

The Relationship between Business Confidence, Consumer Confidence, and Indexes Return: Empirical Evidence in Indonesia Stock Exchange

Resti Ayuningtyas, and Deddy P. Koesrindartoto

Abstract—The purpose of this study is to examine if business confidence and consumer confidence can have relationship with returns of stock market in Indonesia that are represented by some of indexes. The indexes are Jakarta Composite Index (JCI), LQ45 Index, Jakarta Islamic Index (JII), and Sector Index. Linear regression is employed to analyze the relationship of change in business confidence and change in consumer confidence toward quarterly return of each index from 2000 until 2013. The findings provide empirical evidence that change in business confidence has significant and positive relationship with quarterly return of each stock index. Meanwhile, change in consumer confidence only has significant and negative relationship with quarterly return of Agriculture and Trade Index. The results can be consideration for investors to earn return on stock market investments in Indonesia.

Keywords—business confidence, consumer confidence, stock market index, return.

I. INTRODUCTION

THE rise and fall of stock market could be related with many factors that investors always try to find out. One of most influence factor is economic indicator. Economic indicator is an important measurement to evaluate the economic performance in a country at certain period. There are various economic indicators that can be used to analyze how well economic performance of a country in current period and in prediction of future performance. When the economy is good, it is usually good for stock market as well, and vice versa. Investors usually use information related to economic indicators as considerations to forecast the return and also to make decision.

One of macroeconomic indicators assessed to know the economic condition in a country and also becomes one of considerations for investment performance is sentiment. Sentiment relates to consumers' and producers' optimism or pessimism about the economy. Familiar economic indicator known to measure the consumers' optimisms or sentiment about the economy is called consumer confidence index.

There is also economic indicator known to measure the producers' optimism or sentiment about the economy called business confidence index. When consumers have good confidence in their income or finance condition, they tend to spend more. It will have impact for producers too. Higher demand from consumers will affect producers to increase production and inventory levels. Thus, beliefs have effects on how much consumption and investment that will also affect the aggregate demand [1]. In relation with stock market, shareholders usually expect high consumer confidence because it will encourage more spending and create bullish market for stocks [2].

Previous study has examined the joint explanatory power of business confidence and consumer confidence, using generalized least square on total stock market return in 31 countries. The findings showed that business confidence and consumer confidence could correlate positively with stock market return [3]. The causal relationship between consumer confidence and stock price indexes also has ever been investigated and shows that stock returns Granger-cause the changes in the Consumer Confidence Index based on Granger-causality test [4]. Another study also proves that positive news on business consumer confidence gives positive response to stock returns in United States and Germany [5].

The authors want to test if the previous researches, especially research by [3], will get the similar result in Indonesia. This study attempts to answer the ability of business confidence and consumer confidence in explaining return of some stock indexes in Indonesia, which are Jakarta Composite Index (JCI), LQ45 Index, Jakarta Islamic Index (JII), and Sectorial Index. The objectives of this study are: to determine whether there is significant relationship between the change in business confidence, change in consumer confidence, and Jakarta Composite Index's quarterly return from 2000 until 2013, to determine whether there is significant relationship between the change in business confidence, change in consumer confidence, and LQ45 Index's quarterly return from 2000 until 2013, to determine whether there is significant relationship between the change in business confidence, change in consumer confidence, and Jakarta Islamic Index's quarterly return from 2000 until 2013, to determine whether there is significant relationship between the

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change in business confidence, change in consumer confidence, and each sector index's quarterly return from 2000 until 2013.

II. METHODOLOGY

The main dependent variable in this research is quarterly return on stock market index. There are four groups of stock market index in Indonesia that will be used to analyze, which are Jakarta Composite Index, LQ45 Index, Jakarta Islamic Index, and Sector Index. Sector Index consists of agriculture, mining, basic-industry, miscellaneous industry, consumer, property, infrastructure, finance, trade, and manufacture index. Therefore, there are thirteen dependent variables in total. Quarterly return of each index is obtained through the calculation:

$$\frac{(\text{ending_quarter_index} - \text{beginning_quarter_index})}{\text{beginning_quarter_index}} \quad (1)$$

The independent variables of this research are change in consumer confidence and change in business confidence by taking the first difference. In Indonesia, business confidence is published quarterly both by Badan Pusat Statistik and Bank Indonesia. Meanwhile, the consumer confidence is published monthly by Bank Indonesia and quarterly by Badan Pusat Statistik. Since business confidence is only based on quarterly, not monthly, all variables in this research are based on quarter.

Data of all stock indexes are obtained from Indonesia Capital Market Electronic Library. Meanwhile, data of business confidence and consumer confidence are obtained from official website of Badan Pusat Statistik, *www.bps.go.id*. All data have range from third quarter in 2000 until fourth quarter in 2013. There are 54 data for each index as dependent variable.

Linear regression is employed in this study to analyze the explanatory power of business confidence and consumer confidence on each stock market index. Through the regression analysis, the values of numerical variable can be predicted based on the value of other variables since there will be model resulted from the regression processing [6].

To get the good regression model, classical assumption test is necessary to be implemented as a requirement. There are four kinds of test on classical assumption test: normality, heteroscedasticity, multicollinearity, and auto-correlation. Both classical assumption test and linear regression are processed through SPSS, statistic software.

Normality test used in this study is based on Kolmogorov-Smirnov to test whether residual value of regression model is normally distributed or not [7]. So, the null hypothesis of this test is normality. The Asymp. Sig. (2-tailed) needs to be more than significance level (0.05) to not reject H_0 or to prove that data are normal.

Breusch-Page and Koenker is one of method to test heteroscedasticity in statistics. The null hypothesis is homoscedasticity. If the error terms have constant variances, the regression model has met the assumption requirements [8]. Thus, the regression model meets the requirements if null hypothesis is not rejected.

Multicollinearity Test has a purpose to test whether correlations among independent variables or predictors are strong. No correlation between the predictors indicates good regression model. There will be no multicollinearity between independent variables if maximum value of VIF is 10 [9]. Besides, the minimum value of tolerance should be 0.1 [10].

Reference [11] shows that autocorrelation test is needed to detect non-randomness in data. Runs test is one of technique to decide if a data set is from a random process [12]. The runs test should not reject the null hypothesis that states the sequence was produced in a random manner.

After passing classical assumption test, linear regression can be done. Multiple linear regressions is employed in this study since there is more than one independent variable used to predict the value of dependent variable, Y . The equation (2) expresses the linear regression to analyze relationship between change in business confidence and consumer confidence and quarterly return of each stock index.

$$Y_i = b_0 + b_1 DBC + b_2 DCC + e_i \quad (2)$$

Where:

Y_i = return on each stock market index for index i in quarter t

b_0 = Y intercept

β_1 = slope of Y with variable ΔBC , holding variable ΔCC constant

ΔBC = change in the index of business confidence by taking the first difference; that is the value of business confidence index in quarter t less quarter $t-1$

β_2 = slope of Y with variable ΔCC , holding variable ΔBC constant

ΔCC = change in the index of consumer confidence by taking the first difference; that is the value of consumer confidence index in quarter t less quarter $t-1$

e_i = random error in Y for observation i

III. DATA ANALYSIS

Before analyzing through linear regression, classical assumption test is needed to be implement. Using Kolmogorov-Smirnov test, the results show all residual values on each variable are normally distributed since the Asymp. Sig. (2-tailed) is more than 0.05. Thus, null hypothesis of normality is not rejected. Breusch-Pagan and Konker test for testing heteroscedasticity also show there is no heteroscedasticity for all models since the test is not statistically significant or more than 0.05. It indicates null hypothesis of homoscedasticity is not rejected. VIF and tolerance test for checking multicollinearity between independent variables shows there is no multicollinearity as well. The value of VIF is less than 10 and tolerance is more than 0.1. Then, for autocorrelation test, since the data uses first difference or not time series, the data are free from autocorrelation. Also, according to runs test for checking autocorrelation, the result shows there is no autocorrelation for all residual variables on each variable, since the Asymp. Sig. (2-tailed) is more than 0.05. It indicates null hypothesis of sequence was produced in a random manner is not rejected. Based on all tests have been done in classical assumption test, all data and model have met the requirements for good

regression model. Thus, linear regression analysis can be done. The details of classical assumption test can be seen on appendix.

The hypotheses of each stock index as dependent variable have to be identified first before creating the model for each stock index. The hypotheses for all indexes are explained as following:

H_0 : There is no relationship between change in business confidence, change in consumer confidence, and quarterly return of index.

H_1 : There is relationship between change in business confidence and quarterly return of index.

H_2 : There is relationship between change in consumer confidence and quarterly return of index.

H_3 : There is relationship between change in business confidence, change in consumer confidence, and quarterly return of index.

Descriptive statistics are shown in Table 1. While the regression results are shown in Table 2. As in Table 2, the regression results show that quarterly return on Jakarta Composite Index, LQ45 Index, and Jakarta Islamic Index is estimated to be increase by 0.010 per quarter for each increase in the change in index of business confidence. Meanwhile, on sectorial indexes, except on agriculture and trade sector, various numbers between 0.006 and 0.014 estimate quarterly return on each sector, to be increase per quarter for each increase in the change in index of business confidence, as seen in Table 1. On agriculture index, for a given change in consumer confidence, the quarterly return is estimated to be increase by 0.014 per quarter for each increase in the change in business confidence, and for a given change in business confidence, the quarterly return on agriculture index is estimated to decrease by 0.013 for each increase in the change of consumer confidence. Also, on trade index, for a given change in consumer confidence, the quarterly return on trade index is estimated to increase by 0.011 per quarter for each increase in the change in business confidence, and for a given change in business confidence, the quarterly return on trade index is estimated to decrease by 0.007 for each increase in the change of consumer confidence.

TABLE I
DESCRIPTIVE STATISTICS

Variables	Mean	Std. Deviation	N
Dependent JCI – R	0.045911	0.124987953	54
LQ45 – R	0.042897	0.130837564	54
JII – R	0.043785	0.132338076	54
AGRI – R	0.059494	1.98321302	54
MINING – R	0.065683	0.266537570	54
BASICIND – R	0.043576	0.163534596	54
MISCIND – R	0.051372	0.155241902	54
CONSUMER – R	0.049460	0.129894271	54
PROPERTY – R	0.061839	0.189476983	54
INFRASTRUC TURE – R	0.044498	0.127343983	54
FINANCE – R	0.053345	0.130488149	54
TRADE – R	0.040523	0.144159767	54

MANU – R	0.060361	0.130733513	54
Independent Δ BC	-0.3304	6.21612	54
Δ CC	-0.0635	6.28309	54

TABLE II
REGRESSION RESULTS

Stock Index		Intercept	Δ BC	Δ CC	R Square
JCI	Beta	0.049	0.010	-0.005	0.191
	p-value	0.003	0.001	0.094	
LQ45	Beta	0.046	0.010	-0.005	0.176
	p-value	0.008	0.002	0.097	
JII	Beta	0.047	0.010	-0.005	0.186
	p-value	0.007	0.001	0.069	
AGRI	Beta	0.064	0.014	-0.013	0.200
	p-value	0.013	0.003	0.005	
MINING	Beta	0.074	0.014	-0.007	0.095
	p-value	0.040	0.025	0.270	
BASIC-INDUSTRY	Beta	0.044	0.012	-0.005	0.178
	p-value	0.040	0.002	0.167	
MISC-INDUSTRY	Beta	0.057	0.011	-0.005	0.177
	p-value	0.005	0.002	0.139	
CONSUMER	Beta	0.055	0.008	-0.003	0.119
	p-value	0.001	0.011	0.372	
PROPERTY	Beta	0.061	0.011	-0.005	0.103
	p-value	0.020	0.019	0.255	
INFRASTRUC TURE	Beta	0.047	0.006	-0.004	0.086
	p-value	0.008	0.038	0.194	
FINANCE	Beta	0.056	0.007	-0.003	0.089
	p-value	0.002	0.031	0.263	
TRADE	Beta	0.044	0.011	-0.007	0.207
	p-value	0.018	0.001	0.039	
MANUFACTURE	Beta	0.063	0.009	-0.002	0.145
	p-value	0.000	0.005	0.447	

Then, null hypothesis needs to be test by comparing p-value of independent variables on each stock index model with a 0.05 level of significance. The p-value of change in business confidence on all models is less than 0.05. Thus, null hypothesis is rejected. Meanwhile, p-values of change in consumer confidence that are able to reject the null hypothesis, are only on agriculture and trade index. Therefore, the overall decision is to reject H_0 on all stock index models, accept H_1 for all stock index models with exception on agriculture and trade index, and accept H_3 for agriculture and trade index models.

The coefficient of determination (R square) on each model indicates how many percent of the variation in quarterly return on each stock index that can be represented by the model. From thirteen stock market indexes observed, there is not any strong coefficient of determination. The highest coefficient of determination is on trade index that indicates 20.7% of variation in trade sector can be explained by the variation in the change in business confidence and consumer confidence. Meanwhile, the other 80–90% of quarterly return on each index might be influenced by other factors outside change in business confidence and consumer confidence.

It can be summarized from the result for each index that change in business confidence has significant relationship with quarterly return of Jakarta Composite Index, LQ45 Index, Jakarta Islamic Index, and Sectors Index. Thus, change in business confidence can be one of considerations for investors to earn return on stock market investment in Indonesia.

Business confidence can have relationship with stock index return since business confidence is based on businesses or producers perspectives. The producers or the owners of business are the ones who know the condition of business. They could compare their current and previous income and also forecast sales in the future based on the orders. The index of business confidence will increase as their income and their projection of income increases. The increase of their income indicates there is positive return. That is why the producers or the owner of businesses are getting optimistic or confidence with the business. Therefore, there is positive relationship between change in business confidence and quarterly return of stock market indexes observed.

Meanwhile, consumer confidence does not really have impact to the quarterly return of JCI, LQ45, JII, and Sectorial Index. Through the multiple linear regressions, change in consumer confidence does not have significant relationship with each index, except with quarterly return on agriculture and trade index, *but the relationship is negative*. As the change in consumer confidence increases, the return decreases. This empirical results of negative relationship in Indonesia against the common theory existed and the results from previous researches. It indicates there could be something wrong with the methodology in consumer confidence in Indonesia. The authors concluded that overall, change in consumer confidence is not needed as considerations for investors to earn return on stock market investment in Indonesia.

IV. CONCLUSION

Information about economic indicators in a country become consideration for investors in stock market to predict the rise and fall of stock market, moreover, to expect return. Some of economic indicators become the concern in this study are consumer confidence and business confidence. Previous researches have found empirical results that consumer confidence and business confidence could explain return on stock market across countries. This study wants to test if previous research by [3] will get similar result in Indonesia.

The main purpose of this study is to examine if there is significant relationship between change in business confidence, change in consumer confidence, and quarterly return on some stock market indexes in Indonesia. The stock market indexes consist of Jakarta Composite Index, LQ45 Index, Jakarta Islamic Index, and Sector Index, which consist of ten sectors. All data are based on quarter from January 2000 until December 2013. Linear regression is employed to analyze the relationship in this study.

According to regression results, change in business confidence has significant and positive relationship with quarterly return on JCI, LQ45, JII, and all sectors index. As change in business confidence increases, the returns on stock

indexes also increase. In opposite, change in consumer confidence does not have significant relationship with quarterly return on all stock market indexes, except with agriculture and trade index. The relationship, however, is negative. This result of consumer confidence is not suitable with common theory in economics and previous researches. Thus, the authors conclude that in Indonesia, change in consumer confidence could not be used as consideration for investors to earn return on stock market investment. However, change in business confidence could be one of consideration for investors to earn return on stock market investment in Indonesia.

APPENDIX

A. Normality Test

TABLE III
NORMALITY TEST – KOLMOGOROV SMIRNOV

Data	Asymp. Sig	Result
JCI	0.763	Test Distribution is Normal
LQ45	0.829	Test Distribution is Normal
JII	0.340	Test Distribution is Normal
AGRI	0.950	Test Distribution is Normal
MINING	0.239	Test Distribution is Normal
BASICIND	0.857	Test Distribution is Normal
MISCIND	0.817	Test Distribution is Normal
CONSUMER	0.669	Test Distribution is Normal
PROPERTY	0.855	Test Distribution is Normal
INFRAST	0.743	Test Distribution is Normal
FINANCE	0.931	Test Distribution is Normal
TRADE	0.613	Test Distribution is Normal
MANUFACTURE	0.910	Test Distribution is Normal

B. Heteroscedasticity Test

TABLE IV
HETEROSCEDASTICITY TEST – BREUSCH PAGAN AND KOENKER TEST

Data	Significance Level	Result
JCI	0.5124	Homoscedasticity
LQ45	0.6745	Homoscedasticity
JII	0.3455	Homoscedasticity
AGRI	0.2368	Homoscedasticity
MINING	0.2452	Homoscedasticity
BASICIND	0.1266	Homoscedasticity
MISCIND	0.817	Homoscedasticity
CONSUMER	0.669	Homoscedasticity
PROPERTY	0.855	Homoscedasticity
INFRAST	0.743	Homoscedasticity
FINANCE	0.931	Homoscedasticity
TRADE	0.613	Homoscedasticity
MANUFACTURE	0.910	Homoscedasticity

C. Multicollinearity Test

TABLE V
MULTICOLLINEARITY TEST – VIF TEST

Tolerance	VIF	Result
0.841	1.190	Multicollinearity does not exist

D. Auto-correlation Test

TABLE VII
AUTO CORRELATION TEST – RUNS TEST

Data	Asymp. Sig	Result
JCI	0.410	The sequence was produced in a random manner
LQ45	0.410	The sequence was produced in a random manner
JII	0.783	The sequence was produced in a random manner
AGRI	0.783	The sequence was produced in a random manner
MINING	0.169	The sequence was produced in a random manner
BASICIND	0.169	The sequence was produced in a random manner
MISCIND	0.783	The sequence was produced in a random manner
CONSUMER	0.410	The sequence was produced in a random manner
PROPERTY	0.410	The sequence was produced in a random manner
INFRAS	0.783	The sequence was produced in a random manner
FINANCE	0.783	The sequence was produced in a random manner
TRADE	0.410	The sequence was produced in a random manner
MANUFACTURE	0.169	The sequence was produced in a random manner

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