THE ACCURACY OF TECHNICAL ANALYSIS
IN PREDICTING STOCK PRICE

SKRIPSI

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ABSTRACT

Technical analysis has been used publicly by market participant to analyze the stock price to forecast the stock price in near future. It was done by equity researcher and the result of technical analysis is the prediction of the stock price for next day with the recommendation from equity researcher (buy, hold, sell). The issue is the result of technical analysis which is foresight of stock price for tomorrow can be wrong and leads to take wrong recommendation. This paper tests the technical analysis in predicting the stock price and companies in LQ45 become as sample. The result shows the technical analysis can be used in predicting the stock price. However, the researcher give recommendation to not fully used technical analysis itself. The researcher recommends to do fundamental analysis in order to consider fundamental aspect such as macroeconomy, industry overview, company's performance, etc.

Keywords*: Technical Analysis, Stock Price, Predicting Stock Price, Market Capitalization*

INTISARI

Analisis teknikal sudah dipakai oleh para pihak yang berhubungan dengan pasar modal untuk memprediksi harga saham di masa depan. Analisis teknikal dilakukan oleh analis ekuitas perusahaan sekuritas dan hasil dari analisis adalah pandangan tentang harga saham hari selanjutnya beserta rekomendasi (beli, tahan, jual). Permasalahan dari riset ini adalah analis teknikal bisa menghasilkan hasil pandangan yang salah sehingga bisa membuat rekomendasi saham salah. Riset ini dilakukan untuk menguji apakah analisis teknikal bisa dipakai dalam memprediksi harga saham dan indeks LQ 45 adalah sampel untuk riset ini. Kesimpulan dari riset ini adalah analisis teknikal bisa dipakai untuk memprediksi harga saham. Akan tetapi, penulis menyarankan untuk tidak hanya menggunakan analisis teknikal dalam mengambil keputusan investasi. Penulis menyarankan untuk melakukan analisis fundamental juga untuk melihat berbagai aspek seperti makroekonomi, pandangan terhadap industri, kinerja perusahaan, dan aspek yang berkaitan dengan investasi lainnya.

Kata Kunci: Analisis Teknikal, Harga Saham, Prediksi Harga Saham, Kapitalisasi Pasar

CHAPTER I

INTRODUCTION

I.1   RESEARCH BACKGROUND

Market participant and researchers always find the way to predict the future stock price in order to use it in maximizing the gain. There are two ways are commonly used in security market which are the fundamental analysis and technical analysis. The technical analysis has an assumption that price pattern will recur and the assumption of fundamental analysis is the price will move to its intrinsic value.

The technical analysis has assumption that the historical price has pattern that will recur in the future and it does not consider the fundamental aspect such as macroeconomic, industry overview, and condition of company. The oldest theory for technical analysis is Dow Theory which was from Charles Dow published in 1922. Dow Theory stated that the stock price has three movement stock price and market discount everything that will be explained in chapter two. There are many indicators in the technical analysis such as moving average, relative strength index, MACD (Moving Average Convergence Divergence) and other indicators. According to Metastock (2009), the technical analysis has some categories which are trend, volatility, momentum, cycle, market strength, and support and resistance.

Fundamental analysis is another analysis to predict the price. This method valuates the fair value of the company and assume that the stock price will tend to its fair value. The fundamental analysis considers the company's condition, macroeconomy, industry overview, etc. The issue of the fundamental analysis is every analyst has different view in calculating the fair value of the company because every analyst has different assumption used on the calculation of fair value. It leads to different result for every analyst.

Both analysis, especially the technical analysis, are used for predicting the stock movement in the future and it mainly is done by the equity analyst in broker firm. The result of analysis is published to the public by media and equity analyst gives the recommendation what investor should do to respond the future stock movement. However, the result of analysis can be wrong. If the result of the analysis fails to predict the stock price, the recommendation given leads to the false decision taken by investor who follow the recommendation.

This research focuses on the technical analysis because technical analysis can show same chart of technical indicators. Fundamental analysis can have different result due to different perspective of equity analyst.

There are previous researches related to technical analysis. According to Irwin and Park (2007), many academics consider the

technical analysis as pseudoscience meaning it is mistakenly practice based on the scientific result. There is random walk theory by Eugene Fama (1965) that stated the stock price cannot be predicted because the price moves randomly. However, there is previous research about the accuracy of technical analysis done on Macedonian Stock Market. It was done by Zoran Ivanovski, Nadica Ivanovska, and Zoran Narasanov on 2017. The result shows that the technical analysis can be used to predict the stock price movement. Therefore, this research does the test of accuracy of technical analysis in predicting the stock price on Indonesian stock market to look the accuracy of prediction from technical analysis.

I.2   RESEARCH PROBLEM

The research problem is the accuracy of technical analysis in predicting the stock price. The technical analysis can be wrong resulting to the wrong investment action to market participation and investor and trader can have loss on their value of asset. The technical analysis also is considered by many scientists as pseudoscience (Park, 2007) meaning it is mistakenly practice according the scientific result.

I.3   RESEARCH OBJECTIVE

This research has objectives to be completed:

1. To examine the technical analysis in predicting the stock price in every public company on this research.

2. To find out which technical indicator in every public company that is able to predict stock price movement.

I.4 RESEARCH LIMITATION

One of method in technical analysis which is pattern recognition such as Double top, Double bottom, Head & Shoulder Top, etc. However, this research uses technical indicator such as Moving Average, Bollinger Band, Relative Strength Index, and another indicator that will be mentioned in chapter 3. Researcher uses the technical indicators because the technical indicators provide the number that will be used for statistical analysis. Another reason is the technical indicator is easy to interpret of sell signal and buy signal or overbought and oversold. Technical analysis is not used to predict the stock price as value but technical analysis is used to predict the movement. It is because the technical analysis has assumption that the price pattern will be exist.

This research focus on Indonesian stock market and use the public listed companies that become as member of LQ45 period of August 2018 – January 2019 as samples. The reason is LQ45 is the most liquid index in Indonesia.

I.5 RESEARCH BENEFIT

This research gives the contribution to knowledge related to financial and the stock market. It will be beneficial to:

1. Capital market researcher

This research may become an evidence about the accuracy of technical analysis in predicting the stock price on Indonesian stock market.

2. Practitioners in the capital market

This research can give new references about the accuracy of technical analysis on Indonesia stock exchange.

3. Public user

The public user on this context means it is for students who are interested in the capital market, the new researcher who wants to continue this topic, the candidate of new investor, and society as general. This can be the new reference for the public to know the technical analysis.

CHAPTER II

THEORETICAL FRAMEWORK

II.1   TECHNICAL INDICATOR

II.1.1 Moving Average

Moving average basically has same method calculation for calculating the mean (For simple moving average). Moving means that the variable used for calculation are always moved. In other words, if the moving average is calculated for tomorrow, the starting date for calculation are moved forward or the next date.

There are three methods used in the calculation of moving average. There are simple moving average (SMA), weighted moving average (WMA), and exponential moving average (EMA).

They have same interpretation on the sell signal and buy signal. Sell signal appears when the stock price is below than the moving average and vice versa. For time period used, the short period can catch the signal but there will be whipsaw (false signal) and to minimize the whipsaw, it uses longer period for moving average. On this research, MA5 is used in the research because the MA5 has responsive signal.

II.1.1.1 Simple Moving Average (SMA)

The simple moving average has calculation by simply add all closing price on period chosen (For example 5 days). It means there is the total of five days of closing price) and divided by time period used for calculation. It has the same result by using mean calculation.

$$\text{SMA} = \frac{Sum\ of\ Closing\ Price\ of\ number\ of\ days}{Number\ of\ days\ observation}$$

II.1.1.2 Weighted Moving Average (WMA)

The problem for using the simple moving average is there is the delay of the signal. In order to overcome the delay, the calculation use weighted moving average

The formula for calculating the weighted moving average is:

$$\text{WMA} = \frac{(Price\ 1\ x\ weight\ 1)+(Price\ 2\ x\ weight\ 2)+(Price\ n\ x\ weight\ n)}{Total\ weight\ used\ on\ observation}$$

Day	Weight	Price	Weighted Price
1	1	25	25
2	2	26	52
3	3	28	84

4	4	25	100
5	5	29	145
Total	15	133	406

Table 2.1 Calculation of WMA 5 days.

Here is the illustration to the calculation by using the WMA for 5 days.

$$\text{WMA} = \frac{406}{15} = 27.067$$

II.1.1.3 Exponential Moving Average (EMA)

Martin Pring (2014) stated that "Exponential moving average is a shortcut to obtaining a form of weighted MA". The calculation requires exponent. The different time period used is made exponent is different. As the starting point of exponential moving average's calculation, it is needed to calculate the simple moving average and the result of simple moving average become the starting point of EMA. To calculate exponent, the formula is on the below:

$$\text{Exponent} = \frac{2}{\text{Time period}+1}$$

For illustration, there is a table below to show how calculate the EMA.

Date	Price	EMA previous week	Difference	Exponent	Exponent x Difference	EMA
1						99
8	100	99	1	0.1	+0.1	99.1
15	103	99.10	3.9	0.1	+0.39	99.49
22	102	99.49	2.51	0.1	+0.25	99.74
29	99	99.64	(0.64)	0.1	-0.06	99.68

Table 2.2 Calculation of EMA

II.1.2 Bollinger Bands
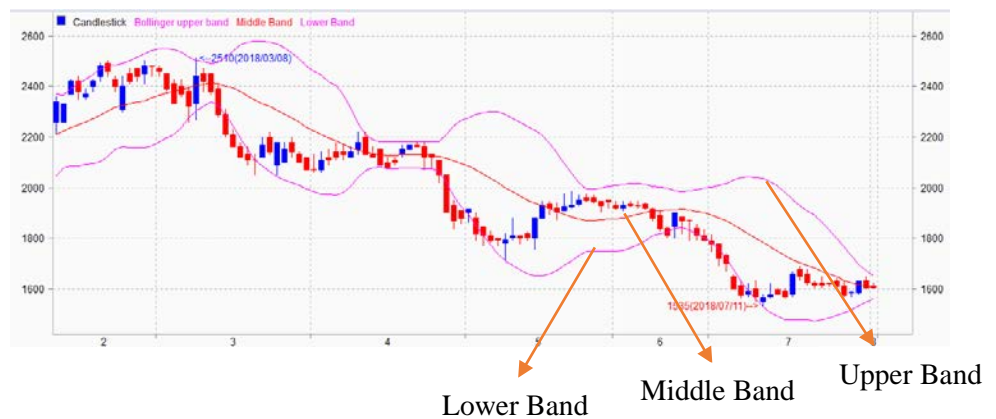
Figure 2.1 Bollinger band of PT Adhi Karya TBK

Bollinger band is one of the technical indicators for volatility. Bollinger band found by John Bollinger in 1980. It has similarity with envelope because, on the graph, there are the upper band and lower band. Bollinger band is calculated using standard deviation. Using two standard deviations, it ensures that 95% price will fall between two trading bands (J. Murphy, 1999). If both bands are wider, the volatility of stock price is higher. In another side, the

bands are narrow, it shows that the volatility of the stock price is lower. John Bollinger recommend for the time period for using in the calculation which is MA-20

For calculating the Bollinger band, there are formulas to plot the graph,

Middle Band: Moving Average of n-period

Upper Band: Middle band + 2 * n period standard deviation

Lower Band: Middle band + 2 * n period standard deviation

II.1.3 MACD (Moving Average Convergence Divergence).

Figure 2.2 Chart Moving Average Convergence Divergence for BBCA (PT Bank Central Asia TBK). The purple line is the MACD line and the orange line is the signal line

MACD (Moving Average Convergence Divergence) is a leading indicator (indicator which to read the momentum of overbought and oversold) founded by Gerald Apple. It uses two exponential moving average for calculation and subtracting the longer period of moving average and shorten the period of moving average. Generally, the combination for EMA is EMA-26 and

EMA 12. There is a signal line by using EMA-9 (9 days). If the EMA for the signal is faster than EMA-9, it will produce a responsive signal but it will produce whipsaw.

To identify the buy and sell signal, the interpretation is as follow:

a. If MACD line resulting from subtracting the EMA-26 and EMA-12 is higher than the signal line, it is buy signal.
b. In another side, if MACD line less that signal line, it is sell signal.

II.1.4 OBV (On Balance Volume)

OBV (On Balance Volume) is founded by Woods and Vignolia on 1940. They called it volume cumulative. On 1960, Joe Granville introduces to the public about the OBV by publishing the book with the title "New Strategy of Daily Stock Market Timing for Maximum Profits".

For calculation, the OBV can be calculated by formula as follow:

If the today closing price is higher than the previous closing price,

$$OBV = OBV_{t-1} + Volume$$

If the today closing price is equal than the previous closing price,

$$OBV = OBV_{t-1}$$

If the today closing price is lower than the previous closing price,

$$OBV = OBV_{t-1}$$

OBV can influence the price change. It usually used by the investor to buy the one stock in order to increase the stock price. Due to increasing the stock price, it will attract the public to buy that. So, the result is the price and OBV go ahead. So, it means that the OBV is on the rising trend if it reaches to the new peak and OBV are on the falling if the successive price is lower than previous stock price.

II.1.5 Positive Volume Index

Positive Volume Index (PVI) can be calculated if the today volume of security is higher than the yesterday volume of the security. If the today volume of security is equal or less than the yesterday volume of security, the PVI is equal to previous PVI.

Formula:

If today volume is higher than yesterday volume,

$$PVI = (PVI_{t-1} + (C - C_{t-1}))/C_{t-1}$$

PVI_{t-1}: Yesterday PVI
C: Today Closing Price
C_{t-1}: Yesterday Closing Price

According to Metastock (2009), rising price is relating to rising volume, the PVI will generally trend upward.

II.1.6 Negative Volume Index

Negative volume index is another side of the positive volume index on the calculation. On PVI, PVI changes due to the increase between the today volume of security and the previous volume of the security. On negative volume index, it changes when the today volume of security is lower than the previous volume of If today volume is lower than yesterday volume,

$$\text{NVI} = (\text{NVI}_{t-1} + (C - C_{t-1}))/C_{t-1}$$

NVI_{t-1}: Yesterday NVI
C: Today Closing Price
C_{t-1}: Yesterday Closing Price

Falling price is related to the falling volume, the NVI usually show the trend downward. It means that if the NVI has higher value, the stock price will fall.

II.1.7 Relative Strength Index (RSI)

RSI (Relative Strength Index) was developed by Wells Wilder. It developed to become a momentum indicator to show whether the security is overbought and oversold.

$$\text{RSI} = 100 - \frac{100}{RS}$$

$$RS = \frac{Average\ of\ n\ days\ up\ close}{Average\ of\ n\ days\ down\ close}$$

Figure 2.3: Chart Relative Strength Index for WSKT (PT Waskita Karya TBK). The blue line is the RSI line and the dot purple line is the signal line.

To do the interpretation of RSI, there are the upper level and lower level. For default, the upper level is 70 and the lower level 30. However, there are user who use the upper level is 80 and lower level 20. If the RSI above upper level means overbought. If the RSI is at bottom lower level means oversold. So, if the RSI increasing, it indicates that the price is higher resulting from the overbought. There will be the turning point or reversal if it reaches above the upper level of RSI. It will turn down. If the RSI is going down, it indicates the price of security turn down. But at some point, if reaches at bottom of the lower level, there will be the possibility to go high (Pring, 2014).

II.1.8 Relative Momentum Index (RMI)

RMI (Relative Momentum Index) was developed due to insensitivity RSI and frustrated with its inconsistent oscillation

between overbought and oversold level. RMI was developed by Roger Altman by added momentum component to RSI. The chart of RMI is identical with the relative strength index's chart.

The interpretation of RMI has some similarity to RSI. For oversold and overbought, the upper level used is 70-90 and lower level used is 10-30. If the RMI above the overbought, there will be in question turning point or the price probably goes down and so the RMI down below oversold do.

If the RMI is above the overbought, there will be the indication of reversal resulting the stock price will fall and If the RMI is below than oversold, there will be the indication for rising the stock price.

II.1.9 Relative Volatility Index

The Relative Volatility Index (RVI) was developed by Donald Dorsey and originally introduced on Technical Analysis of Stock and Commodities (TASC) magazine. The revision is covered in the September 1995. The calculation has similarity to the RSI (Relative Strength Index) but RVI uses the standard deviation of datil stock price instead of price changes.

The rule for buy and sell signal according to Metastock (2009) are:

a. Act to buy signal when RVI > 50

b. Act to sell signal when RVI < 50

II.1.10 Stochastic Oscillator
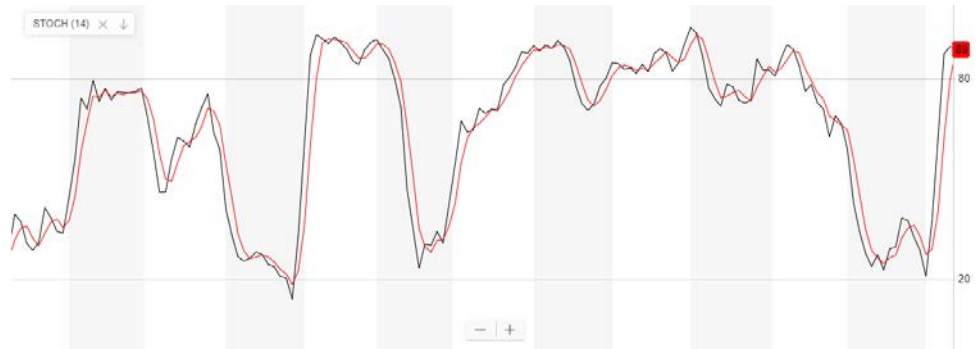
Figure 2.4 Chart of the stochastic oscillator of PT Bank Central Asia Tbk

George Lane is the inventor of the theory behind the stochastic oscillator both stochastic fast and stochastic slow. There are two line plotted which are %K and %D line.

%K $\quad = 100\ [(C - L_nC) / (H_n - L_n)]$

> C: Closing Price
>
> L_nC: Lowest Closing Price on five days period
>
> L_n: Lowest Low for five trading period
>
> H_n: Highest high for five trading period

%D $\quad = 100\ x\ (H_a / L_a)$

> H_a: the n-period sum of $(C - L_n)$
>
> L_a: the n-period sum of $(H_n - L_n)$

Calculation %D uses total numerators on %K formula more than 1 period and total denominators on %K's formula more than 1

period. It is used for make slowed stochastic version in order to get a more accurate signal.

The buy and sell signal have similarity to RSI (Relative Strength Index). The level above 80 is for overbought and the level below 20 is for oversold. If the stock price indicates the overbought or oversold, there is possibility of reversal resulting the price will turn re

II.1.11 William %R

William %R has similarity to stochastic for the calculation and the analysis. It uses level 80/20. The difference is level of above 80 is oversold and level of below 20 is overbought. It is upside down with the other indicator such as stochastic, RSI (Relative Strength Index), and RMI (Relative Momentum Index). So, if the William %R has higher reading, it means the oversold or the price goes down. On another side, if the William %R has lower reading, it means overbought or the price goes up. But, the reversal after on the overbought and oversold is exist on the William %R.

II.1.12 ROC (Rate of Change)

ROC (Rate of Changes) is the simplest way to measure the momentum. ROC can be calculated by current price divided price on the past (10 weeks ago, 52 weeks ago, etc). If the ROC is rising (100 for percentage scaling and 0 using the plus and minus

scaling), it is interpreted as a bullish factor and if the ROC is falling, it interpreted as a bearish factor. It simply has a positive correlation between the price of security and ROC. It is because if the current price higher than the previous price, the ROC is high and so the current price is lower than the previous price.

II.1.13 ADX (Average Directional Index)
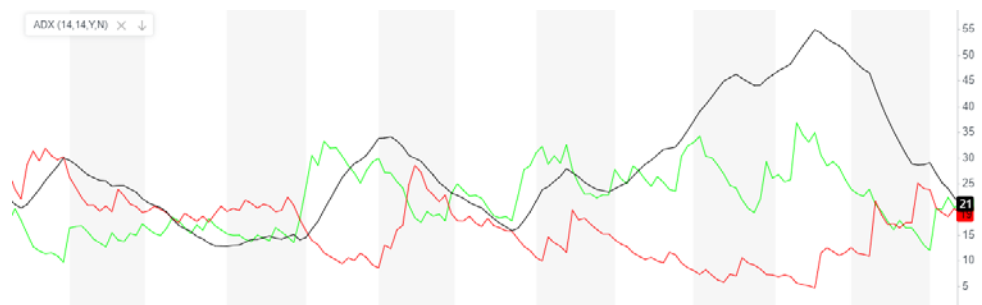
Figure 2.5: Chart ADX (Average Directional Index). The Black line is the ADX line, the red line is the negative directional index, and the green line is the positive directional index.

ADX (Average Directional Index) was developed by J. Welles Wilder in 1978. It is trend strength indicator. To calculate the ADX, it is needed to know the directional movement (+DM and -DM).

UpMove   = Today High – Yesterday High

DownMove   = Yesterday Low – Today Low

If UpMove > DownMove or UpMove > 0, then +DM = UpMove

If DownMove > UpMove or DownMove > 0, then -DM = DownMove

After selecting the time period (Normally 14 days), then calculate +DI and -DI,

+DI   = 100 times EMA of +DM divided by Average True Range (High – Low)

-DI   = 100 times EMA of -DM divided by Average True Range (High – Low)

Then ADX calculated by using formula,

ADX   = 100 times EMA of absolute value of (+DI - -DI) divided by (+DI + -DI)

The ADX is not showing the trend direction but is about the intensity of move from a directional point of view. Low reading in the ADX indicates a lack of directional movement (Pring, 2014).

II.2   Dow Theory

Dow theory was introduced by Charles H Dow and publish on the book "The Stock Barometer" created by W.D Hamilton in 1922. The theory state there are three movements which are the primary movement, secondary movement, and minor movement. Primary movement is movement covering at least four years that has two movements which are bullish (upward price movement) and bearish (downward price movement) and the prediction is made on

this movement. Secondary movement is the decline movement on the bullish trend and inclines movement on the bearish trend (Pring, 2014) and prior period time is two weeks up to month or more. Minor movement is covering day to day (Hamilton, 1922)

Dow theory also tells about the market discount everything. It means that all the judgement and consideration on the trading process is reflected on the stock price.

II.3 Random Walk Theory

The theory random walk theory starts with the premise of "efficient" market. According to the Eugene Fama (1965), the meaning of efficient is "a market where there is the large number of rational, profit-maximizers actively competing, with each trying to predict future market values of individual securities, and when important current information is almost freely available to all participant". So, if the market is efficient, the actual price has reflected current important information that has happened. Due to there is the difference in interpreting information from each analyst, the intrinsic value will have the different value with other fundamental analyst resulting disagreement each market participant. New information that could be related to the company can result in changes in intrinsic value and will adjust

"instantaneously". But, the vagueness around the new information can lead result in adjustment

instantaneously to intrinsic value and there are two implications. First actual price will initially over adjust to changes in intrinsic value as often as they will under adjust or the lag of adjustment of actual price to new intrinsic value will be independent. The theory of random walk implies that past history cannot use to predict future price. But practically, it does not fit the facts exactly as long as there is information that can sufficient to price changes.

The random walk theory is supported by researchers such as Cootner, Fama, Kendall, and Moore. However, the chartist did not agree about the result and consider the test is not adequate. The problem is the simple linear relationship is not too complex to test the complicated pattern.

II.4 Efficient Market Hypothesis

After the Random Walk Theory was introduced in 1965, Eugene Fama introduced new research which is efficient market hypothesis. It assumes that information can be used to predicting the security price due to price is fully reflected information. There are three forms of information reflect on the security price which are weak form, semi-strong form, and strong form. But before explaining the three form, there are market conditions for efficient

market which are (i) there is no cost of transaction in trading securities, (ii) all information is available to all market participants, and (iii) all agree on the implications of current information for the current price and distributions of the future prices of each security (Fama, 1970)

Weak form means that the information set is historical price or return. There is evidence by Eugene Fama that there is positive dependence in day-to-day price changes and return in common stock and it indicates that weak form of the efficient market hypothesis is supported. Another evidence was done by Alexander (1961) which explained did a test on daily price data from 1897 until 1959. The result is Alexander's result denied the independence assumption of random walk (Eugene Fama,1970). Researcher such as Fama - Blume has the same support that they compare the profitability by this filter on individual stock of Dow-Jones Industrial Average.

Semi-strong tells about the price will adjust to all public information available such as financial statement, corporate action, the news about company, etc. Fama, Fisher, Jensen, and Roll (1969) show their research that the announcement of stock spilt that effect to payment dividend is on average fully reflected the price of the stock split at the time of the split. Another research was done by Ball and Brown (1969), Waud, and Scholes (1969) to

examine the public announcement toward the stock return and they support the semi-strong.

Strong form is information set from all information that gets from the insider or monopolistic information. It is supported by research from Niederhoffer and Osborne that find the specialist on the major of security exchange has monopolistic access to information on unexecute limit orders and used it for generating trading profit (Fama, 1970)

CHAPTER III

RESEARCH METHODOLOGY

III.1 Data Collection and Processing

Collecting process started at the beginning of August 2018. The time period for data used is 31/07/2015 - 31/07/ 2018 to look bigger picture of technical indicators for each sample. The sample are companies in LQ45. The consideration of taking companies on LQ45 as sample is the LQ45 contains the most liquid companies and according to Indonesia Stock Exchange, the LQ45 has 70% of the market capitalization in Indonesia. There are 45 companies in the LQ45 but for this research purpose, researcher use forty-four companies due to one of the companies (PT Waskita Beton Precast) does not have data from July 31st 2015. The samples used in the research are:

No	Code	Company
1	ADHI	Adhi Karya (Persero) Tbk
2	ADRO	Adaro Energy Tbk
3	AKRA	AKR Corporation Tbk
4	ANTM	Aneka Tambang Tbk
5	ASII	Astra International Tbk
6	BBCA	Bank Central Asia
7	BBNI	Bank Negara Indonesia (Persero) Tbk
8	BBRI	Bank Rakyat Indonesia (Persero) Tbk
9	BBTN	Bank Tabungan Negara (Persero) Tbk
10	BJBR	BPD Jawa Barat dan Banten Tbk
11	BKSL	Sentul City Tbk
12	BMRI	Bank Mandiri (Persero) Tbk
13	BRPT	Barito Pasific
14	BSDE	Bumi Serpong Damai Tbk

15	ELSA	Elnusa Tbk
16	EXCL	XL Axiata Tbk
17	GGRM	Gudang Garam Tbk
18	HMSP	HM Sampoerna Tbk
19	ICBP	Indofood CBP Sukses Makmur Tbk
20	INCO	Vale Indonesia Tbk
21	INDF	Indofood Sukses Makmur Tbk
22	INDY	Indika Energy Tbk
23	INKP	Indah Kiat Pulp & Paper Tbk
24	INTP	Indocement Tunggal Prakarsa Tbk
25	ITMG	Indo Tambangraya Megah Tbk
26	JSMR	Jasa Marga (Persero) Tbk
27	KLBF	Kalbe Farma Tbk
28	LPKR	Lippo Karawaci Tbk
29	LPPF	Matahari Department Store Tbk
30	MEDC	Medeo Energi Internasional Tbk
31	MNCN	Media Nusantara Citra Tbk
32	PGAS	Perusahaan Gas Negara (Persero) Tbk
33	PTBA	Tambang Batubara Bukit Asam (Persero) Tbk
34	PTPP	PP (Persero) Tbk
35	SCMA	Surya Citra Media Tbk
36	SMGR	Semen Indonesia (Persero) Tbk
37	SRIL	Sri Rejeki Isman Tbk
38	SSMS	Sawit Sumbermas Sarana Tbk
39	TLKM	Telekomunikasi Indonesia (Persero) Tbk
40	TPIA	Chandra Asri Pertochemical Tbk
41	UNTR	United Tractors Tbk
42	UNVR	Unilever Indonesia
43	WIKA	Wijaya Karya (Persero)
44	WSKT	Waskita Karya (Persero) Tbk

Table 3.1 The companies used as samples

The secondary data that are collected are historical price and number of technical indicators. Technical indicators are shown in the form of graphic but on this research, it is required to use on the form of the number for using statistical analysis. The source of technical indicators and historical price are from the application named HOTS owned by PT

Mirae Asset Sekuritas Indonesia. The researcher has access to the application because PT Mirae Asset Sekuritas Indonesia give free access (cannot be used to do trading activity) publicly. Technical indicators used are the Simple Moving Average (SMA), Weighted Moving Average (WMA), Exponential Moving Average (EMA), Moving Average Convergence Divergence (MACD), Bollinger Band, Negative Volume Index (NVI), Positive Volume Index (PVI), Relative Strength Index (RSI), Relative Momentum Index (RMI), Relative Volatility Index (RVI), Stochastic Fast, Stochastic Slow, Average Directional Index (ADX), William %R, Rate of Change (ROC), and On-Balance Volume (OBV).

III.2 Variable and Measurement

The dependent variable is the next day of each company stock price in order to look at the significance of technical analysis toward the stock price of company at next day. Independent variable is the today technical indicators used on the research that has been mentioned previous part. Technical indicators used on the model represent the categories of technical indicator which are the trend, volatility, momentum, cycle, market strength, and support and resistance.

After data is completed, it is tested using multiple regression applying SPSS 25. Regression analysis is the method to analyze the model to look at the significance of the model predicting the outcome. Researcher runs the regression analysis on each of the samples in order to look at the

capability of technical analysis that is represented by technical indicators to predict the next day of stock price on every sample. The researcher set 95% of confidence level for this research.

Regression analysis showed the significance of the model toward outcome based on the R square and F-value. If the R square near to 1.0, it indicates the outcome is significantly explained by independent variables. In order word that the model can be used to predict the outcome. According to Andy Field (2009), F-value measure how much the model has improved the prediction of the outcome compared to the level of inaccuracy of the model. The calculation of F -value is:

$$F = \frac{Mean\ Square\ for\ The\ Model\ (MSm)}{Residual\ Mean\ Square\ (MSr)}$$

The good model is shown by F-value is greater than 1 (means that the Means Square for the model is large than the Residual Means Square.

If the model is significant to explain the outcome, it does not mean all predictors can be used to predict. The researcher has to look at the significance of the individual predictor (independent variable) toward the outcome by comparing the p-value of each predictor to its alpha level. If the p-value of each predictor more than α level, it is not significant to use for prediction. SPSS 25 shows the p-value of individual predictor by showing the Sig. (Significant level).

III.3   Research Model

As the researcher explains the previous part, the researcher run the regression analysis on every sample. Researcher uses the same model when running the regression analysis on every sample.

$$y=\beta_0+\beta_1.x_1+\beta_2.x_2+\beta_3.x_3+\beta_4.x_4+\beta_5.x_5+\beta_6.x_6+\beta_7.x_7+\beta_8.x_8+\beta_9.x_9+\beta_{10}.x_{10}+\beta_{11}.x_{11}+\beta_{12}.x_{12}+\beta_{13}.x_{13}+\beta_{14}.x_{14}+\beta_{15}.x_{15}+\beta_{16}.e_{16}+e$$

y	: Stock price of each company on next day
x1	: Bollinger Band
x2	: ADX (Average Directional Index)
x3	: SMA (Simple Moving Average)
x4	: WMA (Weighted Moving Average)
x5	: EMA (Exponential Moving Average)
x6	: MACD (Moving Average Convergence Divergence)
x7	: NVI (Negative Volume Index)
x8	: OBV (On-Balance Volume)
x9	: PVI (Positive Volume Index)
x10	: RMI (Relative Momentum Index)
x11	: ROC (Rate of Changes)
x12	: RSI (Relative Strength Index)
x13	: RVI (Relative Volatility Index)
x14	: Stochastic Fast
x15	: Stochastic Slow
x16	: William %R
β0	: Constant
β1-B16	: Beta of each independent variable
e	: error

CHAPTER IV

RESULT

IV.1 DATA ANALYSIS RESULT

IV.1.1 PT ADHI KARYA TBK (ADHI)

PT Adhi Karya Tbk is one of companies in LQ45 index. It provides construction, engineering, and property development services. The major ownership of this company is the Indonesian Government.

By running the statistical analysis using SPSS, The result shows that the R^2 is significance to explain the dependent variable (the next day of ADHI's stock price). It shows also that the model used is fit.

R	R Square	Adjusted R Square
.986[a]	.972	.971

Table 4.1a. Result R^2 of ADHI stock price

Another measurement to look at the significance to the outcome is F-Value. F-value of the ADHI stock price shows on Table 4.1b. The F-value shows that the model has significance to the outcome (dependent variable).

	Sum of Squares	df	Mean Square	F	Sig.

Regression	66366563.354	16	4147910.210	1519.658	.000[b]
Residual	1929757.851	707	2729.502		
Total	68296321.204	723			

Table 4.1b. Result ANOVA of ADHI stock price

P-value (Sig.) shows the significance of each independent variable (Technical analysis) toward the dependent variable. Independent variable that has significance if the p-value is less than 5% (α). It shows that the independent variable that has significance to the outcome is NVI (Negative Volume Index, Positive Volume Index, Stochastic Fast, and Stochastic Slow. It indicates that the technical analysis could be used to predict the ADHI stock price with those four technical indicators. The p-value table of technical indicators is on Table 3.1c

Variable	Sig.
NVI	.000
PVI	.000
STOCHASTICFAST	.000
STOCHASTICSLOW	.038
EMA	.102
ADX	.123
OBV	.138
RMI	.154
MACD	.227
SMA	.228
RVI	.286
BOLLINGERBAND	.388
ROC	.514
WMA	.529
RSI	.852

Table 4.1c. P-value of technical indicators on ADHI stock

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. All predictor (independent variables) are not significant to predict the outcome by looking the p-value of each predictor. Based on 95% Confidence Level, Predictors (independent variables) has significance are Negative Volume Index (NVI), Positive Volume Index (PVI), Stochastic Fast, Stochastic Slow.

IV.1.2 PT ADARO ENERGY TBK (ADRO)

PT Adaro Energy is coal mining company. It is one of component of the LQ45 for period August 2018 - January 2019.

The statistical analysis result shows that the R square has significance to explain 99.5% of the dependent variable. It shows on the Table 4.2a.

R	R Square	Adjusted R Square
.997[a]	0.995	0.995

Table 4.2a. Result R^2 of ADRO stock price

Other result shows that the model has significant to the outcome (dependent variable) by looking at the F-value. The F-value shows on the ANOVA Table Table 4.2b

	Sum of Squares	df	Mean Square	F	Sig.
Regression	245901653.505	15	16393443.567	8847.298	.000[b]
Residual	1311876.057	708	1852.932		
Total	247213529.562	723			

Table 4.2b. Result ANOVA of ADRO stock price

In order to look at the significance of each predictor (independent variable) toward the outcome, the researcher look at the p-value of each predictor. If the p-value shows that it more than α (5%), so the predictor does not significant to the outcome to use for prediction. Table of the p-value of independent variable shows on Table 4.2c.

Variable	Sig.
WMA	0.000
SMA	0.000
STOCHASTICSLOW	0.000
STOCHASTICFAST	0.000
RSI	0.000
PVI	0.001
ROC	0.002
RMI	0.030
NVI	0.170
MACD	0.221
BOLLINGERBAND	0.273
ADX	0.366
OBV	0.406
WILLIAM	0.453
RVI	0.656

Table 4.2c. p-value of technical indicators on ADRO stock

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. In order to look detail about the individual predictor that has significance to the next day of the ADRO stock price is by looking at the p-value of each individual independent variable. Independent variables significant are Weighted Moving Average (WMA), Simple Moving Average (SMA), Stochastic

Slow, Stochastic Fast, Relative Strength Index (RSI), Positive Volume Index (PVI), Rate of Change (ROC), and Relative Momentum Index (RMI).

IV.1.3 PT AKR CORPORINDO TBK (AKRA)

PT AKR Corporindo Tbk distributes chemical products such as caustic soda, Polyvinyl Chloride (PVC) resin, sorbitol, soda ash, and sodium sulfate (Bloomberg,2018).

The result shows that the model has significance to the outcome (dependent variable). It is based on R square shows near 1. Also, it based on the F-value that shows the model can be used to predict the outcome (dependent variable).

R	R Square	Adjusted R Square
.982[a]	.964	.963

Table 4.3a. Calculation value R for AKRA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	395901893.446	16	24743868.340	1171.539	.000[b]
Residual	14932423.785	707	21120.826		
Total	410834317.231	723			

Table 4.3b. Result ANOVA of AKRA stock price

After looking the model that significant to the outcome (dependent variable) and it is looking like the whole model, the researcher looks for every individual of the predictor on the model by looking at the p-value. Predictor that significant is the p-value is less than α (5%).

Variable	Sig.
NVI	0.000
PVI	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.009
EMA	0.011
SMA	0.021
BOLLINGERBAND	0.047
OBV	0.055
RMI	0.159
WILLIAM	0.221
RVI	0.261
WMA	0.394
ADX	0.468
ROC	0.551
MACD	0.716
RSI	0.846

Table 4.3c. P-value of technical indicators on AKRA stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The individual independent variables significant to the outcome (dependent variable) are Negative Volume Index (NVI), Positive Volume Index (PVI), Stochastic Fast, Exponential Moving Average (EMA), Simple Moving Average (SMA), and Bollinger Band.

IV.1.4 PT ANEKA TAMBANG (PERSERO) TBK (ANTM)

Aneka Tambang Tbk. Are mining company that engages in the exploration, processing, and marketing the mining material (nickel, gold, silver).

The result shows that the model is significant to the dependent variable based on R square near than 1 and F-value

shows that the model can be used to predict. F-value shows on ANOVA table.

R	R Square	Adjusted R Square
.994[a]	0.989	0.989

Table 4.4a. Calculation value R for ANTM

	Sum of Squares	df	Mean Square	F	Sig.
Regression	24269796.974	15	1617986.465	4194.439	.000[b]
Residual	273107.877	708	385.746		
Total	24542904.851	723			

Table 4.4b. Result ANOVA of ANTM stock price

To look significance of each independent variable, the researcher uses p-value. If the p-value of independent variable less than α (5%), the independent variable is significant.

Variable	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
ADX	0.013
NVI	0.028
OBV	0.039
RMI	0.137
PVI	0.259
ROC	0.314
WILLIAM	0.598
RVI	0.625
RSI	0.776
BOLLINGERBAND	0.829
MACD	0.942

Table 4.4c. P-value of technical indicators on ANTM stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R

square and F value. However, not all independent variable use to prediction due to insignificant to the outcome. The independent variables significant are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Stochastic Slow, Average Directional Index (ADX), Negative Volume Index (NVI), and On Balance Volume (OBV).

IV.1.5 PT ASTRA INTERNATIONAL TBK (ASII)

PT Astra International operate their business mainly as automotive production and having many subsidiaries allow ASII to operates many industries such as mining, plantation, and financial services.

The result shows that the model is significant to the outcome (dependent variable) according to R square that near to 1 and the F-value.

R	R Square	Adjusted R Square
0.987[a]	0.974	0.973

Table 4.5a. Calculation value R for ASII

	Sum of Squares	df	Mean Square	F	Sig.
Regression	573452745.431	16	35840796.589	1625.913	.000[b]
Residual	15584750.253	707	22043.494		
Total	589037495.684	723			

Table 4.5b. Result ANOVA of ASII stock price

R square and F-value is for the whole model. We look at the significance of independent variable toward dependent variable by looking at the p-value.

Variable	Sig.
SMA	0.000
NVI	0.000
STOCHASTICFAST	0.000
WMA	0.001
OBV	0.001
PVI	0.001
STOCHASTICSLOW	0.001
RSI	0.01
MACD	0.113
WILLIAM	0.141
RMI	0.166
ROC	0.214
RVI	0.438
ADX	0.552
BOLLINGERBAND	0.598
(Constant)	0.699
EMA	0.699

Table 4.5c. p-value of ASII stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value.. The independent variables significant to the outcome for predicting the stock price are Simple Moving Average (SMA), Negative Volume Index (NVI), Stochastic Fast, Weighted Moving Average (WMA), On Balance Volume (OBV), Positive Volume Index (PVI), Stochastic Slow, and Relative Strength Index (RSI).

IV.1.6 PT BANK CENTRAL ASIA TBK (BBCA)

BBCA (PT Bank Central Asia TBK) is one of the largest banks in Indonesia. Like another bank, the bank has financial services such as management of pension fund, leasing, and consumer financing services.

The result shows that the model is significantly based on the R square that shows near 1 and the F-value.

R	R Square	Adjusted R Square
.998[a]	0.996	0.995

Table 4.6a. Calculation value R for BBCA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	10082427471.914	14	720173390.851	11412.057	.000[b]
Residual	44742410.683	709	63106.362		
Total	10127169882.597	723			

Table 4.6b. Result ANOVA of BBCA stock price

R square and F-value just show the significance of the whole model to the outcome (dependent variable). P-value (Sig.) shows the significance to each independent variable to the dependent variable. It shows in Table 4.6c.

Variable	Sig.
ADX	0.000
SMA	0.000
NVI	0.000
OBV	0.000
PVI	0.000
STOCHASTICFAST	0.000
WILLIAM	0.038
STOCHASTICSLOW	0.090
ROC	0.103
RMI	0.170
BOLLINGERBAND	0.232
MACD	0.284
RSI	0.318
RVI	0.521

Table 4.6c. p-value of BBCA stock price

The conclusion is that the technical analysis can be sued to predict the BBCA stock price because the result shows the model has significant to the outcome and can be used to predicting the next day BBCA stock price (dependent variable). The predictor

that individually significant to outcome are Average Directional Index (ADX), Simple Moving Average (SMA), Negative Volume Index (NVI), On Balance Volume (OBV), Positive Volume Index (PVI), Stochastic Fast, and William %R.

IV.1.7 PT BANK NEGARA INDONESIA (PERSERO) TBK (BBNI)

BBNI (Bank Negara Indonesia) is one of the banks owned by Indonesia government that operate to serve commercial and consumer banking services.

The result shows that the model is significant to the outcome (dependent variable) according to the R square near to 1 and F-value.

R	R Square	Adjusted R Square
0.996[a]	0.992	0.992

Table 4.7a. Calculation value R for BBNI

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1702252178.937	15	113483478.596	6031.373	.000[b]
Residual	13321394.819	708	18815.529		
Total	1715573573.757	723			

Table 4.7b. Result ANOVA of BBNI stock price

R square and F-value just show the result as the whole model. We need to know the significance of each independent variable by looking at each p-value of the independent variable.

Variable	Sig.
SMA	0.000

WMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
BOLLINGERBAND	0.018
PVI	0.034
NVI	0.045
MACD	0.048
ROC	0.137
RSI	0.272
OBV	0.276
ADX	0.314
RMI	0.606
RVI	0.622
WILLIAM	0.808

Table 4.7c. p-value of BBNI stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. Not all the technical analysis can be used to predict. The technical analysis that can be used is Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Stochastic Slow, Bollinger Band, Positive Volume Index (PVI), Negative Volume Index (NVI), and Moving Average Convergence Divergence (MACD).

IV.1.8 PT BANK RAKYAT INDONESIA (PERSERO) TBK (BBRI)

BBRI (Bank Rakyat Indonesia) is one of the banks owned by Indonesia government that operate to serve commercial and consumer banking services.

The R square shows that the model is significant to the outcome. The model can explain the outcome significantly. The F-value show the same interpretation.

R	R Square	Adjusted R Square
.995ᵃ	0.990	0.990

Table 4.8a. Calculation value R for BBRI

	Sum of Squares	df	Mean Square	F	Sig.
Regression	208916717.824	15	13927781.188	4766.457	.000ᵇ
Residual	2068804.655	708	2922.040		
Total	210985522.479	723			

Table 4.8b. Result ANOVA of BBRI stock price

The independent variables that have significance to predict the outcome are on the p-value table in Table 4.8c.

Model	Sig.
SMA	0.000
EMA	0.000
STOCHASTICFAST	0.000
BOLLINGERBAND	0.007
PVI	0.011
STOCHASTICSLOW	0.011
NVI	0.075
RMI	0.106
RVI	0.471
OBV	0.543
ADX	0.564
RSI	0.614
ROC	0.747
WILLIAM	0.751
MACD	0.832

Table 4.8c. p-value of BBRI stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The predictor has significance to prediction are Simple Moving Average (SMA), Exponential Moving Average

(EMA), Stochastic Fast, Bollinger Band, Positive Volume Index (PVI), and Stochastic Slow.

IV.1.9 PT BANK TABUNGAN NEGARA (PERSERO) TBK (BBTN)

BBTN (Bank Tabungan Negara TBK) is one of the banks that chosen to be component of LQ45. Like another bank, BBTN provides financial service to its customer.

The model is significantly explained to outcome according to the R square and the model can be used to prediction based on the F-value.

R	R Square	Adjusted R Square
.997[a]	0.995	0.995

Table 4.9a. Calculation value R for BBTN

	Sum of Squares	df	Mean Square	F	Sig.
Regression	453643579.179	15	30242905.279	9350.249	.000[b]
Residual	2289989.986	708	3234.449		
Total	455933569.164	723			

Table 4.9b. Result ANOVA of BBTN stock price

Researcher looks further about the individual predictor that has significance to the prediction. It shows in Table 4.9c.

Model	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
RMI	0.002
RSI	0.022
RVI	0.166

BOLLINGERBAND	0.230
MACD	0.246
ADX	0.251
WILLIAM	0.252
NVI	0.357
OBV	0.616
ROC	0.852
PVI	0.896

Table 4.9c. p-value of BBTN stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The significant predictors are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Stochastic Slow, Relative Momentum Index (RMI), and Relative Strength Index (RSI).

IV.1.10 PT BANK JAWA BARAT DAN BANTEN TBK (BJBR)

BJBR (Bank Jawa Barat and Banten) is a commercial bank like other banks in Indonesia. Before the name of Bank Jawa Barat and Banten, the first name before the independence of Indonesia is De EeWrste Nederlandsche-Indische Spaarkas en Hyphoteekbank (DENIS) in 1915.

The R square shows that the dependent variable can be explained significantly by the independent variable and the model can be used to predict the outcome according to its F-value.

R	R Square	Adjusted R Square
.995[a]	0.990	0.990

Table 4.10a. Calculation value R for BJBR

	Sum of Squares	df	Mean Square	F	Sig.
Regression	337788428.071	15	22519228.538	4775.775	.000[b]
Residual	3338434.740	708	4715.303		
Total	341126862.811	723			

Table 4.10b. Result ANOVA of BJBR stock price

R square and F-value is about the significance of one model. We have to look at the predictor that has significant to outcome in prediction by looking at the p-value (Sig.).

Variable	Sig.
SMA	0.000
WMA	0.000
NVI	0.000
PVI	0.000
ROC	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.001
OBV	0.014
RSI	0.017
MACD	0.061
ADX	0.508
RVI	0.754
BOLLINGERBAND	0.948
RMI	0.955
WILLIAM	0.981

Table 4.10c. p-value of BJBR stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The predictors that have significance to the prediction are Simple Moving Average (SMA), Weighted Moving Average (WMA), Negative Volume Index (NVI), Positive Volume Index (PVI), Rate of Changes (ROC), Stochastic Fast,

Stochastic Slow, On Balance Volume (OBV), and Relative Strength Index (RSI).

IV.1.11 PT SENTUL CITY TBK (BKSL)

BKSL (PT Sentul City) is real estate company located in Sentul (Bogor region). BKSL is the new component of LQ45 for period August 2018 – January 2019.

The model shows its significance to predict the outcome based on its R square and the F-value. It shows on table R square and ANOVA.

R	R Square	Adjusted R Square
.995[a]	0.990	0.989

Table 4.11a. Calculation value R for BKSL

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1161391.428	15	77426.095	4520.865	.000[b]
Residual	12125.484	708	17.126		
Total	1173516.912	723			

Table 4.11b. Result ANOVA of BKSL stock

The model shows the significance but we need to look the individual predictor of the BKSL stock price on the model. We look at the significance of predictor to use for prediction by looking at the p-value.

Variable	Sig.
SMA	0.000

WMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
ADX	0.016
PVI	0.055
OBV	0.109
RSI	0.217
BOLLINGERBAND	0.258
RMI	0.278
NVI	0.291
ROC	0.501
WILLIAM	0.667
RVI	0.895
MACD	0.910

Table 4.11c p-value of BKSL stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. However, the individual predictors that can be used to predict are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Stochastic Slow, Average Directional Index (ADX).

IV.1.12 PT BANK MANDIRI (PERSERO) TBK (BMRI)

BMRI (Bank Mandiri Persero) is one of the biggest commercial banks in Indonesia. It provides financial service to the customer like other banks in Indonesia.

The model shows that the model significantly explains the dependent variable based on the R square and the model can be used to prediction based on the F-value.

R	R Square	Adjusted R Square
.995[a]	0.990	0.990

Table 4.12a. Calculation value R for BMRI

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1005844951.421	15	67056330.095	4730.172	.000[b]
Residual	10036818.330	708	14176.297		
Total	1015881769.751	723			

Table 4.12b. Result ANOVA of BMRI stock price

The model can be used to predict the outcome but we have to look at the independent variable that has significance to predict the outcome by using the p-value.

Variable	Sig.
EMA	0.000
STOCHASTICFAST	0.000
PVI	0.001
NVI	0.003
SMA	0.021
STOCHASTICSLOW	0.023
BOLLINGERBAND	0.102
RMI	0.150
OBV	0.183
MACD	0.291
RSI	0.377
ADX	0.426
WILLIAM	0.691
ROC	0.821
RVI	0.987

Table 4.12c. p-value of BMRI stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. However not all the variable has significance to predict the price. The significant dependent variables are Exponential Moving Average (EMA), Stochastic Fast, Positive

Volume Index (PVI), Negative Volume Index (NVI), Simple Moving Average (SMA), and Stochastic Slow.

IV.1.13 PT BARITO PASIFIC TBK (BRPT)

BRPT (PT Barito Pasific) is an energy company that provides petrochemical and geothermal energy.

The result shows that the model significantly explains the dependent variable based on the R square. The model can be used to predict the outcome based on the F-value. R square is shown in Table 4.13a. and F-value is shown on the ANOVA table in Table 4.13b.

R	R Square	Adjusted R Square
.999[a]	0.998	0.998

Table 4.13a. Calculation value R for BRPT

	Sum of Squares	df	Mean Square	F	Sig.
Regression	569393245.465	14	40670946.105	23030.027	.000[b]
Residual	1252091.463	709	1765.996		
Total	570645336.928	723			

Table 4.13b. Result ANOVA of BRPT stock price

The model can be used to a prediction of the outcome but it is for the whole model. The individual predictor (dependent variable) that has significance to prediction is that has the p-value less than 5% (Confidence level 95%).

Variable	Sig.

BOLLINGERBAND	0.000
WMA	0.000
OBV	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
WILLIAM	0.000
MACD	0.009
NVI	0.047
RMI	0.064
RSI	0.286
ROC	0.375
RVI	0.504
ADX	0.519
PVI	0.799

Table 4.13c. p-value of BRPT stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicator that can be used to predict are Bollinger Band, Weighted Moving Average (WMA), On-Balance Volume (OBV), Stochastic Fast, Stochastic Slow, William %R, Moving Average Convergence Divergence (MACD), and Negative Volume Index (NVI). These technical indicators are chosen that can be used to prediction because the p-value (Sig.) is less than 5%.

IV.1.14 PT BUMI SERPONG DAMAI TBK (BSDE)

BSDE (PT Bumi Serpong Damai) is one of the real estate company in Indonesia. BSDE provides housing infrastructure, public facility, golf, and etc.

The result shows that the model can explain significantly the dependent variable (outcome) based on its R square. The model is significant for predicting the outcome based on F-value.

R	R Square	Adjusted R Square
.975[a]	0.950	0.949

Table 4.14a. Calculation value R for BSDE

	Sum of Squares	df	Mean Square	F	Sig.
Regression	21076102.977	16	1317256.436	840.134	.000[b]
Residual	1108514.530	707	1567.913		
Total	22184617.507	723			

Table 4.14b. Result ANOVA of BSDE stock price

If the model is significant to predict the outcome, there are some independent variables that can be used to predict because of its significance to outcome based on every variable's p-value.

Variable	Sig.
SMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
WMA	0.005
EMA	0.016
PVI	0.132
OBV	0.148
NVI	0.226
ADX	0.297
RVI	0.308
MACD	0.311
RSI	0.317
RMI	0.369
BOLLINGERBAND	0.426
WILLIAM	0.837
ROC	0.920

Table 4.14c p-value of BSDE stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. But not all the technical indicators can be used because insignificant of the independent variable. The significant technical indicators are Simple Moving Average (SMA), Stochastic Fast, Stochastic Slow, Weighted Moving Average (WMA), and Exponential Moving Average (EMA).

IV.1.15 PT ELNUSA TBK (ELSA)

ELSA (PT Elnusa TBK) is an oil services company providing geophysical data, drilling, and oilfield services. ELSA also provide information technology service to the oil company and other industry.

The result shows that R square is near one. It means that the model can explain the dependent variable significantly. The F-value show also that the model can be used to the prediction of the outcome.

R	R Square	Adjusted R Square
.990[a]	0.979	0.979

Table 4.15a. Calculation value R for ELSA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	5866555.012	16	366659.688	2088.508	.000[b]
Residual	124121.334	707	175.561		
Total	5990676.347	723			

Table 4.15b. Result ANOVA of ELSA stock price

We need to know the predictors (technical indicators) that significance to predict the outcome based on its individual predictor's p-value because the model can be used to predict the outcome but we have to look every significance of the variable in the model.

Variable	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.000
NVI	0.003
OBV	0.019
PVI	0.024
STOCHASTICSLOW	0.092
EMA	0.154
MACD	0.188
RVI	0.191
WILLIAM	0.339
ROC	0.498
RMI	0.768
BOLLINGERBAND	0.792
RSI	0.809
ADX	0.969

Table 4.15c. p-value of ELSA stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators which significant (Confidence Level 95%) to the outcome are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Negative Volume Index (NVI), On Balance Volume (OBV), and Positive Volume Index (PVI).

IV.1.16 PT XL AXIATA TBK (EXCL)

EXCL (PT XL Axiata TBK) is on of private telecommunication company in Indonesia. EXCL provides mobile telecommunication service in Indonesia.

The result shows the model can explain significantly dependent variable based on its R square and the model can be used to predict based on its F-value.

R	R Square	Adjusted R Square
.985[a]	0.970	0.970

Table 4.16a. Calculation value R for EXCL

	Sum of Squares	df	Mean Square	F	Sig.
Regression	192131553.402	16	12008222.088	1448.607	.000[b]
Residual	5860673.294	707	8289.495		
Total	197992226.696	723			

Table 4.16b Result ANOVA of EXCL stock price

Next is about the significance of each independent variables (technical indicators) toward outcome (next day of the stock price of EXCL). The significance is based on the p-value (Sig.).

Variable	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.001
RMI	0.002
RSI	0.004
NVI	0.114
PVI	0.124
WILLIAM	0.161
ROC	0.278
OBV	0.436

BOLLINGERBAND	0.446
RVI	0.686
EMA	0.790
ADX	0.849
MACD	0.945

Table 4.16c p-value of EXCL stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The significant technical indicators are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Stochastic Slow, Relative Momentum Index (RMI), and Relative Strength Index (RSI).

IV.1.17 PT GUDANG GARAM TBK (GGRM)

GGRM (PT Gudang Garam TBK) is company product cigarettes in Indonesia. GGRM also has a subsidiary in paper-related activities.

The result shows the model is significant to explain the outcome and can be used to predict the outcome (next day of the stock price of GGRM).

R	R Square	Adjusted R Square
.991[a]	0.982	0.982

Table 4.17a Calculation value R for GGRM

	Sum of Squares	df	Mean Square	F	Sig.
Regression	72670060765.906	15	4844670717.727	2579.165	.000[b]
Residual	1329898262.927	708	1878387.377		

Total	73999959028.833	723

Table 4.17b. Result ANOVA of GGRM stock price

The model is significant to the outcome but we need to look at each independent variable's (technical indicators) significance to the outcome. It is based on the p-value (Sig.).

Variable	Sig.
EMA	0.000
PVI	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.001
NVI	0.002
WILLIAM	0.030
BOLLINGERBAND	0.031
RMI	0.038
RSI	0.079
ADX	0.104
SMA	0.147
RVI	0.154
ROC	0.180
MACD	0.248
OBV	0.932

Table 4.17c. p-value of GGRM stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. But not all the technical indicators (independent variables) can be used to predict the outcome. Technical indicators that have significance to outcome are Exponential Moving Average (EMA), Positive Volume Index (PVI), Stochastic Fast, Stochastic Slow, Negative Volume Index (NVI), William %R, Bollinger Band, and Relative Momentum Index (RMI).

IV.1.18 PT H.M. SAMPOERNA TBK (HMSP)

HMSP (PT Handaya Mandala Sampoerna) is company producing cigarette like GGRM.

The result shows the model is significant to explain the dependent variable (next day of the stock price of HMSP) and can be used to predict the outcome based on the R square and F-value.

R	R Square	Adjusted R Square
.977[a]	0.954	0.953

Table 4.18a. Calculation value R for HMSP

	Sum of Squares	df	Mean Square	F	Sig.
Regression	99752365.460	16	6234522.841	919.549	.000[b]
Residual	4793442.842	707	6779.976		
Total	104545808.302	723			

Table 4.18b. Result ANOVA of HMSP stock price

Next part is the significance of the technical indicators (predictors) to the outcome. It is based on the p-value (Sig.).

Variable	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
RVI	0.001
MACD	0.008
PVI	0.013
BOLLINGERBAND	0.018
NVI	0.079
ROC	0.079
RMI	0.186
OBV	0.220
ADX	0.326
WILLIAM	0.373
RSI	0.535
EMA	0.809

Table 4.18c. p-value of HMSP stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The predictors that has significance to outcome are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Stochastic Slow, Relative Volatility Index (RVI), Moving Average Convergence Divergence (MACD), Positive Volume Index (PVI), and Bollinger Band.

IV.1.19 PT INDOFOOD CBP SUKSES MAKMUR TBK (ICBP)

ICBP (PT Indofood CBP Sukses Makmur TBK) is a food product manufacturer and ICBP has raw material production for their food product.

The result shows the model is significant to explain the outcome and can be used to the prediction of outcome (next day of the stock price of the ICBP).

R	R Square	Adjusted R Square
.989[a]	0.978	0.978

Table 4.19a. Calculation R, R Square, Adjusted R Square for ICBP

	Sum of Squares	df	Mean Square	F	Sig.
Regression	622398518.761	16	38899907.423	1972.238	.000[b]
Residual	13944681.342	707	19723.736		
Total	636343200.104	723			

Table 4.19b. Result ANOVA of ICBP stock price

Next part is the significance of the technical indicators (predictors) toward next day of the stock price of HMSP. It is based on the p-value (Sig.)

Variable	Sig.
NVI	0.000
PVI	0.000
STOCHASTICFAST	0.000
MACD	0.016
ADX	0.022
OBV	0.032
STOCHASTICSLOW	0.045
EMA	0.142
RVI	0.154
RMI	0.170
SMA	0.203
RSI	0.285
WILLIAM	0.293
BOLLINGERBAND	0.452
WMA	0.607
ROC	0.625

Table 4.19c. p-value of ICBP stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that are significant predictor are Negative Volume Index (NVI), Positive Volume Index (PVI), Stochastic Fast, Moving Average Convergence Divergence (MACD), Average Directional Index (ADX), On Balance Volume (OBV), and Stochastic Slow.

IV.1.20 PT VALE INDONESIA TBK (INCO)

INCO (PT Vale Indonesia) is mining company produce nickel in matte and operated in Sokoako in Sulawesi (Bloomberg).

The result shows that the model is significant to explain the outcome based on the R square and F-value.

R	R Square	Adjusted R Square
.993[a]	0.986	0.986

Table 4.20a. Calculation R, R Square, Adjusted R Square for INCO

	Sum of Squares	df	Mean Square	F	Sig.
Regression	384902913.298	15	25660194.220	3281.022	.000[b]
Residual	5537122.165	708	7820.794		
Total	390440035.463	723			

Table 4.20b. Result ANOVA of INCO stock price

The next part is to look at the significance of each predictor toward the result. It is based on each p-value of the predictor.

Variable	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
RSI	0.098
NVI	0.260
ADX	0.269
PVI	0.282
BOLLINGERBAND	0.346
WILLIAM	0.373
OBV	0.667
MACD	0.751
RVI	0.798
RMI	0.940
ROC	0.941

Table 4.20c. p-value of INCO stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. It is based on the significance of the model

toward to outcome. The significant predictors are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, and Stochastic Slow.

IV.1.21 PT INDOFOOD SUKSES MAKMUR TBK (INDF)

INDF (PT Indofood Sukses Makmur TBK) is a manufacturing company that produces instant noodle, baby food, flour.

The result shows the model is significant to the outcome and can be used to predict the outcome.

R	R Square	Adjusted R Square
.991[a]	0.982	0.982

Table 4.21a. Calculation R, R Square, Adjusted R Square for INDF

	Sum of Squares	df	Mean Square	F	Sig.
Regression	800136429.275	15	53342428.618	2608.952	.000[b]
Residual	14475714.648	708	20445.925		
Total	814612143.923	723			

Table 4.21b. Result ANOVA of INDF stock price

Next part is the significance of the technical indicators (predictors). It is based on the p-value (Sig.). If the p-value shows less than 5% (Confidence level 95%), it means that predictor is significant for prediction.

Variable	Sig.
SMA	0.000
EMA	0.000
NVI	0.000

PVI	0.000
STOCHASTICFAST	0.001
STOCHASTICSLOW	0.020
(Constant)	0.022
BOLLINGERBAND	0.041
RMI	0.442
ADX	0.451
RVI	0.512
RSI	0.563
OBV	0.574
WILLIAM	0.726
ROC	0.987
MACD	0.999

Table 4.21c. p-value of INDF stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The significant predictors are Simple Moving Average (SMA), Exponential Moving Average (EMA), Negative Volume Index (NVI), Positive Volume Index (PVI), Stochastic Fast, Stochastic Slow, and Bollinger Band.

IV.1.22 PT INDIKA ENERGY TBK (INDY)

INDY (PT Indika Energy TBK) is an energy company that provide energy services, energy resources, and infrastructure.

The result shows that the model is significant to explain the outcome based on its R square and can be used to predict the outcome based on F-value.

R	R Square	Adjusted R Square
.991[a]	0.982	0.982

Table 4.22a. Calculation R, R Square, Adjusted R Square for INDY

	Sum of Squares	df	Mean Square	F	Sig.
Regression	800136429.275	15	53342428.618	2608.952	.000[b]
Residual	14475714.648	708	20445.925		
Total	814612143.923	723			

Table 4.22b. Result ANOVA of INDY stock price

The next part is the significance of the predictor toward the result. It is based on the p-value (Sig.).

Variable	Sig.
SMA	0.000
EMA	0.000
NVI	0.000
PVI	0.000
STOCHASTICFAST	0.001
STOCHASTICSLOW	0.020
BOLLINGERBAND	0.041
RMI	0.442
ADX	0.451
RVI	0.512
RSI	0.563
OBV	0.574
WILLIAM	0.726
ROC	0.987
MACD	0.999

Table 4.22c. p-value of INDY stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Simple Moving Average (SMA), Exponential Moving Average (EMA), Negative Volume Index (NVI), Positive Volume Index (PVI), Stochastic Fast, Stochastic Slow, and Bollinger Band.

IV.1.23 PT INDAH KIAT PULP & PAPER TBK (INKP)

INKP (PT Indah Kiat Pulp & Paper TBK) is a manufacturing company producing pulp and paper located in Tangerang and Serang.

The result shows the model is significant to explain the dependent variable based on R square. The F-value shows us that the model can be used as the prediction.

R	R Square	Adjusted R Square
.999[a]	0.998	0.998

Table 4.23a. Calculation R, R Square, Adjusted R Square for INKP

	Sum of Squares	df	Mean Square	F	Sig.
Regression	17546691178.776	15	1169779411.918	22131.993	.000[b]
Residual	37421112.937	708	52854.679		
Total	17584112291.713	723			

Table 4.23b. Result ANOVA of INKP stock price

The next part is the significance of predictor on the INKP toward the outcome. The significant predictor can be used as the predictor to predict the stock price of INKP.

Variable	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.001
STOCHASTICSLOW	0.002
NVI	0.010
BOLLINGERBAND	0.012
PVI	0.068
ROC	0.110
WILLIAM	0.150
ADX	0.213
RSI	0.223
MACD	0.261

RMI	0.498
RVI	0.703
OBV	0.721

Table 4.23c. p-value of INKP stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Stochastic Slow, Negative Volume Index (NVI), Bollinger band.

IV.1.24 PT INDOCEMENT TUNGGAL PRAKARSA TBK (INTP)

INTP (PT Indocement Tunggal Prakarsa TBK) is one of two cement company in LQ45 beside SMGR.

The result shows the model is significance to the outcome and can be used to predict the outcome. It is based on the R square and F-value.

R	R Square	Adjusted R Square
.973[a]	0.947	0.946

Table 4.24a. Calculation R, R Square, Adjusted R Square for INTP

	Sum of Squares	df	Mean Square	F	Sig.
Regression	3113267520.005	16	194579220.000	796.128	.000[b]
Residual	172795649.885	707	244406.860		
Total	3286063169.890	723			

Table 4.24b. Result ANOVA of INTP stock price

The result shows that not all the technical indicators are significant to be used as the predictor. It is based on the p-value of each technical indicator.

Variable	Sig.
SMA	0.000
MACD	0.001
NVI	0.001
STOCHASTICFAST	0.001
WMA	0.003
PVI	0.004
STOCHASTICSLOW	0.011
OBV	0.015
EMA	0.028
RVI	0.111
ADX	0.154
WILLIAM	0.224
RSI	0.360
BOLLINGERBAND	0.431
RMI	0.775
ROC	0.910

Table 4.24c. p-value of INTP stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Simple Moving Average (SMA), Moving Average Convergence Divergence (MACD), Negative Volume Index (NVI), Stochastic Fast, Weighted Moving Average, Positive Volume Index, Stochastic Slow, On-Balance Volume (OBV), and Exponential Moving Average (EMA).

IV.1.25 PT INDO TAMBANGRAYA MEGAH TBK (ITMG)

ITMG (PT Indo Tambangraya Megah TBK) is ming company that operate exploration the coal, provide energy, and electricity support.

The result shows the model is significance to the outcome and can be used to predict the outcome. It is based on the R square and F-value.

R	R Square	Adjusted R Square
.997[a]	0.995	0.995

Table 4.25a. Calculation R, R Square, Adjusted R Square for ITMG

	Sum of Squares	df	Mean Square	F	Sig.
Regression	36899722797.127	15	2459981519.808	8725.347	.000[b]
Residual	199610036.713	708	281935.080		
Total	37099332833.840	723			

Table 4.25b. Result ANOVA of ITMG stock price

The result shows that not all the technical indicators are significant to be used as a predictor. It is based on the p-value of each technical indicator.

Variable	Sig.
BOLLINGERBAND	0.000
SMA	0.000
EMA	0.000
MACD	0.000
STOCHASTICFAST	0.000
RVI	0.015
RMI	0.046
WILLIAM	0.080
PVI	0.138
ADX	0.254
NVI	0.476
RSI	0.500
STOCHASTICSLOW	0.786
ROC	0.863
OBV	0.945

Table 4.25c. p-value of ITMG stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Bollinger Band, Simple Moving Average (SMA), Exponential Moving Average (EMA), Moving Average Convergence Divergence (MACD), Stochastic Fast, Relative Volatility Index (RVI), and Relative Momentum Index (RMI).

IV.1.26 PT JASA MARGA TBK (JSMR)

JSMR (PT Jasa Marga TBK) is a state-owned enterprise that has the responsibility to construct, build, and operate the toll road and its facilities.

The result shows the model is significance to the outcome and can be used to predict the outcome. It is based on the R square and F-value.

R	R Square	Adjusted R Square
.986[a]	0.973	0.972

Table 4.26a. Calculation R, R Square, Adjusted R Square for JSMR

	Sum of Squares	df	Mean Square	F	Sig.
Regression	269551907.469	16	16846994.217	1564.501	.000[b]
Residual	7613176.612	707	10768.284		
Total	277165084.081	723			

Table 4.26b. Result ANOVA of JSMR stock price

The result shows that not all the technical indicators are significant to be used as the predictor. It is based on the p-value of each technical indicator.

Variable	Sig.
STOCHASTICFAST	0.000
SMA	0.005
RMI	0.006
RSI	0.068
WMA	0.080
EMA	0.102
RVI	0.171
ADX	0.225
STOCHASTICSLOW	0.236
OBV	0.296
ROC	0.337
PVI	0.406
BOLLINGERBAND	0.752
NVI	0.888
MACD	0.941
WILLIAM	0.621

Table 4.26c. p-value of JSMR stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Stochastic Fast, Simple Moving Average (SMA), and Relative Momentum Index (RMI).

IV.1.27 PT KALBE FARMA TBK (KLBF)

KLBF (PT Kalbe Farma TBK) is pharmacy company in Indonesia and the member of LQ45 Index for August 2018 – January 2019.

The result shows the model is significance to the outcome and can be used to predict the outcome. It is based on the R square and F-value.

R	R Square	Adjusted R Square
.978[a]	0.956	0.955

Table 4.27a. Calculation R, R Square, Adjusted R Square for KLBF

	Sum of Squares	df	Mean Square	F	Sig.
Regression	15581749.235	16	973859.327	965.421	.000[b]
Residual	713179.874	707	1008.741		
Total	16294929.109	723			

Table 4.27b. Result ANOVA of KLBF stock price

The result shows that not all the technical indicators are significant to be used as the predictor. It is based on the p-value of each technical indicator.

Variable	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.000
RVI	0.001
STOCHASTICSLOW	0.001
BOLLINGERBAND	0.003
PVI	0.015
NVI	0.022
OBV	0.086
ADX	0.097
MACD	0.111
ROC	0.132
EMA	0.170
WILLIAM	0.303
RSI	0.497
RMI	0.588

Table 4.27c. p-value of KLBF stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are simple moving average, Weighted Moving Average (WMA), Stochastic Fast, Relative Volatility Index (RVI), Stochastic Slow, Bollinger Band, Positive Volume Index (PVI), and Negative Volume Index (NVI).

IV.1.28 PT LIPPO KARAWACI TBK (LPKR)

LPKR (PT Lippo Karawaci TBK) is real estate company located in Karawaci, Tangerang. It provides houses, land, etc.

The result shows the model is significance to the outcome and can be used to predict the outcome. It is based on the R square and F-value.

R	R Square	Adjusted R Square
.997[a]	0.995	0.995

Table 4.28a. Calculation R, R Square, Adjusted R Square for LPKR

	Sum of Squares	df	Mean Square	F	Sig.
Regression	47847937.053	15	3189862.470	8746.610	.000[b]
Residual	258205.492	708	364.697		
Total	48106142.546	723			

Table 4.28b. Result ANOVA of LPKR stock price

The result shows that not all the technical indicators are significant to be used as the predictor. It is based on the p-value of each technical indicator.

Variable	Sig.
SMA	0.000
WMA	0.000
NVI	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
OBV	0.026
PVI	0.047
ADX	0.157
MACD	0.187
RMI	0.502
ROC	0.533
RVI	0.635
BOLLINGERBAND	0.670
RSI	0.733
WILLIAM	0.976

Table 4.28c. p-value of LPKR stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Simple Moving Average (SMA), Weighted Moving Average (WMA), Negative Volume Index (NVI), Stochastic Fast, Stochastic Slow, On Balance Volume (OBV), and Positive Volume Index (PVI).

IV.1.29 PT MATAHARI DEPARTMENT STORE TBK (LPPF)

LPFF (PT Matahari Department Store) is a retail company that most of the product is clothes and most Indonesian people know the store of Matahari Department Store.

The result shows the model is significance to the outcome and can be used to predict the outcome. It is based on the R square and F-value.

R	R Square	Adjusted R Square
.993[a]	0.987	0.986

Table 4.29a. Calculation R, R Square, Adjusted R Square for LPPF

	Sum of Squares	df	Mean Square	F	Sig.
Regression	9078783274.660	15	605252218.311	3517.366	.000[b]
Residual	121829404.898	708	172075.431		
Total	9200612679.558	723			

Table 4.29b. Result ANOVA of LPPF stock price

The result shows that not all the technical indicators are significant to be used as the predictor. It is based on the p-value of each technical indicator.

Variable	Sig.
WMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
RMI	0.001
RSI	0.004
SMA	0.009
MACD	0.102
OBV	0.238
WILLIAM	0.349
RVI	0.365
NVI	0.622
BOLLINGERBAND	0.645
PVI	0.678
ROC	0.695
ADX	0.914

Table 4.29c. p-value of LPPF stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Weighted Moving Average (WMA),

Stochastic Fast, Stochastic Slow, Relative Momentum Index (RMI), Relative Strength Index (RSI), and Simple Moving Average (SMA).

IV.1.30 PT MEDCO ENERGI INTERNASIONAL TBK (MEDC)

MEDC (PT Medco Energi International TBK) is an energy company that product gas and oil, operate a power plant in Batam, and develop bio-fuel.

The result shows the model is significance to the outcome and can be used to predict the outcome. It is based on the R square and F-value.

R	R Square	Adjusted R Square
.997[a]	0.995	0.995

Table 4.30a. Calculation R, R Square, Adjusted R Square for MEDC

	Sum of Squares	df	Mean Square	F	Sig.
Regression	88173162.419	15	5878210.828	8763.063	.000[b]
Residual	474922.193	708	670.794		
Total	88648084.612	723			

Table 4.30b. Result ANOVA of KLBF stock price

The result shows that not all the technical indicators are significant to be used as the predictor. It is based on the p-value of each technical indicator.

Variable	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000

RSI	0.001
RMI	0.002
RVI	0.012
OBV	0.035
WILLIAM	0.095
BOLLINGERBAND	0.234
MACD	0.254
ROC	0.306
NVI	0.365
PVI	0.465
ADX	0.913

Table 4.30c. p-value of MEDC stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Stochastic Slow, Relative Strength Index (RSI), Relative Momentum Index (RMI), Relative Volatility Index (RVI), and On Balance Volume (OBV).

IV.1.31 PT MEDIA NUSANTARA CITRA TBK (MNCN)

MNCN (PT Media Nusantara Citra TBK) is media company that has TV Station, newspaper, radio station, talent management.

The result shows that the model is fit and can be used to predict the outcome based on the R square and F-value.

R	R Square	Adjusted R Square
.987[a]	0.974	0.974

Table 4.31a. Calculation R, R Square, Adjusted R Square for MNCN

	Sum of Squares	df	Mean Square	F	Sig.
Regression	72756195.270	16	4547262.204	1669.657	.000[b]
Residual	1925493.543	707	2723.470		
Total	74681688.812	723			

Table 4.31b. Result ANOVA of MNCN stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with confidence level of 95%.

Variable	Sig.
STOCHASTICFAST	0.000
EMA	0.001
NVI	0.023
STOCHASTICSLOW	0.030
MACD	0.056
BOLLINGERBAND	0.061
PVI	0.064
SMA	0.071
RMI	0.113
ADX	0.188
OBV	0.254
ROC	0.404
WILLIAM	0.411
RSI	0.602
RVI	0.890
WMA	0.987

Table 4.31c. p-value of MNCN stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Stochastic Fast, Exponential Moving Average (EMA), Negative Volume Index (NVI), and Stochastic Slow.

IV.1.32 PT PERUSAHAAN GAS NEGARA (PERSERO) TBK (PGAS)

PGAS (PT Perusahaan Gas Negara TBK) is a company that distributes the gas for industry, commercial, and household user.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.985[a]	0.970	0.969

Table 4.32a. Calculation R, R Square, Adjusted R Square for PGAS

		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	135357632.376	16	8459852.024	1426.521	.000[b]
	Residual	4192798.425	707	5930.408		
	Total	139550430.801	723			

Table 4.32b. Result ANOVA of PGAS stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with confidence level of 95%.

Variable	Sig.
SMA	0.000
WMA	0.000
NVI	0.000
STOCHASTICFAST	0.000
PVI	0.001
STOCHASTICSLOW	0.001
RSI	0.002
ADX	0.004
WILLIAM	0.082
RMI	0.152
ROC	0.210
EMA	0.233
MACD	0.761
OBV	0.765
BOLLINGERBAND	0.796
RVI	0.982

Table 4.32c. p-value of PGAS stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Positive Volume Index (PVI), Stochastic Slow, Relative Strength Index (RSI), and Average Directional Index (ADX).

IV.1.33 PT TAMBANG BATU BARA BUKIT ASAM (PERSERO) TBK (PTBA)

PTBA (PT Tambang Batubara Bukit Asam) is mining company that exploiting, exploitation, production the coal as the product.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.997[a]	0.994	0.994

Table 4.33a. Calculation R, R Square, Adjusted R Square for PTBA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	497480041.518	15	33165336.101	7685.847	.000[b]
	Residual	3055103.510	708	4315.118		
	Total	500535145.028	723			

Table 4.33b. Result ANOVA of PTBA stock price

The result shows the significant individual predictor on the model p-value. Not all the individual predictor is significant on the model with confidence level of 95%.

Variable	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
OBV	0.003
NVI	0.009
PVI	0.018
RSI	0.025
RVI	0.129
RMI	0.329
BOLLINGERBAND	0.720
MACD	0.754
ADX	0.761
WILLIAM	0.808
ROC	0.997

Table 4.33c. p-value of PTBA stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Slow, Stochastic Fast, On Balance Volume (OBV), Negative Volume Index (NVI), Positive Volume Index (PVI), and Relative Strength Index (RSI).

IV.1.34 PT PERUSAHAAN PEMBANGUNAN PERSERO TBK (PTPP)

PTPP (PT Perusahaan Pembangunan Persero TBK) is a construction company in Indonesia and one of three construction

company in LQ45. PTPP provide service to build the bridge, building, road, house, and other construction projects.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.990ᵃ	0.980	0.979

Table 4.34a. Calculation R, R Square, Adjusted R Square for PTPP

		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	201480509.048	16	12592531.815	2146.749	.000ᵇ
	Residual	4147164.393	707	5865.862		
	Total	205627673.441	723			

Table 4.34b. Result ANOVA of PTPP stock price

The result shows the significant individual predictor on the model p-value. Not all the individual predictor is significant on the model with the confidence level of 95%.

Variable	Sig.
NVI	0.000
PVI	0.000
STOCHASTICFAST	0.000
SMA	0.001
STOCHASTICSLOW	0.001
WMA	0.012
RSI	0.015
ADX	0.043
WILLIAM	0.097
OBV	0.166
RMI	0.242
RVI	0.258
MACD	0.363
EMA	0.541
ROC	0.652
BOLLINGERBAND	0.856

Table 4.34c. p-value of PTPP stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Negative Volume Index (NVI), Positive Volume Index (PVI), Stochastic Fast, Simple Moving Average (SMA), Stochastic Slow, Weighted Moving Average (WMA), Relative Strength Index (RSI), and Average Directional Index (ADX).

IV.1.35 PT SURYA CITRA MEDIA TBK (SCMA)

SCMA (PT Surya Citra Media TBK) is the multimedia company that operates to media consultation, house production, and TV station.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.982[a]	0.964	0.963

Table 4.35a. Calculation R, R Square, Adjusted R Square for SCMA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	92511203.340	16	5781950.209	1192.721	.000[b]
	Residual	3427321.246	707	4847.696		
	Total	95938524.586	723			

Table 4.35b. Result ANOVA of SCMA stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with the confidence level of 95%.

Variable	Sig.
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.004
SMA	0.007
RMI	0.015
WMA	0.057
ROC	0.070
EMA	0.132
NVI	0.493
MACD	0.524
RVI	0.560
WILLIAM	0.620
PVI	0.737
BOLLINGERBAND	0.810
ADX	0.832
OBV	0.889
RSI	0.908

Table 4.35c. p-value of SCMA stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Stochastic Fast, Stochastic Slow, Simple Moving Average (SMA), and Relative Momentum Index (RMI).

IV.1.36 PT SEMEN INDONESIA (PERSERO) TBK (SMGR)

SMGR (PT Semen Indonesia TBK) is a cement company that operates to distribute and produce cement to Indonesia.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.968[a]	0.937	0.935

Table 4.36a. Calculation R, R Square, Adjusted R Square for SMGR

		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	583362687.920	16	36460167.995	654.909	.000[b]
	Residual	39360205.727	707	55672.144		
	Total	622722893.646	723			

Table 4.36b. Result ANOVA of SMGR stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with the confidence level of 95%.

Variable	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.000
NVI	0.001
PVI	0.001
STOCHASTICSLOW	0.002
RMI	0.052
WILLIAM	0.069
RVI	0.089
BOLLINGERBAND	0.333
RSI	0.428
MACD	0.456
ROC	0.485
OBV	0.541
ADX	0.604
EMA	0.973

Table 4.36c. p-value of SMGR stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Stochastic Slow, Negative Volume Index (NVI), and Positive Volume Index (PVI).

IV.1.37 PT SRI REJEKI ISMAN TBK (SRIL)

SRIL (PT Sri Rejeki Isman TBK) is the producer of textile and garment, uniform, and fashion clothes.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.976[a]	0.952	0.951

Table 4.37a. Calculation R, R Square, Adjusted R Square for SRIL

		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1852603.814	16	115787.738	869.025	.000[b]
	Residual	94199.737	707	133.239		
	Total	1946803.551	723			

Table 4.37b. Result ANOVA of SRIL stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with the confidence level of 95%.

Variable	Sig.
SMA	0.000
WMA	0.000
NVI	0.000
PVI	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
BOLLINGERBAND	0.155
OBV	0.160
EMA	0.302
WILLIAM	0.307

ADX	0.342
ROC	0.522
RMI	0.564
RSI	0.814
MACD	0.827
RVI	0.873

Table 4.37c. p-value of SRIL stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Simple Moving Average (SMA), Weighted Moving Average (WMA), Negative Volume Index (NVI), Positive Volume Index (PVI), Stochastic Fast, and Stochastic Slow.

IV.1.38 PT SAWIT SUMBERMAS SARANA TBK (SSMS)

SSMS (PT Sawit Sumbermas Sarana TBK) produces crude palm oil and sale it. It operates oil palm plantation and palm oil mill.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.987[a]	0.974	0.974

Table 4.38a. Calculation R, R Square, Adjusted R Square for SSMS

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28598737.791	16	1787421.112	1662.589	.000[b]

Residual	760083.756	707	1075.083
Total	29358821.547	723	

Table 4.38b. Result ANOVA of SSMS stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with the confidence level of 95%.

Variable	Sig.
NVI	0.000
PVI	0.000
EMA	0.001
MACD	0.002
SMA	0.019
STOCHASTICFAST	0.020
BOLLINGERBAND	0.023
RVI	0.039
STOCHASTICSLOW	0.047
RSI	0.322
RMI	0.459
ADX	0.582
OBV	0.694
WILLIAM	0.765
ROC	0.766
WMA	0.956

Table 4.38c p-value of SSMS stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Negative Volume Index (NVI), Positive Volume Index (PVI), Exponential Moving Average (EMA), Moving Average Convergence Divergence (MACD), Simple Moving Average (SMA), Stochastic Fast, Bollinger Band, Relative Volatility Index (RVI), and Stochastic Slow.

IV.1.39 PT TELEKOMUNIKASI INDONESIA PERSERO TBK (TLKM)

TLKM (PT Telekomunikasi Indonesia TBK) is one of the largest telecommunication company in Indonesia providing internet and telecommunication service.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.993[a]	0.987	0.986

Table 4.39a. Calculation R, R Square, Adjusted R Square for TLKM

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	219645459.369	15	14643030.625	3510.016	.000[b]
	Residual	2953623.331	708	4171.784		
	Total	222599082.700	723			

Table 4.39b. Result ANOVA of TLKM stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with the confidence level of 95%.

Variable	Sig.
WMA	0.000
NVI	0.000
OBV	0.000
PVI	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.001
SMA	0.011
RSI	0.070

ROC	0.174
MACD	0.205
RMI	0.439
WILLIAM	0.600
RVI	0.809
ADX	0.892
BOLLINGERBAND	0.998

Table 4.39c. p-value of TLKM stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Weighted Moving Average (WMA), Negative Volume Index (NVI), On Balance Volume (OBV), Positive Volume Index (PVI), Stochastic Slow, Stochastic Fast, and Simple Moving Average (SMA).

IV.1.40 PT CHANDRA ASRI PETROCHEMICAL TBK (TPIA)

TPIA (PT Chandra Asri Petrochemical TBK) is the petrochemical producer that produce ethylene, propylene, mixed C4 and other chemical product.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.999[a]	0.998	0.998

Table 4.40a. Calculation R, R Square, Adjusted R Square for TPIA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3270063537.045	14	233575966.932	24648.546	.000[b]

Residual	6718666.519	709	9476.257
Total	3276782203.564	723	

Table 4.40b. Result ANOVA of TPIA stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with the confidence level of 95%.

Variable	Sig.
(Constant)	0.000
WMA	0.000
NVI	0.000
STOCHASTICFAST	0.000
BOLLINGERBAND	0.003
PVI	0.004
STOCHASTICSLOW	0.004
RSI	0.005
ADX	0.008
RMI	0.012
WILLIAM	0.045
OBV	0.186
MACD	0.316
RVI	0.361
ROC	0.754

Table 4.40c. p-value of TPIA stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that has significance to prediction are Weighted Moving Average (WMA), Negative Volume Index (NVI), Stochastic Fast, Bollinger Band, Positive Volume Index (PVI), Stochastic Slow, Relative Strength Index (RSI), Average Directional Index (ADX), Relative Momentum Index (RMI), and William %R.

IV.1.41 PT UNITED TRACTOR TBK (UNTR)

UNTR (PT United Tractor) is a construction machinery company that operates to distribute and leases the machinery such as Nissan Diesel, Komatsu, Scania, etc.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.997ᵃ	0.993	0.993

Table 4.41a. Calculation R, R Square, Adjusted R Square for UNTR

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43197475226.685	15	2879831681.779	7167.305	.000ᵇ
	Residual	284475224.800	708	401801.165		
	Total	43481950451.485	723			

Table 4.41b. Result ANOVA of UNTR stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with the confidence level of 95%.

Variable	Sig.
BOLLINGERBAND	0.000
EMA	0.000
MACD	0.000
STOCHASTICFAST	0.000
SMA	0.036
RMI	0.073
PVI	0.147

RVI	0.155
STOCHASTICSLOW	0.163
RSI	0.181
NVI	0.267
ADX	0.325
ROC	0.381
OBV	0.677
(Constant)	0.707
WILLIAM	0.942

Table 4.41c. p-value of UNTR stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Bollinger Band, Exponential Moving Average (EMA), Moving Average Convergence Divergence (MACD), Stochastic Fast, and Simple Moving Average (SMA).

IV.1.42 PT UNILEVER INDONESIA TBK (UNVR)

UNVR (PT Unilever Indonesia TBK) is a manufacturing company that produce goods such as soap, detergent, oil, ice cream, tea-based beverage, cosmetic, and etc.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.991[a]	0.981	0.981

Table 4.42a. Calculation R, R Square, Adjusted R Square for UNVR

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17910385164.778	16	1119399072.799	2319.024	.000[b]

Residual	341270797.756	707	482702.684
Total	18251655962.535	723	

Table 4.42b. Result ANOVA of UNVR stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with the confidence level of 95%.

Variable	Sig.
SMA	0.000
NVI	0.000
PVI	0.000
(Constant)	0.001
WMA	0.002
OBV	0.005
STOCHASTICFAST	0.010
RSI	0.018
WILLIAM	0.062
BOLLINGERBAND	0.082
STOCHASTICSLOW	0.130
MACD	0.138
ADX	0.145
ROC	0.675
EMA	0.694
RMI	0.952
RVI	0.971

Table 4.42c. p-value of UNVR stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Simple Moving Average (SMA), Negative Volume Index (NVI), Positive Volume Index (PVI), Weighted Moving Average (WMA), On Balance Volume (OBV, Stochastic Fast, and Relative Strength Index (RSI).

IV.1.43 PT WIJAYA KARYA (PERSERO) TBK (WIKA)

WIKA (PT Wijaya Karya TBK) is state-owned enterprise operates on infrastructures such as build the toll road, rail track, bridge, and the best- known project is track line MRT Jakarta.

The result shows the model is fit and can be used to predict the outcome based on its R square and F-value.

R	R Square	Adjusted R Square
.992[a]	0.983	0.983

Table 4.43a. Calculation R, R Square, Adjusted R Square for WIKA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	113032960.437	16	7064560.027	2600.402	.000[b]
	Residual	1920719.580	707	2716.718		
	Total	114953680.017	723			

Table 4.43b. Result ANOVA of PTBA stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with the confidence level of 95%.

Variable	Sig.
NVI	0.000
PVI	0.000
STOCHASTICFAST	0.000
(Constant)	0.024
ROC	0.024
EMA	0.026
SMA	0.028
RSI	0.036
BOLLINGERBAND	0.073

STOCHASTICSLOW	0.124
ADX	0.153
WMA	0.310
MACD	0.322
OBV	0.435
RVI	0.466
RMI	0.831
WILLIAM	0.919

Table 4.43c. p-value of WIKA stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance to prediction are Negative Volume Index (NVI), Positive Volume Index (PVI), Stochastic Fast, Rate of Changes (ROC), Exponential Moving Average (EMA), Simple Moving Average (SMA), and Relative Strength Index (RSI).

IV.1.44 PT WASKITA BETON PRECAST TBK (WSBP)

On this research, WSBP cannot be chosen to be sample due to the requirement for being a sample on this research is the data has to be 3 years in order to be same with other samples. WSBP does not have 3 years historical data due to IPO of the company is less than 3 year.

IV.1.45 PT WAKSTIKA KARYA (PERSERO) TBK (WSKT)

WSKT is one of the state-owned enterprise that operates on infrastructure to build the road, train track line, bridge and other infrastructure projects.

R	R Square	Adjusted R Square

.991[a]	0.982	0.982

Table 4.45a. Calculation R, R Square, Adjusted R Square for WSKT

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	95464988.005	16	5966561.750	2422.892	.000[b]
	Residual	1741042.796	707	2462.578		
	Total	97206030.801	723			

Table 4.45b. Result ANOVA of PTBA stock price

The result shows the significant individual predictor on the model based on p-value. Not all the individual predictor is significant on the model with the confidence level of 95%.

Variable	Sig.
SMA	0.000
WMA	0.000
STOCHASTICFAST	0.000
STOCHASTICSLOW	0.000
ADX	0.017
NVI	0.049
PVI	0.054
WILLIAM	0.083
RSI	0.185
EMA	0.214
(Constant)	0.243
BOLLINGERBAND	0.245
MACD	0.251
ROC	0.451
OBV	0.657
RVI	0.670
RMI	0.691

Table 4.45c. p-value of WSKT stock price

The result shows that the model has significance statistically to predict the stock price movement according to its R square and F value. The technical indicators that have significance

to prediction are Simple Moving Average (SMA), Weighted Moving Average (WMA), Stochastic Fast, Stochastic Slow, Average Directional Index (ADX), and Negative Volume Index (NVI).

IV.2. EMPERICAL TEST

Although the result on the paper shows the technical analysis can be used to predicting the stock price, the researcher did test to confirm the technical analysis can be used to predicting the stock price in real case. The researcher choose only five companies on LQ45 as samples. Five companies are selected because they are five biggest market capitalization on LQ45. Market capitalization shows the market value of equity of company is calculated by current stock price times outstanding shares.

Five companies as sample on test are:

1. PT Bank Central Asia Tbk (BBCA)
2. PT Hanjaya Mandala Sampoerna Tbk (HMSP)
3. PT Bank Rakyat Indonesia Tbk (BBRI)
4. PT Telekomunikasi Indonesia (TLKM)
5. PT Bank Mandiri (Persero) (BMRI)

The cut-off date for empirical test is August 1, 2018. The researcher identifies the indication whether the price goes up or goes down from the technical indicators used on the research. After

getting the indication on the technical indicators, the researcher make conclusion about whether the price of company goes up or goes down. Then the researcher looked the actual movement of the stock price on August 2nd, 2018. If the conclusion from indication of technical indicators different with stock price on August 2nd 2018, meaning the prediction of technical analysis is wrong.

The researcher run the empirical test and the result shows three out of five companies on empirical test can be predicted by technical analysis which are HMSP, BBRI, and TLKM.

IV.3   RESULT SUMMARY

The result shows that the technical analysis can predict the stock price statistically. Some technical indicators can be used to predict the stock price based on the result of the p-value each indicator. Although the statistical result shows all companies can use technical analysis for predicting the price, the empirical result shows that only 3 out of 5 company can be predicted correctly.

The interesting point is the statistical result is different with the empirical result. It happened because if the statistical result showed the model is significance leading to the technical analysis can be used, it means that at least one technical indicator is significant to the result or in other word at least one technical indicator can be used to predict the stock price. As you can see in

Appendix, three companies which are BBCA and BMRI show that the technical analysis cannot be used in predicting the stock price because more than half of the technical indicators show different result with the actual next day of stock price. There are few technical indicators shows the same result with actual next day of stock price which leads the significant to the statistical result.

CHAPTER V

CONCLUSION, LIMITATIONS, AND RECOMMENDATIONS

V.1   CONCLUSION

As the statistical result shows that technical analysis can be used to predict the stock price in all forty-four companies on LQ45. It is shows by the significance of the model that used on the research to the outcome by the R square value and F-value.

Based on the statistical analysis using a 95% confidence level, all companies show different individual predictor that significant to use for prediction. It is caused by difference indication from each technical indicator.

Empirical test shows three out of five companies can be predicted by most of the technical indicators. Empirical test result and statistical result shows differently due to on the statistical analysis, the model will become significance if at least one technical indicator can be predicted the outcome. On empirical result shows few of technical analysis has correct prediction to the outcome although most of the technical indicator shows wrong prediction to the outcome that leading to wrong prediction for each company.

The conclusion is the technical analysis can be used to predict the stock price in the future although on the empirical test, only three out of five shows that technical analysis can predict the stock price but it does

not mean that all technical indicators was wrong in prediction instead there are few of technical indicator shows the correct prediction.

V.2   LIMITATION

Every study has limitation. The limitation can be a concern for the next of researcher for future. The limitation for the study is that the conclusion cannot cover all public listed company in Indonesia. On the research, it uses forty-four companies from LQ45 (one company cannot be used due to not provide the data with time range researcher set). There are more than six hundred public listed companies in Indonesia and the study only cover forty-four companies be examined.

The second limitation is the technical analysis is not only technical indicators. There is the method that analyze the price pattern such as double top, double bottom, etc

The third limitation is the author could have subjective in analyze the technical indicator on the empirical evidence in interpreting the signal of stock price movement

V.3   RECOMMENDATION

For the recommendation for the next researcher, it needs to examine the technical analysis by analyzing the price pattern to determine sell signal or buy signal and use the most used technical indicators. After the analyzing the price pattern, it can examine the accuracy by same methodology or sophisticated methodology.

The next recommendation is for the market participant. Although the conclusion is the technical analysis can be used to predict the stock price movement, it is better to put consideration about fundamental aspects such as macroeconomy, industry competitiveness, company's condition, and other aspects that can affect the performance of the company and eventually can affect the stock price movement.

EMPERICAL TESTING

This test is done to prove the technical analysis to predict the stock price by analyze each technical indicator that on the research on cut-off date (August 1, 2018). We analyze to get indication of each technical indicator whether the stock price will go up or go down. After analyzing, the researcher concludes the stock price movement and compare the stock price after cut-off date. If it is true, it will be proof the technical analysis can be used to predict the price.

PT BANK CENTRAL ASIA Tbk (BBCA)

a. Average Directional Index (ADX)
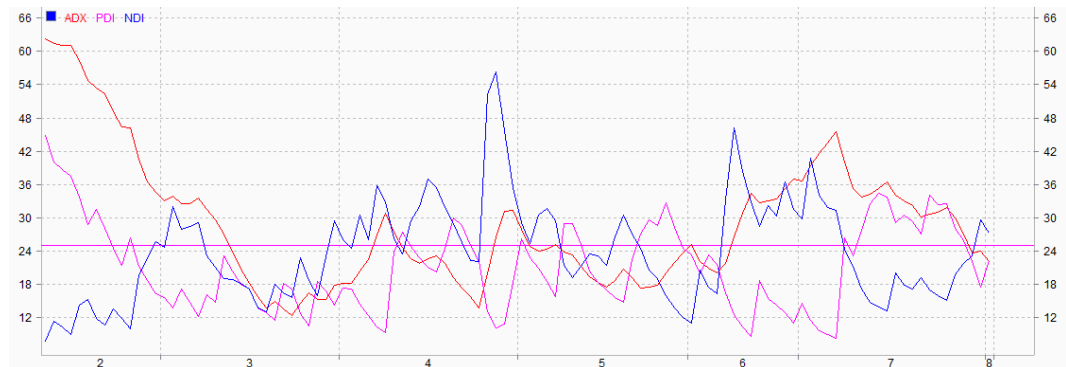
ADX line show the downward meaning it is on the low reading. Low reading of ADX mean that the stock is on the trading range environment which more suitable use oscillator such as RSI. In other word, low reading ADX shows us that the stock is more suitable to analyze by oscillator for look indication and the researcher use RSI as one of oscillator that used to determine the indication.

Indication: Down

b. Bollinger Band

Bollinger band is mainly volatility indicator but in order to look the stock price movement, the researcher uses the middle band (red line) showing the uptrend. The middle band itself is moving average and to look the movement of price, the researcher look on the middle band.

Indication: Up

c. Exponential Moving Average (EMA)

EMA line shows the uptrend by EMA 5, EMA 20, and EMA 60. It indicates the price goes up.

Indication: Up

d. Weighted Moving Average (WMA)

WMA line shows the uptrend based on WMA 5 days, WMA 20 days, and WMA 60 days. It indicates that the price will go up.

Indication: Up

e. Simple Moving Average (SMA)
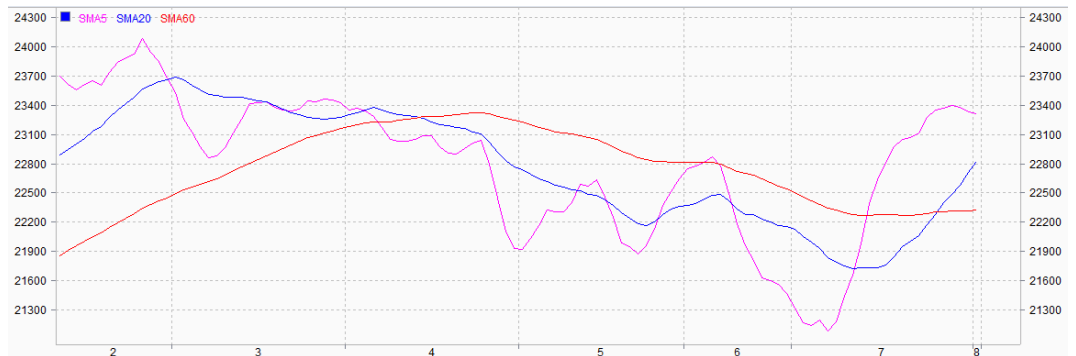
SMA line shows the uptrend based on SMA 5 days, SMA 20 days, and SMA 60 days. It indicates the price will go up.

Indication: Up

f. Moving Average Convergence Divergence (MACD)

MACD line shows that it crosses up the signal line. Crossing up the signal line indicating the buy signal or the price will go up.

Indication: Up

g. **Negative Volume Index (NVI)**
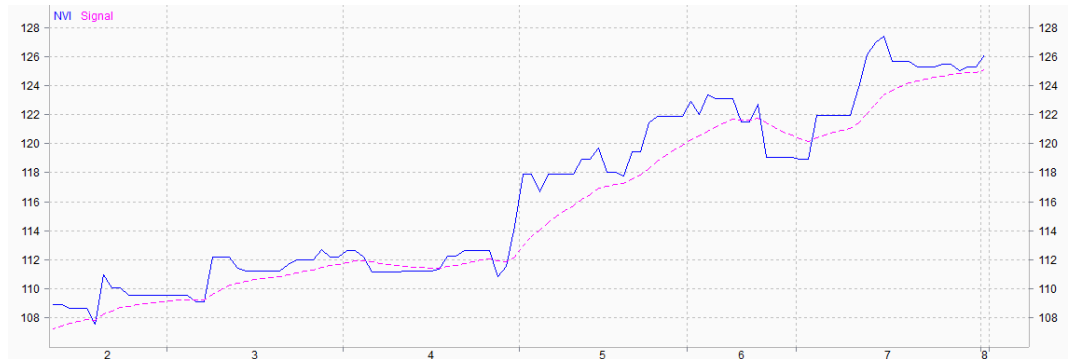
NVI shows the uptrend indicating the price is going up although the volume declines. NVI is calculated if only the volume is decreased. If the volume increase, the NVI is equal the previous NVI. The line shows the uptrend due to the closing price is increasing when the volume decline.

Indication: Up

h. Positive Volume Index (PVI)
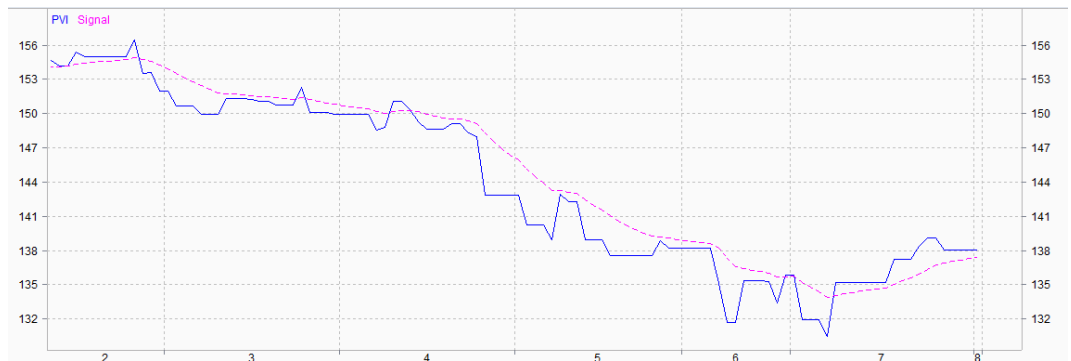
PVI shows the downward indicating the stock price will goes down. The PVI is calculated if there is increasing the volume and if there is decreasing volume, the PVI is equal to previous PVI. It shows that the volume is increase but the price is going down resulting the PVI decline.

Indication: Down

i. On Balance Volume (OBV)

OBV show the downward but it starts to upward. Increasing OBV is caused by increasing the today closing price. So, it indicates the stock price is going up.

Indication: Up

j. Relative Momentum Index (RMI)

RMI shows that the price is on the overbought. However, if the price is on the overbought, the price has possibility tend to goes down or reversal. This indicator shows the price has been down and it predicts that it will goes out from overbought zone.

Indication: Down

k. Rate of Changes (RoC)
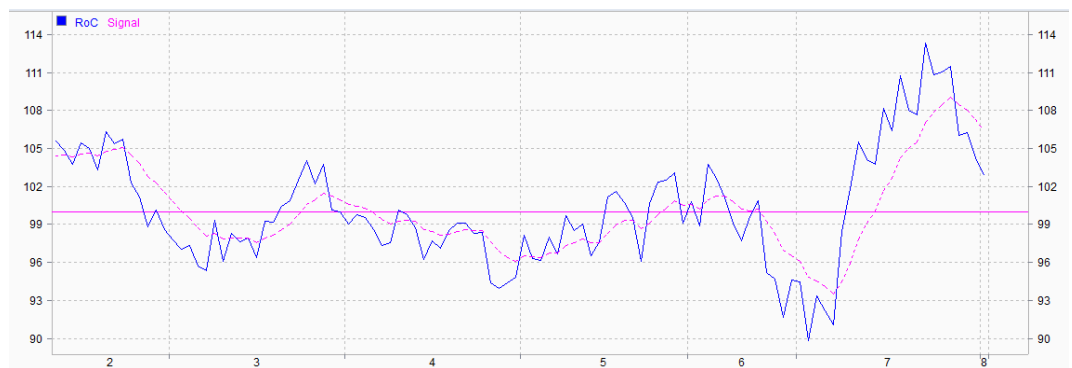
Rate of Changes shows that the downtrend on upper level (above level 100). It means that the price tends to goes down.

Indication: Down

l. Relative Strength Index (RSI)
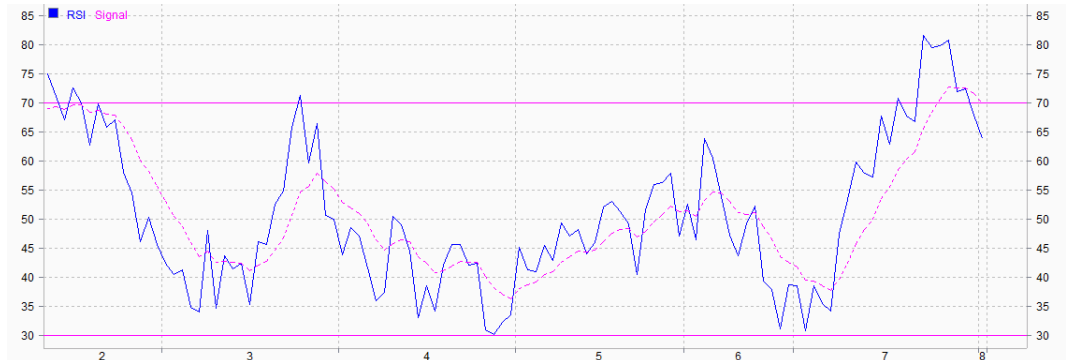
Relative strength index shows the price has been on the overbought

and it starts to goes down.

Indi**cation**: Down

m. Relative Volatility Index (RVI)
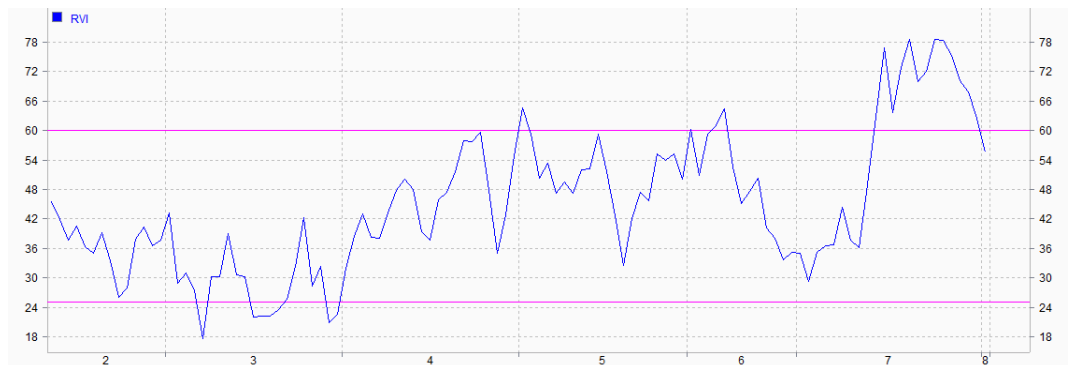
RVI shows the downtrend toward to below 50. The RVI is less

than 50 meaning the sell signal or the price will goes down.

Indication: Down
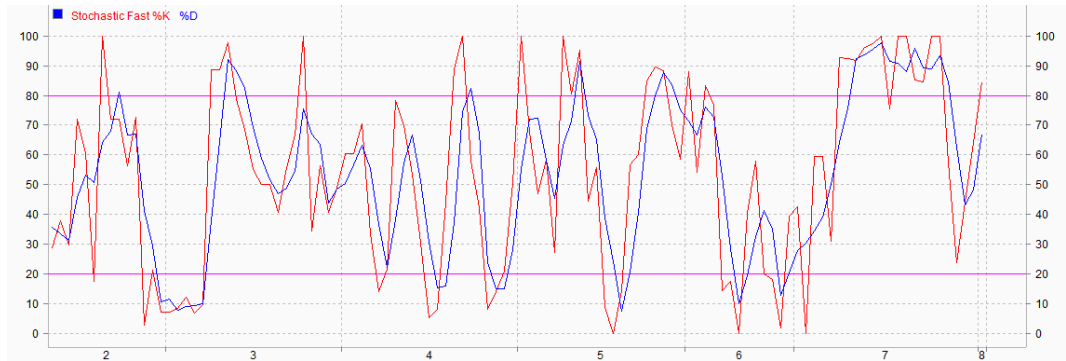
n. Stochastic Fast

The stock is on the overbought zone shown by Stochastic Fast %K are on the above 80 level. Meaning there is probability that the price will do reversal or in other word goes down.

Indication: Down
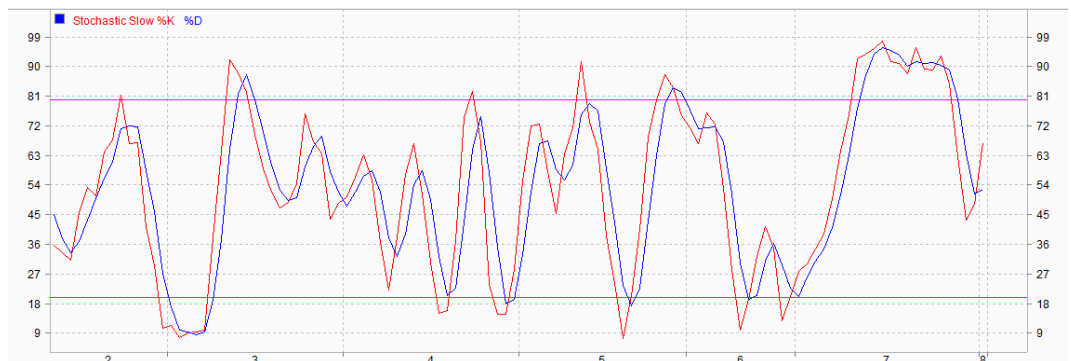
o. Stochastic Slow

Stochastic slow show the price is not on the overbought zone and the %K line shows it moves upward. There is indication that the price will goes up.

Indication: Up

p. William %R

William %R indicate the price is leaving the oversold meaning the price is goes up.

Indication: Up

Technical Indicators	Indication
Average Directional Index (ADX)	Down
Bollinger Band	Up
Exponential Moving Average (EMA)	Up
Weighted Moving Average (WMA)	Up
Simple Moving Average (SMA)	Up
Moving Average Convergence Divergence (MACD)	Up
Negative Volume Index (NVI)	Up
Positive Volume Index (PVI)	Down
On Balance Volume (OBV)	Up
Relative Momentum Index (RMI)	Down
Rate of Change (ROC)	Down
Relative Strength Index (RSI)	Down
Relative Volatility Index (RVI)	Down
Stochastic Fast	Down
Stochastic Slow	Up
William %R	Up

Prediction	Actual
Up	Down

Actual Stock Movement:
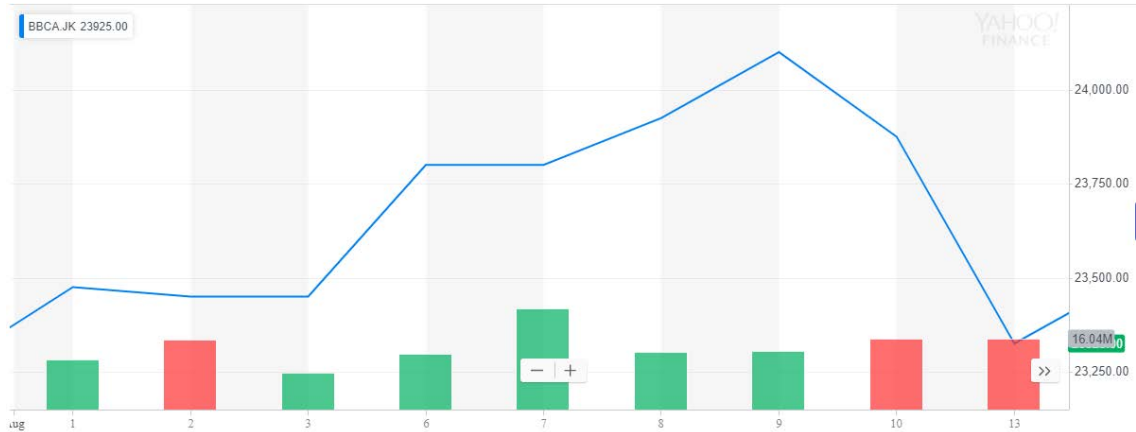
The actual movement shows that the stock price on August 2nd was going down and the close price was same on August 3rd. On next week (August 6 th), the price was going up. The technical indicators that correctly predict the price are ADX, Positive Volume Index, Relative Momentum Index, Rate of Change, Relative Strength Index, and Relative Volatility Index.

PT HANJAYA MANDALA SAMPOERNA Tbk (HMSP)

a. **Average Directional Index (ADX)**

ADX line shows the upward trend after falling from point 56. There is indication that the stock is on the trading range environment. Stock on the trading range environment mean that the price is more indicative trading indicator such as moving average. So, the indication will follow the trading indicator and it is relative strength index (RSI).

Indication: Down

b. **Bollinger Band**

The middle band shows that the price will tend to goes up base on the increasing in the middle band.

Indication: Up

c. Exponential Moving Average (EMA)
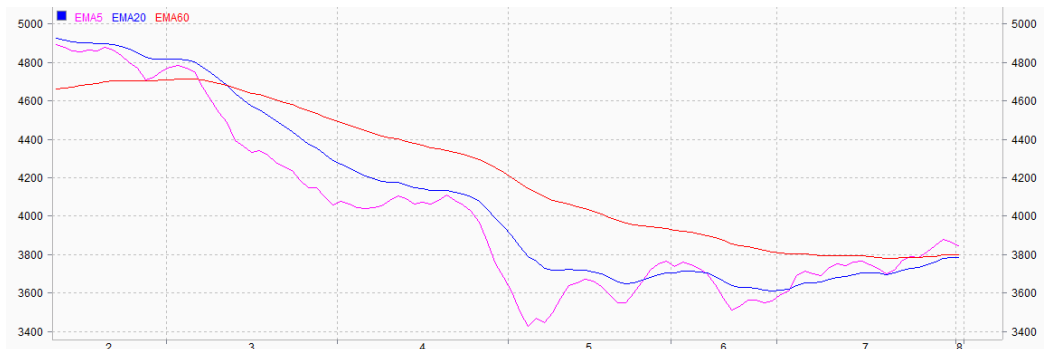
EMA shows that the EMA 5 days and EMA 20 give signal uptrend faster than the EMA 60. It indicates that the price will be go up.

Indication: Up

d. Weighted Moving Average (WMA)

WMA shows the same indication from EMA. It shows that the EMA 5 days and EMA 20 days is increasing meaning the price is tend to goes up.

Indication: Up

e. Simple Moving Average (SMA)
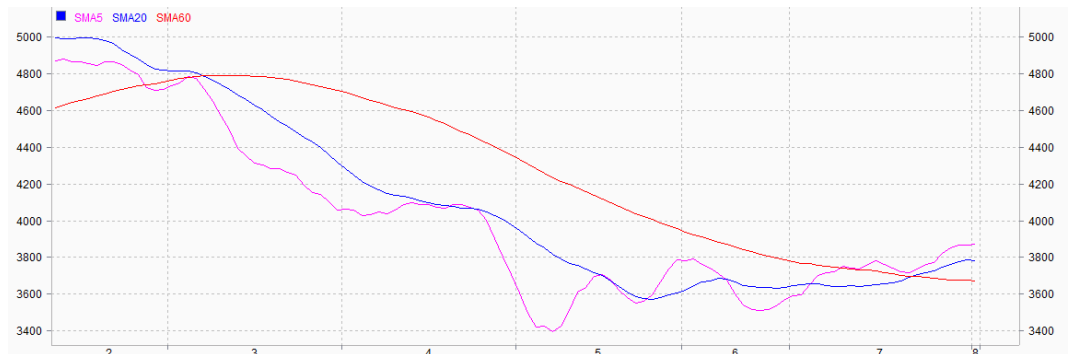
SMA 5 shows the line is upward as well as SMA 20. It indicates the stock price will go up.

Indication: Up

f. Moving Average Convergence Divergence (MACD)
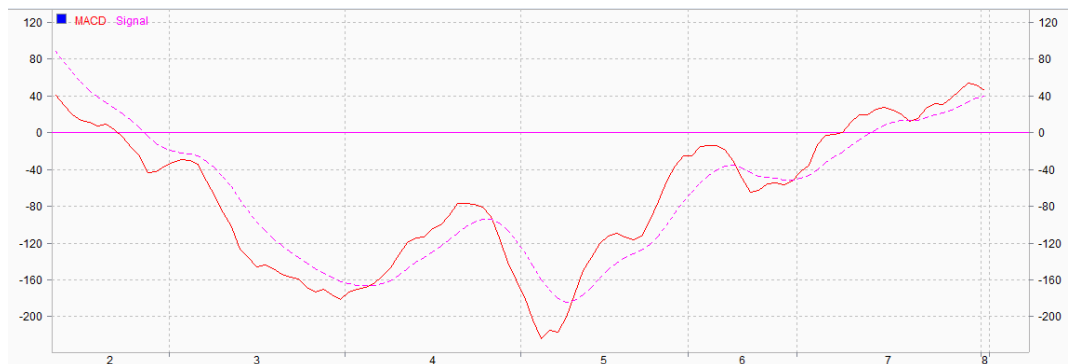
MACD line shows that it is still on the above signal line. It indicates that the stock price will be goes up.

Indication: Up

g. Negative Volume Index (NVI)

Declining the NVI is caused the close stock price is decline as well. So, it indicates the stock price will goes down.

Indication: Down

h. Positive Volume Index (PVI)
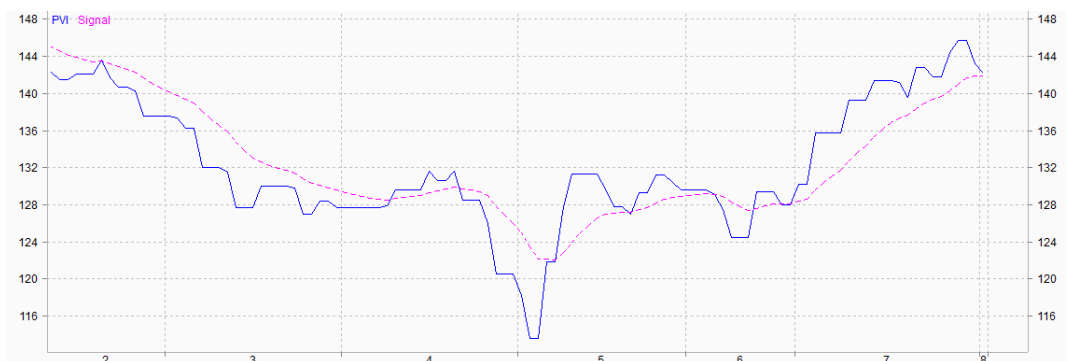
Increasing the PVI shows the closing price is increasing. It indicates the price will go up if it continues the trend.

Indication: Up

i.   On Balance Volume (OBV)

The OBV shows the downtrend because the falling OBV are causing from falling price. So, there is indication the price is goes down.

Indication: Down

j.   Relative Momentum Index (RMI)
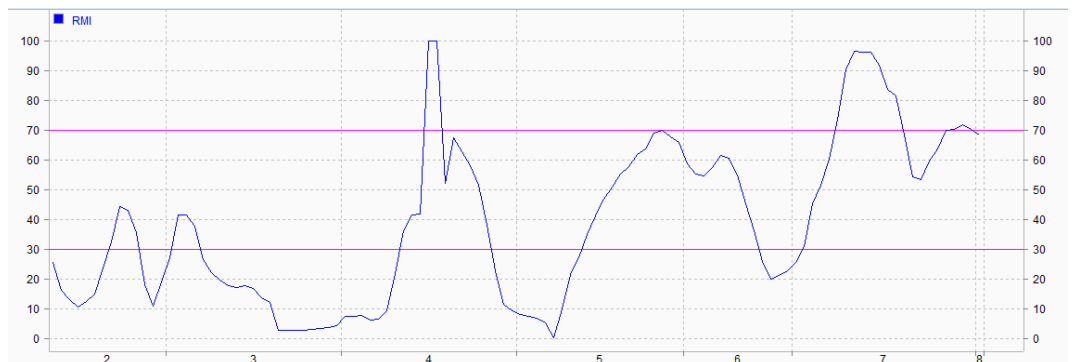
RMI shows the stock is overbought. Although there is probability to price goes down from reversal, the line has just touched the level of 70 meaning there is probability that the price continues to go up as the previous line did.

Indication: Up

k. Rate of Change (RoC)

ROC line shows the downtrend meaning this is indication the price goes down.

Indication: Down

l. Relative Strength Index (RSI)

The RSI line shows it is not overbought zone but there is indication the price will goes down after falling from 68 point.

Indication: Down

m. Relative Volatility Index

RVI shows it is below 50. If the RVI is below 50 meaning the sell

signal or the price will go down.

Indication: Down

n. Stochastic Fast

%K line shows the price is on the oversold after falling and touch

100 point. There is probability to reversal but it could be continue to drop.

Indication: Down

o. Stochastic Slow
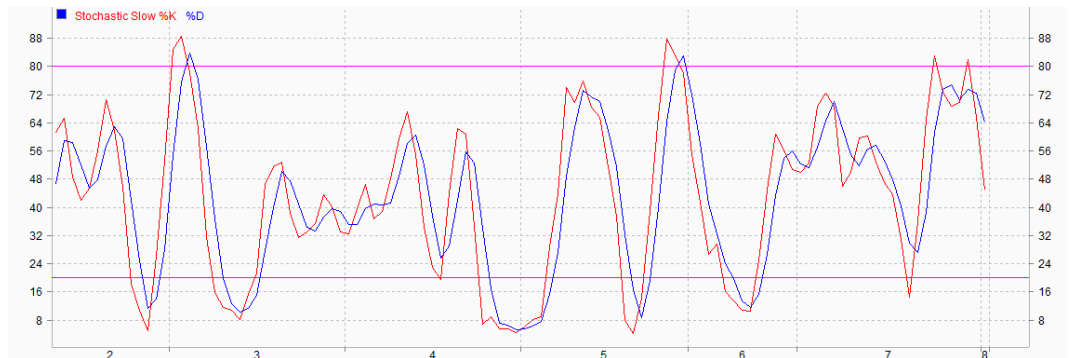
Stochastic slow shows the price is not on the oversold but the trend shows there is indication to falling down.

Indication: Down

p. William %R

William %R shows the price on the overbought. Overbought on William %R is on the below. Overbought has indication the price has reversal or in other word falling down.

Indication: Down

Technical indicators	Indication
Average Directional Index (ADX)	Down
Bollinger Band	Up
Exponential Moving Average (EMA)	Up
Weighted Moving Average (WMA)	Up
Simple Moving Average (SMA)	Up
Moving Average Convergence Divergence (MACD)	Up
Negative Volume Index (NVI)	Down
Positive Volume Index (PVI)	Up
On Balance Volume (OBV)	Down
Relative Momentum Index (RMI)	Up
Rate of Change (ROC)	Down
Relative Strength Index (RSI)	Down
Relative Volatility Index (RVI)	Down
Stochastic Fast	Down
Stochastic Slow	Down
William %R	Down

Prediction	Actual
Down	Down

Actual Price Movement

The stock price continued to go down on August 2nd on the August 3rd, it started to increased. It is predicted by ADX, Negative Volume Index, On Balance Volume, Rate of Change, Relative Strength Index, Relative Volatility Index, Stochastic Fast, Stochastic Slow, William %R

PT BANK RAYKAT INDONESIA TBK (BBRI)

a. Average Directional Index (ADX)

Low reading indicating the stock on the trading mode meaning in order to analyze the stock, the researcher look on the oscillator and the oscillator used on this analysis is RSI (Relative Strength Index). The indication will follow the oscillator.

Indication: Up

b. Bollinger Band

The researcher uses middle band to analyze the movement of stock price and it shows the trend is downtrend meaning the price will goes down.

Indication: Down.

c. Exponential Moving Average (EMA)

EMA 5 and EMA 20 shows the price will be rising up but the EMA 60 has lag to identifies the signal of price going up.

Indication: Up

d. Weighted Moving Average (WMA)
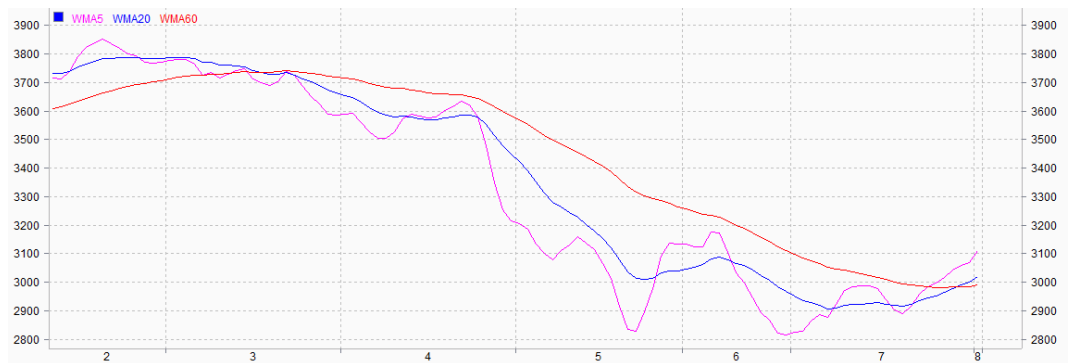
WMA 5 and WMA 20 shows there is indication of price is going up so it indicates the price goes up.

Indication: Up

e. Simple Moving Average (SMA)

SMA 5 and SMA 20 shows there is indication uptrend meaning the price has probability to rising up.

Indication: Up

f. Moving Average Convergence Divergence (MACD)
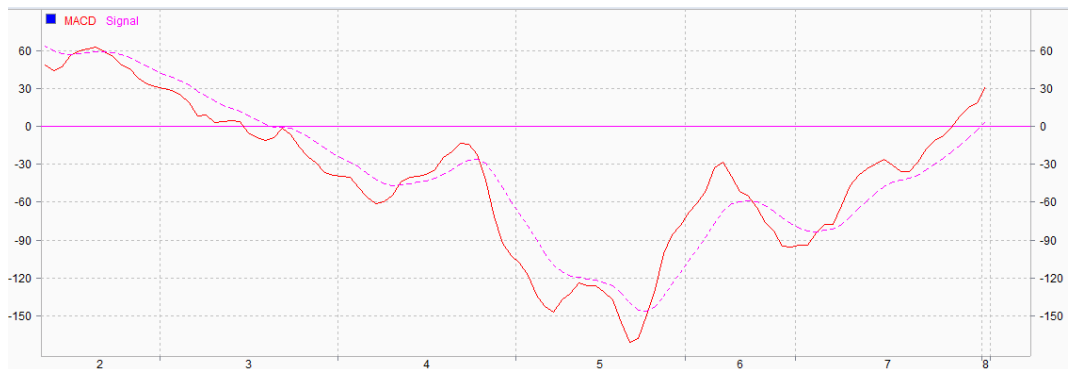
MACD line shows it is above the signal line meaning the price would be rising up.

Indication: Up

g. Negative Volume Index
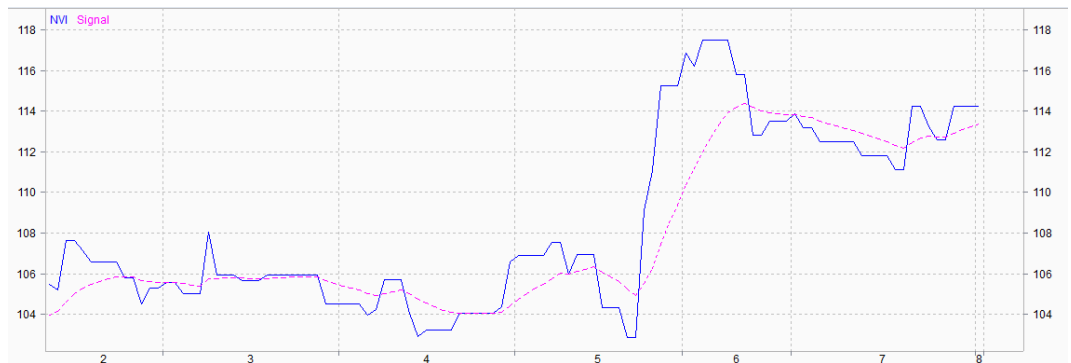
There is decline on the NVI. It is caused by the closing price is lower than the yesterday closing price in the calculation of NVI. If it will continue the trend, the stock price will go down.

Indication: Down

h. Positive Volume Index

PVI show there is increasing and it indicate the stock price will be going up.

Indication: Up

i. On Balance Volume

OBV shows the downtrend after falling from the highest peak. It indicates the price could be goes down.

Indication: Down

j. Relative Momentum Index

RMI shows there is indication the movement starts to increase and start to touch the overbought zone. It indicates the price is still continue goes up.

Indication: Up

k. Rate of Changes (RoC)

RoC shows the trend is uptrend meaning the price will be goes up.

Indication: Up

l. Relative Strength Index

RSI shows the line is on the uptrend after falling the 30 point. It does not indicate the overbought and there is no probability the price is reversal. It will continue to rise up if followed by its trend.

Indication: Up

m. Relative Volatility Index
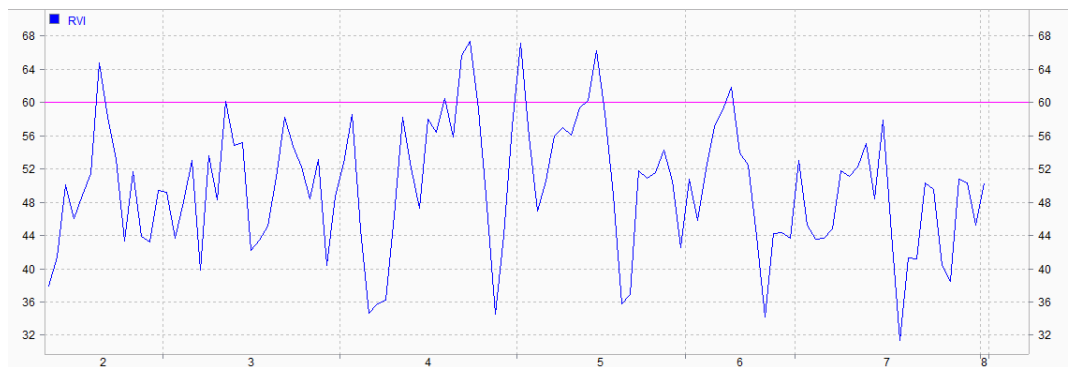
RVI shows that the trend is upward and it could be more than 50 point.

If it is more than 50 point, the price will go up.

Indication: Up

n. Stochastic Fast
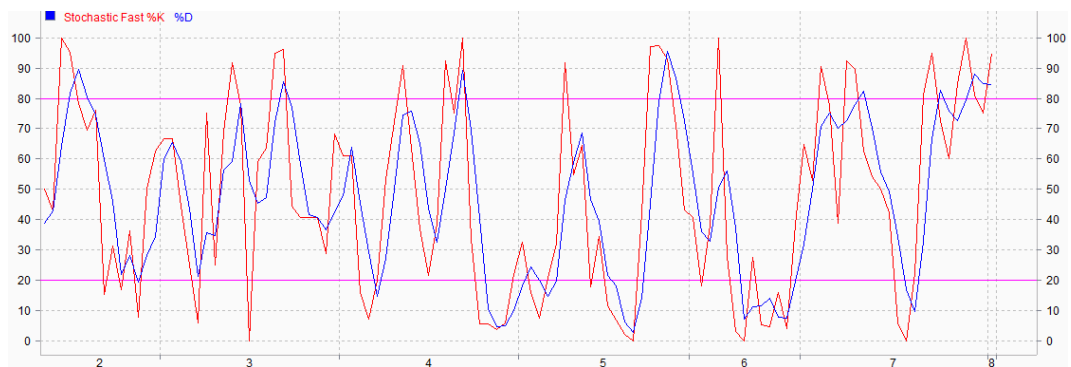
Stochastic Fast has indicate the overbought meaning there is probability reversal or other word is the price will go down

Indication: Down

o. Stochastic Slow
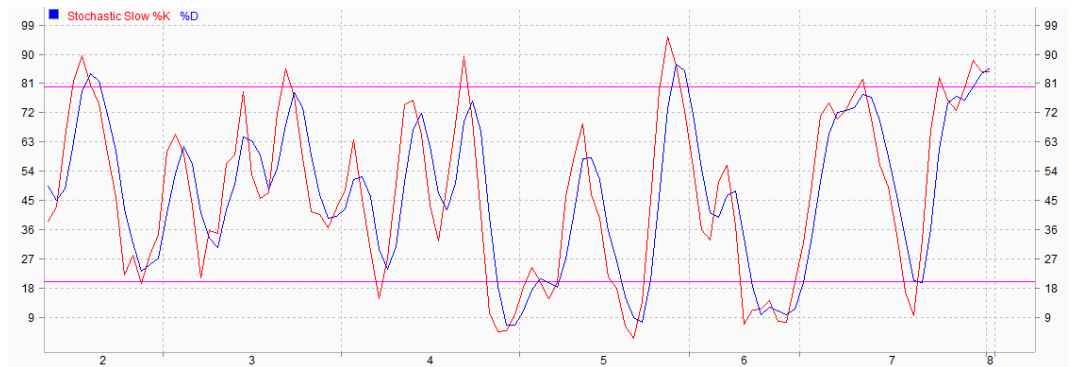
It shows the stock is on the overbought zone and there is

probability to reversal or in other word the price will go down.

Indication: Down

p. William %R
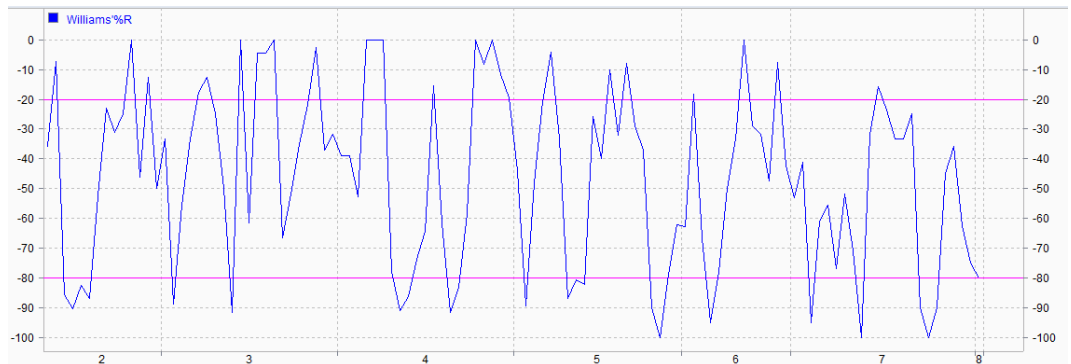
It shows the stock is on the overbought and there is probability to

reversal with caution the price is going down.

Indication: Down

Technical indicators	Indication
Average Directional Index (ADX)	Up
Bollinger Band	Down
Exponential Moving Average (EMA)	Up
Weighted Moving Average (WMA)	Up
Simple Moving Average (SMA)	Up
Moving Average Convergence Divergence (MACD)	Up
Negative Volume Index (NVI)	Down
Positive Volume Index (PVI)	Up
On Balance Volume (OBV)	Down
Relative Momentum Index (RMI)	Up
Rate of Changes (ROC)	Up
Relative Strength Index (RSI)	Up
Relative Volatility Index (RVI)	Up
Stochastic Fast	Down
Stochastic Slow	Down
William %R	Down

Prediction	Actual
Up	Up

Actual Price Movement:

The blue line show that on August 2ⁿᵈ the price is conformed going up

until the August 6ᵗʰ. It means that the technical indicators that can predict are

ADX, EMA, SMA, WMA, MACD, PVI, RMI, ROC, RSI, and RVI.

PT TELEKOMUNIKASI INDONESIA TBK (TLKM)

a. Average Directional Index (ADX)
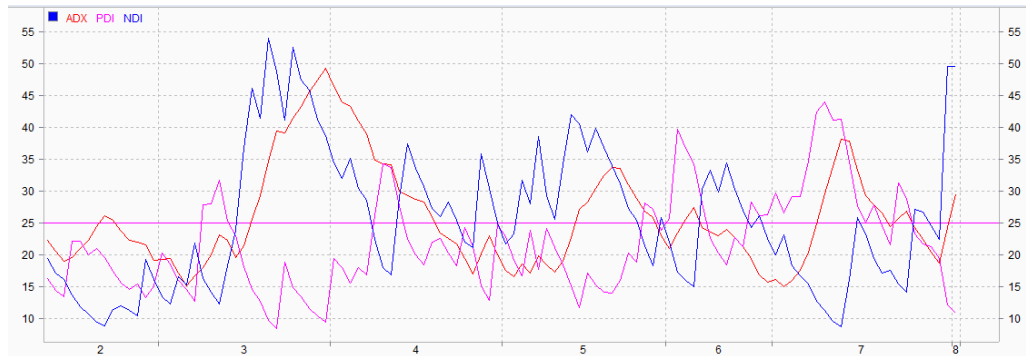
ADX line shows us that it is still on the low reading meaning the security on the trading mode. In other word that the security is more significance to the oscillator such as relative strength index (RSI)

Indication: Up

b. Bollinger Band

In order to look the signal of stock price movement, the researcher use the middle band because the calculation of middle band on Bollinger band is actually the moving average 20 days. The middle band shows us the line was on the bullish trend and there is starting point which the price will go down. It can be signal that the price is starting to go down and

moving average on the middle band is moving average 20 which it has

longer time span and it will reduce the whipsaw

Indication: Down

c. **Exponential Moving Average (EMA)**
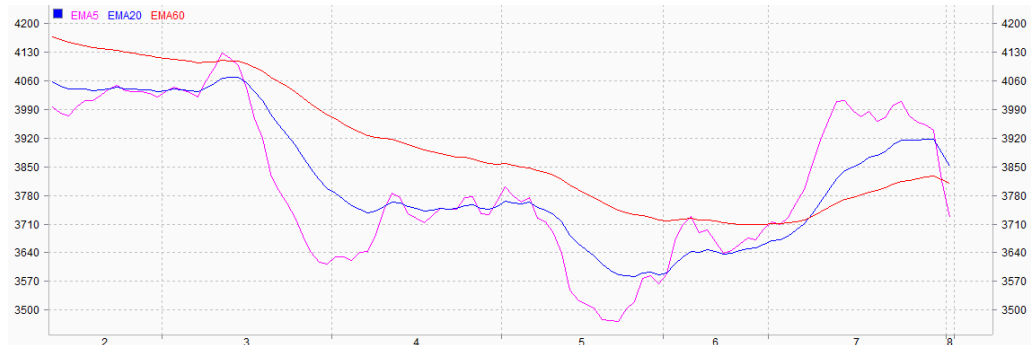
EMA shows there is indication the price will go down and it is indicated by EMA 5 days which the fastest moving average. The researcher looks the EMA with longer time span which is EMA 20 in order to minimize the whipsaw. EMA 20 also show there is indication the price will go down and EMA 60 shows the same indication.

Indication: Down

d. **Weighted Moving Average (WMA)**

WMA 5 shows the indication that the price will go down as the EMA 5 does. The longer time span WMA, WMA 20, shows the same indication which price will go down and WMA 60 shows the same.

Indication: Down

e. **Simple Moving Average (SMA)**
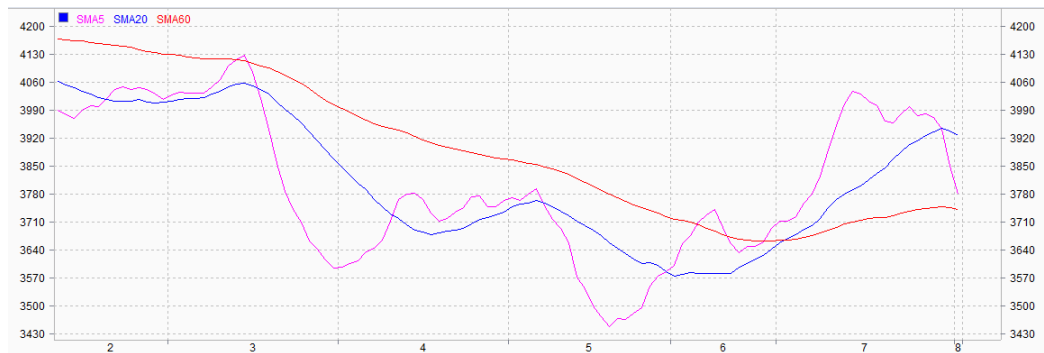
SMA 5 shows the same indication with the WMA and EMA. The indication shows the price will be go down based on SMA 5. The researcher looks the longer time span which is SMA 20 and SMA 60 for reducing the whipsaw. The SMA 20 shows the price was on the uptrend until there is line that direct to downside. It happened to the SMA 60 as well. But SMA 20 and SMA 60 has longer time and it will show the downtrend indication slower than the SMA 5.

Indication: Down

f. Moving Average Convergence Divergence (MACD)
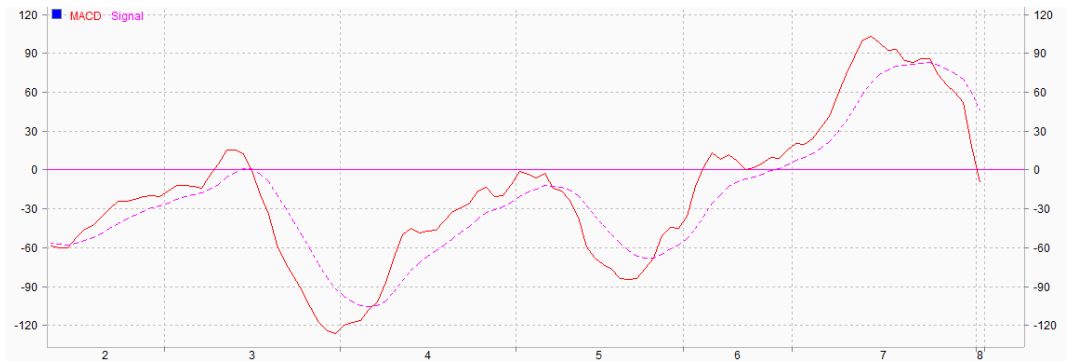
MACD line shows that the line is crossing down the signal line indicating the price will go down.

Indication: Down

g. Negative Volume Index
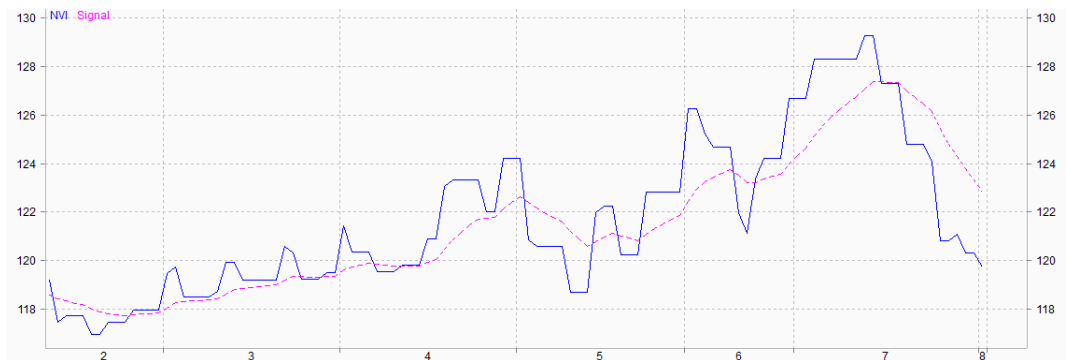
NVI shows it is decline. Decreasing NVI is caused by the today closing price is lower than the yesterday closing price. If it continues, the stock price will go down.
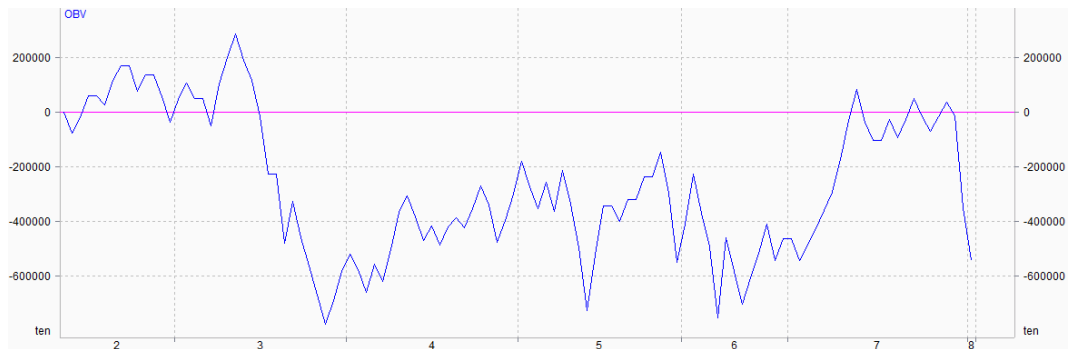
Indication: Down

h. Positive Volume Index
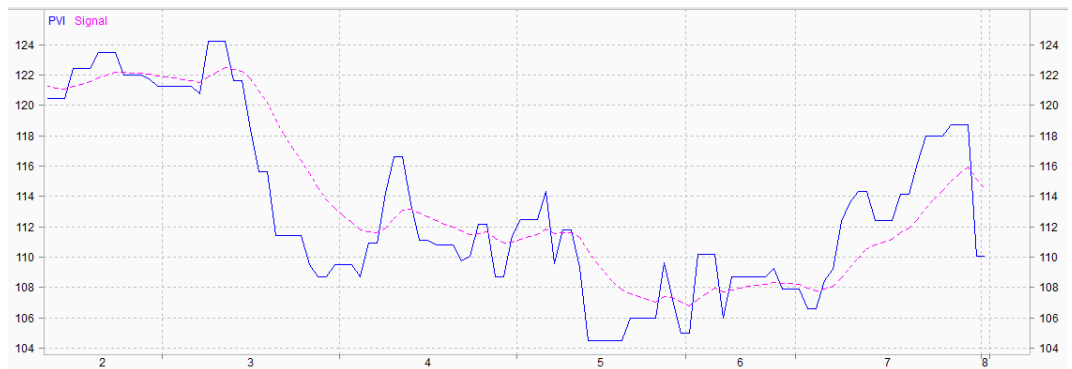
Positive Volume Index shows the uptrend and there was downline in last period. It cannot be sure the price will continue to go up.

Indication: Up

i. On Balance Volume

On Balance Volume shows there is downline indicating the price will falling down.

Indication: Down

j. Relative Momentum Index

RMI shows the security is on the oversold. There is possibility that there is reversal or the price is rebound.

Indication: Up

k. Rate of Changes (RoC)

Rate of changes clearly show there is extreme decline. It indicates the price will go down.

Indication: Down

l. Relative Strength Index (RSI)

Relative strength index shows the stock is on the oversold. It will be reversal that the price will be rebound.

Indication: Up.

m. Relative Volatility Index

Relative volatility index shows the RVI is below the 50 points meaning the it is sell signal or the price will falling down.

Indication: Down
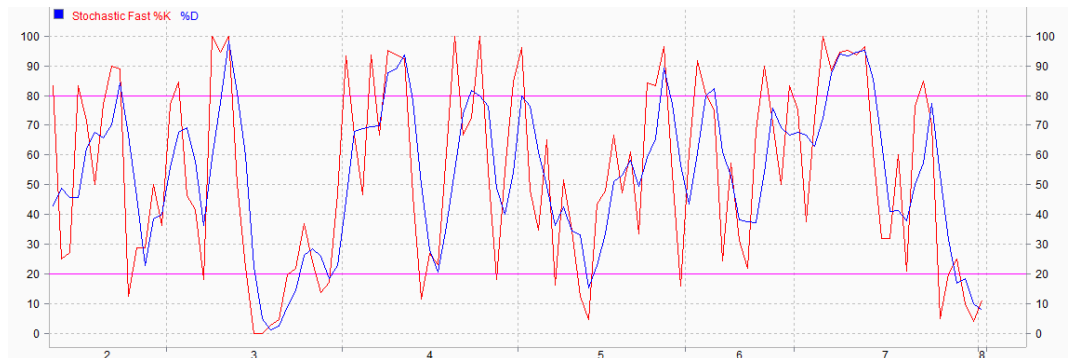
n. Stochastic Fast

Stochastic fast shows the price is oversold but it shows that reversal is starting and that is indication the price will be rebound.

Indication: Up

o. Stochastic Slow

Stochastic slow show the price is on the oversold. There is not indication the price will reversal but there is possibility the price will rebound.

Indication: Up

p. William %R
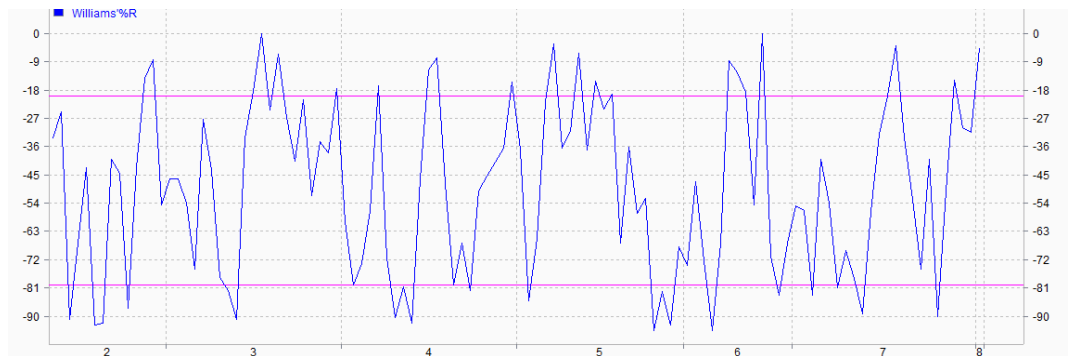
The William %R shows the price is on the oversold and there is possibility the price will go up or rebound.

Indication: Up

Technical indicators	Indication
Average Directional Index (ADX)	Up
Bollinger Band	Down
Exponential Moving Average (EMA)	Down
Weighted Moving Average (WMA)	Down
Simple Moving Average (SMA)	Down
Moving Average Convergence Divergence (MACD)	Down
Negative Volume Index (NVI)	Down
Positive Volume Index (PVI)	Up
On Balance Volume (OBV)	Down
Relative Momentum Index (RMI)	Up
Rate of Changes (ROC)	Down
Relative Strength Index (RSI)	Up
Relative Volatility Index (RVI)	Down
Stochastic Fast	Up
Stochastic Slow	Up
William %R	Up

| Prediction	Actual
Down	Down

Actual Price Movement
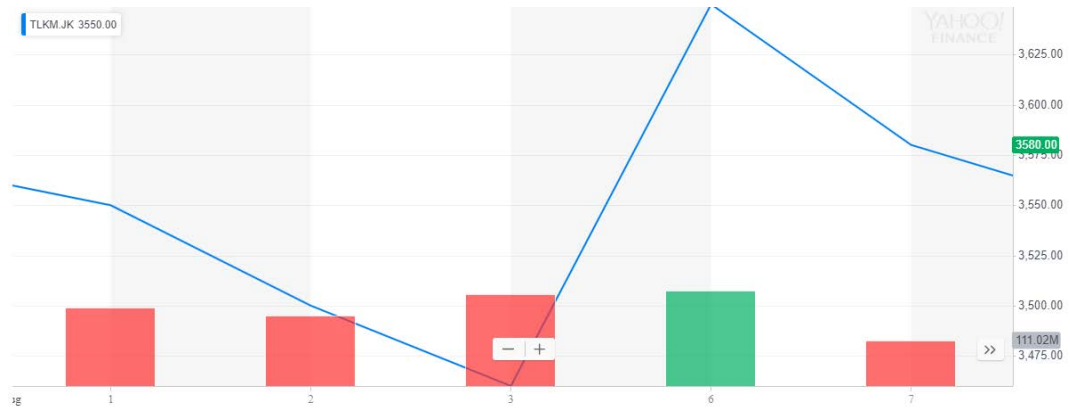
The purple line shows that at August 2nd until August 3rd the stock price of TLKM is confirmed down followed by increasing the stock price only one day and after that the stock price was continuing go down. The technical indicators that correctly predict the stock price are Bollinger Band, EMA, SMA, WMA, MACD, NVI, OBV, ROC, and RVI.

PT BANK MANDIRI (PERSERO) (BMRI)

a. Average Directional Index (ADX)
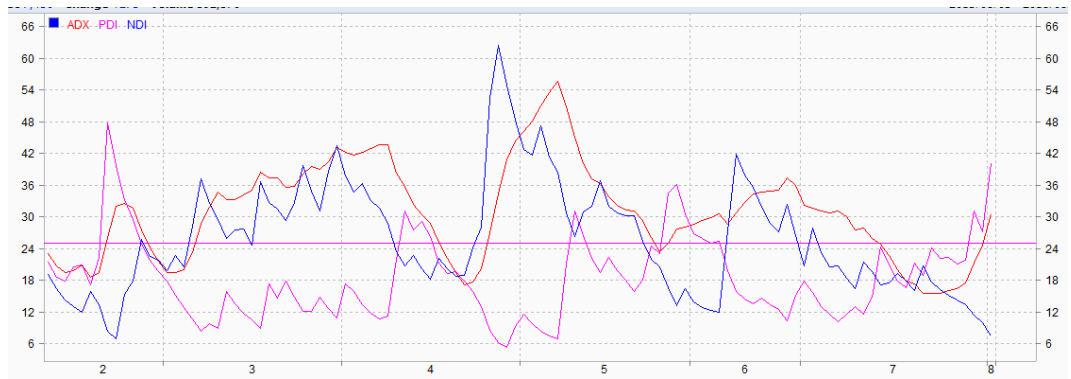
ADX line shows the low reading meaning the security is significantly indicate by trading indicator such as relative strength index.
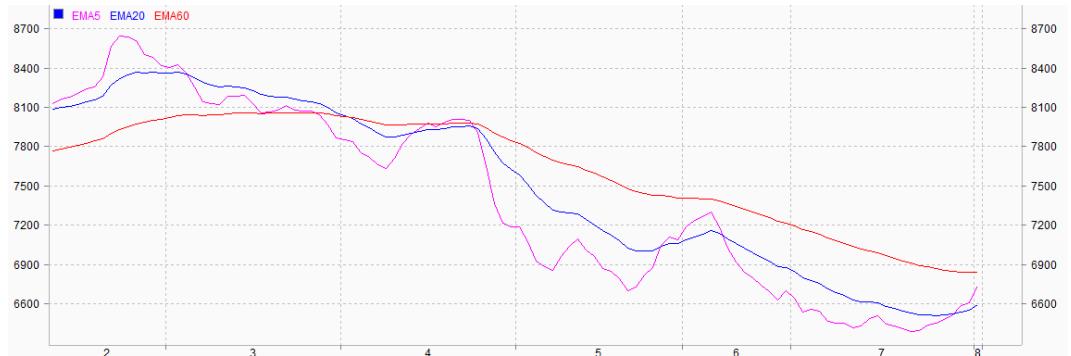
Indication: Down

b. Bollinger Band

The middle band shows there is downtrend indicating the price will be goes down.

Indication: Down

c. Exponential Moving Average (EMA)

EMA 5 shows the line is rising up indicating the stock price will rebound. It is shown by the EMA 20, which has longer time span, that the indication of price will goes up appear but on the EMA 60, it does not appear because the EMA 60 has the longest time span so the signal is not responsive.

Indication: Up

d. Weighted Moving Average (WMA)

WMA 5 shows the line is rising up followed by WMA 20. It is starting point that the stock price will start to rising up.

Indication: Up

e. Simple Moving Average (SMA)

SMA 5 and SMA 20 show that the line is starting to rise up. Those

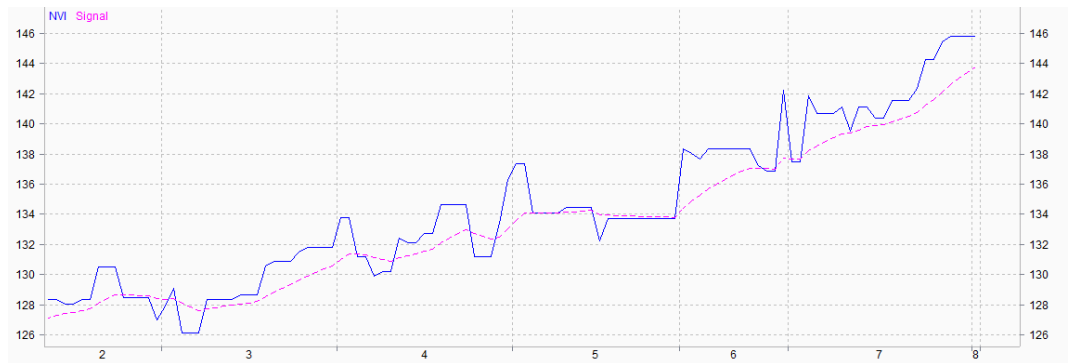SMA indicate the price will be going up.

Indication: Up

f. Moving Average Convergence Divergence (MACD)

MACD line clearly indicate the buy signal by showing the MACD line

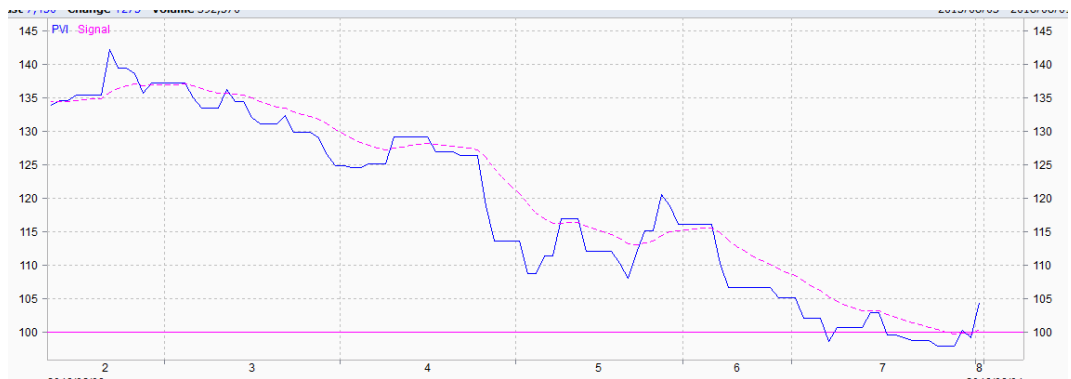cross up the signal line.

Indication: Up

g. Negative Volume Index (NVI)

Increasing NVI is caused the today closing price is higher than the yesterday closing price followed by decreasing volume. If it continues, the price will continue to up.

Indication: Up

h. Positive Volume Index (PVI)

Decreasing PVI shows that it will be followed by price falling. Because the PVI is calculate when the price is goes up. If the price is going down, the PVI will fall as well.

Indication: Down

i. On Balance Volume (OBV)

OBV shows that the trend is going down. It simply indicating the price will going down.

Indication: Down

j. Relative Momentum Index (RMI)

The RMI shows that the price is on the overbought. It will indicate the price will goes down due to possibility to reversal.

Indication: Down

k. Rate of Changes (RoC)

Rate of changes shows there is indication that the stock price is going up because it shows the uptrend on the rate of changes.

Indication: Up

l. Relative Strength Index (RSI)

Relative strength index shows the line is on the overbought and it can continue to goes up because it shows the uptrend.
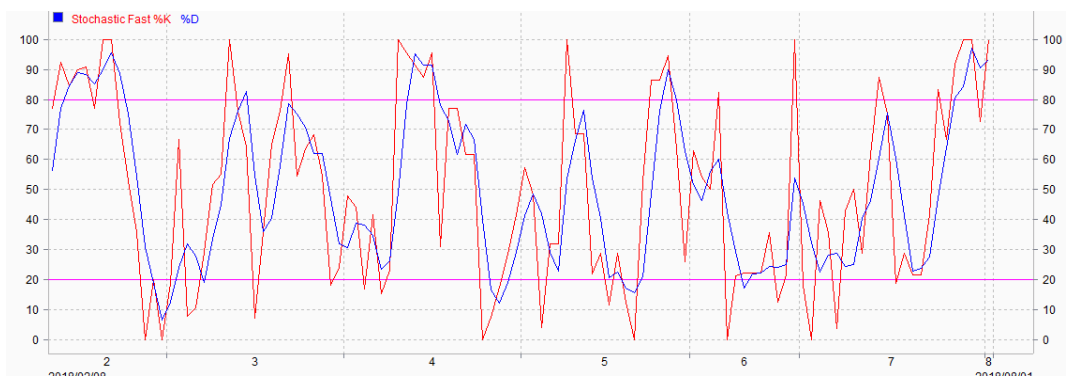
Indication: Up

m. Relative Volatility Index

It shows the uptrend and it indicate the price will goes up.
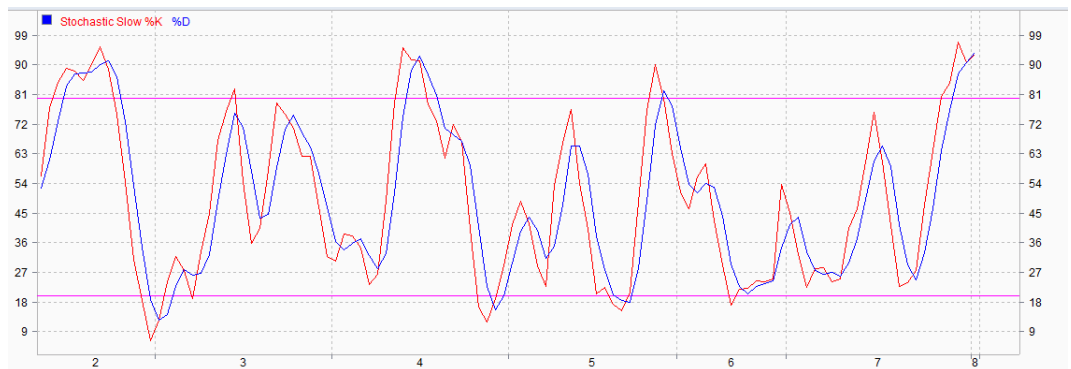
Indication: Up

n. Stochastic Fast

Stochastic fast shows the security is on the overbought and it has probability that the security has reversal due to high reading on the stochastic fast.
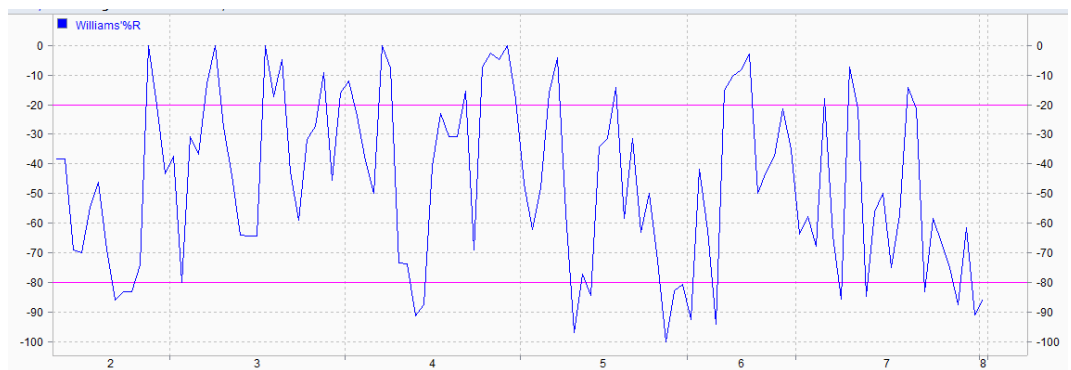
Indication: Down

o. Stochastic Slow

Stochastic slow show the same with the fast one. It shows the security is overbought and it has probability the price will reversal turning down because it has been the high reading.

Indication: Down

p. William %R

William %R show the security is overbought. It has probability the security has reversal.

Indication: Down

Technical indicators	Indication
Average Directional Index (ADX)	Up
Bollinger Band	Up
Exponential Moving Average (EMA)	Down
Weighted Moving Average (WMA)	Down
Simple Moving Average (SMA)	Down
Moving Average Convergence Divergence (MACD)	Down
Negative Volume Index (NVI)	Up
Positive Volume Index (PVI)	Down
On Balance Volume (OBV)	Down
Relative Momentum Index (RMI)	Down
Rate of Changes (ROC)	Up
Relative Strength Index (RSI)	Up
Relative Volatility Index (RVI)	Up
Stochastic Fast	Down
Stochastic Slow	Down
William %R	Down

Prediction	Actual
Down	Up

Actual Price Movement:

After cut-off date, the stock price on BMRI actually was increase until August

6th. The technical indicators that correctly predict the stock price are ADX,

Bollinger Band, NVI, ROC, RSI, and RVI.

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