The Effect of Macro-economic Variables Towards the Financial Index on Indonesia Stock Exchange

By Irwan Ch; Fikri Irawan
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Abstract

This study aims to investigate the effects of macro-economic on the financial index in Indonesia stock exchange with variables consisting of Exchange Rate, Interest Rate, Inflation, and Money Supply (M2) partially. The financial sector index is an indicator of the whole movement of stock prices in the financial industry, which listed on the Indonesia Stock Exchange. The movement of stock prices of the financial index used is the financial sector stock price of index monthly, starting from January 2010 until December 2014 with a total of 60 data.

Quantitative data processing on operational variables to test hypotheses, then done several stages of test data to avoid errors, such as classic mistake, model errors, etc. The US $ Exchange Rate and Money Supply (M2) are partially significant and positively affect the financial index, while the BI Rate significantly and positively affects the financial index. Inflation Rates affect positively but not significantly. According to the results of this study, if the investor expects capital gains derived from financial firms with the financial index as a benchmark, the investor should then look at the macro-economic conditions beforehand. Due to macro-economic conditions, especially the US $ Exchange Rate, Money Supply (M2), BI Rate, and Inflation Rate, in accordance with things observed in this study, the investor can find out the right time to buy or sell his stock.

Keywords: Money Supply, Exchange Rate, Inflation Rate, Financial Index, Stock Exchange

1. Introduction

Investors consider there are many factors that may affect the stock price movements such as performances of the company's financial fundamentals, exchange rate, interest rates, inflation, money supply, social conditions of a country's political and other macro-economic factors. As an investor, such a change in price becomes so crucial because it determines the returns to be obtained. Economic theory postulates that the exchange rates, inflation, money supply, and interest rates, as well as other factors, are important variables in developing a comprehensive understanding of the behavior of stock prices and the index movement (Veizagic & Zarafat, 2013).

The Indonesian economic crisis in 1997-1998 could be a picture of how was the influence of macro-economic conditions on the performance of the stock. With the weakening of the exchange rates and rising interest rates, inflation is inevitable and predictable. The
tightening of the money supply also made the stock performance unstable and fall, especially when the viewed indices and stock prices diminish the trust of the community so that liquidity disrupted.

In an open economy system like Indonesia, changes in macro-economic variables can significantly influence the economic development in various industries, especially in the industry related to the financial sector, which has great engagement with foreign currency transactions, sensitive to the movement of inflation, interest rates, and money supply.

Empirically, many studies were conducted to determine the effect of macro-economic variables on stock price fluctuations in the stock market.

One of the preliminary studies was initiated by Fama (1965), who conduct research on the behavior of the stock prices in the United States, including the effect of macro-economic variables in it.

After that, the other studies exist, which include more various independent variables and more complex methods of analysis. However, from several studies that have been done, it is still not quite satisfying because the research developments have not been evenly distributed. Furthermore, there is a lack of updated information as proof that previous researches are still relevant and valid.

This research will focus on four macro-economic variables, namely exchange rates, interest rates, inflation rates, and money supply. Those four macro-economic variables have been carefully selected from the previous studies. They are the most widely used among various existing macro-economic variables. The author suspects that there are some influences of the four macro-economic variables of this object toward the selected index, which is the financial index.

1.1. PROBLEM STATEMENT

This study focused on the financial index, which is one of the sectoral indexes in the Indonesia Stock Exchange. The researcher assesses that the financial index, as one of the index movement, is greatly influenced by several macro-economic variables.

For this purpose, four macro-economic variables will be used as independent variables that are expected to have an impact on the financial index. The four macro-economic variables are the exchange rate, interest rate, inflation rate, and money supply. Regarding this, the formulated research questions are:

a. Does the exchange rate variable of US $ affect the movement of the financial index?
b. Does the interest rate (BI rate) variable affect the movement of the financial index?
c. Does the inflation rate variable affect the movement of the financial index?
d. Does the M2 (money supply) variable affect the movement of the financial index?

1.2. OBJECTIVE

Following the formulation of the problem described above, this study has the following objectives:

a. To investigate the effect of the exchange rate variable of USS against the movement of the financial index.
b. To investigate the effect of the interest rate variable (BI rate) toward the movement of the financial index.
c. To investigate the effect of a variable rate of inflation on the financial index movement.
d. To investigate the effect of the M2 (money supply) variable toward the movement of the financial index.
2 Literature Overview

An investor can invest in different types of assets, either real assets or financial assets. One type of financial assets that can be selected in stock. To make the right investment decision, the investor needs to make an assessment before the shares that will be chosen to determine further whether the stock returns are under the expected returns.

In analyzing the valuation of shares, investors can use two approaches, namely, fundamental analysis and technical analysis approach. The fundamental approach is an approach to analyze a stock based on the company data such as earnings, dividends, and other sales. Fundamental analysis seeks to determine the intrinsic value of the company’s shares. The intrinsic value of the stock or which is the theoretical value of the actual stock value or is supposed to happen. While technical analysis is an approach to look for patterns of stock price movements that can be used to forecast the movement of stock prices in the future (Tandelilin, 2001).

The ability to estimate the return of an individual security is very important and highly needed by an investor. To be able to estimate the return of a security and create an estimation model that can be easily used. Therefore, the presence of the Capital Asset Pricing Model (CAPM), which can be used to estimate the returns of security, is considered very important for finance.

Arbitrage Pricing Theory (APT) is a theory that is often attributed to the influence of macro-economic variables and the relationship to the value of an asset. This theory was developed by Ross (1976) and served as an alternative assessment of an asset in addition to conventional financial methods of Capital Asset Pricing Model (CAPM). This theory is more general, but similar to the CAPM theory, it has its limitation and does not produce an absolute result in the valuation of an asset.

According to Reilly and Brown (2003), the Arbitrage Pricing Theory (APT) is the theory of equilibrium yield (return), which describes that securities involving several preferences assumptions of investors. Fundamentally, Arbitrage Pricing Theory (APT) states that the value of the yield (return) of an asset is not only influenced by the level of sensitivity of assets against market price movements but also influenced by other factors, such as Gross Domestic Product (GDP), inflation, interest rates, political conditions, etc.

The sensitivity of changes in the return of an asset to the risk factors varies from one asset to another. For example, the sensitivity of changes in bank stock returns to changes in interest rates will vary with the changes in stock returns sensitivity of the mining company. Several risk factors that affect the return on assets are also uncertain, depending on the respective results of conducted international research.

According to Hartono (2013), the market equilibrium occurs when prices of assets are at the level that cannot provide further incentives to conduct speculative trading. The implications of this equilibrium assumptions are as follows:

a. All investors will select all of the market portfolio, i.e., the portfolio that contains all of the assets in the market.

b. Market Portfolio is an optimal portfolio of risky assets, which is located at the efficient point of the frontier.

In addition to securities traded in capital markets, an index that represents the price of the existing stocks is also needed. According to Reilly and Brown (2003), a market index can be used to:

a. As a benchmark for evaluating the performance of investment managers in the management of funds.

b. To create and monitor a portfolio that is formed based on the proportion of stocks in the respective index (index fund).
c. To be able to predict future market movements conducted by market analysts.

In other words, this index can be used as guidelines for investors to invest in the capital market, especially stock.

Further, Reilly and Brown (2003) suggest various types of the stock price index based on the calculation that would have an impact on the movement of an index difference with the other index, as follows:

a. Price Weighted Series, it is the average - arithmetic average of the current share prices, which means that the movement of the index is influenced by differences in stock prices in the index components. One example of this type of index is the Dow Jones Industrial Average (DJIA). The Dow Jones Industrial Average (DJIA) is an index consisting of the 30 best stocks of the industrial sector (blue chips). The calculation gained by summing up the current price of the stocks and divided by the divisor which is always adjusted in the event of stock split or a change in the composition of the stocks in the index, so the index value will remain the same before and after the stock split or change in composition. This is because the Dow Jones Industrial Average (DJIA) weighted price of shares is at a high price (high-priced stocks), weighs more than stocks at low prices (low-priced stocks). So, a 10% increase in the price of high-priced stocks can raise the price of the Dow Jones Industrial Average (DJIA) index with a greater percentage change compared with a 10% increase in the price of the low-priced stock.

b. Market Value Weighted Series, this method is derived by using a calculation of the total market value of all stocks listed on the index. Market value in question is the result of multiplying the number of outstanding shares at the share price prevailing at the time. The value obtained in the calculation for the first time (base date) is used as the base value (base value) and index numbers at that time used as the base index number. The base index number used is 100 but can vary between numbers 10 and 50. Further, the results of the calculation of the current market value will be compared with the baseline value to obtain the percentage change, then multiplied by the base index number, to get the value of the new index. The calculation of the index by using this method has an impact on changes in the market value of major companies that have a greater influence on the price index changes than small companies. So that changes in market prices on these large companies directly will continue to dominate the change price of the index.

c. Unweighted Price Indicator Series, by using this method, all shares have equal weight regardless of the market value. This type of index is used by individuals who were randomly picking stocks as their portfolios and invest a sum of money equal to their respective shares. The movement of this index is based on the arithmetic mean of the percentage change in the price of shares in the index, so that the level of price or market value of each share does not effect because each stock has the same weight.

Traditional economic models argue that changes in the exchange rate affect the balance sheet items through the company's competitiveness in foreign currencies, profits, and equity that lead to a price adjustment in the capital market. This volatility in the price adjustment of individual companies caused an impact on the index (Veijagie & Zarafat, 2013).

According to Wu (2000), the exchange rates and stock prices are expected to have a positive relationship. For a country that is dominated by exports, the depreciation of the country's currency against the currencies of other countries will create products that are exported are relatively cheaper when compared with the products of other countries. As a result, if the demand for such goods is elastic, the level of sales of goods - goods exports will increase, thereby increasing cash flow, profits, and stock prices of domestic
enterprises. Otherwise, the condition would occur contrarily if the domestic currency appreciates.

Ramasamy and Yeung (2002) explain that the impact of exchange rate changes on stock price changes due to changes in the company's profits depends on the level of internationalization of the economy in a country. It can be seen both on the micro and macro perspective.

The interest rate is the rate charged or paid for the use of money. It is often expressed as an annual percentage of the principal. It is calculated by dividing the amount of interest with the principal amount. Interest rates often change as a result of inflation and the policy of the Central Bank. It can play an essential factor in determining the amount of savings as opposed to loans. If the interest rate is low, people will reduce the savings in banks and invest more in the stock market. Therefore, it is considered that this interest can play an important role (Vejiangic & Zamfat, 2013).

Hussainey and Ngoc (2009) put forward the theory issued by Apergis and Eletheriou (2002), who argue that there is a negative relationship between the interest rate at which stock prices are seen in the stock and bond portfolio of an investor. If the interest rate is high, investors will prefer bonds in its portfolio, which implies the decline in stock prices. Conversely, when interest rates decline, investors will prefer stocks.

The increase in inflation is likely to lead to a tightening economic policy, which will further enhance the real interest rate and hence increase the discount rate in the valuation model. The influence of a higher discount rate will not necessarily be neutralized by an increase in cash flow resulting from inflation, mainly due to cash flow, which generally does not grow at the same rate as inflation (Maysami et al., 2004).

3 Methodology

The object of this research is one of the stock price index contained in the Indonesia Stock Exchange because the stock price index is an indicator of stock price movements. There are 12 indices in the Indonesia Stock Exchange (IDX); one of them is the sectoral indices. The sectoral index consists of 10 sectors and using all of the stocks in each sector; one of them is the financial sector. In the financial industry, there are several sub-sectors, namely, banking, financial institutions, securities companies, insurance, and more.

In this study, the stock price index of the financial sector is selected as the research object. The financial sector index is an indicator of the whole movement of stock prices in the financial industry, which is listed on the Indonesia Stock Exchange. The movement of stock prices of the financial index used is the financial sector stock price of index monthly, starting from January 2010 until December 2014 with a total of 60 data.

The research variables that will be used are the financial sector index, exchange rate, interest rate, inflation, and money supply. The financial sector index used the closing price that occurred in the Indonesia Stock Exchange. The variable used is exchange rates, interest rates, money supply, and inflation rates.

The exchange rate variable used is the index of the nominal exchange rate against currencies of major partners (the currency used in this study is US $) or also called Real Effective Exchange Rate (REER). This indicator is used to explain the value of a country's currency relative to the currencies of other countries and shows how the value being paid by consumers in buying imported goods. This indicator can also be used to measure the level of a country's competitiveness in terms of price.

REER indicates a decrease in the domestic currency appreciation that would reduce the competitiveness of domestic products that country exports. While the increase in REER means that the domestic currency depreciates, and it will increase the competitiveness of domestic products as export products.
The interest rate variable, the BI rate, is used as a proxy. BI rate is the interest rate that reflects the attitude of policy or monetary policy stance adopted by Bank Indonesia and announced to the public. BI rate is one of the monetary operation instruments as an effort to manage liquidity in the money market, which is set each month. BI rate is an increase or decrease in steps of 25 basis points (bps) depending on the economic conditions.

Changes in the BI rate will affect bank lending rates, but not directly. Initially, the changes in the BI rate will affect Interbank Overnight (O/N) Rate, followed by changes in interest rates on deposits and, ultimately, in bank lending rates.

The variable amount of money in circulation, which is used, is the money supply in the broad sense (M2). M2 includes M1, quasi-money, and securities issued by a monetary system that is owned by the domestic private sector with a residual maturity of one year and less.

The inflation variable used is the inflation rate calculated based on indicators of the Consumer Price Index (CPI). CPI is an index that calculates the average change in prices over a period of a set of goods and services consumed by the population/households within a certain time. CPI changes over time show the price movement of goods and services consumed by society.

### 3.1. Variable Operationalization

#### 3.1.1. The US Dollar Exchange Rate is the price of one currency against other currencies (Mishkin, 2006)

\[
REER_t = \prod \left( \frac{CUR_t/IDR_t}{(CUR_0/IDR_0)^W} \right)^{1/W} \times \left( \frac{P_{ID}/P_{0}}{P_{ID}/P_{0}} \right)^{1/W} 
\]

Where:
- \( REER \) = real exchange rate index
- \( CUR \) = currency of another country
- \( IDR \) = Indonesian Rupiah
- \( P_t \) = the price index
- \( W \) = weight
- \( t \) = period t
- \( 0 \) = period of the base year (2003)
- \( i \) = state
- \( ID \) = Indonesia

#### 3.1.2. The BI Rate is the policy rate reflecting the monetary policy stance adopted by Bank Indonesia (Indonesia's Central Bank) and announced to the public.

#### 3.1.3. The Inflation Rate is the rate of change in the price level, usually measured as the percentage change per year (Mishkin, 2006).

\[
Inflati = \frac{(IP_{t-1} - IP_t)}{IP_{t-1}} \times 100\%
\]

Where:
- \( IHK \) = consumer price index period
- \( IHK_{t-1} \) = consumer price index previous period

#### 3.1.4. Money Supply in the broadest sense is M2 which includes M1 (currency held by the public and demand deposits denominated in Indonesian Rupiah) and Quasi Money (including savings deposits, time deposits in Indonesian Rupiah and foreign currency, demand deposits in foreign currency), and securities issued by monetary system owned by the domestic private sector with residual maturity up to one year (Bank Indonesia).
3.1.5. The index figures that express the level of prices, trading volume, and so in a certain period in comparison with a value represented by the number of 100 to a specific base period (Financial Services Authority, 2013). In this study, the index focuses on the financial sector stocks.

\[
\text{Index} = \frac{\sum_{t} R_{t} Q_{t} \times \text{Beginning Index Value}}{\sum_{t} P_{t} Q_{t}}
\]

Where:

- \( P_{t} \) = price index on day \( t \)
- \( Q_{t} \) = the last price of the stock (ending price) on day \( t \)
- \( P_{b} \) = the last price of the stock (ending price) on the day (base day)
- \( Q_{b} \) = the number of shares outstanding during the day (base day)

Sources: Reilly and Brown, 2003

3.2. TECHNICAL DATA PROCESSING

Processing quantitative data on operational variables to test the hypothesis, then earlier conducted several stages of the test data to avoid mistakes, such as the classic mistake, model error, etc.

3.2.1. TEST OF NORMALITY

Aims to test whether the data used in the study had a normal distribution or not. The good data require a normal or near-normal distribution. This test is usually used to measure the ordinal data scale, interval, or ratio. If this research is using parametric methods, the normality requirements must be met, that the data came from a normal distribution.

In this study, the method is used to test whether the data were normally distributed or not by using the One-Sample Kolmogorov Smirnov test using a significance level of 0.05. The hypothesis of One-Sample Kolmogorov Smirnov test is as follows:

- \( H_{0} \): Residual normal distribution of data
- \( H_{a} \): Residual data is not normally distributed

Data were expressed normally distributed if the significance of more than 5% or 0.05 (Priyatno, 2010)

3.2.2. TEST OF MULTICOLLINEARITY

This test aims to examine whether the model was found a correlation between the independent variables. In a good model, the correlation between independent variables should not occur, and if there is a correlation, then this variable is called not orthogonal (Ghozali, 2010). According to Gujarati (1995), multicollinearity is the presence of a "perfect" or certain linear relationship among several independent variables from the regression model. When the independent variables are perfectly correlated, it is called perfect multicollinearity.

There are several methods of testing, to see the value of Varian Inflation Factor (VIF) in the regression model, by comparing the value of individual determination coefficient (R²) with simultaneous determination (R²), and with a view of eigenvalue and condition index. In this study, the multicollinearity test is seen through the value of Tolerance and VIF. The smaller the value of tolerance and the greater the value, the closer the VIF
multicollinearity problem, which if Tolerance VIF is more than 0.1 and less than 10, then there is no multicollinearity (Priyatno, 2010).

2.2.3. TEST OF AUTOCORRELATION

Autocorrelation is the correlation between members of a series of observations that are arranged in time series (such as the time series data) or arranged in a series of space (as in the cross-sectional data) (Sumodiningrat, 1999). Autocorrelation test aims to test whether a linear regression model does not correlate between bullies error in period t with an error in period t - 1 (previous). This problem arises because the residual is not free from one observation to another observation (Ghozali, 2010).

One type of test to determine the presence of autocorrelation was developed by Durbin and Watson in 1951. This test is referred to as statistical-d Durbin - Watson was calculated based on the difference of squares of values estimated interfering factors that sequence.

According to Ghozali (2010), the Durbin-Watson test is only used for the autocorrelation level one (first-order autocorrelation) and requires a constant regression model and no variable lag between the independent variables. The decision about whether there is autocorrelation, namely:

a. If the Durbin-Watson value is between the upper bound (du) and (4 - du), the autocorrelation coefficient is equal to zero, it means no autocorrelation.

b. If the Durbin-Watson value is lower than the lower bound (dl), the autocorrelation coefficient is greater than zero, it means there is positive autocorrelation.

c. If the Durbin-Watson value is greater than (4 - dl), the autocorrelation coefficient is smaller than zero, and it means there is a negative autocorrelation.

d. If the Durbin-Watson value is between the upper bound (du) and the lower bound (dl) or between the Durbin-Watson (4 - du) and (4 - dl), then the results are inconclusive.

3.2.4. TEST OF HETEROSCEDASTICITY

This test aims to determine whether in the regression model occurred inequality variants of residuals of the observations to other observations. If the residual varied from one observation to another constant observation, then expressed as homoscedasticity. However, in the case of differences in variance of the residuals of the observations to other observations, it referred to as heteroscedasticity. A good regression model is that homoscedasticity or did not happen homoscedasticity (Ghozali, 2010).

The Glejser test method is used by means of residual regression of the absolute value of the independent variables. If a statistically significant independent variable affects the dependent variable, then there is an indication of homoscedasticity, and if the opposite occurs, that means the homoscedasticity assumption on the model data cannot be denied (Ghozali, 2010). Before conducting the test first compiled hypothesis, namely:

- H₀: There is no heteroscedasticity
- H₁: There is a heteroscedasticity

Decision-making is done by using 0.05 to test two sides. If the correlation between the independent variable residual gives more significance than 0.05 (sig > 0.05), it can be said there was no trouble of heteroscedasticity or H₀ received (Priyatno, 2010).

3.3. THE GOODNESS OF FIT TEST

The accuracy of a regression function in assessing the actual value can be measured from the goodness of fit, and a statistical test can be said to be statistically significant when the value of the statistics is in critical regions (regions where H₀ is rejected). Conversely, it is called insignificant if the statistics are in areas where H₀ is accepted. In addition, it is said
that there are no single test tools for measuring or testing the hypothetical model (Hair et al., 1995; Long, 1983; Tabachnick and Fidell, 1996 in Ferdinant, 2002). A model to assess the use of several tests its Goodness of Fit (Ghozali, 2010; Ferdinant, 2002), among others.

3.3.1. The coefficient of determination ($R^2$) is to measure how the ability of the model in explaining variations of the dependent variable. It is between zero and one. When the $R^2$ value is small, it means that the ability of the independent variables in explaining the variation of the dependent variable is minimal. If the value of $R^2$ is approaching one, it means the independent variables provide almost all the information needed to predict the variation of the dependent variable.

The fundamental weakness of the use of the coefficient of determination is biased against the number of independent variables were entered into the model. Because of every additional independent variable, then the value of $R^2$ improved, no matter whether these variables significantly influence the dependent variable. In addition, the value of $R^2$ for each regression equation artificially can be very high if the samples used to estimate the coefficients of the model are too small. At the other extreme $R^2$ value will always be equal to 1.0 when the number of data observations is equal to the number of estimated coefficients, for each data point (observation) can be placed right on the regression function.

Adjusted $R^2$ can be used Adjusted $R^2$ value, which is the proportion of variation explained after $R^2$ adjusted for sample size and the number of estimated coefficients to overcome the problems of efficiency level. With the Adjusted $R^2$, then additional explanatory variable / independent in the regression model may cause the value of $R^2$ up or down so that the evaluation of the model is expected to be better.

3.3.2. The $f$-Statistic (Simultaneous Significance Test), in principle, this test shows whether all the explanatory/independent variables included in the model have a joint effect on the dependent variable. As for how to draw conclusions in conducting this statistical test by comparing the statistical value $f$ the results of the calculation with the $F$ value according to $F$ table (F table), if the statistical value $F$ is higher than the $F$ table, it can be concluded that all explanatory/independent variables are together same affect the dependent variable (Ho rejected).

4. ANALYSIS AND DISCUSSIONS

4.1. DESCRIPTIVE STATISTICS

Descriptive statistics were used to determine the average value, median, minimum, maximum, and standard deviation in the study. Descriptive statistics include frequency, mean, and standard deviation, which provides descriptive information about the data (Sekaran and Bougie, 2013).

<table>
<thead>
<tr>
<th>Table 4.1. Descriptive Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Descriptive Statistics</strong></td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>US Exchange Rate</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>8532.00</td>
</tr>
<tr>
<td>12438.29</td>
</tr>
<tr>
<td>9614.934</td>
</tr>
<tr>
<td>Std. Deviation: 1219.6945</td>
</tr>
<tr>
<td>Bi Rate</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>5.75</td>
</tr>
<tr>
<td>7.50</td>
</tr>
<tr>
<td>6.5683</td>
</tr>
<tr>
<td>Std. Deviation: 0.6540</td>
</tr>
<tr>
<td>Inflation Rate</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>3.43</td>
</tr>
<tr>
<td>8.79</td>
</tr>
<tr>
<td>5.6537</td>
</tr>
<tr>
<td>Std. Deviation: 1.56722</td>
</tr>
<tr>
<td>Money Supply (M2)</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>2966.49</td>
</tr>
<tr>
<td>4713.33</td>
</tr>
<tr>
<td>3003.1447</td>
</tr>
<tr>
<td>Std. Deviation: 915.72353</td>
</tr>
<tr>
<td>Financial Index</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>303.00</td>
</tr>
<tr>
<td>726.00</td>
</tr>
<tr>
<td>526.0167</td>
</tr>
<tr>
<td>Std. Deviation: 106.0594</td>
</tr>
</tbody>
</table>

9
4.2. TEST OF NORMALITY

The Kolmogorov-Smirnov test as a result of table 4.2, below that is the value of Sig. (Significance) is 0.846. This value is higher than 0.05. Thus H0 is accepted, which means that the research data are normally distributed.

Table 4.2. Normality Test

<table>
<thead>
<tr>
<th>Normal Parameters</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Normal Parameters</td>
<td>0.000000</td>
<td>32.42519112</td>
</tr>
<tr>
<td>Most Extreme Differences</td>
<td>.079</td>
<td>.079</td>
</tr>
<tr>
<td>Kolmogorov-Smirnov Z</td>
<td>.014</td>
<td>.006</td>
</tr>
</tbody>
</table>

a. Test distribution is Normal.
b. Calculated from data.

4.3. TEST OF MULTICOLLINEARITY

Based on the test of multicollinearity in table 4.3 below, it can be concluded that there is an absence of any indication of multicollinearity among variables. This result indicated by the value of Tolerance and VIF, where the value is more than 0.1 Tolerance and VIF is less than 10, then it does not happen multicollinearity inside it.

Table 4.3. Multicollinearity Test

<table>
<thead>
<tr>
<th>Model</th>
<th>Collinearity Statistics</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 US $ Exchange Rate</td>
<td>.394</td>
<td>7.646</td>
<td></td>
</tr>
<tr>
<td>Inflation Rate</td>
<td>.662</td>
<td>1.510</td>
<td></td>
</tr>
<tr>
<td>BI Rate</td>
<td>.301</td>
<td>3.322</td>
<td></td>
</tr>
<tr>
<td>Money Supply (M2)</td>
<td>.152</td>
<td>6.562</td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Financial Index

4.4. TEST OF AUTO-CORRELATION

Referring to the table Durbin-Watson statistics as the basis of decision-making, then the test Durbin-Watson as table 4.4 below, the result amounted to 1.547. If the value is between the upper bound (du) and (4 - du) is 1.4445 up to 1.7274, then there is no problem of autocorrelation.

Table 4.4. Autocorrelation Test

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std Error of the Estimate</th>
<th>Durbin-Watson</th>
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<td>1</td>
<td>.953a</td>
<td>.907</td>
<td>.900</td>
<td>33.58369</td>
<td>1.545</td>
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</tbody>
</table>

a. Predictors: (Constant), Money Supply (M2), Inflation Rate, BI Rate, US $ Exchange Rate
b. Dependent Variable: Financial Index
4.5. TEST OF HETEROSEDASTICITY

To know the data used contain heteroscedasticity or not? Used Glesjer test by doing a regression of absolute residual value to independent variables, so that it can be known significance. The results obtained, Table 4.5 below the overall significance of independent variables are above 0.05, it can be concluded that there is no heteroscedasticity.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig</th>
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<tr>
<td></td>
<td>Intercept</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>Standardized</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>58.814</td>
<td>2.183</td>
<td>.050</td>
</tr>
<tr>
<td></td>
<td>US Exchange Rate</td>
<td>-1.902</td>
<td>-1.309</td>
<td>.186</td>
</tr>
<tr>
<td></td>
<td>Inflation Rate</td>
<td>4.019</td>
<td>2.183</td>
<td>.064</td>
</tr>
<tr>
<td></td>
<td>BI Rate</td>
<td>-4.638</td>
<td>-3.233</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Money Supply (M2)</td>
<td>0.331</td>
<td>0.111</td>
<td>.908</td>
</tr>
</tbody>
</table>

Table 4.5. Heteroscedasticity Test

4.6. THE GOODNESS OF FIT TEST

The goodness of fit was measured by using the determination coefficient (R²). The result obtained is as follows:

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.952²</td>
<td>.907</td>
<td>.900</td>
<td>33.56300</td>
<td>1.546</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Money Supply (M2), Inflation Rate, BI Rate, US Exchange Rate.

b. Dependent Variable: Financial Index.

Based on these calculations, adjusted R² = .907, and this shows that 90.7% of variation Financial Index can be explained from the four independent variables consisting of US Exchange Rate, Inflation Rate, BI Rate and Money Rate (M2).

To measure the accuracy of the regression function, the F-statistic value is used, which shows all the independent variables included in the model have a joint influence on the dependent variable, with the results of the calculation as follows:

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
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<td>Regression</td>
<td>601630.735</td>
<td>4</td>
<td>150406.199</td>
<td>135.355</td>
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<td>Residual</td>
<td>62032.188</td>
<td>55</td>
<td>1137.858</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>663662.923</td>
<td>59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Financial Index

b. Predictors: (Constant), Money Supply (M2), Inflation Rate, BI Rate, US Exchange Rate

Based on Table 4.6.2 above, the significance level is 0.000 (less than 0.05), then all the independent variables (US Exchange Rate, BI Rate, Money Supply (M2), and Inflation Rate) together influence the financial index in the Indonesia Stock Exchange.

4.7. ANALYSIS

Based on several kinds of tests that have been done on the used data research, it can be concluded that the data is worthy used for testing hypotheses.
Analysis of the influence of US $ Exchange Rate, Inflation Rate, BI Rate, and Money Rate (M2) toward Financial Index on Indonesia Stock Exchange with the following results:

Table 4.7.1. T-Statistic Test

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Unstandardized Coefficient</th>
<th>Standardized Coefficient</th>
<th>p-Value</th>
<th>t-Value</th>
<th>Sig</th>
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<tr>
<td>(Constant)</td>
<td>195.130</td>
<td>46.112</td>
<td></td>
<td>4.016</td>
<td>.000</td>
</tr>
<tr>
<td>US $ Exchange Rate</td>
<td>-6.893</td>
<td>.012</td>
<td>-7.958</td>
<td>.000</td>
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<tr>
<td>BI Rate</td>
<td>46.799</td>
<td>12.141</td>
<td>.362</td>
<td>4.016</td>
<td>.000</td>
</tr>
<tr>
<td>Inflation Rate</td>
<td>-2.966</td>
<td>3.803</td>
<td>-1.11</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Money Supply (M2)</td>
<td>27.018</td>
<td>.018</td>
<td>1.52</td>
<td>15.256</td>
<td>.000</td>
</tr>
</tbody>
</table>

Dependent Variable: Financial Index

The exchange rate of US $ has a significant giver effect on the financial index to see the significant value of 0.000 (p-value < 0.05). Negative results indicate that the higher the US $ exchange rate, the lower the financial index value; on the contrary, the lower the US $ exchange rate, the higher the financial index value. This is contrary to the research conducted by Osamwonyi & Evbayiro-Osagie (2012), who found that exchange rates have a significant positive effect on financial index values.

BI rate positive and significant impact on the financial index, which can be seen from the significant value of 0.000 (p-value < 0.05). A positive result indicates that the higher the value of BI, the financial index value will be higher as well; conversely, the lower the BI rate, the value of financial index value would be lower. This is in line with research conducted by Hussain, Aamir, Rasool, Faryaz, and Mumtaz (2012), Issahaku, Ustarz & Domanban (2013) and Maysami, Howe & Hamzah (2004), who found that the value of interest rate brings a significant positive effect on the value of the financial index.

The inflation rate does not have a significant and negative impact on the financial index to see a non-significant value of 0.909 (p-value > 0.05). This is contrary to the research concluded by Hussain, Aamir, Rasool, Faryaz, and Mumtaz (2012), Issahaku, Ustarz & Domanban (2013), Osamwonyi & Evbayiro - Osagie (2012) and Maysami, Howe & Hamzah (2004) who found that the inflation rate has a positive and significant effect on financial index values.

The money supply (M2) positive and significant impacts on the financial index to see a significance value of 0.000 (p-value < 0.05). A positive result indicates that the greater the amount of money supply (M2), the financial index value will be higher, otherwise the smaller the amount of money supply (M2), the financial index value would be lower. This is consistent with research concluded by Humpe & Macmillan (2007), Hussain, Aamir, Rasool, Faryaz, and Mumtaz (2012), Maysami, Howe & Hamzah (2004) and Vejzagic & Zanafat (2013), who found that the money supply brings a significant positive effect on the financial index values. Based on the theory of investment, the investment can be divided into (a) investments in financial assets and (b) investments in real assets. Investments in financial assets carried on the money market, for example, in the form of certificates of deposit, commercial paper, money market securities, and others. Investment may also be made in the stock market, for example, in the form of shares, bonds, warrants, options, and more. Stock is one of the capital market instruments that are preferred by investors to invest because the return is likely to be high. With the investigation of the influence of macro-economic variables on the financial index, it is expected to help investors and prospective investors in making an investment strategy in the stock market to determine investment decisions. To obtain the maximum return from initial gains, investors should also assess the changes that occur on macro-economic variables such as the exchange rate of US $, inflation rate, BI rate, and money supply (M2).
According to the results of this study, if the investor expects capital gains derived from financial firms with the financial index as a benchmark, the investor should then look at the macro-economic conditions beforehand. Due to macro-economic conditions, especially the exchange rate of US $, BI rate, and money supply (M2) in accordance with things that have been observed in this study, the investor can find out the right time to buy or sell his stock.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. CONCLUSIONS

a) The US $ exchange rate has a negative and significant effect on the movement of the financial index on the Indonesia Stock Exchange;

b) The BI rate has a positive and significant effect on the movement of the financial index on the Indonesia Stock Exchange;

c) The inflation rate does not have a significant and negative impact on the movement of the financial index on the Indonesia Stock Exchange;

d) The money supply (M2) has a positive and significant effect on the movement of the financial index on the Indonesia Stock Exchange;

5.2. RECOMMENDATIONS

a) Stock investors in the Indonesia Stock Exchange who expect capital gains from the difference in purchase price and stock selling price, it is recommended to decide the timing of investment taking into account macro-economic variables, specifically the exchange rate of US $, BI rate and money supply (M2).

b) The movement of macro-economic variables, namely the exchange rate of US $, the BI rate and the money supply (M2) can be added information in anticipating further market movements, by the Indonesia Stock Exchange;

c) For further research, additional macro-economic variables can be added that are not included in this study, such as exports, imports, GDP, and others, but in using these macro-economic variables must be in a relatively stable economic condition.

References


The Effect of Macro-economic Variables Towards the Financial Index on Indonesia Stock Exchange

ORIGINALITY REPORT

16%

SIMILARITY INDEX

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