THE STOCK PRICES ADJUSTMENT TO MACROECONOMIC INFORMATION: EVIDENCE FROM THE STOCK EXCHANGE OF THAILAND

BY

MISS ROONGNAPHA SAENGCHAN

ANINDEPENDENT STUDYSUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE PROGRAM IN FINANCE (INTERNATIONAL PROGRAM) FACULTY OF COMMERCE AND ACCOUNTANCY THAMMASAT UNIVERSITY ACADEMIC YEAR 2015

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THAMMASAT UNIVERSITY

FACULTY OF COMMERCE AND ACCOUNTANCY

INDEPENDENT STUDY

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ENTITLED

THE STOCK PRICES ADJUSTMENT TO MACROECONOMIC INFORMATION: EVIDENCE FROM THE STOCK EXCHANGE OF THAILAND

was approved as partial fulfillment of the requirements for

the degree of Master of Science (Finance)

on 01 SEP 2015

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Independent Study Title	THE STOCK PRICES ADJUSTMENT TO MACROECONOMIC INFORMATION: EVIDENCE FROM THE STOCK EXCHANGE OF THAILAND
Author	MissRoongnaphaSaengchan
Degree	Master of Science (Finance)
Major Field/Faculty/University	Master of Science Program in Finance (International Program) Faculty of Commerce and Accountancy Thammasat University
Independent Study Advisor	Associate Professor TatreJantarakolic, Ph.D.
Academic Years	2015

ABSTRACT

This study focuses on investigating how the macroeconomic variables affect the stock prices adjustment. The objective of this study is to reveal the relationship between the stock prices adjustment and macroeconomic variables of the Stock Exchange of Thailand (SET) by employing Vector Autoregressive Model and Impulse Response Function. The fundamental variables such as interest rate, inflation rate, exchange rate and economic growth have been used as proxies for exploring the test. According to the research, it becomes clear that interest rate and the inflation have an inverse relationship with the stock price, while the exchange rate and economic growth have a positive relationship with the stock price. By showing the relationship between macroeconomic factors and stock prices, this research highlights the impact of stock prices adjustment on the macroeconomic fluctuation to provide a better understanding of the capital market to the investors.

Keywords:Macroeconomic variables, Stock prices, Vector Autoregressive

ACKNOWLEDGEMENTS

It is my very pleasure to thank many persons who made this research possible. First of all, I would like to express my sincere thanks to Associate Professor Tatre Jantarakolica, Ph.D. Without his valuable suggestions and comments, this paper could have been incapable to derive appropriate analysis. Moreover, I would like to thank Associate Professor Seksak Jumreornvong, Ph.D. for a very useful recommendation.

Furthermore, I am greatly indebted to my boss and colleagues at the Dharmniti Auditing Co.,Ltd.,especially Mr. Pichai Dachanapirom, Miss.Usa Choochinprakarn and Mr. Thanawut Piboonsawat whose always helping and giving me very warm support.

In addition, I would like to show gratitude for all MIF officefacilitatorsfor kindly assistance in many difference ways.

Any mistakes or error in this research paper are my responsibility alone.

Miss Roongnapha Saengchan

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CHAPTER 1
INTRODUCTION

Over the past few decades, there are many researches that studied about price adjustment of underlying assets to information changes. Most of those studies indicated that the prices are significantly affected by varied information, such as good news, bad news, earnings announcement, etc. Regarding stock market efficiency, there are some papers also studied the responses of stock prices to new information, especially macroeconomic variables, such as interest rate, inflation rate, exchange rate and determinants of stock prices (Cheung and Ng, 1998).

Macroeconomic data potentially determined stock market behavior because the data normally reflected current economic situation and also affect to economic outlook which finally has impacts on investors' expectation over listed companies' performances. In other words, macroeconomic variables are significant data that investors use for estimating and analyzing future stock market performances, and conducting their investment strategies.

The Stock Exchange of Thailand was established in 1975. Throughout 40 years, the stock market has been continuously developed along with the development of the economy, especially in term of trade and liberalization. Since early 1990s, Thai economy had attracted massive volumes of capital inflow from aboard due to its accommodating economic policies, goal, and healthy-looking conditions. At that time, Thailand enjoyed with the high economic growth around 7% to 8% a year. Unfortunately, starting from the year 1995,Thailand's economic growth became much slow down due to a number of factors, such as the contraction in the real estate sector, the emergence of China as an intimidating competitor in international trade, the fall of world demand of semiconductor which was one of the Thai major exports in 1996, and an appreciation of the dollars after Spring 1995. In 1997, the Tom Yum Kung crisis emerged and the growth of Thai economy was slumped, decreased 2.8% and 7.6%, year over year, in 1997 and 1998 respectively. After that, Thailand also confronted with other crises, the subprime crisis in 2008 - 2009, the big flood in 2011, and the euro zone crisis started in 2013. These crises did not undermine the stock market of Thailand but, conversely, it helped to improve the market efficiency. In

other words, the market is more efficient in growth phases in comparison to their preceding decline during the crisis as indicated in the figure1.1.

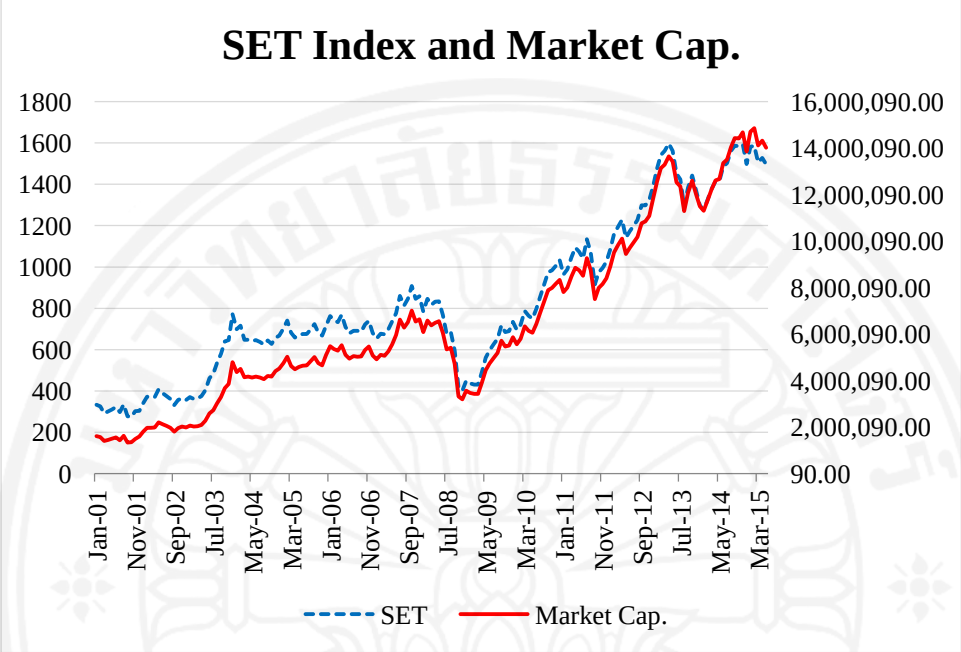

Figure 1.1: The Relationship between SET Index and Market Capitalization

This was confirmed by the study of Kim and Abdul (2008)who also found that the Asian crisis to be insignificant in terms of market efficiency for most East Asian countries; the exceptions were Singapore and Thailand, which achieved efficiency after the crisis. Nowadays the Stock Exchange of Thailand has trading volume around Baht 39 billion. In sum, Thai stock market is an efficiency market because the accommodative regulation, liberalization, and good economic stability. Moreover, numbers of investors, both domestic and foreign, have been continuously increasing. Thus, it is worth to study the factors that effect on the movement of Thai stock market.

As per mention earlier, macroeconomic factors have an important role on the stock market. Choosing some of the fundamental variables and plotting graphs to see the relationship between them could be illustrated in the figures 1.2-1.7.

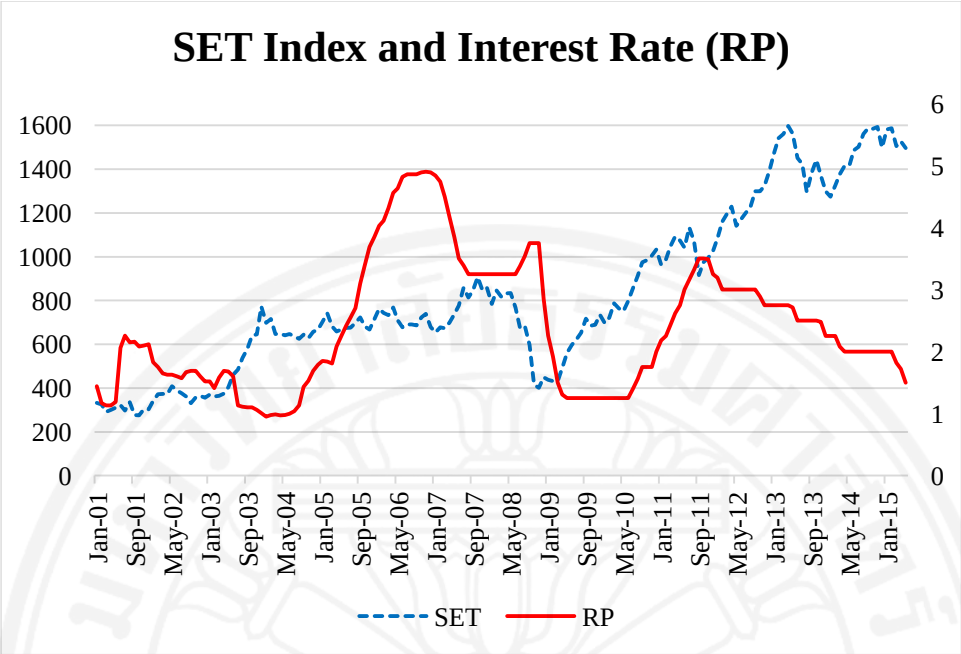

Figure 1.2: The Relationship between SET Index and Interest Rate

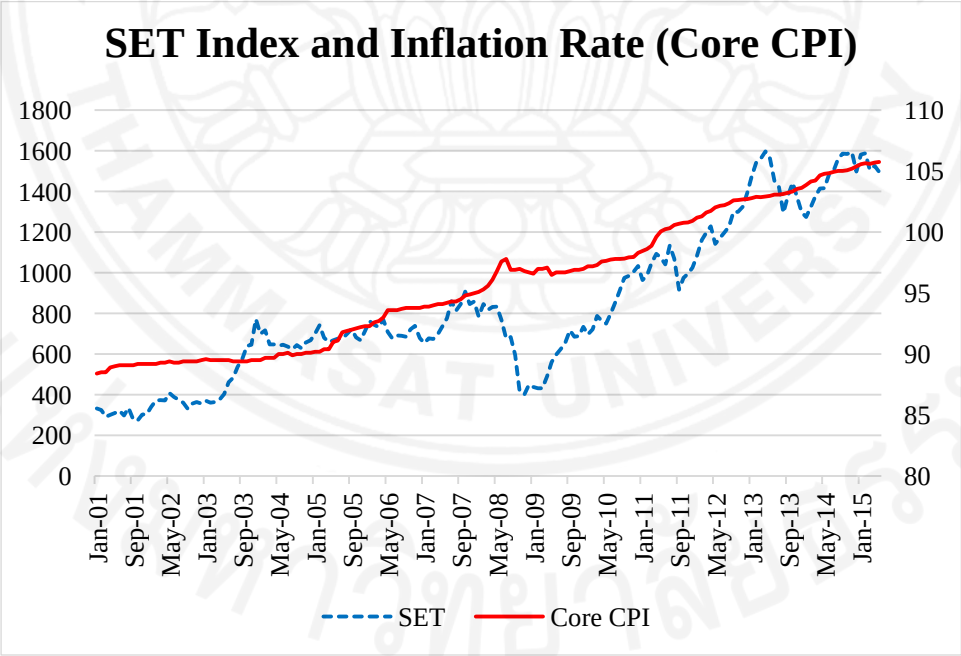

Figure 1.3: The Relationship between SET Index and Inflation Rate

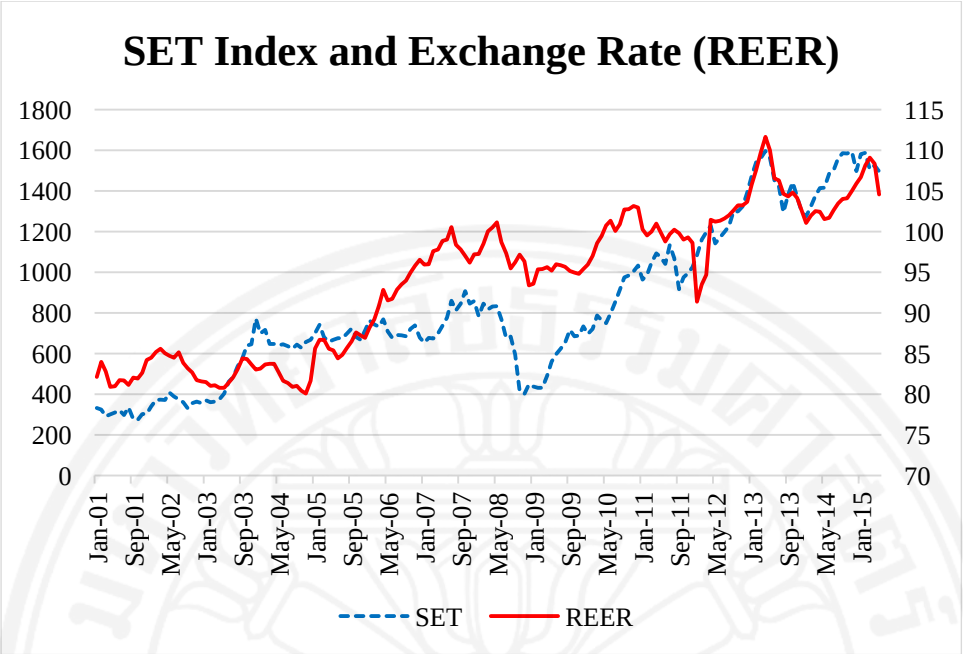

Figure 1.4: The Relationship between SET Index and Exchange Rate

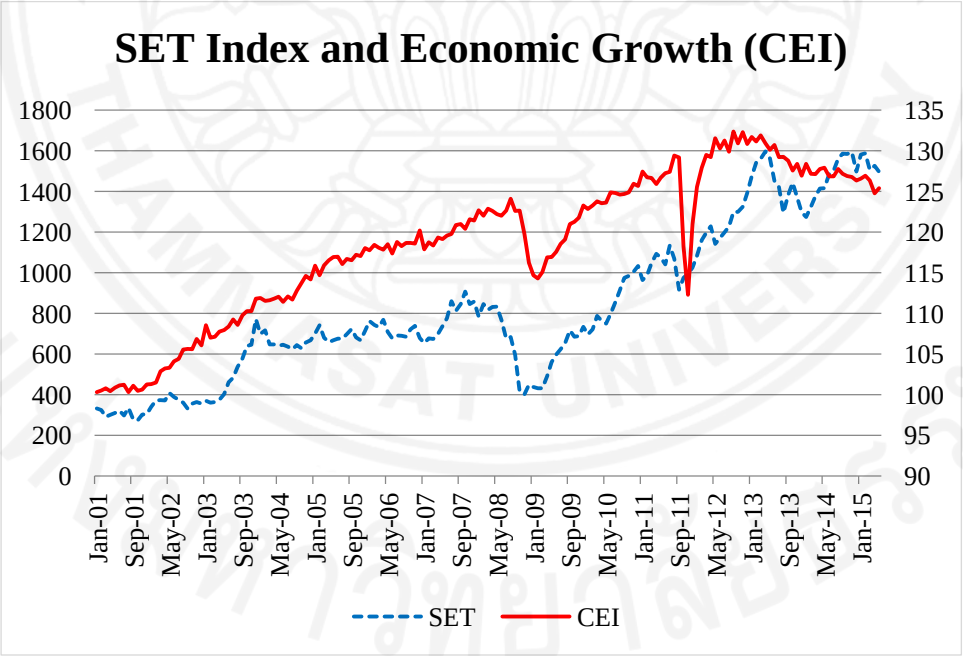

Figure 1.5: The Relationship between SET Index and Economic Growth

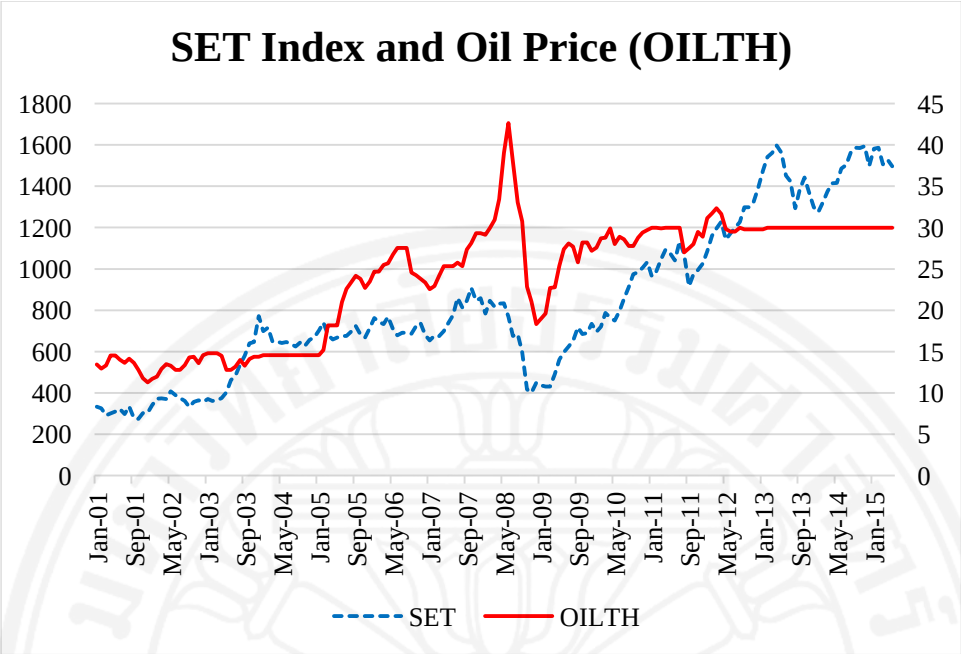

Figure 1.6: The Relationship between SET Index and Oil Price

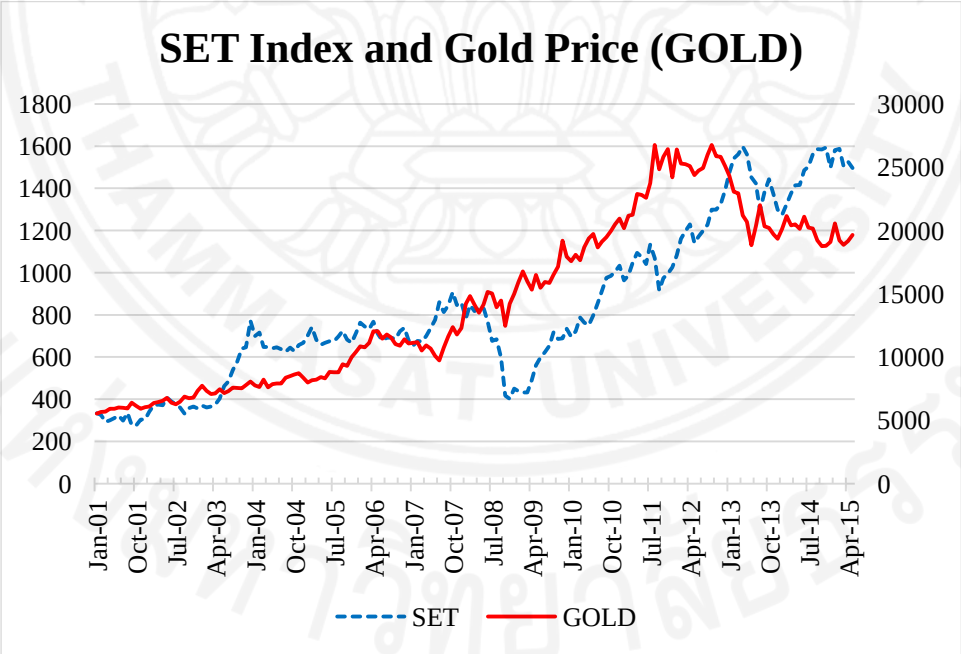

Figure 1.7: The Relationship between SET Index and Gold Price

The graphs in Figure 1.2-1.7 present the patterns or trends over time. The series rate in the same way for economic growth. On the other hand, interest rate, inflation, exchange rate and gold price do not move in the same way. When one variable goes up, another one falls down, however, the oil price has both coincidental and inverse relationship.

Many researchers discussed about the relationship between stock prices and macroeconomic variables that affect the stock prices when the policy is applied. Thus, macroeconomic factors and stock prices are obviously related to each other.

The objectives of this research are (i) to determine impacts of macroeconomic variables on the stock market, (ii)to reveal the relationship between stock price adjustment and macroeconomic variables, and (iii) to study whether the stock prices adjustment relates to the macroeconomic information. This research attempts to support the objective by questioning how they respond to the stock market.

The contribution of this research is to provide a better understanding to the investors about the in-depth stock market movement and stock market activities in responding to the macroeconomic fluctuation.

CHAPTER 2
REVIEW OF LITERATURE

A lot of research focused on firm level when considering about the price adjustment. For instance, Brennan, Jegadeesh and Swaminathan (1993) tested that common information and the number of investment analysis associated with price adjustment by using granger causality. The authors found that a large number of analysts have high price adjustment on information flow. Jennings & Starks (1985) studied that the different level of informativeness exist the differential stock price adjustment, which has high information content associated with the price adjustment process and low information content associated with less price adjustment process by using PW statistical test. The authors found that firms have faster speed of adjustment on high information content based on better earnings per share announcement. Frimpong (2011) examined the speed of adjustment of stock prices to macroeconomic information of the Ghana Stock Exchange by using granger causality. The authors found that exchange rate is the slowest and reflects on foreign investors' behavior.

There are many macroeconomic variables which can stimulate the economy from announcement of the government or the related departments. However, major announcements, such as exchange rate, interest rate, inflation, gold price and oil price or outputcapture the market performance of Thailand.

2.1 Interest Rate

Interest rate is an important factor when making business decision because when interest rate rises, in firm level, it has an impact on the cost of operation which will decrease the net profit and the stock price. But, when interest rate falls, the net profit and the stock price will increase.In another dimension, if the investors borrow money to invest in securities and when interest rate rises, the finance cost will increase then purchasing demand in the securities acquisition will decrease, which means investors will be looking for the less risky securities such as bonds or fixed deposit instead. Hence, the stock price will decrease and vice versa. Uddin and Alam (2009) examined the relationship between interest rate and stock price from 15 developed and developing countries, namely Australia, Bangladesh, Canada, Chile,

Colombia, Germany, Italy, Jamaica, Japan, Malaysia, Mexico, Philippines, South Africa, Spain and Venezuela by applying the two-way fixed effect model. The result revealed that it has significant negative interest rate to stock price.

2.2 Inflation Rate

In the business world, inflation has direct impact on the cash flow of the business. Because when inflation rises, it will cause the factors of production to be higher so the net profit will decrease. As a result, the stock price will also fall. On the other hand, when money has inflated, it would affect the cash flow of dividend payment. That is inflation will cause firm level to spend more money, then cash flow will be utilized more in the operation and net cash flow will decrease. Dividend is one of the firm price drivers. It is a benchmark for investors who are looking to find securities to invest. If net cash flow is reduced, dividend payment will decrease in the same way. Therefore, the cash flow of the stock price will decrease. Schwert (1981) tried to find the relationship between stock prices and unexpected inflation in the Consumer Price Index (CPI). Unexpected inflation is estimated by the first-order moving average process and it is found to react negatively.

2.3 Exchange Rate

In 1997, Thailand has adopted the managed-float exchange rate regime, of which the value of the Baht is determined by the market forces. The Bank of Thailand would intervene in the market only when necessary, in order to prevent excessive volatilities and achieve economic policy targets. The floating regime enhances flexibility and efficiency in monetary policy implementation and increases confidence of domestic and international investors. Thailand's economy counted on international trades, export and import. The appreciation or depreciation of exchange rate will directly affect the performance of export-import companies which, in turn, can affect the stock prices. When Thai Baht appreciates, the purchasing of goods and services from overseas will be spent more than Thai Baht depreciation, which means the cost of operation will be higher. The stock price will reduce from the decreasing net profit of the firm. On the other hand, when Thai Baht depreciates the purchasing of goods and services from overseas will be spent less, which means the cost of operation will

decrease. The stock price will increase from the increasing net profit of the firm. Dimitrova (2005) studied the relationship between exchange rate and stock price, it is suggested that the stock market can be affected by the exchange rate in several ways. Firstly, depreciated currency causes the decline in stock prices because the depreciation of the nominal exchange rate creates expectation of inflation in the future. Secondly, foreign investors are not willing to hold their assets in the depreciated currency which is not good for their return. Thirdly, the effect of exchange rate depends more on its import or export transactions. The importers suffer from the higher cost of operation which is affected by the depreciated currencies. The two stage least square is employed and the result showed that the depreciated currency had depressed the stock market. Also, Rjoub (2011) investigation of stock prices and exchange rates was focused on stock price and exchange rate causality in both of developed country (US market) and developing country (Turkey stock market). VAR was applied and the result showed that the exchange rate and US stock price had a negative impact while the exchange rate and Turkey stock price had a positive impact.

2.4 Economic Growth

Economic growth is an important index to point out the performance of the country. Therefore, it is not surprising why it has a positive effect on the stock price. Arestis, Demertriades and Luintel (2001) studied the financial development and economic growth on the role of the stock market with VAR model. The variables used were real GDP, stock market capitalization ratio, ratio of domestic bank credit to nominal, eight-quarter moving standard deviation of the end-of-quarter change of stock market prices stand for output, stock market development, banking system development and market volatility, respectively, of Germany, US, UK, France and Japan. The results showed that both the stock market and bank have strong impact on output growth in France, Germany and Japan. While in US and UK, the reaction is quite weak. The stock market volatility has negative reaction to output in Japan and France and UK also has very negative direction to financial development and output. However, it has insignificant stock market volatility in Germany.

2.5 Oil price

Oil price is also an important factor when making business decision. Because when oil price rises, in firm level, it has an impact on the cost of transportation which will decrease the net profit and make the stock price lower. But when oil price decreases, the net profit will increase and it will make the stock price higher. Maghyereh (2004) examined the oil price shocks and emerging stock market which consists of 22 countries, namely Argentina, Brazil, Chile, China, Czech Republic, Egypt, Greece, India, Indonesia, Jordan, Korea, Malaysia, Mexico, Morocco, Hungary, Pakistan, Philippines, Poland, South Africa, Taiwan, Thailand, and Turkey. VAR model was carried out to determine its relationship. The results suggested that the stock market return of the emerging country showed insignificant impact on crude oil price changes.Kilian and Park (2007) investigated the impact of oil shocks on US stock market using VAR model. The results showed that the response on stock return might differ. The direction will be negative when it causes oil demand shocks, while oil supply shock has no significant impact on the return. Adaramola (2012) studied oil price shocks and stock market behavior of Nigeria market by using Johansen cointegration and error correction mechanism method. The result suggested that oil price was very significant shock on the stock price both for the long-run and short-run. In the short-run, oil price showeda positive effect on stock price, which exhibited the oil producing country while oil price showeda negative effect on stock price in the long-run to present the oil importing countries and positive shocks for global demand on industrial commodities.

2.6 Gold price

Gold is a kind of precious metal which its value is quite constant or increases over time.

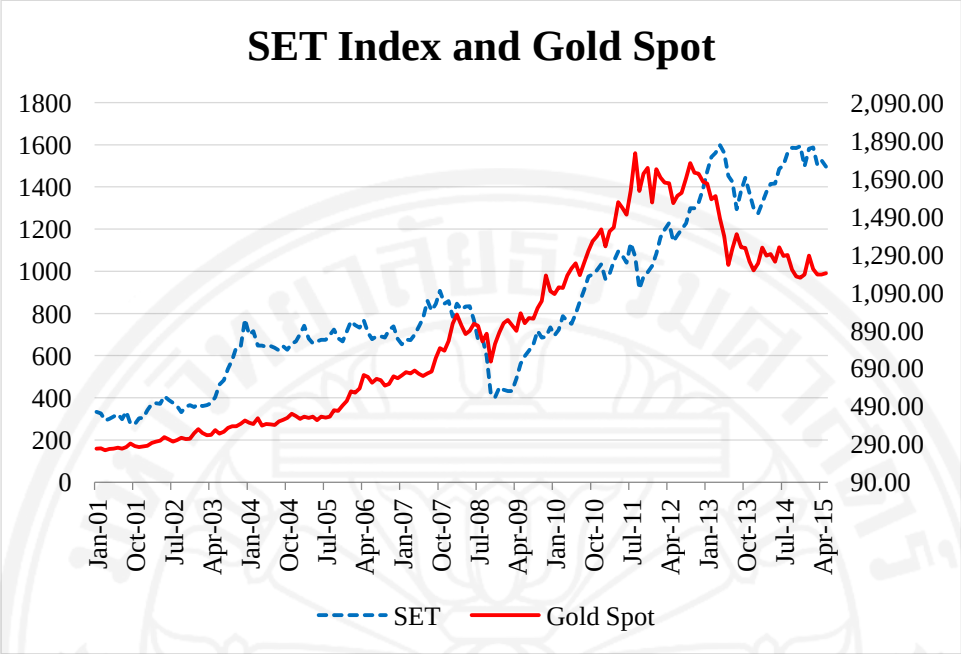

Figure 2.1: Time Trend between SET Index and Gold Spot

The trends of gold and stock price are presented in the figure 2.1. After Asian financial crisis in the past, gold and stock price move along together in upturn. When they were in downturn because of the crisis, the declining rate of gold was still lower than the declining rate of the stock price. Later, the stock price has obviously moved opposite to the direction of the gold price because the gold value has not depreciated although the inflation occurs. Smith (2001) tried to find the relationship between the returns on gold and US stock price indices by using Johansen's cointegration test, Vector Auto Regressive and VECM. The result showed that it has negative direction. Also, Yahyazadehfar and Babaie (2012) investigated gold price and house price versus stock price in Tehran Securities Market by using Juseliuscointegration method and found that there was a negative relationship between gold price and stock price, but there was a positive relationship between housing and stock price.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Data Selection

Since this study focuses on the macroeconomic information; therefore, the selected data are stock price index, interest rate, exchange rate, inflation rate, and economic growth which are used for finding the relation between the stock price index, Stock Exchange of Thailand Index (SET) and macroeconomic variables.

The interest rate is a significant factor which reflects the efficiency of the Bank of Thailand's policy (Saengsrisin, 2011). The selected interest rates for using as a proxy are interbank rate, policy interest rate and repurchase rate. Interbank rate is a short-term interest rate for loan in the money market which is used to adjust the liquidity of commercial bank. Policy interest rate is not only a tool of the central bank which is used as a reference rate within the country, but it is also a signal of money policy. In practice, the Monetary Policy Committee, a department that monitors the economic situation, uses 1-day repurchase rate as a proxy for the interest rate of Thailand.

There are many different interesting exchange rates, such as USD which is the major currency for trading worldwide and it is one of the base currencies of foreign exchange reserves. Secondly, Nominal Effective Exchange Rate (NEER) is the weighted average of the exchange rate which could be determined by the proportion of trade between Thailand and major trade partners. However, Real Effective Exchange Rate (REER) is chosen in this research because apart from NEER, the REER is also adjusted with the inflation effect. It is a good proxy to determine the relationship between an individual value of a country's currency and the other major currencies.

Consumer Price Index (CPI) represents the inflation rate because it is the measurement of the changes in price level of consumer goods and services. There are two types of CPI: the first one is Headline CPI and another one is Core CPI. Headline CPI is an index for all movement of goods and service while Core CPI (CPICORE) excludes energy and food product. Hence, Core CPI is chosen for this study to avoid the price fluctuation.

Economic growth defines the increase of production and consumption goods and services which Gross Domestic Product (GDP) is normally used as an indicator to determine the economic growth. In fact, the monthly GDP is not available in Thailand and another factor Manufacturing Production Index (MPI) is generally used instead of the GDP. Unfortunately, it is focusing more on the manufacturing scheme. Hence, Coincident Economic Indicator (CEI) is employed to be a proxy for economic growth. This indicator is computed from the series of data that move with the overall economic activity. If this index rises, it means the economic activity has expanded whereas the economic activity is contracted if the index falls.

The relation among variables could be captured by using the monthly data of each variable from January 2001 - May 2015. In addition, dummy variables are also included to explain the recession period since there were crises that affected Thailand's economy, which are Subprime crisis, the big flood in Thailand and Eurozone crisis. Dummy variables are taken during December 2007 - June 2009, July 2011 - January 2012 and October 2009 - May 2015, respectively.

3.2 The Model

This research follows Frimpong (2011); therefore, Vector Autoregressive (VAR) is used for studying the dynamic relationship. Each variable does not only reciprocate each other, but also the time lag of themselves. There are 5 steps of testing.

3.2.1 Unit Root Test

3.2.2 Find the Optimal Lag

3.2.3 Stability Test and Granger Causality Test

3.2.4 Impulse Response Function

3.2.1 Unit Root Test

Unit root test is used for looking into the stationary of variables to avoid spurious problem because of time trend movement by using Augmented Dicky Fuller (ADF).

$$y_t = \alpha + \rho y_{t-1} + \delta t + u_t \quad (1)$$

Where $y_t =$ Variables to be tested

$\delta t =$ Time trend

$u_t =$ Disturbance term

The stationary presents consistency of the mean and variance. All variables are needed in order to be checked whether they are stationary. And if non-stationary still occurs, the variables must be adjusted as first difference or higher order until they become stationary.

3.2.2 The optimal lag

The optimal lag can be determined by the following equation

$$AIC = -2(\tfrac{LL}{T}) + \tfrac{2t_p}{T} \quad (2)$$

$$SBIC = -2(\tfrac{LL}{T}) + \tfrac{In(T)t_p}{T} \quad (3)$$

$$HQIC = -2(\tfrac{LL}{T}) + \tfrac{2In\{(T)\}t_p}{T} \quad (4)$$

Where $t_p =$ The total number of parameters

$LL =$ Log likelihood

Since the calculation is based on time series data, lagged variables have significant role play to time series because lagged variables affect the other variables. However, the appropriate lag is determined by the lowest value which basically is the goodness of fit of the model.

3.2.3 Stability Test and Granger Causality Test

Because it is a dynamic relation, after VAR parameters estimation the stability condition has to be checked that all eigenvalues lie inside the unit circle to satisfy the result of VAR from the following matrix.

$$\begin{pmatrix} A_1 & A_2 & \cdots & A_p \\ I & 0 & \cdots & 0 \\ 0 & I & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & 0 \end{pmatrix} \quad (5)$$

VAR will be stable when each eigenvalue of A is strictly less than 1.

After VAR stability has been satisfied, it must be checked whether one variable causes each other which could be tested by proving the following hypothesis.

$H_0 =$ X does not cause Y (6)

$H_1 =$ X granger-cause Y (7)

Where X = Macroeconomic variables

Y = SET index

When null hypothesis is rejected, it means the macroeconomic variable affects the SET index.

3.2.4 Impulse Response Function

In economics, impulse response function is used to describe how the economy reacts overtime to exogenous impulses which is called shocks. Moreover, in VAR, it is used to investigate the effect of the shock on one variable to another. Impulse responses indicate the response of current and future values of each variable to one unit increase in the current value of one of the VAR errors. The error returns to zero in subsequent periods. It is implied that changing in one error while holding the other constant makes most sense when the errors are uncorrelated across equations. Therefore, impulse responses make the result clear to understand that how long of the magnitude and the time length could be held.

CHAPTER 4
RESULTS AND DISCUSSION

4.1 Unit Root Test

Since the data is time series, sothe unit root test must be checked before taking the empirical test to consider whether there are bias or spurious problems. ADF (Augmented Dickey Fuller) is applied to test stationary property of the data which the result is shown in the table below**:-**

Table 4.1: Augmented Dickey-Fuller Test for Unit Root; at level

Variable	T-Statistic	P-Value	Result
RP	-1.308	0.6253	Non-stationary
CPICORE	1.441	0.9973	Non-stationary
REER	-1.089	0.7193	Non-stationary
CEI	-1.942	0.3127	Non-stationary
SET	-0.409	0.9086	Non-stationary

The result of the test shows that all variables are non-stationary, therefore, another test is needed; First difference form is used to test the stationary and the result of this test is presented in the table below.

Table 4.2: Augmented Dickey-Fuller Test for Unit Root; first difference

Variable	T-Statistic	P-Value	Result
RP	-9.087	0.0000	Stationary
CPICORE	-10.269	0.0000	Stationary
REER	-10.278	0.0000	Stationary
CEI	-12.017	0.0000	Stationary
SET	-11.862	0.0000	Stationary

4.2 Stability and Granger Causality Test

According toVAR, finding the appropriate lag could be performed by employing the information criteria. The Akaike's information criterion (AIC) suggested 4 lags while Hannan-Quinn information criterion (HQIC) and Baysian information criterion (SBIC) suggested 1 lag. Hence AIC was employed because AIC showed the lowest value.

Stability and Granger Causality Test

Table 4.3: VAR Lag Order Selection

Lag	LL	LR	FPE	AIC	HQIC	SBIC
0	-1306.03		8.85829	16.3707	16.5255	16.7519
1	-1236.41	139.23	5.10926	15.8199	16.1681*	16.6775*
2	-1205.31	62.201	4.74612	15.7446	16.2862	17.0787
3	-1166.89	76.837	4.03470	15.5789	16.3140	17.3895
4	-1135.06	63.658	3.72917*	15.4946*	16.4232	17.7817

After that, all eigenvalues were checked whether they lie on the circle for showing its stability of the test which means VAR model could be used for the test.

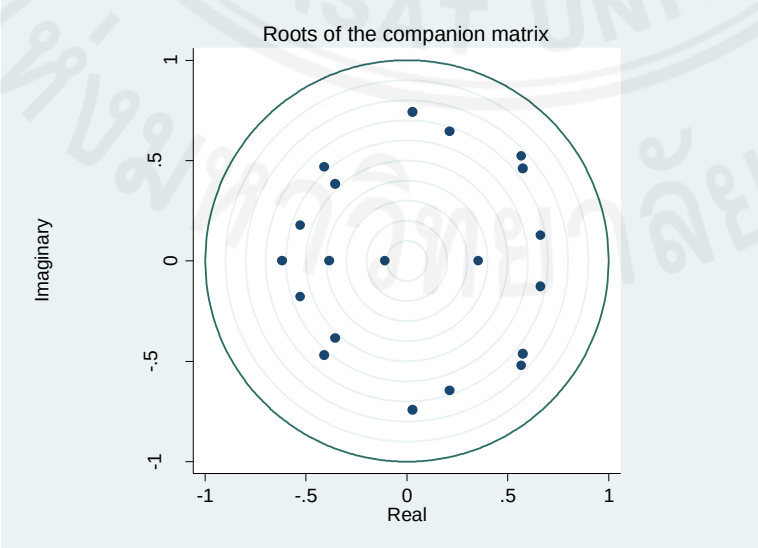

Figure 4.1: VAR Stability Check

Table 4.4: Vector Autoregressive Model

Independent variables	RP	CPICORE	REER	CEI	SET
RP(-1)	5.09***	0.48	-0.52	0.62	-0.89
	(0.000)	(0.633)	(0.601)	(0.538)	(0.375)
RP(-2)	0.90	-0.53	-2.38**	-0.64	0.75
	(0.369)	(0.598)	(0.017)	(0.525)	(0.456)
RP(-3)	1.56	1.26	2.13**	0.21	-1.54
	(0.119)	(0.209)	(0.033)	(0.834)	(0.124)
RP(-4)	-2.42	0.47	0.85	-1.06	-0.36
	(0.116)	(0.637)	(0.397)	(0.287)	(0.721)
CPICORE (-1)	1.57	2.79***	-1.89*	0.91	-1.75*
	(0.116)	(0.005)	(0.058)	(0.365)	(0.081)
CPICORE (-2)	2.43**	1.54	1.12	0.30	2.23**
	(0.015)	(0.124)	(0.264)	(0.767)	(0.026)
CPICORE (-3)	0.49	-1.42	0.51	0.68	-0.22
	(0.625)	(0.154)	(0.613)	(0.495)	(0.829)
CPICORE (-4)	4.95***	0.50	1.28	1.48	-3.18***
	(0.000)	(0.617)	(0.200)	(0.138)	(0.001)
REER (-1)	0.60	1.29	1.04	0.46	-0.80
	(0.548)	(0.198)	(0.299)	(0.646)	(0.421)
REER (-2)	-2.78***	0.28	1.57	-3.24***	0.62
	(0.005)	(0.780)	(0.117)	(0.001)	(0.537)
REER (-3)	-0.53	-1.02	-3.24***	0.59	-0.04
	(0.594)	(0.305)	(0.001)	(0.552)	(0.965)
REER (-4)	1.88*	1.36	-0.07	-1.30	0.13
	(0.060)	(0.173)	(0.946)	(0.193)	(0.899)
CEI (-1)	1.10	-0.11	-1.36	-0.75	0.63
	(0.271)	(0.913)	(0.175)	(0.454)	(0.530)
CEI (-2)	-0.33	1.03	4.05***	-3.58***	0.09
	(0.742)	(0.303)	(0.000)	(0.000)	(0.929)
CEI (-3)	0.09	-0.16	3.99***	-4.13***	0.44
	(0.927)	(0.873)	(0.000)	(0.000)	(0.661)
CEI (-4)	0.08	0.12	0.12	-0.25	-0.87
	(0.936)	(0.906)	(0.908)	(0.800)	(0.386)

Table 4.4: Vector Autoregressive Model

Independent variables	RP	CPICORE	REER	CEI	SET
SET (-1)	-1.08	1.67*	2.16**	3.05***	0.68
	(0.281)	(0.096)	(0.031)	(0.002)	(0.494)
SET (-2)	0.89	0.74	1.75*	4.01***	-0.31
	(0.376)	(0.462)	(0.080)	(0.000)	(0.757)
SET (-3)	2.09**	-0.60	-0.20	0.28	0.64
	(0.037)	(0.547)	(0.839)	(0.776)	(0.521)
SET (-4)	1.10	-0.84	-1.07	1.89*	-1.27
	(0.272)	(0.399)	(0.286)	(0.059)	(0.203)
Flood	-0.75	0.17	-1.27	-1.87*	0.77
	(0.450)	(0.868)	(0.205)	(0.061)	(0.441)
Euro	-2.11**	1.51	0.07	-2.02**	0.70
	(0.034)	(0.131)	(0.946)	(0.043)	(0.483)
C	-1.89*	1.89*	-0.01	1.35	2.45**
	(0.058)	(0.059)	(0.994)	(0.175)	(0.014)

The value in ( ) is probability of T-statistics. While the ***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Granger Causality Test

Table 4.5: Granger Causality Test; Dependent Variable: RP

Excluded	df	Chi-sq	Prob
CPICORE	4	37.784	0.000
REER	4	11.661	0.020
CEI	4	1.4219	0.840
SET	4	7.0808	0.132
ALL	16	66.62	0.000***

Table 4.6: Granger Causality Test; Dependent Variable: CPICORE

Excluded	df	Chi-sq	Prob
RP	4	3.6959	0.449
REER	4	3.3166	0.506
CEI	4	1.1222	0.891
SET	4	4.5011	0.342
ALL	16	14.915	0.531

Table 4.7: Granger Causality Test; Dependent Variable: REER

Excluded	df	Chi-sq	Prob
RP	4	11.294	0.023
CPICORE	4	6.7734	0.148
CEI	4	37.581	0.000
SET	4	9.0836	0.059
ALL	16	62.455	0.000***

Table 4.8: Granger Causality Test; Dependent Variable: CEI

Excluded	df	Chi-sq	Prob
RP	4	2.1265	0.712
CPICORE	4	4.1734	0.383
REER	4	12.504	0.014
SET	4	29.535	0.000
ALL	16	53.914	0.000***

Table 4.9: Granger Causality test; Dependent variable: SET

Excluded	df	Chi-sq	Prob
RP	4	5.4018	0.248
CPICORE	4	15.583	0.004
REER	4	1.0244	0.906
CEI	4	1.6539	0.799
ALL	16	30.75	0.014**

From the result above, it shows that granger causality between macroeconomic variables and stock prices which could be concluded that each macroeconomic variable could be used to explain the stock prices.

4.3 Impulse Response Function

When we use the result from the VAR to plot the graph of IRF, the relationship between macroeconomic variable and the stock prices are shown as follows:-

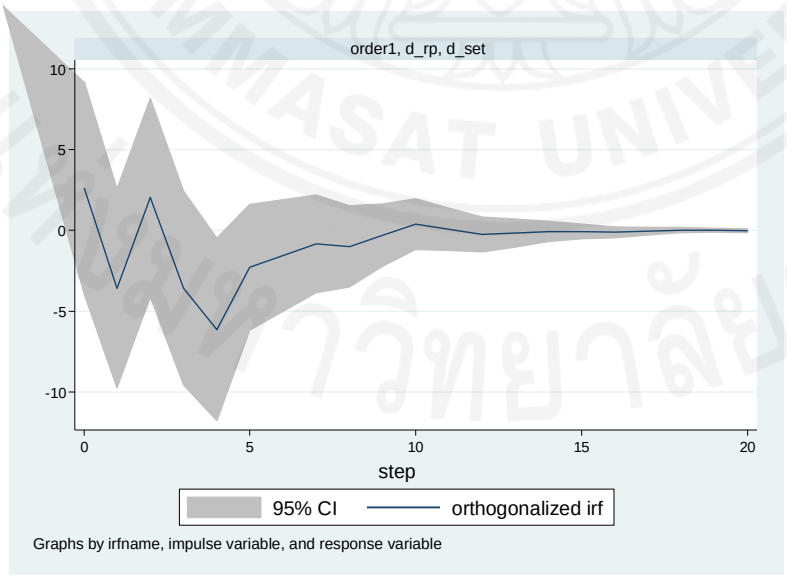

Figure 4.2: Orthogonal of Response Function of RP to SET

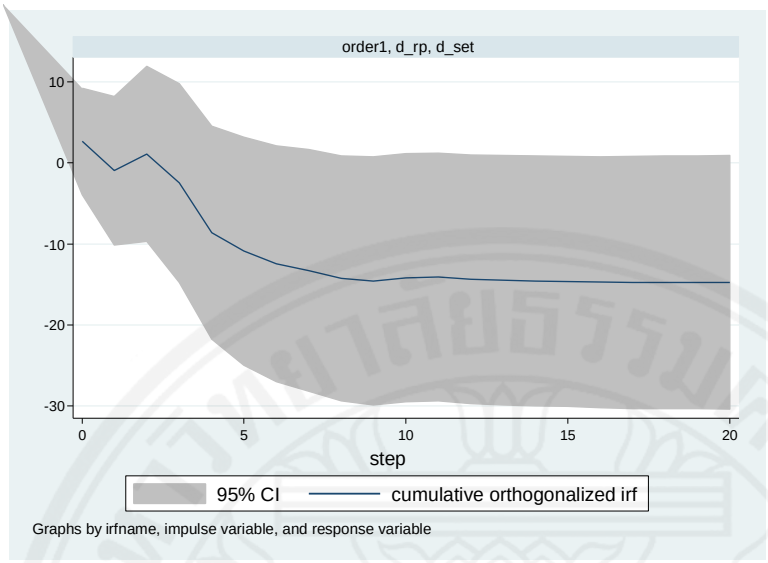

Figure 4.3: Cumulative Response Function of RP to SET

When the shock occurred, it caused a significant negative response of interest rate to the stock price. It reached the peak period within 4 months and declined to zero within 11 months. This could be explained as, when interest rate rises, there will be an additional burden for the firms to make more profit to cover their additional finance cost, especially manufacturing and service industries that have to invest in both tangible and intangible assets. Since most of their debts are the long-term debts, it takes long time to reach the break-even point. Moreover, firms need the new innovation to build competitiveness among others, it makes finance cost unavoidable. When interest rate increases, the stock price decreases in line with its adjustment.

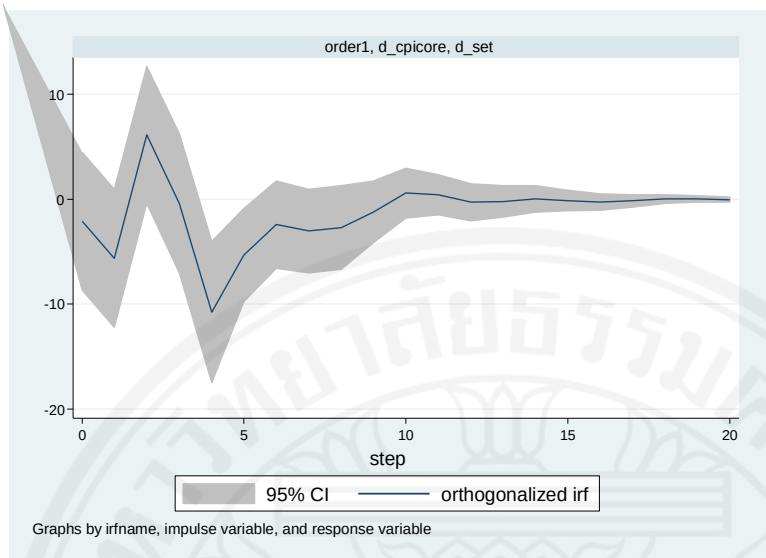

Figure 4.4: Orthogonal of Response Function of CPICORE to SET

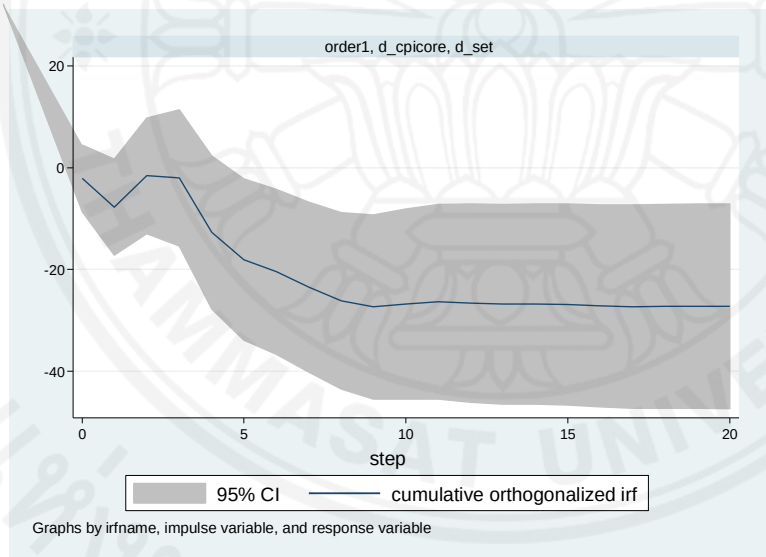

Figure 4.5: Cumulative Response Function of CPICORE to SET

The occurring ofasignificant negative response of inflation to stock price can also be seen from the result. It reached the peak period within 4 months and declined to zero within 11 months.This could be explained as, when interest rate increases, there will be an additional burden for the firms to make more profit to cover their additional cost and operating expenses because the increase in inflation seems to be pervasive. It increases all expenses. From the figure 4.4-4.5, it shows that the response of inflation is more than the response of interest. As the abovementioned, inflation

causes all expenses to be increased while the interest causes only the finance cost to be increased. When inflation increases, the stock price decreases in line with its adjustment.

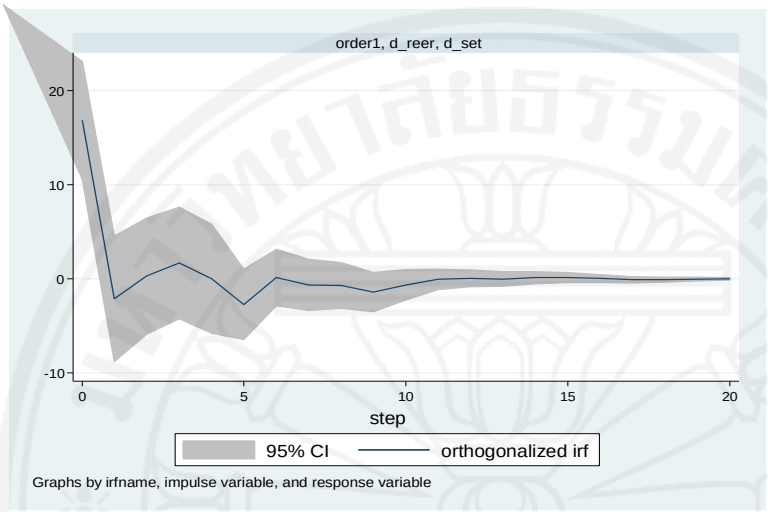

Figure 4.6: Orthogonal of Response Function of REER to SET

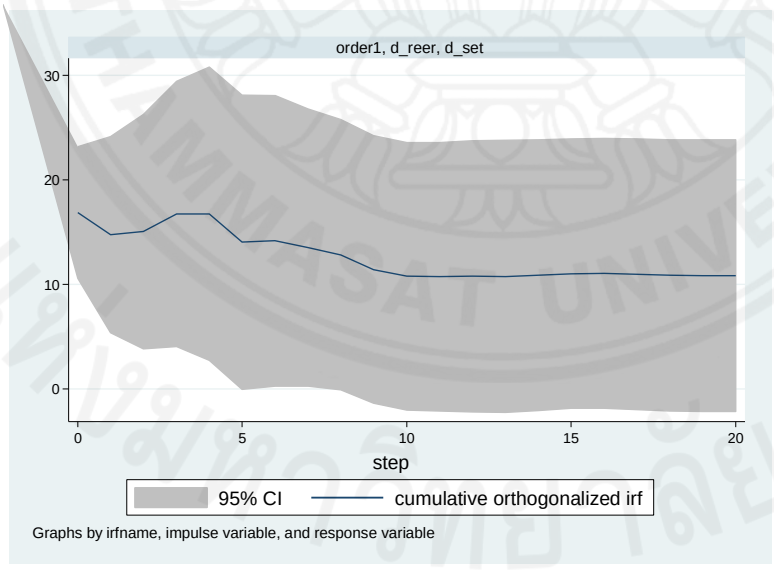

Figure 4.7: Cumulative Response Function of REER to SET

The exchange rate represents a positive response of exchange rate to stock price which reached the peak period within 1 month and declined to zero within 11 months. It is opposite to the fact that when the exchange rate depreciates, the profit is weaken and the stock price decreases. This is suggested by Saengsrisin (2011), Figure

4.8 below which illustrates Thailand trade balance. REER increasing means Thai Baht has appreciated. If Thailand imports more than export, it will benefit from currency appreciation. When REER increases, the stock price increasesin line with its adjustment.

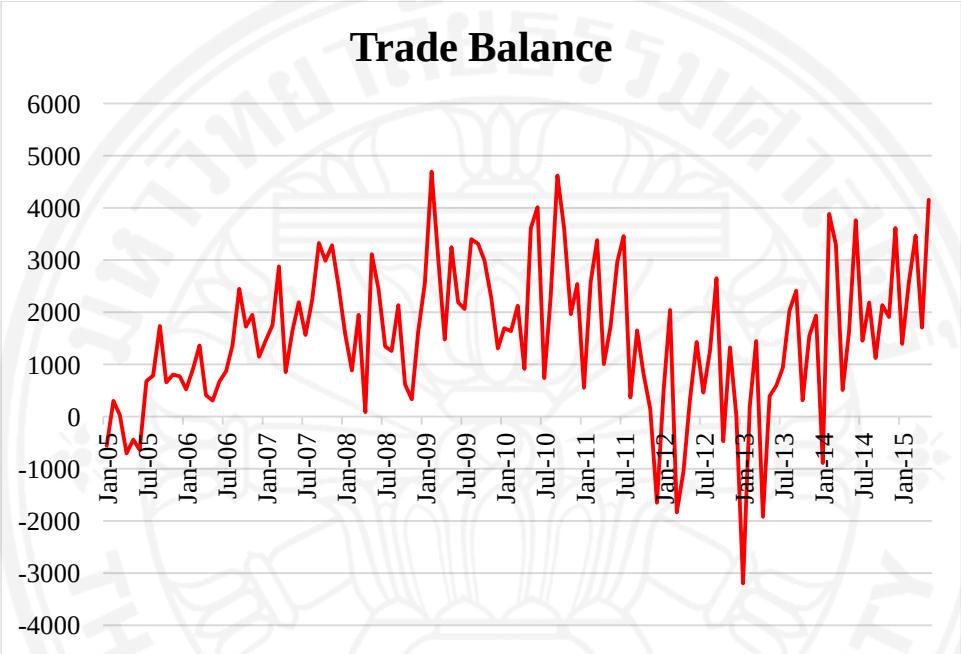

Figure 4.8: Thailand Trade Balance

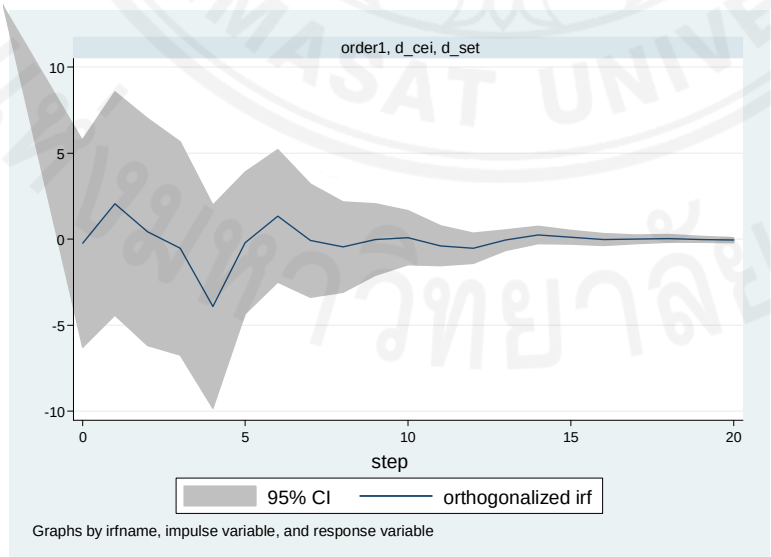

Figure 4.9: Orthogonal of Response Function of CEI to SET

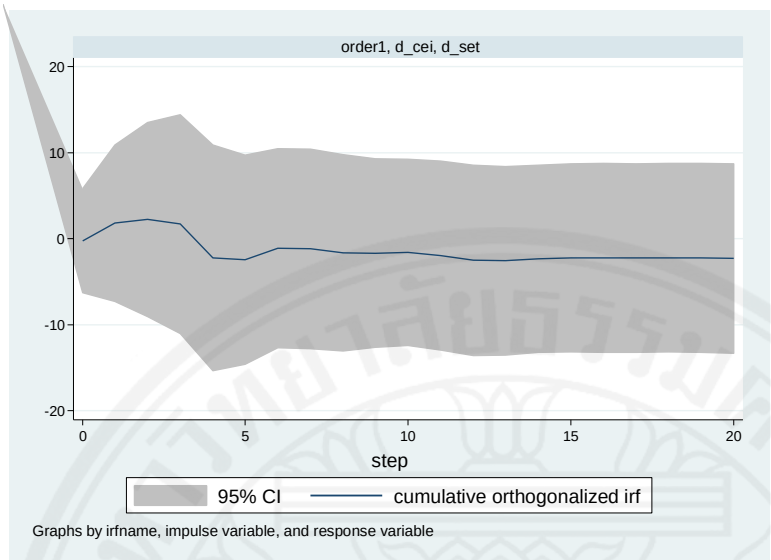

Figure 4.10: Cumulative Response Function of CEI to SET

The figure 4.9 - 4.10 shows a significant positive response of economic growth to the stock price which can be confirmed that the economic growth goes the same way with the stock price. It reached the peak period within 4 months and declined to zero within 13 months. Although the figure presents the positive response, but it is close to zero. Regarding the concept suggested by Greenwood and Jovanovic (1990), it could be explained that the market capital of Thailand is lower than the market capital of the other developed countries.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

Macroeconomic variables describe actual economy in past and present. Moreover, they are widely used by investors to interpret market outlook and also performance of businesses. This suggests that the macroeconomic data can be used for explaining stock price movement. This paper studied the relationship of macroeconomic variables and the stock price in The Stock Exchange of Thailand by using VAR model. Major Thai macroeconomic variables which are interest rate, inflation, exchange rate and economic growth have been used for a proxy for this study.

The results indicated that macroeconomic variables could cause the change in stock price. Then the using of impulse response function to review the relationship of the stock price is needed. The results suggested that the interest rate and the inflation have an inverse relationship with the stock price. While the exchange rate and economic growth have a positive relationship with the stock price.

The negative impact of the interest rate on the stock price shows that people and firms are concerned about the interest rate because they normally use outside funding which creates the finance cost, especially in long-term investment. In addition, investors will also take consideration of the interest rate because the sum of the future discounted cash flow is used to calculate the stock price of the firm. If firms make less profit, the amount of future cash flow will drop and the stock price will finally decline which is consistent with the research of Kwon and Shin (1999). Moreover, in the view of investors, investing in stock is quite risky when comparing to other investments. Investors need to compensate their risk with its rate of return. If risk fluctuates, people will invest in the other investment elsewhere which is safer than the stock.

Regarding the study of the effect of inflation rate on stock price, it shows significant negative impact since the inflation rate affects pervasively through the production cost which causes the cost of goods and services to be increased faster than the revenue. According to the study, the inflation has more negative impact on stock price than the impact from the interest rate and this is consistent with the cost

push inflation research of Chen, Roll and Ross (1986). In addition, running the deficit monetary policy by the government causes people to spend more on the consumption which increases money supply. Hence the price of goods and services will also be increased then the inflation occurs. As the production factor increased by the inflation, the profit decreased, and results as an unanticipated drop in stock prices. This is the signal of the worsening of economy.

In contrary to the negative impact of the interest and inflation rate on stock price, the exchange rate has a positive impact. This can be explained that the appreciation in Thai Baht leads to the higher stock price. The appreciation of real exchange rate means Thai Baht appreciates comparing to the competitors which is the consequence of having a large proportion of the capital inflow caused by running expansionary monetary policy by the other countries to stimulate their own economy.

When Thai Baht appreciates, the import will be less expensive, consequently, firms could increase the import. There are 2 aspects of the import, firstly, firms import as their regular business which they could make profit directly from the appreciation of exchange rate. Secondly, the companies import production factors to develop the quality of goods and services, such as, machineries, to raise the competitiveness and to reduce costs which know-how from the overseas might be needed. Either way causes the higher profit and leads to the higher stock price which is consistent with the study of Dimitrova (2005).

The positive impact of economic growth on the stock price shows that increasing in economic growth leads to the increasing of the expected future cash flow and the stock price will increase. It could be explained that the stock price is associated with the discounted present value of the firms' payout. Progression economy means higher earnings and dividends. If the investors prospect their upward revision forecast, the stock price will increase as a consequence.

The implication of this studying is to providethe relationship between macroeconomic variables and the stock price which helps making better understanding to the investors and develop their effective visions on capital market to their investments. In addition, this studying sheds some light to the policy maker when macroeconomic variables change to influence the economy. Furthermore, the capital market needs to develop its sustainable growth because it helps to provide

source of funding in both of equity and bond market which will drive the money circulation in the economic system.

However, the comparison of the effect that macroeconomic factors have on the stock price between developed and developing countries or the study by separating the sectors of the listed companies could be considered for further study. Since each country or each sector might respond to the stock price differently, for example, the bank and financial institute might be affected by the change in the interest rate more than the other factors while the commerce might react to the change in the inflation rate the most. Moreover, the additional variables, such as tax, could also be used since tax is one of the conditions that affects the consideration on the investment of the foreign investors.

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APPENDICES

APPENDIX A

CEI is chosen over MPI since the CEI has a better conclusion of the test than MPI as shown in the figure below.

Unit Root Test

Since the data is time series, so the unit root test must be checked before taking the empirical test to consider whether there are bias or spurious problems. ADF (Augmented Dickey Fuller) is applied to test stationary property of the data which the result is shown in the table below**:-**

Table A.1: Augmented Dickey-Fuller Test for Unit Root; at Level

Variable	T-Statistic	P-Value	Result
RP	-1.308	0.6253	Non-stationary
CPICORE	1.441	0.9973	Non-stationary
REER	-1.089	0.7193	Non-stationary
MPI	-2.395	0.1433	Non-stationary
SET	-0.409	0.9086	Non-stationary

The result of the test is shown that all variables are non-stationary; therefore, another test is needed. First difference form is used to test the stationary and the result of this test is presented in the table below.

Table A.2: Augmented Dickey-Fuller Test for Unit Root; First Difference

Variable	T-Statistic	P-Value	Result
RP	-9.087	0.0000	Stationary
CPICORE	-10.269	0.0000	Stationary
REER	-10.278	0.0000	Stationary
MPI	-11.652	0.0000	Stationary
SET	-11.862	0.0000	Stationary

Stability and Granger Causality Test

According to VAR, finding the appropriate lag could be performed by employing the information criteria. The Akaike's information criterion (AIC) suggested 4 lags while Hannan-Quinn information criterion (HQIC) and Baysian information criterion (SBIC) suggested 1 lag. Hence, AIC was employed because AIC showed the lowest value.

Stability and Granger Causality Test

Table A.3: VAR Lag Order Selection

Lag	LL	LR	FPE	AIC	HQIC	SBIC
0	-1576.56		249.966	19.7107	19.8654	20.0918
1	-1507.22	138.69	144.66	19.1632	19.5114	20.0209*
2	-1466.24	81.961	118.948	18.9659	19.5076*	20.3001
3	-1431.81	68.865	106.218	18.8495	19.5846	20.6601
4	-1392.52	78.568	89.5426*	18.6731*	19.6017	20.9602

After that, all eigenvalues were checked whether they lie on the circle for showing its stability of the test which means VAR model could be used for the test.

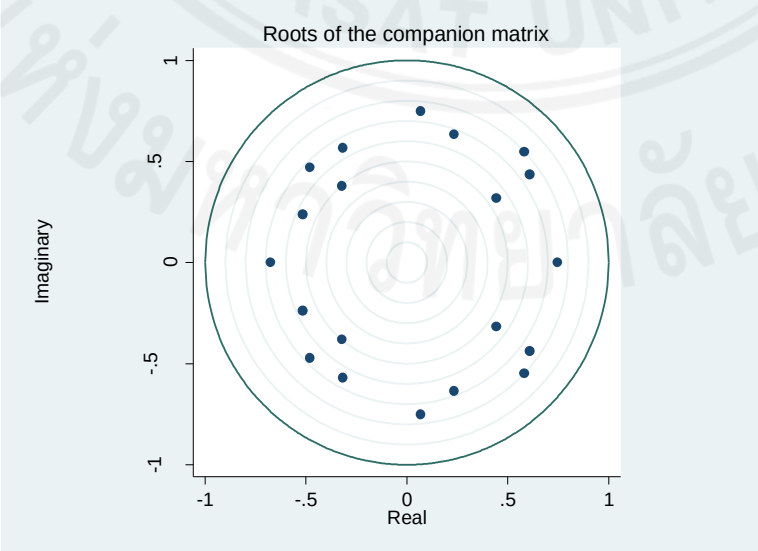

Figure A.1: VAR Stability Check

Table A.4: Vector Autoregressive Model

Independent variables	RP	CPICORE	REER	MPI	SET
RP(-1)	5.12***	0.57	-0.37	-0.38	-0.94
	(0.000)	(0.567)	(0.715)	(0.700)	(0.346)
RP(-2)	0.92	-0.55	-2.51**	-0.08	0.95
	(0.355)	(0.583)	(0.012)	(0.940)	(0.342)
RP(-3)	1.64	1.52	2.28**	0.37	-1.55
	(0.102)	(0.128)	(0.023)	(0.708)	(0.120)
RP(-4)	-2.58**	0.21	1.09	-1.96*	-0.47
	(0.010)	(0.836)	(0.278)	(0.050)	(0.636)
CPICORE (-1)	1.65*	2.76***	-1.92*	1.26	-1.76*
	(0.099)	(0.006)	(0.055)	(0.206)	(0.078)
CPICORE (-2)	2.46**	1.57	1.15	0.61	2.20**
	(0.014)	(0.116)	(0.249)	(0.545)	(0.028)
CPICORE (-3)	0.48	-1.42	0.27	1.12	-0.13
	(0.633)	(0.155)	(0.785)	(0.263)	(0.893)
CPICORE (-4)	5.02***	0.55	1.00	1.43	-3.11***
	(0.000)	(0.585)	(0.317)	(0.152)	(0.002)
REER (-1)	0.75	1.74*	1.08	0.43	-0.60
	(0.454)	(0.082)	(0.279)	(0.668)	(0.548)
REER (-2)	-3.07***	0.26	1.43	-2.58**	0.48
	(0.002)	(0.794)	(0.153)	(0.010)	(0.634)
REER (-3)	-0.68	-1.20	-3.30***	-0.70	-0.21
	(0.497)	(0.230)	(0.001)	(0.481)	(0.832)
REER (-4)	2.12**	1.46	0.12	-1.02	0.22
	(0.034)	(0.144)	(0.907)	(0.308)	(0.829)
MPI (-1)	-0.07	-0.19	-1.29	-0.58	0.28
	(0.947)	(0.846)	(0.198)	(0.560)	(0.779)
MPI (-2)	0.49	0.82	4.40***	-6.20***	-0.26
	(0.627)	(0.412)	(0.000)	(0.000)	(0.791)
MPI (-3)	-1.03	-0.67	3.86***	-2.13**	-0.15
	(0.301)	(0.503)	(0.000)	(0.033)	(0.877)
MPI (-4)	0.59	-0.70	0.26	-2.97***	-1.07
	(0.558)	(0.483)	(0.799)	(0.003)	(0.286)

Table A.4: Vector Autoregressive Model

Independent variables	RP	CPICORE	REER	MPI	SET
SET (-1)	-1.23	1.45	2.35**	2.31**	0.52
	(0.218)	(0.146)	(0.019)	(0.021)	(0.603)
SET (-2)	1.30	0.67	1.81*	3.96***	-0.22
	(0.192)	(0.503)	(0.070)	(0.000)	(0.828)
SET (-3)	2.14**	-0.52	-0.11	0.91	0.81
	(0.032)	(0.606)	(0.912)	(0.364)	(0.419)
SET (-4)	1.14	-0.73	-1.22	2.16**	-1.01
	(0.253)	(0.466)	(0.222)	(0.031)	(0.312)
Subprime	-2.40**	0.95	0.18	-1.46	-1.97**
	(0.016)	(0.340)	(0.856)	(0.145)	(0.049)
Flood	-0.90	0.03	-1.06	-3.17***	0.55
	(0.370)	(0.978)	(0.290)	(0.002)	(0.580)
Euro	-2.16**	1.45	0.33	-2.70***	0.61
	(0.031)	(0.146)	(0.742)	(0.007)	(0.545)
C	-1.88*	2.03**	0.19	0.92	2.55**
	(0.061)	(0.043)	(0.847)	(0.357)	(0.011)

The value in ( ) is probability of T-statistics. While the ***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Granger Causality Test

Table A.5: Granger Causality Test; Dependent Variable: RP

Excluded	df	Chi-sq	Prob
CPICORE	4	38.724	0.000
REER	4	14.596	0.006
MPI	4	1.6071	0.808
SET	4	8.4438	0.077
ALL	16	66.877	0.000***

Table A.6: Granger Causality Test; Dependent Variable: CPICORE

Excluded	df	Chi-sq	Prob
RP	4	4.4345	0.350
REER	4	4.8692	0.301
CEI	4	1.9394	0.747
SET	4	3.3646	0.499
ALL	16	15.799	0.467

Table A.7: Granger Causality Test; Dependent Variable: REER

Excluded	df	Chi-sq	Prob
RP	4	13.099	0.011
CPICORE	4	5.9028	0.207
MPI	4	42.571	0.000
SET	4	10.256	0.036
ALL	16	68.049	0.000***

Table A.8: Granger Causality Test; Dependent Variable: MPI

Excluded	df	Chi-sq	Prob
RP	4	4.9837	0.289
CPICORE	4	6.6427	0.156
REER	4	9.6056	0.048
SET	4	25.843	0.000
ALL	16	50.209	0.000***

From the result above, it shows that granger causality between macroeconomic variables and stock prices which could be concluded that each macroeconomic variable could be used to explain the stock prices.

Impulse Response Function

When we use the result from the VAR to plot the graph of IRF, the relationship between macroeconomic variable and the stock prices are shown as follows:-

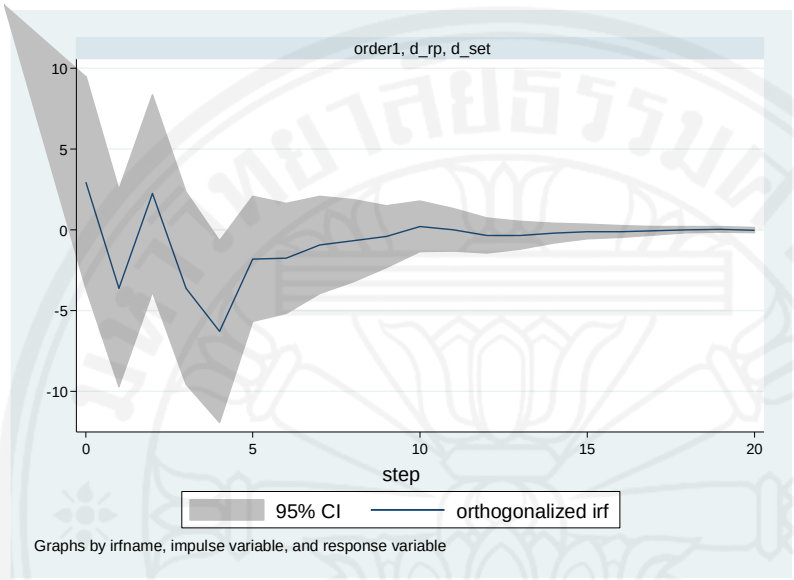

Figure A.2: Orthogonal of Response Function of RP to SET

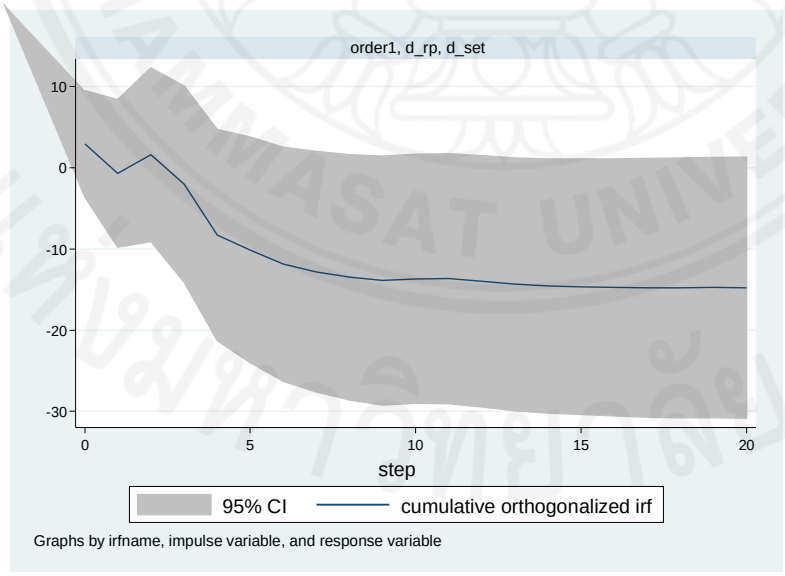

Figure A.3: Cumulative of Response Function of RP to SET

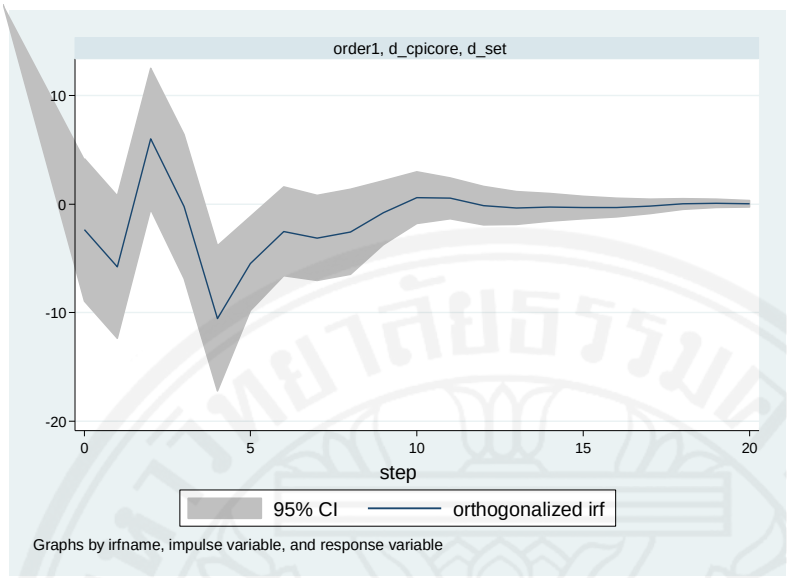

Figure A.4: Orthogonal of Response Function of CPICORE to SET

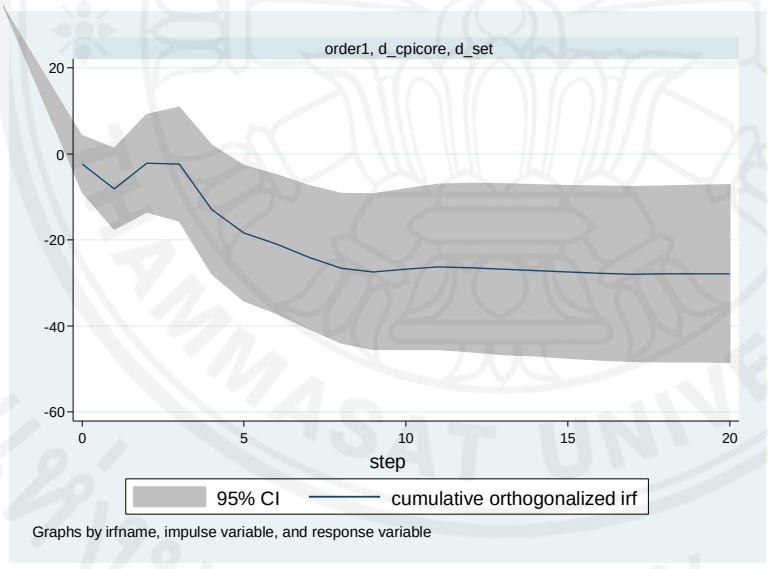

Figure A.5: Cumulative of Response Function of CPICORE to SET

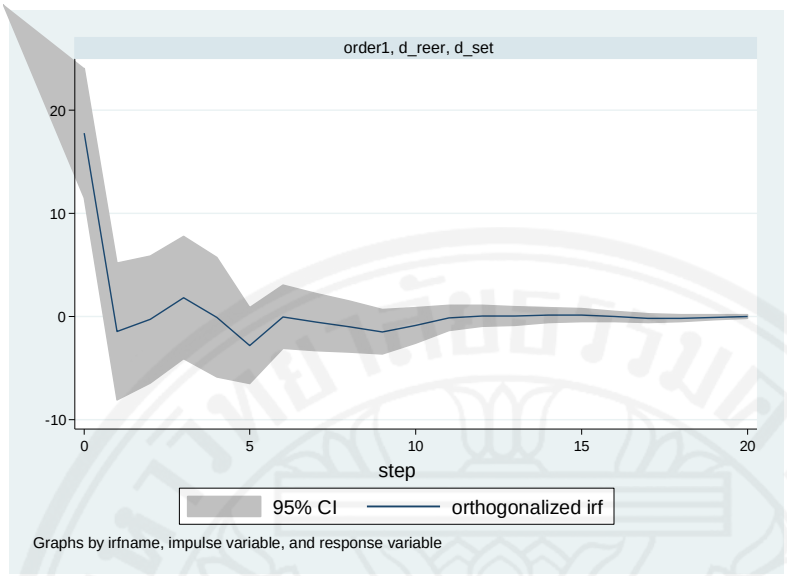

Figure A.6: Orthogonal of Response Function of REER to SET

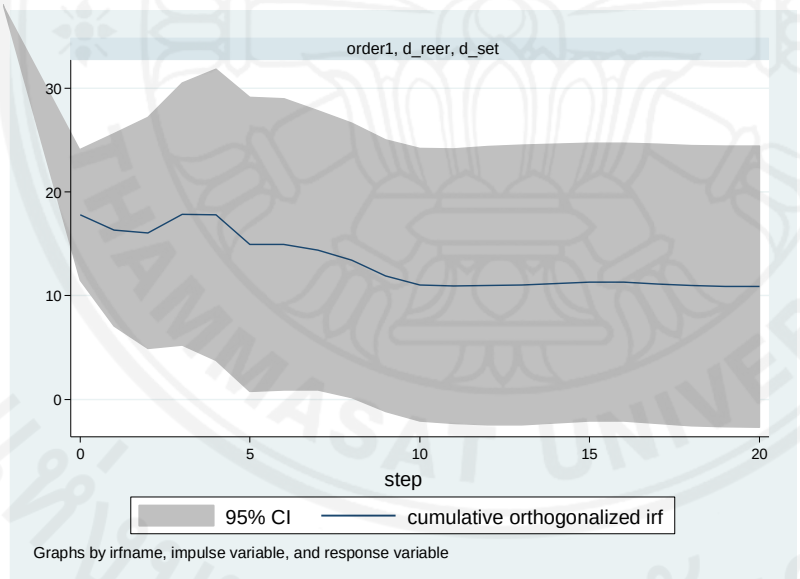

Figure A.7: Cumulative of Response Function of REER to SET

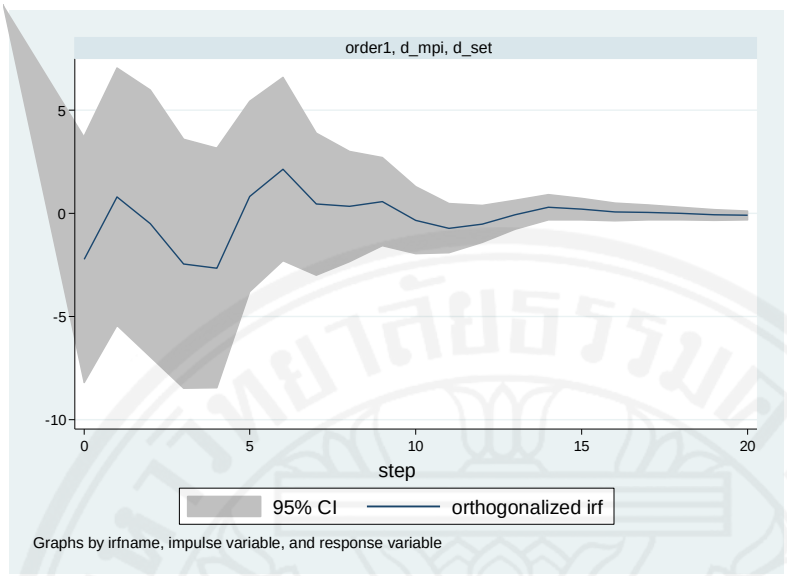

Figure A.8: Orthogonal of Response Function of MPI to SET

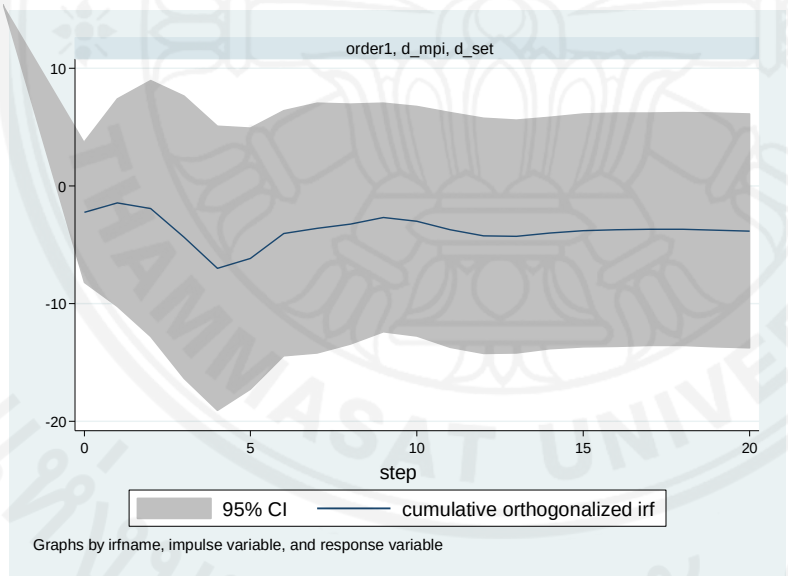

Figure A.9: Cumulative of Response Function of MPI to SET

The first 3 graphs show that the directions of each variable are the same, except for the last one that MPI moves in another direction. MPI is not a good proxy for economic growth regarding the current testing because it doesnot move in the same way as stated in the theory since the MPI might be a good proxy for the manufacturing scheme.

APPENDIX B

In addition, better result are achieved by adding more macroeconomic variableswhich are oil price and gold price as shown below.

Unit Root Test

Since the data is time series, sothe unit root test must be checked before taking the empirical test to consider whether there are bias or spurious problems. ADF (Augmented Dickey Fuller) is applied to test stationary property of the data which the result is shown in the table below**:-**

Table B.1: Augmented Dickey-Fuller Test for Unit Root; at level

Variable	T-Statistic	P-Value	Result
RP	-1.308	0.6253	Non-stationary
CPICORE	1.441	0.9973	Non-stationary
REER	-1.089	0.7193	Non-stationary
CEI	-1.942	0.3127	Non-stationary
OILTH	-1.492	0.5377	Non-stationary
GOLD	-1.171	0.6861	Non-stationary
SET	-0.409	0.9086	Non-stationary

The result of the test shows that all variables are non-stationary; therefore, another test is needed. First difference form is used to test the stationary and the result of this test is presented in the table below.

Table B.2: Augmented Dickey-Fuller Test for Unit Root; First Difference

Variable	T-Statistic	P-Value	Result
RP	-9.087	0.0000	Stationary
CPICORE	-10.269	0.0000	Stationary
REER	-10.278	0.0000	Stationary
CEI	-12.017	0.0000	Stationary
OILTH	-8.896	0.0000	Stationary
GOLD	-15.487	0.0000	Stationary
SET	-11.862	0.0000	Stationary

Stability and Granger Causality Test

According toVAR, finding the appropriate lag could be performed by employing the information criteria. The Akaike's information criterion (AIC) suggested 4 lags while Hannan-Quinn information criterion (HQIC) and Baysian information criterion (SBIC) suggested 1 lag. Hence AIC was employed because AIC showed the lowest value.

Stability and Granger Causality Test

Table B.3: VAR Lag Order Selection

Lag	LL	LR	FPE	AIC	HQIC	SBIC
0	-2868.22		8.0e+06	35.7558	35.9725	36.2894*
1	-2759.64	217.15	3.8e+06	35.0203	35.6161*	36.4879
2	-2698.11	123.07	3.3e+06	34.8656	35.8406	37.267
3	-2639.57	117.09	3.0e+06	34.7477	36.1019	38.0831
4	-2587.15	104.83	2.9e+06*	34.7055*	36.4389	38.9748

After that, all eigenvalues were checked whether they lie on the circle for showing its stability of the test which means VAR model could be used for the test.

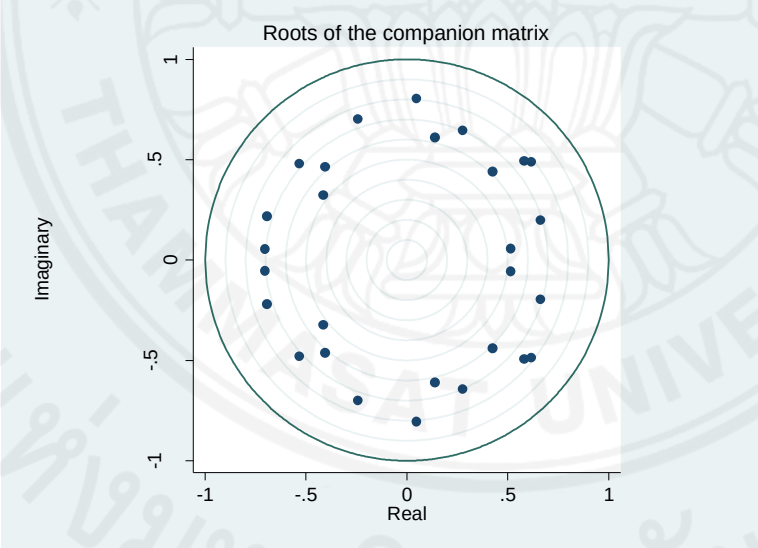

Figure B.1: VAR Stability Check

Table B.2: Vector Autoregressive Model

Independent variables	RP	CPICORE	REER	CEI	OILTH	GOLD	SET
RP(-1)	4.83***	0.55	-0.26	-0.26	-1.66*	-1.24	-0.91
	(0.000)	(0.585)	(0.792)	(0.793)	(0.096)	(0.214)	(0.363)
RP(-2)	0.89	-0.31	-1.59	-0.67	1.67*	0.69	1.32
	(0.373)	(0.758)	(0.112)	(0.503)	(0.096)	(0.489)	(0.187)
RP(-3)	1.97**	1.34	1.62	1.39	-1.63	1.35	-1.76*
	(0.049)	(0.181)	(0.104)	(0.165)	(0.102)	(0.177)	(0.079)
RP(-4)	-2.23**	1.01	0.55	-1.42	1.04	-0.37	-0.20
	(0.026)	(0.312)	(0.582)	(0.155)	(0.297)	(0.714)	(0.842)
CPICORE (-1)	0.10	0.99	-1.98**	-0.11	1.18	1.24	-2.09**
	(0.918)	(0.321)	(0.047)	(0.912)	(0.237)	(0.216)	(0.037)
CPICORE (-2)	0.96	1.44	0.71	-0.68	0.63	1.31	0.92
	(0.337)	(0.151)	(0.475)	(0.496)	(0.531)	(0.191)	(0.356)
CPICORE (-3)	-0.09	-1.85*	1.45	-0.55	-2.14**	-0.06	0.09
	(0.926)	(0.065)	(0.146)	(0.586)	(0.033)	(0.953)	(0.929)
CPICORE (-4)	4.46***	0.89	2.13**	0.15	-3.11***	-0.31	-2.55**
	(0.000)	(0.375)	(0.033)	(0.883)	(0.002)	(0.754)	(0.011)
REER (-1)	0.62	1.92*	0.96	1.17	0.70	0.51	-0.85
	(0.536)	(0.055)	(0.335)	(0.242)	(0.487)	(0.611)	(0.396)
REER (-2)	-2.39**	0.62	1.19	-2.67***	1.64	-2.21**	0.59
	(0.017)	(0.534)	(0.233)	(0.008)	(0.100)	(0.027)	(0.557)
REER (-3)	-0.11	-1.98**	-2.82***	0.49	-0.45	-1.54	0.32
	(0.909)	(0.048)	(0.005)	(0.623)	(0.650)	(0.124)	(0.749)
CEI (-1)	0.95	1.02	-0.49	-0.79	1.20	2.00**	0.64
	(0.344)	(0.310)	(0.628)	(0.429)	(0.231)	(0.045)	(0.525)
CEI (-2)	-0.15	0.57	4.04***	-2.80***	-0.21	1.06	0.16
	(0.880)	(0.569)	(0.000)	(0.005)	(0.832)	(0.288)	(0.876)
CEI (-3)	-0.10	-0.10	4.10***	-4.97***	-0.20	-1.28	0.65
	(0.924)	(0.922)	(0.000)	(0.000)	(0.845)	(0.202)	(0.513)
CEI (-4)	0.16	0.59	0.33	0.19	-0.90	1.61	-1.03
	(0.873)	(0.554)	(0.740)	(0.850)	(0.366)	(0.108)	(0.302)
OILTH (-1)	-0.27	6.50***	0.73	-1.19	3.49***	1.08	0.88
	(0.784)	(0.000)	(0.464)	(0.234)	(0.000)	(0.281)	(0.378)

Table B.2: Vector Autoregressive Model

Independent variables	RP	CPICORE	REER	CEI	OILTH	GOLD	SET
OILTH (-2)	2.81***	-1.21	-0.14	3.28***	0.07	-1.33	0.25
	(0.005)	(0.228)	(0.893)	(0.001)	(0.940)	(0.184)	(0.805)
OILTH (-3)	0.06	-0.95	-0.49	1.65	0.25	-1.75*	0.81
	(0.951)	(0.347)	(0.626)	(0.100)	(0.803)	(0.080)	(0.415)
OILTH (-4)	0.24	1.23	-2.37**	1.22	0.27	0.06	-1.62
	(0.810)	(0.220)	(0.018)	(0.224)	(0.786)	(0.950)	(0.106)
GOLD (-1)	0.25	0.77	0.11	3.03***	-0.51	-2.71***	-0.22
	(0.804)	(0.439)	(0.914)	(0.002)	(0.610)	(0.007)	(0.826)
GOLD (-2)	1.38	0.70	0.15	-0.81	0.97	-1.22	1.38
	(0.167)	(0.481)	(0.881)	(0.420)	(0.331)	(0.224)	(0.168)
GOLD (-3)	2.35**	-0.94	1.13	-2.23**	1.89*	-0.53	1.75*
	(0.019)	(0.347)	(0.259)	(0.026)	(0.058)	(0.593)	(0.080)
GOLD (-4)	0.90	-0.02	0.67	1.48	1.18	0.08	0.49
	(0.370)	(0.984)	(0.503)	(0.139)	(0.238)	(0.933)	(0.625)
SET (-1)	-1.69*	0.72	1.81*	2.57**	2.21**	-0.69	0.31
	(0.091)	(0.471)	(0.070)	(0.010)	(0.027)	0.488	(0.759)
SET (-2)	0.34	-0.74	1.53	3.46***	-0.47	-2.03**	-0.70
	(0.737)	(0.458)	(0.127)	(0.001)	(0.638)	(0.042)	(0.485)
SET (-3)	1.42	-0.59	-0.09	-0.31	0.04	1.81*	0.52
	(0.156)	(0.557)	(0.925)	(0.756)	(0.968)	(0.070)	(0.600)
SET (-4)	1.07	-0.99	-0.65	0.39	-0.37	0.93	-0.95
	(0.287)	(0.324)	(0.515)	(0.694)	(0.713)	(0.354)	(0.342)
Subprime	-2.22**	1.50	-0.41	-0.93	0.24	0.92	-2.07**
	(0.026)	(0.134)	(0.682)	(0.350)	(0.809)	(0.357)	(0.038)
Flood	-1.43	-0.02	-1.87*	-1.34	1.12	1.90*	0.03
	(0.153)	(0.982)	(-0.062)	(0.181)	(0.263)	(0.057)	(0.979)
Euro	-0.89	2.47**	-0.08	-0.77	0.09	-1.19	1.09
	(0.372)	(0.014)	(0.939)	(0.444)	(0.927)	(0.235)	(0.276)
C	-1.53	2.14**	-0.29	2.07**	0.73	0.38	2.50**
	(0.125)	(0.032)	(0.771)	(0.039)	(0.468)	(0.707)	(0.013)

The value in ( ) is probability of T-statistics. While the ***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Granger Causality Test

Table B.3: Granger Causality Test; Dependent Variable: RP

Excluded	df	Chi-sq	Prob
CPICORE	4	21.255	0.000
REER	4	8.8362	0.065
CEI	4	1.0251	0.906
OILTH	4	8.6398	0.071
GOLD	4	6.5497	0.162
SET	4	6.1093	0.191
ALL	24	87.917	0.000***

Table B.4: Granger Causality Test; Dependent Variable:CPICORE

Excluded	df	Chi-sq	Prob
RP	4	6.7337	0.151
REER	4	7.5738	0.108
CEI	4	1.3986	0.844
OILTH	4	44.038	0.000
GOLD	4	2.3419	0.673
SET	4	2.1557	0.707
ALL	24	68.546	0.000***

Table B.5: Granger Causality Test; Dependent Variable:REER

Excluded	df	Chi-sq	Prob
RP	4	5.3676	0.252
CPICORE	4	10.884	0.028
CEI	4	34.888	0.000
OILTH	4	6.7646	0.149
GOLD	4	1.4802	0.830
SET	4	5.9351	0.204
ALL	24	74.058	0.000***

Table B.6: Granger Causality Test; Dependent Variable:CEI

Excluded	df	Chi-sq	Prob
RP	4	3.0968	0.542
CPICORE	4	0.83794	0.933
REER	4	9.4554	0.051
OILTH	4	19.427	0.001
GOLD	4	21.05	0.000
SET	4	18.583	0.001
ALL	24	104.99	0.000***

Table B.7: Granger Causality Test; Dependent Variable: OILTH

Excluded	df	Chi-sq	Prob
RP	4	6.6227	0.157
CPICORE	4	15.228	0.004
REER	4	11.202	0.024
CEI	4	3.4908	0.479
OILTH	4	5.4275	0.246
GOLD	4	5.293	0.259
ALL	24	51.317	0.001***

Table B.8: Granger Causality Test; Dependent Variable: GOLD

Excluded	df	Chi-sq	Prob
RP	4	3.8887	0.421
CPICORE	4	3.4427	0.487
REER	4	14.363	0.006
CEI	4	8.2482	0.083
OILTH	4	6.2835	0.179
SET	4	9.6784	0.046
ALL	24	38.982	0.027**

Table B.9: Granger Causality Test; Dependent Variable: SET

Excluded	df	Chi-sq	Prob
RP	4	5.6286	0.229
CPICORE	4	10.96	0.027
REER	4	1.1916	0.879
CEI	4	2.4581	0.652
OILTH	4	4.0432	0.400
GOLD	4	4.6316	0.327
ALL	24	41.632	0.014**

From the result above, it shows that granger causality between macroeconomic variables and stock prices which could be concluded that each macroeconomic variable could be used to explain the stock prices.

Impulse Response Function

When we use the result from the VAR to plot the graph of IRF, the relationship between macroeconomic variable and the stock prices are shown as follows:-

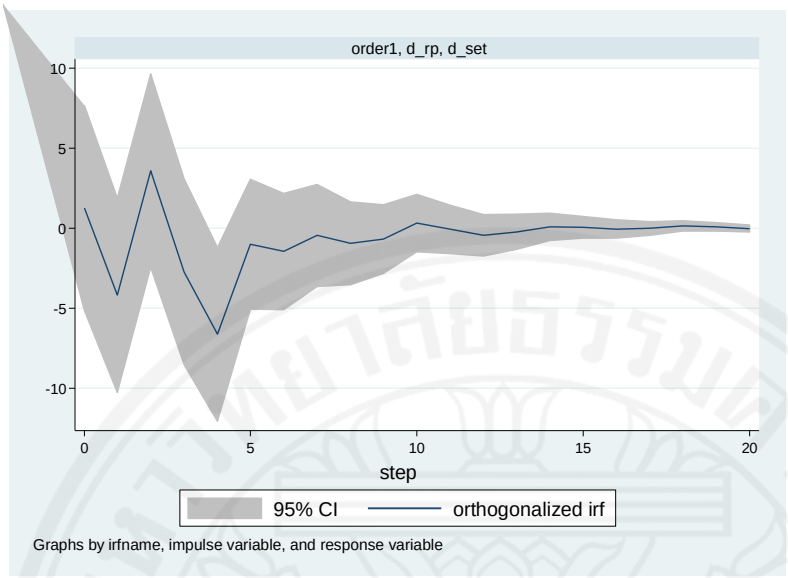

Figure B.2: Orthogonal of Response Function of RP to SET

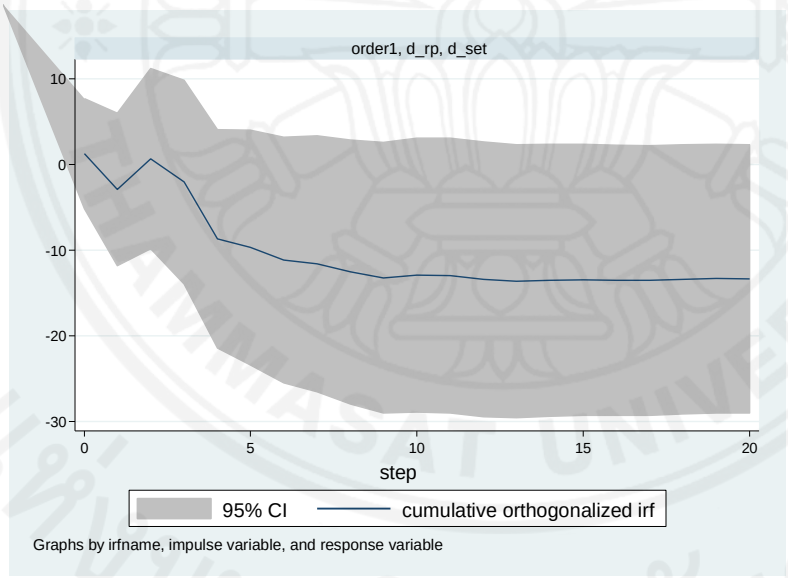

Figure B.3: Cumulative of Response Function of RP to SET

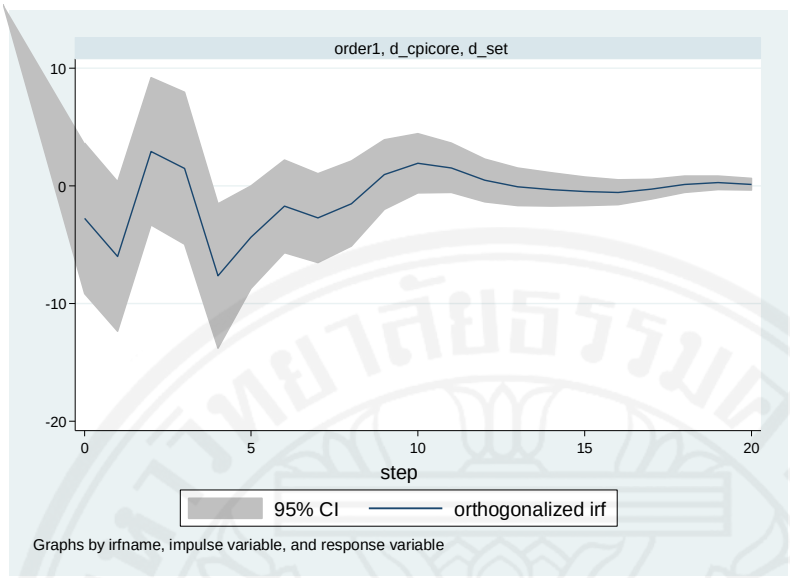

Figure B.4: Orthogonal of Response Function of CPICORE to SET

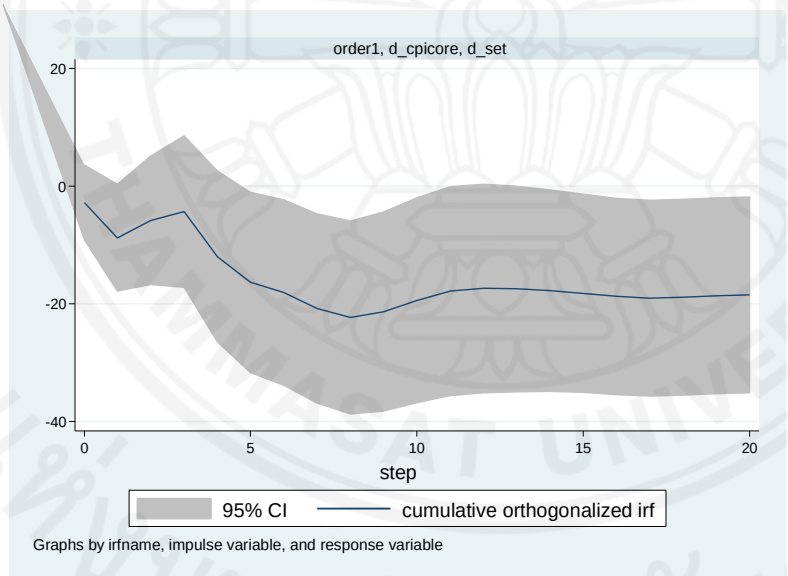

Figure B.5: Cumulative of Response Function of CPICORE to SET

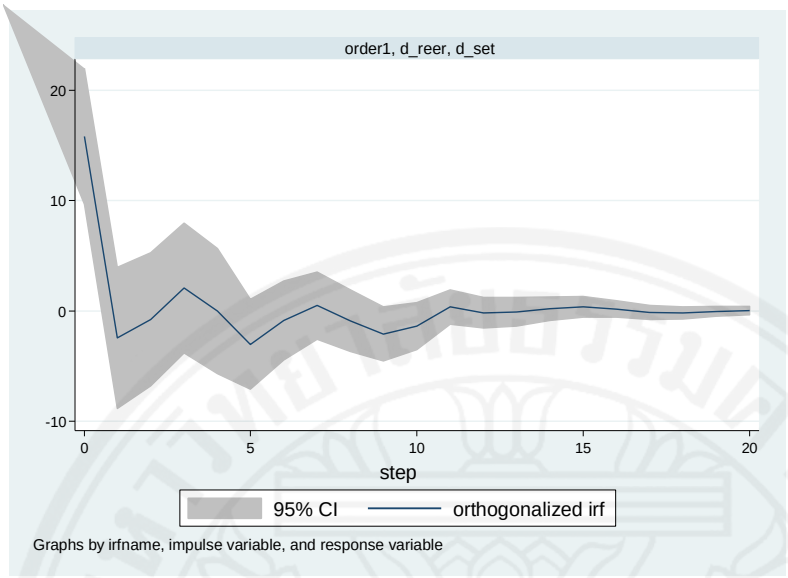

Figure B.6: Orthogonal of Response Function of REER to SET

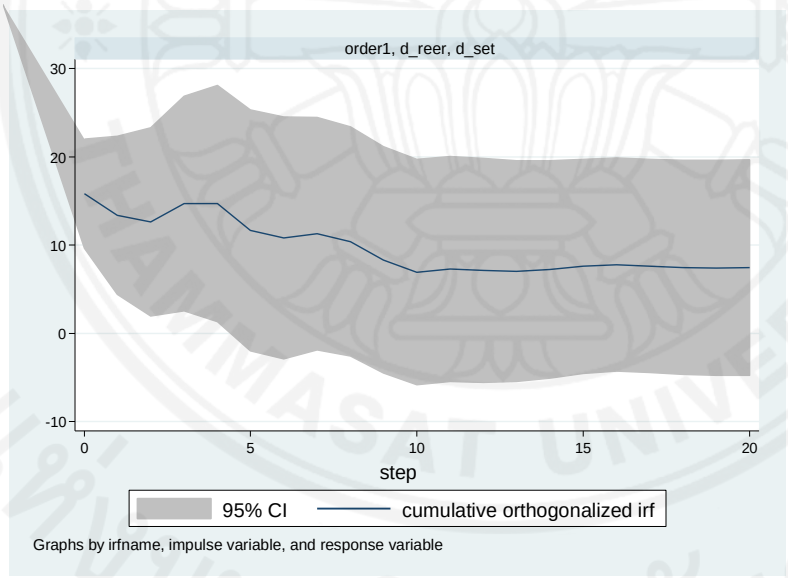

Figure B.7: Cumulative of Response Function of REER to SET

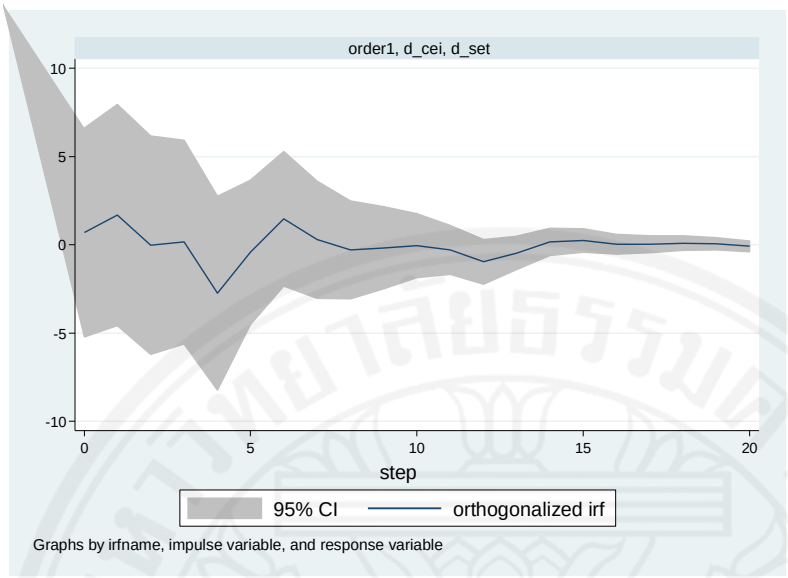

Figure B.8: Orthogonal of Response Function of CEI to SET

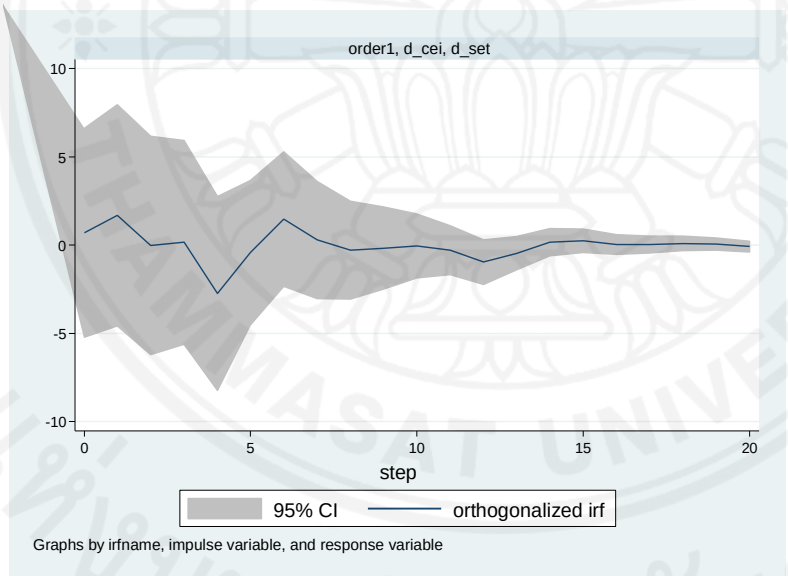

Figure B.9: Cumulative of Response Function of CEI to SET

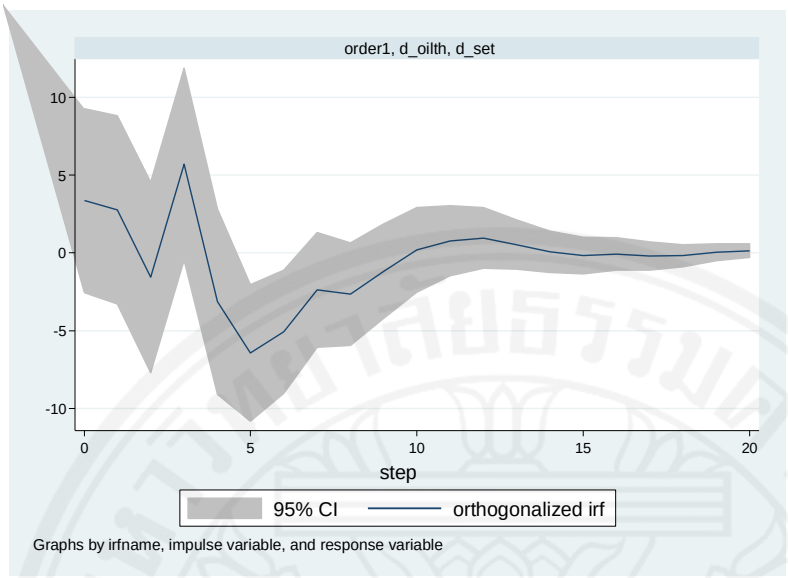

Figure B.10: Orthogonal of Response Function of OILTH to SET

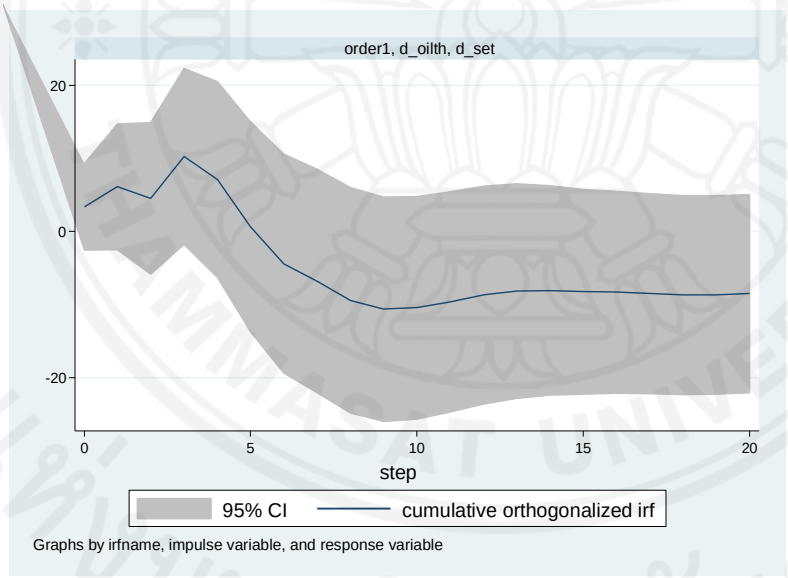

Figure B.11: Cumulative of Response Function of OILTH to SET

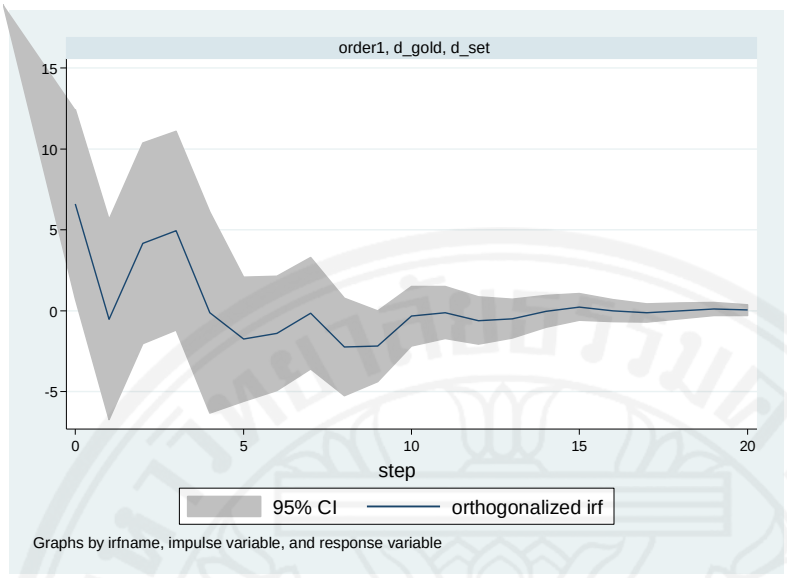

Figure B.12: Orthogonal of Response Function of GOLD to SET

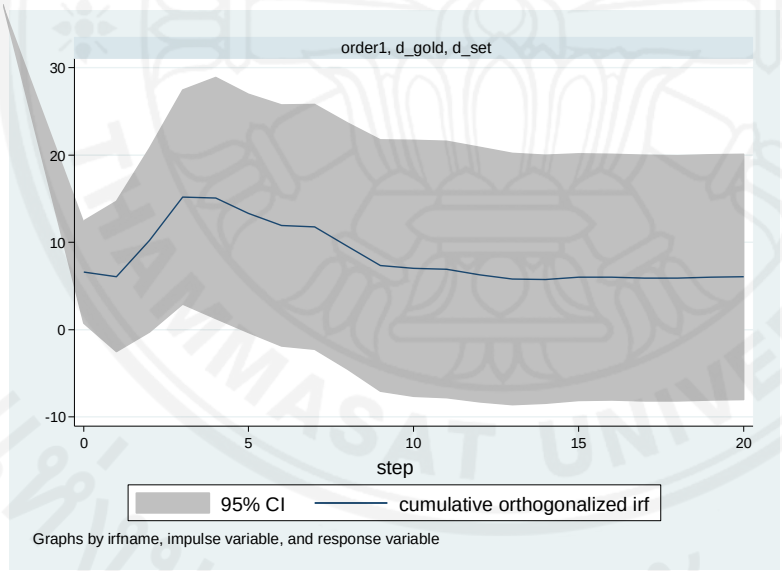

Figure B.13: Cumulative of Response Function of GOLD to SET

From the first 4 graphs, the directions of each variable are the same. The additional variables had a significant negative response of oil price to stock price.This could be explained as, when oil price increases, there will be an additional burden for the firms to make more profit to cover their operating expenses, especiallytransportation business. Moreover, Thailand is an oil consuming country not

oil producing country, thus the change in oil price affectsthefirms directly. When oil price increases, stock price decreases in line with its adjustment.

However, the result is a positive relationship of gold price to stock price. It is quite surprising that it has the same direction since gold is precious and its value increases overtime, sopeople need to keep gold as a safe haven investment. When gold price increases, the stock price also increases in line with its adjustment.

BIOGRAPHY

Name	Miss RoongnaphaSaengchan
Date of Birth	February 28, 1981
Educational Attainment	2003: Bachelor degree in Accounting
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