Relationship between Inflation and Stock Prices in Thailand

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Abstract

This thesis examines relationship between inflation and stock prices in Thailand as well as investigates impact of specific events i.e. Tsunami and global economic recession on the relationship. The observation period ranges from January, 2000 to March, 2010, including Tsunami and the recent global financial crisis. Statistic method like vector autoregression (VAR) is used to find and analyze the association. Besides, interview is also conducted to gather opinion of investors in Stock Exchange of Thailand on how inflation affects equity value. The finding demonstrates that movement of stock prices is irrelevant to inflation. Moreover, this finding is advocated by the investors’ opinions.

Keywords: inflation, stock prices, inflation-stock prices relationship, SET50, Thailand, Stock Exchange of Thailand.
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Chapter 1: Introduction

“Reality is merely an illusion, albeit a very persistent one.”

[Albert Einstein]

There are a lot of factors that an investor takes into account when he/she makes an investment decision. Inflation is one of those factors. This study observes how inflation affects stock prices in the Stock Exchange of Thailand both in term of statistic and investors’ perception.

In this chapter provides general background regarding the relationship, purpose of the study, delimitation, and the thesis disposition.

1.1. Background

The relationship between inflation rate and stock prices has been examined by several financial economists around the world. However, this relationship has not been investigated widely in Thailand, which is regarded as developing economy country. Thailand’s economy plays an essential role in South-East Asia. The Stock Exchange of Thailand (SET) has been successfully established since 1975. Thailand’s economic was stunted by the Asian economic crisis in 1997 and the global economic downturn in late 2008.

The crises have tremendous impact on both economy and stock market in Thailand. During the crises, the inflation rate rose which resulted in higher required rate of return as well as higher stock market volatility. Consequently, it leaded to drop in stock prices to keep the level of price-to-equity ratio. In the view of inflation volatility, the increasing inflation volatility stimulated stock market instability. As a result, it initiates the same consequences as stated earlier.

Fama (1981) proposed proxy hypothesis which illustrates the negative relationship between inflation rate and stock prices. The negative stock returns – inflation relationship is explained by the positive relationship between stock returns and basic determinants of equity values, such as capital expenditures, average real rate of return capital and productivity of a company (Fama, 1981).
In contrast, if you consider stock or security as capital goods, inflation treats the capital goods in the same aspect as other goods, such as agricultural products and industrial products. Simply put, rising in inflation rate should result in higher price level of general goods as well as securities. However, this assumption was argued by Feldstein (1980) that when the future expected inflation rate is higher, the ratio of stock price to real earning will drop. It is due to the fact that effective tax rate on a company’s source of income is increased to correspond to higher inflation rate.

As, in Thailand, there are a large number of mutual funds investing in both domestic and international stock market, the observation of the relationship between inflation rate and stock prices in Thailand would benefit not only portfolio managers, but also economic policy makers (Zhao, 1998; Adrangi et al., 2000). As inflation-stock prices relationship can be used to evaluate how a portfolio manager invests in stock to hedge against inflation. Moreover, this study investigates connection between macroeconomic factor and capital market which induce an economic policy maker to pay attention to inflation controlling.

1.2. Problem Discussion

When the inflation rate rises, almost all product prices in the market increase at the same time. The stock prices, however, inversely relate to the inflation in accordance with various researches (Asprem, 1989; Chen et al., 1986; Wasserfallen, 1989; Najand and Rahman, 1991). Regarding to Brandt and Wang’s model (2003), inflation is a factor that impacts the investor’s risk averse and, consequently, reflects on expected high required return on capital and the real discount rate. However, the stock value is relevant to the profit from capital assets, for example the raw material, labor and capital. Inflation drives up the cost of input assets as well as the output assets. Hence, the shareholders’ expected future cash flow increases from the higher selling prices. The more company’s ability to transfer the inflation panic to the selling price, the higher stock return will be according to Jareno and Navarro (2009).

Siegel (2008) indicates that in developing countries the inflation associates with the negative budget and government over spending. The lower economic and private firm growths affect the stock price owing to the government influences. Based on the Fed model, bond is the alternative investment instead of stock when the earning yield is lower than the bond yield although they are different in term of returns and the risk. The bonds investors anticipate the interest from the
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treasury bonds at risk-free rate while bear the inflation risk, whereas the equity investors earn the dividend and capital gain; in addition, the stock price increases align with inflation (Siegel, 2008). There is confusion about stock prices increase when inflation rate increases, so, investors reduce the inflation risk by stock investment. In 1950, the stock investment as inflation hedge was very popular in spite of the dividend yield was low. It changed after 1970 since the annual compound return on stock, bond and Treasury bill plunge when the inflation rate was high. In the short term hedge against inflation, none of stock, bond and Treasury bill is effective. Nevertheless, the long run stock is good way to hedge against inflation in the stable and uncertain economic (Siegel, 2008).

From the controversy above, it is attention-grabbing to investigate inflation impact on equity prices in Thailand. On top of that, how the stock prices corresponded to changes in inflation during recent financial crisis and Tsunami draw attention to be examined as well.

1.3. Purpose

The aim of the study is to investigate relationship between inflation rate and stock price in the Stock Exchange of Thailand as well as observe behavior of the relationship during economic crisis and Tsunami.

1.4. Research Question

In order to accomplish the objectives of the research, the ultimate research question is

"Does inflation affect stock price in Thailand? If so, how?"

From the above main research question, it is extended to three sub-questions which are

- How was the stock price- inflation relationship look like during January 2000 to March 2010?
- Was the relationship influenced by the natural catastrophe, Tsunami?, and
- Did the recent financial turmoil have impact on the relationship?

1.5. Unit of Analysis

This study investigates relationship between inflation and stock prices in Thailand.
1.6. Delimitations

This thesis focuses on SET 50 index (Stock Exchange of Thailand) during January 2000 to March 2010. The index comprises of 50 most traded stock in SET and the market capitalization of which contains approximately 70 per cent of the entire market. As this study examines the relationship between inflation rate and stock prices, the monthly inflation rate in Thailand during the same period is taken into account. In addition, this thesis depicts two most influential crises in Thailand which are Tsunami, the natural catastrophe, and the recent financial crisis.

1.7. Definition and Terminology

Due to the fact that this study deals with inflation rate, it is essential to understand the meaning of inflation rate beforehand. According to Burda et al. (2003), inflation rate refers to rate of changes in average level of prices. The inflation rate relates closely to consumer price index (CPI). The consumer price index means an index of prices of a set of goods which is a representative for an entire national consumption pattern.

SET50 is stock index in Thailand which illustrates movement in 50 highest common stocks market capitalizations value. Moreover, those 50 stocks need to be liquid in the market and minor shareholders of the qualified stocks have to pass pre-determined criteria. The stock list is revised every 6 months. The SET50, presently, consists of agriculture and food, financial, industrial, property and construction, resources, services, and technology industry (Stock Exchange of Thailand, 2008).

Fig. 1: Industries that are comprised in SET50 index as of March, 2010 (Stock Exchange of Thailand, 2010).
1.8. Disposition of the Thesis

This thesis is divided into 6 chapters as follows;

CHAPTER 1 Introduction

This chapter introduces to the research question, broad background as well as purpose of the study.

CHAPTER 2 Literature Review

In order to create comprehensive understanding of the thesis, this chapter provided theoretical background, reviewing of the literatures relating to the research question.

CHAPTER 3 Methodology

This chapter outlines the thesis in term of applied research method, data collection, research strategy, as well as validity and reliability of the study.

CHAPTER 4 Analysis

The result and empirical evidence of the study are analyzed in this chapter. Moreover, the outcome of the tested hypotheses is also demonstrated.

CHAPTER 5 Discussion

The result from the research is discussed and compared with other researches.

CHAPTER 6 Conclusion

This chapter provides the summary of the previous chapter outcomes, research question answer, research limitations, and recommendations.

References

The complete reference list is included in this section.

Appendices

The statistics tables and additional information are presented here. Besides this, interview questions and summary of interviewees’ response are shown in this part.
Chapter 2: Literature Review

This chapter provides a review of literatures relating to stock price-inflation relationship and the crises, both natural disaster and economic downturn. It is to facilitate comprehensive understanding and assessment of the research question.

2.1. Relationship between inflation and stock prices

In accordance with Feldstein (1980), stock prices boost when inflation rate is at high constant rate. On the contrary, the stock prices fall when the expected inflation rate rises. Feldstein (1980) also demonstrated effect of inflation on stock prices through corporate income taxation, cost depreciation and taxation of nominal capital gains. When inflation rate is higher, the cost depreciation affects corporate earnings since the depreciation is calculated based on historical cost, which is not influenced by the rising inflation rate. The depreciation is less than it is supposed to be drives the real taxable profit to go up (Hong, 1977).

Mervyn King (1977) claimed that increase in a company’s share price is thanks to retained earnings. Feldstein (1980) assumed that a company pays out all of its income after tax in form of dividend to an investor. From a combination of Mervyn’s finding and the assumption, if corporate earnings go up, the company share price also increases.

In order to draw a clear picture on how inflation has an effect on price of company’s security, the following formulas are illustrated.

- No inflation condition

\[
\frac{(1 - \theta)(1 - \tau)}{q} = (1 - \theta)r + \delta
\]

\[
\frac{(1 - \theta)(1 - \tau)}{(1 - \theta)r + \delta} = q
\]

\[
\theta = \text{personal income tax rate}
\]

\[
\tau = \text{corporate income tax rate}
\]

\[
\rho = \text{marginal product of capital}
\]
q = share price that an individual would be willing to pay

r = interest rate on Treasury bill

δ = risk on specific stock

Under circumstances of no inflation, an investor gain from earnings after tax per share deducted by personal income tax. It is equal to risk-free interest from Treasury bill after personal income tax plus required return to compensate risk of the company (Feldstein, 1980)).

• Positive inflation condition

According to Feldstein (1980), when the inflation is rising, the earnings of the company will be \([(1-\tau)\rho - \lambda\pi]\), where \(\lambda\) denotes unit(s) of net corporate profit reduced by increase in one percentage point of inflation, and \(\pi\) denotes inflation rate. An investor receives \((1-\theta)((1-\tau)\rho - \lambda\pi)\) after personal income tax.

Taking tax on capital gain into account, an investor will expose to tax on capital gain only when he/she sells his/her shares. The tax rate on capital gain is denoted as \(c\). Besides, the price of the share is also influenced by the inflation. Consequently, new share price is \(\pi q\). The capital gain after tax is \(c\pi q\). Hence, an individual receives \((1-\theta)((1-\tau)\rho - \lambda\pi) - c\pi q\) (Feldstein, 1980).

a. Fisher Hypothesis

Regarding to Fisher (1930), interest rate comprises of expected real interest rate and expected inflation rate. Accordingly, the ex-ante real rate of stock returns and inflation rate are influenced by nominal rate of stock returns. From the Fisher hypothesis, there is an implication that the investment in securities can hedge against inflation. The relationship between the stock returns and inflation can be formulated as

\[
R_{t,k} = \alpha + \beta E(\pi_{t,k} | f_{t-k}) + \varepsilon_{t,k}
\]

\[
R_{t,k} = \text{nominal stock return from time } t-k \text{ to } t
\]
\[
\alpha = \text{expected real rate of stock returns}
\]
\[ \beta = \text{coefficient of nominal return on common stocks and on expected inflation; according to Fisher hypothesis, } \beta = 1 \]

\[ E(\pi_{t,k} | I_{t-k}) = \text{expected inflation rate from time } t-k \text{ to } t \]

\[ \varepsilon_{t,k} = \text{residual} \]

Owing to the fact that the expected inflation rate is not available in general, the model can be replaced by actual inflation rate (Fisher, 1930).

\[ R_{t,k} = \alpha + \beta \pi_{t,k} + \mu_{t,k} \quad \text{ (4)} \]

From the equation (4), \( \mu_{t,k} \) is residual and mathematically equal to \( \beta [E(\pi_{t,k} | I_{t-k}) - \pi_{t,k}] + \varepsilon_{t,k} \).

Even though the Fisher hypothesis claimed that the coefficient of nominal stock returns on inflation is 1 which is in order to invest in common stocks hedge against inflation, there are empirical findings observed by Wong et al. (2003), and Alagidede (2009) demonstrating that the correlation between the stocks returns and inflation is time-varying. In other words, an investor can use common stock as a hedge against inflation in long-time horizon estimate, but it is not effective in short-time horizon.

According to Gregoriou and Kontonikas (2006), they investigated the stock prices and goods prices relationship in sixteen OECD countries, Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, and United States, during January 1970 to June 2006. Not only did they investigate the impact of inflation on stock prices, but they also examine the impact of stock prices on inflation. Consequently, by applying panel co-integration\(^1\) test, they found that, when they positioned stock prices as independent variable and goods prices as dependent variable, there is no co-integration between those two variables. From the findings, they therefore concluded that it is a causality relationship in which the inflation has influence on stock prices. Besides, according to their study, the stock prices-inflation relationship is

\(^1\) Co-integration refers to statistic process where \( x_t \) and \( y_t \) in \( \mu_t = y_t + \alpha \cdot x_t \) are co-integrated if there exists parameter \( \alpha \) is a stationary process. (Sørensen, B. E., 1997)
positive in long-period timeframe. Moreover, the findings championed generalized Fisher hypothesis that stock can hedge against inflation.

### b. Fed Model

The Fed model\(^2\) postulates that earnings yield of stock market (earning-to-price ratio, E/P) is equal to 10-year Treasury bond yield (Y) (Estrada, 2007).

\[
\frac{E}{P} = Y
\]  

(5)

From the model (equation (5)), it claims that stock is undervalued when \(E/P\) surpasses \(Y\), and expensive when \(E/P\) is less than \(Y\). To put it differently, the model asserts that the stock prices will be fairly valued when \(E/P\) is equal to \(Y\) (Asness, 2003). Campbell (2004) stated that the idea of this model is stocks and bonds fight for room in a portfolio.

According to Campbell (2004), inflation is a foremost impact of nominal bond yields. The Fed model therefore infers that the stock yields are substantially correlated with inflation. In the late 1990’s investors claimed that dropping in stock yields and increasing in stock prices were influenced by declining inflation rate.

To take Gordon Model (Williams, 1938; Gordon, 1962) into consideration, the model illustrates that the combination of dividend yield \((D/P)\) and growth of dividend \((G_D)\) is equal to expected nominal return on stock market \((E(R_s))\). (Asness, 2003; Campbell and Vuolteenaho, 2004)

\[
E(R_s) = \frac{D}{P} + G_D
\]  

(6)

Nominal values are denoted in capital letter, whereas real values (after inflation) are denoted in small letter. The dividend yield \((D/P)\) and earnings yield \((E/P)\) are connected through dividend payout ratio \((D/E)\).

\[
E(R_s) = \text{Payout Ratio} \times \left(\frac{D}{E}\right) + G_D
\]  

(7)

Asness (2003) assumed that the dividend payout ratio is $\frac{1}{2}$ and constant over time, as well as growth rate of earnings ($G_D$) and dividend are at the same level.

\[
E(R_x) = \left(\frac{1}{2}\right) \times \left(\frac{D}{E}\right) + G_E
\]  \hspace{1cm} (8)

\[
E(r_x) = E(R_x) - I
\]  \hspace{1cm} (9)
Accordingly, expected real return on stock is roughly equal to expected nominal stock return less inflation rate. When the inflation rate declines, with an assumption of one-to-one positive relationship between nominal bond yield and inflation rate, the bond yield plunges with the same value as inflation rate. In other words, when the inflation rate declines, the real stock return remains constant. Thus, the nominal stock return falls with the exact rate as the inflation (Asness, 2003).

Bekaert and Engstrom (2009) applied VAR (Vector Autoregression) approach to analyze association between inflation and stock market through the Fed model and the Gordon Growth Model. They found that, from US post-war data, real stock returns highly correlated with nominal bond yields. Furthermore, during economic turmoil period, risk aversion of stock markets’ investor mounts up which results in higher required equity risk premium as well as corresponding stocks return. In case that expected inflation happens to be high during the crisis, returns on bonds rise and, possibly, positive relationship among stocks returns, bond yields, and inflation.

c. Proxy Hypothesis

Proxy hypothesis was introduced by Fama and Schwert (1977). The proposition draws an idea of negative relationship between stock returns and inflation, both expected and unexpected inflation. According to Fama (1981), the stock returns are influenced by inflation through real activities which are essential determinants of the equity values. The real activities are, for instance, capital expenditures, as well as average real rate of return on capital and output.

Liu et al. (1993) decomposed the proxy hypothesis into 3 propositions. Those propositions were (1) present stock returns positively associated with \textit{ex ante} real activities, (2) fiscal policy were countercyclical, that is a decrease in expected real activities grounds a rising in money supply (proposed by Kaul, 1987), and (3) the expected increase in money supply
results in augmenting expected inflation. From the re-examination by using data from the United Kingdom, the United States, Germany, and Canada, the findings advocated the proxy hypothesis only the perspective of negative relationship between the real activities and expected inflation. Nonetheless, this study did not support the entire explanation of the hypothesis due to the fact that immaterial association between real stocks returns and anticipated real activities.

Furthermore, Gallagher and Taylor (2002) also partially opposed the Fama’s implication that, owing to demand innovations, real stock returns insignificantly related to inflations. In contrast, due to supply innovation, real stock returns strongly negatively correlated with inflations.

In sum, from the aforementioned models and hypotheses, even though there are some researchers against some ideas of those models and hypotheses, we can initially conclude that stock price negatively correlates with inflation.

2.2. Crises
   a. Economic Crisis

Dungey et al. (2010) points out that there are several crises from the 1990s to 2000s. For example, Russia and LTCM (Long term capital management) in 1998 resulted from the debt and bond default, Brazilian crisis in 1999 was caused by capital shortage, Argentina crisis and US subprime in 2001 and 2007, respectively. These crises impact stock and bond market in both developed market as well as emerging market.

Post Asian crisis, 1997

In 1997, Thailand crisis was dramatically severe in term of the currency and banking system crisis. This financial crisis originated from floating Thai Baht and expanded to that of other countries in Asia, for instance, Philippines Peso, Malaysian Ringgit, Indonesian Rupiah, and South Korean Won. However, this recession did not impinge on Chinese economy, which isolated from world markets at that time, and Hong Kong, which its currency tied to US dollar (Barro, 2001).

Barro (2001) depicted that Asian crisis affected the economic growth and the investment ratio as well. From the observation, the investment ratio recovered gradually less than the economic
growth. There are numerous perspectives to convey that the economic after crisis was not able to attain as pre crisis economic in particular stock market in long term. Because of the different adverse result to the stock market in Asian countries, the study classified the Asian countries into two groups by severity of the impact; which were considerable and less considerable impact. Thailand was in the former group since there were permanent negative effects to financial market.

Dacharux et al. (2009) studied about post-Asian crisis and found that, after the crisis, the interest rate substantially increased corresponding to high inflation and depreciating Thai currency, Baht. Before the crisis, the average inflation was around 5% and it declined in 2000-2004 as a result of inflation target framework implementation. Inflation is driven by commodities price especially food and energy. In the last quarter 2008, the price dropped down in line with the inflation.

Thailand GDP (Gross Domestic Product) mainly consists of export and tourism. Thus, the world crisis significantly depressed Thai economy due to declining overseas demands. Moreover, Thailand is an open economy correlating with the US and Europe financial market; so, the economic growth in several countries in Asia Pacific including Thailand suffered from the global crisis in second half 2008 to first half 2009 as mentioned by Son & Andres (2009).

World crisis

Nakonthab et al. (2009) indicated that the second half of 2007 was the beginning of the world crisis as a result of the subprime mortgage in US. In the crisis, the inflation substantially amplified from the high commodity and energy prices. The world crisis resulted from two drivers, both macro and micro aspects. The macro aspects were the global imbalance and low interest rate. The micro aspects drew from loose lending standards, improper executives’ remuneration, and over trust rating.

The subprime problem spread over to the financial sector owing to devalued subprime mortgage from the financial institutions. An investment banking, Bear Stearns, stops investors to redeem two hedge funds of that mortgage. It also created the first panic and diminished the confidence of securities mortgage in the worldwide banking system. The Northern Rock, medium sized lender in UK, was the first international victim and the signal to other banks and financial institutions regarding the written down mortgage’s value. The risk exposure to depreciated securities brought about the global financial sector in trouble. To lessen the harm, US government acquired Fanni
Mae, Freddi Mac, and Lehman Brothers as well as provided support to AIG for bankrupt recovery. The real sector dealt with tension transferring from the financial sectors; so, the GDP was expected to drop down remarkably since World War II (Asian Development Bank, 2009).

**US Stock exchange during the world crisis**

According to Asian Development Bank (2009), New York stock exchange was the biggest market equity in the world and valued around $15.7 trillion at ended 2007. New York equity market lost $1.2 trillion only one day, 29 September, 2007, and, at the end of that month, it fell to $13 trillion. At the end of February 2009, the New York stock exchange valued only $8.7 trillion; besides, it lost approximately $5.9 trillion in one year alone. The stock exchange collapsed in all industries. The worst were the automotive and financial industries even though the government and Federal Reserve pushed the capital to sustain these industries. The beginning of March 2009 had tragic in the prior booming industries in mid 2008, for instance, material, basic resource and telecommunication. Their stocks descended about 18% in Down Jones Industrial and S&P 500 index.

![Fig. 3: Timeline of the recent financial turmoil in late 2007. (Nakonthab et al., 2009)](image)

**Crisis impact to Developing Asian**

The original problem of this crisis was the subprime mortgage in US. Subsequently, the housing price in US dropped down and enlarged across to other continent, such as UK and Europe. In
Asia, the global crisis forced the GDP of developing Asian to slowdown which was caused from shrinkage of export due to low demand in the oversea market (Asian Development Bank, 2009).

In fact, financial sectors including financial institutions and banking in developing Asian secured from the financial turmoil, unlike financial sectors in US and EU as a result of the limited exposure direct and indirect subprime loan. Indeed, the direct investment in subprime assets or the collateral loan of Asian commercial banks was low in comparison to the size of bank capital and the total assets. There was the supporting evidence about the cut back total subprime assets of the 100 biggest bank and securities firms as of May 2008. It was approximately $379 billion relative to Asia excluding Japan in amount of $10.8 billion around 3%. On the other hand, the developing Asian countries were in danger in case of down deep and prolonging crisis because it deteriorated firm’s performance and brought about deficit and credit risk exposure (Asian Development Bank, 2009).

There was another reason that developing Asian was immune from this contagion according to the strong grounds during the crisis period and intensive improved banking systems from the Asian crisis. After Asian crisis, the three indicators of healthy financial status consist of the low non-performance loan, high asset returns rate and high risk-weighted capital-adequacy ratio beyond the normal global standard since 1999 to 2007 or 2008 (Asian Development Bank, 2009).

**Thailand and world crisis**

In Thailand, it is not only global crisis but also political issue affecting Thailand’s GDP and economic growth. These concerns weaken Thailand economic in consequence of dwindling government expenditure, private investment and export growth. During 2008, the politic was uncertainty that leaded to have four prime ministers in one year. As a result, it delayed the public investment, for example, the mass rapid transit project in Bangkok (Asian Development Bank, 2009).

In July 2007, the inflation was 9.2% and it had been the highest level since 2001 as mentioned in Asian development outlook 2009. Not such a long time after that, inflation plummeted and was replaced by the deflation scare. Moreover, the Bank of Thailand applied the interest rate policy as well as the commodity and fuel price slowdown. The average inflation in 2008 was at 5.5% and it was about half of that of 2007. As of December 2008, the inflation dropped down due to
decreasing in commodity and fuel price; therefore, the consumer products’ manufacturers had less chance to increase the price. In 2010, the inflation has been increasing slightly owing to the economic recovery.

The stock market index decreased in 2008 approximately 48% though the consumer consumption increased in particular the durable products, such as, cars, motorcycles and electronic appliance. In addition, the inflation fell after the second half of the year to motivate consumer spending (Asian Development Bank, 2009). From the declining in stock index, we can imply that it was a result from rising in consumer consumption. The rising in consumer consumption can be viewed as increasing in aggregate demand which is a factor that affects inflation or demand-pull inflation\(^3\) (Machlup, 1960). In sum, the rising in consumer consumption leads to increasing in inflation rate and, consequently, reflects on declining stock market index. It is in line with the proxy hypothesis (Fama, 1981).

b. Natural Catastrophe

With regard to International Monetary Fund (2005), Tsunami occurred on December 26, 2004 as a result of magnitude of 9.0 Richter earthquake in Sumatra, Indonesia in the Indian Ocean. There were many countries suffering from this disaster and the highest number of victims were in Indonesia (227,000), followed by Sri Lanka (37,000), India (16,500) and Thailand (8,500). According to World Bank and International Monetary Fund (2005), Sri Lanka lost approximately 4.5% of GDP in 2005, 1.5% of GDP in Indonesia, 0.33% of GDP in Thailand and less than 0.25% of GDP in India.

Tsunami extremely destroyed the properties and consumed time to rebuild. Disaster, however, did not significantly influence the economic growth. During the catastrophe, tourism was adversely hit by Tsunami, especially in Maldives and Thailand. It could rapidly recover because there were other safe places on west coast of Thailand and Bali. Another impacted sector was fishing and it took long time to improve owing to lack of fund to acquire new boats and fishing tools. Nonetheless, tourism and fishing were the minimal drivers to change the economic growth.

---

3 Factors of inflation can be divided into two kinds which are cost-push inflation and demand-pull inflation. The cost-push inflation generally refers to increasing in level of price of four main production costs which are labor, capital, land and entrepreneurship at full capacity. The demand-pull inflation refers to rising in aggregate demand in four macroeconomic sectors which are households, businesses, governments, and foreign buyers (Heakal, 2005).
It is possible that inflation changes in disaster area due to food and transportation demand. Reconstruction expenditure may correspond to the economic policy. In addition, as of March 2010, none of the leisure and tourism company listed in the SET50.

Tsunami affected countries can receive the support fund from The Paris club of official creditors. However, Thailand and India, which had sufficient reserve and marginal public debt, rejected the capital fund of The Paris club and other aids. Thailand set the relief package and self financing from 0.8% of GDP (equivalent to $1.5 billion) for reconstruction budget (International Monetary Fund, 2005).

In sum, there are several researchers attempt to describe the inflation-stock prices relationship. The models that are widely known as the models to investigate and describe this relationship are Fisher Hypothesis, Fed Model, and Proxy hypothesis. These models have been reexamined by large number of researchers (Liu et al., 1993; Gallagher et al., 2002; Wong et al., 2003; Campbell, 2004; and Alagidede, 2009). The findings differ from one research to another research. Some researches advocate positive inflation-stock prices relationship (Gregoriou et al., 2006; and Bekaert et al., 2009), while some researches champion negative relationship (Fama et al., 1977). Moreover, significant event like financial crisis is one factor that vigorously affects both inflation and stock behavior as reported by International Monetary Fund, Asian Development Bank, and etc.

From the literature review, we find that there is no study regarding relationship between inflation and stock prices in Thailand, especially, during the period of world financial recession and Tsunami. We therefore examine this relationship to find a reflection of macroeconomic effect, like inflation, on stock market in Thailand.

With the purpose of conducting the aforementioned investigation, the following hypotheses are formulated.

**Null Hypothesis 1**: There is no relationship between inflation and stock price in the Stock Exchange of Thailand.

---

Alternative Hypothesis 1: There is relationship between inflation and stock price in the Stock Exchange of Thailand.

Null Hypothesis 2: Economic crisis and Tsunami have no impact on the stock returns-inflation relationship in Thailand.

Alternative Hypothesis 2: Economic crisis and Tsunami have impact on the stock returns-inflation relationship in Thailand.

In order to test the above hypotheses and observe an investor’s perspective toward the relationship, statistic approach is used to test the hypotheses and interview is conducted to gather the opinion. Therefore, this thesis applies a mixed-method, or both quantitative and qualitative methods are used here.
Chapter 3: Methodology

In this chapter, research philosophy, research approach and research strategy will be portrayed first. Thereafter, data collection and sampling method will be described, and followed by a discussion of reliability and validity of the study.

3.1. Research Philosophy

Research philosophy associates with nature of knowledge and how the knowledge develops (Saunders, Lewis, and Thornhill, 2007). According to Bryman and Bell (2007), research philosophy comprises of two main considerations which are epistemology and ontology. Epistemology is pertinent to what should be considered as acceptable knowledge in the field of study, while ontology relates to nature of social entities. Bhaskar (1975) stated that any epistemology analysis is in conjunction with ontology.

Epistemology derives from Greek words; “episteme” means knowledge or science, and “logos” means information or theory (Johnson and Deberley, 2003). There are three major positions in epistemology which are realism, positivism and interpretivism (Bryman and Bell, 2007). Realism refers to a belief that existence of social reality is independent from researchers’ mind, external reality. This external reality is “structures that are themselves sets of interrelated objects, and of mechanisms through which those subjects interact.” (Sobh, 2006) Positivism is, in accordance with Remenyi et al. (1998, P. 36), “working with an observable social reality and that the end product of such research can be law-like generalizations similar to those produced by the physical and natural scientists”. While, interpretivism is defined as understanding dissimilarity between people and natural science objects as well as subjective meaning of social action (Bryman and Bell, 2007). Interpretivist focuses on studying humans rather than objects (Saunders, Lewis and Thornhill, 2007).

From the aforementioned epistemology positions, the realism perspective will be followed throughout the study. With the purpose of investigating stock prices mechanism toward inflation changes, the existed data and information will be gathered to create insight into stock market of Thailand.
With regards to ontology, there are two major positions which are objectivism and subjectivism. Objectivism is social events existing as external factors to social actors, in other words, the social phenomena occurring in our daily discourse independently exist from social actors (Bryman and Bell, 2007; Saunders, Lewis, and Thornhill, 2007). On the other hand, subjectivism refers to a belief that “the social world is actively constructed through interactions and that symbols, like language, are key to interacting.” as defined by Dan and Kalof (2008). It is in order to grasp how people feel toward others and circumstances (Dan and Kalof, 2008).

This study’s ontological position is a combination of objectivism and subjectivism since this research mainly focuses on not only examination of existing relationship between inflation and stock prices, but also investigation of investor’s feelings or opinions toward the relationship.

3.2. Research Approach

Deductive and inductive approach are the two broad methods of conducting a research (Trochim, 2006).

According to Bryman and Bell (2007), deductive approach refers to a process which begins with formulating hypothesis based on what is known about scrutinized theory. Then, the process follows with gathering data in association with the tested hypothesis, and analyzes the findings which result from the collected information in order to confirm or reject the hypothesis. Last but not least, from the outcome of hypothesis testing, modification or affirmation of the theory will be performed.

The deductive approach works from broad-spectrum to narrow or specific; its moniker is a “top-down” approach (Trochim, 2006).

Inductive approach starts with observations to find tentative hypothesis and devise theory. This approach works from
narrow perspective to wider viewpoint toward research topic and it is more exploratory compared to the deductive approach. It is sometimes called “bottom-up” scheme (Trochim, 2006).

Since this study scrutinizes the inflation-stock price relation based on the existing theories by testing hypotheses through gathering market data and information, the deductive approach is considered to be an appropriate means to conduct the objective side of this research. In addition, interviews to analyze investors’ behavior toward changes in inflation rate are also conducted. Hence, the inductive approach complements the objective part into a realism study. We qualitatively validate the quantitative result.

### 3.3. Research Strategy

Research strategy refers to a scheme that a researcher uses to carry out a study. There are two kinds of strategy; quantitative and qualitative approach. Quantitative method mainly follows deductive approach, works with natural science model, and has viewpoint toward social phenomena as external to social actors. Furthermore, the quantitative strategy works with numerical data. On the contrary, qualitative method follows inductive approach, understands social action through eyes of social actors (how social actors interpret the world), and has subjectivism as ontological position (Bryman and Bell, 2007).

<table>
<thead>
<tr>
<th>Principal orientation to the role of theory in relation to research</th>
<th>Quantitative</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epistemological orientation</td>
<td>Deductive</td>
<td>Inductive</td>
</tr>
<tr>
<td>Natural science model; in particular positivism</td>
<td>Interpretivism</td>
<td></td>
</tr>
<tr>
<td>Ontological orientation</td>
<td>Objectivism</td>
<td>Subjectivism</td>
</tr>
</tbody>
</table>

As this study has view toward social phenomena through the eyes of positivist, quantitative research strategy is applied align with the objective part of realism epistemological position. In addition, this research generally deals with statistic data and methods; to put it differently, this research uses numerical data. Besides, an interview will be conducted in order to collect some opinions from experienced investors which are qualitative information, to identify the subjective experience humans relate to the subject. Thus, this research applies a mixed-method; both quantitative and qualitative data are collected to achieve the aim of the study.
3.4. **Data Collection**

This study uses a variety of sources to obtain data for analysis. The theories and literature review derive from books and journals from Umeå university library’s database. The Stock Exchange Thailand database provide SET50 index from year 2000 -2010 and inflation rate are retrieved from Bank of Thailand’s database. The information concerning natural and economic catastrophes is from International Monetary Fund (IMF), Asian Development Bank (ADB) and Bank of Thailand.

In addition, interview is another source of this study to collect primary data. The interview focuses on responses from the investors in the Stock Exchange of Thailand as well as their responses to the inflation to their portfolios and investment decision. There are eight informants for interview. They have been investors in Stock Exchange of Thailand for at least five years. Moreover, the interview of each informant takes around 20-30 minutes and they are done on 10th -14th May, 2010. The research need at least five years experienced interviewees because they active their portfolio in global crisis and Tsunami event. Hence, they know the stock market response to those situations.

These interviews are the semi-structured interview since interviewer may vary the sequence of questions and ask additional questions that are beyond the interview guide to take some significant points mentioned by interviewees (Bryman and Bell, 2007). The semi-structured interview is appropriate to collect the data because all interviewees are asked the same questions and they can reply the flexible answers. While, the interviewer has advantage to cover all questions and obtains the unexpected matter. The semi-structured interview differs from unstructured interview because the unstructured interview uses the list of topics or issues to ask informal questions that vary interview to interview in term of phasing and sequencing. Anyway, the interviewees can answer them liberally and broadly (Bryman and Bell, 2007). Because of the long distance, the interviews are conducted through telephones.

3.5. **Sampling Method**

Sampling techniques can be roughly classified into 2 categories, probability sampling and non-probability sampling. By using probability sampling or representative sampling, chance for population to be selected as representative cases is equally distributed. On the other hand, non-
probability sampling or judgmental sampling does not apply random sampling to choose representative case. (Saunders, Lewis and Thornhill, 2007). The non-probability sampling is used in this study in which the applied technique is purposive sampling.

In order to reflect present stock circumstances, this study picks up 10-year most recent data for both inflation rate and SET50 index. Likewise, the two different events, recent world economic crisis and Tsunami, are chosen based on the need to observe how the extreme circumstances affected the inflation-stock prices relationship.

Moreover, as interviewing will be conducted in this research, theoretical sampling approach is employed. In other words, interviewing with different respondents will go on until achieve theoretical saturation\(^5\) (Bryman and Bell, 2007).

### 3.6. Analysis Tools

Analysis tools used in this study are statistical method and interview. The employed statistic method is time series analysis as the gathered data is in form of time sequence. To be more specific, unit root and co-integration test are used to verify data validity in order to use vector autoregression (VAR) method. Additionally, as investors’ opinions toward impact of inflation on stock prices are also the aim of this research, interview is employed to gain those perspectives.

### 3.7. Reliability and Validity

The useful information which is derived from the study is the objective to prove the hypothesis in the research. The measure is one critical element to reach the creditable result. Without the reliability and validity measures, it is not possible to obtain the meaningful dependable outcomes. The quality of measures must be evaluated for the first step to develop the study (Graziano and Raulin, 2010).

**Reliability**

Reliability sounds like validity but, actually, it is different. According to Graziano and Raulin (2010), reliability is the quality measures that it is no matter who use the procedures and the findings have to be the same in case of all variables are identical. It means that the reliable measures give stability of the data.

\(^5\) The theoretical saturation is reached when there is no new or relevant information from further sampling or interviewing (Bryman and Bell, 2007).
• **Reliability in quantitative data**

For our study, the regression and time series analysis are applied to investigate the relationship between inflation and stock prices in Thailand. The reliability of these statistics results are acceptable since the inflation data gathered from the following sources. One is from Bank of Thailand and another is from The National Statistical Office, Thailand. The results therefore are reliable to prove the hypothesis and it can be fruitful information.

• **Reliability in qualitative data**

For qualitative data, a list of questions uses to ask all interviewees. Therefore, all of interviewees are asked with the same questions. The interview results derive from the same pattern of the questions and same way to ask questions. Thus, the interview results are reliable.

**Validity**

Besides reliability, the quality measures have to consider about the validity. The reliability measures can be invalid because the reliability concerns merely outcome consistency regardless of the reality. For example, a broken thermometer determines the water temperature at 95 Celsius for many times so that the scale is reliability because it is constant. Nevertheless, it does not have validity because the water is boiling; so, the scale should be 100 Celsius. All in all, the measures can not valid without reliability but they can be reliable without being valid as mentioned by Graziano and Raulin (2010).

• **Validity in quantitative data**

Our data retrieves from the public source of Stock exchange of Thailand and Bank of Thailand, national reserve bank, which its functions are same as other federal reserve bank around the world. Hence, the raw data is from the valid sources. In addition, the processing program, SPSS, to handle the collected data is the reliable and valid program to generate the statistic data. It is the popular program and uses worldwide for quantitative study. Therefore, the results suppose to be valid and reasonable to achieve high degree of validity.

• **Validity in qualitative data**

The primary data derives from interview for the qualitative study from the investors who have the relevant background and invest in SET at least five years. All of the investors still active their
portfolio until now. The information receiving from experienced interviewees can be the valid data. Thus, the multiple sources gain the validity of both quantitative and qualitative study.

3.8. Ethical issues

The accuracy of the numerical is considered for the quantitative data. The intentional attempt to manipulate the evidence is prohibited. For the qualitative data, it is essential that the personal biases should not place in the study by constructed results or premeditatedly misinterpret. Therefore, the triangulation can use to solve this concern (Remenyi et al., 1998). The triangulation is applied in this study to reconcile the findings from both quantitative and qualitative analysis. Additionally, the interviewees’ personal information is kept as confidentiality and anonymity in order to protect their privacy.
Chapter 4: Analysis

This chapter provides result and analysis from empirical data based on the background knowledge gained from literature review.

4.1. Descriptive Statistics

Table 2: Summary of the variables characteristics

<table>
<thead>
<tr>
<th></th>
<th>SET50</th>
<th>Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Valid</td>
<td>123</td>
<td>123</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>391.30</td>
<td>2.49</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>136.16</td>
<td>2.23</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.08</td>
<td>0.18</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>0.2174</td>
<td>0.2182</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-1.31</td>
<td>1.37</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>0.4315</td>
<td>0.4332</td>
</tr>
<tr>
<td>Minimum</td>
<td>177.85</td>
<td>-4.38</td>
</tr>
<tr>
<td>Maximum</td>
<td>672.79</td>
<td>9.17</td>
</tr>
</tbody>
</table>

From table 2, there are two variables in the research interest which are SET50 index and inflation. There are 123 observations for each of SET50 index and inflation. SET50 index ranges from 177.85 basis points to 672.79 basis points. This large range reflects on high standard deviation, 136.16. Average index value between January, 2000 and March, 2010 is 391.30 basis points. Skewness of SET50 index is -0.08 which closes to zero. It means that the normality shape is relatively symmetric. Excess kurtosis is -1.31. As the excess kurtosis is less than zero, the distribution has high peak (Weisstein, 2010).

Regarding to inflation properties, average of inflation during the investigating period is 2.49 per cent. It ranges from -4.38 per cent to 9.17 per cent. The volatility is comparatively high, 2.23. The skewness is 0.18 which refers to nearly symmetric normality shape. The excess kurtosis is 1.37 which is more than zero. It identifies that the distribution is flat-topped (Weisstein, 2010).

According to the abovementioned variables characteristics, they define high volatility of both SET50 index and inflation. Additionally, both variables’ distribution is normal.
Fig. 5 illustrates the SET50 index and inflation over 10 years period, from January 2000 to March 2010. From the graph, the stock index changed over time and plunged significantly in the 4th quarter of 2008. Likewise, the inflation rate also altered from time to time throughout the observed period and plummet dramatically in the same quarter.

The drastic shrink in stock index in late 2008 was owing to not only the global economic recession, but also political issues. The stock index dropped from 417.23 basis points in September, 2008 to 288.76 basis points in October, 2008, approximately 31 per cent.

The inflation rate dropped significantly from 6.08 per cent in September, 2008 to 3.85 per cent in October same year, and it continuously plummeted to negative figure in 2009. The decrease in the inflation rate was to some extent due to declining in global oil prices (see figure 6 below). Besides, the economic turmoil undermined consumers and business sector’s confidence. On top
of that, the political problem also caused deterioration in both public and private spending (Bank of Thailand, 2008).

According to Tourism Authority of Thailand, the Tsunami consequences affected tourism in Thailand from December, 2004 to March, 2005. Concerning SET50 index, there was no considerable momentum in stock index. The reason was because the tourism industry and relating business did not have major role in the stock market, and the Tsunami influencing period was only a short period of time. Regarding inflation rate, according to Bank of Thailand (2005), even though the Tsunami had serious impact on tourism and other relating industries, the effect of Tsunami to the inflation rate was relatively low which was thanks to the fact that the government provided bailout package to ease the problem (Bank of Thailand, 2005).

4.2. Inferential Statistics\(^6\)

In order to observe the inflation – stock price relationship, the two variables are taken into consideration, which are inflation rate and stock index or SET50. The main characteristic of the

\(^6\) All of the statistic tests conducted in this study use GRETL (Gnu Regression, Econometrics, and Time-series Library) which is a freeware.
data or variables is time series property. Therefore, the investigation is conducted by applying regression analysis with time series variables.

With the purpose of conducting time series analysis, it is necessary to test that the variables are stationary or, in contrast, the variables have unit root. Additionally, co-integration process is also required to examine.

a. Testing for Unit root and Co-integration

If a variable has unit-root property, the variable is non-stationary\(^7\). The null hypothesis for unit-root testing is \( \rho = 0 \) in the following equation (Koop, 2008).

\[
\Delta Y_t = \alpha + \rho Y_{t-1} + \varepsilon_t \quad \text{____________ (11)}
\]

Where \( \rho = \phi - 1 \). If \( \phi = 1 \), then \( \rho = 0 \) and \( \Delta Y_t \) depends solely and randomly on \( \alpha \). If \( \phi \) falls between one and negative one, a time series variable is stationary. The critical value to decide whether accepts or rejects the null hypothesis is -2.89 according to Augmented Dickey-Fuller (ADF) test statistic. A variable has a unit-root when test statistic of the variable is less negative than -2.89 and p-value is more than 0.05 at 95% confidence level (Koop, 2008).

Table 3: Summary of test statistic and p-value when testing for unit root.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Test Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET50</td>
<td>-1.14944</td>
<td>0.6982</td>
</tr>
<tr>
<td>Inflation Rate</td>
<td>-2.82131</td>
<td>0.05526</td>
</tr>
</tbody>
</table>

From testing for unit root of SET50 index, the test statistic is -1.14944 which is less negative than the critical value, and the p-value is 0.6982. Therefore, the unit root hypothesis is accepted. Concerning the inflation rate, the test statistic is -2.82131 which is less negative than the critical value, and the p-value is 0.05526 (Appendix A.1). Hence, the unit root hypothesis is not rejected. In sum, both SET50 index and the inflation rate have unit root and are not stationary times series.

When the variables have unit root, co-integration process is needed to be examined. When variables are non-stationary, estimation by using linear regression yields misleading and incorrect result. The linear regression model is as follow.

\(^7\) Non-stationary data is the data that mean, variance, covariance change over time (Lordanova, 2007).
\[ Y_t = \alpha + \beta X_t + \varepsilon_t \]  
\[ \text{(12)} \]

For instance, if the true value of \( \beta \) is zero, but the regression model yields estimation of \( \beta \) other figure apart from zero. This information distorts the result of the model. To put it differently, the linear regression model cannot forecast or estimate the model of relationship among variables that have unit roots. It is spurious regression problem. However, if \( X \) and \( Y \) are co-integrated, the spurious regression can be avoided (Koop, 2008).

According to Koop (2008), \( X_t \) and \( Y_t \) are co-integrated when both following criteria are met.

- The unit root hypothesis is not rejected for both \( X \) and \( Y \).
- The residual of the co-integrating regression does not have unit root.

To create more understanding in co-integration process, “Co-integration refers to a relationship between non-stationary, unit root processes. The existence of a co-integration relationship between two variables has the following economic intuition. When two series are co-integrated it suggests that even though both processes are non-stationary, there is some long-run equilibrium relationship linking both series so that relationship is stationary. This long run relationship is represented by the linear combination implicit in the cointegration relationship.” (Escudero, 2000, P. 12).

From testing for co-integration process between inflation rate and SET50 index, there is no co-integration relationship between those. As the test statistic of the residual of the co-integrating regression model is -1.79555, and the p-value is 0.6325, the test statistic is less negative than the critical value (-2.89) and the p-value is more than 0.05 (Appendix A.1). It refers that the residual is not a stochastic trend.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Test Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual</td>
<td>-1.79555</td>
<td>0.6325</td>
</tr>
</tbody>
</table>

Table 4: Test statistic and p-value of residual from co-integrating regression testing

To put it simply, the co-integrating hypothesis of the relationship between inflation rate and SET50 index is rejected because the unit root does not exist in the residual.
b. Vector Autoregression (VAR)

In this part the Vector autoregression (VAR) model is introduced. This model is used to examine Granger causality. To describe the Granger causality, \( X \) Granger causes \( Y \) when past values of \( X \) is able to give explanation of \( Y \). This causality is only associated with time series variables.

VAR model is appropriate for explaining the data generation process (DGP) of small or moderate group of time series variables. This model is quite popular in economic and finance research (Luetkepohl et al., 2004). VAR model is developed from autoregression (AR) which VAR model deals with more than one variable The basic p-lag vector autoregressive (VAR(p)) model has form of

\[
Y_t = \alpha_1 + \delta_1 t + \phi_{11}Y_{t-1} + \ldots + \phi_{1p}Y_{t-p} + \beta_{11}X_{t-1} + \ldots + \beta_{1q}X_{t-q} + \varepsilon_{1t} \tag{13}
\]

and

\[
X_t = \alpha_2 + \delta_2 t + \phi_{21}Y_{t-1} + \ldots + \phi_{2p}Y_{t-p} + \beta_{21}X_{t-1} + \ldots + \beta_{2q}X_{t-q} + \varepsilon_{2t} \tag{14}
\]

From the former equation, it means that \( X \) Granger causes \( Y \). The latter equation means that \( Y \) Granger causes \( X \) (Koop, 2008).

Although VAR copes with stationary variables, the unit root variables can be tested by using their differences (from time \( t \) to \( t+1 \)) since the differences is assumed to be stationary or do not have unit root (Koop, 2008). As the observed relationship (inflation- stock prices relationship) does not follow co-integrating regression and both of the variables have unit root, the differences of the variables are taken into account. First of all, in order to check that the differences do not have unit root, they are tested for unit root by using Augmented Dickey-Fuller unit root test. It is found that the differences do not have unit root. Consequently, VAR model can be conducted to investigate the relationship.

Prior to yield result from VAR model, the lag length used in the model is chosen by lowest value of information criteria (Koop, 2008). From the information criteria table (table 4), VAR(1) is
chosen because, in comparison with other lags, the VAR(1) has the lowest values of BIC\(^8\) and HCQ\(^9\).

**Table 5:** Information criteria for VAR(\(p\)) lag lengths.

<table>
<thead>
<tr>
<th></th>
<th>AIC(^10)</th>
<th>BIC</th>
<th>HCQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>lag 1</td>
<td>12.0104</td>
<td>12.1491</td>
<td>12.0668</td>
</tr>
<tr>
<td>lag 2</td>
<td>11.9756</td>
<td>12.2079</td>
<td>12.0700</td>
</tr>
<tr>
<td>lag 3</td>
<td>11.9856</td>
<td>12.3126</td>
<td>12.1184</td>
</tr>
<tr>
<td>lag 4</td>
<td>12.0149</td>
<td>12.4376</td>
<td>12.1866</td>
</tr>
</tbody>
</table>

From running VAR model, p-values of all coefficients and constant in the equation 15 are insignificant under 95% confidence level. P-value of each coefficient is in parenthesis under each coefficient (Appendix A.2). It defines that stock prices in Thailand are not influenced by inflation.

\[
\Delta SET50_t = 2.3646 + 0.0125(\Delta SET50_{t-1}) + 0.3338(\Delta Inflation_{t-1}) + \varepsilon_t \quad (15)
\]

\[
(0.4147) \quad (0.8904) \quad (0.9291)
\]

\[
\Delta Inflation_t = 0.0081 + 0.0024(\Delta SET50_{t-1}) + 0.3381(\Delta Inflation_{t-1}) + \varepsilon_t \quad (16)
\]

\[
(0.9035) \quad (0.2584) \quad (0.0001)
\]

From equation 16, there is only coefficient of \(\Delta Inflation_{t-1}\) (\(\Delta\) is difference operator.) that is significant under 95% confidence level. It means that present inflation rate associates with prior month inflation rate. It means that the alteration of inflation rate in time \(t\) depends on the change in previous period. However, this finding is out of the research interest.

To put simply, SET50 moves independently regardless of how high or low the inflation rate is.

From the outcome, there is no statistical relationship between inflation and stock prices in Thailand. Consequently, because there is no such relationship and small number of observations,

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\(^8\) Bayesian Information Criterion (BIC) or Schwarz Criterion (SBC, SBIC) is a criterion to choose a statistic model. The smaller number, the better the model (Ruppert, 2004).

\(^9\) Hannan-Quinn Information Criterion (HCQ) is a criterion to choose a statistic model. Like BIC, the smaller the number, the better the model (Koop, 2008).

\(^{10}\) Akaike’s Information Criterion (AIC) is a criterion to choose a statistic model. Like BIC and HCQ, the smaller number, the better the model (Ruppert, 2004).
only 4 months during Tsunami according to Tourism Authority of Thailand cited by Bank of Thailand (2008), and 12 months during the recent global economic recession according to National Economic and Social Development Board (2010), the impact of the global financial crisis and Tsunami is not tested.

<table>
<thead>
<tr>
<th>Test hypothesis</th>
<th>Description</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null hypothesis 1</td>
<td>No relationship between inflation and stock prices in Thailand.</td>
<td>Accept</td>
</tr>
<tr>
<td>Null hypothesis 2</td>
<td>The economic crisis and Tsunami have no impact on the inflation-stock prices relationship.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

4.3. Interview

This section illustrates the empirical finding of primary data from interviewing. According to the qualitative method, interview is a method to obtain the data to investigate the way humans make sense of their objective reality, thus the subjective experienced relationship inflation and stock prices. Hence, the questions in this interview aim to search for the Thai investors’ point of view regarding to the relationship between inflation and stock prices (Appendix B). The investors response based on their personal behavior and stock market perception.

From the interview responses, the investors can be classified in four groups which are

Group 1: Investors who take inflation into account to maintain their purchasing power

Group 2: Investors who slow down their investment when inflation rate increases

Group 3: Investors who consider inflation as a factor to choose a stock to invest

Group 4: Investors who have not taken inflation into account

*Inflation and investment decisions*

Group 1

Investors in this group take the inflation into consideration to begin investment in the stock market as an alternative choice to maintain the purchasing power. They believe that the increase in inflation diminishes their purchasing power while the interest returns from saving account is too low to keep the purchasing power against the inflation rate. Thus, the inflation is a factor to encourage them to invest more in stock market although they have to bear more risk than bond.
They expect the return from equity is unlimited while return from bond is a fixed rate and low liquidity. The interviewees mention this point that:

“The inflation drives me to search for alternative investment in stock market to keep the purchasing power of my initial fund”

Group 2

Slowing down investment is a strategy of an investor when the inflation trend is forecasted to increase because the higher inflation raises most of the products and services’ prices. An investor thinks that higher inflation is a threat to restrain the stock market growth. The interviewees mention this point that:

“Product price goes up when inflation is higher as a result of drop down demand. The stock reacts the negative way and I decide to slow down investment”

Group 3

There are some investors considering the inflation as a condition to choose the stock into their portfolios but it is not a critical criterion to concentrate on since several significant factors impact the investors’ decision, for instance, the company performance, global economic and GDP. Inflation is determined as indirect concern even though it is a part of macroeconomic. The interviewees mention this point that:

“Inflation leads me to consider some stocks to invest. However, the company performance and other factors is more critical”

Group 4

On the other hands, some investors have never taken inflation into account to motivate the investment in the stock market. The inflation is less attractive to drive them to invest in stock market. Nevertheless, the return on investment can satisfy and persuade them to the market regardless of tax expenses from capital gain. The investors in SET can take benefit from the tax exempt for capital gain by personal direct investment and indirect investment in mutual fund. Moreover, personal tax allowance from personal income, for example, remuneration, bonus and so on can obtain in case of investment in the Long-term equity fund (LTF). LTF is a specific mutual fund investing its major fund in Thai stock market for the long term. Therefore, the
investors investing in the LTF can receive two tax benefits from both capital gain and personal income. By the way, inflation is not a matter for the investors in this classification to consider to their investment. The interviewees mention this point that:

“I make the investment decision without inflation concerns. Most of my considerations are return and tax benefit”

**Inflation and stock price**

**Group 1**

The investors who take inflation into account believe that the high inflation stimulates new investors and funds to go into stock market to find higher return than interest rate of saving account. Though, interest rate from saving accounts bears low risk and as result its return is low. Investing in stock market is a way to find the return rate beyond the inflation rate. The investors’ opinion believe that if the investment return is below the inflation rate, they loss their purchasing power of the investment fund. As a result, the new comers begin to invest in the market and the present investors add more fund to invest. When there are more investors and funds in the market, it brings more demand for the stock and the stock price finally goes up. However, they agree that there is positive relationship between inflation and stock price but it’s just a small effect and the relationship is not strong. The interviewees mention this point that:

“I think inflation encourages investors to trade in the market. The more investors, the more demand on stock”

**Group 2**

An investor who applies slowing down strategy when inflation increase thinks that inflation increases in case of the oil prices that drive some stock prices, for instance, petroleum companies. These firms have an advantage to gain more revenue from the increasing sell price; so, the investors expect the higher profit in these companies as a result of higher stock value. Thus, these stocks have positive relationship between inflation and stock price. On the other hands, the other companies that is in the manufacturing, property, construction, consumer and food industry suffer from the high inflation rate because the customers have to carefully control their spending when the product prices is higher. Due to decreasing customer demand, it is an obstacle to the
companies’ growth and impacts their stock prices in the market. Hence, it is an adverse relationship between inflation and stock prices. The interviewees mention this point that:

“Inflation from oil price drives the petroleum stock price but put the pressure on stock in other groups”

**Group 3**

In an investor’s opinion, inflation, as a factor to choose stock, affects the commercial bank industry. In the high inflation situations, the commercial bank tends to increase the interest rate. It may raise the profit of commercial banks because they have possibility to increase their revenue from higher interest rate even though they also pay more interest rate for fixed and saving account. The big gap between loan interest rate and deposit interest rate is so wide that the commercial banks have more chance to earn additional revenue rather than loss. When inflation increases, the commercial banks’ stock price may rise in case of the fact that they gain more earning as well. Nonetheless, if the profit drops down, their stock prices are supposed to decrease. The interviewees mention this point that:

“The commercial bank stock expect to have the advantage from high inflation but company profit is the big concern to stock price”

**Group 4**

The investors who do not take inflation into account cannot find the relationship between inflation and stock price at all. They cannot find any response from the stock market index and stock price when the inflation rate is announced to the public but they think GDP is more significant than inflation. The interviewees mention this point that:

“Inflation and stock price are totally irrelevant”

*Inflation and stock return and portfolio*

**Group 1**

The investors who take inflation into account believe that the stock prices increase when the inflation rate is high in consequence of a little higher stock return at the immaterial level. For the portfolio, the insignificant increase in stock return does not affect the value of the portfolio. The interviewees mention this point that:
“Stock price is higher from inflation; so, stock return and portfolio are supposed to change but it is not that much”

Group 2
An investor, who thinks that increase in inflation tolerates more risk and applies slowing down strategy to invest, explains that the stock return differs by group of industry. In case of inflation driven by energy prices, the stock of petroleum firms gain more benefit while other industries loss their customer demands and influence to companies’ performance and stock return. Thus, the portfolio value depends on what stocks you have in your portfolio. The interviewees mention this point that:

“The stock of petroleum company provides good return to portfolio in case of inflation from oil price but other stock returns decrease”

Group 3
Investors, who determine the inflation as indirect factor to select investment in stocks, do not think that the stock return of the overall market changes based on the inflation. Consequently, the portfolio value does not change. The interviewees mention this point that:

“Stock return does not response to the inflation because it is indirect factor”

Group 4
Investors, who have never taken inflation into account, cannot find the relationship between inflation and any aspects of the stock market including relationship to stock return and portfolio value. The interviewees mention this point that:

“There are not the relationship between inflation and stock market.

Inflation and stock price during Global crisis

None of investors think that the stock price drops down in the global crisis because of the inflation affects. The stock price drops from the crisis in US and worldwide regarding to subprime loan spreading to financial institutions collapse in US. The interviewees mention this point that:
“During global crisis, the panic from bankruptcy of big financial firm is the key driver to put the pressure on stock market. No one considers inflation at that time”

*Inflation and stock price during Tsunami period*

Tsunami is an extraordinary event in the short period; so, it does not impact to inflation and the stock price changes that time in construction industry as a result of the recovery project to replace the ruin after the Tsunami events. To sum up, Inflation during the Tsunami events does not relate to stock market. The interviewees mention this point that:

“Tsunami event has positive influence to stock in the construction sector but it does not affect the inflation”

**Table 7: Summary of interviewees’ responses**

<table>
<thead>
<tr>
<th>Investors Group</th>
<th>Inflation and investment decisions</th>
<th>Inflation and stock price</th>
<th>Inflation, stock return and portfolio</th>
<th>Inflation and stock price during global crisis</th>
<th>Inflation and stock price during Tsunami</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1: Take inflation into account to keep purchasing power</td>
<td>Inflation drives investment in stock to maintain purchasing power</td>
<td>High inflation brings more funds to market. Then, stock price goes up a bit but it’s not strong inflation-stock price relation</td>
<td>Stock return is insignificantly high and no changes in portfolio when the inflation goes up.</td>
<td>No relationship during crisis</td>
<td>No relationship during Tsunami</td>
</tr>
<tr>
<td>G2: Slow down their investment when inflation high</td>
<td>High inflation is a threat to market so slow down investment</td>
<td>High inflation from oil price is advantage to petroleum companies but obstacle for others</td>
<td>Return varies by group of industries. If inflation from oil price, petroleum stock gain more return while others loss</td>
<td>No relationship during crisis</td>
<td>No relationship during Tsunami</td>
</tr>
<tr>
<td>G3: Consider inflation as an indirect factor to choose a stock</td>
<td>Inflation is indirect concern but the key factor is company performance</td>
<td>High inflation affects interest as well as banking sector. Stock price expect to increase, if bank earn higher profit</td>
<td>No changes for both return and portfolio.</td>
<td>No relationship during crisis</td>
<td>No relationship during Tsunami</td>
</tr>
<tr>
<td>G4: Have not taken inflation into account</td>
<td>Consider return and tax benefit instead of inflation</td>
<td>No inflation-stock prices relationship, and GDP is more significant than inflation</td>
<td>No changes for both return and portfolio.</td>
<td>No relationship during crisis</td>
<td>No relationship during Tsunami</td>
</tr>
</tbody>
</table>
According to the findings, there is, statistically, no inflation-stock prices relationship which is supported by the investors’ perception. The investors think that there is weak relationship or even no such relationship in Thai stock exchange as shown in table 7. Regarding to momentous events that affected Thai economy, the investors unanimously agree that they did not take inflation rate into investment or disinvestment consideration.
Chapter 5: Discussion

This chapter provides extensive idea of the result from analysis chapter as well as benchmarks the result with other researches.

According to the result from examining the relationship between inflation and stock prices in Thailand, there is no obvious association between those two variables. Consequently, the inflation – stock price relationship also cannot be discovered during period of Tsunami and global financial crisis. The Tsunami period defined by Tourism Authority of Thailand (TAT) is from December, 2004 to March, 2005. Having a look at returns on SET50 index in the first quarter of 2005, average return on SET50 of the first quarter of 2005 was 0.56 per cent comparing to that of the same quarter 2004, negative number of 4.09 per cent. Besides, the inflation rate in the same quarter was not affected by the natural disaster in accordance with Bank of Thailand.

Due to very few numbers of observations, 4 months, time series analysis cannot reasonably explain the behavior of inflation-stock prices relationship. Regarding to the responses from interviewees, the impact of Tsunami limited in the short period of time and only in the southern part of Thailand. Hence, it does not affect to both inflation and stock market significantly.

According a report published by National Economic and Social Development Board (2010), the recent economic recession had impact on economy in Thailand since the third quarter of 2008 and started to recovery in the fourth quarter of 2009. Average return on SET50 in the crisis period was 2.53 per cent and the volatility of it tremendously fluctuated, standard deviation was 12.52. Concerning inflation rate in the same period, it slumped continuously to negative number, -4.38 per cent in July 2009. Time series analysis of the correlation between inflation rate and stock prices during the recession is quite difficult to conduct because of relatively small number of observation. Inflation rate, stock prices, and stock return rise and fell exceptionally quickly.

All of the interviewees’ responses point out that inflation rate was not one of the factors that influences the stock prices. The respondents claim that the information employed in investment decision making is company productivity, and the market condition. However, the Reserve Bank of New Zealand (2003) suggested that an investor should distinguish between nominal return and
real return. The nominal return takes an effect of inflation into account, whereas the real return eliminates the impact of inflation. Nominal return has positive relationship with inflation rate.

![Graph](image-url)

**Fig. 7**: Inflation rate and return on SET50 during the world financial recession in Thailand (October, 2008 - September, 2009)

To take the entire observation period into account, the result from regression with times series variables indicates that there is no apparent relationship between inflation rate and stock prices in Thailand. Nevertheless, investors in the market have different perspective toward the influence of inflation on stock prices in Thailand. Some investors believe that the inflation has weak positive inflation-stock prices relationship, or if the inflation increases as a consequence of higher energy price, stock prices in petroleum and fuel industry will follow the trend of the inflation, while the others move in opposite way. On the other hand, the others think that there is no such relationship in the market in Thailand.

However, according to prior empirical studies, negative correlation between inflation and stock movement was found in several countries such as European countries, Brazil, and etc. Adrangi et al. (2000) found that stock returns in Brazil negatively correlate with inflation which supports Fama’s proxy hypothesis. The facts behind this relationship in Brazil are that prospective company’s profit is influenced by inflation, and that inflation causes nominal discount rate to move up which devalue future profits and stock returns.
On the other hand, the inflation-stock prices relationship is controversial in Greece. Apergis et al. (2002) examined such relationship in Athens Stock Exchange (ASE) and found the inverse relationship between the inflation and stock prices in ASE. On contrary, Hondroyiannis et al. (2006) argued that there is no such relationship in ASE no matter whether it is permanent or temporary inflation.

Jung et al. (2007) conducted a study to investigate the relationship in France, Germany, Italy, and the United Kingdom. In France, Italy, and the United Kingdom, both expected and unexpected inflation affects real stock returns. Only Germany do real stock returns not respond to any kind of inflation. As claimed by the authors, one of the possible reasons why the result in Germany was different from the others is that Germany underwent reunification process in 1990s.

Although the findings of this study indicate that no such relationship in the Stock Exchange of Thailand, the relationship might be able to discover when the inflation rate is decomposed into expected and unexpected inflation. In several researches (Sharpe, 2002; Jung et al., 2007; and Apergis et al., 2002), the expected and unexpected inflation rate were separately tested and some of empirical findings indicated different outcome between them.

The political tension in Thailand has remarkable influence on the stock market movement and investors behavior. This condition might have more powerful impact beyond inflation rate and might be a reason why the relationship cannot be detected in this study.
Chapter 6: Conclusion

This section summarizes the entire study as well as answer the research question. The strength and weakness are pointed out in this part as well. The further research mentions at the end of this part.

To remind and highlight the research topic, “Relationship between inflation and stock price” is the question of this study. This study searches for the contents from enormous quantities of literatures review. The literatures demonstrate to both positive and negative inflation-stock price relationship. Moreover, the conclusions regarding to relationship, found in the literature review, have conflict among vast literatures. However, most of the researches study in both developed and emerging stock market throughout the world but our study aims at Stock Exchange of Thailand in particular time period for ten years including period of global crisis and Tsunami. Therefore, this study is conducted to find the inflation-stock price relationship by the quantitative and qualitative method. The statistic and interview are used to serve these two methods. In the analysis chapter, the empirical finding in form of statistical interpretation connects to interview results. The combination of two results is applied to answer the question in this chapter.

*Literature finding compare to empirical finding*

From the literature finding, there are conflicts in several theories about relationship between inflation and stock price. Some authors believe that the relationship is the positive. On the other hands, other authors find out that the relationship is adverse relation.

For the empirical finding in analysis chapter, the research results in both statistical and interview results agree in the same way that there is no relationship between inflation and stock price in SET50 for ten years from 2000 to March 2010. In the period, there is the remarkable global crisis impacting to Thailand and global stock market. Nevertheless, no inflation-stock price relationship can find in that circumstance. For the relationship during the Tsunami, there is no such relationship as well.

In summary, there is no relationship between inflation and stock price in Thailand for year 2000 to March 2010.
**Strength and weakness of the study**

The strength of this study can find from using both quantitative and qualitative method. As a result, this study can serve various perspectives. The quantitative is applied for the hypothesis investigation to answer the question. Meanwhile the interview, representing qualitative method, supports evidence from quantitative results and indicates the real investors’ opinions in particular Stock Exchange of Thailand. Even though, the analysis is against the hypothesis, it brings the different aspects to consider in both normal economic status and global economic crisis. Moreover, it also points out the irrelevance between inflation during Tsunami and stock price.

The small amount of respondents can lead the weakness of this study. Sample of the investors may not represent all the investors in the market. This research focuses only on the stock in Thailand; so, it has a limit to compare to other stock markets in developing countries. However, the quantitative results that agree to interview response can use to answer the research question.

**Further research**

To deepen the study, inflation can be decomposed to expected and unexpected inflation. The decomposed inflation is the advance study in deep and may discover other findings in different viewpoint. Moreover the core inflation, inflation excluding food and oil price, opposes from the headline inflation that this study statistically uses in quantitative method. The study in the core inflation rather than headline inflation may obviously find the connection of inflation and stock price exclusive of any variables. The finding results from core inflation can be the ordinary base in general to further study combining other interesting considerations. In addition, there are various factors influence the stock market all the times. It would be abundant if further study takes other dynamic factors into account based on the key economic drivers in particular countries.

**Final comments**

The researchers hope his study can contribute some aspects to the investors who are interesting in investment in the stock exchange in order to consider and evaluate the critical factors. There are many factors that expose to the risk for the investment. The more risk management, the better sustainable wealth.
References


Koop, G. (2008), *Analysis of Financial Data*, West Sussex: John Wiley & Sons Ltd.


Appendices

Appendix A: Statistic Tables

A.1: Testing for unit-root and cointegration

Step 1: testing for a unit root in SET50

Augmented Dickey-Fuller test for SET50 including one lag of (1-L)SET50, sample size 121

Unit-root null hypothesis: \( a = 1 \)

test with constant

model: \((1-L)y = b_0 + (a-1)*y(-1) + ... + e\)

1st-order autocorrelation coeff. for e: 0.008

estimated value of \((a - 1)\): -0.0243883

test statistic: \(\tau_c(1) = -1.14944\)

asymptotic p-value 0.6982

Step 2: testing for a unit root in Inflation

Augmented Dickey-Fuller test for Inflation including one lag of (1-L)Inflation, sample size 121

Unit-root null hypothesis: \( a = 1 \)

test with constant

model: \((1-L)y = b_0 + (a-1)*y(-1) + ... + e\)

1st-order autocorrelation coeff. for e: -0.088

estimated value of \((a - 1)\): -0.0829859

test statistic: \(\tau_c(1) = -2.82131\)

asymptotic p-value 0.05526

Step 3: cointegrating regression

Cointegrating regression - OLS, using observations 2000:01-2010:03 (T = 123)
Dependent variable: SET50

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. Error</th>
<th>T-ratio</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>319.95</td>
<td>16.428</td>
<td>19.48</td>
</tr>
<tr>
<td>Inflation</td>
<td>28.7929</td>
<td>4.92622</td>
<td>5.845</td>
</tr>
</tbody>
</table>

Mean dependent var 391.6529  S.D. dependent var 136.6588  
Sum squared resid 1776787  S.E. of regression 121.1783  
R-squared 0.220170  Adjusted R-squared 0.213725  
Log-likelihood -763.5846  Akaike criterion 1531.169  
Schwarz criterion 1536.794  Hannan-Quinn 1533.454  
rho 0.952467  Durbin-Watson 0.105181

Step 4: testing for a unit root in uhat(error term)

Augmented Dickey-Fuller test for uhat including one lag of (1-L)uhat, sample size 121

Unit-root null hypothesis: a = 1

\[ (1-L)y = b_0 + (a-1)y(-1) + \ldots + e \]

1st-order autocorrelation coeff. for e: 0.001

estimated value of (a - 1): -0.0525595

test statistic: \( \tau_c(2) = -1.79555 \)

asymptotic p-value 0.6325

There is evidence for a cointegrating relationship if:

(a) The unit-root hypothesis is not rejected for the individual variables.

(b) The unit-root hypothesis is rejected for the residuals (uhat) from the cointegrating regression.

A.2: Vector Autoregression (VAR)

VAR system, lag order 1

OLS estimates, observations 2000:03-2010:03 (T = 121)

Log-likelihood = -720.63216

Determinant of covariance matrix = 510.56667
AIC = 12.0104
BIC = 12.1491
HQC = 12.0668

Portmanteau test: LB(30) = 154.575, df = 116 [0.0097]

**Equation 1: SET50_diff**

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. Error</th>
<th>T-ratio</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.36461</td>
<td>2.88862</td>
<td>0.8186</td>
</tr>
<tr>
<td>SET50_diff_1</td>
<td>0.0125379</td>
<td>0.090769</td>
<td>0.1381</td>
</tr>
<tr>
<td>Inflat_diff_1</td>
<td>0.333802</td>
<td>3.74473</td>
<td>0.08914</td>
</tr>
</tbody>
</table>

Mean dependent var 2.390165  S.D. dependent var 31.46614
Sum squared resid 118787.2  S.E. of regression 31.72808
R-squared 0.00227  Adjusted R-squared -0.016718
F(2, 118) 0.013399  P-value(F) 0.986692
rho 0.011295  Durbin-Watson 1.955789

F-tests of zero restrictions:
All lags of SET50_diff  F(1, 118) = 0.019080 [0.8904]
All lags of Inflat_diff  F(1, 118) = 0.0079458 [0.9291]

**Equation 2: Inflat_diff**

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. Error</th>
<th>T-ratio</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.00807499</td>
<td>0.0664903</td>
<td>0.1214</td>
</tr>
<tr>
<td>SET50_diff_1</td>
<td>0.00237299</td>
<td>0.00208932</td>
<td>1.136</td>
</tr>
<tr>
<td>Inflat_diff_1</td>
<td>0.338084</td>
<td>0.0861961</td>
<td>3.922</td>
</tr>
</tbody>
</table>

Mean dependent var 0.019906  S.D. dependent var 0.773448
Sum squared resid 62.93672  S.E. of regression 0.730316
R-squared 0.123280  Adjusted R-squared 0.108420
F(2, 118) 8.296264  P-value(F) 0.000425
rho -0.080924  Durbin-Watson 2.159690

F-tests of zero restrictions:
All lags of SET50_diff  F(1, 118) = 1.2900 [0.2584]
All lags of Inflat_diff  F(1, 118) = 15.384 [0.0001]
Appendix B: Interview Questions

Question 1: How do you take the inflation into account when you make an investment decision?

Question 2: How do you think the inflation influence the stock price?

Question 3: How do you think the inflation influence the stock return?

Question 4: How do you think the inflation influence your portfolio?

Question 5: How do you think the inflation during global crisis affect to stock price?

Question 5: How do you think the inflation during Tsunami affect to stock price?