

**THE IMPACT OF THAI STOCK MARKET IN RESPONSES TO  
CPI NEWS ANNOUNCEMENTS**



**A THEMATIC PAPER SUBMITTED IN PARTIAL  
FULLFILLMENT OF THE REQUIREMENTS FOR  
THE DEGREE OF MASTER OF MANAGEMENT  
COLLEGE OF MANAGEMENT  
MAHIDOL UNIVERSITY  
2014**

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Thematic paper  
entitled

**THE IMPACT OF THAI STOCK MARKET IN RESPONSES TO  
CPI NEWS ANNOUNCEMENTS**

was submitted to the College of Management, Mahidol University for the degree of  
Master of Management

on  
April 23, 2014



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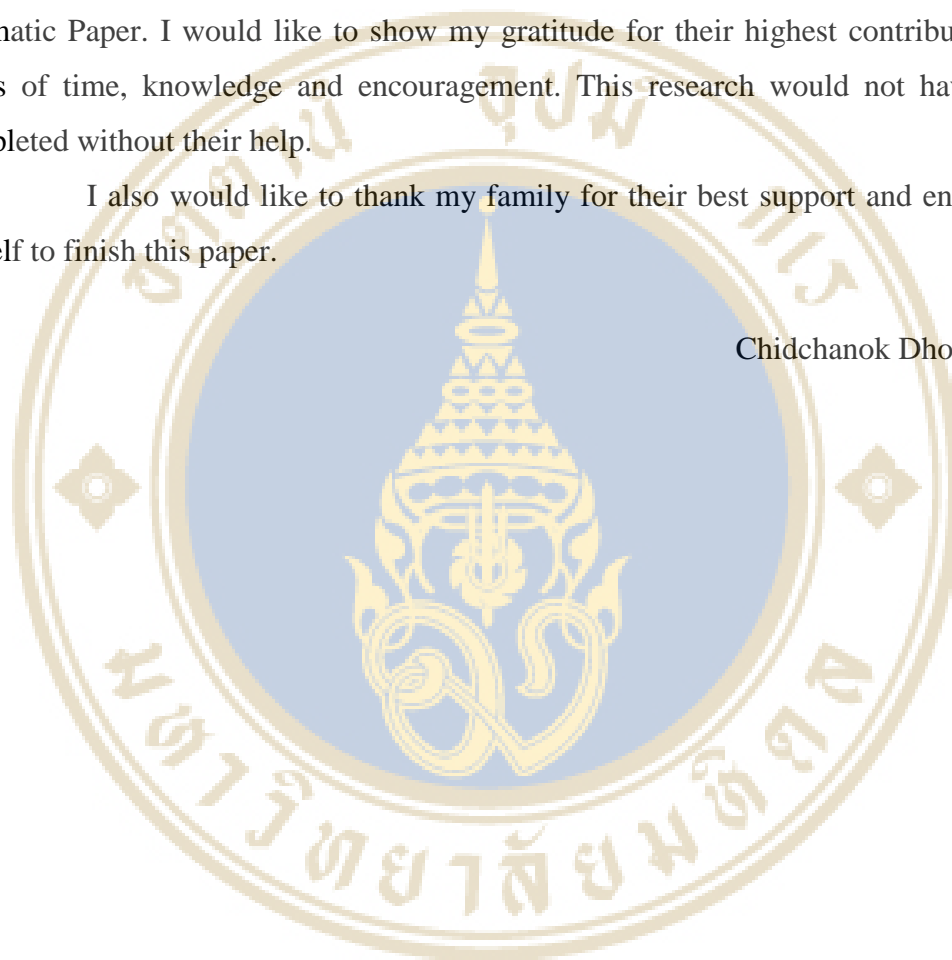
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## ACKNOWLEDGEMENTS

I would like to pay sincerely gratitude to my advisors, Asst. Prof. Chiraphol N. Chiyachantana, Ph.D., Nareerat Taechapiroontong Ph.D., and Eakapat Manitkajornkit, Ph.D., who gave me valuable advices in order to complete this Thematic Paper. I would like to show my gratitude for their highest contributions in terms of time, knowledge and encouragement. This research would not have been completed without their help.

I also would like to thank my family for their best support and encourage myself to finish this paper.

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## **THE IMPACT OF THAI STOCK MARKET IN RESPONSES TO CPI NEWS ANNOUNCEMENTS**

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### **ABSTRACT**

This study examines the relationship between Thai stock returns and the impact of CPI news announced in Thailand, the U.S. and Germany. We find that the market returns and traders, which are categorized into four groups; Mutual, Proprietary, Foreign and Retails react to the news more negatively especially when the market condition is in Bear state. However, according to the regression analysis, we can conclude that the CPI affects on the market can take a long leading time for the market to react to the news.

**KEY WORDS:** Consumer Price Index / Macroeconomic News / Market Returns / Trading Imbalance / Thailand

33 Pages

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## CHAPTER I

### INTRODUCTION

You may ask a question how the news can impact the market returns. Fama Eugene explained it well in his Efficient-Market theory that the information available in the market is the factor that impact stock prices. If this assumption held true, all information is embedded in the prices. Hence, the news announced should lead to the prices changes as a reflection to the news.

Now you may ask how the news impacts the prices and what the linkage is. To answer this question we may need to look at the components of stock prices and the most standard theoretical model we learned in Finance Class. Individual stock prices derives from three main factors which are the future expect cash inflows (e.g. dividend payment or capital gain), discount rate and expected growth; for simplicity we will assume constant growth model for the discussion.

The macroeconomic news announced the changed in monetary policy control by Central Bank as a mean to stabilize the economy. It means that for example if inflation increase to the point where the economic is inflated, the Central Bank will launch a campaign to control inflation by increasing interest rate to reduce the spending in the economy. As interest rate increase, the stock prices decline as investors move their money into a safer alternative; Note that stocks have to compete with other investment alternative such as treasurer bill, fixed deposit or bond market. From the corporate perspective, the inflation affects the firm's cash flows and therefore leading to the changes in stock prices of the individual firm, for example.

As previous researches are mostly focus on the U.S. market. Therefore, in this paper, we would like to see if the market responses to the CPI news announced domestically. We also look further into the market responses to the news announced internationally by developed countries such as the U.S. and Germany as we believe that the global capital markets and economies are integrated through trade and capital flows.

In this study, we would like to test the following hypothesis if it is held true in Thai stock market.

*H1: Thai stock market reaction depends on the news announced domestically and internationally*

This hypothesis has been tested by using the data collected from SETSMART for the market returns and determined the response of the returns on the CPI announcement by Thailand, the U.S and Germany. We would like to test whether the news announced in each country has statistically significant impact to the market returns

*H2: Thai stock market reaction depends on the news announced domestically and internationally conditional to market states*

The next step is to add another condition and test whether the news announced conditional to market states can significant impact the market returns.

*H3: Trading volume by investor types in responses to the news announced domestically and internationally*

In this section, we would like to see who are the buyer and seller on the announcement date. The trading volume in this paper obtains from SETSMART. The method of calculating the trading will be discussed in details in Chapter 3.

*H4: Trading volume by investor types in responses to the news announced domestically and internationally conditional to market states*

Lastly, we would like to add another factor which is the market condition to investor trading to see if there is any significant response in trading and news announcement.

The remainder of this paper is organized as follows. Chapter 2 outlines the theoretical framework and the reviews of related literature. Chapter 3 describes the data with basic static table showing the maximum, minimum, standard deviation and number of observations for three studied variables. Chapter 4 then presents the results and discussion of the findings. Lastly, the final Chapter 5 contains the conclusion of the finding in this paper.



## CHAPTER II

### LITERATURE REVIEW

One of the most cited theories, efficient-market hypothesis, by Fama (1970) stating that all information available in the market is embedded in stock prices, are followed by many researchers on the study of the linkage between macroeconomic news and stock prices. Some questions may derive how the news on macroeconomic can influence stock prices. The answer is well explained in business review from Federal Reserve Bank of Philadelphia by Defina (1991) that investors buy a stock today to claim for the current and future cash inflows from the firms. Therefore, the prices they pay today for the stream of income can determine the stock's rate of return. In other words, the more he or she pays today, the less of rate of return he or she will get.

It might shed some light to our research if we put it in a simple finance model. According to Williams (1938) and Gordon (1962), stock price can be written as expected discount dividends:

$$P_t = \frac{D_{t+1}}{(k-g)} = \frac{\Pi E_{t+1}}{(k-g)} = \frac{\Pi(1+g)E_t}{(k-g)}$$

where  $P_t$  is the stock price at period  $t$ ,  $D_{t+1}$  is the dividend at the next period,  $E_{t+1}$  is the earning of the next period,  $\Pi$  is the dividend payout ratio which assume to be constant,  $k$  is the cost of equity and  $g$  is the constant growth rate.

From this model, we now can see that discount rate, expected future cash flows and future growth rate impact the stock prices. If we put together this knowledge with economic theory, we can derive one hypothesis that if the inflation rate increases, the market participants will expect interest rate to increase in order to reduce spending in the economy and therefore lower stock price as investors may invest in a safer asset. As a result, the stock prices decline when the inflation increase. This is consistent with previous studies by many well known researchers such as Fama and Schwert (1977),

Fama (1981), and Fama and Gibbons (1982). They found that the equity returns are negatively correlated with unexpected inflation since the post U.S. war.

Changes in macroeconomic variables, such as inflation, can affect many firms' cash flows and may influence the discount rate (Flannery, 2001). Thus many researchers try to understand the linkage of economic news to the stock market as this understanding can help investors to foresee the impact of news and reallocate their portfolio accordingly (Funke & Matsuda, 2002). Flannery (2001) also found that inflation is one of the risk factors that have a negative impact on stock returns.

Sharpe (1999) further studied the effect of inflation on expected long-run return by using the Campbell and Shiller (1988, 1989) dividend-price ratio model. He used earnings expectation on S&P500 from I/B/E/S International and Philadelphia Fed survey of professional forecast to conduct the test. The result showed that expected inflation is negatively related to market expectation of earnings growth in long term which leading to the increase in the required return on stocks. In other words, rising inflation tends to decline stock returns as higher inflation would increase long term interest rate; hence raise the rate at which the investors used to discount dividends (Bordo, Dueker & Weelock, 2008). This can be concluded that the unanticipated change in inflation may lead to a more restrictive monetary policy resulting in lower a company's cash flows and consequently lower stock prices (Hu, 1998).

Some researchers studied further in market responses to macroeconomic news across the business cycles in the U.S. market. Wei (2009) found that the excess stock returns respond negatively to unanticipated inflation during economic recession than expansion. This is due to the unexpected inflation will signal a higher risk premium in recession leading to lower equity returns according to three primitive factors<sup>1</sup> determining stock prices which are discount rate, expected growth rate of real activity and equity risk premium. Coelho (2004) found a statistically significant on the

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<sup>1</sup>Wei followed the three primitive factors, which are discount rate, expected growth rate and equity risk premium, in Campbell and Mei (1993)'s study to link the "cyclical response of excess market return to unexpected inflation. According to Wei's study, rising in risk premium in responses to unexpected inflation during recession will lower equity returns

negative correlation between unexpected U.S. inflation announcement and the U.S. stock prices when the economic is in a recession period.

However, many researches are mostly done in the U.S context where in fact the world economy is now integrated in which trade and capital flow are the linkage between each countries. Therefore, we should consider this linkage in a global context (Lu, 2008). The impact of macroeconomic variables in Japanese stock market had been studied by Kim and Kow (2004) and found a significant impact of the scheduled announcement of macroeconomic news on returns and volatility in Japanese market. An empirical result from the similar study in Australian are also found an evidence on the relationship between unexpected changes in macroeconomic variables and Australian stock returns where the surprises news about inflation is negatively correlated to the marker (Sadeghi, 1992).

Another question may arise whether investors can exploit this relationship and generate return from the market. Katzur and Spierdijk (2010) provided a study in the exposure of common stocks to inflation risk and its exposure to portfolio choices. They stated this relationship has substantially impact on optimal asset allocation. Another study done by Lu (2008), a well defined signal of inflation can be used to guide industry rotation strategy which proven to be the beneficial during the bear market.

In this paper, we investigated the Thai stock market responses to CPI news announced in Thailand, the U.S. and Germany and determine if they display patterns similar to previous finding.

## **CHAPTER III**

### **DATA AND METHODOLOGY**

#### **3.1 Data**

Due to the availability of the forecast data for Thailand, The U.S. and Germany, our sample period begins on August 1<sup>st</sup>, 2008 and ends on November 1<sup>st</sup>, 2013; the number of observation (n) for Thailand and the U.S are 111 observations for each country and 110 for Germany. In this paper, we examined the overall market returns including SET and MAI responses to Consumer Price Index (CPI) announced in the interested countries.

##### **3.1.1 Stock Index**

Thai stock market from SETSMART is used to estimate the response of stock prices to CPI. Closing prices of daily stock market are used to compute the market returns. Some announcement news was announced when the stock market was closed. In this case, we used the market return on the following trading day.

##### **3.1.2 Trading Imbalance by Investor Type**

To analyze the marker responses on who the buyer and seller are under the studied events, trading volume by investor types from SETSMART is used. Investor types are categorized into four groups which are Mutual Fund (TV\_M), Proprietary Trade (TV\_P), Foreign traders (TV\_F) and Retails traders (TV\_C). In the case of the announcement news falls on the day that the market is closed, the following trading day is used to analyze the impact of the news which is the same basis used in analysis stock returns.

### 3.1.3 Macroeconomic Announcements

CPI is announced on a monthly basis normally by Bureau of Statistic in each country. It is used to measure the change in the price level of consumer goods and services purchased by household. In this study, Month-over-Month (MoM) CPI data are used for the study in the paper. The MoM CPI is the change in CPI of the current month comparing to the previous month in which it is reported in percentage term.

$$CPI_{MoM} = \frac{CPI_t - CPI_{t-1}}{CPI_t} \times 100$$

where  $CPI_t$  is CPI at month t and  $CPI_{t-1}$  is CPI at month t-1. MoM CPI is the changes in CPI in levels expressed with respect to previous month.

In this study, we used the news announced from Thailand, the U.S. and Germany to test whether domestic and international news has any impact on Thai stock market. Firstly Thai CPI data are from Bureau of Trade and Economic indices Ministry of Commerce Thailand. They provide the information about CPI during the preceding month and are released monthly on the first working day of the month around 11:00 AM. The actual monthly CPI data are available since 1970.

The second variable is the U.S. CPI data which came from United States Department of Labor Bureau of Labor Statistic. The monthly CPI data are provided on the next preceding month and released on various days of the weeks. The announcement time is around 19:00PM Bangkok Time. In this case, as the announcement time for this data happens when Thai stock market is closed, we used the next following trading day to analyze the announcements impact on the market return.

The last variable is the German CPI data which came from Federal Statistic Office, Germany. They provide information about inflation during the preceding month and are released monthly around the third week of the month around 13:00PM Bangkok time. For German data, as the announcement time is when the Thai stock market is still open; therefore we used the same day to analyze the impact on the market returns.

### 3.1.4 Expectation Data

To analyze the market responses to the news, we used surprise factor to examine the impact throughout this paper. In this sense, we obtained the forecast data for Thailand from Bureau of Trade and Economic indices Ministry of Commerce Thailand, Federal Reserve Bank of Philadelphia for the U.S. and Bloomberg for Germany.

Table 3.1 reports the basic statistics for the surprise factors of the sample data. The sample periods are the news announced from August 2008 to November 2013. The number of observation for Thailand, the U.S. and Germany are 111, 111, and 110, respectively.

#### Table 3.1: Descriptive Statistics

*This table presents the basic statistics for CPI announced in Thailand (TH), the U.S. (US) and Germany (GE) between August 2008 and November 2013. The monthly surprise factors for CPI shown below are calculated by taking the differences in forecast and actual data in a percentage term. The monthly expected CPI data are from Bureau of Trade and Economic indices Ministry of Commerce Thailand for Thailand, Federal Reserve Bank of Philadelphia for the U.S and Bloomberg for Germany.*

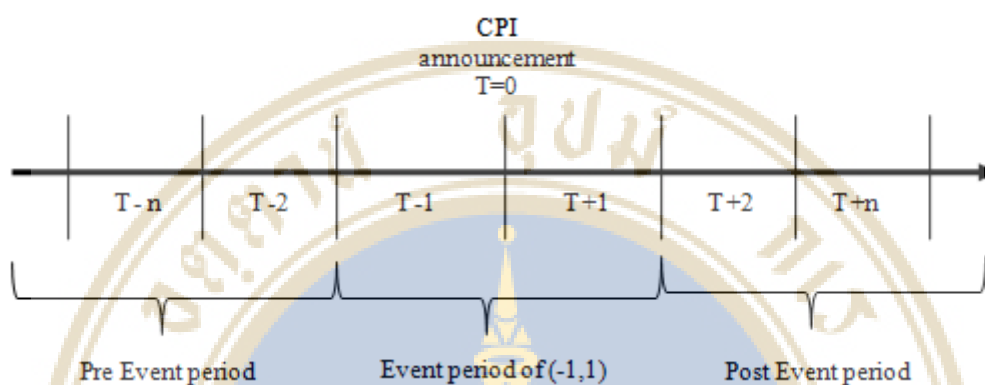
| Monthly Data<br>(August 2008 - November 2013) | TH     | US    | GE    |
|---|--------|-------|-------|
| Consumer Price Index (CPI)                    |        |       |       |
| Number of Observation                         | 111    | 111   | 110   |
| Maximum                                       | 11.54  | 2.20  | 0.30  |
| Minimum                                       | -16.27 | -1.60 | -1.00 |
| Mean  | 0.66   | -0.01 | -0.01 |

### 3.2 Methodology

Event study is used to examine whether the market returns on the announcement date of the study variables in Thailand, the U.S. and Germany have any statistically significant. We built event window around the announcement date from -5



to +30 days. According to Knif, Kolari and Pynnone (2003), they stated in their research that post event of the market reaction to the news is slow and can take over a number of days subsequent to the news. Therefore, we applied a long leading time to the study by creating a studied window of 30 days after the announcements. The following graph illustrated the sequence of the event study on stock market returns for event period (-1, 1):



### 3.2.1 Market Return

We examined the overall stock market in Thailand; therefore daily stock market returns in accordance with the announcement date are used throughout this paper.

$$RET = \ln (SET\_CLOSED_t / SET\_CLOSED_{t-1}) \times 100$$

Where  $SET\_CLOSED_t$  is the market closing price at time  $t$  and  $SET\_CLOSED_{t-1}$  is the closing price at time  $t-1$ . Note that when the announcement date falls on the time when the market is closed, the next trading day, when the market resumes, will be used to analyze the impact.

### 3.2.2 Trading Imbalance by Investor Type

Trading volume for the overall stock market is used to investigate net trading volume by each type of investors. According to the market, investors can be categorized into four groups which are Mutual Fund (TV\_M), Proprietary Trade (TV\_P), Foreign traders (TV\_F) and Retails traders (TV\_C). We used the trade

imbalance by investor types on each announcement date to find the impact. The trading imbalance derived from the following formula:

$$TV_x = \frac{Buy\ Volume_{TV_x} - Sell\ Volume_{TV_x}}{Buy\ Volume_{TV_x} + Sell\ Volume_{TV_x}}$$

when TV<sub>x</sub> is the trading volume by each investor type (TV<sub>M</sub>, TV<sub>P</sub>, TV<sub>F</sub> and TV<sub>C</sub>).

The formula is repeated for each investor type to calculate the net trading volume. The result will be in a percentage term and use to analyze the impact of CPI on the announcement date. Note that when the announcement date falls on the time when the market is closed, the next trading day, when the market resumes, will be used to analyze the impact.

### 3.2.3 Surprised Factor

The surprised factor is the difference between the actual versus the expectation data of CPI announced in Thailand, the U.S. and Germany. We calculated the surprise factor by using the following formula:

$$Pchg_x = CPI_{Actual} - CPI_{Expected}$$

where  $Pchg_x$  represents the surprise factor for the three variables, Thai CPI surprise factor ( $Pchg\_FTH$ ), the U.S CPI surprise factor ( $Pchg\_FUS$ ), and German CPI surprise factor ( $Pchg\_FGE$ ).

For the surprise factors, we also categorized them into positive (Actual CPI > Expected CPI) or negative (Actual CPI < Expected CPI) signals to see if the market responses differently to the news.

### 3.2.4 Market Conditions

According to some researchers, inflation surprises can produce a various market reactions depending on the state of economy (Knif & Kolari & Pynnonen, 2003). Therefore, in this paper, we have divided the stock market condition into Bull or Bear market. The market closing price at the end of the end is used to compare with



the market closing price at the beginning of the month; the negative change will be classified as Bear market and the positive change will be classified as Bull market. The formula is per below.

$$Pchg_{Mkt} = RET_t - RET_{t-1}$$

where  $Pchg_{Mkt}$  represents the market conditions and  $RET_t$  is the market closing price at the beginning of the month and  $RET_{t-1}$  is the market closing price of the ending of the month.

### 3.2.5 Winsorizing Data

A method of averaging the observation values by replacing the smallest and largest values with the nearest observation to them. We used the data at 1 and 99 percentile to replace the smallest and largest observation values to eliminate the outlier. This method is used when analyzing the market returns and trading volume in responses to the news announcement.

### 3.2.6 Regression Model

We applied the model from Lili and Hu (1998) for the regression model. According to their study, the below formula is used to examine the market responses to macroeconomic news.

$$DP_t = \alpha + X_t^\mu \beta + e_t \quad (1)$$

where  $DP_t$  presents the change in the log of the stock prices from the market closing price at time t and t-1. The  $X_t^\mu$  is the vector of unanticipated components of the macroeconomic news announcement computed by taking the differences between actual and survey data.

We therefore applied the same model into this study to find the relationship whether market returns have any statistically significant to the announcement news. The model has been rewritten into the following form:

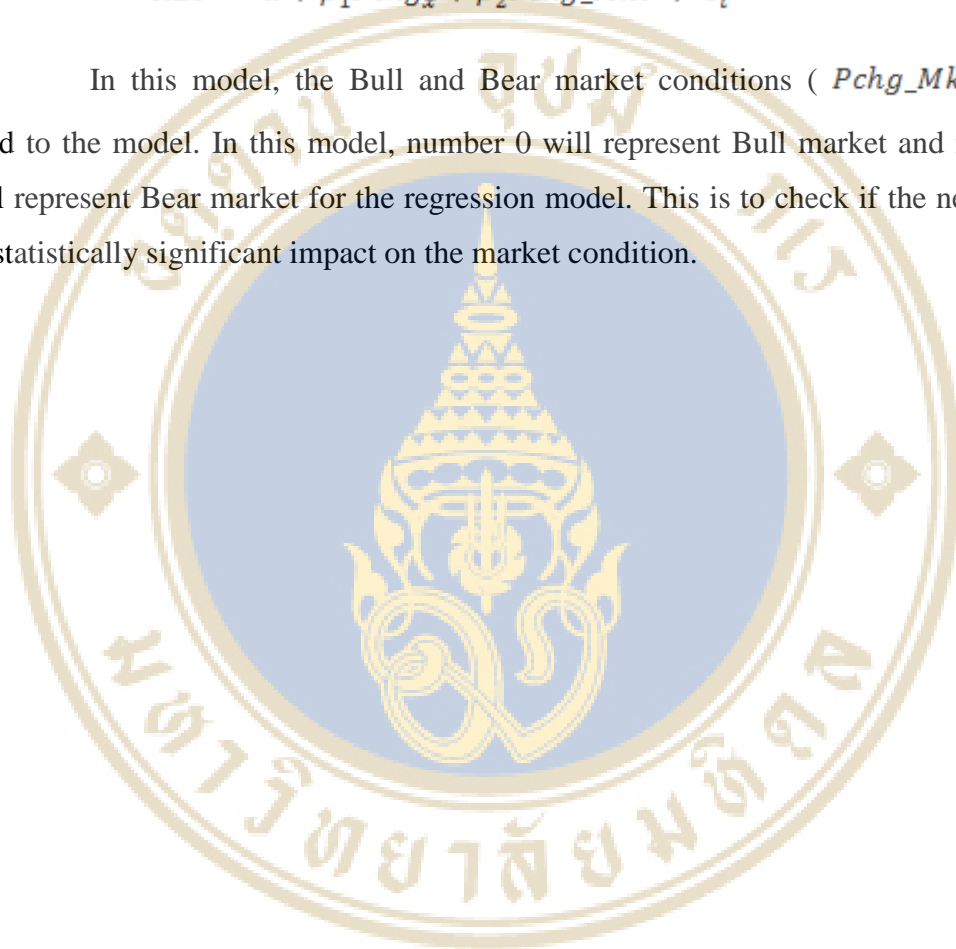
$$RET = \alpha + \beta_1 Pchg_x + e_t \quad (2)$$

where  $RET$  is the log of market return on the announcement date at time  $t$  and  $t-1$ .  $Pchg_x$  indicates the surprise factors for the three studied variables.

In addition, according to Wei (2009), the market condition and CPI announcement also have an impact on the returns. Therefore the third model derived as the following

$$RET = \alpha + \beta_1 Pchg_x + \beta_2 Pchg\_Mkt + e_t \quad (3)$$

In this model, the Bull and Bear market conditions (  $Pchg\_Mkt$  ) are added to the model. In this model, number 0 will represent Bull market and number 1 will represent Bear market for the regression model. This is to check if the news has any statistically significant impact on the market condition.



## CHAPTER IV

### RESULTS AND DISCUSSION

#### 4.1 Results

We examined how the stock market responds to the news only on the date that actual CPI data announced in Thailand, the U.S. and Germany. On the basis of our test we considered the forecast data obtained from the sources are rational expectations of future announcements.

##### 4.1.1 Estimates for Thai Stock Market to CPI Announcements

Table 4.1 below reports the results of the news, categorized into positive and negative news, announced in each country and the responses of market returns. Firstly, Panel A shows the market responses to the news announced domestically. The result shows that when the expected CPI is greater than actual CPI, we classified this event as “*Negative Surprise Factor*”, the market responses to the news at 10 percent significant level with positive coefficient. On the other hands, the market responses to the international news only for the news announced in the U.S at post event period at 10 percent significant level and the coefficient is also positive.

**Table 4.1: Estimates for Thai Stock Market to CPI Announcements**

The table presents the results of the preliminary estimates of the announcements date on the market returns. The surprise factors, computed by taking the differences between actual versus expected CPI data, are divided into two categories; the positive surprise factor (actual CPI > expected CPI) and the negative surprise (actual CPI < expected CPI).

**Panel A: News Announced in Thailand**

|            | Positive Surprise Factor<br>(n = 79) |   |        | Negative Surprise Factor<br>(n = 34) |   |        |
|------------|--------------------------------------|---|--------|--------------------------------------|---|--------|
|            | Mean (%)                             |   | T-stat | Mean (%)                             |   | T-stat |
| Pre-Event  | 0.007                                |   | 1.65   | 0.012                                | * | 1.72   |
| Event      | 0.014                                | * | 1.89   | 0.022                                | * | 1.88   |
| Post-Event | 0.014                                |   | 1.43   | 0.054                                | * | 1.80   |

**Panel B: News Announced in the U.S.**

|            | Positive Surprise Factor<br>(n = 49) |  |        | Negative Surprise Factor<br>(n = 60) |   |        |
|------------|--------------------------------------|--|--------|--------------------------------------|---|--------|
|            | Mean (%)                             |  | T-stat | Mean (%)                             |   | T-stat |
| Pre-Event  | (0.098)                              |  | -1.28  | 0.002                                |   | 0.66   |
| Event      | (0.116)                              |  | -1.15  | 0.007                                |   | 1.60   |
| Post-Event | (0.312)                              |  | -1.62  | 0.045                                | * | 1.87   |

**Panel C: News Announced in Germany**

|            | Positive Surprise Factor<br>(n = 63) |  |        | Negative Surprise Factor<br>(n = 45) |  |        |
|------------|--------------------------------------|--|--------|--------------------------------------|--|--------|
|            | Mean (%)                             |  | T-stat | Mean (%)                             |  | T-stat |
| Pre-Event  | (0.003)                              |  | -0.57  | 0.001                                |  | 0.18   |
| Event      | (0.009)                              |  | -1.36  | (0.007)                              |  | -1.42  |
| Post-Event | (0.001)                              |  | -0.10  | (0.020)                              |  | -0.80  |

\*\*\* Indicates statistical significance at the 0.01 level (one-tailed *t* tests).

\*\* Indicates statistical significance at the 0.05 level (one-tailed *t* tests).

\* Indicates statistical significance at the 0.10 level (one-tailed *t* tests).

According to the results, we can conclude that statistically the market responses to domestic news especially when the expected CPI is greater than the actual CPI. As a result, according to previous researches, the event can create uncertainty to market participants or investors on the stock prices.

### 4.1.2 Estimates for Responses Conditional on the Market Conditions

To estimate the responses that are conditional on the state of the market, we classified the market state into Bull or Bear market by comparing the differences between marking closing price at the first and last trading day of the month. The negative number will be classified as Bear market and Bull market for a positive number.

**Table 4.2: Estimates for Responses Conditional on the Market Conditions**

*The classifications are based on the difference between the market closing price from the first and the last trading day of the month. If the difference is positive, the market state for that month will be classified as Bull market; otherwise it is a Bear market.*

**Panel A: News Announced in Thailand**

| <i>Bull Market</i>              |        |   |                                 |        |   |        |
|---------------------------------|--------|---|---------------------------------|--------|---|--------|
| <u>Positive Surprise Factor</u> |        |   | <u>Negative Surprise Factor</u> |        |   |        |
|                                 | Mean   |   | T-stat                          | Mean   |   | T-stat |
| Pre-Event                       | 0.008  |   | 1.67                            | 0.010  |   | 1.50   |
| Event                           | 0.024  | * | 1.97                            | 0.030  | * | 1.98   |
| Post-Event                      | 0.072  | * | 2.00                            | 0.126  | * | 2.04   |
| <i>Bear Market</i>              |        |   |                                 |        |   |        |
| <u>Positive Surprise Factor</u> |        |   | <u>Negative Surprise Factor</u> |        |   |        |
|                                 | Mean   |   | T-stat                          | Mean   |   | T-stat |
| Pre-Event                       | -0.005 |   | 1.01                            | 0.015  |   | 1.74   |
| Event                           | 0.000  |   | 0.06                            | 0.000  |   | -0.03  |
| Post-Event                      | -0.065 | * | -1.98                           | -0.129 | * | -2.16  |

**Panel B: News Announced in the U.S.**

| <i>Bull Market</i>              |        |   |                                 |        |   |        |
|---------------------------------|--------|---|---------------------------------|--------|---|--------|
| <u>Positive Surprise Factor</u> |        |   | <u>Negative Surprise Factor</u> |        |   |        |
|                                 | Mean   |   | T-stat                          | Mean   |   | T-stat |
| Pre-Event                       | 0.002  |   | 0.41                            | 0.014  | * | 1.86   |
| Event                           | 0.004  |   | 1.12                            | 0.018  | * | 1.97   |
| Post-Event                      | 0.065  | * | 1.91                            | 0.056  | * | 1.91   |
| <i>Bear Market</i>              |        |   |                                 |        |   |        |
| <u>Positive Surprise Factor</u> |        |   | <u>Negative Surprise Factor</u> |        |   |        |
|                                 | Mean   |   | T-stat                          | Mean   |   | T-stat |
| Pre-Event                       | -0.212 |   | -1.29                           | -0.027 | * | -2.03  |
| Event                           | -0.252 |   | -1.17                           | -0.020 | * | -1.85  |
| Post-Event                      | -0.740 | * | -1.73                           | 0.015  |   | 0.73   |

**Table 4.2: Estimates for Responses Conditional on the Market Conditions (Cont.)****Panel C: News Announced in Germany**

|            | <i>Bull Market</i>              |   |        |                                 |   |        |
|------------|---------------------------------|---|--------|---------------------------------|---|--------|
|            | <u>Positive Surprise Factor</u> |   |        | <u>Negative Surprise Factor</u> |   |        |
|            | Mean                            |   | T-stat | Mean                            |   | T-stat |
| Pre-Event  | 0.021                           | * | 1.94   | 0.019                           | * | 1.84   |
| Event      | 0.003                           |   | 1.02   | 0.005                           |   | 1.24   |
| Post-Event | 0.050                           | * | 1.93   | 0.092                           | * | 1.97   |
|            | <i>Bear Market</i>              |   |        |                                 |   |        |
|            | <u>Positive Surprise Factor</u> |   |        | <u>Negative Surprise Factor</u> |   |        |
|            | Mean                            |   | T-stat | Mean                            |   | T-stat |
| Pre-Event  | -0.046                          | * | -1.93  | -0.021                          |   | -1.69  |
| Event      | -0.029                          |   | -1.61  | -0.022                          | * | -1.79  |
| Post-Event | -0.092                          |   | -1.70  | -0.151                          | * | -1.83  |

\*\*\* Indicates statistical significance at the 0.01 level (one-tailed *t* tests).

\*\* Indicates statistical significance at the 0.05 level (one-tailed *t* tests).

\* Indicates statistical significance at the 0.10 level (one-tailed *t* tests).

Table 4.2 presents the results when we added another variable to the analysis which is the market condition classified into Bull or Bear market state. Panel A shows the returns in responses to the news announced in Thailand. According to the result, at the Bull market state, the returns are positive regardless of positive or negative news and significant at 10 percent level on event and post event period; similarly for both positive and negative news. However, when the market is in Bear state, the market tends to response negatively to the news at 10 percent significant level at post event period; regardless to the types of the news.

Panel B and C show the market responses to the news announced in the U.S and Germany. The results share similarity to the news announced in Thailand, the market responses to the news more negatively during Bear market condition at 10 percent significant level.

In conclusion, from the results we can conclude that statistically the returns will responses around event and post event period after the news announced both domestically and internationally more negatively during Bear market when the unanticipated inflation news occurs. This is consistent with the previous research

studied by Wei (2009) that the market responses to the unanticipated inflation more negatively during the economic recession than in expansion.

### 4.1.3 Estimates for Trading Imbalance Responses to CPI

#### Announcements

In this section, trading volume by investor types are used to estimate who are the buyer and the seller when the news is announced in the market. Table 4 shows the results of trading imbalance by each investor type which are Mutual Fund (TV\_M), Proprietary Trade (TV\_P), Foreign traders (TV\_F) and Retails (TV\_C).

**Table 4.3: Estimates for Trading Imbalance Responses to CPI Announcements**

Table 4 presents the trading imbalance by investor types; Mutual Fund (TV\_M), Proprietary Trade (TV\_P), Foreign traders (TV\_F) and Retails (TV\_C) in responses to the surprise factors which are categorized into positive and negative factors for the news announced in Thailand, the U.S. and Germany. Trading imbalance can be obtained by using the following formula;

$$TV_x = \frac{\text{Buy Volume}_{TV_x} - \text{Sell Volume}_{TV_x}}{\text{Buy Volume}_{TV_x} + \text{Sell Volume}_{TV_x}}$$

**Panel A: The responses of Trading Volume on Positive Surprise Factor**

|           | TH     |   |        | US     |   |        | GE     |   |        |
|-----------|--------|---|--------|--------|---|--------|--------|---|--------|
|           | Mean   |   | T-stat | Mean   |   | T-stat | Mean   |   | T-stat |
| Pre-Event |        |   |        |        |   |        |        |   |        |
| TV_M      | -0.332 |   | -1.73  | -0.378 |   | -1.67  | -0.425 | * | -1.78  |
| TV_P      | -0.011 |   | -0.29  | -0.117 |   | -1.67  | -0.116 | * | -1.73  |
| TV_F      | -0.367 | * | -1.92  | -0.147 |   | -1.53  | -0.082 |   | -1.16  |
| TV_C      | 0.052  |   | 1.92   | 0.028  | * | 1.80   | 0.025  | * | 1.73   |
| Event     |        |   |        |        |   |        |        |   |        |
| TV_M      | -0.143 |   | -1.36  | -0.270 |   | -1.64  | -0.292 | * | -1.76  |
| TV_P      | 0.013  |   | 0.32   | -0.155 | * | -1.79  | -0.187 | * | -1.92  |
| TV_F      | -0.007 |   | -0.13  | -0.349 | * | -1.95  | -0.115 |   | -1.39  |
| TV_C      | -0.003 |   | -0.43  | 0.069  | * | 1.99   | 0.035  | * | 1.81   |



**Table 4.3: Estimates for Trading Imbalance Responses to CPI Announcements (Cont.)**

**Panel A: The responses of Trading Volume on Positive Surprise Factor**

|            | TH     |   |        | US     |   |        | GE     |   |        |
|------------|--------|---|--------|--------|---|--------|--------|---|--------|
|            | Mean   |   | T-stat | Mean   |   | T-stat | Mean   |   | T-stat |
| Post-Event |        |   |        |        |   |        |        |   |        |
| TV_M       | -1.714 |   | -1.81  | -1.012 |   | -1.25  | -1.451 |   | -1.65  |
| TV_P       | -0.637 |   | -1.91  | -0.611 | * | -1.92  | -0.495 | * | -1.90  |
| TV_F       | -2.152 |   | -1.95  | -2.222 | * | -1.89  | -1.902 | * | -1.89  |
| TV_C       | 0.303  | * | 1.97   | 0.269  | * | 1.89   | 0.302  | * | 1.96   |

**Panel B: The responses of Trading Volume on Negative Surprise Factor**

|            | TH     |   |        | US     |   |        | GE     |   |        |
|------------|--------|---|--------|--------|---|--------|--------|---|--------|
|            | Mean   |   | T-stat | Mean   |   | T-stat | Mean   |   | T-stat |
| Pre-Event  |        |   |        |        |   |        |        |   |        |
| TV_M       | 0.077  | * | 0.47   | -0.440 | * | -1.87  | -0.543 | * | -1.89  |
| TV_P       | 0.026  |   | 0.66   | -0.031 |   | -0.70  | -0.121 | * | -1.70  |
| TV_F       | -0.222 | * | -1.70  | -0.319 | * | -1.85  | -0.216 | * | -1.69  |
| TV_C       | 0.016  | * | 1.52   | 0.043  | * | 1.91   | 0.037  | * | 1.84   |
| Event      |        |   |        |        |   |        |        |   |        |
| TV_M       | 0.083  |   | 0.80   | -0.181 |   | -1.53  | -0.272 |   | -1.60  |
| TV_P       | -0.049 |   | -0.98  | 0.024  |   | 0.92   | 0.111  |   | 1.47   |
| TV_F       | 0.054  |   | 0.86   | -0.234 | * | -1.79  | -0.454 | * | -1.97  |
| TV_C       | -0.013 |   | -1.21  | 0.027  | * | 1.76   | 0.048  | * | 1.96   |
| Post-Event |        |   |        |        |   |        |        |   |        |
| TV_M       | -1.753 | * | -1.64  | -0.994 |   | -1.51  | -1.056 |   | -1.40  |
| TV_P       | -0.412 | * | -1.65  | -0.455 | * | -1.79  | -0.756 | * | -1.89  |
| TV_F       | -1.556 | * | -1.68  | -2.020 | * | -1.94  | -2.648 | * | -1.94  |
| TV_C       | 0.230  | * | 1.84   | 0.260  | * | 1.97   | 0.310  | * | 1.96   |

\*\*\* Indicates statistical significance at the 0.01 level (one-tailed  $t$  tests).

\*\* Indicates statistical significance at the 0.05 level (one-tailed  $t$  tests).

\* Indicates statistical significance at the 0.10 level (one-tailed  $t$  tests).

Panel A shows the result of the trading volume responses to the positive surprise factor. According to the result, trading activities statistically rely on the international news from the U.S. and Germany where Retails traders are the most active buyer in this period (pre, event and post event study) at 10 percent significant



level. The sellers are foreign and proprietary traders on the event and post event of the news announced in the U.S at 10 percent significant level. The news announced in Germany shows a similar result to the news announced in the U.S where Retails traders are the buyer at 10 percent significant level and the seller are foreign and proprietary traders on post event period. For pre and event period, mutual fund and proprietary traders are traded at 10 percent significant level.

Panel B presents the trading volume responses to the negative surprise factor. When the surprise factor is negative, traders are statistically more active than in positive news especially on the news announced domestically. The result shows that all investors traded at 10 percent significant level at post event period. Under this situation, Retails traders are the buyers where the rest of the investor types are the sellers.

In conclusion, the investors tend to react to the domestic news only when there is a bad news at post announcements. Foreign and Retails traders tend to rely on this type of information at 10 percent significant level.

#### **4.1.4 Estimates for Responses of Investor Trading on the Market Conditions**

In this section, we would like to analyze how investors react to the news conditional to market states. Therefore, in Table 5, it shows the results of trading imbalance by investor types in responses to the news announced in each country with the Bull or Bear market condition.

#### **Table 4.4: Estimates for Responses of Investor Trading on the Market Conditions**

*Table 4.4 shows the results of trading imbalance by four investor types: Mutual Fund (TV\_M), Proprietary Trade (TV\_P), Foreign traders (TV\_F) and Retails (TV\_C) on the market conditions. We classified market conditions into two states; Bull market and Bear market, by taking the differences between the market closing price of the first trading and last trading day. The trading volume and surprise factor are in percentage term. t-statistic are reported in the parentheses.*

|                                     | Bull Market        |                    |                    |                    | Bear Market        |                    |                    |                 |
|-------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-----------------|
|                                     | TV_M               | TV_P               | TV_F               | TV_C               | TV_M               | TV_P               | TV_F               | TV_C            |
| <b>Panel A: Thailand</b>            |                    |                    |                    |                    |                    |                    |                    |                 |
| <b>Positive Surprise Factor (%)</b> |                    |                    |                    |                    |                    |                    |                    |                 |
| Pre Announcement Date               | -0.351<br>(1.67)   | -0.098<br>(1.31)   | -0.261 *<br>(1.69) | 0.049 *<br>1.80    | -0.297<br>(1.37)   | 0.105<br>1.47      | -0.499 *<br>(1.97) | 0.055 *<br>1.90 |
| At Announcement Date                | -0.151<br>(1.26)   | -0.071<br>(1.07)   | 0.069<br>0.83      | -0.014<br>(1.14)   | -0.128<br>(0.89)   | 0.127<br>1.54      | -0.110<br>(1.20)   | 0.011<br>1.00   |
| Post Announcement Date              | -0.794<br>(1.08)   | -0.306 *<br>(1.69) | -1.024<br>(1.66)   | 0.083<br>1.61      | -2.907 *<br>(1.94) | -1.066 *<br>(1.91) | -3.615 *<br>(1.99) | 0.593 *<br>2.01 |
| <b>Negative Surprise Factor (%)</b> |                    |                    |                    |                    |                    |                    |                    |                 |
| Pre Announcement Date               | -0.323<br>(1.43)   | 0.006<br>0.15      | -0.097<br>(0.97)   | 0.014<br>1.21      | 1.071 *<br>1.90    | 0.072<br>0.88      | -0.514 *<br>(2.01) | 0.020<br>1.73   |
| At Announcement Date                | -0.023<br>(0.22)   | 0.051<br>0.87      | 0.208 *<br>1.78    | -0.035 *<br>(1.84) | 0.338<br>1.36      | -0.293 *<br>(2.10) | -0.337 *<br>(1.90) | 0.042<br>1.59   |
| Post Announcement Date              | -3.014 *<br>(1.88) | -0.377 *<br>(1.72) | 0.120<br>0.21      | 0.020<br>0.37      | 1.575<br>1.08      | -0.460<br>(0.99)   | -5.591 *<br>(2.13) | 0.733 *<br>2.15 |
| <b>Panel B: U.S.</b>                |                    |                    |                    |                    |                    |                    |                    |                 |
| <b>Positive Surprise Factor (%)</b> |                    |                    |                    |                    |                    |                    |                    |                 |
| Pre Announcement Date               | -0.223<br>(1.06)   | -0.176 *<br>(1.76) | -0.031<br>(0.37)   | 0.012<br>1.28      | -0.560 *<br>(1.75) | -0.037<br>(0.60)   | -0.288<br>(1.72)   | 0.046 *<br>1.82 |
| At Announcement Date                | -0.261<br>(1.50)   | -0.065<br>(1.41)   | -0.272 *<br>(1.78) | 0.044 *<br>1.91    | -0.268<br>(1.32)   | -0.264 *<br>(1.76) | -0.431 *<br>(2.01) | 0.098 *<br>2.03 |
| Post Announcement Date              | -1.600<br>(1.36)   | -0.498<br>(1.69)   | -0.680<br>(1.07)   | 0.079<br>1.25      | -0.207<br>(0.23)   | -0.728 *<br>(2.00) | -4.099 *<br>(1.98) | 0.501 *<br>1.95 |
| <b>Negative Surprise Factor (%)</b> |                    |                    |                    |                    |                    |                    |                    |                 |
| Pre Announcement Date               | -0.368 *<br>(1.75) | 0.048<br>0.84      | -0.174<br>(1.45)   | 0.019<br>1.53      | -0.588 *<br>(1.84) | -0.218 *<br>(1.81) | -0.647 *<br>(1.98) | 0.100 *<br>2.02 |
| At Announcement Date                | -0.213<br>(1.55)   | 0.016 *<br>0.57    | -0.037 *<br>(0.57) | -0.002 *<br>(0.27) | -0.096<br>(0.61)   | 0.043<br>0.84      | -0.692 *<br>(1.98) | 0.095 *<br>1.96 |
| Post Announcement Date              | -0.944<br>(1.32)   | -0.240<br>(1.69)   | -1.950<br>(1.91)   | 0.234<br>1.95      | -1.056<br>(1.24)   | -0.943<br>(1.66)   | -2.074 *<br>(1.80) | 0.307 *<br>1.95 |

**Table 4.4: Estimates for Responses of Investor Trading on the Market Conditions (Cont.)****Panel C: Germany**

|                                     | Bull Market |          |          |          | Bear Market |          |          |         |
|-------------------------------------|-------------|----------|----------|----------|-------------|----------|----------|---------|
|                                     | TV_M        | TV_P     | TV_F     | TV_C     | TV_M        | TV_P     | TV_F     | TV_C    |
| <b>Positive Surprise Factor (%)</b> |             |          |          |          |             |          |          |         |
| Pre Announcement Date               | -0.416 *    | -0.052   | 0.135    | -0.006   | -0.422      | -0.229 * | -0.482 * | 0.081 * |
|                                     | (1.70)      | (1.11)   | 1.38     | (0.57)   | (1.44)      | (1.81)   | (2.00)   | 2.03    |
| At Announcement Date                | -0.457 *    | -0.141 * | 0.061    | 0.007    | 0.029       | -0.265 * | -0.438 * | 0.086 * |
|                                     | (1.88)      | (1.92)   | 0.81     | 0.85     | 0.20        | (1.78)   | (1.88)   | 1.90    |
| Post Announcement Date              | -1.941      | -0.463 * | -0.878   | -0.178 * | -0.472      | -0.533 * | -3.725 * | 0.519 * |
|                                     | (1.66)      | (1.84)   | (1.51)   | 1.89     | (0.64)      | (1.78)   | (1.95)   | 1.97    |
| <b>Negative Surprise Factor (%)</b> |             |          |          |          |             |          |          |         |
| Pre Announcement Date               | -0.447      | -0.168 * | -0.027   | -0.003   | -0.631 *    | -0.060   | -0.430 * | 0.075 * |
|                                     | (1.70)      | (1.80)   | (0.28)   | 0.30     | (1.87)      | (0.84)   | (1.89)   | 1.98    |
| At Announcement Date                | -0.144      | 0.187    | -0.526 * | 0.039 *  | -0.417      | 0.010    | -0.341 * | 0.058 * |
|                                     | (0.90)      | 1.54     | (1.97)   | 1.84     | (1.68)      | 0.19     | (1.90)   | 2.00    |
| Post Announcement Date              | -0.272      | -0.266   | -1.496   | 0.130    | -1.983      | -1.330 * | -3.955 * | 0.520 * |
|                                     | (0.37)      | (1.50)   | (1.63)   | 1.54     | (1.59)      | (1.91)   | (2.00)   | 2.04    |

\*\*\* Indicates statistical significance at the 0.01 level (one-tailed t tests)

\*\* Indicates statistical significance at the 0.05 level (one-tailed t tests)

\* Indicates statistical significance at the 0.10 level (one-tailed t tests)

Panel A shows the results from the news announced in Thailand. According to the result, Foreign and Retails traders react to the news at 10 percent significant level when the market is in Bear state. During this state, foreign traders are the seller and retails trader are the buyer.

Moving on the investor responses to news announced in the U.S., during this period, there are not much trading activities in the bull market. However, if we take a look at bear market, retails traders are the buyer and foreign traders are also the seller regardless of the types of news (positive or negative surprise factors). These results have a 10 percent significant level.

Lastly, when the investors reposes of the news announced in Germany, the results share some similarities with the news announced in the U.S. where retails traders are the buyer and foreign traders are the seller regardless of the types of news at a 10 percent significant level. This happens when the market is in Bear state.

In conclusion, investors, especially foreign and retails traders are actively traded in the market relying on this type of information during Bear market more than Bull market. The result shows with 10 percent statistically significant.

#### 4.1.5 Regression Model

To investigate the cross sectional variation in the effect of the news announcements on the market return and trading volume, we used a regression model and estimate regressions in the following forms.

$$RET = \alpha + \beta_1 Pchg_x + \beta_2 Pchg\_Mkt + e_t \quad (3)$$

where RET is the log of market return on the announcement date at time t and t-1.  $Pchg_x$  indicates the surprise factors for the three studied variables and Pchg\_Mkt is the state of market. As mentioned in the previous section, we developed this model used in the research by Lili and Hu (1998) and Wei (2009) on their study on the responses of the stock market to economic news.

**Table 4.5: Regression for the Effects of Market Return and Surprise Factors**

To investigate the cross sectional variation in the effect of the news announcements on the market return and trading volume, we used a regression model and estimate regressions in the following forms  $RET = \alpha + \beta_1 Pchg_x + \beta_2 Pchg\_Mkt + e_t$  where  $RET$  is the log of market return on the announcement date at time  $t$  and  $t-1$ .  $Pchg_x$  indicates the surprise factors for the three studied variables; Thailand ( $Pchg\_FTH$ ), the U.S. ( $Pchg\_FUS$ ) and Germany ( $Pchg\_FGE$ ), and  $Pchg\_Mkt$  is the state of market, where 0 represents Bull market and 1 represents Bear market.

**Panel A: A Market Reaction At Event Period**

| Independent variables | Model 1 Dependent variable: Thailand |         |     | Model 2 Dependent variable: US |         |      | Model 3 Dependent variable: Germany |         |      |
|-----------------------|--------------------------------------|---------|-----|--------------------------------|---------|------|-------------------------------------|---------|------|
|                       | Coefficient                          | T value |     | Coefficient                    | T value |      | Coefficient                         | T value |      |
| Intercept             | 0.0133                               | 4.58    |     | 0.0067                         | 0.14    |      | 0.0023                              | 0.59    |      |
| Pchg_Mkt              | -0.0134                              | -2.8    | *** | -0.0807                        | -       | 1.05 | -0.0150                             | -       | 2.42 |
| Pchg_FTH              | 0.0000                               | 0.15    |     |                                |         |      |                                     |         |      |
| Pchg_FUS              |                                      |         |     | 0.0004                         | 0.01    |      |                                     |         |      |
| Pchg_FGE              |                                      |         |     |                                |         |      | 0.0051                              | 0.29    |      |
| Observation           |                                      | 110     |     |                                | 110     |      |                                     | 109     |      |
| F Value               |                                      | 3.95    | **  |                                | 0.56    |      |                                     | 2.97    | **   |
| Adjust R <sup>2</sup> |                                      | 0.05    |     |                                | -       | 0.01 |                                     | 0.03    |      |

**Panel B: A Market Reaction Post Event Period**

| Independent variables | Model 1 Dependent variable: Thailand |         |     | Model 2 Dependent variable: US |         |      | Model 3 Dependent variable: Germany |         |      |
|-----------------------|--------------------------------------|---------|-----|--------------------------------|---------|------|-------------------------------------|---------|------|
|                       | Coefficient                          | T value |     | Coefficient                    | T value |      | Coefficient                         | T value |      |
| Intercept             | 0.0469                               | 6.94    | *** | 0.0284                         | 0.43    |      | 0.0350                              | 2.41    |      |
| Pchg_Mkt              | -0.0888                              | -       | *** | -0.2295                        | -       | **   | -0.0947                             | -       | ***  |
| Pchg_FTH              | 0.0001                               | 0.07    |     |                                |         |      |                                     |         |      |
| Pchg_FUS              |                                      |         |     | -0.0316                        | -       | 0.33 |                                     |         |      |
| Pchg_FGE              |                                      |         |     |                                |         |      | -0.0007                             | -       | 0.01 |

**Table 4.5: Regression for the Effects of Market Return and Surprise Factors (Cont.)**

| Independent variables  | Model 1 Dependent variable: Thailand |           | Model 2 Dependent variable: US |         | Model 3 Dependent variable: Germany |          |
|--|--------------------------------------|-----------|--------------------------------|---------|-------------------------------------|----------|
|  | Coefficient                          | T value   | Coefficient                    | T value | Coefficient                         | T value  |
| Observation  |                                      | 110       |                                | 110     |                                     | 109      |
| F Value  |                                      | 32.71 *** |                                | 2.49 ** |                                     | 8.35 *** |
| Adjust R <sup>2</sup>  |                                      | 0.37      |                                | 0.03    |                                     | 0.1189   |
| *** Indicates statistical significance at the 0.01 level (one-tailed <i>t</i> tests).<br>** Indicates statistical significance at the 0.05 level (one-tailed <i>t</i> tests).<br>* Indicates statistical significance at the 0.10 level (one-tailed <i>t</i> tests). |                                      |           |                                |         |                                     |          |

Table 4.5 reports the estimated coefficients of the regression model for event and post event period. Panel A shows the result for the regression analysis for the responses around event period. The sign of the coefficient on all studies variables, Pchg\_FTH, Pchg\_FUS and Pchg\_FGE are shown as positive but not statistically significant to the market returns. For the Panel A, only model 1 and model 3 are significant at 10 percent level (F-Value = 3.95 and Adjusted R<sup>2</sup> = 5.09% for model 1 and F-Value = 2.97 and Adjusted R<sup>2</sup> = 3.49% for model 3).

Panel B analyze the relationship between the returns, the surprised factors and market conditions at post event period. Model 1 and 3 are significant at 1 percent level (F-Value = 32.71 and Adjusted R<sup>2</sup> = 36.57% for model 1 and F-Value = 8.35 and Adjusted R<sup>2</sup> = 11.89% for model 3). In addition, model 2 is significant at 5 percent level (F-Value = 2.49 and Adjusted R<sup>2</sup> = 2.64%). The sign of the coefficient on Pchg\_FTH is positive but not statistically significant where Pchg\_FUS and Pchg\_FGE's coefficient sign are shown as negative but not statistically significant to the market returns

In conclusion, there is no significant relationship between the studied variables and the market return as P-Value is greater than 10 percent. This is due to the fact that the impact of the news announcement on CPI may have long leading time to impact the return. In other words, CPI does not have significant short term effects on stock returns; studied window in this paper is 30 days after the announcement.

This is similar to one of the research by Kalu O. and Solomon (2013) on their study on the stock returns and inflation impacts in Nigeria market. According to



their research, they found that stock returns and inflation are cointegrated. However, inflation does not have short term impact effects on the stock market.

Next we analyzed the relationship between the surprise factors, market conditions and trading volume by investor types by developing the equation from model 3 mentioned in the previous section.

$$RET_1 = \alpha + \beta_1 Pchg\_Mkt + \beta_2 X_t^{\#} + \beta_3 TV\_M + \beta_4 TV\_P + \beta_5 TV\_F + \beta_6 TV\_C \quad (4)$$

where the independent variable is the market return (RET) and market conditions ( $X_t^{\#}$ ), and trading volume by investors type are dependent variable. Table 7 shows the result of the analysis. We also divided the surprised factor into positive and negative numbers in Table 4.6 below.

**Table 4.6: Regression for the Effects of Market Return and Positive and Negative Surprise Factors**

*To investigate the cross sectional variation in the effect of the news announcements on the market return and trading volume, we used a regression model and estimate regressions in the following forms  $RET = \alpha + \beta_1 Pchg_x + \beta_2 Pchg\_Mkt + e_t$  where  $RET$  is the log of market return on the announcement date at time  $t$  and  $t-1$ .  $Pchg_x$  indicates the surprise factors for the three studied variables where  $Pchg\_Mkt$  is the state of market, where 0 represents Bull market and 1 represents Bear market. In this table, the surprised factor is also divided into positive and negative numbers.*

**Panel A: A Market Reaction Post Event Period (Positive News)**

| Independent variables | Model 1 Dependent variable: Thailand |         |     | Model 2 Dependent variable: US |         |  | Model 3 Dependent variable: Germany |         |     |
|-----------------------|--------------------------------------|---------|-----|--------------------------------|---------|--|-------------------------------------|---------|-----|
|                       | Coefficient                          | T value |     | Coefficient                    | T value |  | Coefficient                         | T value |     |
| Intercept             | 0.035                                | 3.61    | *** | -0.163                         | -0.7    |  | 0.011                               | 0.51    |     |
| Pchg_Mkt              | -0.071                               | -6.03   | *** | -0.400                         | -1.71   |  | -0.071                              | -2.61   | *** |
| Pchg_FTH              | 0.001                                | 0.43    |     |                                |         |  |                                     |         |     |
| Pchg_FUS              |                                      |         |     | 0.376                          | 1.15    |  |                                     |         |     |
| Pchg_FGE              |                                      |         |     |                                |         |  | 0.175                               | 1.14    |     |

**Table 4.6: Regression for the Effects of Market Return and Positive and Negative Surprise Factors (Cont.)**

| Independent variables | Model 1 Dependent variable: Thailand |          | Model 2 Dependent variable: US |         | Model 3 Dependent variable: Germany |          |
|-----------------------|--------------------------------------|----------|--------------------------------|---------|-------------------------------------|----------|
|                       | Coefficient                          | T value  | Coefficient                    | T value | Coefficient                         | T value  |
| Observation           |                                      | 110      |                                | 47      |                                     | 61       |
| F Value               |                                      | 18.2 *** |                                | 2.29    |                                     | 4.36 *** |
| Adjust R <sup>2</sup> |                                      | 0.31     |                                | 0.05    |                                     | 0.0993   |

**Panel B: A Market Reaction Post Event Period (Negative News)**

| Independent variables | Model 1 Dependent variable: Thailand |         | Model 2 Dependent variable: US |         | Model 3 Dependent variable: Germany |           |
|-----------------------|--------------------------------------|---------|--------------------------------|---------|-------------------------------------|-----------|
|                       | Coefficient                          | T value | Coefficient                    | T value | Coefficient                         | T value   |
| Intercept             | 0.018                                | 2.43    | 0.021                          | 1.09    | 0.042                               | 1.21      |
| Pchg_Mkt              | -0.017                               | -1.49   | -0.020                         | -0.93   | -0.125                              | -2.84 *** |
| Pchg_FTH              | 0.000                                | 0.44    |                                |         |                                     |           |
| Pchg_FUS              |                                      |         | -0.019                         | -0.54   |                                     |           |
| Pchg_FGE              |                                      |         |                                |         | -0.033                              | -0.29     |
| Observation           |                                      | 32      |                                | 58      |                                     | 43        |
| F Value               |                                      | 1.14    |                                | 0.62    |                                     | 4.35 ***  |
| Adjust R <sup>2</sup> |                                      | 0.01    |                                | -0.01   |                                     | 0.1349    |

The above table shows the regression result at post event when classified news into positive and negative news. The result shows a significant result when the news is positive at 1 percent level. However, all of the models indicate that the significant is the market conditions (Bull or Bear) not the study variables.

Therefore we moved on to the next regression model shown in table 8 below for the investor behavior during the news announced.

**Table 4.7 Regression for the Effects of Investor Type on the Market Conditions**

*This table shows the relation the relationship between the surprise factors, market conditions and trading volume by investor types by developing the equation at and post event period. The regression model can be written as*

$$RET_1 = \alpha + \beta_1 Pchg\_Mkt + \beta_2 X_t^\mu + \beta_3 TV\_M + \beta_4 TV\_P + \beta_5 TV\_F + \beta_6 TV;$$

*where the independent variable is the market return (RET) and market conditions ( $X_t^\mu$ ), and trading volume by investors types are dependent variable.*



**Table 4.7 Regression for the Effects of Investor Type on the Market Conditions (Cont.)****Panel A: A Market Reaction At Event Period**

| Independent variables | Model 1 Dependent variable: Thailand |         |     | Model 2 Dependent variable: US |         |     | Model 3 Dependent variable: Germany |         |     |
|-----------------------|--------------------------------------|---------|-----|--------------------------------|---------|-----|-------------------------------------|---------|-----|
|                       | Coefficient                          | T value |     | Coefficient                    | T value |     | Coefficient                         | T value |     |
| Intercept             | 0.010                                | 0.44    |     | 0.003                          | 0.16    |     | -0.001                              | -0.03   |     |
| Pchg_Mkt              | -0.010                               | -0.28   |     | 0.091                          | 2.36    |     | 0.039                               | 0.97    |     |
| Pchg_FTH              | -0.002                               | -0.67   |     |                                |         |     |                                     |         |     |
| Pchg_FUS              |                                      |         |     | 0.022                          | 0.68    |     |                                     |         |     |
| Pchg_FGE              |                                      |         |     |                                |         |     | 0.016                               | 0.14    |     |
| TV_M                  | 0.140                                | 3.61    | *** | 0.056                          | 1.55    |     | 0.085                               | 2.6     | *** |
| TV_P                  | 0.312                                | 5.6     | *** | 0.324                          | 4.36    | *** | 0.117                               | 1.79    | *   |
| TV_F                  | 0.132                                | 1.38    |     | -0.031                         | -0.37   |     | 0.022                               | 0.27    |     |
| TV_C                  | 1.018                                | 1.39    |     | -0.816                         | -1.26   |     | -0.227                              | -0.37   |     |
| Observation           |                                      | 110     |     |                                | 108     |     |                                     | 107     |     |
| F Value               |                                      | 10.26   | *** |                                | 6.51    | *** |                                     | 2.32    | **  |
| Adjust R <sup>2</sup> |                                      | 0.34    |     |                                | 0.23    |     |                                     | 0.07    |     |

**Panel B: A Market Reaction Post Event Period**

| Independent variables | Model 1 Dependent variable: Thailand |         |     | Model 2 Dependent variable: US |         |     | Model 3 Dependent variable: Germany |         |     |
|-----------------------|--------------------------------------|---------|-----|--------------------------------|---------|-----|-------------------------------------|---------|-----|
|                       | Coefficient                          | T value |     | Coefficient                    | T value |     | Coefficient                         | T value |     |
| Intercept             | 0.040                                | 0.4     |     | 0.113                          | 1.14    |     | 0.117                               | 1.18    |     |
| Pchg_Mkt              | -0.075                               | -0.44   |     | -0.042                         | -0.26   |     | 0.138                               | 0.86    |     |
| Pchg_FTH              | 0.024                                | 1.7     | *   |                                |         |     |                                     |         |     |
| Pchg_FUS              |                                      |         |     | 0.209                          | 1.53    |     |                                     |         |     |
| Pchg_FGE              |                                      |         |     |                                |         |     | -0.114                              | -0.27   |     |
| TV_M                  | 0.109                                | 3.96    | *** | 0.138                          | 4.92    | *** | 0.131                               | 4.84    | *** |
| TV_P                  | 0.215                                | 2.63    | *** | 0.326                          | 3.6     | *** | 0.328                               | 3.55    | *** |
| TV_F                  | 0.157                                | 2.28    | **  | 0.225                          | 3.14    | *** | 0.204                               | 2.84    | *** |
| TV_C                  | 0.901                                | 1.61    |     | 1.683                          | 2.95    | *** | 1.334                               | 2.31    | **  |
| Observation           |                                      | 110     |     |                                | 108     |     |                                     | 107     |     |

**Table 4.7 Regression for the Effects of Investor Type on the Market Conditions (Cont.)**

| Independent variables   | Model 1 Dependent variable: Thailand |          | Model 2 Dependent variable: US |          | Model 3 Dependent variable: Germany |         |
|---|--------------------------------------|----------|--------------------------------|----------|-------------------------------------|---------|
|   | Coefficient                          | T value  | Coefficient                    | T value  | Coefficient                         | T value |
| F Value   |                                      | 4.02 *** |                                | 6.09 *** |                                     | 5.1 *** |
| Adjust R <sup>2</sup>   |                                      | 0.14     |                                | 0.22     |                                     | 0.19    |
| *** Indicates statistical significance at the 0.01 level (one-tailed <i>t</i> tests). |                                      |          |                                |          |                                     |         |
| ** Indicates statistical significance at the 0.05 level (one-tailed <i>t</i> tests).  |                                      |          |                                |          |                                     |         |
| * Indicates statistical significance at the 0.10 level (one-tailed <i>t</i> tests).   |                                      |          |                                |          |                                     |         |

Panel A shows the results of the analysis at event period of three studied models. Model 1 shows the returns in relation to the news announce in Thailand. The overall model is significant at 1 percent level (F-Value = 10.3 and Adjusted R<sup>2</sup> = 33.65%) and the sign of coefficient between TV\_M and TV\_P are positive and significant at 1 percent level.

Model 2 shows the returns in relation to the news announced in the U.S. The model is significant at 1 percent level (F-Value = 6.51 and Adjusted R<sup>2</sup> = 23.44%). In this model, only one trader which is TV\_P is significant at 1 percent level with positive coefficient. Lastly, Model 3 shows the returns in relation to the news announced in the Germany. The model is significant at 10 percent level (F-Value = 2.32 and Adjusted R<sup>2</sup> = 6.87%) and the sign of coefficient between TV\_M and TV\_P are positive and significant at 1 and 10 percent level, respectively.

Panel B shows the results of the analysis post event period of three studied models. From an overview, all of the models show statistically significant at 1 percent; (Model 1: F-Value = 4.02 and Adjusted R<sup>2</sup> = 14.14%), (Model 2: F-Value = 6.09 and Adjusted R<sup>2</sup> = 22.06%) and (Model 3: F-Value = 5.10 and Adjusted R<sup>2</sup> = 18.70%).

Model 1 shows that the coefficient of TV\_M, TV\_P and TV\_F are positive and significant at 1 percent level for TV\_M and TV\_P, and 10 percent level for TV\_F. Moreover, in this model, the surprise factor of the news announced in Thailand is significant at 10 percent level with positive coefficient to the market returns.

Model 2 shows that all of the investor types have a positive coefficient impact at 1 percent level to the market returns. Lastly, model 3 also shares similar results to the second model where all investor types have positive coefficient at 1 percent level, except for TV\_C where the significant level is at 5 percent, to the market returns. In conclusion, during the event study period, when Mutual Fund and Proprietary trade in the market, it will create positive returns to the market.

Next we also examined the variables by dividing the surprised factors into a positive and negative number focusing on the post event period. The result shows in table 4.8 below.

**Table 4.8 Regression for the Effects of Investor Type on the Market and Surprise Factor Conditions**

*This table shows the relationship between the surprise factors, market conditions and trading volume by investor types by developing the equation at and post event period. The regression model can be written as  $RET_1 = \alpha + \beta_1 Pchg\_Mkt + \beta_2 X_t^\mu + \beta_3 TV\_M + \beta_4 TV\_P + \beta_5 TV\_F + \beta_6 TV_C$ ; where the independent variable is the market return (RET) and market conditions ( $X_t^\mu$ ), and trading volume by investors types are dependent variable.*

**Panel A: A Market Reaction Post Event Period (Positive News)**

| Independent variables | Model 1 Dependent variable: Thailand |         |     | Model 2 Dependent variable: US |         |     | Model 3 Dependent variable: Germany |         |     |
|-----------------------|--------------------------------------|---------|-----|--------------------------------|---------|-----|-------------------------------------|---------|-----|
|                       | Coefficient                          | T value |     | Coefficient                    | T value |     | Coefficient                         | T value |     |
| Intercept             | 0.091                                | 0.71    |     | 0.029                          | 0.1     |     | 0.136                               | 0.77    |     |
| Pchg_Mkt              | -0.190                               | -1.12   |     | 0.185                          | 0.66    |     | 0.175                               | 0.81    |     |
| Pchg_FTH              | 0.027                                | 0.97    |     |                                |         |     |                                     |         |     |
| Pchg_FUS              |                                      |         |     | 0.176                          | 0.46    |     |                                     |         |     |
| Pchg_FGE              |                                      |         |     |                                |         |     | -0.518                              | -0.43   |     |
| TV_M                  | 0.100                                | 3.26    | *** | 0.139                          | 2.9     | *** | 0.129                               | 3.01    | *** |
| TV_P                  | 0.243                                | 2.92    | *** | 0.094                          | 0.5     |     | 0.156                               | 1.01    |     |
| TV_F                  | 0.045                                | 0.61    |     | 0.371                          | 2.88    | *** | 0.268                               | 2.31    | **  |
| TV_C                  | 0.435                                | 0.74    |     | 2.376                          | 2.51    | **  | 1.875                               | 2.16    | **  |
| Observation           |                                      | 77      |     |                                | 45      |     |                                     | 60      |     |
| F Value               |                                      | 5.04    | *** |                                | 1.87    | *   |                                     | 1.79    |     |
| Adjust R <sup>2</sup> |                                      | 0.2394  |     |                                | 0.1042  |     |                                     | 0.0736  |     |

**Table 4.8 Regression for the Effects of Investor Type on the Market and Surprise Factor Conditions (Cont.)**

**Panel B: A Market Reaction Post Event Period (Negative News)**

| Independent variables | Model 1 Dependent variable: Thailand |         |     | Model 2 Dependent variable: US |         |     | Model 3 Dependent variable: Germany |         |     |
|-----------------------|--------------------------------------|---------|-----|--------------------------------|---------|-----|-------------------------------------|---------|-----|
|                       | Coefficient                          | T value |     | Coefficient                    | T value |     | Coefficient                         | T value |     |
| Intercept             | -0.409                               | -1.87   | *   | 0.120                          | 0.74    |     | 0.048                               | 1.18    |     |
| Pchg_Mkt              | 0.449                                | 1.2     |     | -0.177                         | -0.98   |     | 0.160                               | 0.64    |     |
| Pchg_FTH              | -0.026                               | -1.02   | *   |                                |         |     |                                     |         |     |
| Pchg_FUS              |                                      |         |     | 0.210                          | 0.67    |     |                                     |         |     |
| Pchg_FGE              |                                      |         |     |                                |         |     | -0.456                              | -0.76   |     |
| TV_M                  | 0.132                                | 2.61    | *** | 0.158                          | 4.27    | *** | 0.119                               | 3.16    | *** |
| TV_P                  | 0.129                                | 0.75    |     | 0.422                          | 4.24    | *** | 0.384                               | 3.15    | *** |
| TV_F                  | 0.469                                | 3.58    | *** | 0.149                          | 1.75    | *   | 0.015                               | 0.15    |     |
| TV_C                  | 2.529                                | 2.2     |     | 0.149                          | 2.09    | **  | -0.394                              | -0.45   |     |
| Observation           |                                      | 32      |     |                                | 58      |     |                                     | 42      |     |
| F Value               |                                      | 2.99    | **  |                                | 8.34    | *** |                                     | 5.25    | *** |
| Adjust R <sup>2</sup> |                                      | 0.1414  | 0.3 |                                | 0.4316  |     |                                     | 0.3778  |     |

According to the result, we conclude that when the model is significant for news announced locally when it is a positive news where Mutual and Proprietary traders are the major buyers in the market creating positive return during this time. On the other hands, when the international news announced, it will cause investors to buy the stocks at 1 percent significant percent level.

## CHAPTER V

### CONCLUSION

Many researchers are still trying to understand the impact of the macroeconomic news announcement to the stock index; building their assumption in their studies based on the Efficient-Market theory by Fama (1970) that the market is efficient therefore all information available in the market is embedded in the stock prices. They stated that the inflation has inversed impact on the stock market returns conditional to economic condition. It is claimed that the unanticipated inflation is more harmful than the anticipated inflation during the economic recession with empirical results to support the claim.

In this paper, we examined the results of the responses of the news announced domestically and internationally on Thai stock market by using event study method. Similar to previous research, we built our assumption around the Efficient-Market theory. The limitation of this study is that we assume that the expected inflation from the obtained sources is rational for the expectation of the future announcement. Throughout the study, we concluded that the market responses to the domestic news at the bear market condition than bull market condition. We can also conclude from the regression analysis that CPI has a long term effects on stock returns.

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