TECHNICAL ANALYSIS OF MOVEMENT OF 2017 JII INDEX STOCKS USING FIBONACCI RETRACEMENT, STOCHASTIC OSCILLATOR AND RSI INDICATORS

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Abstract: *The purpose of this research is to analyze the movement of JII during 2017 and recommend stocks that are worth buying and selling during 2017. The aims of this study to provide information for traders to be able to predict the actions of entry and exit in 2018. Research methods used technical analysis based on The Dow Theory in the form of descriptive analysis using data through purposive sampling technique. This study uses data analysis techniques in the form of trendline analysis, Fibonacci Retracement using the Fuzzy Logic function, and indicators analysis of the Stochastic Oscillator and Relative Strength Index (RSI). The outputs of this study are recommendations of indexed issuers from JII in 2017 that were eligible to be purchased by a total of 18 Issuers and 29 eligible ones for sale. It is suggested to the next researcher to conduct research in a longer time and conduct further research with a form of predictive research based on the information and data of this study.*

Keywords: *stocks, Jakarta Islamic Index (JII), issuers, Fibonacci Rertracement, Stochastic Oscillator, Relative Strength Index (RSI)*

I.   INTRODUCTION

The capital market has two important roles in supporting economic growth of a country as a means of raising funds and investment facilities for investors. Two advantages of investing in the capital market are *Dividends Yield* and *Capital Gains* (Husnan, 1998). Technically Dividend Yield is an advantage obtained by an investor from the company's ability to obtain company profits that divided, while Capital Gains in the form of profits (or losses) obtained from stock price fluctuations (Rahadjeng, 2011). Investors who benefit through Capital Gain are referred to as traders.

According to Levy & Sarnat (2006) and Rahadjeng (2011) traders have the risk of systematic risk, the risk that is in line with market movements so that they need to explore more about technical analysis. Technical analysis is needed by traders to take a decision to buy, sell, or hold it against the issuer of their owns (Thorp, 2000).

The 559 of issuer listed on the BEI, some of which are grouped according to one index containing Sharia values, this index is known as the Jakarta Islamic Index (JII) (Learning Stock Investment, 2017).

JII was ratified as an official index, recognized by the BEI on March 14 of 2003 with 30 issuers per period. JII base day is dated January 1, 1995 with an index base value of 100 (Yafiz, 2008). Based on data from the Financial Services Authority of the Republic of Indonesia, the total performance value of JII experienced a positive increase from 417.182 in 2009 to 691.039 in 2014, while its capitalization increased from 937,919.08 in 2009 to 1.944.531.70 in 2014 (Sidiq & Setiawan, 2015).

The development of total performance value and capitalization of JII during 2009 to 2014 is technically described as a *major uptrend* (Fuadi, 2014). From this description the trader can plan the buying or selling action against the Islamic issuers that he has. In order to achieve the buying and selling targets, many indicators can analyze the market movement curve technically, some of the indicators are *Fibonacci Retracement, the Stochastic Oscillator, and the Relative Strength Index* (RSI), the three are considered more accurate in analyzing market movements (Purnomo, 2013; Deccasari , 2014; & Fuadi, 2014).

II.   Literatures
2.1   Analysis of Stock Technical

Technical analysis is a method that functions to evaluate stock price statistics that are formed based on demand and supply in the capital market (Vibby, 2008), the motion of this change is recorded in a chart. Technical analysis is based on Dow Theori which states that changes in stock prices affect future price movements (Sukamulja, 2005). According to Steven (2002) the main thing in technical analysis is the history of price changes from a collection of existing trade charts. Important price-forming components to be analyzed are open price, close price, higher price, and lower price (David & Kurniawan, 2010).

2.1.1   *Jakarta Islamic Indeks* (JII)

In supporting the development of the Sharia capital market, the government cooperates with the MUI to set Sharia criteria for several issuers traded on the Indonesia Stock Exchange. The JII Index was published in accordance with the Fatwa of MUI National Council (F-DSN) through a DSN fatwa No. 40 / DSN-MUI / X / 2003 concerning the Capital Market and General Guidelines for the Application of Sharia Principles in the Capital Market, article 4 paragraph 3 (Huda & Mustafa, 2007).

JII is recognized by the Indonesia Stock Exchange as an index with sharia criteria based on the Sharia Supervisory Council, Bapepam regulations, and LK no IXA.A.13 and indexes 30 of the most liquid issuers (Wisambudi, Sudjana & Topowijono, 2014).

2.1.2   *Fibonacci Retracement*

Fibonacci Retracement is an analytical tool that adopts the Fibonacci sequence to determine *support* and *resistance* lines (David, 2010). *Fibonacci Retracement* consists of seven horizontal lines that show traces of price movements of an issuer in the capital market (David, 2010). Seven ratios that are popularly used are: 0%, 23.6%, 38.2%, 50%, 61.8%, 78.6%, and 100% (Boroden, 2008) with two absolute values of ratio of 0% and 100% and *golden ratio* that is 61.8%.

2.1.3   *Fuzzy Logic*

The only *Fibonacci Retracement* approach is not enough to process market movement data into a valid analysis that can be accepted by logic, approach used is the *Fuzzy Logic* analysis method to present a random movement (Bojadziev, 2007).

The advantages of the *Fuzzy Logic* method is to convert numerical information into linguistic information (Ibrahim, 2004) which is referred to as Data Fuzzification. *Fuzzy Logic* has four types of functions, one of the functions used in this study is the Triangle Function with the following description:

$$\mu(x) = a\ (b-x))/(b-c);\ b \geq x \leq c \geq$$
$$= a(d-x)/(d-c);\ c \geq x \leq d$$
$$= 0;\ \text{if not}$$

$\mu(x)$ is a substitution of the recommendation degree starting from 0 to 1, while the symbol (b), (c), and (d) are substitutes for prices that occur at the levels of *support* and *resistance* lines. This *support* and *resistance* line is formed from the Fibonacci sequence as measured by the *Fibonacci Retracement* method. Symbol (a) is substitution of the highest level of recommendation is 1, symbol (x) is the price desired to be analyzed or predicted.

Fuzzy Logic has components that create a system, important components of *Fuzzy Logic* are: (1) *Fuzzy* Variables; (2) Linguistic Variables; and (3) Membership Function.

2.1.4   Indicator of *StokasthicOscillator*

Ong (2012) states that the Stochastic Oscillator Indicator is one of the leading indicators. Traders often use this Indicator to decide when an issuer can be sold or purchased (Mutmainah & Sulasmiyati, 2017).

The Stochastic Oscillator indicator has two lines namely the %K line which called as a *signal line*, and the %D line is called a *trigger line*. (Ong, 2012). *Bullish sign* on the *Stochastic Oscillator* Indicator occurs if the last closing price approaches the highest price, whereas *bearish sign* occurs when the last closing price approaches the lowest price (Mutmainah & Sulasmiyati, 2017).

Based on the *Bullish* and *Bearish Sign* conditions, the *Stochastic Oscillator* Indicator also has a golden cross if %K cuts the %D line in the *overshold zone* and *Death Cross* zone if the %K line crosses the %D line in the *overbought* zone.

2.1.5   RSI (*Relative Strength Index*)

RSI was first published by J Welles Wilder, which serves as a measure of the speed of price changes in the capital market (Mahalanie, 2016). The movement of RSI ranges from 0 (zero) to 100 (one hundred), with the assumption that if the movement above the 70 is called *overbought*, if the price reaches lower than the 30 is stated as *oversold* (Murphy, 1986).

III.   RESEARCH METHOD

The framework of this research refers to Dow Theory and in accordance with its purpose, the research serves as a reference for traders in recommending JII-indexed issuers that are worth buying or selling at the right time. Determination time to monitoring issuer indexed by JII is based on *Fibonnaci Retracement* calculations.

After knowing the index point of monitoring, the researchers looked individually at 30 JII indexed issuers who had selling feasibility of *overbought* and feasibility of buying at *overshold* with the *Stochastic Oscillator* indicators and RSI, at the absolute Fibonacci ratio.

The research framework can be described as follows:

Chart 1. Framework of Research
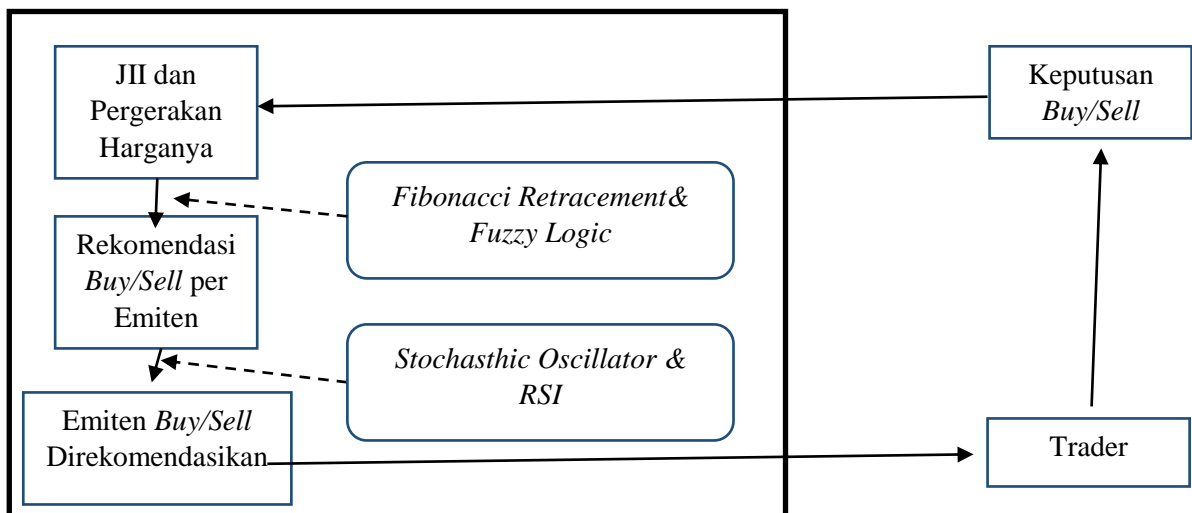
Source: Researcher, 2018

The chart in the box is part of this study, while the chart outside the box is an action outside this study. This study uses qualitative descriptive types to examine a condition in the

present and explain something that is known in certain situations according to the circumstances (Sekaran, 2006; Nazir, 1988).

3.1   Types of Data, Population, and Samples

The data category in this study is secondary data in the form of Chart Bar of JII movement and price movements of 30 listed issuers indexed during 2017. This study uses a population of 30 issuers indexed by JII and sampled using *purposive sampling* based on considerations of JII index movements that have been *overbought* and *overshold* on the value of Absolute Fibonacci of *Fibonacci* Retracement (Sugiyono, 2008), then converted into linguistic information through Fuzzification based on *Fuzzy* Logic analysis.

3.2   Method of Collecting Data

Data was collected using the literature study and observation methods, literature study was used as a theoretical foundation for conducting research while observations were used to determine JII trading and movement activities during 2017 along with 30 indexed issuers.

3.3   Research Time and Analysis Tools

Research analysis time starts from January 3 of 2017 to December 29 of 2017, this time is the active trading time of exchanges on IDX for one year. The analytical tools used in this study are: (1) ChartNexus Version 5.0 program; (2) *Fibonacci Retracement*; (3) *Fuzzy Logic*; (4) *Stochastic Oscillator* indicator; and (5) RSI.

3.4   Data Analysis Technique

Analysis of the data used in this study are: (1) Data Input; (2) Chart Analysis; (3) Determining *Trendline, Swing High, and Swing Low*, all three are important to determine the *Golden Cross* and *Death Cross* points as the base of the measurement using the *Fibonacci Retracement* on the JII index movement; (4) Determination of *Support* Lines and Resistance Line of JII uses the main levels on *Fibonacci Retracement*; (5) Data Fuzzification, with the steps of: (a) determining the *Fuzzy* variable; (b) determine the *Fuzzy* Set; (c) determine the membership function; and (d) determine the Speaking Universe. The basis of data Fuzification in this study is the trend formed by changes in JII during 2017.

3.5   Basic Assumption for Research

Assumptions are used to support empirical truths of a study, because assumptions must be scientifically tested (Sugiyono, 2017). The assumptions in this study are: (a) Changes in the movement of JII indicate that the majority of the indexed price of issuers also increases as well as vice versa; (b) In an uptrend condition, absolute buying lies in the 0% of *Fibonacci retracement* level, absolute selling lies in the 100% of *Fibonacci retracement* level, and absolute resistance lies in the 50% of *Fibonacci retracement* level. While in the *downtrend* condition,

absolute buying lies in the 100% of *Fibonacci retracement* level, absolute selling lies in the 0% of *Fibonacci retracement* level, and absolute resistance lies in the 50% of *Fibonacci retracement* level; (c) The intersection of the %K line with %D on the *Stochastic Oscillator* indicator in the *Golden Cross* region is a buy signal while what happens to *Death Cross* is a sell signal; (d) If the movement of RSI is above 70, it will be *overbought* and there is, while if the movement of RSI is lower than the number 30 it is assumed that *overshold* occurs.

IV. RESULT AND DISCUSSION
4.1 Issuers Registered on JII

JII is the only stock index recognized by the Indonesian capital market as an index that filters 30 sharia-compliant issuers in accordance with halal in Islamic Sharia. For one year, JII conducted two screening of issuers to obtain a valid category according to the criteria set by DSN MUI No. 40 / DSN-MUI / X / 2003 concerning the Capital Market and General Guidelines for the Application of Sharia Principles in the Capital Market, article 4 paragraph 3. Based on the stock *screening*, the three periods of JII index are set for one year as follows: (1) December period to May; (2) June period to November; and (3) December period to May of the following year.

In 2017, the 30 indexed issuers by JII are : (1) AALI; (2) ADHI; (3) ADRO; (4) AKRA; (5) ANTM; (6) ASII; (7) BSDE; (8) ICBP; (9) INCO; (10) INDF; (11) INTP; (12) KLBF; (13) LPKR; (14) LPPF; (15) LSIP; (16) MIKA; (17) MYRX; (18) PGAS; (19) PTBA; (20) PTPP; (21) PWON; (22) SILO; (23) SMGR; (24) SMRA; (25) SSMS; (26) TLKM; (27) UNTR; (28) UNVR; (29) WIKA; (30) WSKT.

In the June period to November 2017 four new issuers indexed by JII are: (1) CTRA; (2) EXCL; (3) PPRO; (4) TPIA and those issued from JII in this period are: (1) ADHI; (2) INTP; (3) MIKA; (4) SILO. Then for the period December 2017 s.d. May 2018 an issuer is added: (1) BRPT; (2) SCMA; (3) WSBP and those issued from JII during this period are: (1) AALI; (2) PPRO; (3) SSMS.

4.2 Analysis of Index Uptrend by JII on 2017

The first and foremost step in this research is to determine the movement trend of JII for one year in 2017 by drawing a straight line drawn from the lowest index in the time specified towards the lowest index in the time specified thereafter. The results show the occurrence of a major uptrend at JII in January to June 2017.

Source: Chartnexus Versi 5.0, 2018.

Figure 1. Trend of Increasing Jakarta Islamic Index in 2017

Corrections occurred in March to May 2017 due to a large volume of sell. On March 16, 2017 there was a large increase in buy volume, which doubled the previous sell volume so that the price rose again to break the support line. The *major uptrend* of JII in January to June 2017 signaled the majority of issuers indexed also experienced an *uptrend*. *Strong uptrend* conditions occur again in December 2017 due to a surge in volume because of changes in indexed issuers by JII.

Source: Chartnexus Version 5.0, 2018.

Figure 2. *Uptrend* Conditions of the Jakarta Islamic Index in December 2017

4.3 Analiysis of Index *Downtrend* by JII on 2017

The *major downtrend* occurred on 2 October to 30 November of 2017, the index immediately fell to the lowest level of 713 with a total volume of Rp 3.954 Billion. This condition occurs due to increased selling volume during October to November 2017.

Source: Chartnexus Versi 5.0, 2018.

Figure 3. Analysis of *Downtrend* by JII Bulan on October to November 2017

4.4 Analysis of Fibonacci Retracement and *Fuzzy Logic* Analysis

After stated the existence of a *major uptrend* in January to June and on December 2017 and the occurrence of a *major downtrend* in October to November 2018, *Fibonacci Retracement* analysis is then performed to determine the recommended points of action to sell or buy.

4.5 2017 JII *Fibonacci Retracement* Analysis at 0% Fibonacci Value (Uptrend)

From the *trend* analysis, there are two extreme points that pertain to the Fibonacci ratio 0% and 100%, the ratio of 0% pertained by the *chart* on December 23 2016. Because 2016 is not included in the study area, then *Fibonacci* numbers of 0% in the January *Uptrend* period until June 2017 was not continued.
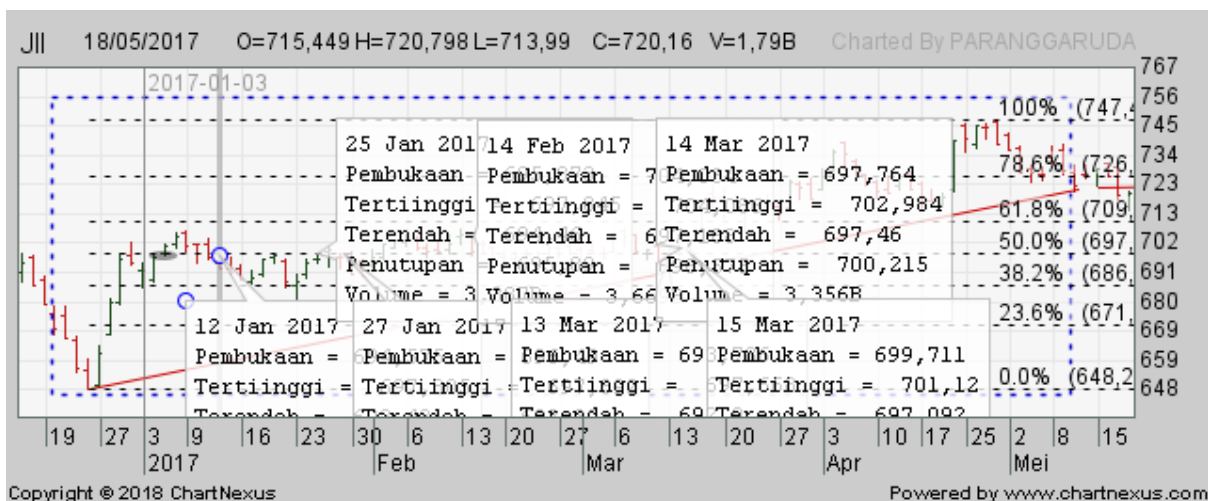
Source:Chartnexus Version 5.0, 2018

Figure 4. Analysis of *Fibonacci Retracement* by JII on *Uptrend* Ratio 0% (January-June 2017)

Whereas in the second period in December 2017, the *Fibonacci* ratio is 0% pertained by the chart on December 6 2017 which indicates there has been oversohld on issuers indexed by JII, so that experience a bearish reversal, with this situation the research can proceed to the analysis of indicators to recommend selling or buy which issuers are indexed on that date.

4.6   Analysis of *Fibonacci Retracement* by JII on 2017 with 50% Ratio (*Uptrend*)

50% Fibonacci Ratio in January to June 2017 on JII is stated with an index of 697, this indicates that the trader must hold his capital absolutely.

Source:Chartnexus Version 5.0, 2018

Figure 5. Analysis of *Fibonacci Retracement* by JII with 50% ratio (January-June 2017)

The time of occurrence of intersection with 50% Fibonacci ratios occurs on the 4th, 5th, 12th, 25th, and 27th of January 2017. In February 2017 the index intersecting with the 50%

Fibonacci ratio occurred on February 14th. In March 2017 the index intersecting with the 50% Fibonacci ratio occurred on March 13th, 14th and 15th.

4.7   Analysis of *Fibonacci Retracement* by JII on 2017 with 100% Ratio (*Uptrend*)

The chart which touched the 50% Fibonacci ratio in the uptrend condition occurred on 25th and 28th April 2017 with an index valued at 746.

Figure 6. JII Fibonacci Retracement Analysis 100% Ratio (January-June 2017)

Source:Chartnexus Version 5.0, 2018

Figure 6. Analysis of *Fibonacci Retracement* by JII with 100% Ratio (January-June 2017)

Fibonacci 100% recommends to traders to sell their shares absolutely because they have been overbought. The Uptrend period at the end of 2017 occurs in December, while besides 2017 there is no further research.

4.8   Analysis of *Fibonacci Retracement* and *Fuzzy Logic* Aanalysis *Downtrend* Indeks JII on 2017

The downtrend conditions in JII in 2017 occurred within the period from October to November 2017, during this period there were four chart points that have been pertain to by the trendline.

Source:Chartnexus Version 5.0, 2018

Figure 7. Analysis of JII *Trendline* on 2017 (*Downtrend*)

Four points on the chart that pertain to the trendline line will be further analyzed according to their Fibonacci ratios to get recommendations which issuers are worth buying by traders.

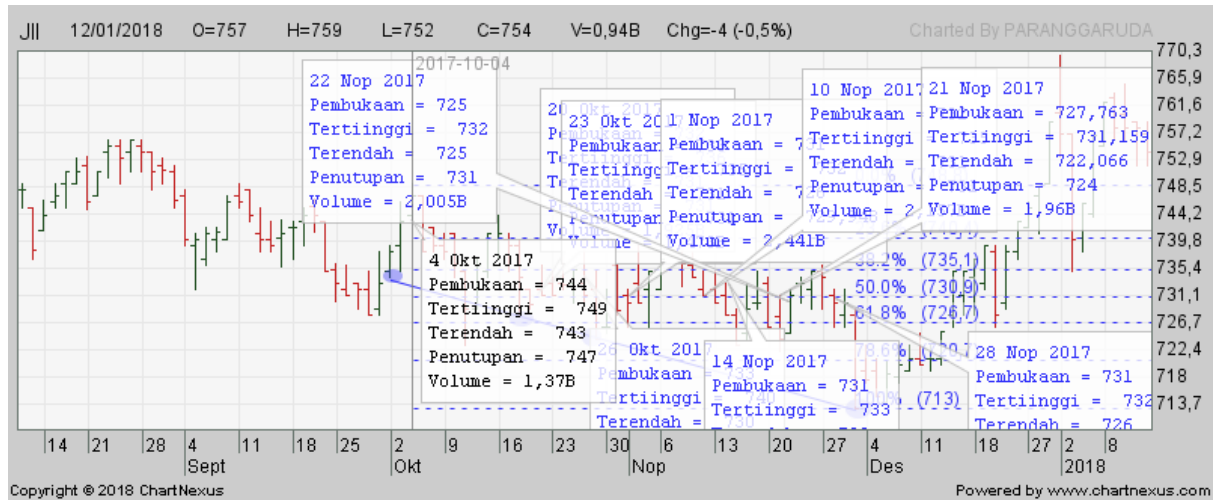### 4.9 Analysis of *Fibonacci Retracement* by JII on 2017 with 0% Ratio (*Downtrend*)

Charts that intersect with ratio of Fibonacci 0% in downtrend conditions are mean as absolute selling conditions because overbought has occurred, this happened on October 4 2017 with an index value of 749. This condition indicates that the majority of issuers indexed by JII on that date are mostly eligible sell.

Source:Chartnexus Version 5.0, 2018

Figure 8. Analysis of *Fibonacci Retracement* by JII with 0% Ratio on 2017 (*Downtrend*)

4.10   Analysis of *Fibonacci Retracement* by JII on 2017 with 50% Ratio (*Downtrend*)

Source:Chartnexus Version 5.0, 2018

Figure 9. Analysis of *Fibonacci Retracement* by JII with 50% Ratio on 2017 (*Downtrend*)

The lowest point of the index pertaining to the Fibonacci ratio of 50% in the downtrend is 371 which occurred on 20th, 23rd and 26th of October 2017 and in November 2017 which occurred on 1st, 10th, 14th, 21st, 22nd and 28th of November 2017.

50% Fibonacci value is not continued in this research process because according to the Fuzzy Logic process, 50% Fibonacci ratio values recommend that the issuer be held in absolute detention so that no further recommendations are made for buy / sell activities.

4.11   Analysis of *Fibonacci Retracement* by JII on 2017 with 100% Ratio (*Downtrend*)

As of November 30 2017, JII continued to decline to a value of 713 which was the lowest point in the downtrend. This condition occurs because there is a intersection between the chart and 100% Fibonacci ratio so that the chart changes the direction of the trend. On this date the majority of issuers are recommended to be purchased so that a defuzification process is carried out on the RSI and Stochastic Oscillator indicators to recommend issuers that are suitable for traders.

4.12   *Defuzifikasi* of JII on 2017 with 0% Ratio (*Uptrend*)

Defuzification analysis to determine buy recommendations for issuers indexed by JII on 6th December 2017 based on issuers indexed on that date.
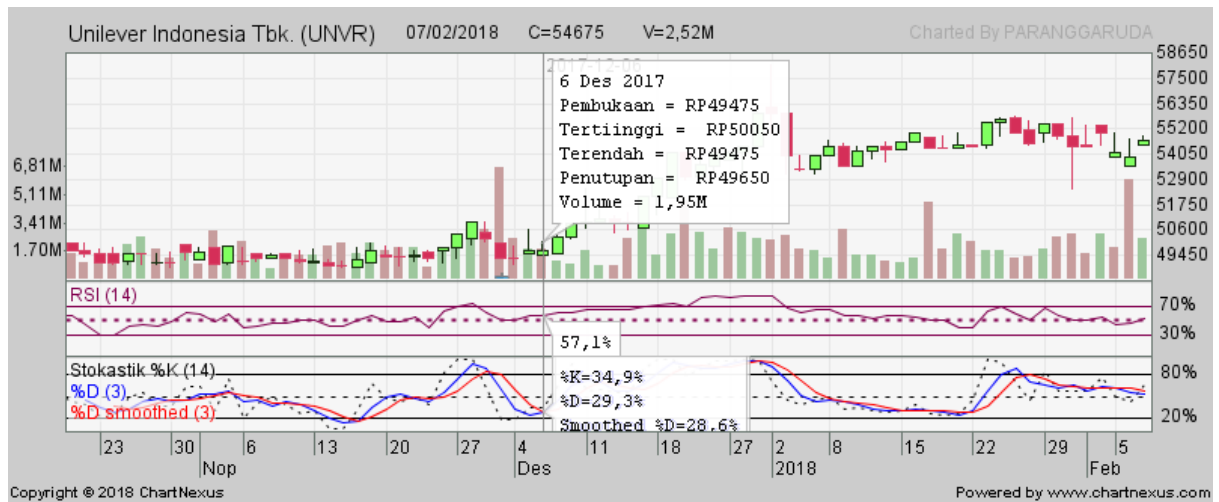
Source:Chartnexus Version 5.0, 2018

Figure 10. B*uy* rekomendation for JII Indexed Issuers on December 6, 2017

The 30 issuers indexed JII that are recommended to be purchased are: BRPT, INCO, INDF, LPKR, LSIP, PGAS, PTPP, TPIA, UNVR, WIKA.

4.13   *Defuzifikasion* **Index of JII in 2017 Fibonacci with 100% Ratio (*Uptrend*)**

Defuzification of data in an uptrend condition in JII is conducted on the trend line which pertain to the chart starting from January to May 2017, the date of the occurrence of the intersection between the chart and the 100% Fibonacci ratio occurring on 25th and 28th of April 2017.

After defuzification of the chart that pertain the 100% Fibonacci ratio, several issuers that were sold on April 25, 2017 were: AALI, ADHI, ADRO, BSDE, UNVR, WIKA, WSKT. On that date the issuers indexed by JII with large capitalization dominated the sell-off which affected the trend reversal of the JII. Then on April 28, 2017, there were recommendations from several issuers indexed by JII that were suitable for sale as follows: WSKT, WIKA, UNTR, SMGR, PGAS, MIKA, KLBF, INDF, ICBP, ADHI. On April 28, 2017 there were two issuers that had two sell recommendations, namely ADHI and WIKA.

4.14   *Defuzifikasion* **Index by JII on 2017, 0% Fibonacci Value in Downtrend Conditions**

The 0% Fibonacci Ratio in Fibonacci Retracement analysis of JII indicates that the index is in the Death Cross position and provides an absolute sell signal to the issuer indexed in it. An index that intersects with the 0% Fibonacci ratio occurs on 4th October 2017 with the highest index value of 749. Death Cross on the MACD indicates an overbought and recommends traders to immediately sell their sharia shares.

Based on the data defuzzification on October 4, 2017, the issuers recommended for sale are: AKRA, ASII, CTRA, INDF, LPPF, SMRA, TLKM, TPIA, UNTR, UNVR, WIKA, and WSKT.

4.15 *Defuzifikasi* of JII on 2017 with 100% Fibonacci Ratio (*Downtrend*)

The 100% Fibonacci Ratio in the Fibonacci Retracement analysis in the downtrend pattern in JII indicates that the index is at the Golden Cross position, this position signals an oversold index so that it gives recommendations to traders to get ready to make purchases against issuers indexed by JII. Golden Cross took place on November 30, 2017 with recommendations from listed companies that are eligible to buy: WIKA, TPIA, PTPP, PPRO, MYRX, INCO, ICBP, and AKRA.

V. CONCLUSION AND RECOMMENDATIONS

The results of this study can be summarized as follows: (1) JII index in 2017 occurred twice uptrend, in the period of January to June 2017 and December 2017. In the period from January to June 2017, the condition of true uptrend occurred on the month January to Mid May 2017; (2) Downtrend conditions occur from October to November 2018; (3) The Uptrend in January to May 2017 does not have a 0% Fibonacci value on the Fibonacci Retracement analysis, while for the 100% Fibonacci value with the 713 index occurs on April 25, 2017 with recommended indexed issuers for sale : AALI, ADHI , ADRO, BSDE, UNVR, WIKA, WSKT and on 28 April 2017 with recommended issuers for sale : WSKT, WIKA, UNTR, SMGR, PGAS, MIKA, KLBF, INDF, ICBP, ADHI; (4) In the Uptrend condition in December 2017, the 0% Fibonacci value on the Fobonacci Retracement analysis occurs on December 6, 2017 with indexed issuers recommended to be purchased : BRPT, INCO, INDF, LPKR, LSIP, PGAS, PTPP, TPIA, UNVR, WIKA; (5) In a downtrend condition, 0% Fibonacci value on Fibonacci Retracement analysis occurs on November 4, 2017 with an index of 749, the recommended issuers for sale are AKRA, ASII, CTRA, INDF, LPPF, SMRA, TLKM, TPIA, UNTR, UNVR, WIKA, and WSKT; (6) In the downtrend condition of 100% Fibonacci value on Fobonacci Retracement analysis occurs on November 30, 2017, the issuers recommended to be purchased are WIKA, TPIA, PTPP, PPRO, MYRX, INCO, ICBP, and AKRA.

To perfect this research to be better, it is suggested to the next researcher to: (1) widen the research time to more than one year; (2) Analysis tools is not limited to Fibonacci Retracement, Stochastic Oscillator, and RSI; and (3) Fuzzy Logic Analysis at the defuzification stage is not limited to the issuer's recommendations, but also the recommendation of selling and buying prices.

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