

# Analysis of Herding Behavior in the Indonesian Capital Stock Market

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**Abstract**— Irrational financial behavior that is often found in financial markets is herding behavior. If market participants do herding, it will affect changes in stock prices and certainly will have implications for asset returns and risks owned. This study aims to determine grazing behavior based on the type of investor in the capital market. Indonesia during the period 2013-2016, to measure the extent to which the effects of grazing behavior were based on the type of investment and to examine how grazing behavior relationships between types of investors. This study uses the Vector Auto Regression (VAR) method, the research data is investor ownership of the LQ-45 index in the 2013-2106 period. The LQ-45 index is used because they have a high stock capitalization, high frequency of trading and high liquidity. Three methods in VAR analysis are used to answer research problems, VAR analysis, Impulse Respond Function (IRF), and Granger Causality. The results show that the impact of herding behavior is significantly influenced by investors of the same type, the response occurs to the average price fluctuations in the initial period. The impact of investor behavior that is only responded by investors of the same type shows that there is a pattern of causality between types of investors.

**Keywords:** Herding behavior, VAR, Behavioral finance

## I. INTRODUCTION

The capital market in Indonesia has become an alternative investment choice for local and foreign investors as seen from the positive movement of both the amount of investment and the frequency of transactions in the capital market. This increase cannot be separated from the role of investors involved, both individual and institutional investors. Investors are people or business entities who invest their capital directly to gain profits in the future. Investors are not limited to domestic investors but also foreign investors. Although they are from different countries, they can still invest in the Indonesian capital market because of the e-trading system, so that investments can be made anywhere, anytime, and by anyone as long as the requirements have been met. So far, the growth of investors in Indonesia based on the share ownership is divided into four types, in which are dominated by domestic institutional investors, followed by foreign institutions, foreign individuals and finally domestic individuals.

Movement of share ownership is not the same for each investor. This is usually due to the asymmetry in information received, and the effect of taking different investment decisions. Each type of investor has a different character in decision making. There are two references used by investors in making investment decisions (May, 2011), namely the fundamental analysis which includes information about financial and company management report, and the technical analysis which is a method of reading price movements using historical stock price data. Rational investors will use both analyses to make investment decisions, but psychological factors also influence and determine the investment decision- making process, which causes investor behavior to be irrational. The irrationality of investor behavior is influenced by psychological characteristics such as fear, greed, and regret (Sarana, et al 2008).

Irrational financial behavior that is often found in financial markets is herding behavior. Herding behavior is the behavior of following the actions of other investors when making investment decisions (Lindhe, 2012). Christie and Huang (1995) define herding as the behavior of investors that emphasizes their personal analysis or opinions and makes other investor's behavior and market sentiment as the basis for investment decisions. Investors who do herding will ignore financial and technical analysis. So that when they make investment decisions, they are strongly influenced by the behavior of other investors.

Hwang (2004) claim that investors will not get maximum results in their stock portfolios when they are herding because the market price does not reflect the actual price. Herding behavior often happens when the market is showing an unstable condition or during a market stress (Chang, et al. 2000). Investors deal with uncertainty about the source of information and receive uncertain signals regarding the market conditions. The uncertainties will lead to asymmetric information which will then will be responded differently by investors. Lindhe (2012) said that when investors are stricken by panic, they will ignore market fundamental analysis and tend to follow the noise or signal from the behavior of other investors who are believed to have higher skills or more experienced to secure the performance of their portfolios.

If market participants are herding, it will affect the stock price changes and it will certainly have implications for the return and risk of the assets owned (Chiang and Zhen, 2010). This condition will result in asset prices deviating from their fundamental values, and not reflecting the information of the company's actual fundamental conditions. Another consequence of the herding behavior is that it can worsen market volatility and make market conditions unstable (Mobarek, et al. 2014).

This phenomenon can be best explained by Behavioral finance and herding theory. This theory explained cognitive errors and emotions in making a financial decision (Hirschey and Nofsinger, 2003). The science of financial behavior tries to explain how and why emotions affect investors and make anomalies in the stock exchange, such as bubbles and crashes. Jordan (2008) defined behavioral finance as a study that tries to analyze and explain how errors can affect investor's decisions and market prices. Biases in behavioral finance relate to how someone processes the information and tries to make decisions with their preferences (Byrne, 2013). Biases can affect all things in making decisions especially it has implications related to money and investment. Ricciardi and Simon (2000) analyze and explain how emotions affect investors in the process of making investment decisions. Thus, behavioral finance is the study of the financial decision- making process, both, by individual investors and institutions that are influenced by psychological and social aspects

Herding behavior in the capital market has been studied in recent years. Lakonishok et al. (1992) detected no herding activity in a sample of pension fund managers using the LSV method. The results of the study conclude that herding can only be detected if the analysis is done on one type of investor. While currently there is more than one investor type. Chang et al (2005) measured herding based on the return equity behavior using the non-linear regression method and concluded that additional regression parameters are needed to describe the non-linear relationship between stock returns and market returns.

The results of previous studies have not been able to explain herding behavior based on the type of investor. The method used in this research is VAR (Vector Autoregressive) which is an analytical tool for projecting time series variables and, most importantly, is able to understand the interrelationship between variables. The Granger Causality test is used to examine the causality relationship between the two variables. The results of the Granger causality test are expected to be able to show the existence of a causal relationship and the direction of herding behavior based on the type of investor. This study describes the herding behavior of foreign and domestic investors based on the type of investor in stock ownership. The stock ownership data used is the data recorded in KSEI (Indonesian Central Securities Depository). The sample used in this study is the ownership of the LQ45 indexed stocks for the periods of January 2013 to June 2016. This study does not discuss the factors that influence herding behavior between different types of investors. The selection of the LQ45 indexed stocks as the object of research is because LQ45 stocks reflect the characteristics of liquidity, high market capitalization, high trading frequency and have good financial growth.

Based on the background of the problems described above, no research has been found that examines investor-based behavior in the Indonesian capital market, it is necessary to do some research on investors by type, large time measurements for each type of investor and know how to connect between type investors.

## II. METHOD

### A. Sample

The research sample is the companies listed on the LQ-45 stock index for the periods of January 2013 to June 2017. The sampling technique utilized is purposive sampling, in which the first criteria is companies whose stock are included in the LQ-45 Index listed on the Indonesian Stock Exchange (IDX) during the period of January 2013-June 2017. Second, they are consistently the most active companies over the period of January 2013-June 2017, and the third is companies that have reported their stock ownership to the Indonesia stock exchange (IDX). There were 45 companies that met the criteria among the 495 listed companies on the Indonesia Stock Exchange.

### B. Measurement

The variables used in this study are investor status and investor type, investor status is divided into domestic and foreign, while investor types are divided by individuals and institutions. This study does not see any external factors that affect investors, thus, this study only examines the interconnected endogenous variables, which is the linkage of behavior between investors to stock ownership.

### C. Analysis

With the VAR method, the variables in this study are not differentiated between endogenous variables and exogenous variables, because all variables are interrelated and are endogenous variables (Sawala 2012, p. 32). This study uses Granger causality test

(testing the relationship) between variables. Investor behavior can be investigated by using VAR because this method can explain how the economic phenomena could happen. The phenomenon of herding is seen from the similarity in investors' behavior, the influence of investors on other investors, the length of influence, and the direction of investor influence. Based on the assessment of the phenomenon, the most suitable method for this research is the VAR (vector autoregressive) method. The phase of the Vector Autoregressive method is VAR estimation, t-test, f test,  $R^2$  test, impulse response analysis, and Granger causality test.

VAR analysis testing requires several statistical tests, which are a stationary test and optimal lag. Test of stationery is a procedure to ensure that the data used is in a timely manner, as seen from the fluctuations in data that move and fluctuate around the average. The time series data used in this study needs to be in a stationary form because unstable data can lead to spurious testing results and insignificant results (Widarjono, 2007). In the stationarity test, Augmented Dickey-Fuller (ADF) is used because the ADF test has considered the possibility of autocorrelation in error term if the data series used is unstable.

This test is based on the comparison between t statistics with t table Mac Kinnon critical values, with the following terms:

- a. If t statistics < t table of Mac Kinnon critical values, then  $H_0$  is accepted which means that the residual data is not stationary.
- b. If t statistics > t table of Mac Kinnon critical values, then  $H_0$  is rejected which means that the residual data is stationary.

This test can also be based on the comparison between the ADF probability value and the significance level of 5%, with the following conditions:

- a. If the ADF probability value is <5% (0.05), then  $H_0$  is rejected which means that the residual data is stationary.
- b. If the ADF probability value is > 5% (0.05) then  $H_0$  is accepted which means that the residual data is not stationary.

The determination of the lag length is used to determine the length of the period a variable is influenced by its past variables and other endogenous variables. In this study, the optimal lag selection considers several criteria from Akaike information criterion (AIC), Schwartz information criterion (SIC), Hannan-Quin Criteria (HQ), Final Prediction Error (FPE), and the Likelihood Ratio (LR). Optimal lag results are the smallest values among the lags which include all of the selected lag order criteria. This study discusses three parts; seeing the herding behavior carried out by investors measured by vector autoregressive test, knowing and analyzing how long it takes to transmit the herding behavior using response impulses, and knowing the relationship between variables using the Granger causality test.

### 1. Vector Autoregressive (VAR) Analysis

VAR has the ability to forecast (forecasting), without requiring assumptions for the value of each endogenous variable in the future. VAR has several advantages, including No need to differentiate endogenous or exogenous variables because all VAR variables are endogenous, both estimates are simple because the Ordinary Least Square (OLS) method can be applied to each equation separately and that three forecast results using this method in many cases is better than the results using complex simultaneous equation models.

### 2. Impulse Response Function Analysis

The F test block and the causality check in the VAR will indicate which variables in the model statistically have a significant effect on the future value of each variable in the system. However, the results of the F test will not be able to explain the sign of the relationship. Therefore, the F test results will not indicate whether changes in a variable have a positive or negative effect on other variables in the system. Information about this will be shown through the impulse response analysis. The function of the Impulse response is to track the response rate of the dependent variable in the VAR to the shock of each variable (Brooks, 2002) (Quoted by Modul Sawala, 2012).

### 3. Granger Causality Test

A causality test is required to determine whether an endogenous variable can be treated as an exogenous variable. This originates from the nescience regarding the influence between variables. If there are two variables Y and X, then whether Y causes X or X causes Y or both or there is no relationship between them. Variable Y causes the variable X. This means that how much the value of X is in the current period can be explained by the value of X in the previous period and the value of Y in the previous period. This test is used to find out the events that happened first which will results in another event to occur. This test is also to see whether an independent variable improves forecasting performance from the non-independent variable. Causality is a two-way relationship. So, if there is causality in this econometric model there is no independent variable. All variables are dependent variables. In the analysis of causality, it is divided into:

1. One-way causality:  $X \rightarrow Y$ , meaning that X causes Y; and  $Y \rightarrow X$ , meaning Y causes X
2. Two-way causality:  $Y \leftrightarrow X$ , there is a simultaneous relationship between Y and X, because of Y causes X and X cause Y.

In this study, the Granger Causality Test explains whether the influence between investor behavior has a two-way relationship or just one direction. The Granger test is essentially looking at past influences on the present conditions. Thus, the data used is time series data (Nachrowi, 2006) in (Sawala, 2012, p. 37).

### III. FINDING AND DISCUSSION

During the period of observation, foreign individual investors were recorded to have 232.18 billion shares (0.9%), foreign institutional investors had 13.401 trillion shares (56.76%), domestic individual investors had 1.86 trillion shares (7.8 %), and domestic individual investors own 8.10 trillion shares (34.34%) from a total of 23.606 trillion stock ownership. The fluctuation in the stock market is related to the high proportion of foreigners in stock trading. The behavior of foreign investors can affect the movement of stock carried out by other types of investors. The stock ownership movement is carried out by the types that have the same characteristics, which are between the types of individual investors and between the types of institutional investors. These movements are dominated by foreign institutional investors. When there is an increase in stock ownership, other types of investors respond to the behavior.

#### A. Test of Stationarity

The test result for the foreign individual investor type (ASING\_ID) shows an Augmented Dickey-Fuller (ADF) probability value of 0.0054. This shows that the ADF probability value is greater than the significance level of 5% ( $0.0054 > 0.05$ ) and it can be concluded that individual foreign variable data is stationary at the grade level. The test result for the foreign institutional investor type (ASING\_INS) shows an Augmented Dickey-Fuller (ADF) probability value of 0.6561, this indicates that the ADF probability value is greater than the 5% significance level ( $0.6561 > 0.05$ ). Thus,  $H_0$  is accepted and it can be interpreted that the foreign institution variable data are not stationary at the grade level. Subsequently, the 1-degree stationary root test is conducted on the foreign institutional investor data. The results show that the Augmented Dickey-Fuller probability value is 0,000. This shows that the ADF probability value is less than the 5% significance value.

The test results for the domestic individual investor type (DOM\_ID) indicate an Augmented Dickey-Fuller (ADF) probability value of 0.0000. This indicates that the ADF probability value is smaller than the significance level of 5% ( $0.0000 < 0.05$ ), so it is already stationary at a 1-degree differentiation. The test result for the domestic institutional investor type (DOM\_INS) shows an Augmented Dickey-Fuller (ADF) probability value of 0.00. This indicates that the ADF probability value is smaller than the significance level of 5% ( $0.00 < 0.05$ ), thus, it is stationary in 1-degree differentiation.

#### B. Determination of Lag

The final prediction error (FPE) test shows  $1.03E + 75$  as the lowest value on the 1st lag, the Akaike information criterion (AIC) test shows 184.0768 as the smallest value on the 1st lag, the Schwartz information criterion (SC) test shows 184.7749 as the lowest value on the 1st lag, the Hannan-Quin Criteria (HQ) test shows 184, 3499 as the smallest value on the 1st lag, and the Likelihood Ratio (LR) test shows the value of 377.6955 on the 1st lag. In this study, the lag found = 1 is a suitable VAR lag model based on the five existing criteria.

#### C. VAR analysis

VAR analysis illustrates that all variables in the simultaneous equation are endogenous variables. This assumption is appointed because the determination of exogenous variables in the VAR equation is often subjective (Widarjono, 2007). Based on the criteria in the VAR analysis, if the t-statistic value is greater than the t-table value, it can be said that the variable is significant. Table 1 shows the VAR estimation result. Based on the VAR analysis test in Table I, the following equation is used.

TABLE I. VAR TEST RESULTS

|                | <i>ASING_ID</i> | <i>ASING_INS</i> | <i>DOM_ID</i> | <i>DOM_INS</i> |
|----------------|-----------------|------------------|---------------|----------------|
| ASING_ID(-1)   | [8.108]         | [0.264]          | [-0.418]      | [0.332]        |
| ASING_INS(-1)  | [0.291]         | [15.59]          | [0.936]       | [1.414]        |
| DOM_ID(-1)     | [-0.805]        | [0.174]          | [8.323]       | [0.989]        |
| DOM_INS(-1)    | [-0.342]        | [1.32]           | [-0.371]      | [11.88]        |
| C              | [2.0756]        | [0.337]          | [2.75]        | [-0.49]        |
| R-squared      | 0.573           | 0.987            | 0.723         | 0.98           |
| Adj. R-squared | 0.544           | 0.986            | 0.704         | 0.979          |
| Sum sq. Resids | 2.30E+19        | 2.43E+21         | 1.57E+20      | 1.33E+21       |
| S.E. equation  | 6.20E+08        | 6.36E+09         | 1.62E+09      | 4.72E+09       |
| F-statistic    | 20.12           | 1200.1           | 39.11         | 745.75         |

Source : Eviews 6.0, Computed Secondary Data, 2017

1. ASING\_ID investor type herding behavior

$$\text{ASING\_ID} = C + 0.7162 * \text{ASING\_ID} (-1)$$

The formulation explains that the behavior carried out by the ASING\_ID investor type in the first period is influenced by the previous behavior of the foreign individual investor type at a real level of 5% with a significance value of 8,108. The increase in foreign investors (ASING\_ID) ownership by 1% one month ago resulted in a change of 0.71% stock ownership of foreign individual investors, in the present. Other types of investors did not respond to ASING\_ID's herding behavior because the significance value of the ASING\_INS, DOM\_ID, and DOM\_INS investor type are below the t-table value, which is 1.671.

2. Behavior of ASING\_INS investor type herding

$$\text{ASING\_INS} = C + 0.9076 * \text{ASING\_INS} (-1)$$

The formulation explains that the behavior carried out by the ASING\_INS investor type in the first period is influenced by the past behavior of the foreign institutional investor type at a real level of 5% with a significance value of 15,598. The increase in investors (ASING\_INS) ownership by 1% one month ago resulted in a change of 0.90% of the foreign institutional investor's ownership in the present period. Other types of investors did not respond to ASING\_INS's herding behavior because the significance value of ASING\_ID, DOM\_ID, and DOM\_INS are below the t-table value, which is 1.671.

3. The Herding Behavior of the DOM\_ID investor type

$$\text{DOM\_ID} = C + 0.7304 * \text{DOM\_ID} (-1)$$

The formulation explains that the behavior carried out by the DOM\_ID investor type in the first period is influenced by the domestic individual investor's past behavior at a real level of 5% with a significance value of 8,322. The increase of 1% of the domestic investors' (DOM\_ID) ownership one month ago resulted in a change of 0.73% of domestic individual investor's stock ownership in the present. Other types of investors did not respond to the DOM\_ID's herding behavior because the significant value of the investor type ASING\_INS, ASING\_ID, and DOM\_INS are below the t-table value, which is 1.671.

4. The herding behavior of the DOM\_INS investor type

$$\text{DOM\_INS} = C + 0.8729 * \text{DOM\_INS} (-1)$$

The formulation explains that the behavior carried out by the DOM\_INS investor type in the first period is influenced by past behavior of the domestic institutional investor type themselves at a real level of 5% with a significance value of 8,322. The increase of 1% of the domestic investors' (DOM\_INS) ownership one month ago resulted in a change of 0.87% of the domestic institutional investors stock ownership in the present. Other types of investors do not respond to the herding behavior of DOM\_INS because the significance value of the ASING\_INS, ASING\_ID, and DOM\_ID investor type are below the t-table value, which is 1,671.

Based on the VAR estimation test, the behavior of foreign individual investors (ASING\_ID) has a t-statistics value of 8.108 and the t-table value is 1.671. This shows that the t-statistics value is greater than the t-table value ( $8.108 > 1.671$ ). So it can be concluded that the herding behavior in the ASING\_ID investor type was caused by the ASING\_ID variable. The results of the research show that the ASING\_ID variable is influenced by the ASING\_ID variable in the previous 1 month period.

Based on the VAR estimation test, the institution's foreign investor behavior (ASING\_INS) has a t-statistic value of 15,598 and the t-table value is 1,671. This shows that the t-statistics value is greater than the t-table value ( $15,598 > 1,671$ ). So it can be concluded that the herding behavior of the ASING\_INS investor type is affected by the ASING\_INS variable. The results of the study show that the ASING\_INS variable is influenced by the ASING\_INS variable in the previous 1 month period.

Based on the VAR estimation test, the behavior of domestic individual investors (DOM\_ID) has a t-statistic value of 8,322 and the t-table value is 1,671. This shows that the t-statistics value is greater than the t-table value ( $8,322 > 1,671$ ). So it can be concluded that the DOM\_ID variable affected the herding behavior of the DOM\_ID investor type. The results show that the DOM\_ID variable is affected by the ASING\_ID variable in the prior 1 month period.

Based on the VAR estimation test, the behavior of foreign institutional investors (DOM\_INS) has a t-statistic value of 11,884 and the t-table value is 1,671. This shows that the t-statistics value is greater than the t-table value ( $11,884 > 1,671$ ). So it can be concluded that the DOM\_INS variable affected the herding behavior of the DOM\_INS investor type. The results show that the DOM\_INS variable is affected by the DOM\_INS variable in the previous 1 month period.

The F statistic test basically shows whether all variables are exogenous or free variables. Those included in the model have an influence on the endogenous variables. Using a significance level of 5%, the F-table value is 3.34. From the statistical calculation results using Eviews, the obtained F-statistical test values are ASING\_ID (20.12), ASING\_INS (12.00), DOM\_ID (39.11), DOM\_INS (74.5). The calculation shows that the numbers are bigger than the F-table value of 3,34. Thus, it can be interpreted that there is a significant influence by the exogenous variables simultaneously on the endogenous variables.

The Coefficient of Determination ( $R^2$ ) measures the ability of the model in explaining the variations of the independent variables. The coefficient of determination has values between zero and one. The results of the analysis show that the Adjusted R-Squared values are: ASING\_ID variable (0,544), ASING\_INS (0,98), DOM\_ID (0,70), DOM\_INS (0,97). Thus, it can be concluded that the ability of all the variables in explaining the variation in the dependent variables is equal to ASING\_ID (54%), ASING\_INS (98%), DOM\_ID (70%), and DOM\_INS (97%). The rest is explained by other factors that are not included in the VAR estimation model results.

#### *D. Impulse Response Function (IRF) Analysis*

Widarjono (2007), said that Impulse response is one of the important analysis in the VAR model. Impulse response analysis tracks the response of endogenous variables in the VAR system due to the shock or changes in the disruption variables. The sequence of the variables in the IRF test must be arranged correctly because IRF is very sensitive to the sequence arrangement of the variables which will be tested.

Here are the results of the impulse response :

Shocks by the behavior of foreign individual investors by 1 standard deviation of 924,702,151, will be responded by the foreign individual investors of the same type by (67.1%). The impulse responses that occurred at the start of the period is 620,824,530.

Shocks by the foreign institutional investor behavior by 1 standard deviation of 56,572,078,349, will be responded by the foreign institutional investors of the same type by (11.3%). The impulse responses that occurred at the start of the period is 6,397,411,257.

Shocks caused by the domestic individual investor behavior by 1 standard deviation of 3,026,298,076, will be responded by the same types of domestic individual investors by (53.6%). The impulse responses that occurred at the start of the period is 1,624,571,308.

Shocks caused by domestic institutional investor behavior by 1 standard deviation 32,762,713,992, will be responded by the same types of domestic institutional investors by (13.4%).

The impulse responses that occurred at the start of the period is 4,418,257,346. The response given by other types of investors does not show fluctuations in the movement of the herd behavior of 1 standard deviation. The conclusion is a positive shock occurred at the beginning of the period until the 10th month, in which afterward is a stable condition between each type of investor and the investors of the same type.

#### *E. Granger Causality Test*

To determine the existence of a shock effect from a variable to another variable, it is necessary to conduct a causality test. Through this causality test, it can be determined whether an endogenous variable in the VAR system has a causality effect on other endogenous variables (Widarjono, 2007). The test is conducted by examining the causality effect of a variable on other variables by looking at the probability value. If the probability value is less than 10% (0.1), it means that there is a causality relationship between the two variables tested. Table 2 shows the results of the Granger Causality test on the research variables.

TABLE II. GRANGER CAUSALITY TEST

| <i>Null Hypothesis:</i>                  | <i>Obs</i> | <i>F-Statistic</i> | <i>Probability</i> |
|--|------------|--------------------|--------------------|
| ASING_INS does not Granger Cause DOM_ID  |            | 3.512              | 0.065              |
| DOM_INS does not Granger Cause ASING_INS | 65         | 1.766              | 0.188              |
| ASING_INS does not Granger Cause DOM_INS |            | 3.140              | 0.081              |
| DOM_INS does not Granger Cause DOM_ID    | 65         | 2.810              | 0.098              |
| DOM_ID does not Granger Cause DOM_INS    |            | 1.459              | 0.231              |

Source: Eviews 6.0, Computed Secondary Data, 2017

From the results of the Granger causality test, it can be seen that there is a causality relationship between several types of investors in the Indonesian stock market. By using a 10% confidence level, there is a significant one-way relationship between investor types.

- a. The Granger Causality results for the foreign institutional investor (ASING\_INS) type. ASING\_INS has a causality relationship with other types of investors. The foreign institutional investor type has a Granger causality relationship with DOM\_ID and DOM\_INS which is significant at a real value of 10%. This shows a one-way

relationship from ASING\_INS to DOM\_ID with a probability of 0.065, and to DOM\_INS with a probability of 0.081. The relationship occurs in a one-way direction but it is not applicable to the opposite direction.

- b. The Granger Causality results for the domestic institutional investor (DOM\_INS) type. DOM\_INS has a causality relationship with other types of investors. The domestic institutional investor type has a Granger causality relationship with DOM\_ID with the probability of 0.098, significant at a real value of 10%. The relationship occurs in one way direction, namely DOM\_INS on DOM\_ID and the opposite does not apply.

#### IV. CONCLUSION

Based on the results of the research that has been carried out through various stages ; namely data collection, data processing and data interpretation, and the results of the herding behavior analysis based on investor types ASING\_ID, ASING\_INS, DOM\_ID, DOM\_INS in stock ownership, it can be concluded that herding behavior did occur between investors of the same type, namely the investors in the group of ASING\_ID, ASING\_INS, DOM\_ID, and DOM\_INS. The behavior of foreign individual investors can be influenced by the foreign individual investor type themselves, the behavior of foreign institutional investors can be influenced by foreign institutional investor themselves, the behavior of domestic individual investors can be influenced by the domestic individual investor type themselves, the behavior of domestic institutional investors can be influenced by the domestic institutional investors themselves.

All research variables provide different responses to herding behavior in each type of investor. The response that can influence herding behavior is the response that is bigger than 30%. Of all types, only the same type of investors give more than a 30% response. The ASING\_ID variable responds to 96.75% of the change caused by the ASING\_ID investor type themselves. The ASING\_INS variable responds to 86.04% of the change caused by the ASING\_INS investor type themselves. The DOM\_ID variable responds to 99.94% of the changes caused by the DOM\_ID investor type themselves. The DOM\_INS variable responds 87,33% of the changes caused by the DOM\_INS investor type themselves. The conclusion is, the herding behavior response is carried out by the same type of investor.

There is a one-way causality relationship between the research variables. The results of the causality test for ASING\_INS and DOM\_ID show a one-way relationship from ASING\_INS to DOM\_ID with a probability of 0.065. The Granger causality relationship is also created between ASING\_INS and DOM\_INS with the probability of 0.081, significant at a real value of 10%. This relationship occurs in a one-way direction, namely ASING\_INS on DOM\_INS and the opposite does not apply. Because of the relationship between variables, it can influence the behavior of investors. The same type of investor will have the same behavior in choosing a stock.

Using monthly share ownership data is a summary of daily stock transactions carried out by investors, monthly data is used because of the difficulty of obtaining daily data on investor stock transactions. Herding behavior research will be more accurate if used daily transaction data for a longer period. The grouping of types of investors also just started in 2013 so that the data used as research can only be taken from 2013 to 2016.

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