



**PRICE TO EARNINGS RATIO, MARKET TO
BOOK VALUE RATIO, AND SIZE EFFECT
IN KUALA LUMPUR STOCK EXCHANGE**

BY

BAI JIANDONG

**A RESEARCH PAPER SUBMITTED IN PARTIAL
FULFILMENT OF THE REQUIREMENT FOR THE
DEGREE OF MASTER'S OF ECONOMICS**

**KULLIYAH OF ECONOMICS AND
MANAGEMENT SCIENCES**

**INTERNATIONAL ISLAMIC UNIVERSITY
MALAYSIA**

DECEMBER 1999

ABSTRACT

Abnormal stocks' returns obtained from cross-sectional time series are reported in a lot of financial literature. To find out similar phenomenon, this paper undertook a research work focused on the size effect in Kuala Lumpur Stock Exchange. The sample covers most listed stocks in KLSE from September 1987 to October 1997. The stocks are sorted, pooled and formed into cross-sectional portfolios to compare the returns of them. Three models, namely two OLS models and one SUR model, are applied in the research. Besides size effect, two other variables, P/E and M/B (Market Price to Book Value Ratio) are also included in this research.

The result indicated the existence of size effect in KLSE as found in other stock markets. However, as for P/E and M/B, we could not reach to a clear-cut and concrete conclusion that these two variables were also able to generate abnormal returns. The finding of size effect in KLSE may add some evidence to the conclusion that this anomaly generally exists. The absence of P/E and M/B effect may be due to highly speculative nature of KLSE. More research work could be done to improve and refine the findings and that may also lead to different results.


ملخص عام

كثيراً ما يتردد في الأدبيات المالية موضوع العوائد الربحية غير الطبيعية (abnormal Returns) للأسهم المالية، هذا ما توافقنا به عادة المعطيات الإحصائية (cross-sectional returns) على نفس المنوال يركز هذا البحث على تحديد حجم آثار هاته الظاهرة (Size Effect) على السوق المالية لكوالا لامبور (KLSE)، العينة المطروحة في هذا البحث تشمل أغلب الأسهم المدرجة في (KLSE)، بدءاً من سبتمبر 1987 إلى غاية أكتوبر 1997. لقد قمنا بترتيب وتصنيف هاته الأسهم في شكل محافظ مالية خلال الفترة الميمنة أعلاه وذلك بغية مقارنة العوائد الربحية لكل منها. هذا ولقد اتبعنا في هذه الدراسة أساساً ثلاث نماذج إحصائية وهي: نموذجين من (OLS) ونموذج واحد يدعى (SUR). إلى جانب تغير حجم الأثر (Size Effect) فقد أدرجنا متغيرين ماليين هما: السعر/العائد الربحي (P/E) وسعر السوق/القيمة الدفترية (M/B).

ولقد خالصنا في الأخير إلى أن متغير حجم الأثر (Size Effect) كما هو ملحوظ في عامة الأسواق المالية فإنه كذلك موجود في (KLSE). إلا أن دراسة M/B, P/E لم تبد نتائج واضحة في المجال. اعتماداً على نتائج (Size Effect) فإننا نستنتج بأن ظاهرة العوائد الربحية غير الطبيعية (Abnormality of returns) هي ظاهرة عامة الانتشار، أما بالنسبة للنتائج الإحصائية التي تخص M/B, P/E والتي تبدو غير حاسمة، مردها ربما إلى المضاربات الكبيرة التي تميز (KLSE). على كل حال، فإنه يرجى مزيد من البحث والعمل الدؤوب في هذا المجال بهدف تحسين وتمحيص النتائج الراهنة التي قد تفضي إلى قراءات واستنتاجات مغايرة.

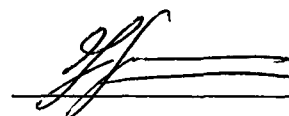
APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a research paper for the degree of Master of Economics.

 4/1/2000

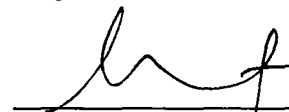
Name **DR. MOHD AZMI OMAR**
DEAN
Supervisor KULLIYAH OF ECONOMICS & MANAGEMENT SCIENCES
INTERNATIONAL ISLAMIC UNIVERSITY, MALAYSIA

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a research paper for the degree of Master of Economics.

 13/1/2000


Name **DR. MANSOR HJ IBRAHIM**
Associate Professor
Examiner Deputy Dean (Academic Affairs)
Kulliyah of Economics and Management Sciences
International Islamic University, Malaysia.

This research paper was submitted to the Department of Economics and is accepted as partial fulfillment of the requirements for the degree of Master of Economics.

 17/1/2000

Name **DR. SELAMAH ABDULLAH YUSOF**
Assistant Professor
Head Department of Economics
Head of Department Economics and Management Sciences
International Islamic University, Malaysia

This research paper was submitted to the Kulliyah of Economics and Management Science and is accepted as partial fulfillment of the requirements for the degree of Master of Economics.

 11/1/2000

Name **DR. MOHD AZMI OMAR**
DEAN
Dean KULLIYAH OF ECONOMICS & MANAGEMENT SCIENCES
INTERNATIONAL ISLAMIC UNIVERSITY, MALAYSIA

ACKNOWLEDGEMENTS

Alhamdulillah, all thanks to Allah, the Almighty God, the most Merciful, and the most Graceful God, this research paper is completed as the final part of my M.Ec. Program.

This research paper involved a lot of work and it took a longer time due to data collection and processing of more than 300 companies' data on average for 120 months. What is the most demanding is that we didn't have a program to automatically sort stocks, divide stocks into portfolios and calculate their returns. Data processing is all manually done using Microsoft Excel. Some companies' names were changed before and in some cases for more than once. And I had to trace back the changes by looking up old issues of magazine *Investor's Digest* to find out previous names. For missing data that are unavailable in downloaded sample in some period, I have to use the magazine again to copy them and input them into data file.

I owed a lot to many people for the completion of this paper. First of all, I would like to thank my supervisor Dr. Mohd Azmi Omar for his advice, guidance, and assistance. I am also very grateful for his encouragement and patience during the writing of this paper.

I also would like to thank Dr. Mansor Hj. Ibrahim for his kind advice and assistance, on model and regression result evaluation. Especially, he explained very patiently to me how to run SURE regression for that I am very grateful.

I also would like to give my thanks to the lecturers who gave me knowledge and encouragement in IIUM and my thanks to secretaries and staffs in General Office of the Kulliyah who have been very helpful to me.

Finally, I would like to thank my parents, my grandfather and my sister for their support and encouragement. I am also grateful to my friends and classmates, Br. Yusuf Guo Shu Tao, Br. Abdullah Ma Yuan Rui, Br. Shabri Abd. Majid, Br. Ali Wan Lei, Br. Hakim, Sr. Khadijah Wu Tian Tian, Br. Ali Abdul Manap from UKM, for all kinds of their help during the writing of this paper.

Thank all of you.

May Allah bless all of you and may His peace be upon all of you.

**Dedicated with Respect and Love to
My Father Yusuf Bai Shang Zhong, and
My Mother Fatimah Bai Rong Fang**

謹以獻給
我尊敬的父親尤素夫·白尚忠和我
親愛的母親法蒂瑪·白榮芳

**Kupersembahkan Dengan Penuh Kasih Sayang Dan Rasa Hormat
Kepada
Ayahanda Tercinta, Yusuf Bai Shang Zhong dan
Ibunda Tercinta Fatimah Bai Rong Fang**

© Copyright by Bai Jiandong and
International Islamic University Malaysia

DECLARATION

I hereby declare that this research paper is the result of my own investigations, except where otherwise stated. Other sources are acknowledged by footnotes giving explicit references and a bibliography is appended.

Name *Bai Jiandong*

Signature *Bai* Date *10 Jun 2000*

TABLE OF CONTENTS

Abstract.....	ii
Approval Page	iv
Acknowledgements	v
Declaration	viii
List of Tables.....	x
List of Figures	xi
CHAPTER ONE INTRODUCTION.....	1
1.1 Introduction.....	1
1.2 Purpose of the Research.....	5
1.3 Outline of the Research.....	6
CHAPTER TWO LITERATURE REVIEW.....	7
CHAPTER THREE DATA AND METHODOLOGY	13
3.1 Data	13
3.2 Methodology	17
CHAPTER FOUR FINDINGS AND RESULT	25
4.1 Statistical Analysis Based on Model 1.....	25
4.1.1 Results Based on Monthly Returns.....	25
4.1.2 Results Based on Yearly Returns.....	29
4.1.3 Results Based on Trimmed Monthly Returns.....	33
4.2 Analysis Using SUR Model.....	38
4.3 Analysis Using Model 3.....	42
CHAPTER FIVE CONCLUSION.....	44
5.1 Conclusion	44
5.2 Implication	46
5.2 Suggestions for Further Studies	47
BIBLIOGRAPHY	48
APPENDIX A.....	51
APPENDIX B.....	52

LIST OF TABLES

Table No.		Page
4-1-1	Summary Statistics for Portfolios Sorted by Fundamental Variables (Monthly Return)	26
4-1-2	Summary Statistics for Portfolios Sorted by Fundamental Variables (Yearly Return)	31
4-1-3	Summary Statistics for Portfolios Sorted by Fundamental Variables From Nov 30, 1987 to June 30, 1997 (Monthly Return)	35
4-2-1	Results Using SUR Model On Portfolios Formed by Sorting Market Value (MV)	38
4-2-2	Results Using SUR Model On Portfolios Formed by Sorting M/B	38
4-2-3	Results Using SUR Model On Portfolios Formed by Sorting P/E	39
4-2-4	Results Using SUR Model on MV Assuming Various Constants	41
4-3-1	Results Using Model 3 Regression on MV Portfolios (Yearly Returns)	42
4-3-2	Results Using Model 3 Regression on MV Portfolios (Monthly Returns)	42

LIST OF FIGURES

Figure No.		Page
4-1-1A	Comparative Average Monthly Returns of Portfolios Sorted by MV, M/B, P/E	27
4-1-1B	Comparative Risk-adjusted Average Monthly Returns of Portfolios Sorted by MV, M/B, P/E	27
4-1-2A	Comparative Average Yearly Returns of Portfolios Sorted by MV, M/B, P/E	32
4-1-2B	Comparative Risk-adjusted Average Yearly Returns of Portfolios Sorted by MV, M/B, P/E	32
4-1-2C	Cumulative Yearly Returns	33
4-1-3A	Comparative Average Monthly Returns of Portfolios Sorted by MV, M/B, P/E (Nov 1987 to June 1997)	36
4-1-3B	Comparative Risk adjusted Average Monthly Returns of Portfolios Sorted by MV, M/B, P/E (Nov 1987 to June 1997)	36

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Efficient Market Hypothesis (EMH) states that in a capital market security prices adjust rapidly to the arrival of new information and, therefore the current prices of securities fully reflect all available information.

There are three assumptions associated with EMH. First, there exist a large number of competing profit-maximizing participants who analyze and value securities independently. Second, the new information regarding securities comes to the market randomly. Third, the investors rapidly adjust security prices to reflect the new information.

The combined effects of these assumptions will lead to a conclusion that *security price changes are prompt to new information in a random way and independent to the historical prices*. We can, therefore, derive a more important implication, that since current prices fully and rather rapidly reflect all relevant information including associated risks, there is no way to consistently obtain abnormal rate of return from securities with risk adjusted.

This interesting contention, of course, was followed by intensive and a large number of research and tests on capital market efficiency since 1960s in the financial literature¹. In fact, the research on market efficiency is among the most successful in empirical economics.

To facilitate study, Fama (1970) divided EMH into three categories, namely, weak-form EMH, semi-strong EMH, and strong-form EMH. Weak-form EMH assumes that current stock prices fully reflect all security market information including variables such as historical data series of prices, rates of return, trading volume and other market-generated information. The tests consequently focused on independence test of these variables, to see if they are really inter-temporally independent. Another approach is to test the trading rules through simulation against buy-and hold investment strategy.

A lot of research has been conducted to examine the serial correlation among stock returns in U.S. equity markets². The results typically indicated insignificant correlation in stocks' returns over time, which supports weak-form EMH. The alternative method, the runs test also supports weak-form EMH³. As for trading rules, most evidence from simulations of specific trading rules indicated that these rules have not been able to outperform a buy-and-hold trading strategy. Therefore the results generally support the weak-form EMH.

¹ For a detailed and comprehensive review on related literature before 1970 see Fama (1970) and its updated version see Fama (1991)

² For example, see Fama (1965), Fama and Macbeth (1973)

³ For example, see Hagerman and Richmond (1973)

Tests of semistrong-form EMH are divided into two categories: one involved in time series analysis of cross-sectional distribution of returns, the other involved in event study. Different from other two efficiency tests, the result of semistrong-form EMH is quite mixed: the hypothesis received strong support from the numerous event studies including stock splits, initial public offerings, world events and economic news, accounting changes, and a variety of corporate finance events¹.

However, some time series data from cross-sections of stocks do indicate some evidence of anomalies where abnormal rates of return obtained are not justified by Capital Assets Pricing Model which states that a security's expected value is determined linearly by its systematic risk β i.e. covariance coefficient with market portfolio.

These time series are risk premiums, quarterly earnings surprise, neglected firms as well as firm size (market value, i.e. stock capitalization), B/M (BV/MV, or B/P, i.e. book value to market value ratio), P/E (price to earnings ratio), C/P (cash flow yield i.e. cash flow to price ratio), D/P (dividend yield, i.e. dividend to price ratio), and leverage (measured by BE/MV, book equity to market value ratio). The anomaly is not only confined within U.S. stock market, but similar phenomenon is also found in Tokyo Security Exchange and other stock exchanges. In fact, some of these variables are also applied in stock valuation for investment purpose.²

¹ For a review on semi-strong form EMH tests and findings, see Reilly and Brown (1997), pp228-234.

² As Hagstrom (1995) described in the book, *The Warren Buffet Way*, the analysis of book value to market value ratio, cash flow to price was part of investment evaluation procedure and contributed to the remarkable investment success, although the legendary investor Warren Buffet applied them in a rather artistic way than a strict mathematical way.

Among them, perhaps small firm size effect is the most significant phenomenon that is found in numerous researches studying semistrong-form EMH. In fact, the examination of the existence of size effect has become a routine in capital market studies where size effect study is either an important part or becomes an aspect to refine the research. And a lot of findings also revealed that correlation exists among these time series. Thus, it is necessary to study relationship among these variables as well as individual variables.

Tests of strong-form EMH are focused on whether a consistent above-average return can be produced by any investment professionals who possibly have access to private information. The general results are mixed, but the bulk of relevant evidence seemed to support the hypothesis for most investors¹.

In Malaysia, some research work has been undertaken to study market efficiency in Kuala Lumpur Stock Exchange (KLSE). In general, the results seemed to indicate that KLSE is efficient.

Kok and Goh (1994) in their study on weak-form efficiency in KLSE suggest that KLSE is weak-form efficient with respect to monthly data, but weekly data has mixed result. Their paper also indicated that KLSE has improved its efficiency and transformed from a generally weak form inefficient market in the middle 1980s to a weak-form efficient market by the late 1980s and early 1990s. And small stock market (second board) was not weak-form efficient, but this inefficiency had been improved.

Isa and Lim (1993) indicate in their research, that regarding stock price movement around acquisition announcement, KLSE is consistent with existing literature i.e. it is efficient in general. But it takes 20 days for stock price to adjust after announcement, which means it shows some inefficiency. The study on bonus issues (Shamsher and Nassir (1993)), as well as on earnings and dividend announcement effects, indicate that KLSE is semi-strong efficient.

Another research on KLSE market efficiency regarding calendar effect has been conducted on so-called Chinese New Year Effect (Davidson and Pecker 1996). In this paper the January Effect is also examined with the conclusion that no evidence is found in favor of either the January Effect or a Chinese New Year Effect.

1.2 Purpose of the Research

From the above, we can see that of all the EMH tests, namely weak-form, semistrong-form, and strong-form EMH tests, those pooled cross-sectional time series data indicated significant and consistent evidence against EMH. But research about KLSE specifically regarding cross-sectional time series like P/E, B/M, and firm size have not been seen in the literature.

Thus, the purpose of this research is firstly, to find out small firm effect on stock returns in Kuala Lumpur Stock Exchange to fill the blank of semistrong-form efficiency study on KLSE in the literature. The second purpose is to accumulate more

¹ For a review on strong-form EMH tests and findings, see Reilly and Brown (1997), pp234-241.

evidence in cross-sectional anomalies in stock returns, which were found in other markets in the world.

The effect of MV¹ is the focus of this research, but we also perform study on P/E, M/B's impact on stocks' returns. Furthermore, we will examine correlation between these variables. If there exists correlation between them, we will conduct multivariate regressions to find out correlation coefficients and by using SUR model to discover the most significant variable that plays a major role in abnormal returns. The selection of variables is based on existing literature and practice of security analysts as well as availability of data.

1.3 Outline of the Research

Chapter two reviews on small size firm effect, P/E and B/M anomalies found in U.S. and other security market. The review also covers the relationship among these three variables. In chapter three, we discuss the data sample and methodology of the research. We will explain how portfolios are formed and present three statistic models. Chapter four presents the finding and regression results as well as implications from the findings. Finally, we will present conclusions of this research and provide suggestions for further studies in chapter five.

¹ MV is Market Value, measure of firm size, which equals stock price times outstanding number; P/E is price over yearly earnings ratio; and M/B is Market to Book Value ratio which is the ratio of stock price over net assets. The data downloaded from Datastream is Market to Book Value Ratio (M/B) not Book to Market Value ratio (B/M), but this is not an issue, because M/B is the reciprocal of B/M. And this would not change the result

CHAPTER TWO

LITERATURE REVIEW

Basu (1975,1977) examined the relationship between the historical price-earnings (P/E) ratios for stocks and their returns. He found that low P/E stocks tend to outperform high P/E stocks. He attributed this finding to reasons that market overestimates high P/E stocks that are normally of high growth companies, while it undervalues low growth companies' stocks. Peavy and Goodman (1983) examined this relationship with adjustment for firm size, industry effects and infrequent trading. Their result supports Basu' conclusion.

Banz (1981) initiated a study on company's market value effect in US stock market. The research on risk adjusted returns for extended periods (10 to 15 years) indicated that small companies consistently outperform larger companies *and* market portfolio as measured by stock market index. Reinganum (1981) simultaneously studied both size effect and P/E ratio effect on stocks' rates of return. His findings are not only favorable of Basu's conclusion, it also indicated that size effect is dominant to P/E. He contended that it was really the size not P/E ratio that caused Basu's results. Later Basu (1983) reexamined Reinganum's research and found that the highest risk-adjusted returns were in portfolios with small firms and low P/Es.

Following their studies, many papers on size effect appeared in financial journals. Brown, Kleidon, Marsh (1983) examined performance over various time intervals in their study and indicated that different methodologies lead to different results and the small firm effect is not stable. During some periods, the phenomenon is confirmed, but in some other periods (1967 to 1970), large firms outperformed the small firms. However, as indicated by Reinganum (1992), this effect is long-run phenomenon, although during some period, contradictory evidence did exist.

Stoll and Whaley (1983) confirmed the size effect, i.e. market value varies inversely with risk-adjusted returns but also found a strong positive correlation between average price per share and market value: firms with small market value have low stock prices. Low price stocks have higher transaction costs due to higher bid-ask spread and high broker's commission. Assuming daily transactions, the original size effect results are reversed. Taking the transaction cost into the consideration of small-firm effect in their research, they found out that rebalancing of portfolio within one month produced negative abnormal rate of return, while portfolios held between 3 months and 1 year produced a positive abnormal rate of return. In their conclusion, size effect must consider transaction costs and specify holding period assumptions. Keim (1983) provided evidence that, month by month study, daily abnormal return is more significant in January, and always positive in January than in any other month.¹

¹ For other recent articles, see Cook and Rozel(1984), Jaffe, Keim and Westerfield(1989), Ritter and Chopra (1989).

Reinganum (1983) conducted an empirical test on small-firm size using two different buy-and-hold strategies from 1963 to 1980. The first strategy is to buy and hold throughout the period, the other strategy is rebalancing the portfolio annually. With annual rebalancing, the smallest-firm portfolio grew from \$1 in 1963 to over \$46 without commissions, whereas \$1 in the largest-firm portfolio grew to about \$4. With no annual rebalancing, \$1 in the smallest-firm portfolio grew to about \$11, whereas \$1 in the largest-firm portfolio grew to over \$4. The difference is so large that even considering reasonable transaction costs can not reduce the return superiority of small-size firms with annual rebalancing.

In a study on *neglected firm effect*, Arbel and Strebel (1983) confirmed the existence of the small-firm effect, even though neglected firm effect applied in all size classes. For the neglected firms, the firms with smaller size performed better than those with larger size.

James and Edmister (1983) examined the relationship between returns, market value and market volume (a measure of market activity). They confirmed the relationship between size and rates of return and found that a strong positive correlation between size and trading activity. The relationship between return and trading activity would justify the excess return for small stocks on the basis of a liquidating premium, but results indicated that mean daily return and market activity has no hypothesized reverse relationship. A test on firms with comparable trading activity confirmed the size effect. In summary, the size effect could not be explained by differential trading activity.

In a study on B/M, Rosenberg, Reid, and Lanstein (1985) found a significant positive relationship between the B/M ratio and stock returns. Fama and French (1992) also found a positive relationship between book value to market value ratio and stock returns. In addition they found although leverage and E/P ratio were significant by themselves, the B/M and size effect are dominant when all the variables put together. But Kothari, Shamken and Sloan(1995) measured beta with yearly returns instead of monthly returns used by Fama and found that beta was still a good measure of risk. They indicated that relationship between returns and B/M ratio may be periodic and was not significant over longer periods.

Recently, in a follow-up study, Fama and French (1995) indicated that size played a more important role in the small stock portfolios, while the B/M ratio was more important for firms with high B/M ratios. In a recent study by Denis et. al. (1995), they confirmed the original Fama-French results. They not only confirmed that optimal combination was portfolios of small firms with high B/M ratios, but showed that this superiority prevailed assuming a 1% transaction cost and annual rebalancing. It is shown that best performance could be derived assuming 4 years rebalancing.

A similar research is also conducted on Tokyo Stock Exchange by Chan, Hamao and Lakonishok (1991). In their univariate analysis, they found significant relationship between expected returns and firm size, P/E, B/M and C/P respectively. This result confirms to general results obtained from previous research. After considering correlation among these data series, they found B/M and C/P have the most significant positive impact on expected returns. In their research, they replaced leverage by cash

yield (C/P) based on contention that earnings are distorted due to Japan's accelerated depreciation convention.

However, we must point out, as indicated by Fama (1991), that any correlation between variables and returns could be consistent with market inefficiency or with the variables proxying for omitted risk factors, i.e. CAPM is misspecified. The joint-hypothesis nature of problems prevents a solid resolution that predictability of returns is a result of market inefficiency or improper CAPM. But Reinganum (1981) contended that the abnormal rates of return are the result of unrealistic description of stock market by simple one-period CAPM. As evidence, in his study the size effect can exist for as long as two years. Chan, Chen and Hsich (1985) used a multifactor pricing model with several risk variables and found the abnormal rates of return was only about 1 or 2 percent compared with about 12 percent before the multifactor adjustment for risk. They contended that size effect could be explained by complete measures of risk. Thus this finding is favorable to Reinganum's conclusion.

Roll (1981) suggested that the risks of small firms were not properly measured. Because small firms are traded less frequently with low volume, this causes an increase in serial correlation of prices over time and a decrease in the variance of returns. The covariance of returns for the stock with the market portfolio is reduced, so the stocks beta is lower, i.e. risk is not properly measured. Reinganum (1992) computed betas for the different market value portfolios using OLS and Dimson's (1979) aggregated coefficient model. He found that beta calculated using OLS is smaller than beta calculated using aggregated coefficient model in small size portfolios (0.75 vs. 1.69 in smallest size portfolio), but largest size portfolio two betas

are almost the same (0.97 vs. 0.98). Although result using Dimson's model indicated underestimated risk for smaller firms, it still can not justify the very large differences in rates of return.

In summary, size effect has emerged as one of the major anomalies in the efficient markets literature. Small firm size effect is not only found in one study, it is confirmed by many research in different respects and with various methodologies. Size effect is also found and confirmed in the research on other variables, such as January effect, Neglected Firm Effect etc. There are evidences against the existence of small size effect, but these findings are only conditional, either conditional on short period, or conditional on other risk measure. Nevertheless, the extensive findings so far indicated that size effect is neither a random phenomenon nor justified by CAPM.

CHAPTER THREE

DATA AND METHODOLOGY

3.1 Data

The data covers most of stocks listed on Kuala Lumpur Stock Exchange (KLSE) main board from September 1987 to October 1997¹. During the sample period, a global stock market crash that originated from New York Securities Exchange in October 1987 extended to Malaysia and caused a similar stock price crash in KLSE. Started at the beginning of July 1997, a historical financial crisis took place in East Asia and KLSE is not escaped. KLSE experienced huge downturn since then. But from middle of 1993 to first quarter of 1994, a super bull market took place that lasted almost one year. Since our sample period includes one complete downturn, one complete bull market and the initial stage of a financial crisis, we may safely say that our sample is not biased to an up-turn or a downturn market.

Our data are divided into two categories, yearly data and monthly data. Yearly data is downloaded form Data Stream Mainframe, and monthly data is downloaded from Bloomberg server.

¹ In 1989, Kuala Lumpur Security Exchange set up a Second Board where small companies with paid-up capital requirement of 10 million Ringgit can be listed, because of limited data we did not include stocks listed in second board.