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Analysis of Effects of Inflation, Interest Rates, Rupiah Exchange Rate toward Composite Stock Price Index with the Gross Domestic Product as Moderation Variable in the Indonesia Stock Exchange

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Abstract:
This study included an explanatory research that discusses the effects of inflation, interest rates, the exchange rate of the composite stock price index by the gross domestic product as a moderating variable. The population in this study throughout the company went public on the Stock Exchange, monthly data taken in time series during the period July 2005 to December 2015, analysis was used to test the hypothesis in this study is the Person's product moment correlations. The research proves inflation, interest rates, exchange rate significantly influence the composite stock price index. Gross domestic product is significantly moderating the effect of inflation on the composite stock price index. While the gross domestic product does not moderate the effect of the interest rate on the composite stock price index and the exchange rate of the composite stock price index.

Keywords: Inflation, interest rates, rupiah exchange rate, gross domestic product, composite stock price index

1. Introduction

The development of the capital market can be reflected on the stock market price fluctuations. Changes in stock prices are influenced by several factors, according to Samsul (2006) there are seven factors: (1) The gross domestic product; (2) inflation; (3) the unemployment rate; (4) the interest rate; (5) exchange rates; (6) the current account; (7) the budget deficit. But not all of these factors can be used as a study variable; among others: the unemployment rate, current account and budget deficits. According to Ebert and Griffin (2000), GDP is the value of all goods and services produced in one year by the national economy by using domestic production factors. Besides the current account was also ignored because it was included in the exchange rate as revealed by Samuelson (2002); that exchange rate movements will continue until the capital account and the current account back into equilibrium positions. While not used as a variable research budget deficit for the budget deficit occurs when government spending is greater than tax revenue. If the budget deficit is covered by issuing bonds on the capital market, then automatically share price will be affected. But budget deficits that occurred in Indonesia closed with a foreign debt so that there is no direct impact on stock prices. Based on the description above, the factors that affect stock price change is (1) inflation; (2) the interest rate; (3) the exchange rate and (4) GDP.

The economic crisis experienced by the Indonesian extremely painful for all Indonesian people, not only the economic impact but also non-economic. The crisis is a situation that illustrates the decline in economic conditions decline in some economic indicators. Mishkin (2004), says that there are five factors that can lead to the worsening problems of adverse selection and moral hazard in the financial markets, and will eventually lead to the financial crisis; namely the stock market decline, rising interest rates, the decline in the aggregate price level are not anticipated, the increased uncertainty and panic bank. This means that the economic crisis will have an impact on capital market activity is reflected in the decline of the stock market price is reflected in the Composite Stock Price Index (CSPI).

2. Literature Review

2.1. Inflation

Inflation is defined as a phenomenon in which the general price level has increased continuously (Nanga, 2001:241). According to Agustina and Sumartio, (2014) Inflation can be defined as the occurrence of long-term price increases. Inflation is the percentage increase continuously up prices prevailing in an economy. According Tandelilin (2010:212) Inflation increases revenues and expenses. If the increase in the cost of production is higher than the increase in prices that can be enjoyed by enterprises, then the company's profitability will drop.

Indicators are often used by the government to measure the inflation rate in Indonesia is the Consumer Price Index (CPI). CPI changes over time shows the price movement of a package of goods and services consumed by society. Inflationary conditions according to Samuelson (2002), by its nature is divided into three parts: 1. Crawling (Creeping Inflation); 2. Inflation medium (Galloping Inflation); 3. High Inflation (Hyper Inflation).

2.2. Interest Rate

According to Dornbusch et. al. (2008:43), Subagyo et. al. (2002) the rate of interest is the level of payments on loans or other investments, the annual percentage stated. According Tandelilin (2010: 212) increased the rate of interest which will lead to an increase in interest rates is conditioned on investment in shares. The interest rate is the income (for creditors) or expense (For the debtor) received or paid by the creditor or debtor (Madura, 2005). In addition, the rate of interest that increases causing investors to attract investment in stocks and move it to the investment in the form of savings or deposits.

Interest rates prevailing in the financial markets and are used in financial transactions is the nominal interest rate that is therein contained inflation premium (Rahayu and Utami, 2003). According to Agustina and Sumartio (2014) the rate of interest of the financial sector is often used as a guide or reference for investors to assess the ability of financial markets to generate optimal profits is the Interest Rate of Bank Indonesia Certificates (SBI). High Interest Rate SBI is a negative signal for the company's performance. An investor will be looking for places to invest more profitable. If interest rates rise, firm performance will go down and vice versa.

2.3. Rupiah Exchange Rate

According Puspopranoto (2004:212), Dornbusch et. al. (2008:46) The exchange rate is the price of a country's currency is exchanged for another country's currency. The exchange rate is the price of a country's currency expressed in another country's currency (Madura, 2005). According Tandelilin (2010:212) The strengthening of the rupiah against foreign currencies will lower the cost of imported materials for production and would lower the rate of interest applicable.

Exchange rates or currency exchange rates referred to in various transactions or buying and selling foreign currency, known there are four types:
1. Selling rate (selling rate) was determined by a bank for the sale of certain foreign currency at a given time.
2. Middle rate (middle rate) is the middle rate between selling and buying rate of foreign currency against national currency, set by the central bank at a given time.
3. Buying rate (buying rate), the exchange rate is determined a bank to purchase foreign currency to another in a moment.
4. Flat rate (flat rate), the rate erlaku Sale and purchase of bank notes and traveler chaque, where the exchange rate has taken into account the promotion and other costs. The position of the exchange rate fluctuate at any time, if the price of a currency to be expensive compared to other currencies, the currency is said to appreciate. Conversely, if the price of a currency dropped against other currencies then the money is said to depreciate (weakened).

2.4. Gross Domestic Product (GDP)

Gross Domestic Product (GDP) or Gross Domestic Product (GDP) is defined as the market value of all final goods and services produced in a country within a certain time (Mankiw, 2003). according to Marcus (2006), which referred to the GDP is a measure of the total production of goods and services in an economy. GDP differs from gross national product (GNP) for inserting factor income from abroad working in the country, so that GDP only counts the total production of a country, regardless of whether the production was performed by using the factors of production in the country or not. Instead, the Gross National Product (GNP) pay attention to the origin of the factors of production used. Gross Domestic Product (GDP) is divided into two:
1) Real GDP (real GDP) is the value of the production of all goods and services at constant prices.
2) Nominal GDP (nominal GDP) is the value of the production of all goods and services based on the prevailing prices.

Real GDP is better than the nominal GDP in measuring a country's economic welfare. This is due to real GDP is not affected by changes in prices, the Real GDP is a measure of the right to determine the level of production of goods and services of an economy. One of the problems that arise when using Real GDP is a constant price level which serve as the base year prices.

2.5. Composite Stock Price Index (CSPI)

Downes and Goodman (2004) says that the index is a statistical composite that measures changes in the economy or in financial markets, and often expressed in percentage changes from a base year or the previous month. Daily stock price index is calculated using the last stock price (closing prize) that occur on an exchange. This index is a composite of a number of sectors, namely agriculture, mining, chemical industry base, a variety of industrial, consumer goods industry, property and real estate, transportation and infrastructure, finance, trade, services and investment (Rahayu, 2005). This index covers all common stock price movements and preferred stock listed in the Indonesia Stock Exchange (IDX). Thus, the Composite Stock Price Index (CSPI) is a reflection of capital market activity. The size of the index is influenced by economic and non-economic variables. CSPI calculation is based on the number of total market value of shares listed on the exchange. Total market value is the total product of each share was recorded (except for companies that are in the restructuring program) at a price in the Indonesia Stock Exchange (IDX) on that day.

The calculations are as follows CSPI = Market Value / Value Basis x 100.

3. Research Hypotheses

Based on the formulation of the problem and theoretical study, the hypothesis in this study as follows:

1. Inflation significant effect on the stock price index
2. The interest rate significantly influence the stock price index
3. The rupiah significant effect on the stock price index
4. Gross domestic product moderating influence of inflation on the stock price index
5. Gross domestic product moderating influence of interest rate on the stock price index
6. Gross domestic product moderating influence of the exchange rate of the composite stock price index

3.1. Research Methods
The problems that will be the discussion of research is the effect of inflation, the interest rate (SBI), the exchange rate, the Composite Stock Price Index (CSPI) with the gross domestic product as a moderating variable in the Indonesia Stock Exchange.
This research is explanatory research that describes the influence of several variables through hypothesis testing. In this study describes the effects of inflation, interest rates, exchange rate of the composite stock price index by the gross domestic product as a moderating variable.

3.2. Population and Sample
This study uses secondary data from the publication of Bank Indonesia in the form of an annual report of Bank Indonesia, Economic and Financial Statistics Indonesia (SEKI), the results of the Indonesia Stock Exchange covering data Composite Stock Price Index (CSPI), the interest rate of Bank Indonesia Certificates (SBI), inflation, the US dollar against the rupiah exchange rate (US $ / US $), with the middle exchange rates calculated on the basis of selling and buying rate set by Bank Indonesia.

3.3. Data Analysis Techniques, that is:
1. Descriptive statisticsThe measurements by calculating the minimum value, maximum value, mean and standard deviation.
2. InferentialStatistics
   Inferential statistical analysis used to test the research model, and testing hypotheses.

3.4. Model Research
The research model is used to view the exogenous variables that affect the endogenous variables.
The research model is divided into two:
Model 1: The effect of inflation, interest rates, exchange rate of the composite stock price index

$$JCI = a + \beta 1 \ IF + \beta 2 \ SB + \beta 3 \ NT + \varepsilon$$

Model 2: Gross domestic product moderating Effects of inflation, interest rates, exchange rate of the composite stock price index

$$CSPI = \beta 4 \ IF + \beta 5 \ SB + \beta 6 \ NT + \beta 7 \ IF* \ GDP + \beta 8 \ SB* \ GDP + \beta 9 \ NT* \ GDP + \varepsilon$$

Remarks:
CSPI	: Composite Stock Price Index
A	: Constants
$\beta 1$-$\beta 9$	: Regression Coefficients
IF	: Inflation
SB	: Interest Rate
NT	: Rupiah Exchange Rate
GD	: Gross Domestic Product
IF*GDP	: The interaction of inflation with gross domestic product
SB*GDP	: The interaction of inflation with gross domestic product
NT*GDP	: The interaction of inflation with gross domestic product

3.3.1. Feasibility Model (Goodness of Fit)
To assess the accuracy of the sample regression function in assessing the actual value can be measured from its Goodness of Fit (Ghozali, 2013:97). In Statistics Goodness of Fit may be measured by the coefficient of determination and the statistical value F.

3.3.2. The Coefficient of Determination (R^2)
The coefficient of determination is basically to measure how far the model's ability to explain the endogenous variables. The coefficient of determination between zero and one. Rated R^2 is small means that the ability of exogenous variables in explaining the endogenous variables is very limited. A value close to one means the exogenous variables provide almost all the information needed to predict the variation of endogenous variables (Ghozali, 2013: 98). To evaluate where the best regression model using adjusted R^2, unlike the R^2, adjusted R^2 can go up or down if one is added to the exogenous variables in the model.

3.3.3. Partial test (t test)
Accept or reject the hypothesis by looking at the output of SPSS, we can only see the significant value of the t test each variable. Significant value if *** <0.10; ** <0.05 and * <0.001, we can conclude that the hypothesis is accepted (Ghozali, 2013: 89).

4. Results and Discussion

4.1. Descriptive Statistics

Descriptive statistics provide an overview of the research object sampled. Explanation of data through descriptive statistics is expected to give a preliminary picture of the issues examined. Descriptive statistics were focused on the maximum, minimum, average (mean) and standard deviation. Based on the sampling during the years 2005-2015 was obtained 126 observations, descriptive statistics test results shown in table 1.

	N	Minimum	Maximum	Mean	Std. Deviation	IF	SB	NT	GNP	JCI
IF	126	.73	18.38	7.1897	3.66157	1	.847**	-.074	-.547**	-.515**
(SB)	126	5.75	12.75	7.7956	1.83913	.847**	1	-.064	-.633**	-.661**
NT (Rp)	126	8532.00	14396.10	10168.6652	1477.23993	-.074	-.064	1	.670**	.451**
GNP	126	439484,00	797333.00	608580.3651	105694.48559	-.547**	-.633**	.670**	1	.718**
JCI	126	1054.58	5443.52	3186.3369	1346.38713	-.515**	-.661**	.451**	.718**	1
Valid N (listwise)	126									

Table 1: Descriptive Statistics & Person's product moment Correlations

From Table 1, Person's product moment correlations were calculated for inflation variable (IF), interest rates (SB), the Rupiah Exchange Rate (NT), the gross domestic product (GDP) and the Composite Stock Price Index (CSPI). The results showed that the variable IF, SB, NT and GDP correlated significantly with CSPI. Of the four independent variables, gross domestic product (GDP) has the strongest correlation with the Composite Stock Price Index (CSPI) at 71.8% with α: 10%. While inflation (IF) and interest rates (SB) negatively affect the Composite Stock Price Index (CSPI).

4.2. Inferential Statistics

	Composite stock price index		
	β	R²	ΔR²
Step 1		0.615*	
Inflation	0.191***		
Bank interest rates	-0.796*		
Currency	0.414*		
Step 2		0.623*	0.008*
Inflation	0.190***		
Bank interest rates	-0.677*		
Currency	0.287*		
Gross domestic product	0.201**		
***p < .1; **p < .05; *p < .001			

Table 2: Results of multiple regression analyses of inflation, bank interest rates,
Currencies, gross domestic product on composite stock price index

From Table 2: R² explains variants influence IF, SB and NT against CSPI. While the difference in the amount of variance explained ΔR² when GDP variable control variable earlier. The results show that IF, SB and NT accounted for 61.5% of the variance in the stock price index. NT (β = 0414, p <.005) were the strongest predictors, while SB is a predictor of having a negative influence by CSPI. When variable construct GDP in the regression model, all the variables explained 62.3% different forms at CSPI variables. Here proves that the GDP variable control variables before (ΔR² = 0.008).

Independent variables	Dependent variable Composite stock price index		
	β	R²	ΔR²
Step 1		0.536*	
Inflation	-0.174**		
Gross domestic product	0.622*		
Step 2		0.561*	0.025*
Inflation	-1.052*		
Gross domestic product	0.295**		
Inflation x Gross domestic product	0.767*		
Step 3		0.586*	
Bank interest rates	-0.345*		
Gross domestic product	0.499*		
Step 4		0.587*	0.001*
Bank interest rates	-0.216ns		
Gross domestic product	0.615ns		
Bank interest rates x Gross domestic product	-0.106ns		
Step 5		0.517*	
Currency	-0.054ns		
Gross domestic product	0.754*		
Step 6		0.524*	0.007*
Currency	-1.060ns		
Gross domestic product	-0.237ns		
Currency x Gross domestic product	1.828ns		
Step 7		0.623*	
Inflation	0.190***		
Bank interest rates	-0.677*		
Currency	0.287*		
Gross domestic product	0.201**		
Step 8		0.675*	0.052*
Inflation	-0.543ns		
Bank interest rates	1.078ns		
Currency	-1.852*		
Gross domestic product	-0.874ns		
Inflation x Gross domestic product	0.636ns		
Bank interest rates x Gross domestic product	-1.493*		

Table 3: Results of moderated regression analyses for Gross domestic product as the moderator

From Table 3 step 1 and 2, when done IF and GDP regression, linear effects of IF ($β$ = - 0174, $p <.05$) and GDP ($β$ = 0622, $p <.001$) accounted for 53.6% of the variance in CSPI, when added interaction of both, the results indicate rising and significant variance to 56.1%. Figure 1, shows plots of the quadratic effect of the moderation of the GDP in the relation between IF and CSPI, the picture shows that GDP is positively and significantly moderate the relationship between IF and CSPI. Interpretation of the regression line shows that there is an interaction for the outcome variable regression predictor variables change as a function of moderator variables (Cohen et. al., 2003).
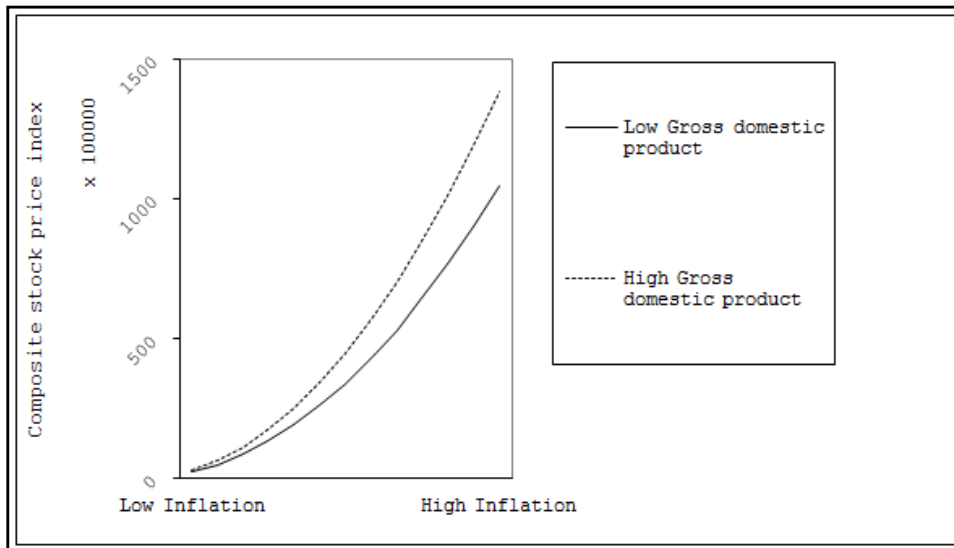
Figure 1: Plots of the quadratic effects moderated of Gross domestic product on relationship of inflation with composite stock price index

From table 3 step 3 and 4, when done SB and GDP regression, linear effect of the IF (β = - 0.345, p <.01) and GDP (β = 0499, p <.001) accounted for 58.6% of the variance in CSPI. When added to the interaction of the two, the results show the value rises and no significant variance becomes 58.7%. Figure 2, shows plots of no quadratic effects of the moderation in GDP in the relationship between SB and CSPI, the picture shows that GDP is positively not significantly moderate the relationship between SB and CSPI. Interpretation of the regression line shows that there is no interaction for the outcome variable regression predictor variables change as a function of moderator variables (Cohen et. al., 2003).
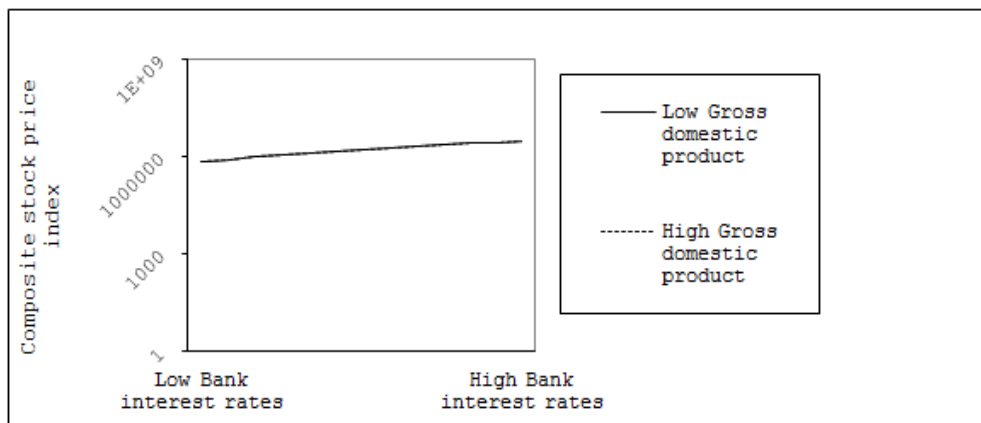

Figure 2: Plots of the quadratic effects moderated of Gross domestic product on relationship of bank interest rates with composite stock price index

From Table 3 step 5 and 6, when done NT and GDP regression, linear effect of NT (β = - 0054, ns) and GDP (β = 0754, p <.001) accounted for 51.7% of the variance in CSPI. When added to the interaction of the two, the results show the value of the variant and no significant rises to 52.4%. Figure 3 shows plots of no quadratic effect of moderating GDP in the relation between NT and CSPI. Figure 3 shows that GDP is positively not significantly moderate the relationship between the NT and CSPI. Interpretation of the regression line shows that there is no interaction for the outcome variable regression predictor variables change as a function of moderator variables or moderating effect was not significant (Cohen et. al., 2003).
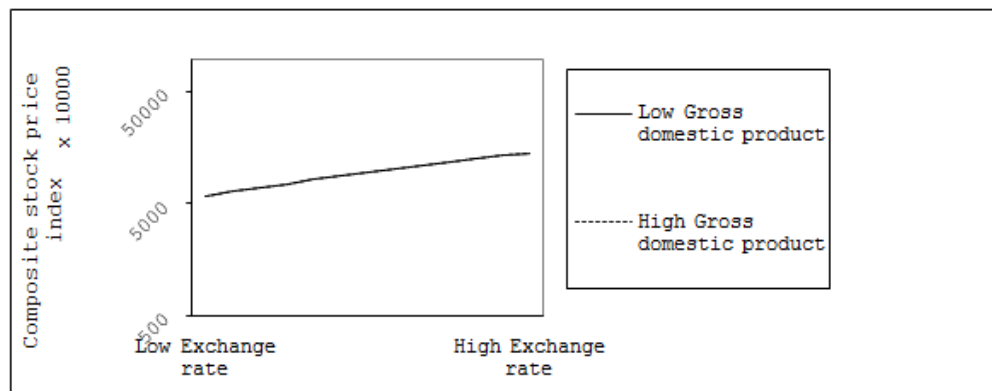
Figure 3: Plots of the quadratic effects moderated of Gross domestic product on relationship of exchange with composite stock price index

5. Conclusion

Based on the analysis and discussion of the results of this study concluded:
1. Inflation, interest rates, exchange rate significantly influence the stock price index.
2. Gross domestic product is significantly moderating the effect of inflation on the stock price index
3. Gross domestic product did not significantly moderate the influence of interest rates and the exchange rate of the composite stock price index

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