0.414		0.601	5.455		-0.295	0.397	242.78	0.000
t-test	7.702	19.091		2.037	6.600		3.522			
p-value	0.000	0.000		0.042	0.000		0.000			
Coefficient	0.220	-0.410	0.006	0.634	5.348	0.049	-0.266	0.398	162.18	0.000
t-test	6.938	-13.072	0.248	1.989	6.424	1.041	-3.190			
p-value	0.000	0.000	0.804	0.047	0.000	0.298	0.002			