# INVESTMENT PATTERNS, BEHAVIOR AND ANALYSIS OF INVESTOR GROUPS IN THAI STOCK MARKET


**BY**

**MR. WEERACHOTE SANTIMAETANEEDOL**


**AN INDEPENDENT STUDY SUBMITTED 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**
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ENTITLED

INVESTMENT PATTERNS, BEHAVIOR AND ANALYSIS OF INVESTOR GROUPS IN THAI STOCK MARKET

was approved as partial fulfillment of the requirements for
the degree of Master of Science (Finance)

on 06 JAN 2017

Chairman _____
(Visit Ongpipattanakul, DBA.)

Member and Advisor _____
(Associate Professor Arnat Leemakdej, DBA.)

Dean _____
(Associate Professor Pipop Udorn, Ph.D.)

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| Independent Study Title | INVESTMENT PATTERNS, BEHAVIOR AND ANALYSIS OF INVESTOR GROUPS IN THAI STOCK MARKET |
| Author | Mr. Weerachote Santimaetaneedol |
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## ABSTRACT

The purpose of this study is to empirically identify the trading style of four different investor groups in the Stock Exchange of Thailand or SET and the Market for Alternative Investment or mai. Our unique dataset includes aggregate daily investment flow data from the Stock Exchange of Thailand (SET). We could see the increasingly more significant role and impact of trading of Institutes and Local investor in both SET and mai. In some major unexpected event that the market was in the highly volatile, we could see in many cases that Institutes and Local investor can play the significant role in stabilizing the market index. It could imply that the most recent data that we use in this study could prove that there are some degree of structural change of the role and trading style or strategy of each investor group in the Thai stock and the markets both the SET and the mai in comparison with the prior study since 1995-1998.

**Keywords**: Investment behavior, Investor group, Stock Exchange of Thailand (SET)

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I would like to say thank you very much and highly appreciate to my adviser, Associate Professor Arnat Leemakdej, DBA. and Ajarn Visit Ongpipattanakul, DBA. for the precious advices, recommendations and great support in all academic aspects as well as their real work experiences in Thai capital market and investment to my accomplishment of this Independent Study which is the vey essential part in completing the requirement in order to graduate from the Master in Finance (MIF), Thammasat University. I am truly grateful.

Mr. Weerachote Santimaetaneedol

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# CHAPTER 1
# INTRODUCTION

Nowadays there has been being a consistently argument that investors' decision making are affected by information about fundamental valuation or by psychological components. There are two categories of theoretical trading models have been developed to illustrate the two possible influences of behavior. The first one is the information-based class of models indicates that trading is based on informational benefits. These models suggest that informed investor trading would show a positive feedback, or momentum of trading pattern, which is high (low) profit in one period leads to a more intensive buying (selling) of stock by investor in the subsequent period. This herding pattern is the consequent of a group of investors trading in the same direction (or positively correlated) with information signals. Whereas the second model, behavioral-based models define that investor decisions are affected by cognitive errors such as overconfidence and disposition effect. These behavioral models also advise that a positive trading pattern can be demonstration of investor overconfidence. Therefore, both information-based and behavioral-based theories anticipate that investor may take part in positive feedback trading.

The source of positive feedback trading can be indicated by investment outcome was proposed by Nofsinger and Sias in 1999. Their concept is positive feedbacks trading that generate high profit show that the information stimulates the trading. Positive feedback trading that generates a low profit indicates a behavioral-based motivation. For instance, an empirical study by Barber and Odean (2001) indicated that poor investment accomplishment is linked with investor's cognitive error and overconfidence.

As a result, the being of a positive feedback trading pattern could indicate an informed trader that will generate high profit (information models) or an investor affected by psychological biases that will get low profit (behavioral models). As the two groups of models forecast different results, which group best describes investor behavior? Our study provides proof that each explanation can explain an investor type. Moreover, we would like to prove that whether or not both information-based

and behavioral-based positive feedback trading can exist in the same market which in this case happens in Thai stock market?

Definitely, investors may use investing strategies that do not indicate themselves as positive feedback trading. A contrarian strategy, or value investing, would demonstrate itself as a negative feedback pattern. That is, after stock prices decrease and become cheaper relative to its fair value, value investors buy. Therefore, investor buying after a negative return had occurred, which is called negative feedback trading. Eventually, investors may trade using strategies that are not connected with historical market returns, such as indexing or trades based on their needs for liquidity. Whereas theory proposes that investor trading may be identified by specific trading patterns, like positive feedback trading, empirical studies can identify the actual trading patterns of investor groups.

The purpose of this study is to empirically identify the trading style of four different investor groups in the Stock Exchange of Thailand or SET and the Market for Alternative Investment or mai. The "Market for Alternative Investment (mai)" was established under The Securities Exchange of Thailand Act. The mai's purpose is to create new fund-raising chances for high potential growth of innovative business as well as provide a greater scope of investment options. It officially began operations on June 21, 1999. Those four groups are local individual investors, foreign investors, institutional investors and proprietary trading by securities firms. To be consistent with theoretical models, we first look for the positive and negative feedback trading patterns. Where positive feedback trading exists, we try to recognize its motivation (information-based or behavioral-based) using the post trading profit. The linkage of the Stock Exchange of Thailand or SET and the Market for Alternative Investment or mai for studying the behavior and influence or impact of each investor group with the return on stock market could be defined as some little contribution over the prior studies.

As we know that the role of each investor group or the strength of impact of its trading style could change over time. We have some assumptions regarding the structural changes in the Thai stock market or SET and the Market for Alternative Investment or Mai. Since the year 1999, Thai government has approved the law to change or amend the law to allow foreign investor to own share of Thai corporations

both listed and non-listed firms indirectly by using the nominee shareholder as we ever heard like Kularb Kaew, Saowanee Holding, Shin Corporation (at that time was sold the majority of shares to Temasec Holding of Singaporean government) and other holding companies which have some proportion owned by foreign investors such as the commercial banks and insurance firms and Telecommunication firms in Thailand nowadays that usually have quite strong foreign alliances to support and sustain their upcoming highly growth of business as well as its expansion. At that time, we could see some foreign investor came to invest in Thailand increasingly over time after the Asian financial crisis in 1997 that have made Thai baht currency highly depreciated against the US dollar. The Thai government policies at that time highly encouraged both foreign direct investment as well as the investment in the stock market.

We also could see the rise of institutional investor that gain on tax reduction privilege on investing in Retirement Mutual Fund or RMF since the year 2001 and the later on the coming of Long-term Equity Fund or LTF in 2004. All these things could make some potentially significant changing of behavior or trading style of each individual investor group. Thai capital market development could be one of the major reasons of increasing the number of investors in all type or group and the volume and value of stock trading turnover as well. We could see the establishment of Thailand Futures Exchange (TFEX), a subsidiary of the Stock Exchange of Thailand (SET), was established on May 17, 2004 as a derivatives exchange. TFEX has started its operation to trade derivatives products from the SEC since Feb 11, 2005. We see a lot of new investors coming into the stock market because of the innovative of financial technology or Fintech that generate the more convenience way of trading platform by using the advanced computer programming or the Algorithmic trading that encourage the even higher frequency trading than before.

Our unique dataset includes aggregate daily investment flow data from the Stock Exchange of Thailand (SET). We use daily data of returns of Thai stock market or SET and the daily net buying value of investor group from 23 December, 2013 to 20 December, 2016 (totally 729 observations). We obtained these data from the SETSMART (SET Market Analysis and Reporting Tool) which is the web-based application from the Stock Exchange of Thailand. This data gives us the chance to

investigate something that is unique. Whereas most studies of investor behavior study trading patterns connected with individual stocks, we investigate behavior associated with aggregate market timing. The data set also has several other advantages over prior studies. Specific advantages of this dataset are the most recent dataset, the short intervals (daily), and the division of flow data into four different types of investor group.

# CHAPTER 2
# REVIEW OF LITERATURE

(Anya Khanthavit 1998)

This study explored the information and trading behavior of investors in the Thai stock market. This market was an important emerging market in the Pacific region, whose structure was different from that of a more advanced market. He proposed a vector autoregressive model (VAR) to describe and test action and reaction of the portfolio reallocation of investors and the movement of stock prices over time. Using daily market data from January 3, 1995 to October 27 1997, this study found that, in the Thai market, the foreign investors bought stocks when prices had risen. This strategy was consistent with a positive autocorrelation in the stock return. The local individual investors bought stocks when prices had fallen, while the local institutional investors ignored price changes in the past. These two investor groups also indicated herd behavior of both informational cascades and interpersonal communications types. They followed each other and reacted negatively to an innovation or an error term in the stock return. It was appealing to find that the foreign investors brought new information into the market. The local individual and local institutional investors brought in noise, but the describing part of this noisy information in the stock volatility was so small. Thus, the study ended up with the conclusion that the volatility in the Thai stock market was not too much.

(Kamesaka, Nofsinger, Kawakita 2003)

They investigated the investment patterns and performance of foreign investors, individual investors, and five types of institutional investors by using weekly total investment flow from Japan. From the sample period, they found that brokerage firms, banks, and foreign investors perform well. Individual investors perform unsuccessfully. They also found that foreign investor trading was correlated with positive feedback market timing and that this trading could gains high profit. Alternatively, individual investors used positive feedback trading in their market timing but get low profit. Therefore, they verified evidence that was consistent with information-based models (foreign investors) and behavioral based models (individual

investors). It was an especially new and interesting finding that proof of both information-based trading and behavioral-based trading happened in the same stock market.

(Choi, Skiba 2015)

This paper explored herding behavior of institutional investors in international markets. They found evidence that institutional investors herd more in markets identified by low levels of information asymmetry (high level of information transparency). This result recommended that institutional investors' herding behavior was likely push by correlated signals from fundamental information. Finally, they showed that price change mechanism is quicker in the markets that can approach to information equally and fairly.

(Venezia, Nashikkar, Shapira 2011)

They found a herding tendency among both amateur and professional investors and conclude that the tendency to herd was lower in the professionals. Most of the results were consistent with the theory that herding is information-based. They also found that the herding behavior of the two groups was a persistent incident, and that it was positively and significantly correlated with stock market returns' volatility. Finally, herding, mainly by amateurs, caused market volatility in the Granger causality sense.

(Chiyachantana, Jain, Jiang, Wood, 2004)

This study identified institutional trading in international stocks from 37 countries during 1997 to 1998 and 2001. They found that the underlying market environment was a main reason of the price impact and, more significantly, of the asymmetry between price impacts of institutional buy and sell orders. In bullish markets condition, institutional buying had a greater price impact than selling; nevertheless, in the bearish markets condition, selling had a higher price impact. This differed from preceding findings on price impact asymmetry. Their study further recommended that price impact fluctuation rely on order attribute, firm-specific factors, and cross-country differences.

(Richards, 2005)

This paper analyzed a new dataset for the aggregate daily trading of all foreign investors in six Asian emerging stock markets and provided two new findings. First, foreign investor flows into several markets indicated positive feedback trading with respect to global, as well as domestic, stock returns. The nature of this trading suggests it was due to behavioral factors or foreign investor taking information from recent returns, rather than portfolio rebalancing effects. Second, the price impacts associated with foreign investors' trading were much greater than previous forecasts. The findings recommended that foreign investors and external conditions had a larger impact on emerging markets than implied by previous work.

(Phansatan, Powell, Tanthanongsakkun, Treepongkaruna, 2012)

This paper explored the trading behavior and disintegrated the trading performance of foreign, individual and institutional investors and proprietary traders in a dynamic emerging stock market, the Stock Exchange of Thailand (SET). Foreign investors followed a positive feedback, momentum strategy and were good short term performers but had poor security selection performance in poor markets, therefore recommending that they had a macro (market timing) but not a micro (security selection) informational advantage relative to local investors. Institutions and proprietary traders had poor security selection trading performance. Individuals demonstrated herding behavior and have moderately good security selection performance, but individual investors appeared to reimburse proprietary traders for the condition of short term liquidity by proprietary traders, so individuals' security selection profits were offset by market timing losses.

# CHAPTER 3
# RESEARCH METHODOLOGY

## Theoretical framework

### Net investment flow

We compute each week's trade imbalance by investor group in order to examine investor behavior and performance. As we are interested in whether investor group i was a net buyer or seller during week t, we compute the following Net Investment Flow (NIF) portion:

$$NIF_{it} = \frac{(\text{Purchasing Value}_{it} - \text{Selling Value}_{it})}{(\text{Purchasing Value}_{it} + \text{Selling Value}_{it})}$$

NIF will be positive (negative) when the investor group buys more (less) stocks than sells during the week. We interpret large trade imbalances in either direction as an evidence of market timing. Large net buying (selling) implies that the investor group thinks the SET index is under- (over-) valued relative to the alternatives.
In many studies, large trading imbalances are demonstrative of investor herding.

Nofsinger and Sias in 1999 defined that herding was a group of investors buying or selling at the same time interval. The length of the time interval is an empirical issue and could be as short as 1 day or as long as 1 year. Theory recommends that investors could herd for rational reasons such as they are following the same information signals (Froot et al., 1992; Hirshleifer et al., 1994). Or, investors could herd for irrational reasons like following fashions (Bikhchandani et al., 1992). To determine whether the herding is rational or not, Nofsinger and Sias (1999) recommend investigating the post herding returns. A high return after buy-herding (or low return after sell-herding) shows rational herding. Even though the herding models are formed for herding on individual stocks, we should interpret the finding as herding into and out of the aggregate stock market.

Feedback trading is also known as either contrarian investing or value investing when the trade imbalance is negatively correlated with past return or momentum investing when the correlation is positive. By investigating the returns in

the week(s) before the trading week, we can investigate the range to which investors positive or negative feedback trade. Prior examinations of herding concentrate on the linkage between trading and individual stocks, whereas we examine flows into and out of the aggregate stock market.[1]

**Research Methodology**

This study proposes a Vector Autoregressive or VAR model for analyzing the trading and investment behavior of each category of investor groups as well as trying to measure the performance of each group of investors. The reason that we choose VAR for this study because we realize the dynamic of the system that the change in stock market return could affect the trading behavior or patterns of each investor groups whereas the change in net buying or selling value of stock portfolio of each groups of investor could interdependently affect the change in stock market return as well.

**VAR model of portfolio reallocation and stock return**

We decided to follow the method of Professor Anya Khanthavit 1998, to consider the structural VAR(p) model that describes the dynamic of portfolio reallocation of each groups of investor and the stock market return.

$$X_t = B_0 + B_1X_{t-1} + \dots + B_pX_{t-p} + \S_t \qquad (1)$$

Where $X_t = \{x_{1t}, x_{2t}, r_t\}$ is a (3x1) vector consisting of time t's reallocation of Investor1 ($x_{1t}$), Investor2 ($x_{2t}$), and the stock market return ($r_t$). $\{x_1, x_2\}$ can be {local investor, foreign investor}, {local investor, institution investor}, {local investor, proprietary investor}, {foreign investor, institution investor}, {foreign investor, proprietary investor}, {institution investor, proprietary investor}.

The system considers two groups of investor at a time to avoid singularity. $B_j$'s, where j = 0, 1, 2,…, p, are (3x3) coefficient matrices. The diagonal elements of $B_0$ are identically zero to avoid trivial case. $\S_1 = \{e_{1t}, e_{2t}, e_{rt}\}$ is a (3x1) vector of the structural shocks or error terms.

[1] One notable exception is Karolyi's (2002) study of the investor group reaction to the Asian financial crisis in 1997. Also, Murase (2001) investigates the correlation coefficients between investor groups and market returns.

The VAR model is estimated for each investor group using heteroscedasticity consistent standard errors. One benefit of using the VAR model is the ability to test for Granger causality between investor group trading and market returns. We implement the causality test by computing a Wald test with the null hypothesis that all four lag coefficients are equal to zero.

**Data**

We use daily data of returns of Thai stock market or SET and the daily net buying value of investor group from 23 December, 2013 to 20 December, 2016 (totally 729 observations). We obtained these data from SETSMART (SET Market Analysis and Reporting Tool) which is the web-based application from the Stock Exchange of Thailand. This data gives us the chance to investigate something that is unique. Whereas most studies of investor behavior study trading patterns connected with individual stocks, we investigate behavior associated with aggregate market timing. The data set also has several other benefits over prior studies. Specific feature of this data set are the most recent data set, the short intervals (daily), and the breakup of flow data into four different types of investor group.

**Limitation of the study**

The limitation of this study is that it is quite difficult to define or separate the volume or value of trading by the Proprietary for the securities firms. As we know that they might not trade for themselves in every amount of money that have. They might be hired as the proprietary trading for their clients or in some case they implement hedging for the amount of block trade that they had already come in as the counterparty of their clients for the potentially big volume or value such as in the single stock futures trading for the purpose of market risk management mechanism.

The proprietary trading may be involved with the more risky investment contract for the purely speculation purpose in the derivatives market or TFEX such as the single stock futures or the SET50 index futures that they may hired by the institutional investors that they cannot invest by themselves in their portfolio because of the prohibited investment policy in their mutual fund. This study does not cover the other innovative products in the TFEX both futures contracts and options which could

be the issue for further study of behavior of investor groups in Thai derivatives market and their linkage or interconnected strategically trading which is quite more complicated to this study.

# CHAPTER 4
# RESULTS AND DISCUSSION

VAR for SET

System1: $X_1$ = Institutes, $X_2$ = Proprietary, $X_3$ = Foreign, $r_t$ = dailySETreturn

Perform stability test

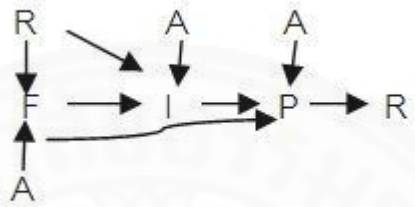
All eigenvalue lie inside the circle, the VAR model is stable.

Perform the Granger exogeneity test.

1. From the table p-value of the determination of Proprietary to Institutes is 0.074 which is greater than 0.05 so, the Institutes determine Proprietary.
2. The table p-value of the determination of Foreign to Institutes is 0.00 which is less than 0.05 so, Foreign determine Institutes.
3. From the table p-value of the determination of dailySETreturn to Institutes is 0.012 which is less than 0.05 so, the dailySETreturn determine Institutes.
4. From the table p-value of the determination of all variable to Institutes is 0.00 which is less than 0.05 so, all variable determine Institutes.
5. The table p-value of the determination of Institutes to Proprietary is 0.003 which is less than 0.05 so, Institutes determine Proprietary.
6. From the table p-value of the determination of Foreign to Proprietary is 0.00 which is less than 0.05 so, Foreign determine Proprietary.
7. The table p-value of the determination of dailySETreturn to Proprietary is 0.439 which is greater than 0.05 so, Proprietary determine dailySETreturn.
8. The table p-value of the determination of all variable to Proprietary is 0.00 which is less than 0.05 so, all variable determine Proprietary.
9. From the table p-value of the determination of Institute to Foreign is 0.739 which is greater than 0.05 so, Foreign determine Institutes.
10. The table p-value of the determination of Proprietary to Foreign is 0.084 which is greater than 0.05 so, Foreign determine Proprietary.
11. The table p-value of the determination of dailySETreturn to Foreign is 0.001 which is less than 0.05 so, the dailySETreturn determine Foreign.

12. The table p-value of the determination of all variable to Foreign is 0.00 which is less than 0.05 so, all variable determine Foreign.

According to these results, we could come up with the following diagram below;
(F = Foreign, I = Institutes, P = Proprietary, R = daily SET return, A = All Variable)

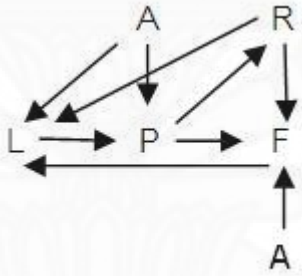



System2: $X_1$ = Proprietary, $X_2$ = Foreign, $X_3$ = Local, $r_t$ = dailySETreturn
Perform stability test
All eigenvalue lie inside the circle, the VAR model is stable.
Perform the Granger exogeneity test.

1. From the table p-value of the determination of Foreign to Proprietary is 0.743 which is greater than 0.05 so, Proprietary determine Foreign.
2. The table p-value of the determination of Local to Proprietary is 0.003 which is less than 0.05 so, Local determine Proprietary.
3. From the table p-value of the determination of dailySETreturn to Proprietary is 0.439 which is greater than 0.05 so, Proprietary determine dailySETreturn.
4. From the table p-value of the determination of all variable to Proprietary is 0.00 which is less than 0.05 so, all variable determine Proprietary.
5. The table p-value of the determination of Proprietary to Foreign is 0.049 which is less than 0.05 so, the Proprietary determine Foreign.
6. From the table p-value of the determination of Local to Foreign is 0.739 which is greater than 0.05 so, Foreign determine Local.
7. The table p-value of the determination of dailySETreturn to Foreign is 0.001 which is less than 0.05 so, dailySETreturn determine Foreign.
8. The table p-value of the determination of all variable to Foreign is 0.00 which is less than 0.05 so, all variable determine Foreign.

9. From the table p-value of the determination of Proprietary to Local s is 0.546 which is greater than 0.05 so, Local determine Proprietary.
10. The table p-value of the determination of Foreign to Local is 0.045 which is less than 0.05 so, Foreign determine Local.
11. The table p-value of the determination of dailySETreturn to Local is 0.00 which is less than 0.05 so, the dailySETreturn determine Local.
12. The table p-value of the determination of all variable to Local is 0.001 which is less than 0.05 so, all variable determine Local.

According to these results, we could come up with the following diagram below;
(F = Foreign, L = Local, P = Proprietary, R = daily SET return, A = All Variable)

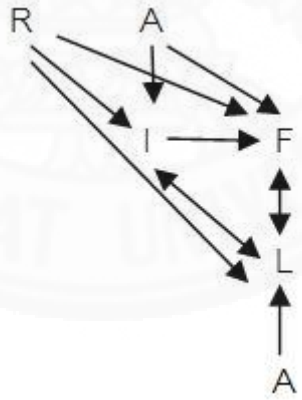



System3: $X_1$ = Institutes, $X_2$ = Foreign, $X_3$ = Local, $r_t$ = dailySETreturn
Perform stability test
All eigenvalue lie inside the circle, the VAR model is stable.
Perform the Granger exogeneity test.

1. From the table p-value of the determination of Foreign to Institutes is 0.204 which is greater than 0.05 so, the Institutes determine Foreign.
2. The table p-value of the determination of Local to Institutes is 0.074 which is greater than 0.05 so, Institutes determine Local.
3. From the table p-value of the determination of dailySETreturn to Institutes is 0.012 which is less than 0.05 so, the dailySETreturn determine Institutes.
4. From the table p-value of the determination of all variable to Institutes is 0.00 which is less than 0.05 so, all variable determine Institutes.
5. The table p-value of the determination of Institutes to Foreign is 0.049 which is less than 0.05 so, Institutes determine Foreign.

6. From the table p-value of the determination of Local to Foreign is 0.084 which is greater than 0.05 so, the Foreign determine Local.
7. The table p-value of the determination of dailySETreturn to Foreign is 0.001 which is less than 0.05 so, dailySETreturn determine Foreign.
8. The table p-value of the determination of all variable to Foreign is 0.00 which is less than 0.05 so, all variable determine Foreign.
9. From the table p-value of the determination of Institute to Local s is 0.546 which is greater than 0.05 so, Local determine Institutes.
10. The table p-value of the determination of Foreign to Local is 0.578 which is greater than 0.05 so, the Local determine Foreign.
11. The table p-value of the determination of dailySETreturn to Local is 0.00 which is less than 0.05 so, the dailySETreturn determine Local.
12. The table p-value of the determination of all variable to Local is 0.001 which is less than 0.05 so, all variable determine Local.

According to these results, we could come up with the following diagram below;
(F = Foreign, L = Local, I = Institutes, R = daily SET return, A = All Variable)




Impulse response analysis and forecast error

Perform impulse response analysis and determine which variable has more impact between Institutes and dailySETreturn.

Irf: So, Institutes has more impact than the daily SETreturn since irf = 1.3 e-11 > -2.1e+07

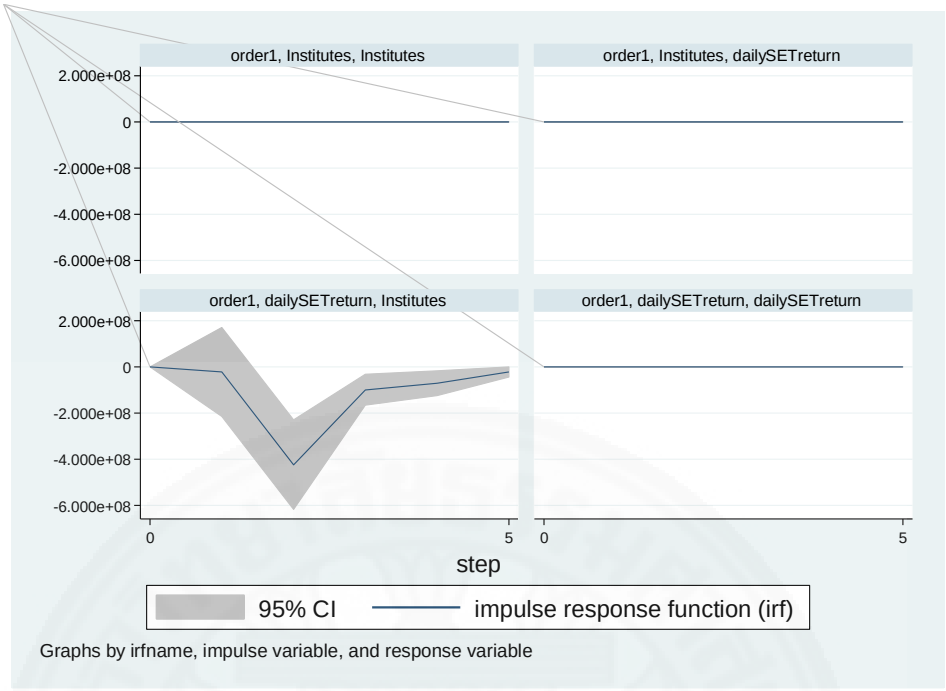



**Figure 1:** Impulse Response Function between Institutes and dailySETreturn

So, the impact of Institutes to dailySETreturn and dailySETreturn to Institutes go to 0.

Oirf: So, Institutes has more impact since 0.03939 >-1.5e+07

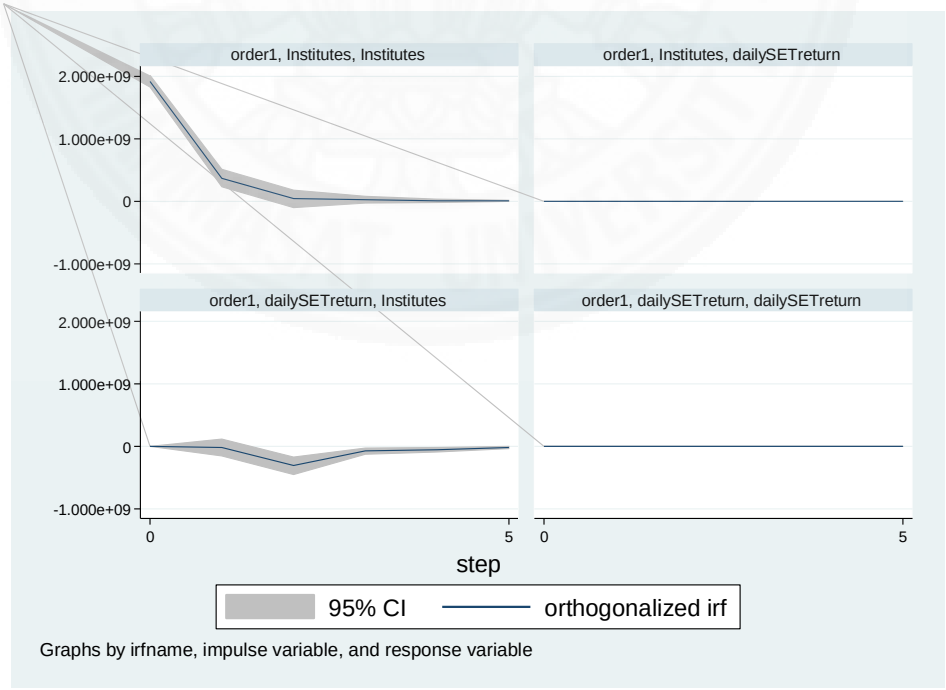



**Figure 2:** Orthogonal Impulse Response Function between Institutes and dailySETreturn

Coirf: So, Institutes has more impact since 0.515093 >-1.5e+07

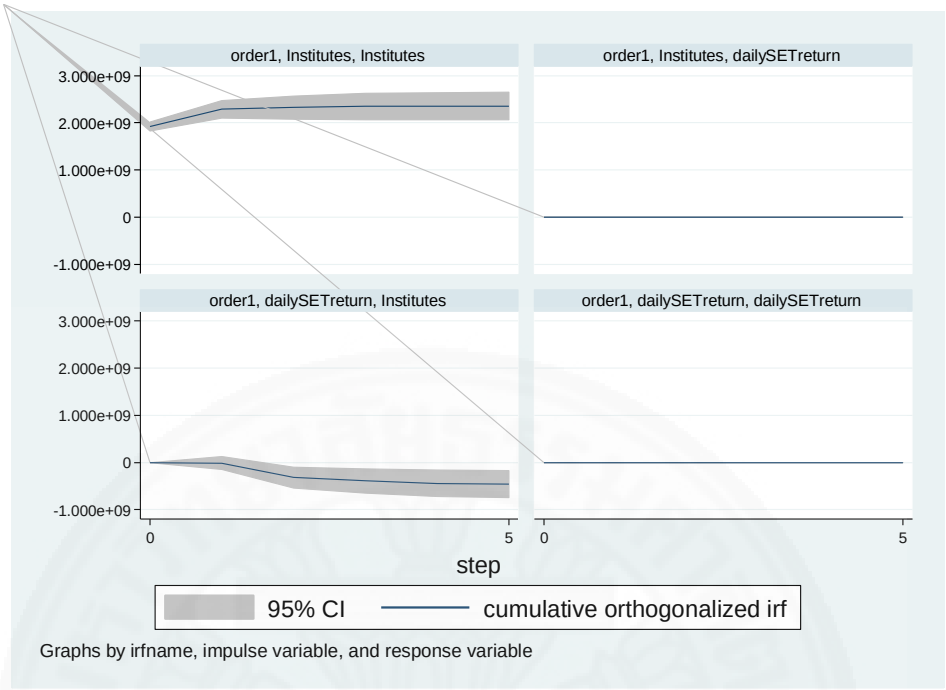



**Figure 3:** Cumulative Orthogonal Impulse Response Function between Institutes and dailySETreturn

Perform forecast error

The response (Institutes) creates the unbound error fevd, so the Institutes has more impact than the dailySETreturn.

Perform impulse response analysis and determine which variable has more impact between Proprietary and dailySETreturn.

Irf:  So, the dailySETreturn has more impact irf = 8.9e+07 > -2.2e-11

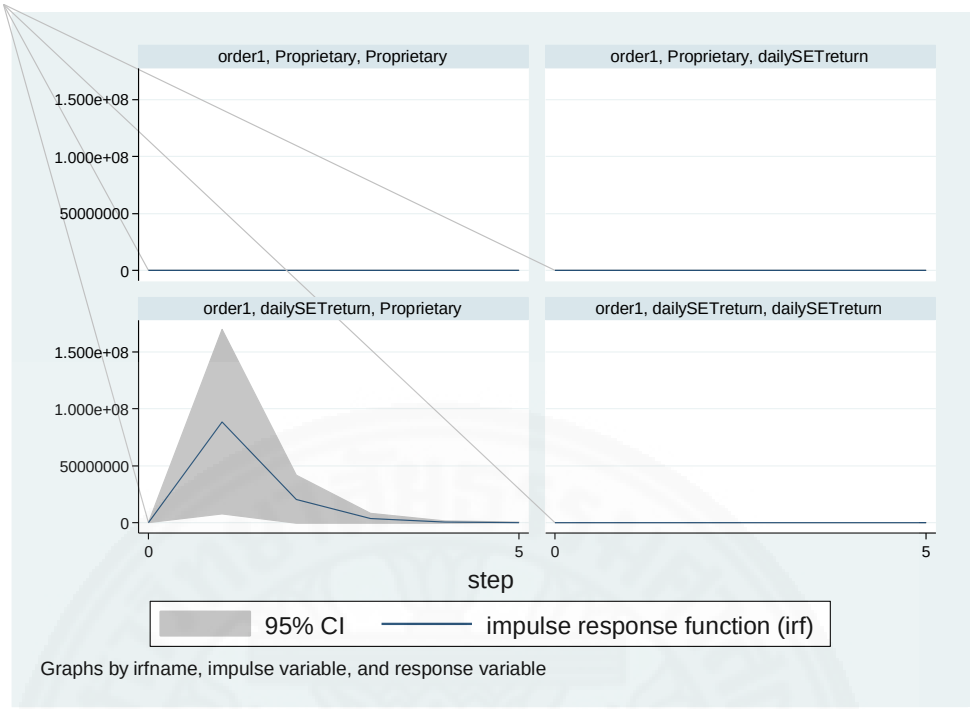



**Figure 4:** Impulse Response Function between Proprietary and dailySETreturn

So, the impact of Proprietary to dailySETreturn and dailySETreturn to Proprietary finally go to 0.

Oirf: So, the dailySETreturn has more impact 7.2e+07 > -0.002808

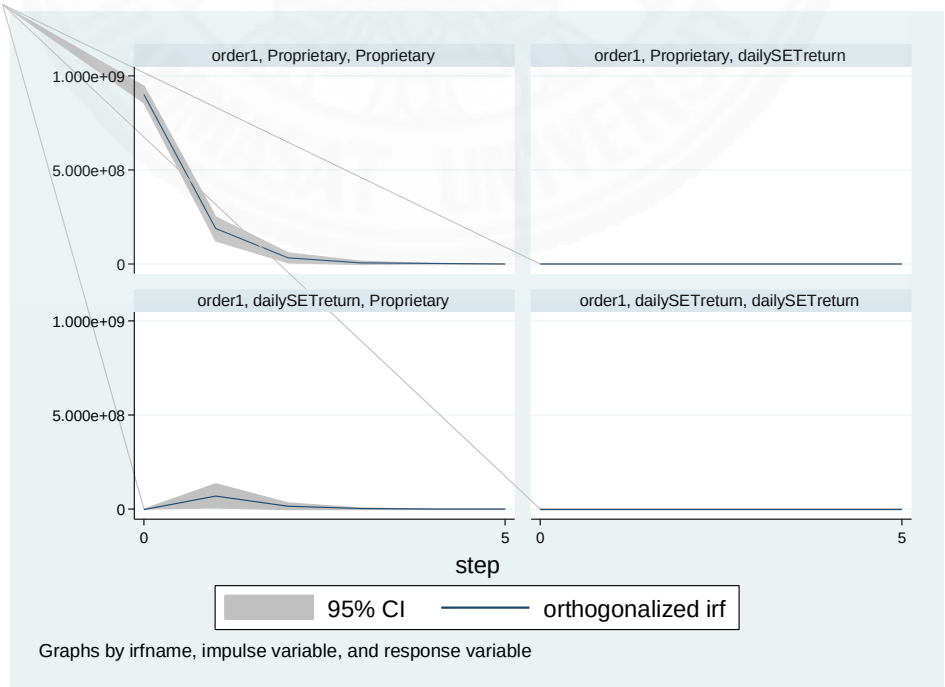



**Figure 5:** Orthogonal Impulse Response Function between Proprietary and dailySETreturn

Coirf: So, the dailySETreturn has more impact 7.2e+07 > 0.307858

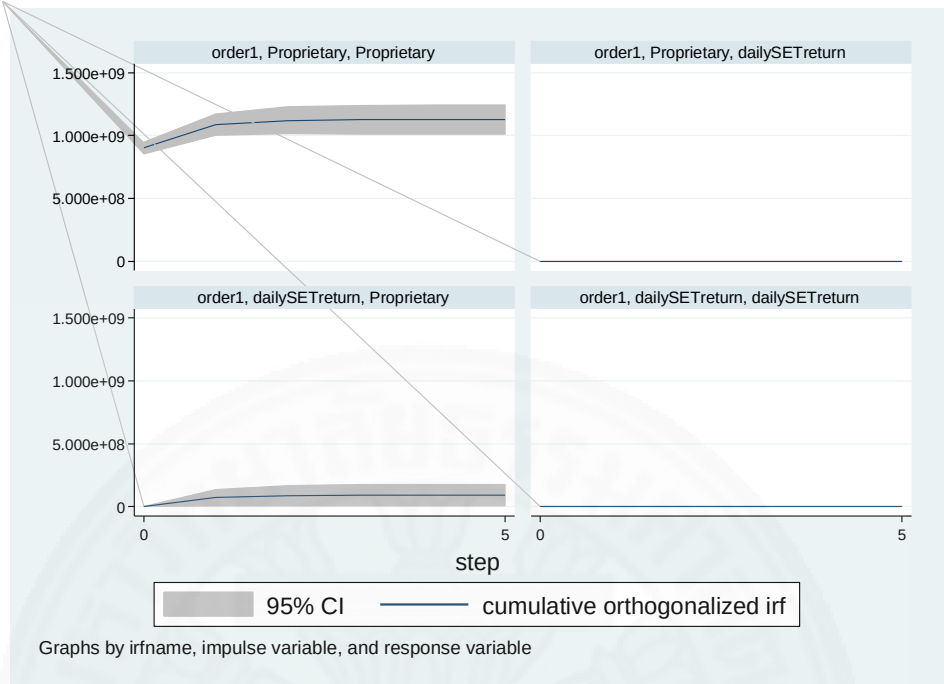



**Figure 6:** Cumulative Orthogonal Impulse Response Function between Proprietary and dailySETreturn

Perform forecast error

The response (Proprietary) creates the unbound error fevd, so the Proprietary has more impact than the dailySETreturn.

Perform impulse response analysis and determine which variable has more impact between Foreign and dailySETreturn.

Irf: So, the dailySETreturn has more impact since 3.9e+08 > 1.8e-11

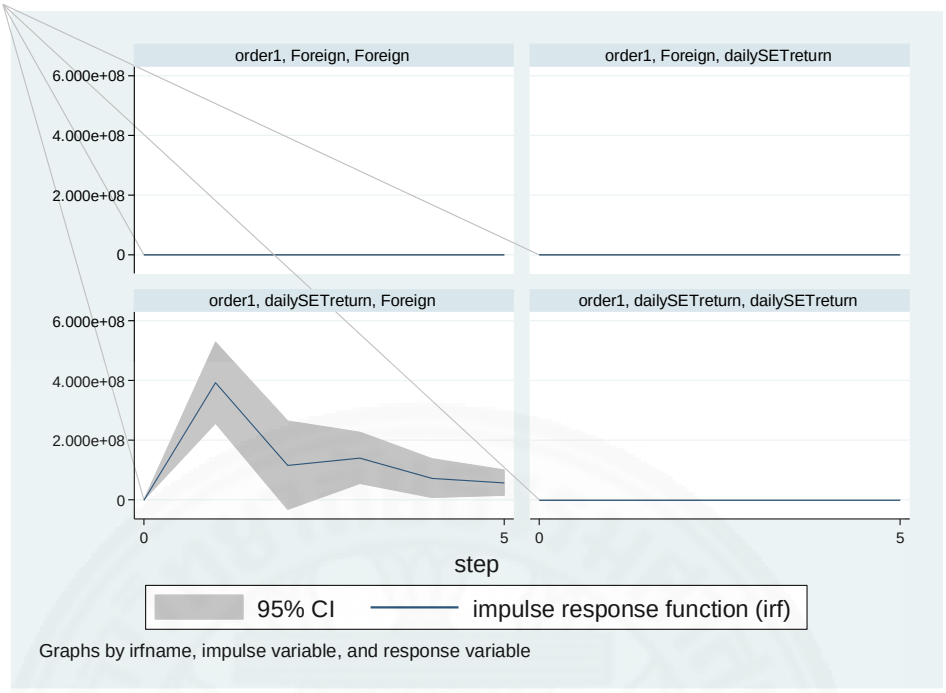



**Figure 7:** Impulse Response Function between Foreign and dailySETreturn

So, the impact of dailySETreturn to Foreign investor trading decision finally decreasing over time.

Oirf: So, the dailySETreturn has more impact since 3.3e+08 > 0.035978

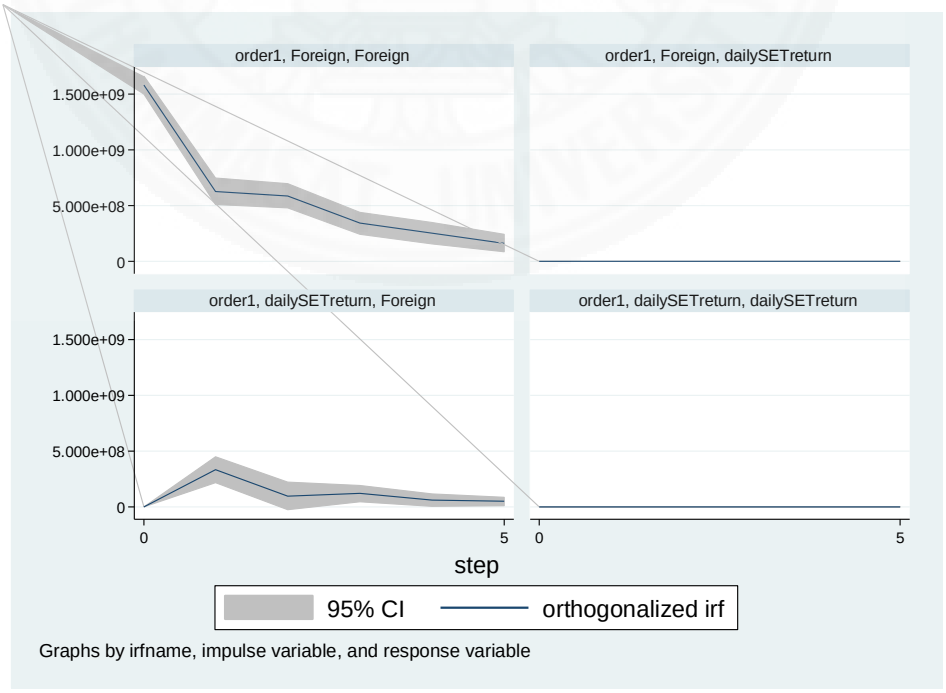



**Figure 8:** Orthogonal Impulse Response Function between Foreign and dailySETreturn

Coirf: So, the dailySETreturn has more impact since 3.3e+08 > 0.236966

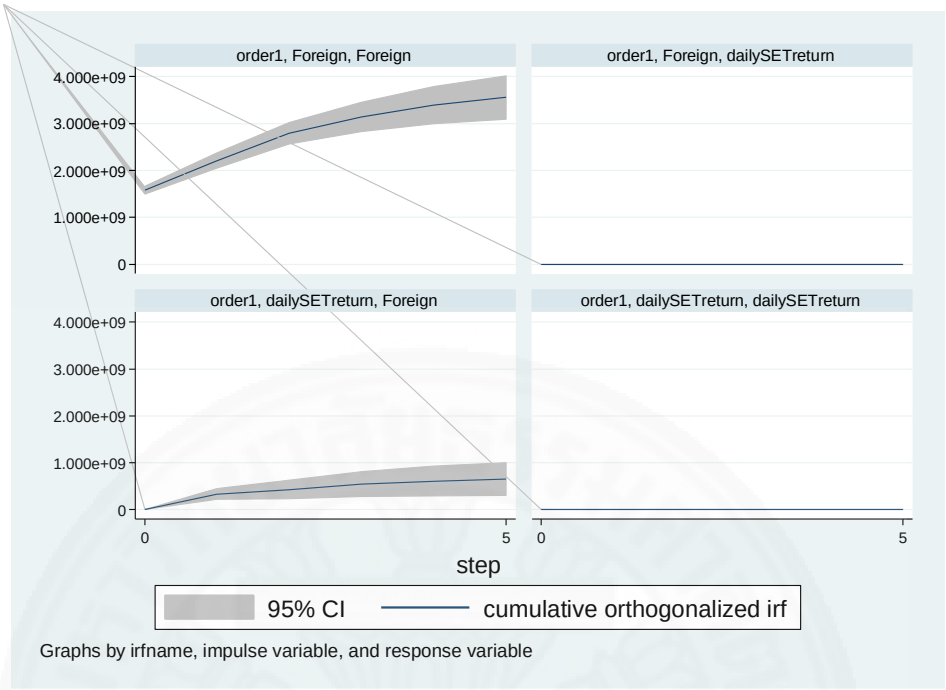



**Figure 9:** Cumulative Orthogonal Impulse Response Function between Foreign and dailySETreturn

Perform forecast error

The response (Foreign) creates the unbound error fevd, so the Foreign has more impact than the dailySETreturn.

Perform impulse response analysis and determine which variable has more impact between Local and dailySETreturn.

Irf: So, the Local has more impact since -1.4e-11 > -4.9e+08

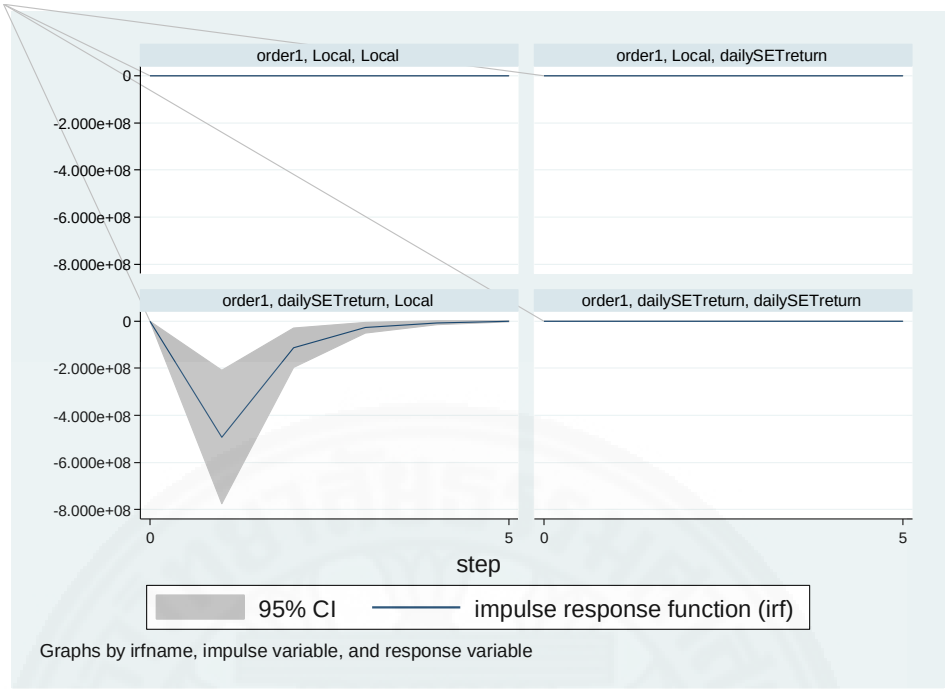



**Figure 10:** Impulse Response Function between Local and dailySETreturn

Oirf: So, the Local has more impact since -0.46311 > -3.1e+08

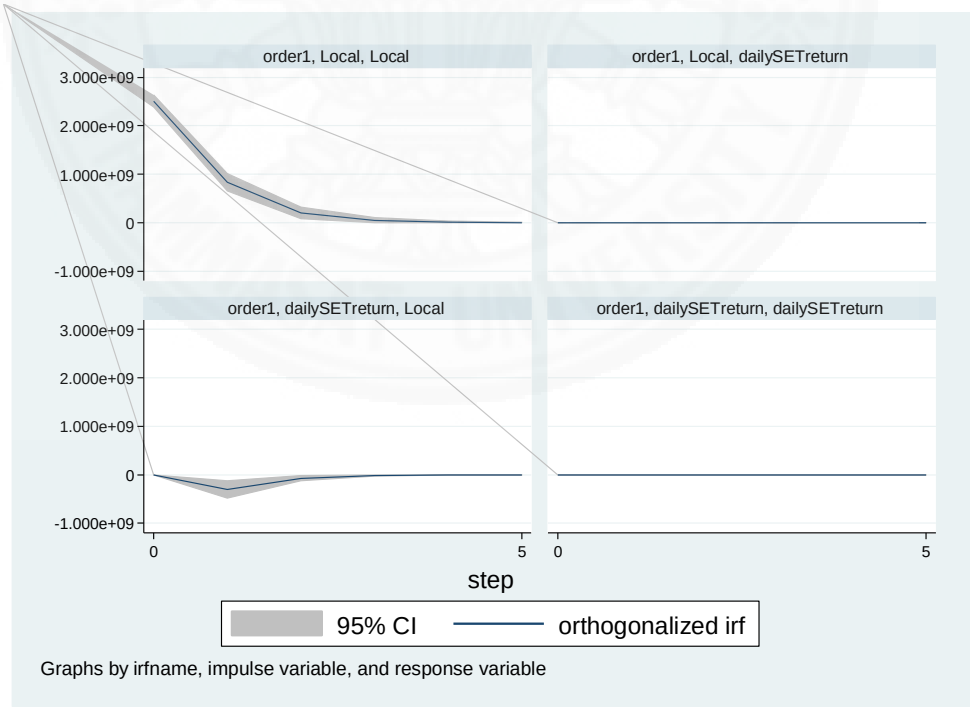



**Figure 11:** Orthogonal Impulse Response Function between Local and dailySETreturn

Coirf: So, the Local has more impact since -0.645131 > -3.1e+08

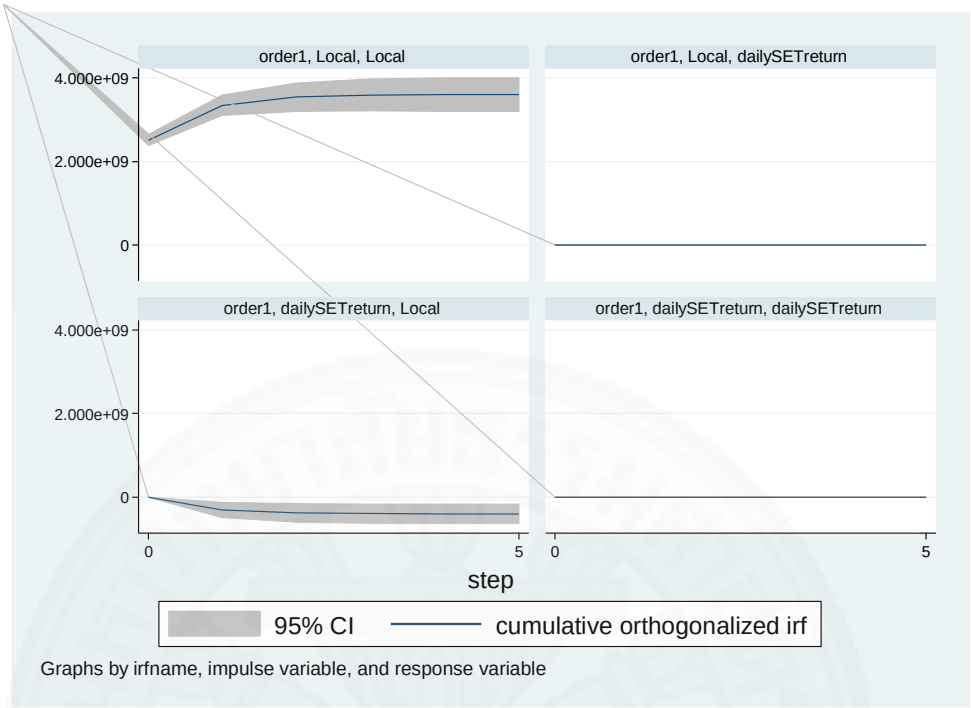



**Figure 12:** Cumulative Orthogonal Impulse Response Function between Local and dailySETreturn

Perform forecast error

The response (Local) creates the unbound error fevd, so the Local has more impact.

VAR for mai

System1: $X_1$ = Institutes, $X_2$ = Proprietary, $X_3$ = Foreign, $r_t$ = dailymaireturn

Perform stability test

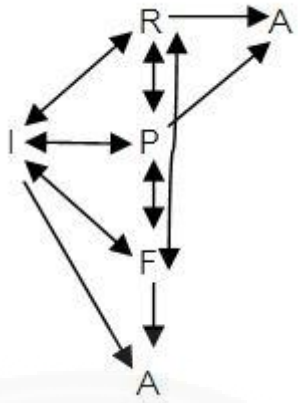
All eigenvalue lie inside the circle, the VAR model is stable.

Perform the Granger exogeneity test.

1. From the table p-value of the determination of Proprietary to Institutes is 0.72 which is greater than 0.05 so, the Institutes determine Proprietary.
2. The table p-value of the determination of Foreign to Institutes is 0.474 which is greater than 0.05 so, Institutes determine Foreign.
3. From the table p-value of the determination of daily mai return to Institutes is 0.67 which is greater than 0.05 so, Institutes determine daily mai return.
4. From the table p-value of the determination of all variable to Institutes is 0.847 which is greater than 0.05 so, institutes determine all variable.

5. The table p-value of the determination of Institutes to Proprietary is 0.689 which is greater than 0.05 so, Proprietary determine Institutes.
6. From the table p-value of the determination of Foreign to Proprietary is 0.292 which is greater than 0.05 so, Proprietary determine Foreign.
7. The table p-value of the determination of daily mai return to Proprietary is 0.686 which is greater than 0.05 so, Proprietary determine daily mai return.
8. The table p-value of the determination of all variable to Proprietary is 0.694 which is greater than 0.05 so, Proprietary determine all variable.
9. From the table p-value of the determination of Institute to Foreign is 0.557 which is greater than 0.05 so, Foreign determine Institutes.
10. The table p-value of the determination of Proprietary to Foreign is 0.979 which is greater than 0.05 so, Foreign determine Proprietary.
11. The table p-value of the determination of daily mai return to Foreign is 0.544 which is greater than 0.05 so, Foreign determine daily mai return.
12. The table p-value of the determination of all variable to Foreign is 0.858 which is greater than 0.05 so, Foreign determine all variable.
13. From the table p-value of the determination of Institutes to daily mai return is 0.611 which is greater than 0.05 so, daily mai return determine Institutes.
14. The table p-value of the determination of Proprietary to daily mai return is 0.231 which is greater than 0.05 so, daily mai return determine Proprietary.
15. The table p-value of the determination of Foreign to daily mai return is 0.52 which is greater than 0.05 so, daily mai return determine Foreign.
16. The table p-value of the determination of all variable to daily mai return is 0.549 which is greater than 0.05 so, daily mai return determine all variable.

According to these results, we could come up with the following diagram below;
(F = Foreign, P = Proprietary, I = Institutes, R = daily mai return, A = All Variable)




System2: $X_1$ = Proprietary, $X_2$ = Foreign, $X_3$ = Local, $r_t$ = dailymaireturn

Perform stability test

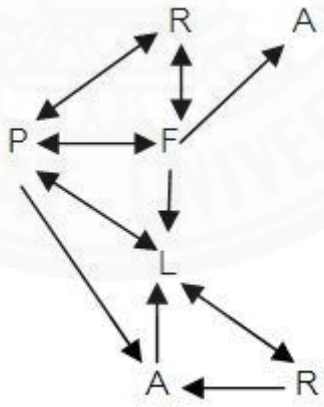
All eigenvalue lie inside the circle, the VAR model is stable.

Perform the Granger exogeneity test.

1. From the table p-value of the determination of Foreign to Proprietary is 0.304 which is greater than 0.05 so, Proprietary determine Foreign.
2. The table p-value of the determination of Local to Proprietary is 0.689 which is greater than 0.05 so, Proprietary determine Local.
3. From the table p-value of the determination of daily mai return to Proprietary is 0.686 which is greater than 0.05 so, Proprietary determine daily mai return.
4. From the table p-value of the determination of all variable to Proprietary is 0.694 which is greater than 0.05 so, Proprietary determine all variable.
5. The table p-value of the determination of Proprietary to Foreign is 0.974 which is greater than 0.05 so, Foreign determine Proprietary.
6. From the table p-value of the determination of Local to Foreign is 0.557 which is greater than 0.05 so, Foreign determine Local.
7. The table p-value of the determination of daily mai return to Foreign is 0.544 which is greater than 0.05 so, Foreign determine daily mai return.
8. The table p-value of the determination of all variable to Foreign is 0.858 which is greater than 0.05 so, Foreign determine all variable.
9. From the table p-value of the determination of Proprietary to Local is 0.487 which is greater than 0.05 so, Local determine Proprietary.

10. The table p-value of the determination of Foreign to Local is 0.00 which is less than 0.05 so, Foreign determine Local.
11. The table p-value of the determination of daily mai return to Local is 0.463 which is greater than 0.05 so, Local determine daily mai return.
12. The table p-value of the determination of all variable to Local is 0.00 which is greater than 0.05 so, all variable determine Local.
13. From the table p-value of the determination of Proprietary to daily mai return is 0.214 which is greater than 0.05 so, daily mai return determine Proprietary.
14. The table p-value of the determination of Foreign to daily mai return is 0.422 which is greater than 0.05 so, daily mai return determine Foreign.
15. The table p-value of the determination of Local to daily mai return is 0.611 which is greater than 0.05 so, daily mai return determine Local.
16. The table p-value of the determination of all variable to daily mai return is 0.549 which is greater than 0.05 so, daily mai return determine all variable.

According to these results, we could come up with the following diagram below;
(F = Foreign, P = Proprietary, L = Local, R = daily mai return, A = All Variable)




System3: $X_1$ = Institutes, $X_2$ = Foreign, $X_3$ = Local, $r_t$ = dailymaireturn

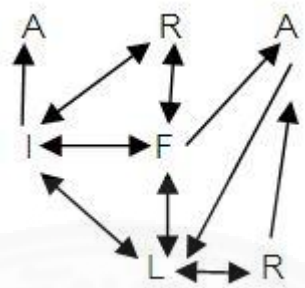
Perform stability test

All eigenvalue lie inside the circle, the VAR model is stable.

Perform the Granger exogeneity test.

1. From the table p-value of the determination of Foreign to Institutes is 0.665 which is greater than 0.05 so, the Institutes determine Foreign.
2. The table p-value of the determination of Local to Institutes is 0.72 which is greater than 0.05 so, Institutes determine Local.
3. From the table p-value of the determination of daily mai return to Institutes is 0.67 which is greater than 0.05 so, Institutes determine daily mai return.
4. From the table p-value of the determination of all variable to Institutes is 0.847 which is greater than 0.05 so, Institutes determine all variable.
5. The table p-value of the determination of Institutes to Foreign is 0.974 which is greater than 0.05 so, Foreign determine Institutes.
6. From the table p-value of the determination of Local to Foreign is 0.979 which is greater than 0.05 so, the Foreign determine Local.
7. The table p-value of the determination of daily mai return to Foreign is 0.544 which is greater than 0.05 so, Foreign determine daily mai return.
8. The table p-value of the determination of all variable to Foreign is 0.858 which is greater than 0.05 so, Foreign determine all variable.
9. From the table p-value of the determination of Institute to Local s is 0.487 which is greater than 0.05 so, Local determine Institutes.
10. The table p-value of the determination of Foreign to Local is 0.973 which is greater than 0.05 so, the Local determine Foreign.
11. The table p-value of the determination of daily mai return to Local is 0.463 which is greater than 0.05 so, Local determine daily mai return.
12. The table p-value of the determination of all variable to Local is 0.00 which is less than 0.05 so, all variable determine Local.
13. From the table p-value of the determination of Institutes to daily mai return is 0.214 which is greater than 0.05 so, daily mai return determine Institutes.
14. The table p-value of the determination of Foreign to daily mai return is 0.263 which is greater than 0.05 so, daily mai return determine Foreign.
15. The table p-value of the determination of Local to daily mai return is 0.231 which is greater than 0.05 so, daily mai return determine Local.
16. The table p-value of the determination of all variable to daily mai return is 0.549 which is greater than 0.05 so, daily mai return determine all variable.

According to these results, we could come up with the following diagram below;
(F = Foreign, I = Institutes, L = Local, R = daily mai return, A = All Variable)




Impulse response analysis and forecast error

Perform impulse response analysis and determine which variable has more impact between Institutes and daily mai return.

Irf: So, the daily mai return has more impact since irf = 838726 > 3.1e+-10

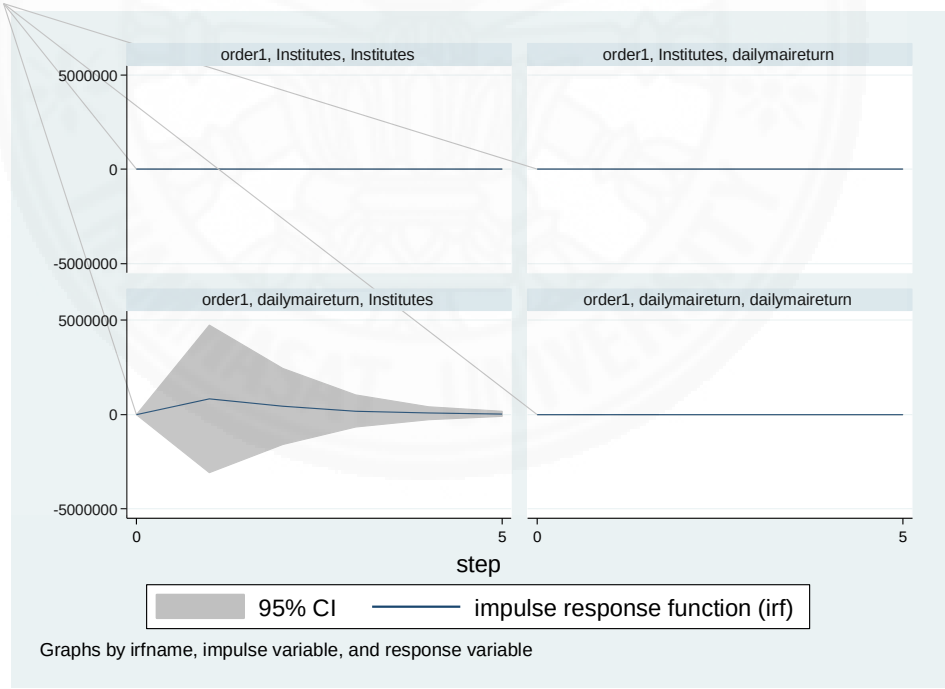



**Figure 13:** Impulse Response Function between Institutes and daily mai return

So, the impact of daily mai return at the beginning stage seems to be both highly positive and negative to Institutes and then finally decrease to 0 over time.

Oirf: So, the daily mai return has more impact since 1.0e+06 > 0.008758

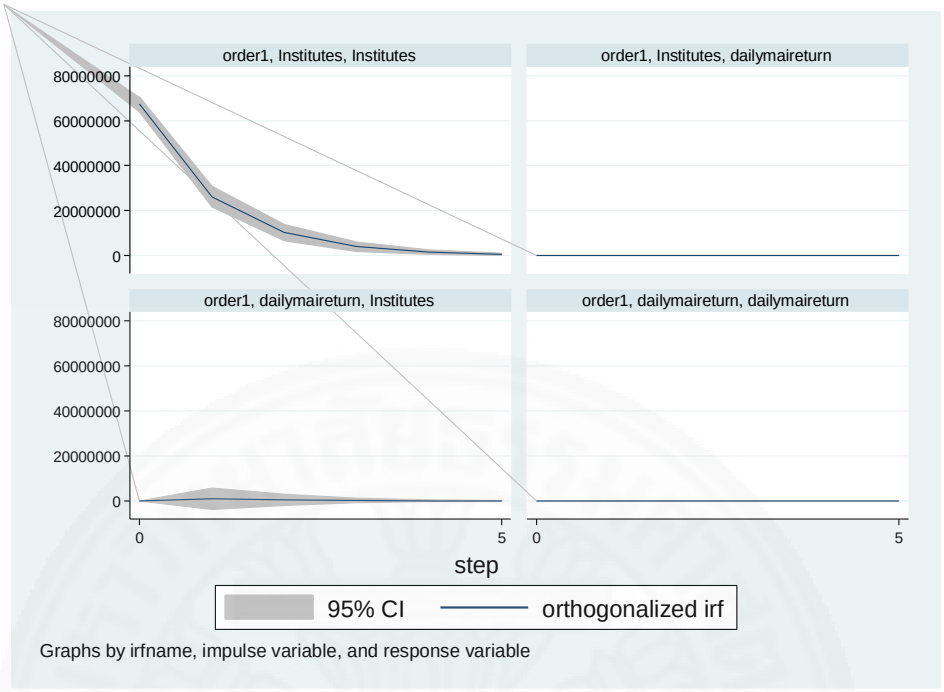



**Figure 14:** Orthogonal Impulse Response Function between Institutes and daily mai return

Coirf: So, the daily mai return has more impact since 1.0e+06 > -0.090439

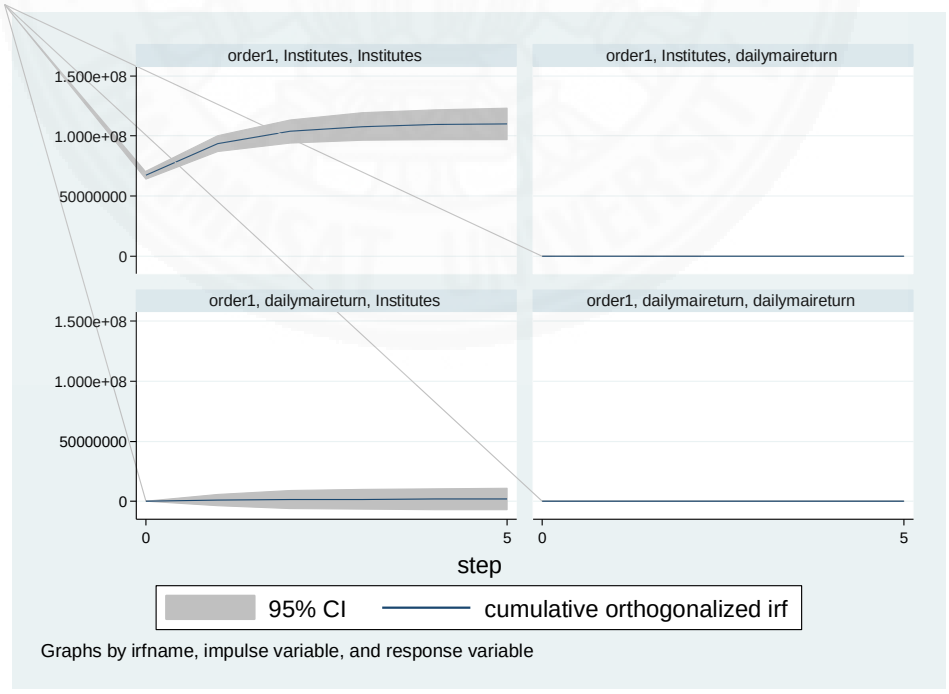



**Figure 15:** Cumulative Orthogonal Impulse Response Function between Institutes and daily mai return

Perform forecast error

The response (Institutes) creates the unbound error fevd, so the Institutes has more impact than the daily mai return.

Perform impulse response analysis and determine which variable has more impact between Proprietary and daily mai return.

Irf:  So, the daily mai return has more impact since irf = 68434.4 > -7.6e-09

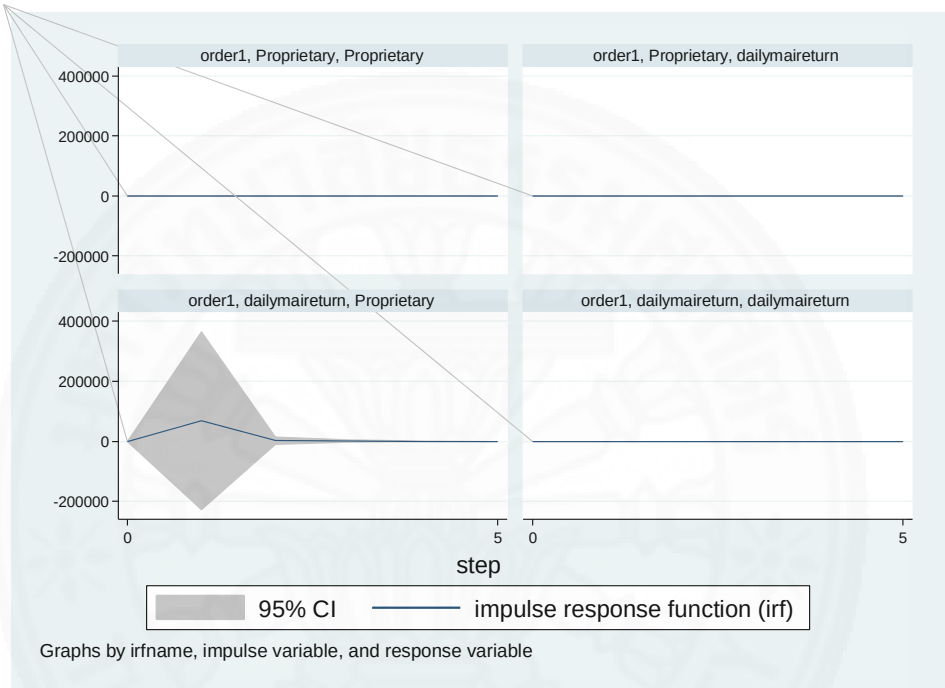



**Figure 16:** Impulse Response Function between Proprietary and daily mai return

So, the impact of daily mai return to Proprietary trading behavior seems to be extremely high (both positive and negative) at the beginning stage and then sharply fall to zero.

Oirf:  So, the daily mai return has more impact 84885 > -0.029568

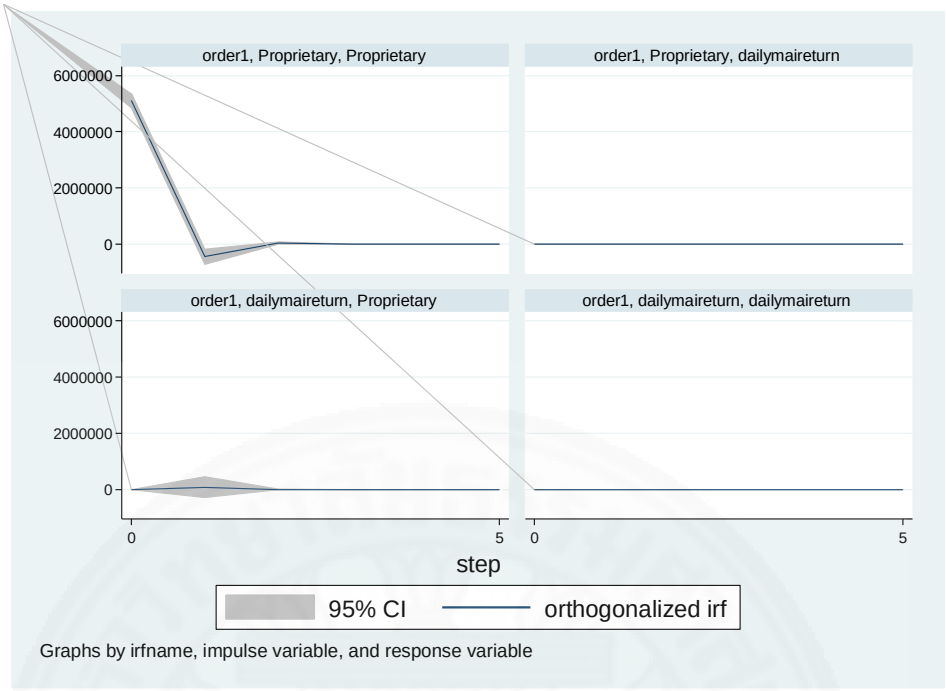



**Figure 17:** Orthogonal Impulse Response Function between Proprietary and daily mai return

Coirf: So, the daily mai return has more impact 84885 > 0.048499

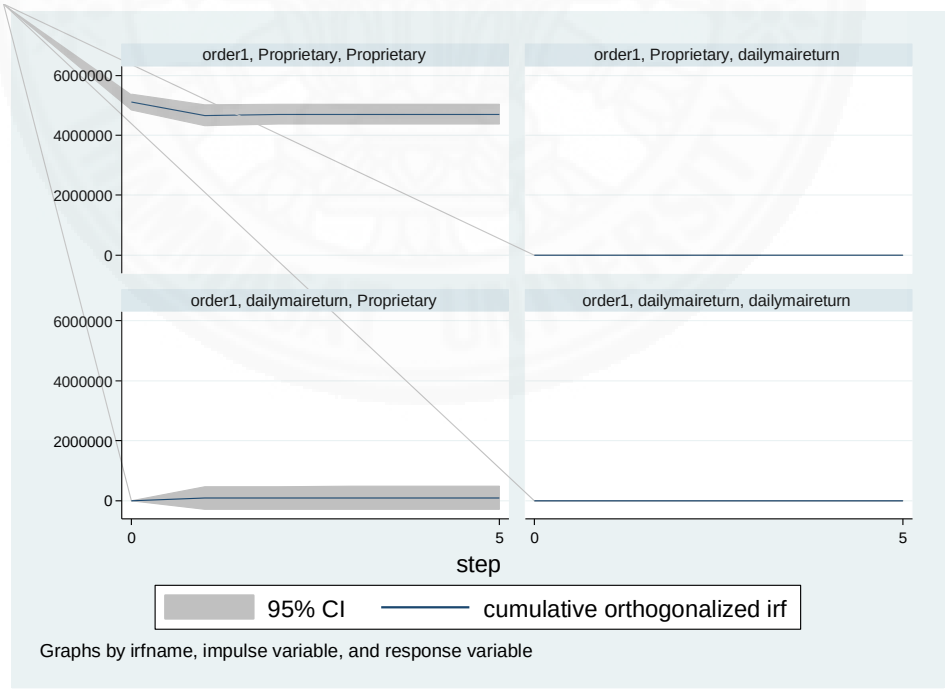



**Figure 18:** Cumulative Orthogonal Impulse Response Function between Proprietary and daily mai return

Perform forecast error

The response (Proprietary) creates the unbound error fevd, so the Proprietary has more impact than the daily mai return.

Perform impulse response analysis and determine which variable has more impact between Foreign and daily mai return.

Irf:  So, the daily mai return has more impact since 1.3e+06 > -4.4e-10

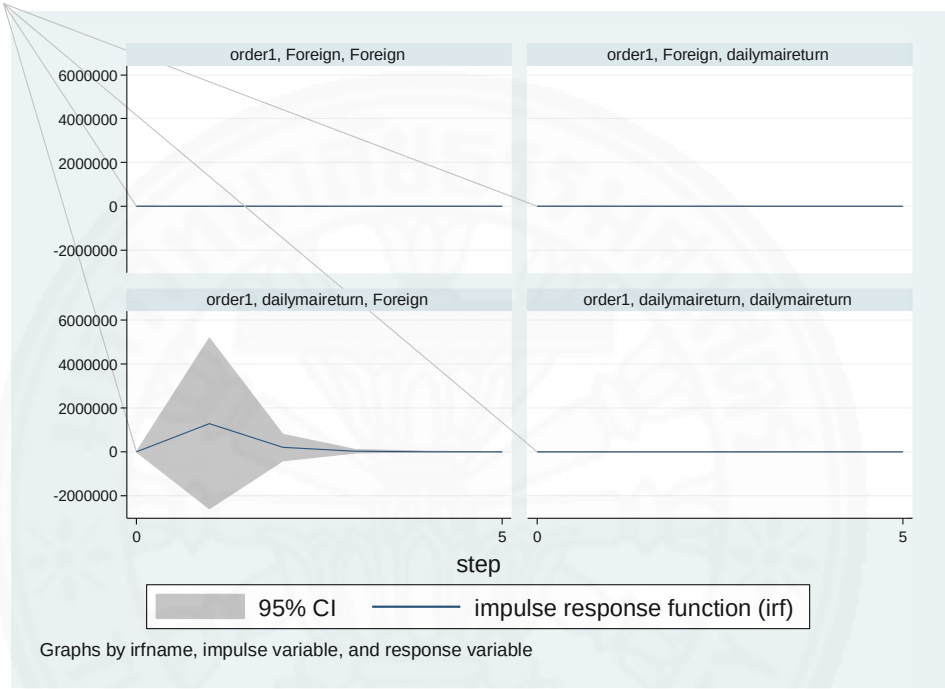



**Figure 19:** Impulse Response Function between Foreign and daily mai return

So, the impact of daily mai return to Foreign investor trading decision finally drop sharply over time.

Oirf:  So, the daily mai return has more impact since 1.6e+06 > -0.026765

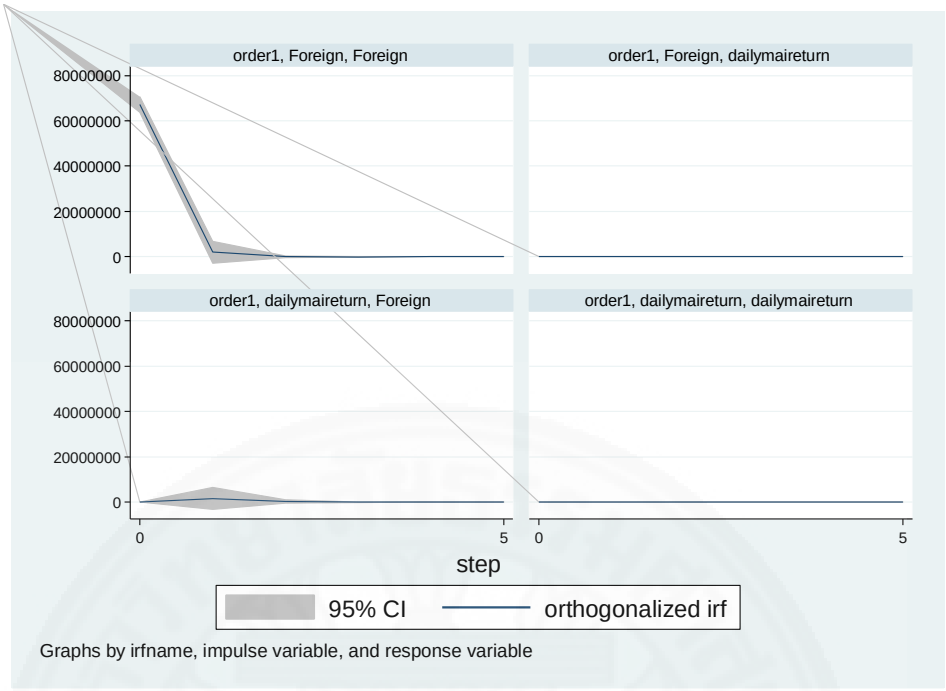



**Figure 20:** Orthogonal Impulse Response Function between Foreign and daily mai return

Coirf: So, the daily mai return has more impact since 1.6e+06 > -0.002938

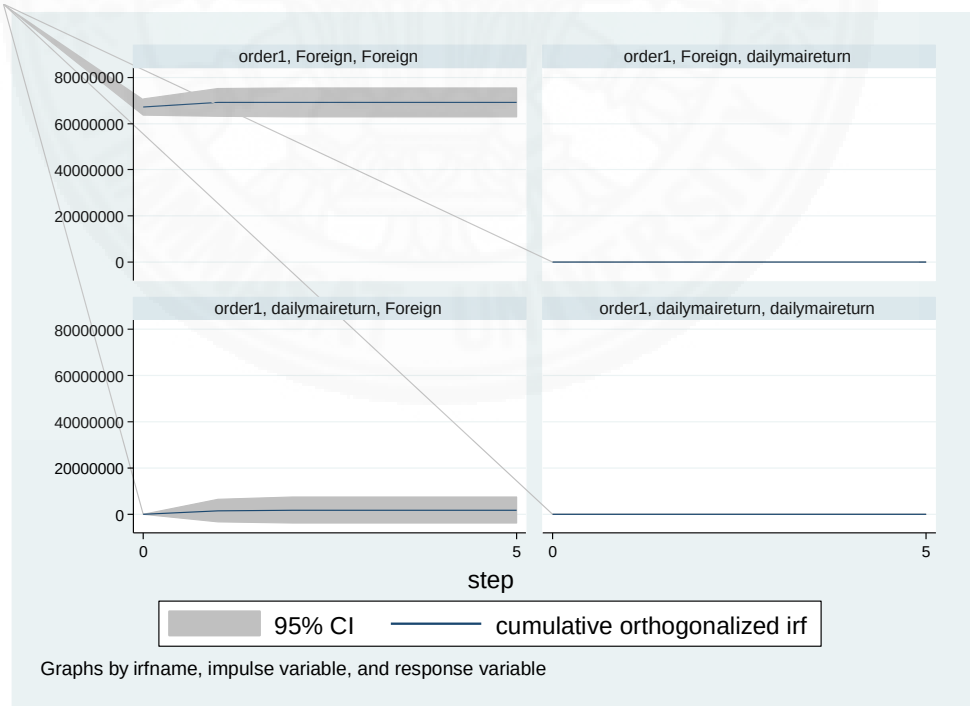



**Figure 21:** Cumulative Orthogonal Impulse Response Function between Foreign and daily mai return

Perform forecast error

The response (Foreign) creates the unbound error fevd, so the Foreign has more impact than the daily mai return.

Perform impulse response analysis and determine which variable has more impact between Local and daily mai return.

Irf:  So, the Local has more impact since 7.4e-11 > -1.2e+06

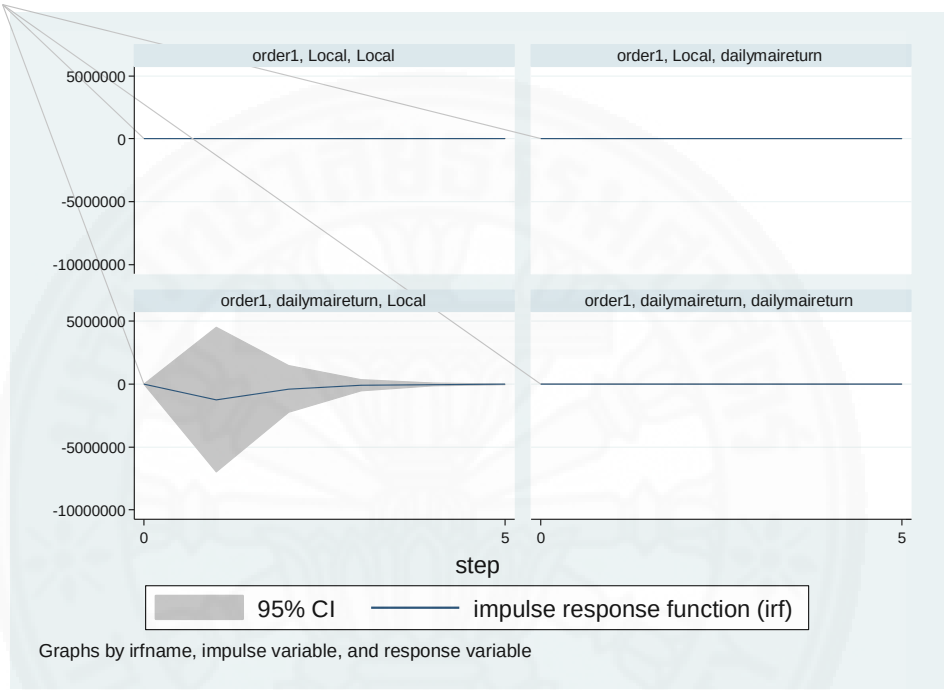



**Figure 22:** Impulse Response Function between Local and daily mai return

Oirf:  So, the Local has more impact since 0.012035 > -1.5e+06

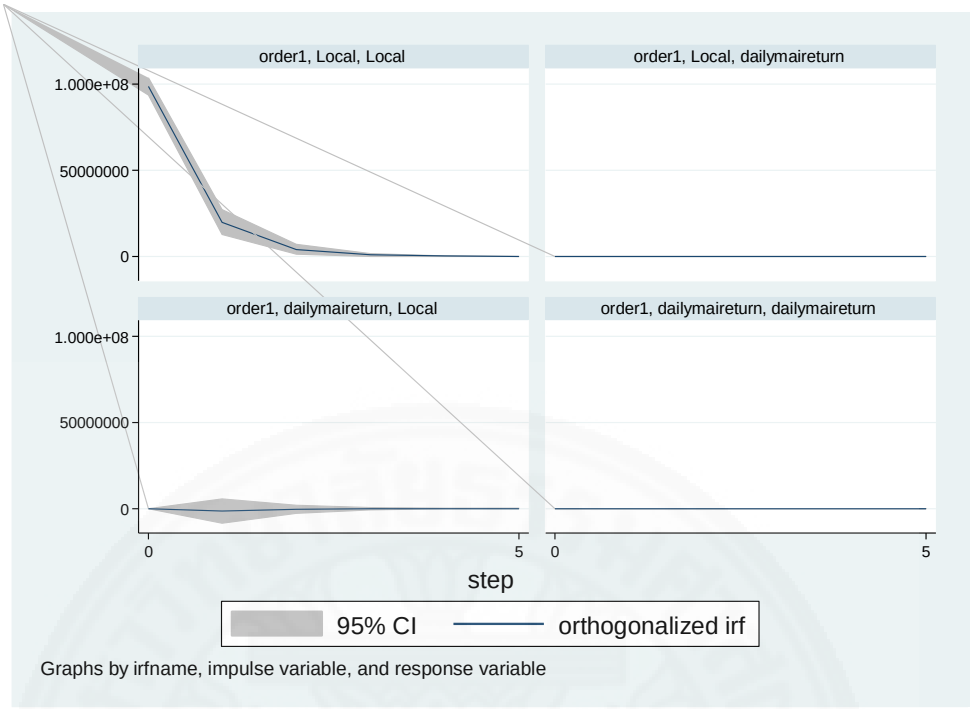



**Figure 23:** Orthogonal Impulse Response Function between Local and daily mai return

Coirf: So, the Local has more impact since 0.05151 > -1.5e+06

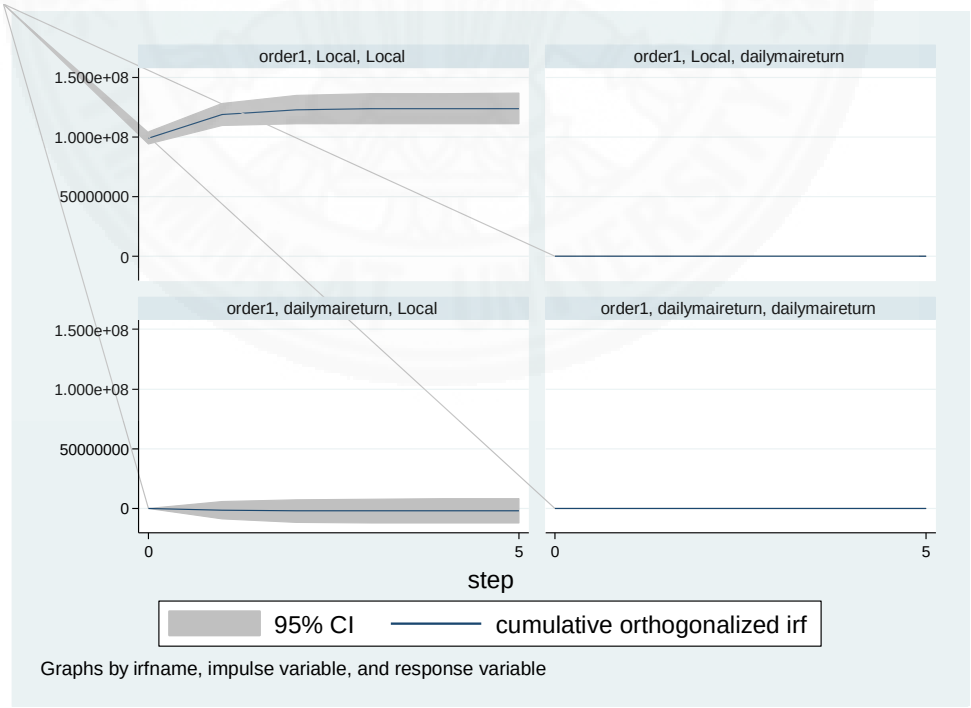



**Figure 24:** Cumulative Orthogonal Impulse Response Function between Local and daily mai return

Perform forecast error

The response (Local) creates the unbound error fevd, so the Local has more impact than the daily mai return.

# CHAPTER 5
# CONCLUSIONS AND RECOMMENDATIONS

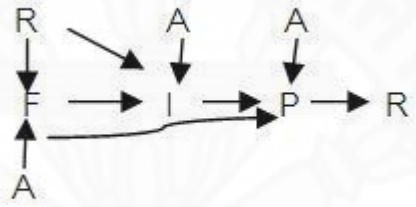
For SET

VAR

System1: $X_1$ = Institutes, $X_2$ = Proprietary, $X_3$ = Foreign, $r_t$ = dailySETreturn

According to these results, we could come up with the following diagram below;

(F = Foreign, I = Institutes, P = Proprietary, R = daily SET return, A = All Variable)

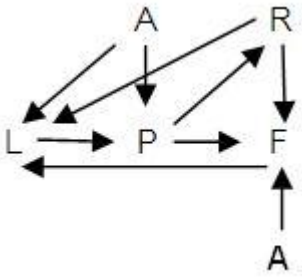



We can imply that Foreign and Institutes use momentum trading strategy whereas Proprietary trading could move the daily SET index return. Foreign determine Institutes and Proproietary. Institutes determine Proprietary. All variable determine Foreign, Institutes and Proprietary.

System2: $X_1$ = Proprietary, $X_2$ = Foreign, $X_3$ = Local, $r_t$ = dailySETreturn

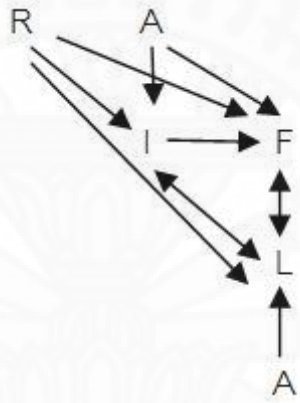
According to these results, we could come up with the following diagram below;

(F = Foreign, L = Local, P = Proprietary, R = daily SET return, A = All Variable)



We can imply that Foreign and Local use momentum trading strategy whereas Proprietary trading could move daily SET index return. Local determine Proprietary. Proprietary determine Foreign. Foreign determine Local. All variable determine Local, Proprietary and Foreign.

System3: $X_1$ = Institutes, $X_2$ = Foreign, $X_3$ = Local, $r_t$ = dailySETreturn
According to these results, we could come up with the following diagram below;
(F = Foreign, L = Local, I = Institutes, R = daily SET return, A = All Variable)




We can imply that Foreign, Institutes and Local use momentum trading strategy. Institutes co-move with Local. Foreign co-moves with Local. Institutes determine Foreign. All variable determine Institutes, Foreign and Local.

Impulse response analysis and forecast error

1. between Institutes and dailySETreturn
   Irf: So, Institutes has more impact than the dailySETreturn.
   Oirf: So, Institutes has more impact than the dailySETreturn.
   Coirf: So, Institutes has more impact than the dailySETreturn.

Perform forecast error : The response (Institutes) creates the unbound error fevd, so the Institutes has more impact than the dailySETreturn.

2. between Proprietary and dailySETreturn
   Irf: So, the dailySETreturn has more impact than Proprietary.
   Oirf: So, the dailySETreturn has more impact than Proprietary.
   Coirf: So, the dailySETreturn has more impact than Proprietary.

Perform forecast error: The response (Proprietary) creates the unbound error fevd, so the Proprietary has more impact than the dailySETreturn.

3. between Foreign and dailySETreturn

   Irf: So, the dailySETreturn has more impact than Foreign.

   Oirf: So, the dailySETreturn has more impact than Foreign.

   Coirf: So, the dailySETreturn has more impact than Foreign.

Perform forecast error: The response (Foreign) creates the unbound error fevd, so the Foreign has more impact than the dailySETreturn.

4. between Local and dailySETreturn

   Irf: So, the Local has more impact than the dailySETreturn.

   Oirf: So, the Local has more impact than the dailySETreturn.

   Coirf: So, the Local has more impact than the dailySETreturn.

Perform forecast error: The response (Local) creates the unbound error fevd, so the Local has more impact.

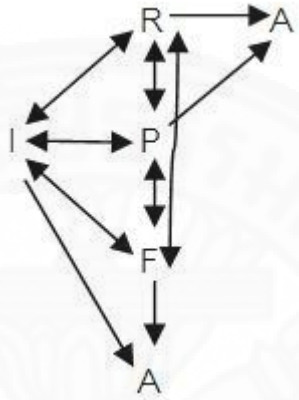
For mai

VAR

System1: $X_1$ = Institutes, $X_2$ = Proprietary, $X_3$ = Foreign, $r_t$ = dailymaireturn

According to these results, we could come up with the following diagram below;

(F = Foreign, P = Proprietary, I = Institutes, R = daily mai return, A = All Variable)

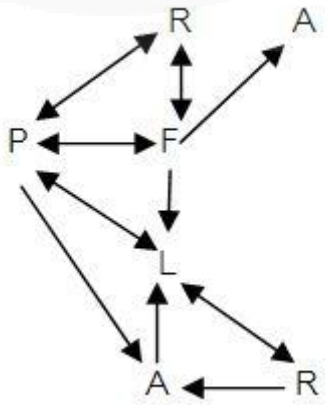



We can imply that Institutes, Proprietary and Foreign trading co-move with the daily mai return. Institutes, Foreign and Proprietary trading co-move each other in mai market. Institutes, Foreign and Proprietary trading determine all variable.

System2: $X_1$ = Proprietary, $X_2$ = Foreign, $X_3$ = Local, $r_t$ = dailymaireturn

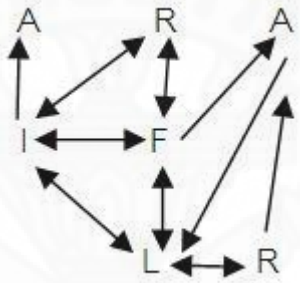
According to these results, we could come up with the following diagram below;

(F = Foreign, P = Proprietary, L = Local, R = daily mai return, A = All Variable)



We can imply that Proprietary, Foreign and Local trading co-move with the daily mai return. Proprietary trading co-move with Foreign and Local. Foreign determine Local. Foreign and Proprietary trading determine all variable. All variable determine Local. Daily mai return determine all variable.

System3: $X_1$ = Institutes, $X_2$ = Foreign, $X_3$ = Local, $r_t$ = dailymaireturn
According to these results, we could come up with the following diagram below;
(F = Foreign, I = Institutes, L = Local, R = daily mai return, A = All Variable)




We can imply that Institutes, Foreign and Local trading co-move with daily mai return. Institutes, Foreign and Local trading co-move each other in mai market. Institutes and Foreign determine all variable whereas all variable determine Local. Daily mai return determine all variable.

Impulse response analysis and forecast error

1. between Institutes and daily mai return
   Irf: So, the daily mai return has more impact than Institutes.
   Oirf: So, the daily mai return has more impact than Institutes.
   Coirf: So, the daily mai return has more impact than Institutes.

Perform forecast error: The response (Institutes) creates the unbound error fevd, so the Institutes has more impact than the daily mai return.

2. between Proprietary and daily mai return
   Irf: So, the daily mai return has more impact (very huge) than Proprietary.
   Oirf: So, the daily mai return has more impact (very huge) than Proprietary.
   Coirf: So, the daily mai return has more impact (very huge) than Proprietary.

Perform forecast error: The response (Proprietary) creates the unbound error fevd, so the Proprietary has more impact than the daily mai return.

3. between Foreign and daily mai return

   Irf: So, the daily mai return has more impact than Foreign.

   Oirf: So, the daily mai return has more impact than Foreign.

   Coirf: So, the daily mai return has more impact than Foreign.

Perform forecast error: The response (Foreign) creates the unbound error fevd, so the Foreign has more impact than the daily mai return.

4. between Local and daily mai return

   Irf: So, the Local has more impact than the daily mai return.

   Oirf: So, the Local has more impact than the daily mai return.

   Coirf: So, the Local has more impact than the daily mai return.

Perform forecast error: The response (Local) creates the unbound error fevd, so the Local has more impact than the daily mai return.

In conclusion, we can notice that there are some major differences between the trading strategies across the two markets (the SET and the mai).

In the SET, system1; we can imply that Foreign and Institutes use momentum trading strategy whereas Proprietary trading could move the daily SET index return. Foreign determine Institutes and Proprietary. Institutes determine Proprietary. All variable determine Foreign, Institutes and Proprietary. For system2; Foreign and Local use momentum trading strategy whereas Proprietary trading could move daily SET index return. Local determine Proprietary. Proprietary determine Foreign. Foreign determine Local. All variable determine Local, Proprietary and Foreign. For system3; Foreign, Institutes and Local use momentum trading strategy. Institutes co-move with Local. Foreign co-moves with Local. Institutes determine Foreign. All variable determine Institutes, Foreign and Local.

But for the mai, system1; we can imply that Institutes, Proprietary and Foreign trading co-move with the daily mai return. Institutes, Foreign and Proprietary trading co-move each other in mai market. Institutes, Foreign and Proprietary trading determine all variable. For system2; Proprietary, Foreign and Local trading co-move with the daily mai return. Proprietary trading co-move with Foreign and Local.

Foreign determine Local. Foreign and Proprietary trading determine all variable. All variable determine Local. Daily mai return determine all variable. For system3; Institutes, Foreign and Local trading co-move with daily mai return. Institutes, Foreign and Local trading co-move each other in mai market. Institutes and Foreign determine all variable whereas all variable determine Local. Daily mai return determine all variable.

For the impulse response analysis, we can conclude that in the SET, both Institutes and Local has more impact than the daily SETreturn, whereas Proprietary and Foreign have less impact than the daily SETreturn. In the mai, we can conclude that, Local has more impact than the daily mai return, whereas the remaining other three investor groups have less impact than the daily mai return.

In final conclusion, we could see the increasingly more significant role and impact of trading of Institutes and Local investor in both SET and mai. In some major unexpected event that the market was in the highly volatile, we could see in many cases that Institutes and Local investor can play the significant role in stabilizing the market index. It could imply that the most recent data that we use in this study could prove that there are some degree of structural change of the role and trading style or strategy of each investor group in the Thai stock and the markets both the SET and the mai in comparison with the prior study since 1995-1998.

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# BIOGRAPHY

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|---|---|
| Name | Mr. Weerachote Santimaetaneedol |
| Date of Birth | June 19, 1978 |
| Educational Attainment | 2011: Master of Arts in International Relations, Thammasat University |
| | 2002: Bachelor of Business Administration (Major: International Business Management), Assumption University |
| Work Experiences | Manager – Global markets department at Asia Plus Securities Co.,Ltd. (2016) |
| | Trader (Gold Spot) at Classic Gold Co., Ltd. (2016) |
| | Assistant Analyst at Hua Seng Heng Gold Futures Co., Ltd. (2013-2015) |
| | Gold Dealer at Gcap Co., Ltd. (2011-2013) |
| | Marketing Officer – Equity Investment at Sicco Securities (Public) Co., Ltd. (2003-2006) |