

# ความสัมพันธ์ระหว่างปัจจัยทางเศรษฐกิจต่อการเคลื่อนไหวดัชนีราคาหลักทรัพย์ ในตลาดหลักทรัพย์แห่งประเทศไทย

## Relationship between Economic Factors and the Stock Price Index Movement in the Stock Exchange of Thailand

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### บทคัดย่อ

การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์ระหว่างปัจจัยทางเศรษฐกิจต่อการเคลื่อนไหวดัชนีราคาหลักทรัพย์ในตลาดหลักทรัพย์แห่งประเทศไทย ด้วยแบบจำลอง VAR โดยใช้ราคาน้ำมัน อัตราแลกเปลี่ยน และดัชนีราคาผู้บริโภค และดัชนีราคาหลักทรัพย์ 8 กลุ่มอุตสาหกรรมในตลาดหลักทรัพย์แห่งประเทศไทย ทำการเก็บรวบรวมข้อมูลรายเดือนแบบอนุกรมเวลา ตั้งแต่เดือน มกราคม 2561 ถึงเดือน ธันวาคม 2565 เพื่อศึกษาและเปรียบเทียบระยะเวลา ทิศทาง และการเป็นส่วนประกอบความแปรปรวนของปัจจัยทางเศรษฐกิจที่มีต่อการเปลี่ยนแปลงของดัชนีราคาหลักทรัพย์ 8 กลุ่มอุตสาหกรรม ผลการศึกษาบ่งชี้

ว่าการเปลี่ยนแปลงของดัชนีราคาหลักทรัพย์ขึ้นอยู่กับ การเปลี่ยนแปลงของดัชนีราคาหลักทรัพย์ในอดีตเป็นสำคัญ ราคาน้ำมัน อัตราแลกเปลี่ยน และดัชนีราคาผู้บริโภค ตามลำดับ ดังนั้นเพื่อป้องกันความเสี่ยงที่เกิดขึ้นจากความผันผวนที่อาจจะเกิดขึ้น นักลงทุนควรพิจารณาการเปลี่ยนแปลง ราคาน้ำมัน อัตราแลกเปลี่ยน และดัชนีราคาผู้บริโภค มาประกอบการตัดสินใจลงทุน นอกจากนี้สำนักงานคณะกรรมการตลาดหลักทรัพย์ (ก.ล.ต.) ในฐานะผู้ดูแลตลาดทุนของประเทศไทย ควรดำเนินนโยบายให้บริษัทที่จดทะเบียนในตลาดหลักทรัพย์มีการป้องกันความเสี่ยงจากการผันผวนของปัจจัยเศรษฐกิจมหภาคร่วมด้วย เพื่อส่งเสริมให้เกิดการลงทุนอย่างมีประสิทธิภาพ ตลอดจนก่อให้เกิดการพัฒนาตลาดทุนไทยเป็นไปอย่างยั่งยืน

**คำสำคัญ:** ราคาน้ำมัน, อัตราแลกเปลี่ยน, ดัชนีราคาผู้บริโภค, ตลาดหลักทรัพย์แห่งประเทศไทย

## Abstract

This study used the VAR model to study the relationship between economic factors and the stock price index movement in the Stock Exchange of Thailand (SET). Oil price, exchange rate, consumer product index, and stock price indices of 8 industry groups in the Stock Exchange of Thailand (SET) were employed and studied as variables. Time series monthly data was collected from January 2018 to December 2022 to study and compare the duration, direction, and variance composition of economic factors affecting the changes in stock price indices of 8 industrial groups. The results of the study indicated that changes in stock price indices depend mainly on past changes in stock price indices, followed by oil prices, exchange rates, and the consumer product index, respectively. Therefore, investors should consider oil prices, exchange rates, and consumer product indexes in investment decisions to prevent risks arising from potential fluctuations. In addition, the Securities and Exchange Commission (SEC), as Thailand's capital market supervisory board, should implement a policy for companies listed on the stock exchange to protect against risks from fluctuations in macroeconomic factors in order to promote the efficiency of investment and to contribute the sustainable development of the Thai capital market.

**Keywords:** Oil price, Exchange rate, Consumer product index, Stock exchange of Thailand

## Introduction

The Stock Exchange of Thailand (SET) is one of the country's important venture capital, serving as a center for trading in listed securities to support the development and drive the country's economy, affecting production, employment, and product price levels in the market (Tuna et al., 2021). In addition, it

reflects investor confidence, which will positively affect the expansion and economic growth of the country as a whole (Musembi & Chun, 2020). Nowadays, investors are increasingly interested in investing in the capital market. From securities business statistics between 2020 and 2022, it is found that the number of customers opening accounts has continued to increase. In 2020, the number of customers who opened accounts was 2,154,900, increasing to 3,101,457 in 2021, accounting for 43.92 percent, and in 2022 the number was 3,401,106, increasing 9.66 percent. This indicates an increase in interest in investing in capital market. However, investors expect dividend returns and margins from securities trading from increased the capital gain (Bunnun & Chancharat, 2023). However, investing involves risk and uncertainty of returns. Investors need to study information before deciding to invest in allocating investment funds to be worthwhile and within the level of risk tolerance they can accept (Zaimi, 2022).

However, economic conditions inside and outside the country affect stock price index movement, resulting in fluctuations in both the price and trading volume of securities (Managi et al., 2022; Sarwar et al., 2020; Si Mohammed et al., 2023). When economic conditions change, every industry group in the capital market does not always change in the same direction as the economic condition because securities in some industries may be slightly affected by changes in economic conditions, while others may be greatly affected (Chang et al., 2020; Ghaemi Asl et al., 2022; Hashmi et al., 2022). Therefore, it is necessary to analyse securities together with economic analysis to help decide on the right industry (Thailand Securities Institute, 2011). Many studies examine the impact of economic factors on stock prices (Borteye & Peprah, 2022; Chikwira & Mohammed, 2023; Milon et al., 2023; Prieto & Lee, 2019). Chen, Roll and Ross (1986) studied the use of economic theory to explain the impact of economic factors on stock prices. The study found that various economic factors such as industrial output growth, inflation, interest rates, and oil price have an impact on the return rate of securities because stock price adjusts to the movement of economic variables. Consistent with the research of Jindal (2023), it was found that the SET industry group index was greatly influenced by oil price, exchange rate, and consumer product index (CPI). Fluctuations in these factors can have far-reaching effects on different industries. In addition, the system's gross domestic product, unemployment rate, and money supply are also economic factors that affect stock prices (Paul et al., 2023).

The previous studies indicate that the price index of securities in the capital market often moves up and down according to the economic situation. Investors should, therefore, be aware of various factors related to the stock price index due to the uncertainty of economic factors in each period, which will increase investment risk and result in fluctuations in investment returns. Therefore, it is an important reason to study how changes in economic factors affect the stock price index in SET. The results of this study will benefit

both domestic and foreign investors for use in risk assessment as a guideline for considering investing in SET, resulting in understanding and being able to predict future events to a certain extent to reduce losses caused by risks and increase returns on investments. It is also beneficial to securities companies and securities management companies by using the information obtained as tools for investment planning.

## **Objective**

This study aims to investigate the relationship between economic factors and the stock price index movement in the Stock Exchange of Thailand (SET).

## **Literature Reviews**

For decades, the capital market has been an important economic hub, providing a long-term source of both national and international capital that strengthens the financial strength of businesses and drives national economic development (Olokoyo et al., 2020). However, the capital market is sensitive to economic changes, and there is an interconnection between national capital markets (Wuthisatian, 2014). Therefore, it is necessary to study the impact on the movement of the stock price index. From the literature review, the details are as follows:

### **Oil Price and Stock Market**

Oil price is one of the important economic factors and an important fuel source. It is a key factor in transportation that cannot be replaced in the manufacturing process. Moreover, oil is also a popular product in the world market. Therefore, rising oil price fluctuations impact increased business costs and energy-dependent industries, resulting in increased future expenses. However, when considering the oil price movement across industries (Singhal et al., 2019), oil price fluctuations increase revenue if the company is an oil producer and decrease it if it is an oil user. Particularly for importing countries, an increase in oil prices will put pressure on lower exchange rates and increase inflation in the country (Trinh & Nhan, 2023). In addition, Shen and Variam's research (2018) found that changes in the value of many types of assets as a result of changes in oil prices also affect the returns of securities markets and affect the economic system, especially during periods of economic crisis (Ajmi et al., 2021; Asaad, 2021). Moreover, Rahman's research (2020) found that crude oil price negatively relates to the securities market returns. The impact depends on the industry group. In industries sensitive to oil prices, returns of securities will decrease.

### **Exchange Rate and Stock Market**

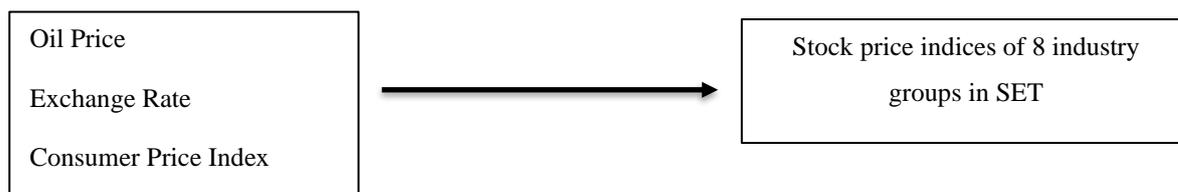
The exchange rate plays an important role in whether a company's value increases or decreases (Sikarwar & Gupta, 2019). Consistent with Chaiphath (2014) who studied the impact of foreign currency exchange rates on the capital market and found that fluctuations in the exchange rate may affect the profits

of companies listed in the securities market. A weaker domestic currency may help increase exporters' earnings, as a result, increase the competitiveness of their products in international markets (Sikarwar, 2018). The relationship between the exchange rate and stock returns has been investigated in the context of the SET Index. It was found that changes in the exchange rate between the US dollar and the Baht may affect the returns from investing in the stock market (Chancharat, et al., 2017). Investors can adjust their strategies based on the exchange rate fluctuations' expected impact on the companies' performance in the capital market (Bernal-Ponce et al., 2020; Javangwe & Takawira, 2022; Wong, 2022). Moreover, the IMF's research examines financial globalisation's impact on developing countries. Financial globalisation may cause economies to experience increased exchange rate fluctuations, which may affect trade flows and economic stability. Fluctuations in exchange rates can cause uncertainty for investors and influence market sentiment. In addition, the exchange rate movement also affects foreign investment in Thailand's stock market.

#### **Consumer Product Index and Stock Market**

The consumer product index (CPI) is an important economic indicator that shows the inflation rate, which greatly affects economic development. It reflects a general increase in the goods and services' price level or decreased spending power. Such changes may impact different sectors differently (Sathyanarayana & Gargesa, 2018). The previous studies of the relationship between inflation and capital markets found that higher inflation can lead to increased production costs for businesses. Especially in industrial sectors that rely on raw materials, it can affect the profitability and efficiency of stock prices (Eldomiaty et al., 2020; Karki, 2018). During periods of deflation or low inflation, consumer spending may decline, which affects sectors that depend on consumer demand. Investors also follow the CPI because it can influence central banks' decisions on interest rates. A higher CPI could encourage central banks to raise interest rates to reduce inflation, which could also affect business borrowing costs and stock prices. In addition, Hammoudeh et al. (2013) and Cogoljević (2018) stated that if the inflation rate increases, investors will adjust their investments to diversify investment risk that may occur in the future.

According to the review of related literature, the conceptual framework for the research has been drawn as shown in Figure 1



**Figure 1** Research Conceptual Framework of The Relationship Between Economic Factors and The Stock Price Index Movement in SET

## Methods

This quantitative research aimed to analyse the relationship between economic factors and the stock price index movement in SET by the Econometric method. The secondary data obtained from the literature review were used for analysis in this current research. The details are as follows:

### 1. Population and Sample

The research population is the stock price index in SET. This study used a purposive sampling method to be in line with the research objectives of 8 industry groups in SET consisting of Agro & Food Industry, Consumer Products, Financials, Industrials, Property & Construction, Resources, Services, and Technology (retrieved from [www.setsmart.com](http://www.setsmart.com)). Data on economic factors are oil price (retrieved from [www.investing.com](http://www.investing.com)), exchange rate (retrieved from Bank of Thailand), and consumer product index (retrieved from National Statistical Office). This study is a time series data of 60 months between January 2018 and December 2022. The scope of variables can be classified as shown in Table 1.

**Table 1** Scope of Variables

Variables	Description	Reference
Dependent Variable		
Stock Price Index	Index that reflects stock price movements within the same industry group.	Rujirangsan, K., & Chancharat, S. (2019); Chancharat, S., Sangsai, H., & Rujirangsan, K. (2017)
Independent Variable		
Oil Price (USD Per Barrel)	Crude oil price moves in the World market.	Sirimat et al. (2023) Asaad (2021)

Variables	Description	Reference
Exchange Rate (THB:USD)	Price of 1 unit of US dollar per Baht.	Paul et al. (2023) Jindal (2023) Rujirarangsana & Chancharat (2019)
Consumer product index (CPI)	Current changes in prices of goods and services compared to prices in a given year (base year).	Sirimat et al. (2023) Eldomiaty et al. (2020) Karki (2018)

## 2. Data Analysis

To study the relationship between economic factors and stock price index movement in SET using the VAR model (Vector Autoregressive Model) was a relationship analysis of time series data with many related variables. In order to make the analysis results complete and in line with the study objective, the researchers divided the data analysis into four steps with the following details:

2.1 Unit Root Test: Since the data used in the analysis is a monthly time series data, it must be tested for stationarity of the data before taking it to the next step for analysis. However, the analysis of non-stationary time series data may cause problems with unreal relationships among variables in the model (Spurious Regression). This study tested the stationarity of the data using Augment Dickey-Fuller (ADF) (Dickey & Fuller, 1979).

2.2 The optimal lag length was selected based on the Akaike Information Criteria (AIC) (Akaike, 1974). An optimal lag length will result in the lowest AIC value because VAR models analyse relationships between variables in a time series. Moreover, there is a limit on the optimal lag length that should be equal for all variables. Therefore, an optimal lag length test must be performed (Lutkepohl, 1991).

2.3 The impulse response analysis is a method that uses Impulse Response Function (IRF) to analyse the movement of time series variables according to the specified VAR model. Analysing the dynamic effects of changes from shocks caused by one variable or an impulse that affects another variable or a response for the entire system within the same and future periods.

2.4 Variance Decomposition Analysis is a method that can analyse overall changes and compare the relative proportions between the variances in the model at each period. It explains another component of the error variance that occurs in forecasts. Therefore, this study will analyse both impulse response (IRF) and variance decomposition, making the direction and size of the effect of changing the variable of interest on other variables clearer.

## Results

This research studied the relationship between economic factors and stock price index movement in SET using the VAR model to analyse monthly time series data for 60 months from January 2018 to December 2022. The researchers divided the study results into six parts as follows.

### 1. Descriptive Statistics Results

From collecting and analysing data with descriptive statistics such as mean, minimum, maximum, and standard deviation values, the results can be summarised as shown in Table 2.

**Table 2** Descriptive Statistics Results

Variables	Mean	Std. Deviation	Minimum	Maximum
ARGO	441.72	34.75	333.36	507.08
CONSUMP	99.16	20.29	61.98	151.08
FINCIAL	168.42	26.37	110.57	216.49
INDUS	118.70	23.59	64.47	163.88
PROPCON	120.52	16.46	86.81	151.49
RESOURC	210.87	19.17	150.55	247.13
SERVICE	482.33	42.54	365.17	552.87
TECH	193.70	40.45	140.70	276.97
OIL	69.53	20.47	23.34	120.08
EXC	32.34	1.79	29.99	37.92
CPI	101.06	2.96	97.17	108.06

Table 2 displays the outcomes of 11 variables using descriptive statistics. The oil price had a mean of 69.53 and SD of 20.47, the exchange rate had a mean of 32.34 and SD of 1.79, the consumer product index had a mean of 101.06 and SD of 2.96, Agro & Food Industry had a mean of 441.72 and SD of 34.75, Consumer Products had a mean of 99.16 and SD of 20.29, Financials had a mean of 168.42 and SD of 26.37, Industrials had a mean of 118.70, and SD of 23.59, Property & Construction had a mean of 120.52 and SD of 16.46, Resources had a mean of 210.87 and SD of 19.17, Services had a mean of 482.33 and SD of 42.54, and technology had a mean of 193.70 and SD of 40.45.

## 2. Result of Unit Root Test

This study tested the unit root by ADF method. From testing the data for all 11 variables at normal levels, it was found that the data for 11 variables in natural logarithm form (ln) were non-stationary at the statistical significance level of 0.01. Therefore, the first difference and a higher rank relationship were tested. All data were stationary at the first difference (order of integration equal to 1) at the statistical significance level of 0.01 as shown in Table 3.

**Table 3** Result of Unit Root Test

Variable	At Level		First Difference		Result
	T-Statistic	P-Value	T-Statistic	P-Value	
lnARGO	-2.287379	0.1794	-7.63251	0.0000	I(1)
lnCONSUMP	-0.88897	0.7851	-8.40159	0.0000	I(1)
lnFINCIAL	-1.03522	0.7351	-6.40161	0.0000	I(1)
lnINDUS	-0.81727	0.8067	-7.27786	0.0000	I(1)
lnPORPCON	-1.02444	0.7390	-8.23601	0.0000	I(1)
lnRESOURC	-2.59493	0.0997	-8.30964	0.0000	I(1)
lnSERVICE	-2.14185	0.2295	-8.72441	0.0000	I(1)
lnTECH	-1.92498	0.3189	-6.69059	0.0000	I(1)
lnOIL	-1.6376	0.4571	-6.30486	0.0000	I(1)
lnEXC	-2.87588	0.0544	-5.86423	0.0000	I(1)
lnCPI	-1.64043	0.4559	-6.40668	0.0000	I(1)

## 3. Result of Optimal Lag Length

The results of optimal lag length were the selection of the optimal number of retrospectives for the VAR Model analysis based on the Likelihood Ratio Test (LR). The optimal lag length criterion is Akaike Information Criteria (AIC), with the lowest value of the seven industry groups, including ARGO, CONSUMP, FINCIAL, INDUS, PROPCON, RESOURC, and SERVICE. The test statistics revealed that lag1 means that the stock price index, seven industry groups, oil price, exchange rate, and consumer product index (CPI) had the most impact on each other over the past month, except for the TECH industry. The statistical value of the test showed that lag2 means that the stock price, oil price, exchange rate, and consumer product index will have the most impact on each other during the past two months, as shown in Table 4.

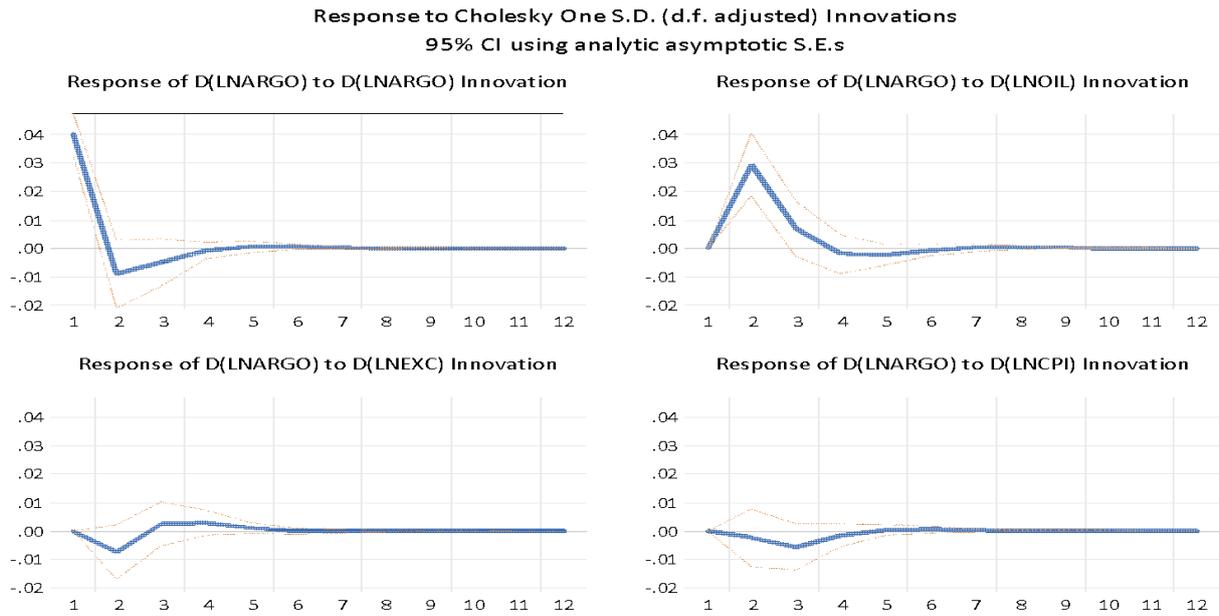
**Table 4** Results of Optimal Lag Length

ARGO			CONSUMP		FINCIAL		INDUS	
Lag	LR	AIC	LR	AIC	LR	AIC	LR	AIC
0	NA	-16.010	NA	-15.801	NA	-15.576	NA	-15.216
1	54.608*	-16.532*	47.712*	-16.182*	51.295*	-16.030*	53.553*	-15.716*
2	14.0050	-16.251	23.002	-16.101	21.383	-15.913	15.919	-15.477
3	10.0690	-16.010	14.989	-15.873	6.452	-15.477	9.287	-15.111
PROPCON			RESOURC		SERVICE		TECH	
0	NA	-15.760	NA	-15.4318	NA	-15.8295	NA	-15.637
1	60.394*	-16.400*	63.514*	-16.135*	64.449*	-16.552*	36.263	-15.785
2	15.774	-16.158	16.176	-15.902	16.255	-16.321	30.023*	-15.859*
3	10.261	-15.816	11.189	-15.582	13.096	-16.048	13.653	-15.600

Note: \* the lowest value

#### 4. Results of Impulse Response Analysis and Variance Decomposition Analysis

The impulse response analysis considers the occurrence of shocks of the stock price index in the agriculture and food industry (lnARGO), oil price (lnOIL), exchange rate (lnEXC) and consumer index (lnCPI). It was found that the stock price index in the Agriculture and Food Industry Group (lnARGO) was the most responsive to unexpected events arising from each industry index. The Agriculture and Food Industry Group (lnARGO) stock price index will decrease immediately in the 1<sup>st</sup> to 2<sup>nd</sup> month, then increase and reach equilibrium in the 7<sup>th</sup> month. The response to unexpected events caused by oil price (lnOIL) increases in the 1<sup>st</sup> to 2<sup>nd</sup> month, then drops to the lowest in the 5<sup>th</sup> month and increases again to reach equilibrium in the 7<sup>th</sup> month. Moreover, the response to unexpected events caused by the exchange rate (lnEXC) decreases in 1<sup>st</sup> to 2<sup>nd</sup> month. Then, it increases to reach equilibrium in 6<sup>th</sup> month. In addition, the response to unexpected events caused by the consumer index (lnCPI) will decrease in 1<sup>st</sup> to 3<sup>rd</sup> month, then increase again to reach equilibrium in 8<sup>th</sup> month, as shown in Figure 2.



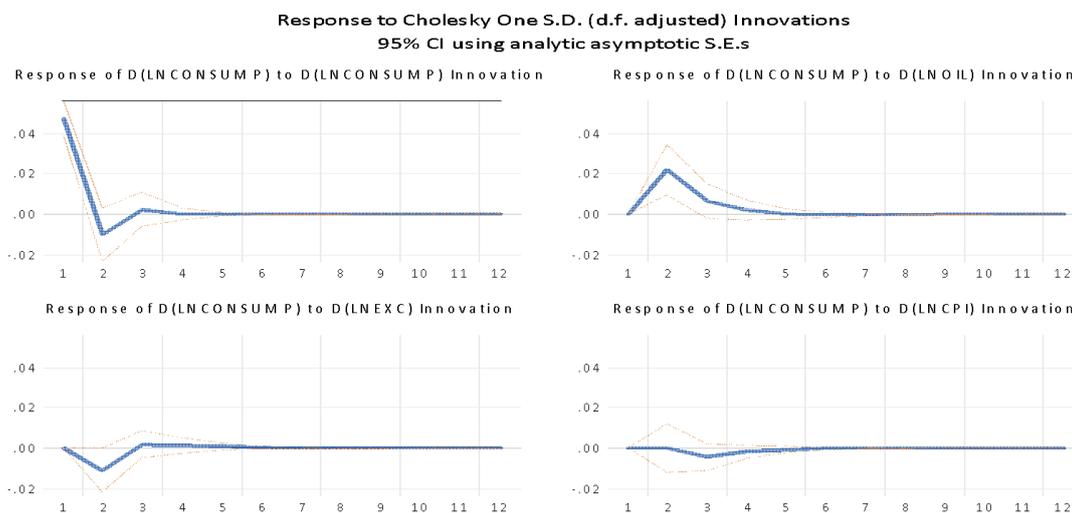
**Figure 2** Result of AGRO impulse response analysis

**Table 5** Results of ARGO variance composition analysis

ARGO					
Period	S.E.	D(LNARGO)	D(LNOIL)	D(LNEXC)	D(LNCPI)
1	0.040	100.000	0.000	0.000	0.000
2	0.051	64.477	33.157	2.123	0.244
3	0.052	62.809	33.557	2.280	1.354
4	0.052	62.452	33.518	2.584	1.445
5	0.052	62.306	33.635	2.614	1.445
6	0.052	62.291	33.642	2.613	1.453
7	0.052	62.289	33.641	2.615	1.454
8	0.052	62.288	33.642	2.615	1.454
9	0.052	62.288	33.642	2.615	1.454
10	0.052	62.288	33.642	2.615	1.454
11	0.052	62.288	33.642	2.615	1.454
12	0.052	62.288	33.642	2.615	1.454
AVERAGE		65.672	30.780	2.325	1.222

The results of the variance composition analysis of the stock price index changes in the agricultural and food industry group (lnARGO) found that in the 1<sup>st</sup> month, the fluctuation of the stock price

index change in the agricultural and food industry group (lnARGO) would affect itself 100 percent. As time passes, the impact will decrease, with an average impact of 65.67 percent, a change in the oil price (lnOIL) of 30.78 percent, a change in the exchange rate (lnEXC) of 2.32 percent, and a change in the consumer index (lnCPI) of 30.78 percent, arranged in order of relationship from the highest to the lowest (average of 12 months), as shown in Table 5.



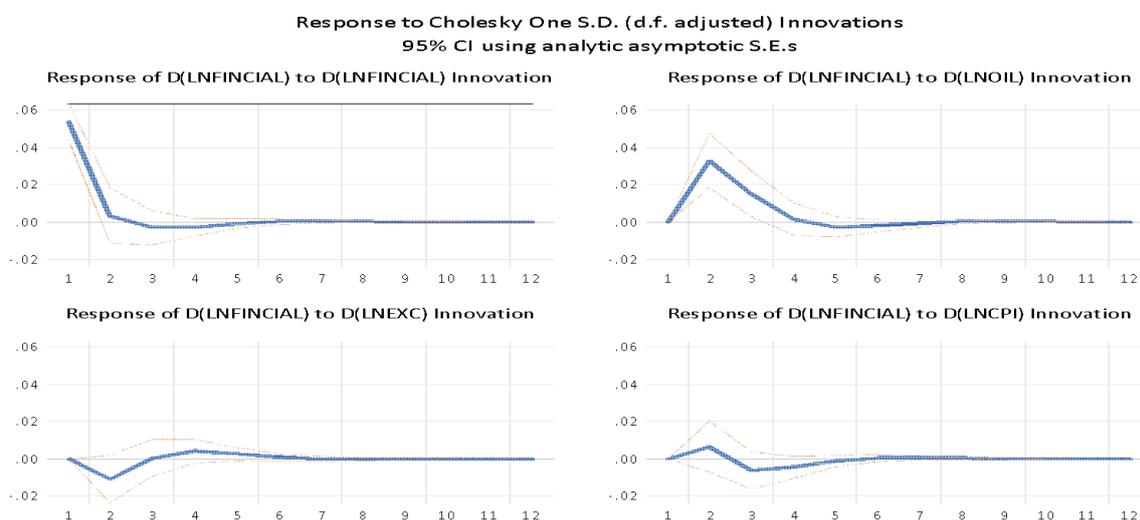
**Figure 3** Result of CONSUMP impulse response analysis

**Table 6** Results of CONSUMP variance composition analysis

CONSUMP					
Period	S.E.	D(LNCONSUMP)	D(LNOIL)	D(LNEXC)	D(LNCPI)
1	0.0472	100.000	0.000	0.000	0.000
2	0.0541	79.642	16.340	4.018	0.000
3	0.0547	77.950	17.362	4.061	0.627
4	0.0548	77.689	17.452	4.135	0.724
5	0.0549	77.649	17.446	4.171	0.734
6	0.0549	77.649	17.446	4.171	0.734
7	0.0549	77.648	17.447	4.171	0.734
8	0.0549	77.647	17.447	4.171	0.734
9	0.0549	77.647	17.447	4.171	0.734
10	0.0549	77.647	17.447	4.171	0.734
11	0.0549	77.647	17.447	4.171	0.734
12	0.0549	77.647	17.447	4.171	0.734
AVERAGE		79.705	15.894	3.799	0.602

The impulse response analysis considers the occurrence of shocks of the stock price index in the consumer product (lnCONSUMP), oil price (lnOIL), exchange rate (lnEXC) and consumer index (lnCPI). It was found that the stock price index in the consumer product (lnCONSUMP) was the most responsive to unexpected events arising from each industry index. The consumer product (lnCONSUMP) stock price index will decrease immediately in the 1<sup>st</sup> to 2<sup>nd</sup> month, then increase and reach equilibrium in the 4<sup>th</sup> month. The response to unexpected events caused by oil price (lnOIL) increases in the 1<sup>st</sup> to 2<sup>nd</sup> month, then drops to reach equilibrium in the 5<sup>th</sup> month. Moreover, the response to unexpected events caused by the exchange rate (lnEXC) decreases in 1<sup>st</sup> to 2<sup>nd</sup> month. Then, it increases to reach equilibrium in 6<sup>th</sup> month. In addition, the response to unexpected events caused by the consumer index (lnCPI) will occur in 2<sup>nd</sup> to 3<sup>rd</sup> month, then increase again to reach equilibrium in 7<sup>th</sup> month, as shown in Figure 3.

The results of the variance composition analysis of the stock price index changes in the consumer product (lnCONSUMP) found that in the 1<sup>st</sup> month, the fluctuation of the stock price index change in the consumer product (lnCONSUMP) would affect itself 100 percent. As time passes, the impact will decrease, with an average impact of 79.71 percent, a change in the oil price (lnOIL) of 15.90 percent, a change in the exchange rate (lnEXC) of 3.80 percent, and a change in the consumer index (lnCPI) of 0.60 percent, arranged in order of relationship from the highest to the lowest (average of 12 months), as shown in Table 6.



**Figure 4** Result of FINCIAL impulse response analysis

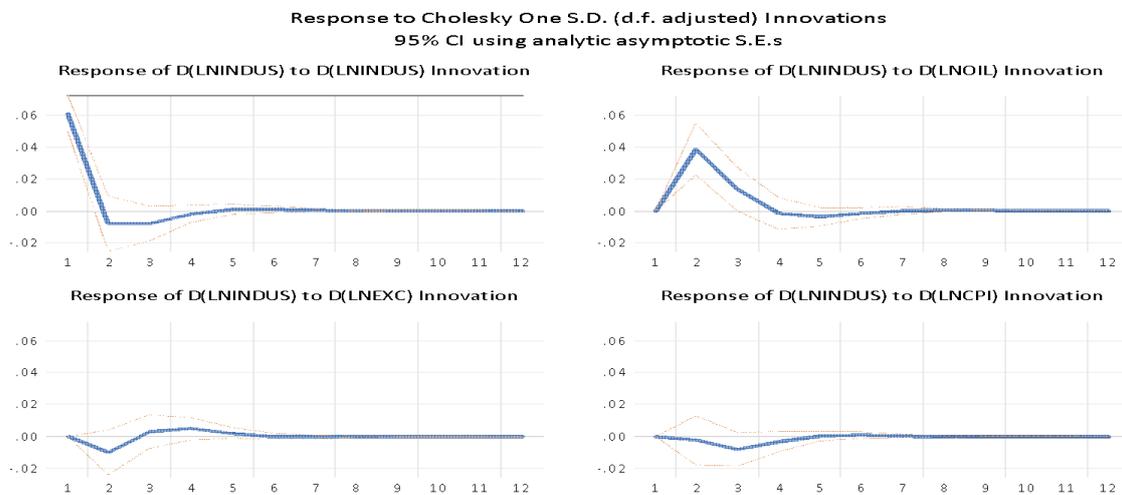
**Table 7** Results of FINCIAL variance composition analysis

FINCIAL					
Period	S.E.	D(LNFICIAL)	D(LNOIL)	D(LNEXC)	D(LNCPI)
1	0.0534	100.000	0.000	0.000	0.000
2	0.0641	69.710	26.331	2.953	1.006
3	0.0662	65.686	29.710	2.779	1.825
4	0.0665	65.189	29.446	3.091	2.274
5	0.0666	64.968	29.510	3.222	2.300
6	0.0667	64.894	29.577	3.228	2.301
7	0.0667	64.884	29.580	3.229	2.308
8	0.0667	64.881	29.579	3.230	2.309
9	0.0667	64.880	29.580	3.231	2.309
10	0.0667	64.880	29.580	3.231	2.309
11	0.0667	64.880	29.580	3.231	2.309
12	0.0667	64.880	29.580	3.231	2.309
AVERAGE		68.311	26.838	2.888	1.963

The impulse response analysis considers the occurrence of shocks of the stock price index in the financial (lnFINCIAL), oil price (lnOIL), exchange rate (lnEXC) and consumer index (lnCPI). It was found that the stock price index in the financial (lnFINCIAL) was the most responsive to unexpected events arising from each industry index. The financial (lnFINCIAL) stock price index will decrease immediately in the 1<sup>st</sup> to 4<sup>th</sup> month, then increase and reach equilibrium in the 6<sup>th</sup> month. The response to unexpected events caused by oil price (lnOIL) increases in the 1<sup>st</sup> to 2<sup>nd</sup> month, then drops to reach equilibrium in the 8<sup>th</sup> month. Moreover, the response to unexpected events caused by the exchange rate (lnEXC) decreases in 1<sup>st</sup> to 2<sup>nd</sup> month. Then, it increases to reach equilibrium in 7<sup>th</sup> month. In addition, the response to unexpected events caused by the consumer index (lnCPI) will increase immediately in 1<sup>st</sup> to 2<sup>nd</sup> month, then decrease to equilibrium in 6<sup>th</sup> month, as shown in Figure 4.

The results of the variance composition analysis of the stock price index changes in the financial (lnFINCIAL) found that in the 1<sup>st</sup> month, the fluctuation of the stock price index change in the financial (lnFINCIAL) would affect itself 100 percent. As time passes, the impact will decrease, with an average impact of 68.31 percent, a change in the oil price (lnOIL) of 26.84 percent, a change in the exchange rate

(lnEXC) of 2.89 percent, and a change in the consumer index (lnCPI) of 1.96 percent, arranged in order of relationship from the highest to the lowest (average of 12 months), as shown in Table 7.



**Figure 5** Result of INDUS impulse response analysis

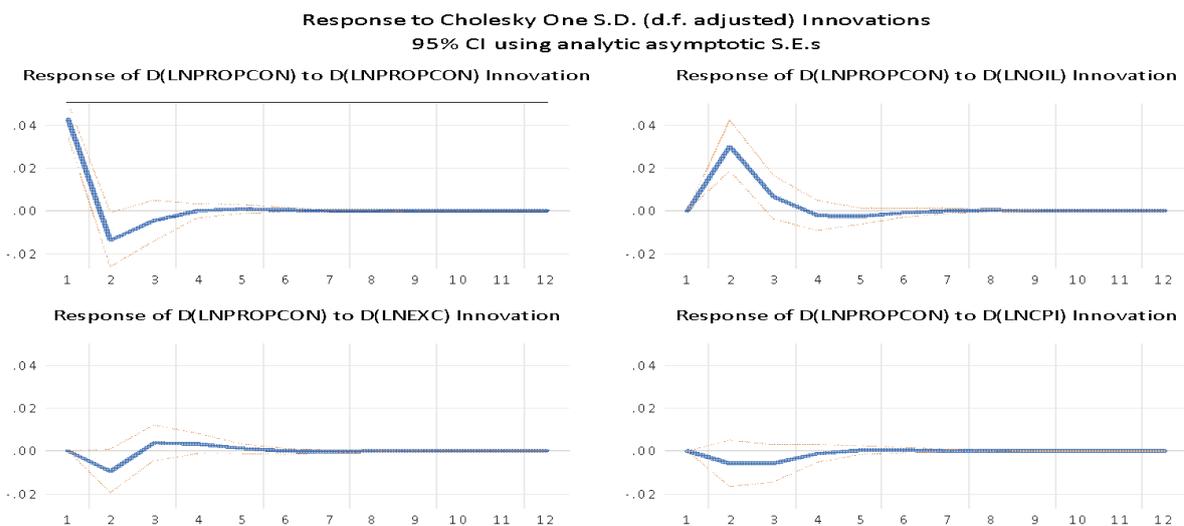
**Table 8** Results of INDUS variance composition analysis

INDUS					
Period	S.E.	D(LNINDUS)	D(LNOIL)	D(LNEXC)	D(LNCPI)
1	0.0605	100.000	0.000	0.000	0.000
2	0.0729	70.039	27.966	1.895	0.101
3	0.0751	67.259	29.575	1.948	1.217
4	0.0754	66.842	29.409	2.346	1.403
5	0.0755	66.621	29.572	2.410	1.398
6	0.0755	66.587	29.595	2.408	1.409
7	0.0755	66.584	29.593	2.411	1.412
8	0.0755	66.581	29.595	2.412	1.412
9	0.0755	66.581	29.595	2.412	1.412
10	0.0755	66.581	29.595	2.412	1.412
11	0.0755	66.581	29.595	2.412	1.412
12	0.0755	66.581	29.595	2.412	1.412
AVERAGE		69.736	26.974	2.123	0.051

The impulse response analysis considers the occurrence of shocks of the stock price index in the industry (lnINDUS), oil price (lnOIL), exchange rate (lnEXC) and consumer index (lnCPI). It was found

that the stock price index in the industry (lnINDUS) was the most responsive to unexpected events arising from each industry index. The industry (lnINDUS) stock price index will decrease immediately in the 1<sup>st</sup> to 3<sup>rd</sup> month, then increase and reach equilibrium in the 7<sup>th</sup> month. The response to unexpected events caused by oil price (lnOIL) increases in the 1<sup>st</sup> to 2<sup>nd</sup> month, then increases to reach equilibrium in the 5<sup>th</sup> month. Moreover, the response to unexpected events caused by the exchange rate (lnEXC) decreases in 1<sup>st</sup> to 2<sup>nd</sup> month. Then, it increases to reach equilibrium in 6<sup>th</sup> month. In addition, the response to unexpected events caused by the consumer index (lnCPI) will decrease in 1<sup>st</sup> to 3<sup>rd</sup> month, then increase again to reach equilibrium in 8<sup>th</sup> month, as shown in Figure 5.

The results of the variance composition analysis of the stock price index changes in the industry (lnINDUS) found that in the 1<sup>st</sup> month, the fluctuation of the stock price index change in the industry (lnINDUS) would affect itself 100 percent. As time passes, the impact will decrease, with an average impact of 69.74 percent, a change in the oil price (lnOIL) of 26.97 percent, a change in the exchange rate (lnEXC) of 2.12 percent, and a change in the consumer index (lnCPI) of 0.05 percent, arranged in order of relationship from the highest to the lowest (average of 12 months), as shown in Table 8.



**Figure 6** Result of PROPCON impulse response analysis

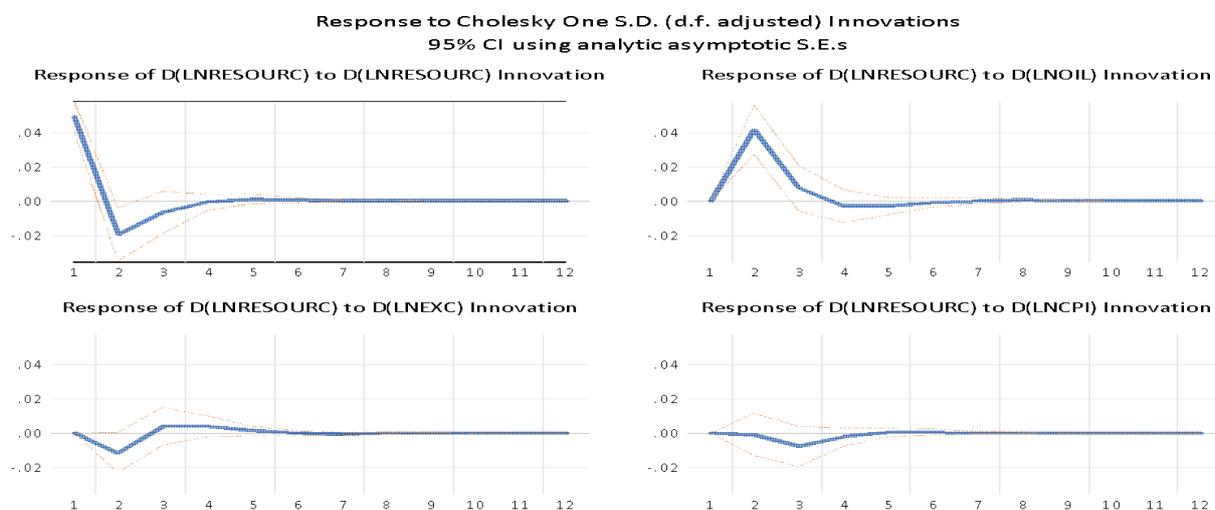
**Table 9** Results of PROPCON variance composition analysis

PROPCON					
Period	S.E.	D(LNPROPCON)	D(LNOIL)	D(LNEXC)	D(LNCPI)
1	0.0429	100.000	0.000	0.000	0.000
2	0.0556	65.592	30.346	2.967	1.096
3	0.0566	63.961	30.638	3.286	2.116
4	0.0567	63.583	30.608	3.649	2.160
5	0.0568	63.458	30.706	3.675	2.161
6	0.0568	63.445	30.712	3.675	2.168
7	0.0568	63.443	30.711	3.677	2.169
8	0.0568	63.442	30.712	3.677	2.169
9	0.0568	63.442	30.712	3.677	2.169
10	0.0568	63.442	30.712	3.677	2.169
11	0.0568	63.442	30.712	3.677	2.169
12	0.0568	63.442	30.712	3.677	2.169
AVERAGE		66.724	28.107	3.276	1.893

The impulse response analysis considers the occurrence of shocks of the stock price index in the property and construction group (lnPROPCON), oil price (lnOIL), exchange rate (lnEXC) and consumer index (lnCPI). It was found that the stock price index in the c property and construction group (lnPROPCON) was the most responsive to unexpected events arising from each industry index. The property and construction group (lnPROPCON) stock price index will decrease immediately in the 1<sup>st</sup> to 2<sup>nd</sup> month, then increase and reach equilibrium in the 6<sup>th</sup> month. The response to unexpected events caused by oil price (lnOIL) increases in the 1<sup>st</sup> to 2<sup>nd</sup> month, then increases to reach equilibrium in the 7<sup>th</sup> month. Moreover, the response to unexpected events caused by the exchange rate (lnEXC) decreases in 1<sup>st</sup> to 2<sup>nd</sup> month. Then, it increases to reach equilibrium in 6<sup>th</sup> month. In addition, the response to unexpected events caused by the consumer index (lnCPI) will decrease in 1<sup>st</sup> to 3<sup>rd</sup> month, then increase again to reach equilibrium in 6<sup>th</sup> month, as shown in Figure 6.

The results of the variance composition analysis of the stock price index changes in the property and construction group (lnPROPCON) found that in the 1<sup>st</sup> month, the fluctuation of the stock price index change in the property and construction group (lnPROPCON) would affect itself 100 percent. As time passes, the impact will decrease, with an average impact of 79.71 percent, a change in the oil price (lnOIL) of 15.90 percent, a change in the exchange rate (lnEXC) of 3.80 percent, and a change in the consumer

index (lnCPI) of 0.60 percent, arranged in order of relationship from the highest to the lowest (average of 12 months), as shown in Table 9.



**Figure 7** Result of RESOURC impulse response analysis

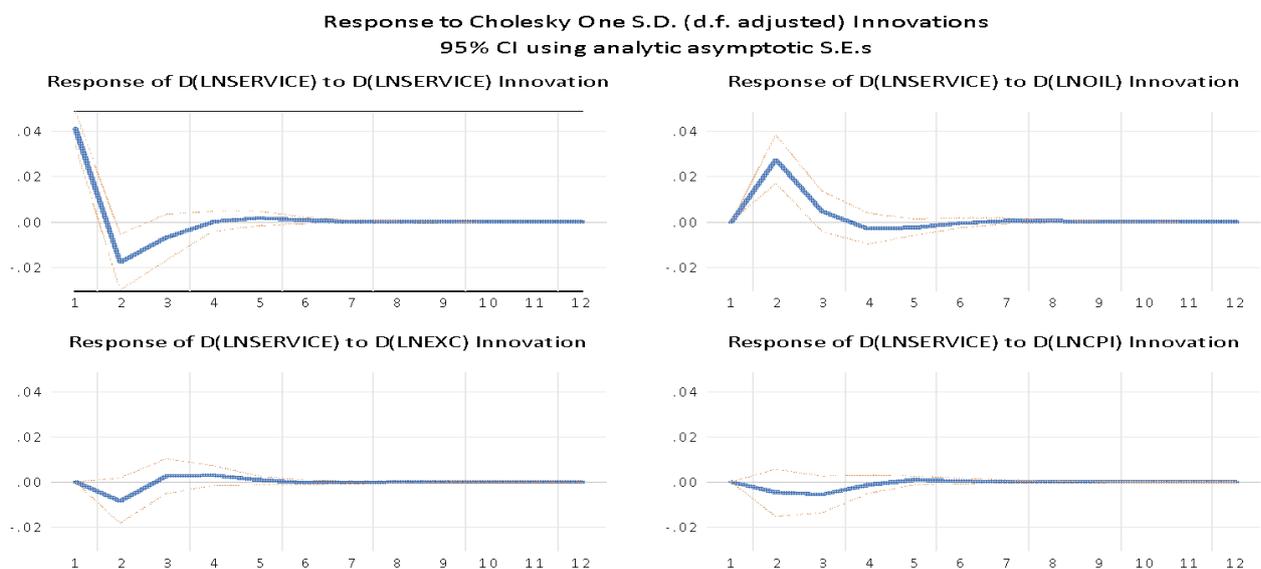
**Table 10** Results of RESOURC variance composition analysis

RESOURC					
Period	S.E.	D(LNRESOURC)	D(LNOIL)	D(LNEXC)	D(LNCPI)
1	0.0488	100.000	0.000	0.000	0.000
2	0.0678	60.112	37.017	2.855	0.016
3	0.0690	58.881	36.789	3.075	1.255
4	0.0692	58.526	36.766	3.361	1.346
5	0.0693	58.404	36.865	3.384	1.346
6	0.0694	58.395	36.867	3.384	1.354
7	0.0694	58.393	36.867	3.386	1.355
8	0.0694	58.392	36.867	3.386	1.355
9	0.0694	58.392	36.867	3.386	1.355
10	0.0694	58.392	36.867	3.386	1.355
11	0.0694	58.392	36.867	3.386	1.355
12	0.0694	58.392	36.867	3.386	1.355
AVERAGE		62.056	33.792	3.031	1.121

The impulse response analysis considers the occurrence of shocks of the stock price index in the resource (lnRESOURC), oil price (lnOIL), exchange rate (lnEXC) and consumer index (lnCPI). It was

found that the stock price index in the resource (lnRESOURC) was the most responsive to unexpected events arising from each industry index. The resource (lnRESOURC) stock price index will decrease immediately in the 1<sup>st</sup> to 2<sup>nd</sup> month, then increase and reach equilibrium in the 6<sup>th</sup> month. The response to unexpected events caused by oil price (lnOIL) increases in the 1<sup>st</sup> to 2<sup>nd</sup> month, then increases to reach equilibrium in the 7<sup>th</sup> month. Moreover, the response to unexpected events caused by the exchange rate (lnEXC) decreases in 1<sup>st</sup> to 2<sup>nd</sup> month. Then, it increases to reach equilibrium in 6<sup>th</sup> month. In addition, the response to unexpected events caused by the consumer index (lnCPI) will decrease in 1<sup>st</sup> to 3<sup>rd</sup> month, then increase again to reach equilibrium in 6<sup>th</sup> month, as shown in Figure 7.

The results of the variance composition analysis of the stock price index changes in the resource (lnRESOURC) found that in the 1<sup>st</sup> month, the fluctuation of the stock price index change in the resource (lnRESOURC) would affect itself 100 percent. As time passes, the impact will decrease, with an average impact of 62.06 percent, a change in the oil price (lnOIL) of 33.80 percent, a change in the exchange rate (lnEXC) of 3.03 percent, and a change in the consumer index (lnCPI) of 1.12 percent, arranged in order of relationship from the highest to the lowest (average of 12 months), as shown in Table 10



**Figure 8** Result of SERVICE impulse response analysis

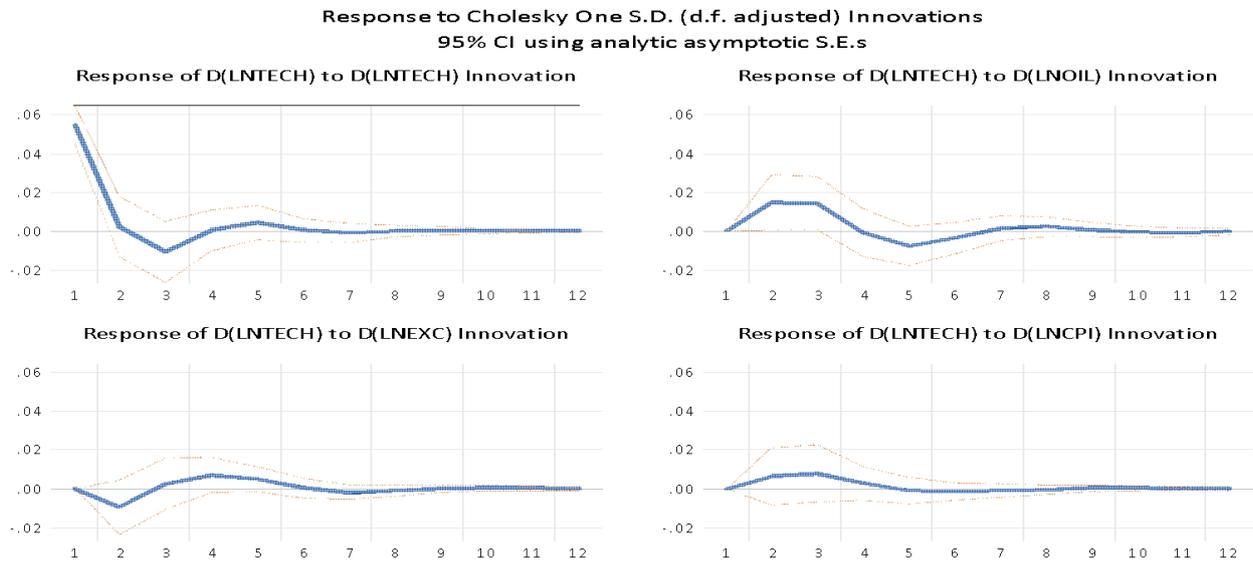
**Table 11** Results of SERVICE variance composition analysis

SERVICE					
Period	S.E.	D(LNSERVICE)	D(LNOIL)	D(LNEXC)	D(LNCPI)
1	0.0412	100.000	0.000	0.000	0.000
2	0.0536	70.135	26.600	2.458	0.807
3	0.0546	69.177	26.417	2.616	1.789
4	0.0548	68.737	26.563	2.882	1.818
5	0.0549	68.605	26.673	2.895	1.827
6	0.0549	68.598	26.671	2.895	1.835
7	0.0549	68.594	26.673	2.898	1.835
8	0.0549	68.593	26.674	2.898	1.835
9	0.0549	68.593	26.674	2.898	1.835
10	0.0549	68.593	26.674	2.898	1.835
11	0.0549	68.593	26.674	2.898	1.835
12	0.0549	68.593	26.674	2.898	1.835
AVERAGE		71.401	24.414	2.595	1.591

The impulse response analysis considers the occurrence of shocks of the stock price index in the service (lnSERVICE), oil price (lnOIL), exchange rate (lnEXC) and consumer index (lnCPI). It was found that the stock price index in the service (lnSERVICE) was the most responsive to unexpected events arising from each industry index. The service (lnSERVICE) stock price index will decrease immediately in the 1<sup>st</sup> to 2<sup>nd</sup> month, then increase and reach equilibrium in the 7<sup>th</sup> month. The response of service (lnSERVICE) stock price to unexpected events caused by oil price (lnOIL) increases in the 1<sup>st</sup> to 2<sup>nd</sup> month, then increases to reach equilibrium in the 8<sup>th</sup> month. Moreover, the response to unexpected events caused by the exchange rate (lnEXC) decreases in 1<sup>st</sup> to 2<sup>nd</sup> month. Then, it increases to reach equilibrium in 7<sup>th</sup> month. In addition, the response to unexpected events caused by the consumer index (lnCPI) will decrease in 1<sup>st</sup> to 3<sup>rd</sup> month, then increase again to reach equilibrium in 6<sup>th</sup> month, as shown in Figure 8.

The results of the variance composition analysis of the stock price index changes in the service (lnSERVICE) found that in the 1<sup>st</sup> month, the fluctuation of the stock price index change in the service (lnSERVICE) would affect itself 100 percent. As time passes, the impact will decrease, with an average impact of 71.40 percent, a change in the oil price (lnOIL) of 24.41 percent, a change in the exchange rate

(lnEXC) of 2.60 percent, and a change in the consumer index (lnCPI) of 1.59 percent, arranged in order of relationship from the highest to the lowest (average of 12 months), as shown in Table 11.



**Figure 9** Result of TECH impulse response analysis

**Table 12** Results of TECH variance composition analysis

<b>TECH</b>					
<b>Period</b>	<b>S.E.</b>	<b>D(LNTECH)</b>	<b>D(LNOIL)</b>	<b>D(LNEXC)</b>	<b>D(LNCPI)</b>
1	0.0548	100.000	0.000	0.000	0.000
2	0.0580	89.409	6.660	2.679	1.251
3	0.0613	83.108	11.563	2.559	2.770
4	0.0618	81.816	11.405	3.843	2.936
5	0.0626	80.109	12.636	4.374	2.881
6	0.0627	79.814	12.912	4.360	2.914
7	0.0628	79.680	12.944	4.434	2.942
8	0.0628	79.535	13.064	4.456	2.944
9	0.0629	79.524	13.074	4.456	2.946
10	0.0629	79.506	13.083	4.460	2.951
11	0.0629	79.492	13.096	4.461	2.951
12	0.0629	79.491	13.096	4.461	2.951
AVERAGE		82.624	11.128	3.712	2.536

The impulse response analysis considers the occurrence of shocks of the stock price index in the technology (lnTECH), oil price (lnOIL), exchange rate (lnEXC) and consumer index (lnCPI). It was found that the stock price index in the technology (lnTECH) was the most responsive to unexpected events arising from each industry index. The technology (lnTECH) stock price index will decrease immediately in the 1<sup>st</sup> to 3<sup>rd</sup> month, then increase and reach equilibrium in the 8<sup>th</sup> month. The response to unexpected events caused by oil price (lnOIL) increases in the 1<sup>st</sup> to 3<sup>rd</sup> month, then increases to reach equilibrium in the 10<sup>th</sup> month. Moreover, the response to unexpected events caused by the exchange rate (lnEXC) decreases in 1<sup>st</sup> to 2<sup>nd</sup> month. Then, it increases to reach equilibrium in 9<sup>th</sup> month. In addition, the response to unexpected events caused by the consumer index (lnCPI) will increase in 1<sup>st</sup> to 3<sup>rd</sup> month, then increase again to reach equilibrium in 9<sup>th</sup> month, as shown in Figure 9.

The results of the variance composition analysis of the stock price index changes in the technology (lnTECH) found that in the 1<sup>st</sup> month, the fluctuation of the stock price index change in the technology (lnTECH) would affect itself 100 percent. As time passes, the impact will decrease, with an average impact of 82.62 percent, a change in the oil price (lnOIL) of 11.13 percent, a change in the exchange rate (lnEXC) of 3.71 percent, and a change in the consumer index (lnCPI) of 2.54 percent, arranged in order of relationship from the highest to the lowest (average of 12 months), as shown in Table 12.

### Summary of Impulse Response Results

A study of the analysis of impulse response by using variables to analyse the period and direction of impact on changes in the stock price index of 8 industrial groups can be summarised as follows.

**Table 13** Summary of Impulse Response analysis and relationship direction.

Variable	Stock Price Index <sub>t-1</sub>		lnOIL		lnEXC		lnCPI	
	Period (month)	Directio n	Period (month)	Directio n	Period (month)	Directio n	Period (month)	Directio n
lnARGO	7	+,-	7	+,-	6	+,-	8	+,-
lnCONSUMP	4	+,-	5	+	6	-	7	+,-
lnFINCIAL	6	+,-	8	+,-	7	+-	6	+,-
lnINDUS	7	+,-	7	+,-	6	+,-	8	+,-
lnPORPCON	6	+,-	7	+,-	6	+,-	6	+,-
lnRESOURC	6	+,-	7	+,-	6	+,-	6	+,-
lnSERVICE	7	+,-	8	+,-	7	+,-	6	+,-
lnTECH	8	+,-	10	+,-	9	+,-	9	+,-

Note: + Factors that positively affect changes in the stock price index of industrial groups  
- Factors that negatively affect changes in the stock price index of industrial groups

According to Table 13, the impulse response analysis found that the stock price index of the CONSUMP industry group has the lowest 5-month average correlation with the stock price index, and the highest was the 7-month average. The TECH group has the highest correlation with the average stock price index for nine months, and the highest for 10 months. As for the industrial groups ARGO, FINCIAL, INDUS, PORPCON, RESOURC, and SERVICE, most of which have an average of 7 months and a maximum of 8 months. The relationship direction of the stock price index of 8 industry groups has both positive and negative relationship directions.

## Discussion

From the analysis of the relationship between economic factors and stock price index movement in SET using monthly data for 60 months, namely January 2018 to December 2022. The stock price index of the industry groups used in the study has eight industry groups, including the oil price, exchange rate, and consumer index. The data were analysed in terms of time and direction of the relationship and the percentage of variance determination of changes in the stock price index for each industry using the VAR technique. The study results indicate that changes in the stock price index for each industry depend mainly on changes in the stock price index in the past, followed by oil price, exchange rate, and consumer product index, respectively. Changing the stock price index for each industry in the past, most of them affected the change in the stock price index for each industry group. The first three orders are TECH, CONSUMP, SERVICE. It will affect 82.62 percent, 79.70 percent, and 71.40 percent, respectively. Oil price changes affect the stock price index for each industry group the most, the first three being RESOURC, ARGO, and PROPON. On average, it will affect 33.79 percent, 30.78 percent, and 28.11 percent, respectively. This results in fluctuations up and down in each period. The exchange rate and consumer product index only slightly affect the changes in the stock price index for each industry group. The results of the data analysis show that in explaining the relationship between the stock price index and oil price (Sirimat et al., 2023; Asaad, 2021), the exchange rate (Paul et al., 2023; Jindal, 2023; Rujirarangsana & Chancharat, 2019), and consumer index (Sirimat et al., 2023; Eldomiaty et al., 2020; Karki, 2018) are the main factors that reflect securities trading behavior and changes in the stock price index. It can be said that SET is still an inefficient market. This may affect the reliability of information announcements from both the public and private sectors because the stock price may not move with the company's operating results. Therefore, in securities analysis for deciding to buy and sell securities listed on Stock Exchange of Thailand, one cannot rely on

only one method of fundamental analysis in securities analysis. This study suggests that fundamental analysis should be combined with technical analysis to make more complete stock price predictions.

## Suggestions

By studying economic factors on stock price index movement on SET in 8 industrial groups, both domestic and foreign investors can predict the stock price index of each industry group from macroeconomic changes to prevent risks arising from fluctuations that may occur. For this reason, investors should consider oil prices, exchange rates, and consumer product indexes in making investment decisions. In addition, as Thailand's capital market supervisory board, SEC should implement a policy for businesses registered in the securities market to protect against risks from fluctuations in macroeconomic factors for promoting efficient investment and creating sustainable development of the Thai capital market. Besides, the contributions of this research, it also has some limitations. The economic factors employed for this study were synthesised by Thai context. However, there are other factors that may have potentially relevant for the stock price index movement. So that, further study may investigate other factors.

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