

## ANALYSIS OF FEDERAL FUND RATE AND BI RATE ANNOUNCEMENT TO ABNORMAL RETURN IN INDONESIA STOCK MARKET

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**ABSTRACT:** *The purpose of this study is to determine the effect of Fed rate and BI rate announcement on abnormal return in Indonesian stock market. This study uses an event study methods of sectoral data from August 2016 to March 2017. The method to calculating abnormal return is using event study, with stages as determination of estimation period, which in this study using event window (-3, +3), (-5, +5), and (-7, +7) and the estimated period of 200 days, the next stage is the calculation of actual return and then followed the calculation of expected return by using ordinary least square (OLS). The results showed that sectoral indices in Indonesia stock exchange tend to have significant differences in the abnormal return is not consistent. This is because there are many other factors that influence abnormal return, such as the US presidential election in November 2016 and February 2017 governor election. The only sectors that responded consistent to the announcement were the transportation, infrastructure and utilization sectors. Meanwhile, agricultural sector did not respond to all the announcement of Fed rate dan BI rate. Investor must be carefully to invest in transportation, infrastructure and utilization sector. Because when fed rate increase and BI rate constant stock price company in transportation, infrastructure and utilization sector will volatility and give a negative abnormal return.*

**KEYWORDS:** Fed Rate, Bi Rate, Abnormal Return, Event Etudy, Ordinary Least Square

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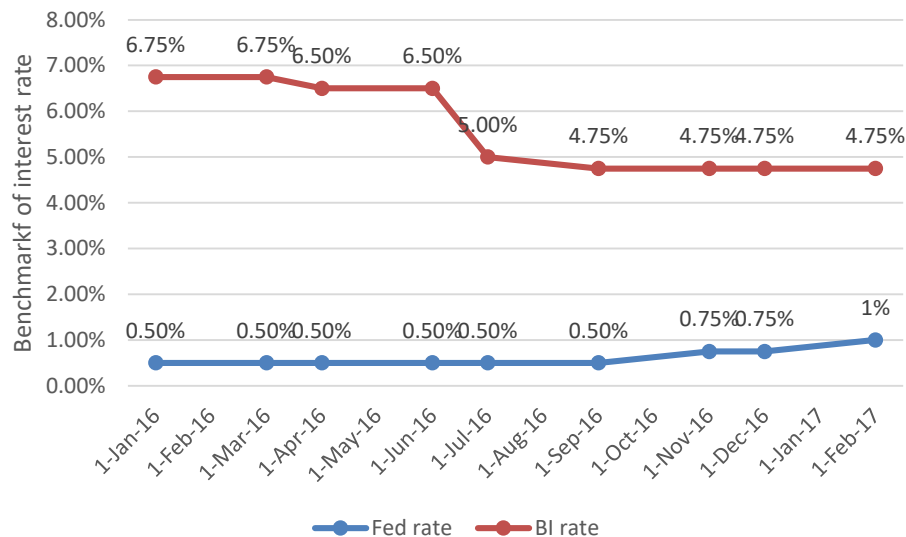
## INTRODUCTION

The stock market is a important instrument for every country, since it becomes one of company external funding for productive activity. There are two factors which influence investors in making the investment; company's internal factors and company's external factors. The internal factors that affect the stock market stock is the structure of capital, debt structure, and others. While one of the external factors that affect the movement of stock price movements is monetary policy.

Today, economic system in many countries, applies open economic system, which leads to the connection among the countries. This causes the country which is a small open economy like Indonesia will affect the events that occur in the large economy like America, Europe, and etc. Therefore the external factors of the company such as monetary policy becomes one of the most important considerations that must be considered by investors to make investment, both domestic monetary policy and foreign monetary policy. Monetary policy is an action performed by the central bank to influence the money supply that affects economic activity. According Wang (2013) the monetary policy of the United States which the center attention for various countries is the announcement of interest rate of the Federal Fund Rate (Fed Rate).

Fed rate has become a benchmark of interest rate in other countries' central bank, as US dollar is a global currency for business and foreign exchange saving. In doing so, the announcement

of USD interest rate is used as a reference of interest rate, including in Indonesia. The determination of Indonesia interest rate is regulated by Bank Indonesia (BI) to preserve the stability of domestic microeconomic and macroeconomic. BI rate determination not only consider the condition of domestic macroeconomics condition, but also examine the world interest rate or Federal Fund Rate. As a result, there is a correlation between interest rate reference of the United State (Fed rate) and interest rate reference of Indonesia (BI rate). The following figure. 1 is Fed rate and BI rate movement in the year of 2016 until 2017.

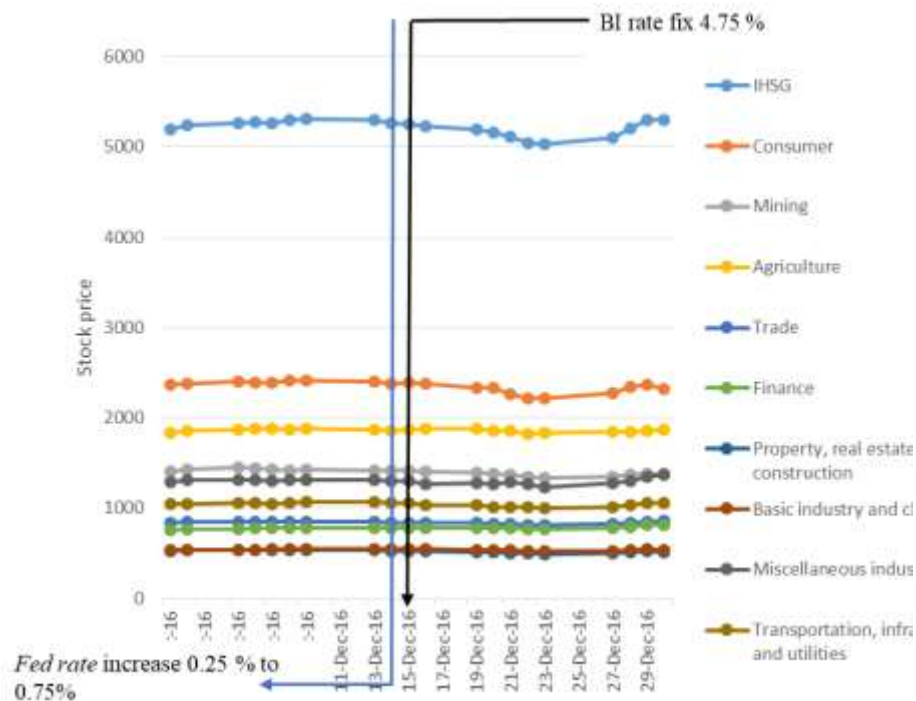


**Figure 1 The movement of benchmark interest rates Fed rate and BI rate 2016 – 2017**

Study of Wijayaningsih (2016), suggest that BI rate and Fed rate are used as investors' reference in making the investment in Indonesia Stock Exchange. In case a rise in BI rate occurs, the investors would shift investment fund to less risk such as deposit, valuable papers and other instruments which cause the fall of stock prices. On the other hand, when Fed rate is raised, it will followed by increased deposit interest rate in US banks. It caused capital outflow from Indonesia. This condision causes the value of Rupiah will depreciate from US. Companies that trend to import will have decreased in profit because of the increase in productivity costs. Therefore investor will sell the stock of that company and cused a decline stock price in the stock market Indonesia.

Fed rate and BI rate announcement may influence movement of the stock market in Indonesia. Stock market reaction towards a phenomenon can be measured by abnormal return. Abnormal return is a change of stock prices which caused by below expected return received by investors. The method used to find the impact of interest rate announcement towards abnormal return is event study (Campbell and MacKinley, 1997). The impact of announcement towards abnormal return can value positive or negative, depends on each stock in responding Fed rate and BI rate.

The announcement of Fed rate and BI rate affects the changing of Mixed Stock Price Index in Indonesia. As shown in figure 2 which describes the fall of Fed rate in December 13th, 2016 and the fall of stock price of 30.80 points. The other decline also happened on December 14th, 2016 for 8.45 points. The decline of stock price not only occur in Indonesia composite index, but also influence nine sectoral indexes in Indonesia.



**Figure 2. The movement of stock price indexes in the moment of Fed rate and BI rate announcement**

Based on previous explanations, it can be concluded that there is a correlation between Fed rate and BI rate announcement toward the stock price in Indonesia, so this research is conducted to find out the impact of Fed rate and BI rate announcement toward the stock market in Indonesia.

### Problems of Research

Research about the influence of foreign and domestic monetary policy on abnormal return has never been done before. The research has been done before is about of the influence of domestic monetary policy or foreign monetary policy on stock market with partially. The research of influence of foreign monetary policy towards large economy such as Gurib (2015) Dubai have negatively impact on abnormal return. Same with large economy, foreign monetary policy also affect small open economy like Indonesia and Bangladesh countries. Research by Wijayaningsih (2009) and Mamun, Uddin, Hoque (2013) show the change Fed rate give a negative impact to stock market Indonesia and Bangladesh stock market. But this research only focuses to analyse the influence of Fed rate towards return actual without considering abnormal return.

Research about the influence of domestic policies on capital markets has been done before, but the results of research are inconsistent. Research by Wasanaroongroj (2008) shows a negative relationship between the Thai interest rate announcement to the abnormal return in Thailand stock market that is SET index and financial index. Different result by Valadkhani and Harvie (2007) found that interest rates do not affect the Thailand stock market.

Similar to research in Thailand, research about influence of domestic monetary policy on stock markets in Indonesia have inconsistent results. Studies by Sumantyo and Anggraeni (2016)

which used the companies listed in LQ 45, Lestari (2014) which analysed 28 registered banks, conclude that did not find a significant abnormal return. Different result conducted by Gumanti (2015) towards 28 public banks registered in BEI, which showed there is a different abnormal return before and after announcement of BI rate.

Generally, previous researches only analysed stock market in the banking sector as stated in the researches by Lestari (2014) and Gumanti (2015). Beside banking sub-sector, this research is also applied to the companies listed on LQ45. The research about the impact of fed rate and BI rate on sectoral indexes is was never conducted before. Sectoral indexes are the indexes with high sensitivity. The risk rate on the market would be reflected toward each sectoral index movement. In doing so, this research uses sectoral indexes to find out the influence of Fed rate and BI rate fully. Based on those explanations, the problems of this research are how is the impact of Federal Fund rate and BI rate toward abnormal return and nine sectors of Indonesia market stock?

### Objectives of Research

The aims of this research are to analyse Federal Funds rate and BI rate announcement impact toward abnormal return of nine sectors of Indonesia market stock

## RESEARCH METHODS

### Data Types and Sources

This research uses secondary data which are focused to analyse the impact of Fed rate and BI rate announcement toward the abnormal return during August 2016 until March 2017. The data of stock price were gained from [www.idx.com](http://www.idx.com). This research is conducted from August 2016 which correspond with the change of Indonesia interest rate, from BI rate to BI rate 7 day report. The following is the announcement of Fed rate and BI rate occurred in Indonesia:

**Table 1 Announcement of Fed rate and BI rate in Indonesia**

No	Announcement date Fed rate	Announcement BI rate	Fed rate	BI rate
1	21 Sept, 2016	22 Sept, 2016	Fixed 0.5%	Decreased 1.5% to 5.0 %
2	27 Nov, 2016	21 Nov, 2016	Fixed 0.5%	Decreased 0.25% to 4.75%
3	14 Dec, 2016	15 Dec, 2016	Increase 0.25% to 0.75%	Fixed 4.75%
4	1 Feb, 2017	16 Feb, 2017	Fixed 0.75%	Fixed 4.75%
5	15 March, 2017	16 March, 2017	Increase 0.25% to 1.0%	Fixed 4.75%

### Data Analysis

This stage of research is conducted by defining Fed rate and BI rate announcement on September 2016, November 2016, December 2016, February 2017 and March 2017. The event window used in this research is an event window (-3,+3), (-5, +5) and (-7, +7) with event estimation for 200 days. The initial step of abnormal return calculation is done by actual return calculation with the following formula Lasmanah (2014):

$$R_{it} = \frac{P_{it} - P_{it-1}}{n}$$

Description:

Rit : stock return on the period of t

Pit : stock price I on the period of t

Pit-1 : stock price I on the day of t-1

The calculation of expected return by ordinary least square method (OLS) which estimated with market return which is IHSG. The following formula is IHSG market return calculation and the expected return calculation:

Return market:

$$R_{mt} = \frac{IHSG_t - IHSG_{t-1}}{n}$$

Description:

Rmt : market indexes return

IHSGt : integrative stock price indexes on the day t

IHSGt-1 : Integrative stock price indexes on the day t-1

*Market model (OLS) (Suryanto, 2015):*

$$R_t = \hat{\alpha} + \hat{\beta} \cdot R_{mt} + \varepsilon$$

Description:

Rt : expected return of sectoral indexes

$\hat{\alpha}$  : intercept of sectoral indexes intercept

$\hat{\beta}$  : slope coefficient, which is the beta of sectoral indexes

Rmt : market indexes return

$\varepsilon$  : Residual error and mistaken standard

Abnormal return is the indicator used to see the stock movement. According Shah (2014) abnormal return is the deviation of actual return gained by investors with expected return. The following is the formula of abnormal return calculation (Schrey, 2017):

$$AR_{it} = R_{it} - E(R_{it})$$

Description:

AR<sub>it</sub> : stock abnormal return i on the day of t

R<sub>it</sub> : stock actual return i on the day of t

$E(R_{it})$  : stock expected return  $i$  on the day of  $t$

The next calculation is average abnormal return which is the average abnormal return of Fed rate and BI rate for every occurring date, the following is the formula to calculate AAR (Asri, 1996):

$$AAR_{nt} = \frac{\sum_{i=1}^n AR_{it}}{n}$$

Description :

$AAR_{nt}$  : average of stock abnormal return on the day of  $t$

$\sum_{i=1}^n AR_{it}$  : abnormal return accumulation during event periode

$n$  : number of occurrence

The final step is conducting T paired test to find out the difference of abnormal return before and after the announcement. Moreover, the stages of t paired test examination are:

a. Formulate hypothesis

1st Hypothesis

$H_0: \mu_1 - \mu_2 = 0$

2 nd Hypothesis

There are three hypotheses on this research, which are:

$H_1: \mu_1 - \mu_2 < 0$  (Fed rate constant, and BI rate decrease)

$H_2: \mu_1 - \mu_2 \neq 0$  (Fed rate and BI arte constant)

$H_3: \mu_1 - \mu_2 > 0$  ( Fed rate increase and BI rate constant)

Description:

$\mu_1$ : average abnormal return before Fed Rate and BI Rate Announcement

$\mu_2$  : average abnormal return after Fed Rate and BI Rate Announcement

b. Determine signification rate

Signification rate used in this research is 5%

c. Calculate t value using t paired test

d. Conclusion

If the counted t value is bigger than the t on table,  $H_0$  will be denied, which can be concluded that there is a change of abnormal return on the announcement of Fed rate and BI rate.

**RESULT AND DISCUSSION****Average Abnormal Return Analysis (AAR) Before and After Announcement Fed rate and BI rate (T paired test)**

Announcement of Fed rate and BI rate are one of key investment indicators for investor, thus it is believed that these announcement could affect volatility in Indonesia stock market. Due to this phenomenon, Fed rate and BI rate announcement could give different investment signal. According Brown and Warner (1980) When the announcement are carrying positive information, then overall stock price would increase and abnormal return would be positive. On the contrary, if the announcement are carrying negative information, overall stock price would decline and abnormal return would be negative.

However, its overall affecting power, Fed rate and BI rate announcement are having different effect on each sectoral index in Indonesia Stock Exchange. Ekayanake (2008) state that each sectoral index would respond differently to change in interest rate depending on its unique condition. The result of this research shows that each sector respond to the announcement differently each announcement month. Table 2 shows the differences of abnormal return before and after the announcement were made for each sector.

**Table 2. The results T paired test abnormal return before and after Fed rate and BI rate announcement**

Sectoral index	Category I			Category I			Category III			Category II			Category III		
	September			November			Desember			Febuari 2017			Maret 2017		
	2016			2016			2016								
							<i>Event window</i>								
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Consumer	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	-	TB
Mining	+	+	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	+
Agriculture	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB
Trade, service, and investment	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	-
Finance	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	+	TB
Property, real estate, and building	TB	-	TB	TB	TB	TB	TB	TB	TB	TB	-	TB	TB	+	+
Basic and chemical industry	+	+	TB	TB	TB	TB	TB	-	TB	TB	TB	TB	TB	TB	TB
Miscellaneous industry	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	+	+
Transportation, infrastructure, and utilities	TB	TB	TB	TB	TB	TB	-	TB	TB	TB	TB	TB	-	-	-

Description:

- Positive mark (+), Average abnormal return after greater than before
- Negative sign (-), Average abnormal return after smaller than before



- TB, there is no significant difference in abnormal returns before and after the Fed rate and BI rate announcement
- Category I, Fed rate constant and BI rate decreased
- Category II, Fed rate and BI rate constant
- Category III, Fed rate increased and BI rate constant

During the course of observation period from August 2016 to March 2017, we could categorize Fed rate and BI rate announcement into three announcement category. The first category are when Fed rate were announced with no change while BI rate were announced decreased. Second category are when both Fed rate and BI rate were announced with no change. Third category are when Fed rate were announced increased while BI rate were announced with no change. Among nine sector within Indonesia stock exchange, majority of these sector responded to the announcement inconsistently. Ellen (2016) said that Fed rate announcement had been fully anticipated by investor and Indonesian government, also several economic policy had been instated such as tax amnesty and strong exchange reserve are believed to minimized the impact, reducing the volatility within Indonesia stock exchange when announcement occurred.

Results of this research shows that only agricultural sector had not been affected at all through all announcement during observation period. This indicate that investor shows no significant difference in trade activity which could result in significant change in abnormal return when Fed-BI rate announced. Therefore it could be concluded that Fed-BI rate announcement had no impact to agriculture sector. This conclusion however are contradicting the research hypothesis, because of investor do not consider interest rate change as major factor to invest in agriculture sector. Instead, they would rely on other factors such as change in agriculture commodity prices. This reasoning are in accordance with Fadilaa (2015) whose research shows that interest rate change does not affecting price in agriculture sectors.

On first announcement category which occurred on September 2016 and November 2016, BI rate were announced decreased by 150 basis point (1.5%) to 5.00% on September 2016 and decreased by 25 basis point (0.25%) to 4.75% on November 2016, while Fed rate announcement is constant. The result on this category shows inconsistent results among nine sectors. Abnormal returns significant difference only found on September 2016, while there were no significant difference on November 2016 at all. These onconsistencies could be by global phenomenon which occurred on November 2016 during election in USA. This global phenomenon could be the leading cause affecting not only Indonesia Stock Exchange, but also major stock exchange around the world. Utomo (2016) stated that uncertainty in the future of USA policy increase investment risk in stock market. Therefore on November 2016 investors tend to withdrew activity on investment activity, so there is no significant change in abnormal return on November 2016.

Decrease in Indonesia interest rate tend to give positive result reflected on increase in abnormal return. Decrease in interest rate will be followed by decrease in lending interest rate. This will caused increase in investment activity, especially on sectors with capital intensive characteristic, since lower lending rate could give better incentives to take bank loan. This informasion creates a positive sentiment to investor, since increase in investment activity are associated with higher in business performance.



Mamun, Udin, and Hoque (2013) found a negative correlation between interest rate and investment. This indicates when decrease in interest rate (BI rate) encourages investor to invest in risky asset such as stock rather than riskless asset such as savings. This increase in performance are shown by two sectors, mining sectors. and basic and chemical sectors. Setianto (2015) stated that mining sector are a capital intensive sectors, either for investments or operating activities. With the decrease of interest rate, it is expected performance on mining sector would increase. Therefore, investor were having more confidence on investing in mining sectors.

The same result can be seen in basic and chemical industries, which also require massive working capital. Again, decrease in interest rate giving positive signal to investor to invest on this sector. Same result are found by Rahman (2014) which also showed that decrease in interest rate positively affecting share price.

In contrast, the property sector are responding negatively to the announcement. This is obviously contradicting theory and hypothesis, where it is expected that with the decrease of interest rate, consumer purchasing power are expected to increase, including in mortgage. Ellen (2016) explained that decrease in stock price among property sectors were caused by its bad performance occurred in its previous quarters and yet to recover. Investor were still lack of confidence due to this, therefore property sector could not utilize the decrease of interest rate as means to increase its performance.

On second announcement category, which occurred on February 2017, results shows that majority of the sector does not respond to the announcement, as shown by lack of significant difference on abnormal return. The result of second announcement category are not in accordance of hypotheses. This could be because of Jakarta Governor electoral event which coincidentally occurred in the same month. Jakarta governor electoral event is the only electoral event in Indonesia which were anticipated by many, including investor, because any Jakarta governor policy could have major economic impact. Therefore, it is suspected that investor held back any investment decision until the electoral result announced, therefore explaining why there were no significant change in abnormal return.

The only one out of nine sectors shows significant abnormal returns, which is property sectors. Khusiono (2017) stated that property market were sector with most influenced by political condition in a nation. Uncertainty in political issues often lead to decrease in property sales, decreasing its performance. Governor election were considered as negative information, therefore it is causing property sector to have negative abnormal return.

Third announcement category occurred in December 2016 and March 2017. Fed rate were announced increased by 25 basis point (0.25%) to 0.75% on December 2016 and another increased by 25 basis point (0.25%) to 1.00% on March 2017, while BI rate were announced with no change. Misgayanti (2009) stated that increase in Fed rate will directly affecting foreign exchange, then transmitting its effect to stock exchange. The transmission occurred through appreciateion (depreciation) of Indonesia Rupiah to US Dollar. Increase in Fed rate will put pressure to Indonesia Rupiah, leading to depreciation of Rupiah's value, vice versa. This is bad news to investor and any industries that rely on imported material. Depreciation on Rupiah's value will increased material cost on Rupiah equivalent, therefore increasing overall cost and lead to potential decrease in profit. It is expected that investor chose to divert their investment and creating negative abnormal return.

Within third category, only Transportation, infrastructure, and utilities sectors has negative consistent respond. This negative impact is caused transportation, infrastructure and utilities sector tend to use foreign capital for their funding. Therefore increase in Fed rate will also increase its interest rate and potentially reduce its profit. Barnanke and Kuttner (2005) also found that increase in Fed rate will result in negative abnormal return.

Meanwhile, sectors like Consumer industries, mining, trade, and miscellaneous industries respond inconsistently. This inconsistencies could be caused by many reason, according to respective sectors. However, many believed that the difference of announcement impact could be led by fact that investor had already anticipate increase on Fed rate, therefore could minimizing impact or even taking advantage of the impact altogether. (Ellen, 2016)

Consumer sector respond negatively on March 2017 announcement but do not respond to December 2016 announcement. Consumer sector are tend to rely on imported raw material. For example, food and beverages industries. Increase in Fed rate translate to increase in production cost. Since it is not wise to increase their selling price, decrease in profit are to be expected. Investor respond to this potential transmission by selling their share in consumer sector and resulted in negative abnormal return. This negative respond were also proven by Gurib (2015) where it is found that increase in Fed rate would often having negative effect to abnormal stock market.

Mining sector respond positively to March 2017 announcement, but did not respond to December 2016 announcement. Significant difference on positive abnormal return could be caused by two factors. First, according to report of Bank of Indonesia (2017), price increase on coal and crude oil occurred. Secondly, majority of Indonesia mining sector market are export. While increase in Fed rate were bad news for import-based business, it is a good sentiment on export based business. Joseph (2002). Since increase in Rupiah equivalent profit are to be expected. Combined with increase on global energy price, it is understandable that investor tend to have more confidence investing on mining sector. Segoro (2015) also found that oil price positively significant affecting mining sector.

Trade, service, and investment sector were responding negatively to the announcement on March 2017. Similar to consumer sector, trading sector are relying heavily on imported goods. Therefore, increase in Fed rate give a negative sentiment to this sectors. Misgayanti (2009) also found that increase in interest rate will cause investment substitution from stock market to foreign market. The results of this study in accordance with the research hypothesis, according to Ali (2012) interest rate has a negative effect on stock prices.

Financial sector respond positively to March 2017 announcement. This result are contradicting the hypothesis. Nasution (2017) stated that increased in Fed rate had been anticipated by investor and government. Also, Bank of Indonesia (2017) also reported that current Indonesia financial system are in stable condition and supported by good financial market stability and resistance. This cause financial sector to have minimal impact on Fed rate increase.

Property sector also respond positively to March 2017 announcement. Positive change in abnormal return could be caused by recovery on property sector and investor's increase in confidence to property sector. Segara (2017) explained that increase in property sector performance could be seen by increase in mortgage. This could be the reason why increase on Fed rate had no negative impact on property sector.

Basic and chemical industry respond negatively to December 2016 announcement. Increase in Fed rate would decrease profit due to increase on production cost. Indonesia Ministry of Industry (2016) stated that basic and chemical industry are relying too much to imported raw materials. Similar to consumer and trading sector, reliance to imported raw materials are the reason why negative abnormal return occurred when increase on Fed rate announced. This negative respond were also proven by Sherman and Tehranian (1997), where it is found that increase in Fed rate would often having negative effect to abnormal stock market.

Last sector is miscellaneous industries which respond positively to March 2017 announcement. Increase in Fed rate supposedly followed by decrease in return, however the result show otherwise. Priyambada (2017) explain that increase in Fed rate had been anticipated by investor, therefore negative impact on this industries could be minimized.

## CONCLUSION AND IMPLICATION

According to t paired sample result, it can be concluded that sectoral indices in Indonesia Stock Exchange tend to have significant difference on abnormal return inconsistently. This is because there are many other factor affecting the abnormal return, such as US presidential election on November 2016 and February 2017 governor electoral election. The only sector respond consistently to the announcement are transportation, infrastructure, and utilites sector when Fed rate increased and BI rate fixed. Meanwhile, the only sector which did not respond to the announcement at all is agriculture sector.

Investor must be carefully to invest in transportation, infrastructure and utilization sector. Because when fed rate increase and BI rate constant stock price company in transportation, infrastructure and utilization sector will volatility and give a negative abnormal return. Also, it is advisable that investor also considering global and domestic political situation, since these issues could affect Indonesia Stock Market.

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