ASYMMETRIC AND CROSS-SECTIONAL EFFECTS OF INFLATION ON MALAYSIAN STOCK RETURNS UNDER VARYING MONETARY CONDITIONS

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Asymmetric and Cross-Sectional Effects of Inflation on Malaysian Stock Returns under Varying Monetary Conditions

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DECLARATION

I hereby declare that:

(1) This MKMA25106 Research Project is the end result of my own work and that due acknowledgement has been given in the references to all sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

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ABSTRACT

This study examines the relationship between inflation and Malaysian stock returns in the new perspective. The relationship is evaluated in the context of positive and negative changes in expected and unexpected inflation (asymmetric effect) , controls for the influence of firm size and value (firm cross sectional effects) , under different monetary policy (loosening and tightening) conditions.

Without controlling for risk premiums, we document a negative relationship between stock returns and inflation under the symmetric model. However, this relationship is positive and consistent with the Fisher hypothesis when they are examined in the context of a firm cross sectional effects.

When we further examine the asymmetric impact of inflation, we see that stock returns provide a virtuous asymmetrical hedge against expected and unexpected inflation, an observation that is lost by summing the inflation components.

We further study the relationship of inflation and stock returns under different monetary policy periods. Our results indicate that for the symmetric model; the changes in inflation (both expected and unexpected) are significantly positive correlated with stock returns only during monetary loosening period. However, there are no significant impacts of the effect of inflation (both expected and unexpected) on stock returns during monetary tightening period.

For the asymmetric model, our results indicate that under monetary loosening period, a virtuous asymmetric are observed for both expected and unexpected change of inflation. However, under monetary tightening period, virtuous asymmetric is observed for expected change of inflation; and perverse asymmetric is observed for unexpected change of inflation.

CHAPTER 1

INTRODUCTION

1.0 Introduction of Research Project

In this new global economy, stock market return has become a main issue in Malaysia's stock market (Majid, 2010). The importance of the stock market return definitely cannot be ignoring because it will represent a country's economic activity (Durham, 2005). Since performance of the stock market can reflect the overall performance of a country's economy, therefore it is very important to understand and analyse what are the factors and criteria that can affect performance of the stock market. The determinant used in this study is inflation.

Inflation generally has a negative impact on equities, but efforts to increase liquidity during times of crisis can help equities. For international investors, central banks that provide liquidity during times of crisis can help boost equities by promoting economic recovery. Besides, excess capital provided by bank to companies with cheap loans, can spur economic growth and drive higher earnings. But out-of-control inflation can result in troubles for the entire economy, including lower returns in equities for the investors. Therefore, it's important for investors to watch inflation rate and measure that against economist expectations.

The linkage between inflation and stock returns has been subjected to extensive research and has arouse the interests of academics, researchers, practitioners and policy makers globally (Khan, 2010). This is because it carries important implications for the role of monetary policy in influencing asset prices and asset's inflation-hedging ability. Thus, in this paper, this research aimed to examine the asymmetric and cross-sectional effects of inflation on Malaysian stock returns under varying monetary conditions.

In chapter 1, this research will briefly discuss the research background. The research background section will briefly discuss the background of Bursa Malaysia, FTSE Bursa Malaysia KLCI, and inflation of Malaysia. The problems that exist in literature will be discussed after the research background section. After that, the research objectives will be clearly defined. Then, research questions will be covered. Lastly, the significance of the study will be discussed.

1.1 Research Background

1.1.1 Background of Bursa Malaysia and the FTSE Bursa Malaysia KLCI

Bursa Malaysia, which represents Malaysian stock market, has gained the fast momentum of globalization. With a history stretching back about 50 years ago, Malaysian stock market is one of the biggest stock markets in Southeast Asia. Bursa Malaysia is a holding company that controls a number of exchanges in Malaysia since 1964. It plays an important role in growing the Malaysian stock market's global reach by providing competitive infrastructure and services through adoption of international standards which are globally relevant (FTSE Bursa Malaysia KLCI, 2011).

The Industrial Index, launched in 2 January 1970 was the first barometer of the Malaysian stock market. With the base year of 1970, it consists of 30 industrial stocks. However, the Industrial Index was no longer able to reflect the Malaysian stock market in the year of 1985. Therefore, the Kuala Lumpur Composite Index (KLCI) which was more reflect the stock market performance, indicate the changes of government policy, sensitive to investors expectation, and responsive to structural changes in the economy was introduced in 1986. The KLCI which launched as an open ended index was calculated three times a day with the trading volume criteria of 250 lots per annum with a total of 83 companies. The calculation frequency was improved to every 15 minutes in 1990. In year 1992, trading volume criteria was increased to 1,000 lots per annum. In order to accommodate the listing of stock index futures, the constituents numbers was increased and fixed at 100 and computation frequency had increased to every 60 seconds on 18 April 1995 (Bursa Malaysia, 2011).

On 6 July 2009, the KLCI became known as Financial Times Stock Exchange (FTSE) Bursa Malaysia KLCI, an effect on the adoption of the FTSE's global index standards in ensuring that it remains vigorous in the measurement of the national economy with increasing links to the global economy. The FTSE Bursa Malaysia KLCI was enhanced by adopting the internationally accepted index calculation methodology with the intention of providing a better transparently managed, tradable, and investable index. However, for existing users of the KLCI who prefer a broader coverage of companies, the FTSE Bursa Malaysia Top 100 Index and FTSE Bursa Malaysia EMAS Index was also available (FTSE Bursa Malaysia KLCI, 2011).

The introducing of FTSE Bursa Malaysia KLCI had changed the number of constituents from 100 to 30 largest firms by full market capitalisation on the Bursa Malaysia's Main Market so that it could be managed more easily and become more attractive for the creation of Index Linked products to promote the stock market liquidity. There are two major eligibility requirements to be fulfilled in order to be selected as a FTSE Bursa Malaysia KLCI constituent. Each firm is requested to have a minimum free float of 15% and a liquidity screen is to be applied to ensure that the firm's stocks are enough liquidity to be traded (Bursa Malaysia, 2011).

FTSE Bursa Malaysia KLCI was calculated by using the real time and closing prices sourced from Bursa Malaysia based on a value weighted formula and adjusted by a free float factor. In order to track the market pulse efficiently and closely, the frequency of index calculation had also changed from every 60 seconds to 15 seconds (FTSE Bursa Malaysia KLCI, 2011).

To preserve the continuity of the KLCI, the historical index values of KLCI was retained for the new FTSE Bursa Malaysia KLCI up to 3 July 2009. The closing value of the KLCI on 3 July 2009 was become the opening value of the FTSE Bursa Malaysia KLCI on 6 July 2009 (FTSE Bursa Malaysia KLCI, 2011).

With the collapse of Lehman Brothers in September 2008, the accompanying global liquidity squeeze also affected Malaysia. The KLCI dropped around 558.93

points in 2008 and this lead to a drop around a 40 percent in its value. However, the index has recovery and grown strongly around 1174 points over the period from May to July 2009 (Angabini & Wasiuzzaman, 2011). The KLCI currently had reached 1680 points at the end of December 2012 (Bursa Malaysia, 2013).

1.1.2 Background of Malaysia Inflation

Malaysian had enjoyed a stable and low inflation rates in the last two decades. In South East Asia, Malaysia's inflation rate are the least volatile and ranked the second lowest behind Singapore**.** During the year from 1999 to 2007, the average annual inflation rate (average consumer price change) of Malaysia was 2.1 percent. During the financial crisis of year 2008, Malaysia's experienced a volatile inflation. At that crisis period, inflation was surged to 5.4 percent in 2008 and dipped to 0.6 percent in 2009. However, inflation rates were successfully recovered to pre-financial crisis levels. Malaysia's experienced 1.7 percent inflation in year 2010, and was 2.0 percent in 2012. Malaysia is expecting to continue enjoy stable and low inflation rate, which range between 2.0 percent and 2.5 percent within 2013 to 2017 period (Economy Watch, 2013).

1.2 Problem Statement

The linkage between stock returns and inflation has inspired both theoretical and empirical studies. The foundation of the treatise is the Fisher (1930) equity stocks proclamation. The Fisher hypothesis postulates that nominal asset returns should move in tandem with inflation. In such a situation, the relationship between stocks returns and inflation should be positively correlated. Therefore, the firms share prices in nominal terms should fully reflect expected inflation.

However, the researchers found that Fisher hypothesis was not explain the results, and just mainly concerned with describing and documenting the nature of the relationship between stock returns and inflation (Fama, 1981). In order to solve this issue, a few alternative explanations have emerged. Feldstein (1980) had proposed the Tax-Effect Hypothesis. The researcher tries to explain that inflation

will produces artificial capital gains due to the valuation of inventories and depreciation (usually nominally fixed) subjected to taxation inflation.

Fama (1981) had proposed the Proxy Hypothesis. The researcher try to hypothesize that the abnormal linkage found between real stock returns and inflation in the United States is results from the two factors: negative correlation between inflation and real activity, and the positive correlation between stock returns and real activity. Therefore, if a given monetary expansion leads to negative shocks in real activity, a decline in stock price can be coincident with an increase in inflation.

Geske and Roll (1983) had elaborating on Fama's work, and had proposed the Reverse Causality Hypothesis. The researcher try to hypothesize that because of the fiscal and monetary linkage, stock returns and inflation are negatively related. They argue that countercyclical monetary policy plays a huge role in order to explain the negative linkage between stock returns and inflation. Therefore, they try to explain that a higher inflation leads to expectations of tighter monetary policy, and this will lowers stock market returns.

It noted that an application of the Fisher hypothesis to share markets only implies a linkage between the two variables: stocks returns and inflation. Therefore, some researchers had expand the study scopes and try to analyzing the dynamic interactions between inflation, stock returns, monetary policy, and real activity. However, the results are mixed. Laopodis (2006) reveals there is a sign inconsistent dynamic relationship among inflation, stock returns and monetary policy. Park and Ratti (2000) indicates the evidence which is consistent with the Reverse Causality Hypothesis that countercyclical monetary policy shocks had produced a negative correlation between stock returns and inflation. Lee (1992) provides partial support for the Proxy Hypothesis by finding out that stock returns account for economic activity only but not inflation, and furthermore, inflation fails to explain variations in real economy activities.

Several empirical studies re-examine this issue by analyzing the reaction of share markets to inflation in different economic states. The results indicate that the

reactions of share markets to inflation are subjected to the economic state. Knif, Kolari, and Pynnonen (2008) reveals that share markets returns react negatively to positive inflation shocks, during periods of rising and normal economic activity. Hess and Lee (1999) found out negative inflation shocks tend to be good news for the share market only during an economic slowdown. McQueen and Roley (1993) found that stock markets only respond negatively to inflation shocks in the medium economic states; however, not in the low and high economic states.

Marc and Sanjay (2012) examine the relationship between returns on portfolios, comprised of stocks of various size and book values, and changes in inflation. The relationship is evaluated in the context of positive and negative changes with the expected and unexpected inflation. Besides that, the relationship is also investigated under expansionary and contractionary monetary policy conditions. They concludes that the nature of this asymmetric relationship is complex and contingent on several factors including the state of the monetary policy, whether one is examining expected or unexpected inflation shocks, and the size and book values of the stocks. In general, a positive shock to expected and unexpected inflation produce a favourable result on stock returns during monetary expansion, but not during monetary tightening.

From the literature review, it concludes that empirical statement of the relationship between stock returns and inflation are mixed, and subjected to various other influencing factors. Unfortunately, almost all of the empirical researches only use the United States and developed countries data in the analysis. We found out lack of research are conducting by using emerging countries data. Due to inflation is also considered a main concern in many emerging countries such as Malaysia, therefore additional detailed researches for this specific research area is welcome. In this paper, we makes an attempt to find out whether linkages exist between inflation and Malaysian stock returns by explicitly allowing stock returns to respond asymmetrically to positive versus negative changes towards the inflation under different monetary policy conditions. Besides, it also examines the effect of the expected and unexpected changes in inflation to the Malaysian stock returns. Finally, this research controls for the influence of firm size and value in evaluating the linkage between inflation and Malaysian stock returns.

1.3 Research Objectives

Our study aims to address the following objectives:

i) **To evaluates the impact of the both expected and unexpected changes in inflation to the Malaysian stock returns**.

The distinction between the two components of inflation is critical in understanding the behaviour of market participants. Under conditions of market efficiency, one would expect that market prices incorporate all relevant information. It is necessary, therefore, to examine how market participants revalue securities in light of new information; as occurs when the unexpected component in the change in inflation is revealed. Specifically, this study use a survey-based technique to split inflation series into expected and unexpected changes in inflation, and relationship between inflation and stock returns is examined under pooled estimation framework.

ii) To examine the firm cross sectional effects towards the relationship between Malaysian stock returns and inflation.

By examining firms with varying value and size, the results would determine if there is an added cross-sectional dimension to the relationship between stock returns and inflation.

iii) To investigate the asymmetric effects of inflation (under context of positive and negative changes) on Malaysian stock returns.

Majority of previous studies implicitly assume that increases and decreases in inflation have a symmetric effect on nominal stock returns. So consequently, these two types of changes are expected to bring the same responses from stock market. While it seems reasonable, there is some related evidence in the capital market literature that suggests that this assumption is not necessarily valid.

Specifically, stock returns have been documented to adjust asymmetrically to interest rate movements (Domian, Gilster, & Louton, 1996), announcements of changes in the federal funds target rate (Lobo, 2000), good versus bad macroeconomic news (Boyd, Hu, & Jaganathan , 2005) and expansionary versus contractionary monetary policy environments (Jensen, Mercer, & Johnson, 1996;

Madura and Schnusenberg, 2000). Relevant to this study, the weak or insignificant relationship between stock returns and inflation that were reported by earlier studies may be misleading since they do not control for asymmetry in the impact of inflation on stock returns.

iv) To study the influence of the different monetary policy conditions towards the relationship between Malaysian stock returns and inflation.

The symmetric and asymmetric stocks market behaviour is investigated under the framework that allows for the interpretation of results under different monetary policy conditions. The response of stock returns to inflationary news could be contingent on monetary policy conditions. This study differentiates the market environments based on the Bank Negara's broad monetary policy stance.

The monetary policy condition is a more readily available tool for investors to measure economic environment, and its influential role in capital markets has been widely documented (Bernanke and Kuttner, 2005; Durham, 2005). For instance, given the countercyclical nature of the Bank Negara's monetary policy, let us consider a situation where the Bank Negara responds to a slowing economy by pursuing monetary expansion. In this environment, investors are likely to consider positive (negative) inflation shocks as 'good' ('bad') news and therefore react favourably (unfavourably). In a similar fashion, equity investors are likely to view negative (positive) inflation shocks during monetary tightening as 'good' ('bad') news for the stock market. The exact nature and magnitude of their response, however, is an empirical question.

1.4 Research Questions

In order to reach the research objectives, some answers are required for the following:

i) Is there any impact of both expected and unexpected changes in inflation towards Malaysian stock returns?

ii) Does the firm cross sectional effects capture the impacts to the relationship between Malaysian stock returns and inflation?

iii) Is that inflation has a asymmetric effects (in the context of positive and negative changes) on Malaysian stock returns?

iv) Is that different monetary policy conditions can influence the relationship between Malaysian stock returns and inflation?

1.5 Significance of the Study

The present study contributes to the evolving debate in the literature in several important ways. This study allows inflation to have asymmetrical effects on stock prices. Therefore, the results of the study carry important implications for portfolio management. From an investor's perspective, the asymmetric response of stock returns could be either virtuous (i.e. helpful to the investor's long positions in stocks) or perverse (i.e. detrimental to the investor's long positions in stocks). Asymmetry in stock return responses would be regarded as virtuous if stock returns tended to rise with inflation (consistent with Fisher hypothesis), but then either continues to rise or at least does not fall correspondingly when inflation declines, ceteris paribus. This would be the case if changes in stock returns are directly related with positive shocks to inflation, but the relationship between changes in stock returns and negative changes in inflation are either insignificant or negative. On the other hand, perverse asymmetry would exist if stock returns fell when inflation was rising, and either continues to fall or had no relationship with declining inflation, ceteris paribus. This would be the case if changes in stock returns and positive inflation shocks are inversely related, but relationship between changes in stock returns and negative changes in inflation are either positive or insignificant.

Besides, this study controls for the influence of firm size and value of equity in estimating the relationship between stock returns and inflation. This approach is different with the prior studies which examine this issue using portfolios or indices that are more heavily weighted towards large cap stocks. Therefore, results from examining firms with varying value and size would determine if there is an

added cross-sectional dimension to the relationship between stock returns and inflation.

Standing from policy maker in Malaysia, this study can be a useful tool for them to implement an appropriate policy. It can help the policy maker to make a correct decision in helping the stock market. Besides, it also helps to predetermine and stabilize and avoid volatility in stock return.

Finally, this research will give the guidelines to the future researchers in examining the relationship between inflation and stock return in Malaysian stock market with the useful research methods and data. Besides, it also will serve as a foundation for future research.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

The literature review includes three sections. The first section studies relevant theoretical models of the stock return, inflation, and the relationship between stock returns and inflation. The second section covers the review of previous literature for the relationship between stock returns and inflation from the international and Malaysia context. The last section concludes the literature review.

2.1 Review of Relevant Theoretical Models

2.1.1 Stock Return

A total of five models had been reviewed for the stock returns. There are Efficient Market Hypothesis, Random Walk Hypothesis, Modern Portfolio Model, Capital Asset Pricing Model, and Fama& French Three Factor Model.

2.1.1.1 Efficient Market Hypothesis

Efficient Market Hypothesis (EMH) is an important financial investment ideology, which become famous in the late 1960's. Before that, there was a common perception that the stock markets were inefficient. The major point of this hypothesis mentioned that it is impossible for any investors to gain the profit above average return by trading in the share market. None of the investor is able

to perform better than the share market because all the new information is already reflected in the existing share prices (Khan, 2010). Fama (1970) defined EMH into three types:

a) Weak form of EMH states that existing share prices already reflect all historical information. Therefore, investors are unable to make use the past data for forecasting future share prices and gaining abnormal returns.

b) Semi-Strong form of EMH mentioned that the existing share price had absorbs historical information, and also the publicly available information. Therefore, investors are unable to make use the new information data to gain abnormal returns in the stock market.

c) Strong form of EMH mentioned that existing share prices is already reflect all the available information whether it is public or private. Therefore, none of the investor is able to gain abnormal return by using insider's or private information.

The main hypothesis for EMH is none of the investor can gain abnormal return due to stock prices rapidly and accurately reflect all available information. However, in this case, the critical factor is the time for the adjustment for any new information; the market is considered more efficient if it adjusts more quickly and accurately.

Fama and French (1989) mentioned that a stock market is considered efficient if:

a) the stock prices traded in the stock market is able to fully reflect all available information.
b) the stock prices had react in unbiased fashion and instantaneously to new information.

By contrast, the alternative hypothesis is that stock market is inefficient and that stock price is not accurately reflecting the new information.

2.1.1.2 Random Walk Hypothesis

Random Walk Hypothesis is consistent with the Efficient Market Hypothesis.According to the Random Walk Hypothesis investment theory; the investors are not able to predict the stock market prices. This is because the stock market prices will evolve according to a random walk pattern. Investors will not able to use the past direction or movement of the stock prices to predict its future movement. The fluctuations of the stocks price are independent within each other and have the equal probability distribution. However, the stock's price will remain an upward trend over a period of time. To summarize up, Random Walk Hypothesis mentioned that stocks will experienced an unpredictable and random path. There are same chances for the stock's future price to experience an upward trend as compared with downward trend (Fama, 1965).

A supporter of Random Walk Hypothesis believes that without assuming additional risk, it is very impossible to outperform the stock market. Burton Malkiel, whom had wrote *A Random Walk Down Wall Street* in 1973, mentioned that both fundamental analysis and technical analysis are basically are wasting time and still cannot proven in outperforming the markets. Malkiel highlighted that the financial investors should not try to predict the stocks market, and the best investment strategy is a long-term buy-and-hold strategy. In order to back his hypothesis, Malkiel present the statistics reveal that most of the mutual funds in the US fail to outperform the benchmark averages like the S&P 500 (Chaudhuri & Wu, 2003).

However, there are some researchers found that the Random Walk Hypothesis is strongly rejected for a variety of size-sorted portfolios and aggregate indexes, for the whole period and for all sub period. According to their empirical research, even though the rejections are mainly due to the behavior of small stocks, but still they cannot be completely belong to the effects of time-varying volatilities or infrequent trading (Lo & MacKinlay, 1999).

2.1.1.3 Modern Portfolio Model

Harry Markowitz is the developer for Modern Portfolio Model (MPT) since 1952. 50 years later, this theory is widely used based on the same principles due to armed with the investor's concepts and tools and also influenced by the financially sophisticated. It is most applicable to portfolio management. MPT give a detailed structure to build and choose the portfolios based on the performance of the investment the investor expected and the level of the risk investors expected (Fabozzi, Gupta & Markowitz, 2002).

Basically, this model assumes that the investors are risk averse and only two things they will care more which are mean and variance of their return of investment when they are selecting among portfolios (Fama & French, 2003). Because of this, MPT introduced a new terminology that based on the mean-variance analysis which has become the standard practice in the field of financial investment management. Markowitz has developed the basic ideology of mean variance portfolio, which are holding constant variance, holding constant expected return minimize variance , and maximize expected return. The main point of this ideology is that the security could not be chosen just based on characteristic which were unique to that security. Instead, investors need to be aware of how each security co-moved with another (Elton & Gruber, 1997).

2.1.1.4 Capital Asset Pricing Model (CAPM)

Capital Asset Pricing Model is come out after the Modern Portfolio Model. It was the first asset pricing theory, developed by William Sharpe (1964) and John Lintner (1965). Sharpe had been awarded Nobel Prize in 1990 for his contribution on this ideology. CAPM attempts to describe the relationship between the investment risk and the investment expected return in order to decide a suitable price for the investment. CAPM highlighted that money has two values. There are the time value and the risk value. Thus, the investor should be compensated for the any risky investment, due to both of their time and money is tied up in the

risky investment. This compensation, which is the required return on asset, must be in addition to the risk-free rate of return (Fama & French, 2003).

The CAPM is computed according to the following formula:

$E(R_i) = R_f + \beta_i [E(R_m) - R_f]$

Where:

$E(R_i)$ = return required on asset i

R_f = risk-free rate of return

β_i = beta value for asset i

$E(R_m)$ = average return on the stock market

2.1.1.5 Fama - French Three-Factor Model (FF)

FF has come out as an alternative ideology for the ongoing argument on asset pricing. As compared with the traditional asset pricing model - Capital Asset Pricing Model which uses only one variable, beta, to define the returns of a portfolio/ stock with the returns of the market as a whole. In contrast, FF uses the three variables to describe the returns of a portfolio/ stock.

FF found out two types of stocks has a better performance as compared with the overall stock market performance. These two types of stocks are the small market capitalization stocks and high book-to-market ratios stocks. The book-to-market ratio is equal to the book value of a stock's divide with that market value of a stock's. Value stocks are the high book-to-market ratio stocks. Growth stocks are the low book-to-market stocks. Because those small capitalization stocks and value stocks gain a better return performance than the overall stock market, FF hypothesized that there are additional two variables to explain the returns of a portfolio/stock, which are size premium and value premium, besides the market risk premium as described by the traditional asset pricing model – CAPM (Fama & French, 1992).

In order to develop for these two premiums, FF had built another two risk factors beside the market risk. FF used *SMB* (small minus big) to define the size risk, and used *HML* (high minus low) to define for the value risk. The size premium calculates the additional returns received by the investors for participating in small

market capitalization stocks. The positive *SMB* factor showed more returns for small market capitalization stocks as compared with the big market capitalization stocks and vice versa. The value factor represents an additional return rewarded to the investors for invest in the value stocks. The positive *HML* factor represents investors receive more returns for value stocks as compared with growth stocks (Fama & French, 1992).

The FF model is computed according to the following formula:
$E(R_{it}) - R_{ft} = \beta_{i,1}[E(R_{mt}) - R_{ft}] + \beta_{i,2}[SMB_t] + \beta_{i,3}[HML_t]$
Where:

$E(R_{it})$ = expected rate of return of asset i

R_{ft} = risk-free rate of return

$E(R_{mt})$ = average return on the stock market

$[E(R_{mt}) - R_{ft}]$ = market premium,

SMB_t = size premium

HML_t = value premium.

The β describe the sensitivities of the risk: $\beta_{i,1}$ = market risk, $\beta_{i,2}$ = size, and $\beta_{i,3}$ = value.

2.1.2 Inflation

Inflation is defined as an increase in the general price level of goods and services in economy activities over a period of time. Each currency unit will only be able to buy lesser goods and services when the general level of price increases. As a result, inflation will also erode the purchasing power of money. Inflation rate is the main measurement of the price inflation, which is the general price index (normally represented by Consumer Price Index, CPI) percentage change over a period of time (Thomas, 1981).

The cause of inflation had been debated by the researchers over period of time. Currently there are two main ideology hypothesize to the causes of inflation: Keynesian View and Monetarism View. Keynesian View emphasizes on the pressures of the supply and demand in the economy, and affected by the relative

interest rates, prices, and elasticity of wages. Monetarism View emphasizes on growth rate of money supply (Thomas, 1981).

2.1.2.1 Keynesian View

Keynesian view proposes inflation is the result of the pressures in the economy expressing themselves in prices. In contrast, the changes in money supply do not directly affect prices.

There are three main types of inflation under the Keynesian view (Thomas, 1981):

- *Demand-pull inflation* mentioned that when aggregate demand is increased beyond its ability to produce, the inflation rates will surge up. Therefore, inflation will be created by the any factor that will increases aggregate demand.

  There are several reasons that could increase the aggregate demand. For example: The reduction of income tax by the government will increase the tax payers' disposable income and consequently will increase the consumer expenditure of the tax payers. A loosening monetary policy (by cutting the interest rate) implemented by Bank Negara will encourage the investor to increase the investment in the country, and also will bring a more consumer spending on the consumer durables. The country exports activities might increase if the income of the foreigners' is increased. The inflation also might caused by the government aggressively budget spending activities.

- *Cost-push inflation*, also defined as "supply shock inflation," is happened due to decrease in the aggregate supply (potential output). This phenomenon (drop of aggregate supply) may be caused by increasing of the input prices, or natural disasters. For example, cost-push inflation may caused by a sudden drop in the oil supplying activities, which will lead to the increased oil prices. Also, for the manufacturers whom oil is a part of their manufacturing costs, they can pass this on to end users by increase the finish goods prices.

- *Built-in inflation* is often caused by the "wage/price circle ". In this scenario, inflation is happened when the workers is trying to keep their salaries up with prices (above the inflation rate), and the company is transferring those higher labour costs to their customers by increasing the selling prices of the products.

2.1.2.2 Monetarism View

Monetarism is a macroeconomic ideology that totally contrasts with Keynesian microeconomic ideology. Monetarism approach is developed by Milton Friedman (a Nobel Prize winning economist once supported the Keynesian approach, but after that reject it). It is named as “Monetarism” because of it emphasizes on the role of money in the economy. Monetarists consider the extent of the money supply (by using the M2 definition) grows or shrinks is a vital factor influence the inflation or deflation. By the way, monetarists consider the government budget spending policy, central bank fiscal policy (tightening/ loosening monetary policy), or country taxation policy is an ineffective way to control the inflation. Therefore, the central bank should play a role to expand or limit the money supply in the economy. The inflation rates will increases rapidly if central bank decides to expand the money supply quickly. Consequently, the goods will be sold at the more expensive price to the consumers, and this will puts tremendous pressure on the current economy, ending with the depression or recession (Thomas, 1982).

This is totally different from the Keynesian approach, which emphasizes the government duty in playing the economy through expenditures, rather than on the role of monetary policy. Monetarists view that the best thing to manage the economy is pay attention to the supply of money, and subsequently just let the market free to react itself (without interrupt it). This will result that markets are more efficient to handle with the inflation and unemployment issues.

Basically, monetarism has several key points (Thomas, 1982):

- The main key to overcome the inflation issues is the control of the money supply.

- Market forces are the most efficient way to make an immediate effect on the economy as compared with the government fiscal policy adjustment.
- The forward interest rates will be influenced by the market expectations regarding inflation.
- A natural unemployment rate is exists. A government interruption to try to lower down the unemployment rate below that natural rate causes inflation.

2.1.3 Relationship between Stock Returns and Inflation

Irving Fisher is the first researcher which hypothesizes the relationship between stock returns and inflation. Fisher (1930) stresses that the real assets, for example the stocks, should act as a hedge against inflation. Since there, the extensive study had been conducted by other researchers to study the stock return-inflation relationship. By the way, during the post-World War II period, Fisher's hypothesis had been contradicted by other researches, which found out the negative correlation between stock returns and several of expected and unexpected inflation measurement.

A few of alternative hypotheses have been developed by the researchers to order to define the correlation between stock returns and inflation includes:
1) Tax-Effect Hypothesis (Feldstein, 1980)
2) Proxy Hypothesis (Fama, 1981)
3) Reverse Causality Hypothesis (Geske & Roll, 1983)

2.1.3.1 Fisher Hypothesis

Fisher (1930) stated that in order to achieve the equilibrium real interest rate, the expected/future nominal interest rate should fully anticipate the movements in expected inflation. The Fisher hypothesis can further applied to any others returns of real assets. For example: common stocks, real estate, and other risky securities. Therefore, by applying the Fisher hypothesis, those real assets returns will make a move accordingly with expected inflation rates.

The common stocks, which act as claims against the real assets, should act as a hedge against inflation. Therefore, when the expected inflation is declared, the investors would sell stocks in exchange for real assets. The relationship between stock returns and expected inflation should correlate positively, and subsequently the nominal stock market returns should fully reflect expected inflation. In short, the real value of the common stocks is immune to the pressure of the inflation.

2.1.3.2 Tax-Effects Hypothesis

The Tax-Effect Hypothesis proposed by Feldstein (1980) highlighted that the negative valuation's effect of the inflation's is due to the characteristic of the current US tax laws, especially the taxation of nominal capital gains and the historic cost depreciation. Subsequently, this will increase the tax liabilities of the corporate and then the corporate real after-tax earnings will be reduced. In this case, inflation will correlate negatively with the stock returns, and investors would consider the effect of inflation by reduce the value of the common stock.

However, the Tax-Effect Hypothesis had some limitation. Feldstein which propose this hypothesis just focus the research on the United States tax law. Besides, other researchers had found the evidence of negative correlation between stock returns and inflation in other countries with different tax laws, for example: Brazil and Argentina, in which depreciation and inventories adjusted value are included for tax purposes (Akaike, 1974).

2.1.3.3 Proxy Hypothesis (money demand shocks)

In order to define the correlation between inflation and stock returns in the United States, Fama (1981) had proposed the Proxy Hypothesis. According to this hypothesis, the negative relationship between stock returns and inflation is due to:

- Positive correlation between stock returns and real activity, and;
- Negative correlation between inflation and real activity

Therefore, according to the Proxy Hypothesis, the debate is based on the behaviour of money demand that sense a decrease in economic activity and

therefore a fall in the demand of money (which implied by the investor undesirable to hold increasingly worthless money). Subsequently, this will cause an excess money stock and resulting inflation. In another word, the increase of inflation rate will reduce the real activity and demand for money.

2.1.3.4 Reverse Causality Hypothesis (money supply shocks)

Geske and Roll (1983) hypothesized that money supply behaviour can help to define the relationship between stock returns and inflation (besides "money demand" ideology proposed by Fama). According to their hypothesis - Reverse Causality Hypothesis, stock returns and inflation are correlated negatively due to monetary and fiscal linkage. They suggest that reaction of the stock price in anticipation of future economic activity (Fama's ideology) is highly linked to government revenue. So when the economic output decreases, the government will face a deficit financial situation. In order to balance the budget, the government will either issues or borrows money through the central bank, thus resulting inflation.

2.2 Review of the Literature

This section explores the previous literature related to the relationship between stock returns and inflation in the international and Malaysia context.The review of literature will be discussed which is based on previous researchers. Besides, a clear indication will be given on what had found in the result from all journals and articles that had been reviewed. The review of the literature will be organised and presented according to the year the journals and articles had been published.

2.2.1 International Context

Adrangi, Chatrath, and Raffiee (1999) had test the Proxy Hypothesis in the two emerging countries, Mexico and Korea. The industrial production index is act as a proxy for the real economic activity in the both market. Their findings support the negative correlation between stock returns and inflation for the Korea market only. By the way, their research (under the framework of Johansen and Juselius

cointegration tests) shows some evidence of long-run equilibrium relationship between equity prices, inflation, and real economy activity, which is consistent with Proxy Hypothesis.

Omran and Pointon (2001) had intent to investigate the effect of the inflation rate on the Egyptian stock market performance from the period 1980 to 1998. Instead of the traditional approach by using stock returns and prices as a proxy for the stock market performance, they use market activity and liquidity to measure the performance of the stock market. The results indicated that there is a negative relationship between inflation and market performance in terms of market activity and market liquidity. From the cointegration analysis through error correction mechanisms (ECM), they found a significant long-run and short-run relationship between the variables, revealing that the inflation rate generally has had an impact upon the Egyptian stock market performance.

Sharpe (2001) investigates the impact of inflation on stock valuations and expected long-run stock returns. The study reveals a negative relation between stock valuations and expected inflation. Besides, the researcher also noticed a substantial effect of inflation to the expected long-run stock returns. A one percentage point increase in expected inflation is estimated to rise required real stock returns about one percentage point, which on average would imply a 20 percent decline in stock prices.

Geyser and Lowies (2001) try to investigate whether the top performing firms that are listed on the Namibian Stock Exchange (Namibia) and Johannesburg Securities Exchange (South Africa) can provide a sound hedge against inflation. They use simple regression analysis to conduct this study. The results are consistent with Fisher hypothesis. All of the Namibia selected firms demonstrates that there is a strong positive relationship between equity price and inflation. For South Africa firms, only mining sector firms provide a negative relationship with inflation, while firms in other sectors correlated slightly positive between equity price and inflation.

Rapach (2002) use latest developments in the testing of long-run neutrality propositions to examine the long-run response of real equity prices to a permanent inflation shock for 16 individual developed countries. Their research result demonstrates a considerable support for long-run inflation neutrality with respect to real equity prices. The study also shows the evidence of the positive correlation between long-run real equity price responses to a permanent inflation shock in a number of developed countries. There is little evidence for a negative correlation between long-run real equity price responses to a permanent inflation shock. Their results indicate that inflation does not erode the long-run real value of equity, and consistent with Fisher Hypothesis.

Ioannides, Katrakilidis and Lake (2002) had investigated the relationship between stock returns and inflation in Greece. They use the monthly data from year 1985 to 2000. The study uses ARDL cointegration and Granger causality tests to detect possible effects of short-run and long-run between the variables involved and the direction of these effects. The results had shown a favourable bidirectional negative long-run causal relationship which is consistent with Proxy Hypothesis. Besides, the research shown a empirical evidence of short run causal effects running from stock returns to inflation between period of 1985 and 1992, while for the period 1993 to 2000 the direction is from inflation towards stock returns.

Merikas (2002) had re-investigate the Proxy Hypothesis proposed by Fama (1981), which state the negative relationship between stock returns and inflation is due to negative correlation between inflation and real economic activity, and positive correlation between stock returns and real economic activity. The study had used annual data of the German economy from year 1960 to 2000, to test the hypothesis of the negative impact of real economic activity on stock returns.
The real economic activities are measured in five macroeconomic variables which are employment growth, fixed capital formation, retail sales, GDP growth, and industrial production. All of the variables were tested by the Augmented Dickey-Fuller and the Phillips- Perron method.

The results suggest that employment growth has a negative correlation with stock returns and positive correlation with inflation, which is contrast with the Proxy

Hypothesis. The author claims that employment growth has a large influence on aggregate demand due to newly employed workers have a high marginal propensity to consume, and subsequently induced the inflation. The government policy makers will react to the high inflation news, by launching a counter cyclical macroeconomic policy. Thus the stock market will correlated negatively to a high rate of employment growth activity if the expected effect of a contractionary policy was greater than the expected output gain (Merikas, 2002).

Boucher (2004) had study the relationship between inflation and stock prices on the new perspective, by estimating the common long-term trend in real equity prices (which represented in the earning-price ratio), and both expected and unexpected inflation. They investigate the role of the transitory deviations from the common trend in the earning-price ratio and inflation for predicting stock market movement. The author use quarterly data of Standard & Poor's (S&P) nominal stock prices, earnings indexes, and dividends from 1951:4 to 2004:1. In particular, they found that the trend deviations from the equity trend in the earning-price ratio and inflation exhibit substantial in-sample and out-of-sample forecasting abilities for both excess returns and real stock returns. Besides, they found that these trend deviations provide information about future equity returns at short and intermediate horizons (from 1 to 12 quarters) which is not captured by other popular forecasting variables.

Floros (2004) examines the relationship between stock returns and inflation rate in Greece. The researcher uses monthly data of the Greece CPI and Athens Stock Exchange Price Index over the period 1988-2002. Various econometric methods had been used in the research, which include: the traditional regression model (OLS), the Johansen method and Granger-Causality tests. The simple OLS model demonstrates an evidence of a positive but not significant relationship. However, after considering a system of equations including lagged values of inflation, the author found a negative but not significant effect of lagged inflation to stock returns. When using the Johansen cointegration approach, the result shows that there is no cointegration between stock returns and inflation in Greece. Therefore there is no long-run relationship between those two variables. The Granger-Causality tests demonstrate that there is no evidence of causality for both variables.

So there is no correlation between the current value and the past values. Consequently, the stock returns and inflation are identified as independent factors in Greece.

Madsen (2004) had applying the Fisher Hypothesis to study the correlation between inflation and stock returns for the OECD countries. Numerous research papers had contradict the Fisher hypothesis, and Madsen claim that theoretically and empirically that standard method of testing the Fisher hypothesis can provide biased results and that the misleading depending on the Fisher equation specification, the process governing inflation, time aggregation of the data, and measurement of inflation expectations. The author suggests that, given the inflationary environment, the suitable combination of model specification, time aggregation, and instruments, will yield any results an author desires.

Laopodis (2006) study the dynamic interactions among the stock market, inflation, real economic activity, and monetary policy under three sub-periods of monetary policy using bivariate and multivariate vector autoregressive cointegrating specifications. They use the monthly data for the period 1970–2004, and divide the sample data into three sub-periods (1970s, 1980s, and 1990s) to detect potential changes in the dynamic linkages between the variables over the period of time. With bivariate results, they detect weakly supports for the negative correlation between stock returns and inflation for the 1970s and 1980s, in contrast to the Fisher Hypothesis. The bivariate and multivariate results also show a negative correlation between stock returns and the federal funds in the 1970s and 1980s but a unidirectional one in the 1990s. There appears to be no consistent dynamic relationship between stock market and monetary policy, since the nature dynamics differ so much across monetary regimes. This is contrary with the Proxy Hypothesis, which stated that real activity and stock returns were positively correlated, and inflation and real activity were negatively correlated.

Jorgensen and Terra (2006) had study the causality relationship among inflation, stock returns, real economic activity, and interest rates in the context of seven Latin American developing countries and seven industrial countries, by using a VAR approach. The result demonstrates that equity unable to acts as an inflation

hedge effectively as hypothesised by the Fisher Hypothesis. Besides, the finding reveals that the differences between industrial and developing countries are not as sharp as one might initially presume, with slightly more support to the Reverse Causality Hypothesis. The authors suggest that existing Fisher Hypothesis theory is not able to fully explain the phenomenon, and further theoretical investigation is necessary.

Hafiz, Param and Imad (2007) had study the nature of the asymmetric for the relationship between stock returns and inflation in the G7 countries by applying two-stage regime switching consistent threshold autoregressive (TAR) and momentum threshold autoregressive (M-TAR) models. The sample data (by quarterly) covers the period from 1957:1 to 2000:1. The researchers noticed that evidence for cointegration was found when a consistent M-TAR model was used. Besides, the results demonstrate that inflation will only erode stock returns in all G7 countries when inflation rises; and there is no effect on stock returns when inflation drops. This finding is contrary with the proposition of the inflation neutrality with respect to stock returns. Besides, the error correction model provides evidence for negative short run correlation between inflation and stock returns only in the U.S., and the evidence was not found in other G7 countries.

Kolluri and Wahab (2008) had study the relationship between stock returns (in the nominal and real context) and inflation (in the expected, unexpected, and changes in expected inflation context). In order to differentiate the response of the stock return during low and high inflation period, the authors use an asymmetric test specification to conduct the study. In order to get the robustness results, the authors use two well-established inflation forecast models (instead of one) to generate expected inflation estimated used in the study, which are Fama's (1981) money demand inflation model and Geske/Roll's (1983) reverse causality inflation model. The two inflation forecast models are estimated in the two contexts: the first is "in-sample" to produce ex-post inflation forecasts, and the second is "out-of-sample" to produce one-step-ahead ex-ante inflation forecasts. The authors had monitoring the response of stock return on the differences between ex-ante (or ex-post) inflation forecasts and the unconditional long-run mean of actual inflation rates. The authors had divided a 44 years monthly data

into two inflationary periods: the first is the high inflation period which defined as the periods when inflation forecasts (ex-ante or ex-post) equal or exceed the historical (unconditional) mean inflation rate; the second is the low inflation period which defined as the periods when (ex-ante or ex-post) inflation forecasts fall below the unconditional mean inflation rate. The authors found a negative correlation between stock returns and inflation during low inflation periods; and a positive correlation during high inflation periods.

Wei (2009) had conducted a study to investigate the relationship of the United States stock market returns of Fama-French Size (market value) Portfolio and Value Portfolio (book value / market value), with the unexpected inflation under different business cycle. The author uses the time-series model to regress the expected and unexpected components of inflation. The business cycles are defined under contractions and expansions, and are determined by United States National Bureau of Economic Research (NBER) business cycle date. The sample period covers from February 1963 to December 2007. There are 66 months of contraction and 461 months of expansion during the sample period. In order to examine the cross sectional effect of the firm stock returns, the author had construct four factors, based on the three Fama-French factors and the momentum factor, namely excess market return, factor, small minus big factor, high minus low factor, and momentum factor.

The author found out four main finding in this research. The first finding is the nominal stock returns respond to the unexpected inflation more negatively during contractions than expansions. Secondly, the firm stock returns with lower Value Portfolio, and medium Size Portfolio react more negatively with unexpected inflation. These two types of portfolio also demonstrate strong asymmetric relationship with the unexpected inflation under the different business cycle. Thirdly, after examine the cross sectional effect of the firm stock returns, the author found that the cross sectional correlations of returns on Size Portfolio and Value Portfolio, with the unexpected inflation reflect mostly the heterogeneous factor loading on only excess market return factor (excess market return factor is the only factor reacts to the changes in expected and unexpected inflation). Fourthly, after examine the cyclical responses to unexpected inflation of the three

main forces which decide the stock prices: the stock risk premium, the discount rate, and the expected growth rate of real activity. The author found that changes in stock risk premium and expected growth rate of real activity, signalled by unexpected inflation, are important in defining the asymmetric reactions of the stock market to unexpected inflation under the different business cycle (Wei, 2009).

Marwan and Adel (2010) had examined the relationship of the stock returns and inflation for four Arab countries: Jordan, Saudi Arabia, Morocco, and Kuwait, by using cointegration methods. In order to perform the study, the researcher had used the generalized forecast error variance decomposition components and the generalized impulse response functions computed from estimated unrestricted vector autoregressive (UVAR) models. Their result support the long term Fisher Hypothesis as stock portfolio provide a good hedge against inflation over the long run in four Arabic equity markets. The long-run Fisher elasticities of stock prices with respect to goods prices are in the range of 1.01 to 1.36 across the four countries under study. In the case of Saudi Arabia, Morocco, and Jordan, the empirical results support the Fisher hypothesis, with estimated coefficients near unity.

Choudhry and Pimentel (2010) had conducted a research to study the relationship between stock returns and inflation of Brazil, by using monthly data from ten Brazilian companies and the Brazilian stock market. The companies selected are mostly in manufacturing sectors and vary in size from small to relatively large. The study covers for the period 1986-2008, which includes an unstable high inflation period (1986-1994) and a stable low inflation period (1994-2008). The authors use Standard linear regressions to predict the relationship. Their studies demonstrate a significant negative relationship between inflation and stock returns during the total period and high inflation period. However, no significant relationship is found during the low inflation period. Therefore, stock returns do act as a hedge against high inflation but fail to act against low inflation. The authors conclude that a negative relationship is possible between the expected real rate of returns with the expected and the unexpected rate of inflation.

Adam and Siaw (2010) had re-examined the Fisher Hypothesis on the Ghana stock market. By using cointegration analysis, they test the long run relationship between equity returns and inflation. They use the data from January 1991 to December 2007 for this study. They found that the results give strong support to the Fisher Hypothesis. The result reveals that Ghana equity market provides full hedge against inflation. The investors are compensated in high equity returns when inflation rises.

Aliyu (2011) had study the effect of inflation on stock returns on the Ghana and Nigeria stock market, by using the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model. Besides, the author also using the quadratic GARCH model to access the effect of asymmetric shocks. The finding show the evidence of time varying volatility in equity market returns across the two markets. Besides, from the asymmetric model, the result show that good news has larger impact on stock volatility than bad news in the Ghana stock market, while a strong opposite case holds for Nigeria. Furthermore, results show that inflation rate and its three month average are one of the underlying determinants stock market volatility in the two countries.

Jyoti (2011) had examined the linkage between inflation and stock returns in India during 1991:4 to 2009:3. Besides, the researcher also carries the analysis for the sub period 2002:4 to 2009:3, and the pre-crisis and post-crisis analysis is conducted through the analysis of the sub period 2005:1 to 2009:4. Unit root tests, Granger causality test and regressions have been employed to investigate the nexus between the variables. Vector Autoregression (VAR) methodology is performed for examining the causal relationship between stock returns and inflation. The results obtained through all standard econometric tests suggest that there is no significant relation between stock returns and inflation during the period of studied. The unit root test results reveal that all the three series, i.e., Inflation, Sensex returns and Nifty returns are stationary, therefore unable to check the cointegration. The Granger causality test results indicate that no significant relation between stock returns and inflation. Similar results were obtained from regression analysis. The results during the sub period also indicated independence of variables. The researcher concludes that Fisher Hypothesis does

not support the Indian market, and the stock returns do not provide a hedge against inflation.

Shukairi, Waleed, Abdul and Marwan (2012) had investigate the relationship between inflation and stock returns of Jordan by takes a random sample from the firms that listed in the Anman stock market. The results are mixed and vary. Some firms' stock returns are negatively correlated with inflation, while some firms reveal a slightly positive correlation between stock returns and inflation.
To summarize, they found that not all the firms offer a perfect hedge against inflation.

Zahar and Zulfiqar (2012) investigate the relationship between inflation and stock returns for the SAARC countries, namely India, Sri Lanka, Pakistan, and Bangladesh. Their sample data cover the period 1993 to 2010. By applying the ARDL bound testing method, their results demonstrate that the long run relationship exists between stock returns and inflation for all the countries under studied. However, the results are mixed. It shows negative relationship for Pakistan, India and Bangladesh, but positive relationship for Sri Lanka.

Marc et al. (2012) examine the relationship between returns on portfolios, comprised of stocks of various size and book values, and changes in inflation. The relationship is evaluated in the context of positive and negative changes in expected and unexpected inflation, under expansionary and contractionary monetary policy conditions. Results from their panel estimation procedure show that inflation has a strong asymmetric impact on stock returns, and this may explain why simply summing up inflation shocks, as in previous studies, could lead to misleading conclusions. They concludes that the nature of this asymmetric relationship is complex and contingent on several factors including the state of the monetary policy, whether one is examining expected or unexpected inflation shocks, and the size and book values of the stocks. In general, a positive shock to expected and unexpected inflation has a favourable effect on the returns of stocks during monetary expansion, but not during monetary tightening.

2.2.2 Malaysia Context

Janor, Rahim, Yaacob and Ibrahim (2010) had examines the validity of the Fisher hypothesis by testing the relationship between inflation and stock returns, by using Malaysian monthly data over a period of 27 years from 1980 to 2006. The researchers use Kuala Lumpur Stock Exchange Composite Index (KLCI) as a proxy for stock prices, and consumer price index (CPI) as a proxy to inflation. The researchers using Autoregressive Distributed Lag (ARDL) bounds test, and found that no long-run relationship between inflation and stock return, which is inconsistent with the Fisher hypothesis. This finding which inflation is not significant in explaining stock returns may suggest that the investment perception in the Malaysian financial markets is quite different from other countries financial markets.

Majid (2010) had studied the relationship between inflation and stock returns in Malaysia in the post-1997 Asian financial turmoil. The researcher intend to investigate whether Malaysian stock market is consistent with Fisher Hypothesis; and to test Fama's Proxy Hypothesis which hypothesizes that negative stock returns-inflation relationship is indirectly explained by a negative inflation-real activity relationship and a positive real activity-stock returns relationship. The study covers the quarterly data for the period from 1999:Q1 to 2008:Q4. In order to test the Fisher Hypothesis, the inflation had been divided into three types: actual, expected and unexpected inflation. Three econometric models were designed to test the correlation of the stock returns with each type of inflation. Four equation models had been derived to test the Fama's Proxy Hypothesis. Auto-Regressive Integrated Moving Average (ARIMA) model had been selected in this study in order to estimate expected inflation and forecast errors as the unexpected component of inflation. The results demonstrated that stock returns are independent of inflationary trends, which implies that Malaysian stock market provides a good hedge against inflation. A positive relationship between inflation and economic activity and a positive economic activity-stock returns relationship were recorded which totally contradict Fama's Proxy Hypothesis.

Geetha, Mohidin, Chandran and Chong (2011) examine the relationship between inflation and stock returns in the short run and long run for Malaysia. The inflation was defined as expected and unexpected inflation separately. The sample data used in the study covers the monthly time series data from January 2000 to November 2009. The Augmented Dickey Fuller (ADF) test is carried up for unit root test. Then Cointegration test (Johansen test) is used to determine the number of cointegrating vectors. After determining the cointegrating vectors that show the long run relationship between the variables, the Vector Error Correction Modeling (VEC) is used to determine the short run relationship. ADF result shows that all the variables are stationary. The Johansen test for cointegration result reveals that there is a long run relationship between expected and unexpected inflation with stock returns. The expected and unexpected inflation found to have negative impact on the stock market. The VEC result indicated that no short run relationship between the stock market, expected inflation, and unexpected inflation for Malaysia.

Nurul, Zuraidah and Nor (2012) had conducted a study to examine the effect of inflation towards stock markets for difference exchange rate periods which are 'pegged to USD' and 'managed float'. The data uses in their study are from 1999-2005 (for pegging to USD) and 2006-2011 (for managed float). The sample data consists of monthly time series of 132 months from the period of January 2000 until December 2010. Their results indicated that inflation rate shows negative coefficient impact towards KLCI performance during managed float period; and there was no significant impact towards the KLCI during pegged to USD period.

Ramzi and Cristina (2012) had conducted a study to investigate the ability of inflation to predict future stock market returns in Malaysia stock market. The sample data is chosen from Malaysia stock exchange in the period of January 2000 – December 2011 (12 years). A linear regression analysis is applied for this study. The result of this study using the regression analysis indicates that there is a strong positive significant relationship among inflation and stock return.

2.3 Conclusion

In conclusion, the previous literature studies show that relationship between inflation and stock return resulted in mixed response for different countries, under varying research methodologies, and different monetary policy condition, even through in Malaysia. Table 1 and Table 2 indicate the summary of the literature on the relationship of stock returns and inflation in the international context and Malaysia context, respectively. We found out four types of correlation between that two variable: positive correlation, negative correlation, mixed (some results positive, and some results negative), and independent variable. Some research indicated a consistent result with Fisher Hypothesis, but other research may reveal that stock market is not a good hedge to against the inflation. The same results also applied to Proxy Hypothesis. So far, the debate remains unsettled. Therefore it is very interesting for this study to find out the asymmetric and cross-sectional effects of inflation on the Malaysian stock returns under varying monetary conditions.

Table 1: Summary of the Literature on the Stock Returns and Inflation Relationship (International Context)

Positive Relationship	Negative Relationship	Mixed Relationship	Independent Variable
Geyser et al. (2001)	Adrangi et al. (1999)	Kolluri et al. (2008)	Floros (2004)
Rapach (2002)	Omran et al. (2001)	Wei (2009)	Jyoti (2011)
Merikas (2002)	Sharpe (2001)	Aliyu (2011)	
Boucher (2004)	Ioannides et al. (2002)	Shukairi et al. (2012)	
Madsen (2004)	Laopodis (2006)	Zahar et al. (2012)	
Marwan et al. (2010)	Jorgensen et al. (2006)	Marc et al. (2012)	
Adam et al. (2010)	Hafiz et al. (2007)		
	Choudhry et al. (2010)		

Table 2: Summary of the Literature on the Stock Returns and Inflation Relationship (Malaysia Context)

Positive Relationship	Negative Relationship	Mixed Relationship	Independent Variable
Majid (2010) Ramzi et al. (2012)	Geetha et al. (2011)	Nurul et al. (2012)	Janor et al. (2010)

This paper has reviewed a series of journal regarding this topic. However, this study finds that there are a lot of research studying on abroad, but not in Malaysia. Therefore, this paper mainly focuses in Malaysia and would try to explain the significant relationship from the empirical results.

It is hoped that this paper can provide directions to future researchers in studying the linkage between inflation and stock returns in Malaysian stock market with the useful data and methodologies.

CHAPTER 3

RESEARCH METHOD

3.0 Introduction

The Chapter 3 – *Research Method* consists of two sections. The first section – *Data Description* discuss the details of data of the dependent variable, independent variables, and monetary policy environment under this study. The second section – *Methods of Analysis* explores the methodological specification, theoretical consideration, models specification of the symmetrical and asymmetrical effects of inflations on stock returns, and the influence of the monetary policy environment to the symmetrical and asymmetrical effects of inflations on stock returns.

3.1 Data Description

This research which analyses the linkage between stock returns and expected and unexpected changes in inflation, had cover the ten years (120 months) period from January 2003 to December 2012. Due to the data limitations (the IMF had start publish Malaysia inflation forecast data from the end of 2002), therefore this study had only able to cover the ten years period from January 2003 to December 2012.

The Data Descriptive section consists of three topics. The first topic discusses the dependent variable used in this study. The second topic will explore the independent variables used in this study. The last topic descripts the monetary policy environment data under this study. The detailed discussion of explanation

of each variable, proxy used for each variable, data collection method, unit's measurement of each variable, and source of data will be covered in each topic.

3.1.1 Dependent Variable

In this study, the dependent variable is the firm stock return. The proxy for this dependent variable is represented by R_t, which is the excess return of the firm equity, at time t.

R_t = represent the excess return of the firm equity, at time t

$= [SP_{i,t} – SP_{i, t-1} / SP_{i, t-1}][100\%] - RF_t$ **Equation (1)**

Where: $SP_{i,t}$ = represent closing equity price at month-end for firm i at time t.

RF_t = represent risk-free asset proxy, namely the Malaysia Interbank 3 month middle rate at time t.

Our data include 92640 observations (772 firms' monthly financial data for ten years), which cover the period from January 2003 to December 2012.

Our selection of sample firms was based on several criteria:

a) Listed on the KLSE Main Board as at 31 December 2012, and must have survived the minimum1-year period.
b) Excluded the ACE Market firms since those firms Market Value (MV) and Book Value (BV) are too less, and not so representative.
c) Excluded closed-end fund and exchange traded fund firms, due to those firms are generally governed by different rules and practices with regard to financing.
d) Excluded PN 17 firms due to those firms have been defined by Bursa Malaysia as having financial distress, and do not meet the financial requirement as mentioned in the Practice Notes.

The unit's measurement for excess return of the firm equity at time t (R_t) is in the percent (%). The source of data for the closing equity price at month-end for firm i at time t ($SP_{i,t}$) and Malaysia Interbank 3 month middle rate at time t (RF_t) are obtained from Thomson Reuters Datastream.

3.1.2 Independent Variables

The major independent variable used in this study is inflation. The inflation variable is measured in two types: expected and unexpected change in inflation. The other empirical variables are Market Risk Premium, Size, and Value.

3.1.2.1 Expected and Unexpected Change in Inflation

Monthly CPI data had been used as a proxy for the inflation in this study. The actual values of the monthly CPI data are obtained from Thomson Reuters Datastream. Consensus forecasts of the CPI data are obtained from International Monetary Fund (IMF) World Economic and Financial Surveys, which are the survey-based expected inflation polled by the economists from IMF.

The consensus forecasts are used to bifurcate the change in inflation from 1 month to another into two parts: one represents the unexpected inflation changed; another representing the expected inflation changed. For example, consider π_t which is the change in inflation from 1 month to another:

$\pi_t = \% \Delta CPI_t - \% \Delta CPI_{t-1}$ **Equation (2)**

Between time t-1 and time t, expectations are formed by market participants as to what inflation would be at time t.

The expected change in inflation (π_t^e) is the result of forecast of the future inflation rate minus the previous inflation rate:

$\pi_t^e = [\text{Forecast of } \% \Delta CPI_t] - \% \Delta CPI_{t-1}$ **Equation (3)**

The unexpected change in inflation is the actual value of the percent change in CPI during announcement at time t minus the forecast of the CPI. That is:

$\pi_t^u = \% \Delta CPI_t - [\text{Forecast of } \% \Delta CPI_t]$ **Equation (4)**

Thus:

$$\pi_t = \pi_t^u + \pi_t^e \qquad \textbf{Equation (5)}$$

This research uses survey-based measure of expected inflation. The principal benefit of using this approach is because it overcomes the econometric and conceptual issues which related with the estimation of expected and unexpected components of the time series data of economic.

Janor et al. (2010) highlighted that initially the researchers in the developed countries tend to use Treasury bill rate as a proxy for expected change in inflation. For example, Fama and Schwert (1977), Fama (1981) had used this method. Under this method, unexpected change in inflation is the difference between actual inflation and the Treasury bill rate as calculated on an ex post basis. This is acceptable due to the inflation rates in developed countries are relatively stable almost all the time. However, in the developing countries like Malaysia, the inflation rates are relatively not constant. By the way, this method had a major weakness, it does not accommodate for time-varying real rates.

Some researchers have used autoregressive time-series techniques to differentiate the expected and unexpected components of inflation. For example, Yobaccio, Rubens, & Ketcham (1995), and Janor et al. (2010) had used this method. However, a studies done by McQueen et al. (1993), and Almeida, Goodhart, & Payne (1998) reveal that survey forecast data have found to be unbiased and superior in the estimation (lower mean squared errors), as compared with autoregressive time-series techniques. Therefore, a survey forecast method had been adopted in several recent studies in different contexts. For example, Balduzzi, Elton, & Green (2001) for yield curve modelling; Andersen, Bollerslev, Diebold, & Vega (2003) for examination of currency markets; and Simpson & Ramchander (2004) for Treasury futures prices. Therefore, this study uses survey-based measure of expected inflation, which following similar methods adopted by Marc et al. (2012).

3.1.2.2 Market Risk Premium, Size, and Value

Market Risk Premium at time t, is represented by MRP_t, which:

$MRP_t = [KLCI_t - KLCI_{t-1} / KLCI_{t-1}][100\%] - RF_t$ **Equation (6)**

Where: $KLCI_t$ = closing Kuala Lumpur Composite Index at month-end at time t.

RF_t = risk-free asset proxy, namely the Malaysia Interbank 3 month middle rate at time t.

The unit's measurement for Market Risk Premium at time t (MRP_t) is in the percent (%). The source of data for the closing Kuala Lumpur Composite Index at month-end at time t ($KLCI_t$) and Malaysia Interbank 3 month middle rate at time t (RF_t) are obtained from Thomson Reuters Datastream.

In order to examine the role played by size and value factors in influencing the linkage between inflation and stock returns, the following firms' monthly financial data had been obtained from Thomson Reuters Datastream for further analysis:

1) Number of shares issued by firms (NOSH)
2) Share price of the firms (SP)
3) Assets per share of the firms (APSH)

The Size factor, which is represented by Market Value (MV), which:

(MV) = (NOSH) x (SP) **Equation (7)**

The Value factor, is represented by: Book Value (BV)/ Market Value (MV)

Where: Book Value (BV) = (NOSH) x (APSH) **Equation (8)**

Our data include 92640 observations (772 firms' monthly financial data for ten years), which cover the period from January 2003 to December 2012. The unit's measurement for Market Value (MV) is in the RM (million) unit, and the unit's measurement for Value factor is in the ratio.

3.1.3 Monetary Policy Environment

A researcher should take into consideration for the potential effect of various monetary policy conditions towards the linkage between inflation and stock returns while interpreting the results. For this study undertaken, the monetary condition is defined as whether contractionary or expansionary according to the Bank Negara interest rate decision making. If Bank Negara increases the interest rate, then it is consider under tightening monetary policy periods. If Bank Negara decreases the interest rate, then it is consider under loosening monetary policy periods.

Following Jensen, Mercer, & Johnson (1996) and Marc et al. (2012) research method; As long as the consecutive interest rate changes are all in the same direction, the Bank Negara is considered to be operating under the same monetary policy stance. In this study, we used Bank Negara overnight policy rate as a proxy for interest rate. The Bank Negara overnight policy rate data is obtained from Thomson Reuters Datastream.

Table 3: Contractionary and Expansionary Monetary Periods

Type of Period	Beginning Month	Ending Month	Δ in Bank Negara Interest Rate over the Period
Contractionary	January 2003	November 2008	80 basis point
Expansionary	December 2008	February 2010	-150 basis point
Contractionary	March 2010	December 2012	100 basis point

Applying this classification rule, Table 3 indicates the breakdown covering 2003 to 2012 sample period into two phases of the monetary period (contractionary or expansionary). The Table 3 reveals that, there are one sub-period classified as expansionary, and two sub-periods classified as contractionary. The Malaysian stock market experienced the phases of growth (January 2003- November 2008), financial crisis (December 2008 – February 2010), and recovery (March 2010-December 2012) during our chosen period of study. Therefore, our results are robust as our data cover all phases of the Malaysian stock market.

3.2 Methods of Analysis

This section consists of five topics. This first topic explain the methodological specification used in this study. The second topic will explore the theoretical consideration behind the research method of this study. The third topic discuss about the models specification of the symmetrical effects of inflations on stock returns. The fourth topic discuss about the models specification of the asymmetrical effects of inflations on stock returns. The last topic discuss about the influence of the monetary policy environment to the symmetrical and asymmetrical effects of inflations on stock returns.

3.2.1 Methodological Specifications

The empirical examination is carried out in the framework of OLS pooled regression research method, in estimating models with panel data. The traditional OLS regression models are used to estimate symmetric model, and modified OLS regression models are used to estimate asymmetric model. A detailed discussion about the theoretical considerations that motivate the asymmetric model will be discussed in the next topic.

In order to decide the relationship between stock return and explanatory variables, this study had applied regression methodology using panel (pooled time-series cross-section) data set. Our data include 92640 observations (772 firms' monthly data for ten years). The regression results could be obtained through the EVIEWS.

There are several advantages by using panel data (pooled time-series cross-section). This methodology gives more variability, more observations, and more level of freedom (Baltagi, 1995). Besides, pooled data are more efficient to measure the effects that are undetectable in pure time-series or pure cross-sections data. This research method will also reduce the biases induced from omitted variables, and decrease the measurement biases arising from aggregation over individuals and firms (Pindyck and Daniel, 1998).The advantage of panel data

over cross-section data is the ease of modelling the differences in behaviour across individuals (Greene, 2000).

Following Marc et al. (2012) research methodology, several different model specifications are estimated in the third topic, fourth topic and fifth topic. Each successive model entails an increasing number of control variables. Models that assume symmetrical reactions of equity returns toward the changes in inflation will be estimated first, and then compared with models that accommodate asymmetry.

3.2.2 Theoretical Considerations

Inspired by the theoretical considerations of the asymmetric model presented by Marc et al. (2012), therefore the theoretical considerations that motivate the asymmetric model will be discussed in this topic. One of the weaknesses of the traditional symmetric model (Ordinary Least Square regression models) is that the response of equity prices to inflation (which is conditional on its changes being either positive or negative) is forced to be the same. However, there is no reason to believe that the response of equity prices to inflation is the same when inflation declines or increases. Therefore, we will highlight the conditions which conventional symmetric model may hide the true underlying asymmetric relationships between stock returns and inflation, thus giving wrong results to the research undertaken.

We need to consider the following two data generating processes, in order to understand how the assumption of a symmetrical response could provide such contrary results:

$$R_t = \alpha + \beta\pi_t + \varepsilon_t \qquad \textbf{Equation (9)}$$

$$R_t = \mu + \beta_+\pi_t^+ + \beta_-\pi_t^- + \xi_t \qquad \textbf{Equation (10)}$$

Equation (9) represents the stock returns (R_t) reaction to a change of the inflation (π_t) as being symmetrical, i.e. whatever the value of π_t, the impact on stock returns is $\beta\pi_t$.

Equation (10) models the stock returns (R_t) asymmetric reaction to a change of inflation. In Equation (10), π_t^+ represent the vector that contains the inflation changed, during the change in inflation is positive and a zero otherwise; π_t^- represent the vector that contains the inflation changed, during the change in inflation is negative and a zero otherwise ; β_+ and β_- represents the associated model parameters.

The below situation must exist, i.e.: $\beta = \beta_+ = \beta_-$, if the stock returns respond symmetrically to inflation changed. Therefore, the new relationship may derive as follows:

$R_t = a + b(\pi_t^+ + \pi_t^-) + e_t$ **Equation (11)**

If b is the OLS estimate of β, then:

$b = w_+ b_+ + w_- b_-$ **Equation (12)**

Where OLS estimates of β_+ and β_- are b_+ and b_- , respectively,

Therefore,

$$w_+ = \frac{Var(\pi_t^+) + Cov(\pi_t^+, \pi_t^-)}{Var(\pi_t^+) + Var(\pi_t^-) + 2Cov(\pi_t^+, \pi_t^-)}$$

$$w_- = \frac{Var(\pi_t^-) + Cov(\pi_t^+, \pi_t^-)}{Var(\pi_t^+) + Var(\pi_t^-) + 2Cov(\pi_t^+, \pi_t^-)}$$ and,

$w_+ + w_- = 1$

The β coefficient expected value in Equation (9), therefore, will become β_+ and β_- coefficients weighted-average in Equation (10).

During a condition when b_+ is positive and b_- is negative, b will be negative whenever $\frac{|b_-|}{b_+} > \frac{w_+}{w_-}$.

Please take note that w_+ and w_- (denominator for each of the weights) represents the variance of $\pi_t^+ + \pi_t^-$ .To concluded, the denominator is the variance of π_t. Therefore, if Var (π_t^+) < Var (π_t^-) then $w_+ < w_-$, subsequently b_- will have more influence (compared with b_+) in the estimation of b and vice versa. Lastly, b_+ and b_- absolute magnitudes will also decide which of the two estimates will command the traditional OLS b.

3.2.3 Symmetric Inflation and Stock Returns

To study the basic relationship between inflation and stock returns, also to help reconcile this study's results with prior evidence, nominal changes in stock returns will be regressed into the expected and unexpected change in inflation parts as follows:

Model 1: $\Delta R_t = \alpha_t + \lambda \pi_t^e + \gamma \pi_t^u + \varepsilon_t$ **Equation (13)**

The Fisher hypothesis relates the level of returns to the level of inflation. Given that our inflation-related variables are measured in changes, it would be appropriate to use changes in stock returns on the left-hand side of the regressions, for consistency.

Where:

R_t = represent the excess return of the firm equity, at time t.

π_t^e = represent the levels of expected changes in inflation.

π_t^u = represent the levels of unexpected changes in inflation.

α_t = the constant number of equation.

ε_t = random error.

To account the special impact of inflation and simultaneously control for the influence of Market Risk Premiums (MRP) and other important empirical factors, two alternate specifications of the above basic model are estimated as follows.

Model 2: $\Delta R_t = \alpha_t + \beta(\Delta MRP_t) + \lambda \pi_t^e + \gamma \pi_t^u + \varepsilon_t$ **Equation (14)**

Model 3:

$$\Delta R_t = \alpha_t + \beta(\Delta MRP_t) + \phi(\Delta SIZE_t) + \eta(\Delta VALUE_t) + \lambda\pi_t^e + \gamma\pi_t^u + \varepsilon_t$$ **Equation (15)**

Where:

R_t = represent the excess return of the firm equity, at time t.

MRP_t = represent the market risk premium at time t.

$SIZE_t$ = represent the size premiums at time t.

$VALUE_t$ =represent the value premiums at time t.

π_t^e = represent the levels of expected changes in inflation.

π_t^u = represent the levels of unexpected changes in inflation.

α_t = the constant number of equation.

ε_t = random error.

3.2.4 Asymmetric Inflation and Stock Returns

The effects of asymmetric of inflation on equity returns are examined by separating expected and unexpected inflation shocks into positive and negative values; by controlling for the Fama–French risk factors. They are estimated as follows:

Model 4:

$$\Delta R_t = \alpha_t + \beta(\Delta MRP_t) + \phi(\Delta SIZE_t) + \eta(\Delta VALUE_t) + \lambda^+\pi_t^{e,+} + \lambda^-\pi_t^{e,-} + \gamma^+\pi_t^{u,+} + \gamma^-\pi_t^{u,-} + \varepsilon_t$$

Equation (16)

Where:

R_t = represent the excess return of the firm equity, at time t.

MRP_t = represent the market risk premium at time t.

$SIZE_t$ = represent the size premiums at time t.

$VALUE_t$ = represent the value premiums at time t.

$\pi_t^{e,+}$ = represents the vector that involves the value of the expected inflation, when inflation is positive and a zero otherwise.

$\pi_t^{e,-}$ = represents the vector that involves the value of the expected inflation, when inflation is negative and a zero otherwise.

$\pi_t^{u,+}$ = represents the vector that involves the value of the unexpected inflation, when inflation is positive and a zero otherwise.

$\pi_t^{u,-}$ = represents the vector that involves the value of the unexpected inflation, when inflation is negative and a zero otherwise.

α_t = the constant number of equation.

ε_t = random error.

3.2.5 The Influence of the Monetary Policy Environment

The influence of the prevailing monetary policy condition in order to determining the linkage between inflation and stock returns is estimated by the following two models:

Model 5:

$$\Delta R_t = \alpha_t + \sum_{i=1}^{2} D_i \left[\beta(\Delta MRP_t) + \phi(\Delta SIZE_t) + \eta(\Delta VALUE_t) + \lambda\pi_t^e + \gamma\pi_t^u \right] + \varepsilon_t$$

Equation (17)

Model 6:

$$\Delta R_t = \alpha_t + \sum_{i=1}^{2} D_i \left[\beta(\Delta MRP_t) + \phi(\Delta SIZE_t) + \eta(\Delta VALUE_t) + \lambda^+\pi_t^{e,+} + \lambda^-\pi_t^{e,-} + \gamma^+\pi_t^{u,+} + \gamma^-\pi_t^{u,-}\right] + \varepsilon_t$$

Equation (18)

Model 5 measure the symmetrical effects of positive and negative inflations on stock returns. Model 6 measure the asymmetrical effects of positive and negative inflations on stock returns.

Where:

D_1= represent the dummy variable that takes the value of 1 during loosening monetary regimes and zero otherwise.

D_2= represent the dummy variable that takes the value of 1 during tightening monetary regimes and zero otherwise.

CHAPTER 4

RESEARCH RESULTS AND INTERPRETATION

4.0 Introduction

The Chapter 4 – *Research Results and Interpretation* consists of four sections. The first section presents and analyses the descriptive statistics results. In the second section and third section, we will presents and interpret the results for the effect of inflation on stock returns under symmetric models and asymmetric models, respectively. The final section will presents and interpret the role of the monetary policy environment in influencing the effect of inflation on stock returns.

4.1 Descriptive Statistics

Table 4: Descriptive Statistics of Expected and Unexpected Changes in Inflation

	Expected Change in Inflation (%)			Unexpected Change in Inflation (%)		
	All, π_t^e	Positive, $\pi_t^{e,+}$	Negative, $\pi_t^{e,-}$	All, π_t^u	Positive, $\pi_t^{u,+}$	Negative, $\pi_t^{u,-}$
Sample Size	120	65	55	120	56	64
Mean	0.13	1.04	-0.95	-0.12	1.04	-1.14
SD	1.5	0.98	1.28	1.69	1.43	1.16

Notes:

π_t^e = [Forecast of % Δ CPI_t] - % Δ CPI_{t-1} Equation (3)

π_t^u = % Δ CPI_t - [Forecast of % Δ CPI_t] Equation (4)

Table 4 indicates the descriptive statistics on the variables of inflation: expected change in inflation (π_t^e), and unexpected change in inflation (π_t^u). The number of observation, mean and SD are reported for each type of inflation variable. Besides, the number of observation, mean and SD for the positive ($\pi_t^{e,+}$ & $\pi_t^{u,+}$) and negative ($\pi_t^{e,-}$ & $\pi_t^{u,-}$) observations for each variable also reported.

By examining the data for the period January 2003 to December 2012 in Table 4, there are a total of 120 observations (10 years x 12 months per year) of expected changes in the inflation, whereby 65 are positive changes; 55 are negative changes. The mean (SD) for the expected changes in inflation is 0.13 (1.50). The mean (SD) positive in expected change in inflation is 1.04 (0.98), whereas, negative in expected change in inflation has a mean (SD) of -0.95 (1.28).

For the unexpected changes in inflation, there are 56 positive changes; 64 are negative changes. The mean (SD) for the unexpected changes in inflation is -0.12 (1.69). The mean (SD) positive in unexpected change in inflation is 1.04 (1.43), whereas, negative in unexpected change in inflation has a mean (SD) of -1.14 (1.16).

Table 5: Descriptive Statistics of the firm's Book Value (BV), SIZE factor (MV), and VALUE factor (BV/MV)

	Book Value (RM' million)	SIZE factor (RM' million)	VALUE factor (ratio)
Sample Size	92640	92640	82746
Mean	697.50	965.72	0.95
SD	2421.66	4161.01	23.94

Notes:
SIZE factor is represented by Market Value (MV).
VALUE factor is represented by: Book Value (BV)/ Market Value (MV).

Table 5 indicates the descriptive statistics of the firm's Book Value, SIZE factor, and VALUE factor. The number of observation, mean and SD for the firm's Book Value are 92640, RM 697.50 million, and RM 2421.66 million respectively. The number of observation, mean and SD for the firm's SIZE factor are 92640, RM

965.72 million, and RM 4161.01 million respectively. The number of observation, mean and SD for the firm's VALUE factor are 82746, 0.95, and 23.94 respectively.

The VALUE factor will identify the equity either is undervalued or overvalued, by taking the book value and dividing it by market value. The equity is defined as undervalued if the ratio is above 1; the equity is defined as overvalued if the ratio is less than 1. Therefore, the Malaysian firm's equity on average is consider as slightly overvalue (0.95) for the period of samples data taken - January 2003 to December 2012. However, the standard deviation result (23.94) reveals that the VALUE factor for the Malaysian firm's is quite volatility. This is due to our samples size across different categories of stocks (772 firms' monthly financial data for ten years), as compares with stock indices that are predominantly comprised of large firm equities.

Table 6: Descriptive Statistics of Excess Return of the Firm Equity, R and Market Risk Premium, MRP

	Excess Return of the Firm Equity, R (%)	Market Risk Premium, MRP (%)
Sample Size	82517	120
Mean	-2.25	-2.17
SD	14.05	4.46

Notes:

$R_t = [SP_{i,t} - SP_{i, t-1} / SP_{i, t-1}][100\%] - RF_t$ Equation (1)

Where: $SP_{i,t}$ = represent closing equity price at month-end for firm i at time t

RF_t = represent risk-free asset proxy, namely the Malaysia Interbank 3 month middle rate at time t

$MRP_t = [KLCI_t - KLCI_{t-1} / KLCI_{t-1}][100\%] - RF_t$ Equation (6)

Where: $KLCI_t$ = closing Kuala Lumpur Composite Index at month-end at time t

Table 6 indicates the descriptive statistics of the excess return of the firm equity (R) and market risk premium (MRP) for the period January 2003 to December 2012. The number of observation, mean and SD for excess return of the firm equity are 82517, -2.25, and 14.05 respectively. The number of observation, mean and SD for market risk premium are 120, -2.17, and 4.46 respectively.

Table 6 results reveal that on average Malaysian stock market (in term of individual firms and KLCI market index performances) provide the negative stock return to the investor (after minus the risk-free asset proxy). This implies that; there are very risky in the equity investment in Malaysian stock market. Therefore, investors are advice to invest their capital in other low risk investment opportunities (for example, put the capital in fixed deposit or bond), unless investors willing to take a risk (which may reward them with high return), and make a correct portfolio selection in the equity investment.

The standard deviation measures volatility of the stock markets. From the view of statistical, it's measured as the square root of equity's volatility. A low standard deviation indicates that the data points tend to be very close to the mean, while high standard deviation indicates the date is spread out from the mean. The result indicates that the return of the firm's equity is more volatility than KLCI market index.

To conclude, on average the KLCI market index performs better than individual firms in the mean and variance of their return of investment. KLCI market index is computed based on constituents of 30 largest firms on the Bursa Malaysia's Main Market. Therefore, it is advisable to invest in the portfolio combination rather than individual firms in Malaysian stock market. This is quite consistent with the Modern Portfolio Model (MPT) developed by Harry Markowitz. MPT had introduced a new concept to portfolio management that based on the mean-variance analysis which has become the standard practice in the field of financial investment management. Basically, this model assumes that the investors are risk averse and only two things they will care more which are mean and variance of their return of investment when they are selecting among portfolios (Fama & French, 2003).

4.2 Effect of Inflation on Stock Returns: Symmetric Models

Table 7 reports the results from estimating Model 1, 2, and 3, respectively. These results are estimated from the models that assume the symmetrical effects of inflation on stock returns. Model 1 results perform to the basic specification where

changes in nominal excess stock returns are regressed on the expected and unexpected components of the change in inflation. Then, each successive model (Model 2 and 3) entails an increasing number of control variables.

Table 7: Effect of Inflation on Stock Returns: Symmetric Models

Variables	Model 1	Model 2	Model 3
Constant	- 0.01 (-0.10)	- 0.01 (-0.19)	- 0.05 (-0.74)
ΔMRP_t		0.95 (79.33 ***)	0.92 (77.48 ***)
$\Delta SIZE_t$			0.00 (23.52 ***)
$\Delta VALUE_t$			- 0.07 (-5.70 ***)
π_t^e	-1.22 (-13.55 ***)	0.41 (4.61 ***)	0.39 (4.34 ***)
π_t^u	-1.19 (-14.89 ***)	0.24 (2.99 ***)	0.24 (3.08 ***)

Notes:
*** indicate statistical significance at 0.01 levels.
t-statistics reported in parentheses.

Model 1: $\Delta R_t = \alpha_t + \lambda\pi_t^e + \gamma\pi_t^u + \varepsilon_t$ Equation (13)

Model 2: $\Delta R_t = \alpha_t + \beta(\Delta MRP_t) + \lambda\pi_t^e + \gamma\pi_t^u + \varepsilon_t$ Equation (14)

Model 3:

$\Delta R_t = \alpha_t + \beta(\Delta MRP_t) + \phi(\Delta SIZE_t) + \eta(\Delta VALUE_t) + \lambda\pi_t^e + \gamma\pi_t^u + \varepsilon_t$ Equation (15)

Model 1 result indicates the presence of a significant negative relationship between the stock returns and the expected (π_t^e) and unexpected (π_t^u) components of inflation. Model 1 result is contrast with the Fisher Hypothesis which stated that the relationship between stock returns and inflation should correlate positively.

Model 2 present the enhanced version of the basic specification that includes Market Risk Premium (MRP). By controlling for the change in Market Risk Premium (ΔMRP_t) in Model 2, the negative correlation between stock returns and the expected (π_t^e) and unexpected (π_t^u) components of inflation disappears. In contrast, positive and significant relationships are observed between these two variables, which are consistent with the Fisher Hypothesis.

Model 3 which are the enhance version of the Model 2, controls for the change in Market Risk Premium, Size Premium, and Value Premium, provide a similar results with Model 2. The coefficients for both the expected and unexpected changes in inflation are positively and significantly related with changes in stock returns. Model 3 results are consistent with Fisher Hypothesis, which stated that the equities should act as a hedge against inflation.

The result of Model 3 draw an important implication, which the tests for the Fisher Hypothesis must control for the different risk dimensions; especially market, size and value factors. Besides, we observed that the coefficients for the market, size and value factors are all highly significant, which confirm the importance and validity of the three-factor return generating model in estimating the relationship between stock returns and inflation.

However, it is important to recognize that the above results are obtained by using a symmetric framework that controls for market, size and value risk premiums. It would be interesting to see how the stock returns respond to asymmetric changes in inflation. These results along with the influence of the monetary policy environment are examined next.

4.3 Effect of Inflation on Stock Returns: Asymmetric Models

Before interpret the results for the asymmetric model, we need to understand the term "*virtuous"* and *"perverse"*. From an investor's perspective, the asymmetric response of stock returns can be either:

- Virtuous – Helpful to the investor's long positions in stocks.
- Perverse – Detrimental to the investor's long positions in stocks.

Virtuous asymmetric in stock return is defined as stock return tended to rise with inflation ($\pi_t^{e,+}$ or $\pi_t^{u,+}$), which consistent with Fisher Hypothesis. But when inflation declines ($\pi_t^{e,-}$ or $\pi_t^{u,-}$), the stock return is either:

- continue to rise, or;
- do not fall significantly, or;

- had no relationship with declining inflation, ceteris *paribus.*

Perverse asymmetric in stock return is defined as stock return tended to fall when inflation is rising ($\pi_t^{e,+}$ or $\pi_t^{u,+}$). But when inflation declines ($\pi_t^{e,-}$ or $\pi_t^{u,-}$), the stock return is either:

- continue to fall, or;
- do not rise significantly, or;
- had no relationship with declining inflation, ceteris *paribus.*

Table 8 and Table 9 summarize the characteristics of virtuous asymmetric and perverse asymmetric, respectively.

Table 8: Virtuous Asymmetric in Stock Return

Change in Inflation	Excess Return of the Firm Equity , R		Explanation
+ve	+ve		Increase when inflation is rising
-ve	-ve	or;	Continue to increase when inflation is falling
	insignificant +ve	or;	Decrease insignificantly when inflation is falling
	insignificant in both +ve & -ve		Insignificant relationship when inflation is falling

Table 9: Perverse Asymmetric in Stock Return

Change in Inflation	Excess Return of the Firm Equity , R		Explanation
+ve	-ve		Decrease when inflation is rising
-ve	+ve	or;	Continue to decrease when inflation is falling
	insignificant -ve	or;	Increase insignificantly when inflation is falling
	insignificant in both +ve & -ve		Insignificant relationship when inflation is falling

Table 10 present the asymmetric response of changes in stock returns to expected and unexpected changes in inflation in the framework of the modified version Fama-French three factor model. The result of Model 4 (Asymmetric Model) agrees with Model 3 (Symmetric Model) that there is on average a positive

relationship between stock returns and inflation, and most importantly, this relationship is asymmetric.

Table 10: Effect of Inflation on Stock Returns: Asymmetric Model

Variables	Model 4
Constant	- 0.64 (-3.76 ***)
ΔMRP_t	0.91 (77.48 ***)
$\Delta SIZE_t$	0.00 (23.49 ***)
$\Delta VALUE_t$	- 0.07 (-5.72 ***)
$\pi_t^{e,+}$	1.48 (7.76 ***)
$\pi_t^{e,-}$	0.34 (1.77 *)
$\pi_t^{u,+}$	- 0.10 (-0.48)
$\pi_t^{u,-}$	0.14 (0.71)

Notes:
* and *** indicate statistical significance at the 0.1 and 0.01 levels, respectively.
t-statistics reported in parentheses.

Model 4:

$$\Delta R_t = \alpha_t + \beta(\Delta MRP_t) + \phi(\Delta SIZE_t) + \eta(\Delta VALUE_t) + \lambda^+ \pi_t^{e,+} + \lambda^- \pi_t^{e,-} + \gamma^+ \pi_t^{u,+} + \gamma^- \pi_t^{u,-} + \varepsilon_t$$

Equation (16)

For expected changes in inflation, this asymmetric is virtuous from the investor's perspective. When expected inflation is rising, stock returns tend to increase. But when expected inflation is declining, stock returns does not fall correspondingly/ significantly as compared with increasing rate of stock returns when expected inflation is rising.

An insignificant perverse asymmetric is observed for the unexpected changes in inflation. Stock returns tend to decrease when inflation is rising; and stock returns continue to decrease when inflation is falling. By the way, the result is insignificant; therefore we conclude that unexpected changes in inflation do not have a significant impact to the stock returns in Malaysian stock market.

The result from Table 10 indicates two important observations into the nature of the relationship between inflation and stock returns that has not been documented in previous studies:

- The positive relationship between expected inflation and stock returns in Model 4 is a result that is most likely attributed to periods during which expected inflation is increasing.
- The positive relationship between unexpected inflation and stock returns in Model 4 is a result that is most likely attributed to periods during which unexpected inflation is decreasing.

To summarize, this results suggest that stock returns provide a virtuous asymmetrical hedge against expected and unexpected inflation, an observation that is lost by summing the inflation components.

We notice that the coefficients for the market, size, and value all are highly significant which confirm the importance and validity of the three-factor return generating model in estimating the relationship between stock returns and inflation.

4.4 Effect of Inflation on Stock Returns: Role of the Monetary Policy Environment

Table 11 examines the robustness of the symmetric relationship between inflation and stock returns under loosening and tightening monetary policy conditions, by re-estimate the Model 3. We wish to highlight this re-estimation does not allow for the asymmetric effect of inflation on stock returns. The results indicate that changes in inflation (both expected and unexpected) are significantly correlated with stock returns only during monetary loosening period, with a positive relationship which is consistent with Fisher Hypothesis. However, there are no significant impacts of the effect of inflation (both expected and unexpected) on stock returns during monetary tightening period.

Table 11: Symmetric Response of Changes in Stock Returns to Changes in Inflation during Different Monetary Environments

	Model 5	
Variables	Monetary Loosening	Monetary Tightening
Constant	- 0.02 (-0.33)	- 0.02 (-0.33)
ΔMRP_t	0.96 (32.66 ***)	0.94 (70.19 ***)
$\Delta SIZE_t$	0.00 (9.01 ***)	0.00 (21.45 ***)
$\Delta VALUE_t$	- 2.57 (-28.77 ***)	- 0.02 (-1.93 **)
π_t^e	1.42 (7.26 ***)	- 0.04 (-0.43)
π_t^u	1.01 (6.29 ***)	- 0.14 (-1.40)

Notes:
** and *** indicate statistical significance at the 0.05 and 0.01 levels, respectively.
t-statistics reported in parentheses.

Model 5:

$$\Delta R_t = \alpha_t + \sum_{i=1}^{2} D_i \left[\beta(\Delta MRP_t) + \phi(\Delta SIZE_t) + \eta(\Delta VALUE_t) + \lambda \pi_t^e + \gamma \pi_t^u \right] + \varepsilon_t$$

Equation (17)

Table 12: Asymmetric Response of Changes in Stock Returns to Changes in Inflation during Different Monetary Environments

	Model 6	
Variables	Monetary Loosening	Monetary Tightening
Constant	- 0.64 (-3.69 ***)	- 0.64 (-3.69 ***)
ΔMRP_t	1.05 (35.78 ***)	0.94 (69.45 ***)
$\Delta SIZE_t$	0.00 (8.93 ***)	0.00 (21.48 ***)
$\Delta VALUE_t$	- 2.54 (-28.38 ***)	- 0.02 (-1.91 *)
$\pi_t^{e,+}$	5.32 (11.12 ***)	1.17 (5.90 ***)
$\pi_t^{e,-}$	1.63 (3.03 ***)	0.08 (0.40)
$\pi_t^{u,+}$	1.32 (3.12 ***)	- 0.17 (-0.78)
$\pi_t^{u,-}$	- 3.40 (-8.23 ***)	0.96 (4.53 ***)

Notes:
* and *** indicate statistical significance at the 0.1 and 0.01 levels, respectively.
t-statistics reported in parentheses.

Model 6:

$$\Delta R_t = \alpha_t + \sum_{i=1}^{2} D_i \left[\beta(\Delta MRP_t) + \phi(\Delta SIZE_t) + \eta(\Delta VALUE_t) + \lambda^+ \pi_t^{e,+} + \lambda^- \pi_t^{e,-} + \gamma^+ \pi_t^{u,+} + \gamma^- \pi_t^{u,-} \right] + \varepsilon_t$$

Equation (18)

In the concluding part of the analysis, this study examines the robustness of the asymmetric relationship between inflation and stock returns under different monetary policy conditions, by re-estimate Model 4. Table 12 summarizes the result.

The virtuous asymmetric (for both expected and unexpected change of inflation) are observed under monetary loosening period. For expected changes in inflation; when expected inflation is rising, stock returns tend to increase significantly with *p*-value (0.0000). But when expected inflation is declining, stock returns does not fall significantly with *p*-value (0.0025), as compared with increasing rate of stock returns when expected inflation is rising. For unexpected changes in inflation; when unexpected inflation is rising, stock returns tend to increase significantly. But when unexpected inflation is declining, stock returns continue to increase significantly.

However, under the monetary tightening period; a virtuous asymmetric is observed for expected change of inflation, and a perverse asymmetric is observed for unexpected change of inflation. For expected changes in inflation; when expected inflation is rising, stock returns tend to increase significantly. But when expected inflation is declining, stock returns falling insignificantly. For unexpected changes in inflation; when unexpected inflation is rising, stock returns decrease insignificantly. However, when unexpected inflation is declining, stock returns decrease significantly.

We observe some interesting results emerge from the Table 12:

- In general, the findings indicate that stock returns respond asymmetrically to changes in inflation under different monetary periods.
- Fisher Hypothesis and virtuous asymmetric are observed under monetary loosening period, for both expected and unexpected change of inflation.
- Fisher Hypothesis and virtuous asymmetric is observed for expected change of inflation under monetary tightening period.
- Perverse asymmetric (contrast with Fisher Hypothesis) is observed for unexpected change of inflation under monetary tightening period.

- Positive relationships are observed between stock returns with the increases in expected and unexpected inflation during monetary loosening periods. This may due to during monetary loosening period, investors perceive countercyclical monetary policy to improve future economic growth and business conditions. So, increases in expected and unexpected inflation are treated as good news by investors.
- Stock returns decrease in response to negative shocks to expected and unexpected inflation shocks during monetary tightening periods, which is consistent with Fisher Hypothesis.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.0 Introduction

The Chapter 5 – *Discussion and Conclusion* consists of four sections. The first section discusses the validation on the research objectives. The second section will cover the implications of the study. The third section discusses the limitation of the study and the recommendation for future research. Lastly, an overall conclusion of the entire study will be presented.

5.1 Validation on the Research Objectives

As stated in Chapter 1, our study aims to address the following objectives:

1. To evaluates the impact of the both expected and unexpected changes in inflation to the Malaysian stock returns.
2. To examine the firm cross sectional effects towards the relationship between Malaysian stock returns and inflation.
3. To investigate the asymmetric effects of inflation (under context of positive and negative changes) on Malaysian stock returns.
4. To study the influence of the different monetary policy conditions towards the relationship between Malaysian stock returns and inflation.

For the findings of objective No. 1:

We noticed that both expected and unexpected changes in inflation have a significant impact to the Malaysian stock returns. This study found the presence of a significant negative relationship between the stock returns and the expected (π_t^e) and unexpected (π_t^u) components of inflation, under the symmetric model

(Model 1), which perform the basic specification where changes in nominal excess stock returns are regressed on the expected and unexpected components of the change in inflation. However, a significant positive correlation are observed between the stock returns and the expected (π_t^e) and unexpected (π_t^u) components of inflation, under the symmetric model (Model 2 & 3), which perform the enhanced version of the basic specification that include additional control variables.

For the findings of objective No. 2:

By controlling for the change in Marker Risk Premium, Size Premium, and Value Premium in Model 2 & 3, the negative correlation between stock returns and the expected (π_t^e) and unexpected (π_t^u) components of inflation in Model 1 disappears. In contrast, positive and significant relationships are observed between these two variables, which are consistent with the Fisher Hypothesis.

Besides, we observed that the coefficients for the market, size and value factors are all highly significant in Model 3, 4, 5 & 6, which confirm the importance and validity of the three-factor return generating model in estimating the relationship between stock returns and inflation.

Therefore, we concluded that the firm cross sectional effects capture the impacts to the relationship between Malaysian stock returns and inflation.

For the findings of objective No. 3:

Model 4 results suggest that stock returns provide a virtuous asymmetrical hedge against expected and unexpected inflation, an observation that is lost by summing the inflation components.

For the findings of objective No. 4:

Model 5 (symmetric model) indicate that changes in inflation (both expected and unexpected) are significantly correlated with stock returns only during monetary loosening period, with a positive relationship which is consistent with Fisher Hypothesis. However, there are no significant impacts of the effect of inflation

(both expected and unexpected) on stock returns during monetary tightening period.

Model 6 (asymmetric model) indicate that under monetary loosening period, a virtuous asymmetric are observed for both expected and unexpected change of inflation. However, under monetary tightening period, virtuous asymmetric is observed for expected change of inflation; and perverse asymmetric is observed for unexpected change of inflation.

Therefore, this study concludes that different monetary policy conditions can influence the relationship between Malaysian stock returns and inflation.

5.2 Implications of the Study

There are three main implications due to the empirically analysis of this paper.

Firstly, to some extent it resolved a great puzzle regarding the relationship between stock return and inflation in Malaysian stock market. Relevant to this study, the relationship between stock returns and inflation that were reported by earlier studies of the researchers (Majid, 2010; Ramli et al., 2012; Geetha et al., 2011; Nurul et al., 2012) may be misleading since they do not control for asymmetry in the impact of inflation on stock returns. Our results suggest that stock returns provide a virtuous asymmetrical inflation-hedge against expected and unexpected inflation, an observation that is lost by summing the inflation components. This virtuous asymmetric effect is most obviously during the monetary loosening period, which covers the Subprime financial crisis period from December 2008 to February 2010. This may due to during financial crisis period, investors perceive countercyclical monetary policy to improve future economic growth and business conditions. So, increases in expected and unexpected inflation are treated as good news by investors. This indicates that the Bank Negara efforts to increase liquidity (by pursuing monetary expansion) during times of crisis can help boost equities by promoting economic recovery.

Second, our result reveals that monetary policy plays an influential role in Malaysian stock markets. Therefore, the results of this study carry important implications for portfolio management. The response of stock returns to inflationary news could be contingent on monetary policy conditions.

Third, our result implies that firm cross sectional effects capture the impacts to the relationship between Malaysian stock returns and inflation. Therefore, the results by earlier studies (Majid, 2010; Ramli et al., 2012; Geetha et al., 2011; Nurul et al., 2012) may be misleading since they do not control for firm added cross-sectional dimension for the impact of inflation on stock returns.

5.3 Limitations and Recommendations of the study

Several limitations encountered in this study will be highlighted, and some recommendations are also made for future researchers with the purpose to provide future directions in order to generate a more comprehensive research.

This study use a survey-based measure of expected inflation to overcomes the econometric and conceptual issues which related with the estimation of expected and unexpected components of the time series data of economic. The consensus forecasts of the inflation data are obtained from International Monetary Fund (IMF) World Economic and Financial Surveys, which are the survey-based expected inflation polled by the economists from IMF. However, due to the data limitations (the IMF had start publish Malaysia inflation forecast data from the end of 2002), therefore this study had only able to cover the ten years period from January 2003 to December 2012. A further hard work in completeness data finding should be concerned. Ideally, in analyzing the relationship between stock returns and inflation of Malaysia under different monetary policy condition, this research should use twenty years period to represent both the Asian financial crisis (1997) and Subprime crisis (2008) periods.

Our study covers the sample data of the 772 firms' that had listed on the KLSE Main Board, and our results are based on the overall performance of these selected

firms which represent various sectors in the KLSE Main Board. For example: our sample data had included consumers sector, industrial products sector, properties sector, plantation sector, etc. However, it will be interested to examine the relationship between stock returns and inflation of the Malaysia under different monetary policy condition from the different perspective; by studying the portfolio of the firms' performance under different sectors in the KLSE Main Board. This is because the response to monetary policy shocks should differ across firms according to the subsector of economic activity. The equity returns of firms in cyclical industries, capital-intensive industries, and industries those are relatively open to trade should be affected more strongly by monetary policy shock. Therefore, understanding the stock returns in the individual sector of the KLSE Main Board under different monetary policy to the impact of inflation is an interesting issue to investigate.

This study had controls for the influence of sample data of the 772 firms' size and value of equity in estimating the relationship between stock returns and inflation. This approach is different with the prior studies which examine this issue using indices that are more heavily weighted towards large cap stocks. However, it is generally believed that individual firms' stock returns react differently to monetary policy according to their size (small and large firms), and value (financially constrained and less-constrained firms). Under imperfect capital markets with information asymmetries, the stock prices of firms under different portfolio of size and value respond to monetary policy in different ways. Therefore, in order to generate a more comprehensive research, it is suggests that to divide the sample of the firms' stocks into different value-weighted portfolios, and analyse the individual value-weighted portfolio data separately.

Moreover, our research has examined the relationship between dependent variable (firm stock return) and independent variables (inflation), by controlling for the change in marker risk factor, size factor, and value factor. Therefore, future research is recommended to add in additional control variable. For example, Wei (2009) had suggested adding the momentum factor in the research.

Lastly, this research paper only investigates in Malaysia. The result and information provided in this study is only useful for the Malaysia investor and policy maker. Therefore, the future researchers are recommended to broaden their sample frame to other regions if the result is to be contributed globally.

5.4 Conclusion

This research re-examines the relationship between inflation and stock returns of the Malaysia in the new perspective. The relationship is evaluated in the context of positive and negative changes in expected and unexpected inflation (asymmetric effect) , controls for the influence of firm size and value (firm cross sectional effects) , under different monetary policy (expansionary and contractionary) conditions.

Without controlling for risk premiums, we document a negative relationship between stock returns and inflation under the symmetric model. However, this relationship is positive and consistent with the Fisher hypothesis when they are examined in the context of a firm cross sectional effects.

When we further examine the asymmetric impact of inflation, we see that stock returns provide a virtuous asymmetrical hedge against expected and unexpected inflation, an observation that is lost by summing the inflation components. That is, increases in expected and unexpected inflation tend to be positively and significantly related to stock returns, while declining inflation tends to be negatively or insignificantly related to stock returns.

We further study the relationship of inflation and stock returns under different monetary policy periods. Our results indicate that for the symmetric model; the changes in inflation (both expected and unexpected) are significantly positive correlated with stock returns only during monetary loosening period. However, there are no significant impacts of the effect of inflation (both expected and unexpected) on stock returns during monetary tightening period.

For the asymmetric model, our results indicate that under monetary loosening period, a virtuous asymmetric are observed for both expected and unexpected change of inflation. However, under monetary tightening period, virtuous asymmetric is observed for expected change of inflation; and perverse asymmetric is observed for unexpected change of inflation.

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APPENDICES

APPENDIX A

EVIEWS RESULT- DESCRIPTIVE STATISTICS OF EXPECTED CHANGES IN INFLATION (π_t^e), AND UNEXPECTED CHANGE IN INFLATION (π_t^u)

	EI	PEI	NEI	UI	PUI	NUI
Mean	0.127396	1.041011	-0.952331	-0.124715	1.038035	-1.142122
Median	0.195507	0.895767	-0.614183	-0.146304	0.729735	-0.921985
Maximum	5.734260	5.734260	-0.004612	6.316733	6.316733	-0.040340
Minimum	-6.316733	0.040340	-6.316733	-5.734260	0.001422	-5.734260
Std. Dev.	1.503431	0.981365	1.283547	1.687206	1.428211	1.158858
Skewness	-0.736793	3.187043	-3.085328	0.588416	2.854457	-2.797134
Kurtosis	9.879457	15.49521	12.45884	8.816333	10.36476	11.43928
Jarque-Bera	247.4919	532.8897	292.2946	176.0733	202.6067	273.3792
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	15.28753	67.66571	-52.37818	-14.96585	58.12998	-73.09583
Sum Sq. Dev.	268.9761	61.63693	88.96465	338.7532	112.1883	84.60603
Observations	120	65	55	120	56	64

Notes:

EI = Expected changes in inflation (π_t^e)

PEI = Positive observations of expected changes in inflation ($\pi_t^{e,+}$)

NEI = Negative observations of expected changes in inflation ($\pi_t^{e,-}$)

UI = Unexpected changes in inflation (π_t^u)

PUI = Positive observations of unexpected changes in inflation ($\pi_t^{u,+}$)

NUI = Negative observations of unexpected changes in inflation ($\pi_t^{u,-}$)

APPENDIX B

EVIEWS RESULT- DESCRIPTIVE STATISTICS OF EXCESS RETURN OF THE FIRM EQUITY (R), MARKET RISK PREMIUM (MRP), THE FIRM'S BOOK VALUE (BV), SIZE FACTOR (MV), AND VALUE FACTOR (BV/MV)

	R	MRP	BV	SIZE	VALUE
Mean	-2.253555	-2.167764	697.5044	965.7174	0.951708
Median	-3.420000	-2.120659	162.9444	106.3450	1.399737
Maximum	990.5300	9.196090	46607.34	76466.00	209.5959
Minimum	-100.4368	-13.98669	-10879.67	0.000000	-1160.006
Std. Dev.	14.05130	4.461491	2421.658	4161.012	23.93934
Skewness	7.407155	0.035602	8.482808	8.670917	-33.84647
Kurtosis	339.8640	3.274294	99.54525	94.20854	1377.111
Jarque-Bera	3.91E+08	0.401536	37090038	33272183	6.53E+09
Probability	0.000000	0.818102	0.000000	0.000000	0.000000
Sum	-185956.6	-260.1316	64616812	89464059	78749.99
Sum Sq. Dev.	16291879	2368.683	5.43E+11	1.60E+12	47420499
Observations	82517	120	92640	92640	82746

APPENDIX C

EVIEWS RESULT- EFFECTS OF INFLATION ON STOCK RETURNS: SYMMETRIC MODELS (MODEL 1)

Dependent Variable: D(R)
Method: Panel Least Squares
Date: 03/22/13 Time: 23:34
Sample (adjusted): 2003M02 2012M12
Periods included: 119
Cross-sections included: 772
Total panel (unbalanced) observations: 81745

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.007023	0.071382	-0.098386	0.9216
EI	-1.219689	0.089991	-13.55342	0.0000
UI	-1.193341	0.080141	-14.89045	0.0000

R-squared	0.002736	Mean dependent var	-0.020339
Adjusted R-squared	0.002712	S.D. dependent var	20.39010
S.E. of regression	20.36243	Akaike info criterion	8.865297
Sum squared resid	33892580	Schwarz criterion	8.865639
Log likelihood	-362343.9	Hannan-Quinn criter.	8.865402
F-statistic	112.1440	Durbin-Watson stat	3.059109
Prob(F-statistic)	0.000000		

Notes:

EI = Expected changes in inflation (π_t^e)

UI = Unexpected changes in inflation (π_t^u)

APPENDIX D

EVIEWS RESULT- EFFECTS OF INFLATION ON STOCK RETURNS: SYMMETRIC MODELS (MODEL 2)

Dependent Variable: D(R)
Method: Panel Least Squares
Date: 03/22/13 Time: 23:34
Sample (adjusted): 2003M02 2012M12
Periods included: 119
Cross-sections included: 772
Total panel (unbalanced) observations: 81745

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.013310	0.068784	-0.193504	0.8466
D(MRP)	0.945923	0.011925	79.32586	0.0000
EI	0.411084	0.089119	4.612728	0.0000
UI	0.236891	0.079301	2.987223	0.0028

R-squared	0.074020	Mean dependent var	-0.020339
Adjusted R-squared	0.073986	S.D. dependent var	20.39010
S.E. of regression	19.62131	Akaike info criterion	8.791159
Sum squared resid	31469957	Schwarz criterion	8.791615
Log likelihood	-359312.6	Hannan-Quinn criter.	8.791298
F-statistic	2178.048	Durbin-Watson stat	3.067994
Prob(F-statistic)	0.000000		

Notes:

EI = Expected changes in inflation (π_t^e)

UI = Unexpected changes in inflation (π_t^u)

D (MRP) = represent the market risk premium at time t

APPENDIX E

EVIEWS RESULT- EFFECTS OF INFLATION ON STOCK RETURNS: SYMMETRIC MODELS (MODEL 3)

Dependent Variable: D(R)
Method: Panel Least Squares
Date: 03/22/13 Time: 23:34
Sample (adjusted): 2003M02 2012M12
Periods included: 119
Cross-sections included: 772
Total panel (unbalanced) observations: 81745

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.051073	0.068560	-0.744929	0.4563
D(MRP)	0.923472	0.011919	77.47945	0.0000
D(SIZE)	0.004653	0.000198	23.51512	0.0000
D(VALUE)	-0.068185	0.011969	-5.696938	0.0000
EI	0.385292	0.088810	4.338363	0.0000
UI	0.243510	0.079024	3.081488	0.0021

R-squared	0.080625	Mean dependent var	-0.020339
Adjusted R-squared	0.080569	S.D. dependent var	20.39010
S.E. of regression	19.55145	Akaike info criterion	8.784049
Sum squared resid	31245473	Schwarz criterion	8.784732
Log likelihood	-359020.0	Hannan-Quinn criter.	8.784258
F-statistic	1433.637	Durbin-Watson stat	3.060443
Prob(F-statistic)	0.000000		

Notes:

EI = Expected changes in inflation (π_t^e)

UI = Unexpected changes in inflation (π_t^u)

D (MRP) = represent the market risk premium at time t

D (SIZE) = represent the size premium at time t

D (VALUE) = represent the value premium at time t

APPENDIX F

EVIEWS RESULT- EFFECTS OF INFLATION ON STOCK RETURNS: ASYMMETRIC MODELS (MODEL 4)

Dependent Variable: D(R)
Method: Panel Least Squares
Date: 03/22/13 Time: 23:34
Sample (adjusted): 2003M02 2012M12
Periods included: 119
Cross-sections included: 772
Total panel (unbalanced) observations: 81745

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.637107	0.169551	-3.757614	0.0002
D(MRP)	0.909699	0.011681	77.87855	0.0000
D(SIZE)	0.004645	0.000198	23.48742	0.0000
D(VALUE)	-0.068450	0.011964	-5.721418	0.0000
IIN*DPEI	1.484862	0.191311	7.761487	0.0000
IDE*DNEI	0.340763	0.192262	1.772384	0.0763
IIN*DPUI	-0.098316	0.203935	-0.482094	0.6297
IDE*DNUI	0.142205	0.199936	0.711252	0.4769

R-squared	0.081321	Mean dependent var	-0.020339
Adjusted R-squared	0.081242	S.D. dependent var	20.39010
S.E. of regression	19.54429	Akaike info criterion	8.783341
Sum squared resid	31221833	Schwarz criterion	8.784252
Log likelihood	-358989.1	Hannan-Quinn criter.	8.783620
F-statistic	1033.618	Durbin-Watson stat	3.059493
Prob(F-statistic)	0.000000		

Notes:

D (MRP) = represent the market risk premium at time t

D (SIZE) = represent the size premium at time t

D (VALUE) = represent the value premium at time t

IIN*DPEI = represents the vector that involves the value of the expected inflation, when inflation is positive and a zero otherwise ($\pi_t^{e,+}$)

IDE*DNEI = represents the vector that involves the value of the expected inflation, when inflation is negative and a zero otherwise ($\pi_t^{e,-}$)

IIN*DPUI = represents the vector that involves the value of the unexpected inflation, when inflation is positive and a zero otherwise ($\pi_t^{u,+}$)

IDE*DNUI = represents the vector that involves the value of the unexpected inflation, when inflation is negative and a zero otherwise ($\pi_t^{u,-}$)

APPENDIX G

EVIEWS RESULT- SYMMETRIC RESPONSE OF CHANGES IN STOCK RETURNS TO CHANGES IN INFLATION DURING DIFFERENT MONETARY ENVIRONMENT (MODEL 5)

Dependent Variable: D(R)
Method: Panel Least Squares
Date: 03/22/13 Time: 23:34
Sample (adjusted): 2003M02 2012M12
Periods included: 119
Cross-sections included: 772
Total panel (unbalanced) observations: 81745

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.022698	0.068866	-0.329594	0.7417
DEXPAND*D(MRP)	0.962838	0.029481	32.65969	0.0000
DEXPAND*D(SIZE)	0.004692	0.000521	9.012513	0.0000
DEXPAND*D(VALUE)	-2.574401	0.089467	-28.77489	0.0000
DEXPAND*EI	1.417884	0.195216	7.263150	0.0000
DEXPAND*UI	1.013794	0.161209	6.288714	0.0000
DTIGHT*D(MRP)	0.937849	0.013361	70.19457	0.0000
DTIGHT*D(SIZE)	0.004562	0.000213	21.44958	0.0000
DTIGHT*D(VALUE)	-0.023133	0.012014	-1.925587	0.0542
DTIGHT*EI	-0.044729	0.105060	-0.425752	0.6703
DTIGHT*UI	-0.135107	0.096367	-1.402010	0.1609

R-squared	0.090194	Mean dependent var	-0.020339
Adjusted R-squared	0.090083	S.D. dependent var	20.39010
S.E. of regression	19.45003	Akaike info criterion	8.773709
Sum squared resid	30920266	Schwarz criterion	8.774962
Log likelihood	-358592.4	Hannan-Quinn criter.	8.774092
F-statistic	810.2777	Durbin-Watson stat	3.050941
Prob(F-statistic)	0.000000		

Notes:

DEXPAND*D (MRP) = represent the market risk premium at time t, *during monetary loosening period*

DEXPAND*D (SIZE) = represent the size premium at time t, *during monetary loosening period*

DEXPAND*D (VALUE) = represent the value premium at time t, *during monetary loosening period*

DEXPAND*EI = Expected changes in inflation (π_t^e), *during monetary loosening period*

DEXPAND*UI = Unexpected changes in inflation (π_t^u), *during monetary loosening period*

DTIGHT*D (MRP) = represent the market risk premium at time t, *during monetary tightening period*

DTIGHT*D (SIZE) = represent the size premium at time t, *during monetary tightening period*

DTIGHT*D (VALUE) = represent the value premium at time t, *during monetary tightening period*

DTIGHT*EI = Expected changes in inflation (π_t^e), *during monetary tightening period*

DTIGHT*UI = Unexpected changes in inflation (π_t^u), *during monetary tightening period*

APPENDIX H

EVIEWS RESULT- ASYMMETRIC RESPONSE OF CHANGES IN STOCK RETURNS TO CHANGES IN INFLATION DURING DIFFERENT MONETARY ENVIRONMENT (MODEL 6)

Dependent Variable: D(R)
Method: Panel Least Squares
Date: 03/22/13 Time: 23:34
Sample (adjusted): 2003M02 2012M12
Periods included: 119
Cross-sections included: 772
Total panel (unbalanced) observations: 81745

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.637672	0.172901	-3.688069	0.0002
DEXPAND*D(MRP)	1.049820	0.029338	35.78400	0.0000
DEXPAND*D(SIZE)	0.004655	0.000521	8.927836	0.0000
DEXPAND*D(VALUE)	-2.537521	0.089418	-28.37812	0.0000
DEXPAND*IIN*DPEI	5.319891	0.478319	11.12206	0.0000
DEXPAND*IDE*DNEI	1.633654	0.539927	3.025693	0.0025
DEXPAND*IIN*DPUI	1.320998	0.423346	3.120371	0.0018
DEXPAND*IDE*DNUI	-3.401463	0.413106	-8.233866	0.0000
DTIGHT*D(MRP)	0.939067	0.013522	69.44791	0.0000
DTIGHT*D(SIZE)	0.004561	0.000212	21.48114	0.0000
DTIGHT*D(VALUE)	-0.022964	0.011999	-1.913842	0.0556
DTIGHT*IIN*DPEI	1.170789	0.198447	5.899746	0.0000
DTIGHT*IDE*DNEI	0.078173	0.197675	0.395462	0.6925
DTIGHT*IIN*DPUI	-0.168130	0.214252	-0.784732	0.4326
DTIGHT*IDE*DNUI	0.959062	0.211835	4.527405	0.0000

R-squared	0.092379	Mean dependent var	-0.020339
Adjusted R-squared	0.092223	S.D. dependent var	20.39010
S.E. of regression	19.42714	Akaike info criterion	8.771403
Sum squared resid	30846035	Schwarz criterion	8.773112
Log likelihood	-358494.2	Hannan-Quinn criter.	8.771926
F-statistic	594.1830	Durbin-Watson stat	3.048826
Prob(F-statistic)	0.000000		

Notes:

DEXPAND*D (MRP) = represent the market risk premium at time t, *during monetary loosening period*

DEXPAND*D (SIZE) = represent the size premium at time t, *during monetary loosening period*

DEXPAND*D (VALUE) = represent the value premium at time t, *during monetary loosening period*

DEXPAND*IIN*DPEI = represents the vector that involves the value of the expected inflation, when inflation is positive and a zero otherwise ($\pi_t^{e,+}$), *during monetary loosening period*

DEXPAND*IDE*DNEI = represents the vector that involves the value of the expected inflation, when inflation is negative and a zero otherwise ($\pi_t^{e,-}$), *during monetary loosening period*

DEXPAND*IIN*DPUI = represents the vector that involves the value of the unexpected inflation, when inflation is positive and a zero otherwise ($\pi_t^{u,+}$), *during monetary loosening period*

DEXPAND*IDE*DNUI = represents the vector that involves the value of the unexpected inflation, when inflation is negative and a zero otherwise ($\pi_t^{u,-}$),*during monetary loosening period*

DTIGHT*D (MRP) = represent the market risk premium at time t, *during monetary tightening period*

DTIGHT*D (SIZE) = represent the size premium at time t, *during monetary tightening period*

DTIGHT*D (VALUE) = represent the value premium at time t, *during monetary tightening period*

DTIGHT*IIN*DPEI = represents the vector that involves the value of the expected inflation, when inflation is positive and a zero otherwise ($\pi_t^{e,+}$), *during monetary tightening period*

DTIGHT*IDE*DNEI = represents the vector that involves the value of the expected inflation, when inflation is negative and a zero otherwise ($\pi_t^{e,-}$), *during monetary tightening period*

DTIGHT*IIN*DPUI = represents the vector that involves the value of the unexpected inflation, when inflation is positive and a zero otherwise ($\pi_t^{u,+}$), *during monetary tightening period*

DTIGHT*IDE*DNUI = represents the vector that involves the value of the unexpected inflation, when inflation is negative and a zero otherwise ($\pi_t^{u,-}$), *during monetary tightening period*

APPENDIX I

NAME LIST OF THE FIRMS (LISTED AT KLSE MAIN BOARD) SELECTED FOR THE STUDY

ID	Company Name	ID	Company Name
001	A & M REALTY BERHAD	041	ASAS DUNIA BHD.
002	A-RANK BHD.	042	ASIA FILE CORP.BHD.
003	ABLEGROUP BERHAD	043	ASIA KNIGHT BHD.
004	ABRIC BHD.	044	ASIAN PAC HOLDINGS BHD.
005	ACOUSTECH BHD.	045	ASTINO BHD.
006	ADVANCE SYNERGY BHD.	046	ASTRAL ASIA BHD.
007	ADVD.PACK.TECH.(M) BHD.	047	ASTRAL SUPREME BHD.
008	AE MULTI HOLDINGS BHD.	048	ATLAN HOLDINGS BHD.
009	AEON CO.(M) BHD.	049	ATRIUM REIT.TRUST
010	AEON CREDIT SER.(M) BHD.	050	ATURMAJU RESOURCES BHD.
011	AFFIN HOLDINGS BHD.	051	AUTOAIR HOLDINGS BHD.
012	AHB HOLDINGS BERHAD	052	AWC BERHAD
013	AHMAD ZAKI RES.BHD.	053	AXIATA GROUP BERHAD
014	AIRASIA BHD.	054	AXIS REAL EST.INV.TST.
015	AJINOMOTO(MALAYSIA) BHD.	055	AYS VENTURES BHD.
016	AJIYA BHD.	056	BATU KAWAN BHD.
017	AL-AKQAR HEALTHCARE REIT	057	BCB BHD.
018	AL-HADHARAH BOUS.REIT	058	BENALEC HOLDINGS BHD.
019	ALAM MARITIM RES.BHD.	059	BERJAYA CORP.BERHAD
020	ALIRAN IHSAN RES.BHD.	060	BERJAYA ASSETS BERHAD
021	ALLIANCE FINL.GP.BHD.	061	BERJAYA FOOD BHD.
022	ALLIANZ MALAYSIA BERHAD	062	BERJAYA LAND BHD.
023	ALUMINIUM CO.OF MAL.BHD.	063	BERJAYA MEDIA BHD.
024	AMAL.INDL.STEEL BHD.	064	BERJAYA SPORTS TOTO BHD.
025	AMANAH HARTA TANAH PNB	065	BERTAM ALLIANCE BHD.
026	AMANAHRAYA REIT.TST.	066	BHS INDUSTRIES BERHAD
027	AMCORP PROPERTIES BHD.	067	BIG INDUSTRIES BHD.
028	AMFIRST REIT.TST.	068	BIMB HOLDINGS BHD.
029	AMMB HOLDINGS BHD.	069	BINA DARULAMAN BHD.
030	AMTEK HOLDINGS BHD.	070	BINA PURI HOLDINGS BHD.
031	AMTEL HOLDINGS BHD.	071	BINTAI KINDEN CORP.BHD.
032	AMWAY (MAL.) HDG.BHD.	072	BINTULU PORT HDG.BHD.
033	ANALABS RESOURCES BHD.	073	BIO OSMO BERHAD
034	ANCOM BHD.	074	BIOSIS GROUP BERHAD
035	ANN JOO RESOURCES BHD.	075	BLD PLANTATION BHD.
036	APEX EQUITY HDG.BHD.	076	BOLTON BERHAD
037	APEX HEALTHCARE BHD.	077	BONIA CORPORATION BHD.
038	APFT BHD.	078	BOON KOON GROUP BHD.
039	APM AUTOMOTIVE HDG.BHD.	079	BORNEO OIL BERHAD
040	APOLLO FOOD HDG.BHD.	080	BOUS.HVY.INDS.CORP.BHD.

ID	Company Name
081	BOUSTEAD HOLDINGS BHD.
082	BOX-PAK (MALAYSIA) BHD.
083	BP PLASTICS HOLDING BHD.
084	BRAHIM'S HOLDINGS BHD.
085	BREM HOLDINGS BHD.
086	BRIGHT PACK.IND.BHD.
087	BATOB.(MALAYSIA) BERHAD
088	BSL CORPORATION BHD.
089	BUMI ARMADA BHD.
090	BURSA MALAYSIA BHD.
091	CAB CAKARAN CORP.BHD.
092	CAELY HOLDINGS BHD.
093	CAHYA MATA SARAWAK BHD.
094	CAM RESOURCES BHD.
095	CAN-ONE BHD.
096	CAPITAMALLS MAL.TRUST
097	CARLSBERG BREW.MAL.BHD.
098	CB INDL.PRODUCT HDG.BHD.
099	CBSA BERHAD
100	CCK CONS.HDG.BHD.
101	CCM DUOPH.BIOTECH BHD.
102	CENSOF HOLDINGS BERHAD
103	CENTRAL INDL.CORP.BHD.
104	CENTURY BOND BHD.
105	CENTURY LOGIST.HDG.BHD.
106	CEPATWAWASAN GROUP BHD.
107	CHEE WAH CORP.BHD.
108	CHEETAH HOLDINGS BHD.
109	CHEMICAL CO.OF MAL.BHD.
110	CHIN TECK PLTNS.BHD.
111	CHIN WELL HOLDINGS BHD.
112	CHINA OUHUA WINERY HDG.
113	CHOO BEE METAL INDS.BHD.
114	CHUAN HUAT RES.BHD.
115	CI HOLDINGS BHD.
116	CIMB GROUP HOLDINGS BHD.
117	CLASSIC SCENIC BHD.
118	CME GROUP BHD.
119	CN ASIA CORPORATION BHD.
120	CNI HOLDINGS BHD.
121	COASTAL CONTRACTS BHD.
122	COCOALAND HOLDINGS BHD.
123	COMINTEL CORP.BHD.
124	COMPLETE LGST.SVS.BHD.
125	COMPUGATES HOLDINGS BHD.
126	CMP.FORMS (MAL.)BHD.
127	CONCRETE ENGR.PRDS.BHD.
128	COUNTRY HEIGHTS HDG.BHD.
129	COUNTRY VIEW BHD.
130	CRESCENDO CORP.BHD.
131	CREST BUILDER HDG.BHD.
132	CSC STEEL HOLDINGS BHD.
133	CYC.& CARR.BINTANG BHD.
134	CYL CORPORATION BHD.
135	CYMAO HOLDINGS BHD.
136	CYPARK RESOURCES BHD.
137	D & O GREEN TECHS.BHD.
138	D'NONCE TECHNOLOGY BHD.
139	DAIBOCHI PLT&PKG.IND.BHD
140	DAIMAN DEVELOPMENT BHD.
141	DAMANSARA REALTY BHD.
142	DATAPREP HOLDINGS BHD.
143	DAYA MATERIALS BHD.
144	DAYANG ENTER.HDG.BHD.
145	DBE GURNEY RES.BHD.
146	DEGEM BHD.
147	DELEUM BERHAD
148	DELLOYD VENTURES BHD.
149	DENKO INDL.CORP.BHD.
150	DIALOG GROUP BHD.
151	DIGI.COM BHD.
152	DIGISTAR CORP.BHD.
153	DIJAYA CORPORATION BHD.
154	DKLS INDUSTRIES BHD.
155	DKSH HDG.(MALAYSIA) BHD.
156	DOLOMITE CORP.BHD.
157	DOMINANT ENTERPRISE BHD.
158	DPS RESOURCES BHD.
159	DRB-HICOM BHD.
160	DUFU TECH.CORP.BHD.

ID	Company Name
161	DUTALAND BERHAD
162	DU.LADY MILK INDS.BHD.
163	EASTERN & ORIENTAL BHD.
164	EASTLAND EQUITY BHD.
165	ECOFIRST CONS.BHD.
166	ECS ICT BERHAD
167	EDARAN BERHAD
168	EDEN INC BERHAD
169	EFFICIENT E-SLTN. BHD.
170	EG INDUSTRIES BHD.
171	EKOVEST BHD.
172	EKOWOOD INTL.BHD.
173	EKSONS CORPORATION BHD.
174	EMAS KIARA INDS.BHD.
175	EMICO HOLDINGS BHD.
176	ENCORP BHD.
177	ENG KAH CORPORATION BHD.
178	ENGTEX GROUP BHD.
179	EONMETALL GROUP BHD.
180	EP MANUFACTURING BHD.
181	ESTHETICS INTL.GP.BHD.
182	ETI TECH CORP.BHD.
183	EUPE CORPORATION BHD.
184	EURO HOLDINGS BHD.
185	EUROSPAN HOLDINGS BHD.
186	EVERGREEN FIBRD.BHD.
187	EVERSENDAI CORP.BHD.
188	EWEIN BERHAD
189	EXCEL FORCE MSC BHD.
190	FABER GROUP BHD.
191	FACB INDS.INCO.BHD.
192	FAJARBARU BLR.GROUP BHD.
193	FAR EAST HOLDINGS BHD.
194	FARLIM GROUP (MAL.) BHD.
195	FARM'S BEST BHD.
196	FAVELLE FAVCO BHD.
197	FCW HOLDINGS BHD.
198	FED.FRTR.HDG.(M) BERHAD
199	FIAMMA HOLDINGS BHD.
200	FIBON BERHAD
201	FIMA CORPORATION BHD.
202	FITTERS DIVERSIFIED BHD.
203	FOCAL AIMS HOLDINGS BHD.
204	FOCUS LUMBER BHD.
205	FORMIS RESOURCES BHD.
206	FORMOSA PSC.INDS.BERHAD
207	FRASER & NEAVE HDG.BHD.
208	FREIGHT MAN.HDG.BHD.
209	FRONTKEN CORP.BHD.
210	FSBM HOLDINGS BERHAD
211	FURNIWEB INDL.PRDS.BHD.
212	FUTUTECH BHD.
213	GADANG HOLDINGS BERHAD
214	GAMUDA BHD.
215	GE-SHEN CORP.BERHAD
216	GENTING BERHAD
217	GENTING MALAYSIA BHD.
218	GENTING PLANTATIONS BHD.
219	GEORGE KENT (MAL.) BHD.
220	GHL SYSTEMS BHD.
221	GLOBAL ORIENTAL BHD.
222	GLOBETRONICS TECH.BHD.
223	GLOMAC BHD.
224	GOH BAN HUAT BHD.
225	GOLDEN LAND BERHAD
226	GOLDEN PHAROS BHD.
227	GOLDIS BHD.
228	GOLSTA SYNERGY BHD.
229	GOODWAY INTEG.INDS.BHD.
230	GOPENG BHD.
231	GPA HOLDINGS BHD.
232	GRAND CENTRAL ENTS.BHD.
233	GRAND HOOVER BHD.
234	GRAND-FLO SOLUTION BHD.
235	GREEN PACKET BHD.
236	GREENYIELD BERHAD
237	GROMUTUAL BHD.
238	GSB GROUP BERHAD
239	GUAN CHONG BHD.
240	GUH HOLDINGS BHD.

ID	Company Name
241	GUINNESS ANCHOR BERHAD
242	GUNUNG CAPITAL BHD.
243	GUOCOLAND (MAL.)BHD.
244	HAI-O ENTERPRISE BHD.
245	HALEX HOLDINGS BERHAD
246	HANDAL RESOURCES BERHAD
247	HAP SENG CONS.BHD.
248	HAP SENG PLTNS.HDG.BHD.
249	HARBOUR-LINK GROUP BHD.
250	HARN LEN CORP.BHD.
251	HARRISONS HDG.(MAL.) BHD
252	HARTALEGA HOLDINGS BHD.
253	HARVEST COURT INDS.BHD.
254	HB GLOBAL LTD.
255	HEITECH PADU BHD.
256	HEKTAR REIT
257	HELP INTL.CORP.BERHAD
258	HEVEABOARD BHD.
259	HEXZA CORPORATION BHD.
260	HIAP TECK VENTURE BHD.
261	HIBISCUS PETROLEUM BHD.
262	HIL INDUSTRIES BHD.
263	HING YIAP GROUP BERHAD
264	HO WAH GENTING BHD.
265	HOCK HENG STONE INDS.BHD
266	HOCK SENG LEE BERHAD
267	HOMERITZ CORP.BHD.
268	HONG LEONG BANK BHD.
269	HONG LEONG CAPITAL BHD.
270	HONG LEONG FINL.GP.BHD.
271	HONG LEONG INDS.BHD.
272	HOVID BHD.
273	HUA YANG BHD.
274	HUAT LAI RESOURCES BHD.
275	HUBLINE BHD.
276	HUNZA PROPERTIES BHD.
277	HUP SENG INDUSTRIES BHD.
278	HWA TAI INDUSTRIES BHD.
279	HWANG-DBS (MAL.) BHD.
280	HYTEX INTEGRATED BHD.
281	I-BERHAD
282	IBRACO BHD.
283	IGB CORPORATION BHD.
284	IJM CORPORATION BHD.
285	IJM LAND BERHAD
286	IJM PLANTATIONS BHD.
287	IMASPRO CORPORATION BHD.
288	INDUSTRONICS BHD.
289	INGRESS CORPORATION BHD.
290	INNOPRISE PLTNS.BERHAD
291	INSAS BHD.
292	INTEG.LOGISTICS BERHAD
293	INTEGRAX BHD.
294	IOI CORPORATION BHD.
295	IPMUDA BHD.
296	IQ GROUP HOLDINGS BHD.
297	IRE-TEX CORPORATION BHD.
298	IREKA CORP. BHD.
299	IRM GROUP BHD.
300	IVORY PROPERTIES GP.BHD.
301	JADI IMAGING HDG.BHD.
302	JAKS RESOURCES BHD.
303	JASA KITA BHD.
304	JAVA BERHAD
305	JAYA TIASA HOLDINGS BHD.
306	JAYCORP BHD.
307	JCY INTERNATIONAL BHD.
308	JERASIA CAPITAL BHD.
309	JMR CONGLOMERATION BHD.
310	JOBSTREET CORP.BERHAD
311	JOHAN HOLDINGS BHD.
312	JOHORE TIN BHD.
313	JT INTERNATIONAL BERHAD
314	K & N KENANGA HDG.BHD.
315	K SENG SENG CORP.BHD.
316	K-STAR SPORTS LTD.
317	KAF-SEAGROATT & CAMP.BHD
318	KAMDAR GROUP (M)BERHAD
319	KARAMBUNAI CORP.BHD.
320	KAWAN FOOD BHD.

ID	Company Name
321	KBB RESOURCES BHD.
322	KBES BHD.
323	KECK SENG (MAL.) BERHAD
324	KEIN HING INTL.BHD.
325	KEJURUTERAAN SMD.TIMUR
326	KELADI MAJU BHD.
327	KELINGTON GROUP BERHAD
328	KEN HOLDINGS BHD.
329	KESM INDUSTRIES BHD.
330	KEY ASIC BERHAD
331	KFC HOLDINGS (MAL.)BHD.
332	KHEE SAN BHD.
333	KHIND HOLDINGS BHD.
334	KIA LIM BHD.
335	KIAN JOO CAN FAC.BHD.
336	KIM HIN INDUSTRY BERHAD
337	KIM LOONG RESOURCES BHD.
338	KIMLUN CORP.BERHAD
339	KINSTEEL BHD.
340	KKB ENGINEERING BHD.
341	KLCC PROPERTY HDG.BHD.
342	KLUANG RUB.CO.(M) BHD.
343	KNM GROUP BHD.
344	KNUSFORD BHD.
345	KOBAY TECHNOLOGY BHD.
346	KOMARKCORP BHD.
347	KONSORTIUM LOGISTIK BHD.
348	KONSR.TRANSNASIONAL BHD.
349	KOSSAN RUBBER INDS.BHD.
350	KOTRA INDUSTRIES BHD.
351	KPJ HEALTHCARE BHD.
352	KPS CONSORTIUM BHD.
353	KRETAM HOLDINGS BHD.
354	KRISASSETS HOLDINGS BHD.
355	KSK GROUP BHD.
356	KSL HOLDINGS BHD.
357	KUALA LUMPUR KEPONG BHD.
358	KUANTAN FLOUR MILLS BHD.
359	KUB MALAYSIA BHD.
360	KUCHAI DEVELOPMENT BHD.
361	KULIM (MALAYSIA) BERHAD
362	KUMPULAN EUROPLUS BHD.
363	KUMPULAN FIMA BHD.
364	KUMPULAN H&L HI.TECH BHD
365	KUMPULAN HARTANAH SLGR.
366	KUMPULAN JETSON BHD.
367	KUMPULAN PRSNG.SLGR.BHD.
368	KUMPULAN POWERNET BHD.
369	KWANTAS CORPORATION BHD.
370	KYM HOLDINGS BHD.
371	LAFARGE MALAYAN CMT.BHD.
372	LAND & GENERAL BHD.
373	LANDMARKS BHD.
374	LATEXX PARTNERS BHD.
375	LATITUDE TREE HDG.BHD.
376	LAY HONG BHD.
377	LB ALUMINIUM BHD.
378	LBI CAPITAL BHD.
379	LBS BINA GROUP BHD.
380	LCTH CORPORATION BHD.
381	LEADER STEEL HDG.BHD.
382	LEBTECH BERHAD
383	LEE SWEE KIAT GROUP BHD.
384	LEN CHEONG HOLDING BHD.
385	LEWEKO RESOURCES BHD.
386	LIEN HOE CORP.BHD.
387	LII HEN INDS.BHD.
388	LNGK.TRANS KOTA HDG.BHD.
389	LINGUI DEVELOPMENTS BHD.
390	LION CORPORATION BHD.
391	LION DIVR.HDG.BHD.
392	LION FOREST INDS. BHD.
393	LION INDS.CORP.BHD.
394	LONDON BISCUITS BHD.
395	LPI CAPITAL BHD.
396	LTKM BHD.
397	LUXCHEM CORPORATION BHD.
398	LYSAGHT GALVANIZED STEEL
399	MAGNA PRIMA BHD.
400	MAGNI-TECH INDS.BHD.

ID	Company Name
401	MAH SING GROUP BHD.
402	MAJOR TEAM HOLDINGS BHD.
403	MAJUPERAK HOLDINGS BHD.
404	MALAYAN BANKING BERHAD
405	MALAYAN FLOUR MILLS BHD.
406	MALAYAN UNITED INDS.BHD.
407	MALAYSIA AICA BHD.
408	MALAYSIA AIRPS.HDG.BHD.
409	MAL.BUILDING SOC.BHD.
410	MALAYSIA MAR.& HVY.ENGR.
411	MALAYSIA PAC. CORP. BHD.
412	MALAYSIA PACK.IND.BHD.
413	MALAYSIA SMELT.CORP.BHD.
414	MAL.STL.WKS.(KL) BERHAD
415	MLAYSN.AE MODELS HDG.BHD
416	MALAYSIAN ALN.SY.BHD.
417	MALAYSIAN BULK CRRS.BHD.
418	MALAYSIAN PAC.INDS.BHD.
419	MALAYSIAN RES.CORP.BHD.
420	MALPAC HOLDINGS BHD.
421	MALTON BHD.
422	MANULIFE HOLDINGS BERHAD
423	MARCO HOLDINGS BHD.
424	MASTER-PACK GROUP BERHAD
425	MASTERSKILL ED.GP.BHD
426	MAXIS BERHAD
427	MAXWELL INTL.HDG.BHD.
428	MBF HOLDINGS BHD.
429	MBM RESOURCES BHD.
430	MEDA INCORPORATED BERHAD
431	MEDIA PRIMA BHD.
432	MEGA FIRST CORP.BHD.
433	MELATI EHSAN HDG.BHD.
434	MELEWAR INDL.GP.BHD.
435	MENANG CORP.(M) BERHAD
436	MERCURY INDUSTRIES BHD.
437	MERGE ENERGY BHD.
438	MESB BHD.
439	MESINIAGA BHD.
440	METAL RECLAMATION BHD.
441	METROD HOLDINGS BHD.
442	METRONIC GLOBAL BHD.
443	MHC PLANTATIONS BHD.
444	MIECO CHIPBOARD BHD.
445	MILUX CORP.BHD.
446	MINETECH RESOURCES BHD.
447	MINHO (M) BERHAD
448	MINTYE INDUSTRIES BHD.
449	MISC BERHAD
450	MITRAJAYA HOLDINGS BHD.
451	MK LAND HOLDINGS BHD.
452	MKH BERHAD
453	MMC CORPORATION BHD.
454	MNRB HOLDINGS BHD.
455	MSM MALAYSIA HDG.BHD.
456	MTD ACPI ENGR.BERHAD
457	MUAR BAN LEE GROUP BHD.
458	MUDA HOLDINGS BHD.
459	MUDAJAYA GROUP BHD.
460	MUHIBBAH ENGR.(M) BHD.
461	MUI PROPERTIES BHD.
462	MULPHA INTL.BHD.
463	MULPHA LAND BHD.
464	MULTI SPORTS HLTD.
465	MULTI-PURPOSE HDG.BHD.
466	MULTI-USAGE HDG.BHD.
467	MULTICODE ELTN.INDS.BHD.
468	MWE HOLDINGS BHD.
469	MY EG SERVICES BERHAD
470	MYCRON STEEL BHD.
471	NADAYU PROPERTIES BHD.
472	NAGAMAS INTL.BERHAD
473	NAIM HOLDINGS BERHAD
474	NAIM INDAH CORP. BHD.
475	NAKAMICHI CORP.BHD.
476	NARRA INDUSTRIES BHD.
477	NWIDE.EXPR.COURIER SVS.
478	NCB HOLDINGS BHD.
479	NEGRI SEMBILAN OIL PALMS
480	NESTLE (MALAYSIA) BHD.

ID	Company Name
481	NEW HOONG FATT HDG.BHD.
482	NI HSIN RESOURCES BHD.
483	NICHE CAP.EMAS HDG.BHD.
484	THE NOMAD GROUP BERHAD
485	NOTION VTEC BHD.
486	NPC RESOURCES BHD.
487	NTPM HOLDINGS BHD.
488	NWP HOLDINGS BHD.
489	NYLEX (MALAYSIA) BHD.
490	OCB BHD.
491	OGAWA WORLD BERHAD
492	OKA CORP.BHD.
493	OLDTOWN BHD.
494	OLYMPIA INDUSTRIES BHD.
495	ORNTL.FOOD INDS.HDG.BHD.
496	ORIENTAL HOLDINGS BHD.
497	ORIENTAL INTEREST BHD.
498	ORNAPAPER BHD.
499	OSK HOLDINGS BHD.
500	OSK PROPERTY HDG.BHD.
501	PA RESOURCES BHD.
502	PACIFIC & ORIENT BHD.
503	PADIBERAS NASIONAL BHD.
504	PADINI HOLDINGS BHD.
505	PAN MALAYSIA CORP.BHD.
506	PAN MALAYSIA HDG.BHD.
507	PAN MALAYSIAN INDS.BHD.
508	PANASONIC MNFG.MAL.BHD.
509	PANSAR BHD.
510	PANTECH GROUP HDG.BERHAD
511	PAOS HOLDINGS BHD.
512	PARAGON UNION BHD.
513	PARAMOUNT CORP.BHD.
514	PARKSON HOLDINGS BERHAD
515	PASDEC HOLDINGS BHD.
516	PBA HOLDINGS BHD.
517	PCCS GROUP BHD.
518	PDZ HOLDINGS BHD.
519	PELANGI PBL.GP.BHD.
520	PELIKAN INTL.CORP.BHD.
521	PENSONIC HOLDINGS BHD.
522	PENTAMASTER CORP.BHD.
523	PERAK CORPORATION BHD.
524	PERDANA PETROLEUM BHD.
525	PERDUREN (M) BHD.
526	PERISAI PTL.TEK.BHD.
527	PERMAJU INDUSTRIES BHD.
528	PERSTIMA.MAL.(PERSTIMA)
529	PERWAJA HOLDINGS BERHAD
530	PESONA METRO HDG.BERHAD
531	PETALING TIN BHD.
532	PETRA ENERGY BERHAD
533	PETRON MAL.REFN.& MKTG.
534	PETRONAS CHEMS.GP.BHD.
535	PETRONAS DAGANGAN BHD.
536	PETRONAS GAS BHD.
537	PFCE BERHAD
538	PHARMANIAGA BHD.
539	PIE INDUSTRIAL BHD.
540	PINEHILL PACIFIC BHD.
541	PINTARAS JAYA BHD.
542	PJ DEVELOPMENT HDG.BHD.
543	PJBUMI BHD.
544	PJI HOLDINGS BERHAD
545	PLB ENGINEERING BHD.
546	PLENITUDE BHD.
547	PLS PLANTATIONS BERHAD
548	PMB TECHNOLOGY BHD.
549	PNE PCB BHD.
550	POH HUAT RES.HDG.BHD.
551	POH KONG HOLDINGS BERHAD
552	POLY GLSS.FIBRE (M) BHD.
553	POS MALAYSIA BERHAD
554	POWER ROOT BHD.
555	PPB GROUP BHD.
556	PREMIUM NALFIN BHD.
557	PRESS METAL BHD.
558	PRESTAR RESOURCES BHD.
559	PRESTARIANG BHD.
560	PRICEWORTH INTL.BERHAD

ID	Company Name
561	PRINSIPTEK CORP.BHD.
562	PROGV.IMPACT CORP.BERHAD
563	PROLEXUS BHD.
564	PROTASCO BHD.
565	THE PUBLIC BANK BERHAD
566	PUBLIC PACKAGES HDG.BHD.
567	PUNCAK NIAGA HDG.BHD.
568	PW CONSOLIDATED BERHAD
569	QL RESOURCES BHD.
570	QSR BRANDS BHD.
571	QUALITY CONC.HDG.BHD.
572	QUILL CAPITA TRUST
573	RALCO CORPORATION BHD.
574	RAPID SYNERGY BHD.
575	RCE CAPITAL BHD.
576	RELIANCE PACIFIC BHD.
577	RESINTECH BERHAD
578	REX INDUSTRY BHD.
579	RGB INTERNATIONAL BERHAD
580	RHB CAP.BHD.
581	RIMBUNAN SAWIT BHD.
582	RIVERVIEW RUB.ESTS.BHD.
583	RUBBEREX CORP.(M) BERHAD
584	SALCON BHD.
585	SAM ENGR.& EQU.(M)BHD.
586	SAMCHEM HOLDINGS BERHAD
587	SANBUMI HDG.BHD.
588	SAPURA INDUSTRIAL BHD.
589	SAPURA RESOURCES BHD.
590	SARAWAK CABLE BHD.
591	SARAWAK CONS.INDS.BHD.
592	SARAWAK OIL PALMS BHD.
593	SARAWAK PLANTATION BHD.
594	SBC CORPORATION BHD.
595	SCANWOLF CORP.BERHAD
596	SCGM BERHAD
597	SCICOM MSC BHD.
598	SCIENTEX BERHAD
599	SCOMI ENGINEERING BHD.
600	SCOMI GROUP BHD.
601	SCOMI MARINE BHD.
602	SEACERA GROUP BHD.
603	SEAL INCORPORATED BHD.
604	SEALINK INTL.BERHAD
605	SEE HUP CONS.BHD.
606	SEG INTL.BHD.
607	SELANGOR DREDGING BHD.
608	SELANGOR PROPERTIES BHD.
609	SENI JAYA CORP.BHD.
610	SEREMBAN ENGR.BHD.
611	SERN KOU RESOURCES BHD.
612	SHANGRI-LA HTLS.(MAL.)
613	SHELL REFN.CO.FOM BHD.
614	SHH RESOURCES HDG.BHD.
615	SHIN YANG SHIP.CORP.BHD.
616	SHL CONSOLIDATED BHD.
617	SIG GASES BERHAD
618	SIGNATURE INTL.BHD.
619	SILK HOLDINGS BERHAD
620	SIME DARBY BHD.
621	SIN HENG CHAN (MALAYA)
622	SINARIA CORPORATION BHD.
623	SINO HUA-AN INTL.BHD.
624	SINOTOP HOLDINGS BHD.
625	SKB SHUTTERS CORP.BHD.
626	SLP RESOURCES BERHAD
627	SMIS CORP.BHD.
628	SMPC CORP.BHD.
629	SOUTH MALAYSIA INDS.BHD.
630	SOUTHERN ACIDS (M) BHD.
631	SOUTHERN STEEL BHD.
632	SP SETIA BHD.
633	SPRITZER BHD.
634	STAR PUBS.(MAL.) BERHAD
635	STARHILL REIT.UNITS
636	STONE MASTER CORP.BHD.
637	SUBUR TIASA HDG.BHD.
638	SCSS.TRANSFMR.CORP.BHD.
639	SUIWAH CORP.BERHAD
640	SUNCHIRIN INDS.MAL.BHD.

ID	Company Name
641	SUNGEI BAGAN RUB.CO.(M)
642	SUNWAY BERHAD
643	SUNWAY RLST.INV.TRUST
644	SUPER ENTER.HDG.BHD.
645	SUPERLON HOLDINGS BERHAD
646	SUPERMAX CORP.BHD.
647	SUPPORTIVE INTL.HDG.BHD.
648	SURIA CAPITAL HDG.BHD.
649	SWS CAPITAL BHD.
650	SYARIKAT TAKAFUL MAL.BHD
651	SYCAL VENTURES BERHAD
652	SYF RESOURCES BHD.
653	SYMPHONY HOUSE BHD.
654	TA ANN HOLDINGS BHD.
655	TA ENTERPRISE BHD.
656	TA GLOBAL BERHAD
657	TA WIN HOLDINGS BHD.
658	TADMAX RESOURCES BERHAD
659	TAFI INDUSTRIES BHD.
660	TAHPS GROUP BERHAD
661	TAKASO RESOURCES BHD.
662	TALIWORKS CORP.BHD.
663	TAMBUN INDAH LAND BHD.
664	TAN CHONG MOTOR HDG.BHD.
665	TANCO HOLDINGS BHD.
666	TANJUNG OFFSHORE BHD.
667	TAS OFFSHORE BERHAD
668	TASCO BERHAD
669	TASEK CORPORATION BHD.
670	TATT GIAP GROUP BERHAD
671	TDM BHD.
672	TEBRAU TEGUH BHD.
673	TECK GUAN PERDANA BHD.
674	TECNIC GROUP BERHAD
675	TEK SENG HOLDINGS BHD.
676	TEKALA CORPORATION BHD.
677	TELEKOM MALAYSIA BHD.
678	TENAGA NASIONAL BHD.
679	TEO GUAN LEE CORP.BHD.
680	TEO SENG CAPITAL BERHAD
681	TEXCHEM RESOURCES BHD.
682	TH HEAVY ENGR.BERHAD
683	TH PLANTATIONS BHD.
684	THE STORE CORP.BHD.
685	THONG GUAN INDS.BHD.
686	THREE-A RESOURCES BERHAD
687	TIEN WAH PRESS HDG.BHD.
688	TIGER SYNERGY BERHAD
689	TIMBERWELL BHD.
690	TIME DOTCOM BHD.
691	TIME ENGINEERING BHD.
692	TIONG NAM LOGIST.HDG.BHD
693	TMC LIFE SCIENCES BHD.
694	TOMEI CONS.BERHAD
695	TOMYPAK HOLDINGS BHD.
696	TONG HERR RESOURCES BHD.
697	TOP GLOVE CORP.BHD.
698	TOWER RLST.INV.TRUST
699	TOYO INK GROUP BHD.
700	TPC PLUS BHD.
701	TRADEWINDS CORP. BHD.
702	TRADEWINDS (M) BERHAD
703	TRADEWINDS PLTN.BHD.
704	TRANSOCEAN HOLDINGS BHD.
705	TRC SYNERGY BHD.
706	TRINITY CORPORATION BHD.
707	TRIPLC BERHAD
708	TRIUMPHAL ASSOCS.BHD.
709	TSH RESOURCES BHD.
710	TSR CAP.BHD.
711	TURBO-MECH BHD.
712	TURIYA BHD.
713	UAC BHD.
714	UCHI TECHS.BHD.
715	UEM LAND HOLDINGS BERHAD
716	UMS HOLDINGS BHD.
717	UMS-NEIKEN GROUP BHD.
718	UMW HOLDINGS BERHAD
719	UNICO-DESA PLTNS.BHD.
720	UNIMECH GROUP BHD.

ID	Company Name
721	UNISEM (M) BERHAD
722	UNITED BINTANG BHD.
723	UNITED MALACCA BHD.
724	UNITED PLTNS.BHD.A/S
725	UNITED U-LI CORP.BHD.
726	UOA DEVELOPMENT BHD.
727	UOA REAL ESTATE IT.
728	UPA CORP.BHD.
729	UTUSAN MELAYU (MAL.)BHD.
730	UZMA BERHAD
731	VERSATILE CREATIVE BHD.
732	VITROX CORPORATION BHD.
733	VOIR HOLDINGS BERHAD
734	VS INDUSTRY BHD.
735	WAH SEONG CORP.BHD.
736	WANG-ZHENG BHD.
737	WARISAN TC HOLDINGS BHD.
738	WAWASAN TKH HDG.BHD.
739	WCT BERHAD
740	WEIDA (M) BHD.
741	WELLCALL HOLDINGS BERHAD
742	WHITE HORSE BHD.
743	WIDETECH (MALAYSIA) BHD.
744	WILLOWGLEN MSC BHD.
745	WING TAI MALAYSIA BHD.
746	WONG ENGR.CORP.BERHAD
747	WOODLANDOR HOLDINGS BHD.
748	WTK HOLDINGS BHD.
749	WZ STEEL BERHAD
750	XIAN LENG HDG.BHD.
751	XIDELANG HOLDINGS LTD.
752	XINGQUAN INTL.SPS.HLTD.
753	Y&G CORPORATION BHD.
754	YA HORNG ELT.(M) BERHAD
755	YEE LEE CORP.BHD.
756	YEN GLOBAL BERHAD
757	YEO HIAP SENG (MAL.) BHD
758	YI-LAI BHD.
759	YINSON HOLDINGS BHD.
760	YLI HOLDINGS BERHAD
761	YNH PROPERTY BHD.
762	YOKOHAMA INDUSTRIES BHD.
763	YONG TAI BHD.
764	YOONG ONN CORP.BHD.
765	YSP STHEAST.AI.HLDG.BHD.
766	YTL CORP.BHD.
767	YTL LAND & DEV.BHD.
768	YTL POWER INTL.BHD.
769	YUNG KONG GVNG.INDS.BHD.
770	ZECON BERHAD
771	ZELAN BERHAD
772	ZHULIAN CORPORATION BHD.