

CHAPTER 1

INTRODUCTION

1.1 Objective of the study

The objective of this study is to examine the relationship between the average stock returns in the Kuala Lumpur Stock Exchange (KLSE) and various measures of risks such as systematic risk (beta), unsystematic risk (residual standard deviation), total risk (variance), relative skewness of return-distribution, firm size, beta and price-to-book-value ratio.

1.2 Significance of the Study

It is the aim of every investor, be it institutional or individual investor, to maximise his investment returns. To do so he must know the type of risk he faces in investing in securities. An investor in the stock market faces two types of risk, that is, market (systematic) risk and unique (unsystematic) risk. Market risk of a security is the risk that is affected by economic factors or non-company-specific factors and cannot be eliminated by diversifying a portfolio. Investors with diversified portfolios are also subjected to this risk. This risk is inherent in the market and is affected by factors such as Oil crisis during the Gulf war in 1991 and the currency crisis in Asia in 1997. Unsystematic risk of a security refers to changes in the return of the security as a result of factors influencing the performance of the company. Diversifying the portfolio will eliminate unique risk. A study of these risks is important in managing investment portfolio. For this purpose the investment theory based on Capital Asset Pricing Model (CAPM) will be looked at in greater detail. This study aims to assess the applicability of CAPM on the Kuala Lumpur Stock Exchange.

1.3 Hypotheses of the study

It has been postulated that the expected returns of stocks or portfolio are associated with various risk factors. These risks are systematic risk (beta), unique risk (residual standard deviation), total risk (variance), relative skewness of return-distribution, firm size and price-to-book-value. According to Capital Asset Pricing Model, the relationship between expected returns of stocks or portfolio and systematic risk (beta) is linear and positive. Besides testing systematic risk, this study aims to test other risk factors that may influence the Malaysian market such as, unsystematic risk (residual standard deviation), total risk (variance), beta squared, relative skewness of return-distribution, firm size and price-to-book-value.

The Fama-Macbeth (1973) cross-sectional regression method will be used to test these variables systematic risk(beta), unique risks(residual standard deviation), total risk(variance), relative skewness of return-distribution, firm size and price-to-book-value and explain the variations in the returns.

The following hypotheses are tested to assess the explanatory power of the individual independent variables, as well as its interrelationship with the other independent variables. Statistical significance is established using a standard t-test.

(i) *Hypothesis 1* : The relationship between returns and systematic risk, beta, is

linear. This implies the following equations:

$$\tilde{R}_{it} = \hat{\delta}_{0t} + \hat{\delta}_{2t}\beta_i^2 + \tilde{U}_{it} \dots\dots\dots(1a)$$

$$\tilde{R}_{it} = \hat{\delta}_{0t} + \hat{\delta}_{1t}\beta_i + \hat{\delta}_{2t}\beta_i^2 + \tilde{U}_{it} \dots\dots\dots(1b)$$

This means that $E(\hat{\delta}_{2t}) = 0$ and $E(\hat{\delta}_{1t}) \neq 0$.

(ii) *Hypothesis 2* : Market only compensates for a portion of the systematic risk, not the unsystematic risk, SE_i . This implies the following equations:

$$\tilde{R}_{it} = \hat{\delta}_0 + \hat{\delta}_{3t}SE_i + \tilde{U}_{it} \dots\dots\dots(2a)$$

$$\tilde{R}_{it} = \delta\alpha_{ot} + \hat{\delta}_{1t}\beta_i + \delta_{3t}SE_i + \tilde{U}_{it} \dots\dots\dots(2b)$$

This means that $E(\hat{\delta}_{3t}) = 0$.

(iii) *Hypothesis 3* : The market price of risk is positive and equal the average return on the proxy market portfolio.

$$\tilde{R}_{it} = \hat{\delta}_{ot} + \hat{\delta}_{1t}\beta_i + \tilde{U}_{it} \dots\dots\dots (3a)$$

This means that $E(\hat{\delta}_{1t}) = E(\tilde{R}_{mt}) > 0$ where \tilde{R}_{mt} is the average returns on the market portfolio at time t

(iii) *Hypothesis 4*: The distributions of asset returns are symmetrical.

This implies the following equations:

$$\tilde{R}_{it} = \hat{\delta}_0 + \hat{\delta}_{5t}SKEW_{it} + \tilde{U}_{it} \dots\dots\dots(4a)$$

$$\tilde{R}_{it} = \hat{\delta}_0 + \hat{\delta}_{1t}\beta_i + \hat{\delta}_{5t}SKEW_{it} + \tilde{U}_{it} \dots\dots\dots(4b)$$

where $SKEW_i$ is the skewness of the ith asset at time t. This means that $E(\hat{\delta}_{5t})=0$.

(iv) *Hypothesis 5* : (Sharp-Lintner hypothesis) There is unrestricted borrowing and lending at a risk free rate.

$$\tilde{R}_{it} = \hat{\delta}_{ot} + \hat{\delta}_{1t}\beta_i + \tilde{U}_{it} \dots\dots\dots (5a)$$

This means that $E(\hat{\delta}_{ot}) = 0$.

(v) *Hypothesis 6* : (Levy's hypothesis) Financial markets are not perfect and hence investors are not well diversified - they hold too few stocks.

This implies the following equations:

$$\tilde{R}_{it} = \hat{\delta}_0 + \hat{\delta}_{4t}\sigma_i^2 + \tilde{U}_{it} \dots\dots\dots(6a)$$

$$\tilde{R}_{it} = \hat{\delta}_{0t} + \hat{\delta}_{1t}\beta_i + \hat{\delta}_{4t}\sigma_i^2 + \tilde{U}_{it} \dots\dots\dots(6b)$$

where σ_i^2 is the variance of the i^{th} asset.

This means that $E(\hat{\delta}_{4t}) = 0$.

(vi) *Hypothesis 7*: There is no relationship between returns and firm size.

This implies the following equations:

$$\tilde{R}_{it} = \hat{\delta}_{0t} + \hat{\delta}_{6t} \ln(mkt)_{i,t-1} + \tilde{U}_{it} \dots\dots\dots(7a)$$

$$\tilde{R}_{it} = \hat{\delta}_{0t} + \hat{\delta}_{1t}\beta_i + \hat{\delta}_{6t} \ln(mkt)_{i,t-1} + \tilde{U}_{it} \dots\dots\dots(7b)$$

where size of firm is measured by $\ln(mkt)_{i,t-1}$, the logarithm of the market capitalisation of the i^{th} asset at time $t - 1$.

This means that $E(\hat{\delta}_{6t}) = 0$.

(vii) *Hypothesis 8*: The relationship between returns and price-to-book value is

linear. This implies the following equations:

$$\tilde{R}_{it} = \hat{\delta}_{0t} + \hat{\delta}_{7t}PBV_{i,t-1} + \tilde{U}_{it} \dots\dots\dots(8a)$$

$$\tilde{R}_{it} = \hat{\delta}_{0t} + \hat{\delta}_{1t}\beta_i + \hat{\delta}_{7t}PBV_{i,t-1} + \tilde{U}_{it} \dots\dots(8b)$$

where $PBV_{i,t-1}$ is the price to book value of the i^{th} asset at time $t - 1$.

This means that $E(\hat{\delta}_{7t}) = 0$.

4 Scope of the study

This study will focus on sixty stocks listed in the KLSE from January 1979 to December 1998. Stocks are only considered for the study if the following criteria are satisfied:

- Availability of end of month closing prices for the period of January 1979 to December 1998

- Not more than 4 missing months trading or suspension

- Availability of data for price-to-book-value (January 1989 to December 1998)

5 Organisation of Study

The report is organised as follows. *Chapter 1* will give a brief introduction of the study. The hypotheses and its related regression equations are shown and explained here. In *Chapter 2*, the Literature review discusses the theory, models and research related to this study. This chapter will focus on studies conducted on various markets especially the Asian markets such as the Tokyo Stock Exchange, Taiwan Stock Exchange, Hong Kong Stock Exchange, Singapore Stock Exchange and the Kuala Lumpur Stock Exchange. This chapter will also look at the institutional framework of the KLSE and the performance of the KLSE from 1979 to 1998. *Chapter 3* covers the research methodology – the data, the approach to obtaining the variables - systematic risk(beta) unsystematic risks(residual standard deviation), total risk(variance), relative skewness of return-distribution, firm size and price-to-book-value. The construction, estimation and test periods and cross-sectional regression techniques are mentioned in detail. *Chapter 4* presents the analysis and research results. Cross-sectional time series regression for each of the hypothesis is tabulated here. Details such as t-values, significance level and adjusted coefficient of

determination are also displayed here. Finally, *Chapter 5* shows summary of the results, conclusions, implications, applications and suggestions for future research. Limitations of this study are also mentioned here.

1.6 Institutional Framework of the Kuala Lumpur Stock Exchange

The history of the Kuala Lumpur Stock Exchange (KLSE) can be traced back to the 1930s. The Exchange was established in 1973 to provide a place for investors to transact business in shares, bonds and various other securities of Malaysian listed companies. At that time a strong link existed between the KLSE and the Stock Exchange of Singapore (SES) as the Malaysian incorporated companies were also listed and traded through the SES and the Singapore incorporated companies were also listed and traded in KLSE. It was in 1990 that the KLSE achieved a milestone with the delisting of Singapore incorporated companies from the KLSE and the delisting of Malaysian incorporated companies from the SES. The exchange took measures to improve its functions. Notable among them is the computerisation of the clearing system with the formation of a central clearing house SCANS, the launching of the Second Board in 1988 to enable smaller companies with good earning records and the implementation of CDS, an automated clearing and settlement system of the KLSE. As a result of this move the Kuala Lumpur Stock Exchange is made of two Boards: the Main Board and the Second Board. As at 31 December 1998, 454 companies are listed on the Main Board while 282 are listed on the Second Board making a grand total of 736 companies listed on the KLSE (Investors Digest, Mid-Jan 1999). During the height of the economic boom in the early nineties the value of shares traded in the KLSE exceeded RM84 billion for the month December 1993.

The chart of the end of the month KLSE Composite Index from 31st January 1979 to 31st December 1998 is shown in Chart 1. The chart was plotted with the vertical axis as the end of month KLSE Composite Index and the horizontal axis as the end of months. The chart shows the KLSE undergoing several upturns and downturns.

From the end of the month low of 160.61 points on February 1979 it reached a peak of 451.89 points on April 1981. During the month of February 1979, the market was affected by bearish developments outside the country (the fall of Cambodia in Indo-China and the crisis in Iran). By April 1981, the local stock market was experiencing the seventh month of advances. Total turnover was a record 206,399,000 units of shares traded.

The economy was experiencing a global recession by August 1982. Commodity prices were depressed. The KLSE Composite Index plunged to a low of 247.45 on August 1982 before reaching a high of 423.81 on January 1984. By January 1984 the local stock market was experiencing an upturn. Total turnover was another record high of 316,354,000 units of shares traded on January 1984.

The KLSE Composite Index continued to move downwards after that until it hit a low of 171.74 points on April 1986. It then moved upwards to a high of 448.71 on July 1987 before the Black Monday 19th October crash of 1987 where it reached a low 243.24 points on November 1987.

After the crash it continued on a slow road of recovery to reach a high of 603.18 points on February 1990. Total turnover of 2,368,663,000 units of shares worth RM 4,822,612,000 was traded in February 1990. From then on the economy was booming. The KLSE continued on its march until it hit a high of 1275.32 points on December 1993. By this time the total turnover was 16,947,341,000 units of

shares worth RM 84,480,201,000. Thereafter the KLSE continued to hover around 1000 points until the economy was hit by the currency crisis on September 1997 where the total turnover shrunk to 5,924,288,000 units of shares worth RM 25,481,485. By August 1998, the total turnover shrunk further to 2,516,709 units of shares worth RM 3,753,440. The KLSE Composite Index plunged to a low of 102.91 points on 28 August 1998.

Graph of End of Month KLSE Composite Index

