

**LEADING MACROECONOMIC INDICATOR ANNOUNCEMENT
AND THE RESPOND TO THAI STOCK MARKET**



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ABSTRACT

This paper examines how leading macroeconomic indicators announcements (BSI index) have reacted to the stock market. How those indicators play such an important role in the market. The impacts are divided into positive and negative changes in index have reactions to market return on few before and after announcement date. The proxy for measurement is the return on the closing index from Stock Exchange of Thailand. Each sector listed in stock market respond differently of BSI signals. Also, the Retail investors and Foreign investors respond to BSI index in both negative and positive changes but behave in opposite direction. The relationship also examines which shows that Proprietary Trading investors have a relationship to BSI index changes.

KEY WORDS: Macroeconomic news/ Leading indicators/ Stock markets

28 pages

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CHAPTER I

INTRODUCTION

Based on the modern financial theory, most people believe that a stock price fluctuates depends on the macroeconomic announcements. No matter how each individual investor perceives those information, or interprets those information, either way macroeconomic announcements have played a crucial role responding to financial market. Once Bank of Thailand has publicly announced an increasing in any Money supply leading indicators, some investors observed that the stock price volatiles before, after, or even real time changing. If you could remember, Thailand has faced Tom Yum Kung crisis during 1994 that Thai government decided to float Thai baht that made Thai baht become more depreciated. From this situation, most manufacturers were in burden of foreigner debts and went bankruptcy. This is the result of the currency collapse. Of course, this was driven to the stock market went down. Later in 1996-1997, Thailand was in serious problem of currency crisis, banking crisis, and international bank crisis that were driven the entire economic in suffering. Thai import shrank. Current account were in high severely deficit. For example, Thai export condition expanded not more than 1% in 1996 compared to 23% and 21% in 1994 and 1995. Its result could send a signal to all foreigner investors in term of psychology and influence their investment behavior in Thai stock market. They lose confident to invest in Thai stock market. Later June-July 1998, SET index went below 300 points (Jesse, 2013).

By confronting with crucial economic situation, Bank of Thailand (BOT) has come up with an idea of useful domestic economic indices. It is an essential tool to use as an alerting indicator of the Thai business condition. Some leading indicators contain of the actual month index as well as a forecasting business condition in the next 3 months ahead. They turn to be more acceptable as a proxy and used after the crisis of 1997. BOT has setup a professional team to support this activity for all public and private sectors to be aware of unexpected situation. One of the best economic

indicators is Business Sentiment Index (BSI) which helps investors, manufactures, foreigner investors, or even financial institutions for a better confident in Thai economy.

Many researchers have documented that the changing in macroeconomic leading indices, such as Business Sentiment Index, can be somehow predicted the purchasing power for return on financial market. They are linkage. The index itself is not only useful for macroeconomic environment, but also it is a decent fit with the return in the stock market. Such those leading indicators have a strong correlation with the market. To prove, the graph from Bloomberg can show the positive correlation between Thai Business Sentiment Index, or symbol “THBSI:IND”, and Stock Exchange of Thailand, or symbol “SET:IND”. They move in the same direction to one another.

BSI is the leading macroeconomic indicator which moves pro-cyclically to economic. It is representing to Thai business cycle. BSI was introduced by Bank of Thailand on April 2004 after crisis. Its purpose is to systematically collect information of the business condition from most of big and famous companies in Thailand in order to analyze overall business sentiment. BSI index itself does not only help to act as the business leading indicator, but also point out requirements and difficulties from manufacturers’ point of views. Furthermore, BSI index will also help BOT to set strategies and tactics as such monetary policy, and for either micro- or macroeconomic policy protecting against inflation. BSI index is constructed from a monthly questionnaire passing to the medium to large firms over 1,010 companies listed in Thai stock market with registered capital of 200 million baht minimum, and with Ministry of Industry Thailand. The representatives are from manufacturer and service industry. Examples of manufacture companies are from 9 different types which are food, wood products, textiles, paper and paper products, chemicals, non-metallic products, metallic products, machinery and equipment, and others. Examples of service industry are from Hotels & Restaurants, Hospitals, Real Estates, and Trade (Retail & Wholesale).

The questionnaire, or so-called “Business Sentiment Survey:BSS”, is divided into 2 parts. First part is built of 6 questions. It refers to the overall of the economic condition that are used to compute BSI index such as Economic condition or business performance, Total order books, Investment, Employment, Cost of production or the cost of business, and Production. The answers are in both present situation and next 3 months outlook. Each question has 3 choices to answer which are up, unchanged, and down. Second part is the information that is used to reflect the business condition. But this information might not use to compute for BSI index. Examples are Inventories, Financial conditions, financial market outlook, Selling price, Export, Production capacity, Expected inflation, Limits of the business. By each month, for example collect data for February, the questionnaire will be sent, by the end of January, together with introductory letter stating its purpose of doing survey, and confirmation letter stating that the results will be return back to the user. The company should have returned the questionnaire back to BOT by the ninth of February, or by the ninth of following month. Then BOT will continue the analyzing process. As a result, BSI index, as of February, will be public announced on BOT website on the last working day of that particular month. The announced time is 14:00:00 hrs.

The interpretation of the announcement index is that

- BSI index = 50 ; indicates that the business condition remains stable
- BSI index < 50 ; indicates that business condition is deteriorating
- BSI index > 50 ; indicates that business condition is improving

Nonetheless, the result of BSI index is an indicator that represents most investors’ perceptions and use as a guideline to study of the investors’ behaviors toward investment. Even the BSI index is below 50, it does not really imply to the magnitude of the deterioration. We need to further study of the diffusion indices in order to help us to interpret in detail based on this qualitative information (Bank of Thailand, 2014).

This paper will study further for the impact and relationship between the changes in monthly BSI signals, both positive and negative, to the return on Stock

Exchange of Thailand (SET). Also it needs to be considered the relationship of diffusion indexed to the change of positive and negative signal.

By above theory, this paper would extend more research about the linkage between BSI index and stock market in detail. For better understanding and further knowledge, the paper will prove with evidences that once actual of BSI index of one particular month is announced publicly, how the return on the stock market respond to the announcement. If the actual index increased from previous month, does the return on the index changed positive or negative. The paper will analyze who will perceive this information, and also what are their investment's behaviors towards announcement.

This paper contributes further studying of the respond of stock market to macroeconomic announcements and report into five ways. First is to look into the market return by changing of BSI index. The change in BSI index will be described more later on the paper. Second is to look into the return from eight different industries. Most sectors are significant in positive surprises but only Technology & Resources impact from negative change in BSI index. Third is to examine the net trading imbalance of four investor types reacted to the BSI changing signal. Forth is to find the impact to return on equity market after a few days of BSI index announcements (where event study is +2,+3). Last is to examine the relationship of changing in BSI index to six diffusion indexes in term of two different perspectives, positive and negative.

CHAPTER II

THEORETICAL FRAMEWORK AND LITERATURE REVIEWS

2.1 Theory

The impact to the return on the stock market regarding to surprise events from macroeconomic announcements has been studying through many researchers. The responds are examined on the announcement days and more when announcement are made. The data used are assumed to be under efficient market hypothesis where asset price respond to new economic information. The model used to estimate the impact from the announcement surprises are;

$$DP_t = \alpha + X_t^u \beta + \varepsilon_t$$

.....(2.1.1)

where DP is the closing stock price index from one business day which DP_t represents the log change of the closing price index on business day t-1. For variable X_t^u demonstrate the value differences between the macroeconomic announcements and the forecasted value, collected from a survey of rational expectations for future announcements, on announcement date.

2.2 Literature Reviews

Li Li & Zulu (1998) examined the financial market respond to the macroeconomic news announcement by looking deeply into two main parts. They use daily stock index as an estimation proxy of a stock price reaction by calculating changing of log index return. Those data are collected from four U.S. stock indices; Dow Jones Industrial Index where contain most of blue chips stocks, Standard &

Poors (S&P) 500 Index where contain 500 largest market value firms, Russell 3000 Index where contain 3,000 large market cap companies representing 98% of the



investible U.S. market, and Russell 2000 & 1000 Index where contain small cap stock market index. First part is to find the impact from the surprise events of announcements by doing simple regression where dependent variable is the return of stock price index for markets and independent variables are the changes in actual and forecast of economic data announcements. The forecast data is assembled from Money Market Survey International (MMS). The results are Money Supply indicators (M-1), data announced by U.S. Federal, and discount rate changes are significant and move in the opposite direction with stock price. Malcolm & Jeffery (2007) have studied about investors' sentiment through investment which sends a wave to return on stock market. Jensen & Johnson (1995) shows indicated that changing in discount rate announced by Federal Reserve has a relation to the market return.

Announcement of the inflation rate drive stock price to go down. Some positive macroeconomic indicators such as nonfarm payrolls have pressed S&P 500 and Russell 1000, or unexpected positive changes in housing starts are significant with positive reaction to all markets. However, negative macro indicators such as trading balance have driven Dow Jones Industrial Index. Last, unemployment news announcements have a significant impact to small cap stocks rather than blue chips stocks.

In second part, they observe market return in different stage of economy with macroeconomic indicators. The conditions of the economic are separated by industrial production, leading macroeconomic indicators, National Bureau of Economic Research, Business cycle turning points, unemployment rate, and discount rate. The model used is written below;

$$DP_t = \alpha + \sum_i D_i \beta_i + \varepsilon_t \quad \dots\dots\dots(2.2.1)$$

Where D_i is dummies variables for each stage of economy. Then run regression with variables. To calculate, they define a High and Low value by estimating and the log industrial production forecast index, collected from monthly seasonal adjusted index as an economic proxy, and doing regression with log actual industrial production index. To crate degree, any forecast value that lies above or below 25 percent of the actual index will consider as a “High” and “Low”

respectively. For results, when economic is high, Dow Jones Industrial Index, S&P 500, and Russell 1000 are significant to the M-1 announcements. Also, the high stage of economy has positive reactions to Dow Jones index caused from unexpected unemployment rate announcements. As well as nonfarm payrolls index where shows significant impact to S&P 500 during the high stage of economy. In the opposite, the changing in discount rate is significant which result to the negative impact to market return during high stage. CPI indicator shows significant which moves inverse direction with the stock price when the economy is in low condition. Whereas, PPI indicator shows a negative correlation coefficient with stock price when the market enter into a high stage of economy. The positive macroeconomic announcements such as housing starts and inventory send positive effects to the market. Small cap stocks are concern announcements on inflation, employment, and trading balance more than large cap stocks.

For NBER & Business cycle, the paper divided into two stages which are expansion and recession. The results show that Money Supply indicators show a strong impact to small cap stocks while facing recession. The change of discount rate has a negative impact to four indexes during expansion and recession. Other macroeconomic indicators show significant and react to the market such as Capital utilization rate reacts to S&P 500 during an expansion period, or Home sales index (HIS) reacts to Russell 2000 during a contraction period which generates lower return than other index. Additionally, when announcement of Unemployment rate is high, this sends a negative impact to four indexes, but the positive trading balance rise stock price of four indexes during expansion period. Last, in term of monetary indicators, whenever Federal comes up with monetary restriction policy, it definitely has a strong impact to the market in a large scale. The paper proves that the unanticipated increased in inflation leads to dampen stock prices. At the same time, a positive change in Industrial Production Index (IPI) also lead to decrease in stock prices because of inflation risk concerns. During this tight stage, most small cap gain less return compared to the large big firms because most firms are facing with interest rate risk during 1987 crisis in U.S stock market.

More evidence from James & Lena (1997) where examined the impact from monetary policy react to security returns which found that a restrictive of

monetary policy could lead to the decrease in asset return for small and large cap stocks.

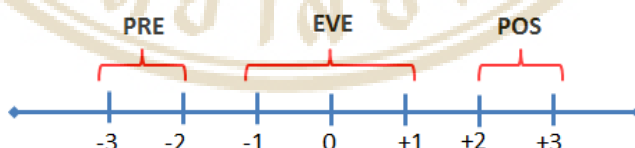


CHAPTER III

DATA AND METHODOLOGY

3.1 Data

The return on indices for a stock market will be used for a study in this paper. The data is from SET Market Analysis and Reporting Tool (Set Smart) available by Settrade website. Collected data is the daily SET index closed which I gather data from 01/01/2002 up to 29/03/2013. The stock market can be referred to an index measuring stocks which can be calculated by the index price differences between the actual date and previous date in order to find investment gain or loss. This is the way to find a return on index from the stock market. The method I use is to lag daily closing index and divided with the previous closing index, minus 1, and multiply by 100 to find the percentage return. The purpose is to see the respond of the index return on surprised events, 134 days as of a data sample, and also two days earlier and two days after announcement dates. So, interesting event study periods are categorized into 3 stages; First, Event day (EVE) which is -1 & +1 days from announcement date. Second, Pre-event day (PRE) which are -3 & -2 days from announcement date. Third, POST-event day (POS) which are +3 & +2 days from announcement date.



Example of the index return is calculated by follow;

$$r(t) = \left[\frac{z_{close}}{\text{lag}(z_{close})} \right] - 1 \quad \dots\dots\dots(3.3.1)$$

Nonetheless, I also collect the data of buy & sell volume from each investor types. It is a daily trade from 04/01/2000 up to 06/02/2014. Then I compute

the net trading im balance from each investor which later will explain how to compute it. Also, the daily index returns by different industries. I collect data from 04/01/2000 up to 01/03/2013. Then find the index return using the same method with index return above.

This study uses surprised of 134 monthly Business Sentiment Index (BSI) announcement dates. Observations are from 31/01/2002 up to 28/02/2013. BSI index is deliberated an economic leading indicator which is very important as same as the level of GDP. The index is announced by Bank of Thailand website every last working day of each month. I believe that BSI index is announcement might have an impact to the stock volatility which reflects to the return. Besides, the data is highly reliable because it is released by the government. For this paper, the changing in the value of BSI is more concern and people especially investors should pay attention to it because once the actual index has neither positive nor negative changes from the previous month, the respond act differently. By this mean, I lag actual month to minus with previous month. Then, I divided the data into positive changes and negative changes in order to see the overall big picture and easier to interpret the data. Furthermore, the diffusion indices that are released together with BSI index will be using to find the relationship with BSI index as well. This paper will show once BSI index change positively, which diffusion index respond and which one are not.

Table 3.1 is the report of the descriptive statistic where stated the number of positive and negative BSI index changes which I group into 3 events such as PRE, EVE, and POS. The numbers are in the rage of January 2002 up to February 2013 which contains of 134 months. The sample includes 70 observations of positive changes in BSI index and 64 observations. The percentage of the positive change has an average of 52% of the total change of BSI index. From this number, you can see that the positive and negative change almost half-half which can be assumed that the economy is quite stable from the pass 11 years. The highest positive change is in year 2003. According to BOT, Thai economy in year 2003 was in health condition with growth rate of 6.7 percent increased by 1.3% compare to 2002 (Bank of Thailand, 2004).

TABLE 3.1: Descriptive Statistics

The table below is the number of BSI index changing of the actual announcement date compared to the previous month of BSI index. The paper will look in two different perspective which are the positive change and the negative change in index. The information are collected from each month from period of January 2002 to February 2013

<u>Year</u>	<u>Numbers of Positive change in BSI index</u>	<u>Numbers of Negative change in BSI index</u>	<u>Total Events</u>	<u>% Positive Changes</u>
2002	5	7	12	41.67%
2003	9	3	12	75.00%
2004	5	7	12	41.67%
2005	6	6	12	50.00%
2006	4	8	12	33.33%
2007	6	6	12	50.00%
2008	6	6	12	50.00%
2009	8	4	12	66.67%
2010	7	5	12	58.33%
2011	7	5	12	58.33%
2012	6	6	12	50.00%
2013	1	1	2	50.00%
Total	70	64	134	52.24%

3.2 Methodology

Later on, the event study methodology used for this paper is the Multiple Linear Regression in order to examine the marginal impact and relationship towards each factors controlling for BSI index. To run regression, I have group POS event days (+2, +3) as of the independent variable, and run regression with return on net trading from each investor type as explanatory variables. Total observations are 268 days.

$$Y_t = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 + \varepsilon_t$$

.....(3.2.1)

Where Y represents the change in the log of market close index

X_1 is a changing in BSI index between actual months with previous month

X_2 is a net trading imbalance from retail investors

X_3 is a net trading imbalance from foreign investors

X_4 is a net trading imbalance from institution investors

X_5 is a net trading imbalance from proprietary trading investors

X_6 is a dummy variable of a market condition (where 0 shows Bear market and 1 shows Bull market)





CHAPTER IV

EMPIRICAL RESULTS

For this paper, the empirical study was taken into a closer look for four stages. First, I find the daily index return from SET market, and find the BSI index changes for monthly data. Second, I find the index return around the announcement date, and group into three different periods such as PRE, EVE, and POS for deeply study. Third, I examine the relationship by using Multiple Regression to find how each investor's invest and return on one day before and after announcement date. Last, by using the same regression model, I study more about diffusion index whether changing in BSI index to positive and negative has a relationship to diffusion index or not. The last one will be looking at the announcement date only.

4.1 Positive & Negative Changing of Business Sentiment Index on the Announcement date

To observe whether the changing of BSI index of the actual month which becomes more positive and negative number has an effect to the return on the stock market, the purpose is that I would like to look at the market return as a whole. By mean, I examine by using a standard of event study. I calculate daily normal return around announcement date. For BSI change number, I take the actual month of BSI index not the expected BSI index subtracts with the previous BSI index. If the number is negative, I consider that the economic decline and put it in the negative change of BSI and vice versa.

Table 4.1 is the summary of the theory above. This paper studies of the return around announcement date of BSI index by analyzing the daily normal return. In order to check the information is absorbed by the market or not, it should had better to look at any significant number showing the changing in BSI react to the return on

the stock market. Finally, the data was run through SAS program illustrated that it is significant at 99% level of confident that positive changing in BSI index has a reaction on EVE days which EVE consists of -1 , 0 , +1 days from the announcement date where 0 is the date of BSI announcement. P-value is 0.0006 which is much far than 0.01. The return is very high compared to other event with mean return of 0.51%. The minimum market return is 15% with minimum return of -5%.

TABLE 4.1: Positive & Negative Change in BSI Index

This table examine the market return from SET index which the data is from daily closing index as of January 2002-February 2013. The statistic table below shows a significant at 99% level of confident at EVE date. EVE consist of -1, 0 ,+1 days from the announcement date where 0 is the announcement date of BSI index

<u>BSI</u>	<u>Event</u>	<u>Mean</u>	<u>Minimum</u>	<u>Maximum</u>	<u>P-value</u>	
<u>changing signal</u>	<u>Study</u>	<u>Observations</u>	<u>Market return</u>	<u>Market return</u>	<u>Market return</u>	
Positive Signal		210				
	EVE	70	0.51%	-4.78%	14.79%	0.0006 ***
	POS	70	0.05%	-3.95%	7.21%	0.6970
	PRE	70	0.24%	-6.53%	5.97%	0.1316
Negative Signal		192				
	EVE	64	0.20%	-10.21%	19.67%	0.3043
	POS	64	0.17%	-5.09%	6.20%	0.2434
	PRE	64	0.08%	-6.20%	9.00%	0.6456

To interpret from the table, the market acknowledges and responds when the index is announced by a high percentage of return. If the BSI index shows a positive changed, investors might feel confident and dare to invest more because the index has showed that the economic is getting improve from previous month. By further study, the table 4.1.1 below shows that the market reacts only one day before BSI index announcement by the end of each month. It is a significant at 95% level with P-value of 0.0139. On one day before announcement, the mean return is 0.71%.

TABLE 4.1.1 Positive Change in BSI Index on Each Event Days

Change in BSI index	Event study	Obs	Mean return	Min return	Max return	P-value
Positive	-3	70	0.26%	-4%	5%	0.2295
	-2	70	0.23%	-5%	5%	0.3674
	-1	70	0.71%	-5%	6%	0.0139 **
	0	70	0.35%	-4%	10%	0.1546
	1	70	0.48%	-3%	9%	0.0454
	2	70	0.01%	-4%	6%	0.9683
	3	70	-0.12%	-8%	5%	0.6240

4.2 BSI Index Announcement and Reaction to Separate Industries

Once I study the market return as an overall big picture, then it is a good opportunity to study the return on each different sector in SET market. There are 8 categories which are Agro & Food industry, Consumer products, Financial or Banking, Industrials, Property & Constructions, Resources, Services, and Technology. I calculate to find the return on the index from individual sectors by looking at the daily closed index. Then compute return by using the same method of index return in table 4.2.

TABLE 4.2: Reaction to Separate Industry

This table examine the return of individual sectors from SET market. The return is calculated from daily closing index as of 04/01/200 up to 01/03/2013. The statistic table below shows a significant at 99% level of confident on the positive change in BSI.

Industry	BSI		Obs	Mean return	Minimum	Maximum	P-value	
	changing signal	Event Study			return	return		
Agro	Positive Signal	EVE	70	0.94%	-4.98%	6.54%	0.0005	***
		POS	70	0.46%	-3.06%	4.77%	0.0088	***
		PRE	70	0.35%	-2.78%	3.11%	0.0251	
	Negative Signal	EVE	64	0.41%	-6.45%	6.54%	0.1180	
		POS	64	0.20%	-3.72%	3.68%	0.1813	
		PRE	64	0.36%	-6.65%	4.69%	0.1199	
Consump	Positive Signal	EVE	70	0.53%	-4.75%	10.11%	0.0183	**
		POS	70	0.05%	-3.96%	4.76%	0.7185	
		PRE	70	-0.01%	-5.79%	3.87%	0.9403	
	Negative Signal	EVE	64	0.29%	-4.21%	5.60%	0.1653	
		POS	64	0.26%	-3.41%	5.30%	0.1033	
		PRE	64	0.03%	-1.86%	2.67%	0.8160	
Financial	Positive Signal	EVE	70	1.35%	-5.53%	10.58%	0.0008	***
		POS	70	0.02%	-4.51%	6.27%	0.9473	
		PRE	70	0.63%	-5.48%	12.68%	0.0512	
	Negative Signal	EVE	64	0.52%	-6.92%	14.54%	0.2620	
		POS	64	0.16%	-5.33%	5.67%	0.5362	
		PRE	64	0.33%	-5.84%	7.94%	0.3473	
Industrial	Positive Signal	EVE	70	1.45%	-6.16%	13.63%	0.0011	***
		POS	70	0.33%	-5.45%	8.72%	0.2726	
		PRE	70	0.51%	-5.37%	7.28%	0.1004	
	Negative Signal	EVE	64	0.44%	-13.55%	9.34%	0.3337	
		POS	64	0.03%	-7.07%	5.68%	0.9159	
		PRE	64	0.28%	-3.84%	9.77%	0.3926	
Propcon	Positive Signal	EVE	70	1.63%	-4.19%	9.57%	0.0000	***
		POS	70	0.22%	-4.18%	7.29%	0.3892	
		PRE	70	0.45%	-6.16%	6.40%	0.0675	
	Negative Signal	EVE	64	0.64%	-8.26%	12.61%	0.1827	
		POS	64	0.23%	-5.54%	6.52%	0.3395	
		PRE	64	0.21%	-4.56%	8.61%	0.4820	
Resources	Positive Signal	EVE	70	1.39%	-6.94%	14.76%	0.0024	***
		POS	70	0.41%	-4.96%	6.36%	0.1288	
		PRE	70	0.27%	-9.83%	8.56%	0.4082	
	Negative Signal	EVE	64	1.06%	-9.32%	21.91%	0.0449	**
		POS	64	0.43%	-5.44%	5.28%	0.0648	
		PRE	64	0.06%	-6.78%	5.49%	0.8451	
Services	Positive Signal	EVE	70	1.01%	-4.91%	7.65%	0.0003	***
		POS	70	0.19%	-3.06%	3.29%	0.2794	
		PRE	70	0.33%	-3.13%	4.25%	0.0369	**
	Negative Signal	EVE	64	0.52%	-8.94%	10.84%	0.1320	
		POS	64	0.16%	-4.28%	3.69%	0.3676	
		PRE	64	0.43%	-4.51%	6.69%	0.0572	
Technology	Positive Signal	EVE	70	0.80%	-6.30%	9.26%	0.0317	**
		POS	70	0.02%	-4.85%	7.48%	0.9440	
		PRE	70	0.59%	-5.70%	7.95%	0.0651	
	Negative Signal	EVE	64	1.00%	-8.72%	20.62%	0.0384	**
		POS	64	0.03%	-8.93%	5.59%	0.9135	
		PRE	64	0.50%	-4.82%	9.64%	0.1498	

For interpretation, I group into three categories which make it easier to see. There is strong evidence that the positive change in BSI index send the positive signal of return to many industries which you can see from the significant at 99% level of confident in Table 4.2.1 below.

Table 4.2.1 : Showing a significant level at 99% confident of a positive change in BSI index

BSI changing signal	Event Study	Industry	Obs	Mean return	Minimum return	Maximum return	P-value
Positive Signal	EVE	Agro	70	0.94%	-5%	7%	0.0005 ***
		Financial	70	1.35%	-6%	11%	0.0008 ***
		Industrail	70	1.45%	-6%	14%	0.0011 ***
		Propcon	70	1.63%	-4%	10%	0.0000 ***
		Resources	70	1.39%	-7%	15%	0.0024 ***
		Services	70	1.01%	-5%	8%	0.0003 ***
	POS	Agro	70	0.46%	-3%	5%	0.0088 ***

Most industries react to the positive change at the EVE days. Those industries are Agro & Food industry, Financial, Industrial, Property & constructions, Resources, and Services. In six of them, one sector that generates highest return in EVE day is the Property & Constructions industry which can generate positive mean return of 1.63%, and maximum return of 10%. The reason that Property & Constructions industry take into an account is that BSI index is mainly constructed information from industrial & services companies which directly effect to Property & Constructions industry. The sub sectors of Property & Constructions industry are Construction Material, Construction Services, Property Development, and Property Funds & REITs (Stock Exchange of Thailand, 2014). All of them are the major gears to drive the economic. If BSI has positive changes, this mean that the diffusion indices of BSI are expected to improved. For instance, it can be assumed that the overall productions are getting better. Then the performances are getting better as well which mean there are more investment and people are more confident to invest. So that is why Property & Constructions industry can rely on and correlate with positive changes in BSI index announcement. Moreover, there is evidence that the positive change in BSI index has a significant impact to Agro & Food industry in POS event, or it can be saying that this effect to the return on the days after announcement date. Agro & Food industry can generate positive mean return of 0.5%, and with maximum return of 5%. All of these that have mentioned above are the industries that directly effect to the positive changes in BSI index announcement.

As Table 4.2.2 below, Consumer products & Technology sectors effect from the positive changes in BSI index announcement at EVE day with a significant level of 95% confident.

Table 4.2.2 : Showing a significant level at 95% confident of a positive change in BSI index

BSI changing signal	Event Study	Industry	Obs	Mean return	Minimum return	Maximum return	P-value
Positive Signal	EVE	Consump	70	0.53%	-5%	10%	0.0183 **
		Technology	70	0.80%	-6%	9%	0.0317 **
	PRE	Services	70	0.33%	-3%	4%	0.0369 **

For instance, Technology sector can generate positive mean return of 0.8%, and with maximum return of 9%. Besides, Services sector also effect to the positive change but result in PRE event with positive mean return of 0.33%, and maximum return of 4% (Mfcfund, n.d.).

Here is the summary of the positive changes in BSI index announcement in different time series. All eight industries perceive the information and send a positive respond to the market return. Only Service & Agro and Food industries have a positive respond only on PRE and POS event days from the announcement respectively.



Nevertheless, the return on the market somehow responds to the negative change in BSI index announcement as well. From Table 4.2.3 below, there are two sectors that respond to the negative sign of BSI index announcement which are Resources & Technology sectors. The reason behind is that these two sectors produce the living products that everyone need in everyday life. To look into the sub-sectors, Resources sectors contain Energy & Utilities companies in the sector such as

companies producing oil, gas, electricity, and water. Even the economic has shifted downwards, people still need to consume products anyway. It is only the return that is reduced compared to the positive change in BSI index announcement. The difference is the return is 0.33% less if the BSI changes negatively.

For another sector, the table stated that the return for technology sector become positive and also more return compared to positive change in BSI announcement. The reason behind is that Technology is considered as a one of Thailand top list export product around the world such as ASEAN, US, Japan, China, Europe, and Honk Kong. The export activity does not rely on the negative change in BSI index announcement. This paper later on explains the relationship of negative change in BSI index announcement with BSI diffusion indices which the paper found the interesting results. Many sub-indices are not relying on negative BSI index announcement. To look into sub-sector of Technology, this sector consists of companies manufacturing electronic components, companies providing technology services, companies providing & servicing computer systems, and companies manufacturing & distributing technology equipment such as telecommunication hardware (Thailand Board of Investment, 2013).

Table 4.2.3 : Showing a significant level at 95% confident of a negative change in BSI index

BSI changing signal	Event Study	Industry	Obs	Mean return	Minimum return	Maximum return	P-value
Negative Signal	EVE	Resources	64	1.06%	-9%	22%	0.0449 **
		Technology	64	1.00%	-9%	21%	0.0384 **

4.3 BSI Index Announcement and Reaction to Each Investor Type

By looking into each sectors return, it is also need to look at investment of different investor types. BSI index announcement might have an impact to the investment behavior. In this point, BSI index announcement will be separated into positive & negative changes same as other tables. The factor measuring the respond is from a net trading balance. These four investor categories are Local investor, or so-called “Retail investor”, Foreign Investors, Local Institutions, and Proprietary Trading.

The data is collected from period 04/01/2000 up to 06/02/2014. This paper will use SAS program to help analyze the data. As a result, there are two types of investors who react to the changes of BSI index, Retail investors & Foreign Investors. Other two types of investors do not react to the change in BSI index which are Local Institutions & Proprietary Trading. To calculate the net trading imbalance from each investor type, the formula is provided below. This helps to find the proportion of buy volume from total volume of investment;

$$\text{Trading Imbalance}_{i,t} = \frac{\text{Buy volume}_{i,t} - \text{Sell volume}_{i,t}}{\text{Buy volume}_{i,t} + \text{Sell volume}_{i,t}} \dots\dots\dots(4.3.1)$$

From the table shows that once BSI index publicly announcement, there are two investor types respond during few days after the announcement. For the positive change in BSI, it influences retail investors to execute the orders “Buying” in the market investing with the positive net trading of 1.33%, and maximum purchase is 29% from total net trading for retail investors. The table shows a 95% significant level at 0.0226 which is less than 0.05. Retail investors perceive that the economic will be getting better in the future and that is why they assure to inject money into stock market. Because most retail investors are not professional analyses. They are constantly attacked by the waves of economic reports, broker consensus, news, and rumors. Once BSI announce with a positive change, they respond directly. For instance, the economic tends to improve during October 2002 – March 2003 due to the positive BSI & diffusion index above the benchmark as Table 4.3.4 below. Retail investors see the consecutive improvement showing with the increased in most business performance, more production per unit produce, increase the number of employment, and more investment. The positive of the real economic index might raise investors’ expectations toward future growth and also help to increase the asset price. In the same time, Foreigner, Institutions, and Proprietary investors are in the status of selling side for the positive signal of changing, and during the same stage with retail investors where are in the buying side. It could be the reason that the grater of BSI index changing than their expectations and forecasts might lead to a more restrictive of

monetary policy in the nearly future and somehow dump the share price in the market. Bank of Thailand might take an action to stabilize the economy when any real macroeconomics indicators rise above the nature rate. This can be done by adjust the interest rate (Bank of Thailand, 2002).

TABLE 4.3.1: Reaction to Separate Investor Types

This table examine the net trading balances from each investor type trading in SET market. Net trading balance is retrieved from total volume buy & sell of four different investor categories trading in SET market.

The calculation method is from : $(\text{Total buy volume} - \text{Total sell volume}) \div (\text{Total buy volume} + \text{Total sell volume})$

The data is collected from period 04/01/2000 up to 06/02/2014. So, this statistic table below shows a significant data in 99% & 95% level of confident.

Investor Types	BSI	Event Study	Obs	Mean	Minimum	Maximum	P-value
	changing signal			Trading Balance	Trading Balance	Trading Balance	
Local Individuals (Retail Investor)	Positive Signal	EVE	70	-0.08%	-10.49%	18.39%	0.8914
		POS	70	1.33%	-7.04%	28.97%	0.0226 **
		PRE	70	-0.21%	-14.02%	13.27%	0.7303
	Negative Signal	EVE	64	0.84%	-11.16%	20.69%	0.2495
		POS	64	1.20%	-22.06%	8.72%	0.0393 **
		PRE	64	1.17%	-10.03%	20.20%	0.1091
Foreign Investors	Positive Signal	EVE	70	0.97%	-125.91%	78.84%	0.8405
		POS	70	-5.86%	-125.62%	68.48%	0.0974
		PRE	70	2.96%	-99.25%	96.98%	0.4905
	Negative Signal	EVE	64	-4.76%	-175.83%	65.98%	0.3854
		POS	64	-10.94%	-81.74%	75.72%	0.0034 ***
		PRE	64	-7.82%	-97.83%	60.31%	0.0916
Local Institutions	Positive Signal	EVE	70	-4.53%	-143.21%	149.82%	0.5733
		POS	70	-9.95%	-103.69%	96.79%	0.0801
		PRE	70	-7.13%	-134.50%	96.84%	0.2157
	Negative Signal	EVE	64	-2.98%	-142.87%	156.07%	0.7172
		POS	64	-5.80%	-106.98%	119.05%	0.3517
		PRE	64	-1.75%	-119.55%	115.27%	0.7551
Proprietary Trading	Positive Signal	EVE	70	2.00%	-118.75%	82.25%	0.5918
		POS	70	-3.64%	-144.01%	34.25%	0.1804
		PRE	70	-1.28%	-66.23%	44.47%	0.5650
	Negative Signal	EVE	64	-3.70%	-137.75%	80.34%	0.4351
		POS	64	-0.58%	-65.36%	52.75%	0.8108
		PRE	64	-0.96%	-55.87%	61.28%	0.7032

Table 4.3.2 : Showing a significant level at 95% confident of a positive change in BSI index

BSI changing signal	Event Study	Investor Types	Obs	Mean Trading Balance	Minimum Trading Balance	Maximum Trading Balance	P-value
Positive Signal	POS	Local Individuals	70	1.33%	-7%	29%	0.0226 **

Table 4.3.3 : Showing a significant level at 99% & 95% confident of a negative change in BSI index

BSI changing signal	Event Study	Investor Types	Obs	Mean Trading Balance	Minimum Trading Balance	Maximum Trading Balance	P-value
Negative Signal	POS	Foreign Investors	64	-10.94%	-82%	76%	0.0034 ***
	POS	Local Individuals	64	1.20%	-22%	9%	0.0393 **

Table 4.3.4 : Sample of actual BSI index from particular months

Month/Year	31/10/2002	29/11/2002	27/12/2002	31/01/2003	28/02/2003	31/03/2003
Actual BSI Index	51.5	51.0	50.2	51.6	50.3	51.8
+/- from Benchmark	1.5	1.0	0.2	1.6	0.3	1.8
(where Benchmark =50.0)						
Expected BSI	55.8	56.5	56.9	55.4	54.7	50.3
Performance	56.5	58.1	56.5	58.4	56.1	58.2
Production	55.5	51.6	50.6	55.5	52.7	58.2
Employment	52.1	53.4	52.0	54.2	53.9	52.9
Investment	52.7	54.7	54.4	55.8	55.3	55.9

Unlike positive changing signal, there are two investor types who react to the negative announcement in the same time but different actions which are Retail investors and Foreign investors showing in Table 4.3.3. Foreign investors are more likely to get the impact from negative changes in BSI index on a few days after the announcement date. The negative change signal influences foreign investors to execute the orders “Selling” in the market. There is a big number from selling side. The mean selling volume is 10.9% from total net trading with maximum selling of 76%. It is a significant at 99% level because of P-value is 0.0034 much less than 0.01. Its transaction is an opposite direction with retail investor. On the other side, Retail investors are the only type who tend to buy assets in the market even it declares negative changes. Reversely, a transaction is different from other type of investors as well. Foreign, Institution, and Proprietary investors are selling assets during this time. The buying from Retails is only 1.20% with maximum buying of 9% from the net trading balance. It is a significant at 95% level with P-value of 0.0393 less than 0.05. In the Foreign Investors’ perspectives, it can be stated that the negative sign shows a slow growth of economy, and unimproved of the overall business. Due to many crisis happening during the past ten years, Thai economic was in unhealthy condition such as Thai political crisis during 2008-2010 or flooding during 2011-2012. This act

created Foreigners withdrawn their money from the economic. Also, this could lead to the liquidity problem. They observe a tighter of the monetary policy from BOT and directly impacts to the investors, who are the market participants, react to stock market in the future. Once BOT comes up with the solution of increasing interest rate, stock prices might drop. This is as such an intrinsic perspective from Foreign investors. For a Retail investors, they react to both positive and negative changes in BSI index due to a reason that BSI index is a 3 months indicator. It provides the index of a short term period from companies. So, Retail investors still have confident to invest.

4.4 Impact to Market Return from Investor Types' Net Trading Imbalance

From previous table, the paper study investors' investment behaviors during the announcement days. The results are Retail and foreign investors respond to the announcements. Unfortunately, Table 5 is a study of the impact to the market return from a net trading imbalance from each investor during POS event days (+2, +3), and run regression through monthly market conditions as dummy variables by computing the differences between closing index by the end of each month with beginning closing index by the beginning of each month (where 0 represent "Bull" market condition and 1 represent "Bear" market condition). This paper makes a correlation analysis by SAS program. The stated hypothesis testing is to prove that there is a significant linear relationship between the market return ("ret" – as a dependent Y variable) with independent X variables (Change in BSI index, four different investor types, and market conditions as dummy) and the slope will not equal to zero. The null hypothesis is that a slope is equal to zero.

Hypothesis:

$$H_0: \beta_1 = 0;$$

$$H_1: \beta_1 \neq 0$$

.....(4.4.1)

To run regression for analysis, data is divided into positive and negative change in BSI index in order to see the real relationship. You can see that Table 5 of positive change in BSI index shows a significant effect of some independent variables

on market return with F test is 3.70 and F value is 0.0020 less than 0.05 prob. The null hypothesis is rejected with extremely high 99% level of confident where stated that there is a relationship. The table shows 127 observations with 121 is the error degree of freedom. It can be concluded that a net trading from proprietary investors has an impact to market return because it is significant at 99% level of confident at proprietary trading investors, and has a positive beta of 0.0049.

R-square of 0.1431 indicates there is a correlation coefficient between X and Y variables. It shows a good fit of the model. Then I look at adjusted R-square where is equal 0.1044 which can be referred that there is only 10.44% of the variation in market return is explained by the variation in proprietary trading investors. Finally, overall F-test for a significant model shows that the alternative hypothesis is accept and at least one X variable can explain Y variable. The interpretation is that the positive change in BSI index has a better relationship with the market return compare to negative sign change. This regression can be written as equation below;

$$\begin{aligned} \text{Market return} = & 0.0049 - 0.0009 (\text{BSI Positive Chang}) - 0.0969 (\text{Retail investors}) + \\ & 0.0171 (\text{Foreign investors}) + 0.0083 (\text{Local Institutions}) + 0.0296 \\ & (\text{Proprietary Trading}) - 0.0027 (\text{Dummy variables}) \\ & \dots\dots\dots(4.4.2) \end{aligned}$$

Where X_1 is a changing in BSI index between actual months with previous month

X_2 is a net trading imbalance from retail investors

X_3 is a net trading imbalance from foreign investors

X_4 is a net trading imbalance from institution investors

X_5 is a net trading imbalance from proprietary trading investors

X_6 is a dummy variable of a market condition (where 0 shows Bear market and

1 shows Bull market)

TABLE 4.4: Regression Between Market Return

Table 5 shows a multiple linear regression analysis for the impact on the trading balance from four different types of investors to the return on the market. The return is a normal return calculated from daily close index from Stock Exchange of Thailand. The regression will run only the return on the POS event (-1, 0, +1) on announcement date. The regression will be divided into positive & negative change in BSI index. The model equation is:

$$R_m = \alpha_0 + \alpha_1 \text{Chg_BSI}_{t-1} + \alpha_2 \text{RetailNT}_i + \alpha_3 \text{ForeignNT}_i + \alpha_4 \text{InstitutionsNT}_i + \alpha_5 \text{ProprietaryNT}_i + \alpha_6 \text{Dummy} + \varepsilon_i$$

where BSI_{t-1} is an actual BSI index different from previous index.

RetailNT is a net trading imbalance from Local Individual during POS events

ForeignNT is a net trading imbalance from Foreign Investors during POS events

InstitutionsNT is a net trading imbalance from Local Institutions during POS events

ProprietaryNT is a net trading imbalance from Proprietary Trading during POS events

Dummy is a market condition where 0 represent "Bear" market condition and 1 represent "Bull" market

Dummy is a market condition where 0 represent Bear market condition and 1 represent Bull market						
Variables	Expected Sign	Coefficient	Std. Error	t-Statistic	Prob.	
Positive Change in BSI Index						
Intercept		0.0049	0.0031	1.57	0.1191	
BSI Positive Change	-	-0.0009	0.0010	-0.99	0.3233	
Local Individual (Retail)	-	-0.0969	0.1035	-0.94	0.3511	
Foreign Investors	+	0.0171	0.0175	0.98	0.3300	
Local Institutions	+	0.0083	0.0061	1.36	0.1752	
Proprietary Trading	+	0.0296	0.0106	2.79	0.0060	***
Dummy variables	-	0.0027	0.0034	-0.81	0.4218	
R-squared	0.1431	F-Statistic			3.70	
Adjusted R-squared	0.1044	Prob (F-Statistic)			0.0020	
Negative Change in BSI Index						
Intercept		0.0038	0.0029	1.31	0.1922	
BSI Negative Change	+	0.0004	0.0007	0.52	0.6041	
Local Individual (Retail)	-	0.0888	0.0983	-0.90	0.3687	
Foreign Investors	-	0.0137	0.0167	-0.82	0.4131	
Local Institutions	+	0.0024	0.0068	0.35	0.7292	
Proprietary Trading	+	0.0326	0.0116	2.82	0.0056	***
Dummy variables	-	0.0032	0.0033	-0.97	0.3318	
R-squared	0.0917	F-Statistic			2.04	
Adjusted R-squared	0.0466	Prob (F-Statistic)			0.0660	

The reason proprietary trading investors show significant is that they mainly focus on return rather than commission for clients. This group has special qualifications. They understand the market very well. Mostly are working with banks or financial institutions which are the reason that they must be able to foresee the market in every condition. Clients control and provide a strict policy with terms and conditions for them to follow which make most proprietary traders have an ability to

control risk and cut loss. Another good reason is that normally the trading fee for this type of investors is cheaper than regular investors due to a reason that they provide liquidity to the market and it is a part of their jobs. Besides, they purchase and sell stocks in a very big volume compared to regular investors due to a usage of computer algorithms for trading stocks, or so-called “High Frequency Trading (HFT)”. It provides them to trade in a very big volume (Richard Finger, 2013).



CHAPTER V

CONCLUSION

A positive announcement of BSI index shows a significant return on event day which the periods are include one day before and after the announcement with a positive mean return of 0.51%. Also, the positive change in BSI index has sent a signal with some sectors respond with a positive return as you can see in Table 3. For instance, Property & Constructions sector generate positive mean return of 1.63% around event days. Moreover, Retail investors and foreign investors get an impact to the changing signal of BSI index both positive and negative signals. Last the regression analysis showing the relationship between the market return with independent variables. The table shows that Proprietary Trading investors are significant and has a positive correlation to the stock market a few days of announcement of BSI index.

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