CHAPTER 1

INTRODUCTION

1.1 An Overview on Efficient Market Hypothesis (EMH)

Many literatures have accumulated over the past 30 years concerning the validity of the weak-form efficient market hypothesis with respect to stock markets in the developed countries. According to the definition of Fama (1970), EMH postulates that successive one-period stock returns are independently and identically distributed and they resemble 'random walk' patterns. The notion that the current price of a stock fully reflects available information was taken to imply the successive price changes are independent. Consequently, there will be no serial correlation between the returns. Moreover, the assumption of the successive stock returns are identically distributed requires that the distribution of the changes in stock prices must be stationary over time. The implication of this random walk theory is that the stock price series does not contain any purely cyclical or other deterministic components, such as seasonal pattern or trend.

Fama (1970) defines a market as being weak-form efficient if current prices of stock fully reflect all relevant and available information contained in past prices. This implies that future stock returns cannot be predicted using past stock returns as a forecaster. Therefore, investors cannot use information contained in the past to make superior forecast and reap abnormal profits. This is known in the literature as the weak form of the efficient markets hypothesis.

There are two other forms of the efficient markets hypothesis, namely the semi-strong form and the strong form. The semi-strong form of the efficient market hypothesis asserts that all publicly available information is fully reflected in the stock prices. This implies that the market is not only efficient in processing information contained in past prices, but is also efficient in processing all information contained in published annual reports, newspaper and stock market newsletters. All published information is assumed to be made available to all investors simultaneously and they are equally able to use this information to bid prices of stock.

The strong form of the efficient markets hypothesis asserts that all published and unpublished information are fully reflected in stock prices. This means nobody can use the privileged information to make extraordinary profits in the stock markets and superior forecasts of future prices.

1.2 The Stock Market Anomalies

The efficient markets hypothesis represented the conventional wisdom among academics during the 1970s. However, during the 1980s and early 1990s, researchers have discovered numerous stock market anomalies that seem to contradict the efficient markets hypothesis. An anomaly is *an exception to the rule, a deviation from what is expected.* Anomalies and regularities of the stock returns imply that the market is not efficient. From the past studies, the market anomalies have become the basis for the investors to search systems or patterns that can be used to earn abnormal returns from the capital market.

Since the pioneering research had by Fama (1965) and Cross (1973), many studies had been done in the developed countries. Their result indicated some proven anomalies in the validity of the efficiency of the stock markets. Among these anomalies, which are considered prevalent and significant, appear to be firm size effect, January effect (turn of the year), end-of-the-month effect, Monday effect (weekend effect) and pre-holiday effect. Stocks in general have generated abnormally high returns from these market anomalies.

According to some studies, the January effect refers to the average returns in January are higher compared to the average returns for other months of the year. Some stocks in general consistently show higher returns on the last day of the month and the day before holidays. Both of these phenomena are called as end-of-the-month effect and pre-holiday effect, respectively. In addition, several studies have shown that the stock returns exhibit the day-of-the-week effect, which refer to stock returns are significantly negative on Mondays and positive on Fridays.

By observing these patterns or trends in the stock market, some investment analysts are capable in applying the statistical techniques to analyze the past historical prices and provide information to predict future price direction. Hence, they are able to exploit the stock market and obtained abnormal returns.

1.3 Literature Review

Many studies had been done on the major calendar anomalies in the stock markets over the past twenty years in developed stocks market such as U.S., U.K and Japan. Major calendar anomalies identified by previous studies include higher average return in January (January effect), beginning of the year (the turn-of-the year effect), end-of-the month effect, the pre-holiday effect and day-of-the-week effect. Some studies also had investigated the relationship between the firm size effect and those calendar anomalies on stock markets. Recently, some studies had focused on emerging stock markets such as Malaysia, Thailand, Philippines, Korea, Taiwan and Singapore.

1.3.1 Empirical Evidence On The-Day-Of-The-Week Effect

The evidence that stock returns depend on the day-of-the-week effect in the developed stock markets (U.S., U.K., Japan) has been well documented. Evidence for the U.S. market from the study by French (1980), Gibbons and Hess (1981), Keim and Stambaugh (1984), Lakonishok and Smidt (1988) indicates that the stock market returns on Monday tend to be significantly negative and lower than the other days of the week, while the return on the last trading day of the week tend to be positive.

French (1980) studied the daily returns on the Standard and Poor's Composite portfolio of the 500 largest firms (S & P 500) during the period of 1953 to 1977. He concluded that the average return on Monday was significantly negative during the entire sample period and five year sub-periods.

Gibbons and Hess (1981) conducted similar studies on the S & P 500 during the period of 1962 to 1978. Their result showed that the returns on Monday and Tuesday

appear to be significantly lower and negative. They also studied the day-of-the-week effect in Treasury Bill market and the result also indicated that there is a strong Monday effect whereby Monday's returns are significantly negative.

By doubling the length of period as examined by French (1980), Keim and Stambaugh (1984) found negative Monday's returns as early as in 1928. They also investigated the relations between the weekend effect and firm size. They found a weekend effect for firms in all size deciles, especially the smaller firms have the tendency for higher returns on Friday.

Rogalski (1984), by using both the Dow Jones Industrial Average (DJIA) and the Standard and Poor 500 during the period of 1974 to 1984, has found significant negative returns from Friday's close to Monday's opening and insignificant negative returns on Monday itself. Thus the Monday effect clearly becomes the weekend effect. Further, he showed that small firms on average have higher returns on Monday in January than large firms. This suggests that the firm size effect was interrelated with the day-of-the-week effect.

In recent years, similar studies have been done on the emerging stock markets such as Hong Kong, Taiwan, Thailand, Malaysia and Singapore. Wong and Ho (1986) conducted study on SES All Share and six other sector indices on the Singapore Stock Exchange during the period of 1975 to 1984. Their result confirmed the existence of a significant day-of-the-week effect, with the lowest returns occurred on Monday and was significantly negative, while the highest positive return occurred on Friday.

Wong, *et al.* (1992) further extend the study of the day-of-the-week effect to the stock markets in Singapore, Malaysia, Hong Kong and Thailand. The results confirm the

existence of the day-of-the week effect in the stock markets of Singapore, Malaysia and Hong Kong, in which Monday's returns are significantly negative. However in Thailand, the mean returns are found to be negative on Tuesday.

Kim (1988), Jaffe and Westerfield (1985) and Aggarwal and Rivoli (1989) also confirm the existence of the day-of-the-week effect in some Asian markets including Hong Kong, Korea, Taiwan, Japan and Singapore. They discovered that the stock indices of the above markets showed negative returns on Monday and positive returns on Friday.

Most of the past studies had used the classical ordinary least square (OLS) methodology to investigate the existence of the calendar anomalies in the stock markets, whereby the classical model in time series and econometric model operate under an assumption of a constant variance. Some recent studies have employed the robust methodology in the similar investigation. Engle (1982) has introduced the ARCH (Autoregressive Conditional Heteroskedastic) process, which allows the conditional variance in time series model to change over time as a function of past error term.

The ARCH model has extended to more general process that was introduced by Bollerslev (1986), called GARCH (Generalized Autoregressive Conditional Heteroskedastic). In GARCH model, the conditional variance of the error term at a particular time is dependent not only on past squared disturbances but also on past conditional variances. This model has proved useful in modeling and forecasting many financial time series, such as stock prices, inflation rates, foreign exchange rates, etc.

The latest study provided by Kamath, *et al.* (1998) employed the GARCH (1,1) model and OLS model for investigation of the day-of-the-week effect in the Stock Exchange of Thailand (SET) during the period of 1980 to 1994. The study suggests that

the results obtained from the GARCH model are fairly consistent with those from the OLS methodology, which support the hypothesis of the day-of-the-week effect in the SET. Specifically, there is strong evidence of significantly positive Friday's returns and negative Monday's returns for the SET as well as for its sub-indices. In addition, they also found that the parameters in the conditional variance equation are significant for the SET index. This implies that the volatility of the stock returns persists over the entire period in the SET index.

Clare, Ibrahim and Thomas (1998) examined the seasonal patterns in the returns on the Kuala Lumpur Stock Exchange Composite Index (KLCI) from 1983 to 1993. Results indicate that there is a strong day-of-the-week effect with the lowest returns occurring on Monday and the highest on Thursday and Wednesday. In their study, they also applied ARCH model and GARCH model for the stock returns to investigate the seasonal variation of return volatility on the KLCI. They found the existence of the day-of-the-week effect in the Malaysian stock market is due to seasonal variation in equity market risk. In particular, they found that the mean returns on Monday, Wednesday and Friday are significantly different after the changes of volatility are taken into account in the Malaysian stock market returns.

1.3.2 Empirical Evidence On Pre-Holiday Effect

The previous studies have provided the evidence of the holiday effect in stock return where stocks show a high mean returns on the trading day prior to holidays. Amongst the studies that have uncovered a holiday seasonal patterns in stock returns are Lakonishok and Smidt (1988), Ariel (1990), Wong (1992), Kim and Park (1994), Ho, *et al.* (1994) and Clare, *et al.* (1998).

Lakonishok and Smidt (1988) studied 90 years of the Dow Jones Industrial Average (DJIA) on the trading day prior to the holidays. They found that the average pre-holiday daily return was about 23% higher than the normal days.

In Ariel's study (1990), he examined the holiday seasonal pattern in the Center for Research in Security Prices' (CRSP) value-weighted and equally-weighted daily index return for the years 1963 through 1982. The report stated the significant result in which the mean returns on the pre-holiday are higher than those on non-pre-holiday. Ariel also provides evidence that the high pre-holiday returns are not a manifestation of other calendar anomalies such as January effect or the weekend effect.

Kim and Park (1994) provided further evidence of the holiday effect by investigating three major stock markets in U.S., namely the NYSE, AMEX and NASDAQ during the period of 1963 to 1986. In common with the findings of Ariel (1990), they found that the pre-holiday effect exists in all three major stock markets. They further investigated the relation between holiday effect and firm size effect. The result shows that after controlling for the day-of-the-week effect and pre-New year's day effect, firm size effect is not present in mean returns on pre-holiday.

For the Asian stock markets, Wong (1992) found a significantly higher return in the month immediately prior to the Chinese New Year holidays in Malaysia, Hong Kong and Singapore. In Malaysia, Clare, *et al.* (1998) examined the Malaysian stock returns from 1983 to 1993 and provided evidence that stock prices tend to rise on the day prior to a public holiday compared to the rest of the other days.

1.3.3 Empirical Evidence On End-Of-The-Month Effect (Monthly Effect)

The end-of-the-month effect refers to the average returns on the last trading day of the month are higher than the rest of the days. First study of this monthly effect was reported by Ariel (1987) who found that there is a significant positive stock returns in the last trading day and the first nine trading days of each month. He found that this effect could not be explained by January effect, dividend patterns or higher return volatility at the beginning of months.

Jacobs and Levy (1988) further investigated the end-of-the-month effect on the Dow Jones Industrial Average (DJIA) by using the average returns for trading days near end of the month from 1897 to 1986. The result indicates that returns are high for each trading day from the last day in the previous month to the third trading days in the current month. They suggest that a higher month-end cash flows such as salaries as a possible explanation to this anomaly.

Pearce (1996) analyzed the end-of-the-month effect by using all stocks traded on the New York Stock Exchange: value-weighted (NYSE VW) and equally-weighted (NYSE EW) and all stocks traded on NASDAQ: value-weighted (NASDAQ VW) and equally-weighted (NASDAQ EW) for the period of 1972 to 1994. In the study, Pearce

investigated the major calendar anomalies simultaneously by embedding them into one model for daily returns. These major calendar anomalies included weekend effects, pre-holiday effects, January effect and end-of-the-month effect. The result shows that the returns in the end-of-the-month for all stocks are higher than in the rest of the days.

1.3.4 Empirical Evidence On The Firm Size Effect

From the past studies, the results proved that some calendar anomalies are related to the firm size or capitalization of stock. In the developed stock markets, Keim (1983) and Keim and Stambaugh (1984) found that about one half of the abnormal returns for small firms occur in January, especially during the first five trading days of January. They also found that the January effect and the weekend effects are more significant for small firms compared to the larger firms.

In Ariel's study (1990), he provided further evidence that there are no incremental pre-holidays returns accruing to small firm size after adjusting the day-of-the-week effect and pre-New-Year's-Day effect. The results also suggested that the systematic trading patterns around holidays are not able to explain the holiday effects.

Besides providing further evidence of the holiday effect of the stock markets in U.S., Kim and Park (1994) investigated the relationship between the holiday effects and firm size. In their study, they ranked the stocks on the NYSE and the AMEX into 10 portfolios based on the market value. They observed the daily mean returns on pre-holidays are higher than those on ordinary days for all size decile portfolios. Their result also showed that after controlling the day-of-the-week effect and pre-New-Year's-Day effect, size effects is not present in mean returns on pre-holidays.

In Pearce (1996) study, he also investigated the effect of the firm size on calendar anomalies. The result indicated that the evidence for calendar anomalies is much stronger in small firms. In general, small firms showed their returns are consistently lower after weekends and higher on the days preceding holidays. He also provided clear evidence that small firms have higher returns in January and during the end-of-the-month as compared to large firms.

For emerging stock markets, Lee (1988) examined the size effect of the Taiwan Stock Exchange for the period of 1967 to1987. He used monthly returns to estimate the systematic risk (betas) in a market model and found that there is no discernible difference on betas among five size portfolios. He concluded that large firm size stocks earned significantly higher abnormal return than small firm size stocks.

In Malaysian stock market, Clare, *et al.* (1998) used a random selection of 200 Malaysian stocks and divided them into ten size-sorted portfolios in order to test the existence of the seasonality in the returns of small firms. In general they observed that small firms have higher returns than large firms. In particular, small firms returns are twice as much as large firms on Wednesday and Friday.

1.3.5 Empirical Evidence On 'Good' News and 'Bad' News Market Environment

Many studies that were discussed in previous section about the market seasonalities failed to consider the market environment where the stocks were traded. In the stock trading market, if the price of the stocks increased on a particular day, this phenomenon can be interpreted as the consequence of a positive information flow. In contrast, if the price of stock decreased on a particular day, then the market can be interpreted as the consequence of negative information flow. Thus, in other words, the market can be identified as a good or bad news environment.

Not many studies have been done in considering this good and bad news market environment when they studied the market anomalies. However, Zainudin, *et al.* (1996) used the daily returns from Financial Times Industrial Ordinary Shares Index (FT 30) to study among good news, bad news and weekend effect. Their sample period covered about sixty years, from 1 July 1935 through 31 December 1994.

They subdivided the entire sample into two groups on the basis of positive and negative return days. The result indicates that there is more bad news present on Monday and the average returns are significantly lower than other days in a week. However, for the good news sample, the average Monday's returns are not significantly different to other days. A further result shows that Monday's return is not the lowest of the daily returns amongst the good news sample, rather the mean returns on Friday is the lowest. They concluded that there is more bad news arriving on Mondays compared to the other days of the week.

1.4 Objectives of Study

The objective of this study is to explore the existence of some calendar anomalies of 30 stocks which are component stocks of the Finance sector in the KLSE. In particular this study examines the behaviour of stock returns on the day-of-the-week, pre-holiday, end-of-the-month and for different firm size.

If there are significant results shown from this study about the existence of such calendar anomalies in the entire sample period, this study further investigates the behaviour of stock returns in sub-periods corresponding to the market performance, such as in the rising market, stable market and declining market.

In addition, this study also investigates whether the day of the week effects in the Finance stocks are due to seasonal variation in return volatility. The GARCH model is used in investigating the day-of-the-week effect on the daily mean returns. The purpose of using these two methods is to see if the results vary substantially across estimation methods.

1.5 Organization of Study

The study is organized through a brief introduction to the market efficient hypothesis, the market anomalies, the literature review and the research objective in Chapter 1. Subsequently, the description of data and methodology of various statistical tests used, both parametric and nonparametric, are presented in Chapter 2. Chapter 3 encompasses the findings of the analysis and results of this study. Finally, the conclusion and discussion of this study are presented in Chapter 4.