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Examining of Contagion Effect in Macro Economics Variable and Indonesia Stock Market: A Regression Approach

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Abstract

This study aims to investigate the macroeconomic variables of Indonesia with a composite stock price index by proposing 4 models of equations into the study using a simple regression analysis model. This research uses economic variable data and composite stock price index during 1984-2017 period. From the research done, it can be explained that for the results of simple regression analysis with models 1, 2, 3 and 4 in the results obtained that between macroeconomic variables and stock price indices combined there is a significant and largely no significant effect by using 4 a simple regression analysis model proposed. This is clarified with the result of correlation test which shows the result of not finding strong correlation between macroeconomic variable and composite share price index in Indonesia. This result is not in accordance with that done by researchers from several countries in Europe in [6,7,8].

Key Words: Macroeconomic variable, IHSG, simple regression, correlation test.

1. Introduction

In the mid-2017 data composite index price index (IHSG) showed a decline for the index of trade, statistically Indonesian domestic macroeconomic data is considered not able to support the rate of this JCI. Many capital market analysts are hoping the value of this JCI can be considered as one of the reference in the prediction of economic activity. But market sentiment generates positive opinions, and considers Indonesia's macroeconomic conditions, to remain hopeful and guided by global markets, particularly Asia and the United States. On the other hand, many capital market analysts are optimistic and confident that Indonesia's capital market trade will have a better impact if it is supported by the more conducive global market of Asia and the United States of America. China is considered as a country with the center of the Asian economy, the capital market is still in a state of lack of enthusiasm and can make the impact on the capital market indoensia.www.kompas.com.

In some financial and economic literature, the impact of macroeconomic variables on the stock market is empirically and extensively analyzed in various writings. The emergence of various motivations in the show with the results of empirical research, using various models and proposals in determining the model of macroeconomic analysis of the stock market. Starting with asset and consumption pricing, make inputs to a range of products within the affected and influencing macro economy. In the economic model proposed by [1] It clearly provides an opinion on the theory of efficient market hypothesis. Where in theory [1] it is argued that asset prices can be a mirror of information in the market.

Therefore, the market will get the latest information such as the surprises and expectations of market participants who can finally explain the economic activity now and in the future.

The existence of a function of the interest rate in the market, which is considered risk free makes one source of securities in the news to be conveyed and that will be identified.

The occurrence of macroeconomic conditions is different from the expectations of market participants, making the effects of these economic mekro affect the stock index. The emergence of various obstacles and various motivations to make market participants should make better analysis and policy, by issuing various models of economic proposals, both real and predictive.

Therefore, this research is conducted to propose a skeleton model in a title Examining of Contagion Effect in Macro Economics Variable and Indonesia Stock Market: A Regression Approach, using the following sections: The second part describes the study of theory, the three-part model of econometric approaches in proposed. Section four results and discussion of the research and the five conclusions of the research conducted.

2. Literature Review

Sampi with the current, has not found a special approach that can provide an explanation on how to know the relationship that occurs between the facto economy and stock. There have been many empirical economic and financial studies that provide an explanation of this. However, other empirical study studies have emerged and provide different and different models of proposals related to economic and stock factors.

The study conducted by [2,3,4,5] is a form of empirical research that explains the economic and stock factors. Various methods and techniques of data analysis are used in explaining the relationship of economic and stock factors. From the study of data analysis techniques that are used, among others, 2SLS, regression and econometric model.

From some of these studies, one of them provides empirical results for the suitability between the methods used, in case studies of stock markets in different countries. Each creates a result of unequal advantages over the use of analytical methods used.

One empirical study tries to decide on several factors that are likely to influence and predict the movement of economic variables and stocks in detail. Using the Turkish stock market case study, and using some macro-economic variables of the Turkish state, as well as stock-market variables, the results of their research show stock market indices can predict with predictive error rates ranging between ten percent. The average misplaced prediction decreases every year, as time goes by, until it reaches a figure of nine point five percent. So that information users and decision makers can explain and retrieve information on their empirical studies.

In other empirical studies [6,7,8], using model and analysis techniques VAR and GARCH model.

Some countries in Europe made as a sample for the analysis of economic factors with stocks. The countries incorporated in the euro made good empirical studies during the period 1994 to 2003.

The results of their empirical studies indicate that the macroeconomic variables of some countries in Europe and other countries in particular have side-by-side and significant effects between macroeconomic variables and stock prices. Empirically from the research they conducted showed significant value of Volatility, if seen the value of stock return, and the occurrence of volatility on stock price in connection with the occurrence of decline in value of shares in several countries in doing research. From their research, the markets in some countries in Europe give negative responsiveness and results, but if we look back at the reactions that occur in the country in the perusal, have a period of economic and financial crisis to a new stage.

3. Research Methods

This research is done by the author in 2017. In this study conducted using macroeconomic variables Indonesia during the period of 1984-2017. The macroeconomic variables in this sample are: exchange rate of rupiah to dollar (US_ $), consumer price index (CPI) of Indonesia gross domestic product (GDP), Indonesian bank interest rate (BI_RATE), inflation rate in Indonesia (INF_IND), world oil price (WP) and composite stock price index (JCI). In this study using multiple linear regression data analysis techniques by proposing 4 data analysis model as follows:

IHSG = a + INF__IND_ + PDB + US_$_RP + WP + BI_RATE + IHK (Model 1)

d(IHSG) = a + d(INF__IND_) + d(PDB) + d(US_$_RP) + d(WP) + d(BI_RATE) + d(IHK) (Model 2)

log(IHSG) = a + log(INF_IND) + log(PDB) + log(US_$_RP) + log(WP) + log(BI_RATE) + log(IHK) (Model 3)

IHSG(-1) = a + INF_IND(-1) + PDB(-1) + US_$_RP(-1) + WP(-1) + BI_RATE(-1) + IHK(-1) (Model 4)

Here is the show for the results of data overview, using the correlation test.

Table 1 : Result for correlation analisys

	BI_RATE	IHK	IHSG	INF__IND_	PDB	US_$_RP	WP
BI_RATE	1						
IHK	0.06970052	1					
IHSG	0.24062712	0.21295888	1				
INF__IND_	0.44986114	0.13688448	0.17177799	1			
PDB	-0.07743169	-0.6250063	-0.5272282	0.13270035	1		
US_$_RP	-0.27403093	-0.5481598	-0.6267644	0.04898509	0.86297011	1	
WP	-0.42875285	-0.6209330	-0.7098392	-0.1851293	0.83778470	0.89618471	1

Sourced: Proceed by author with statistic software

4. Result and Discussion

In one study, there is a proper use of models and theories that make good research. But the end result, from an appearance to the proposed model, makes the analysis more comprehensive. Where the analysis includes all the things and possibilities that will be influenced and influence upon the research phenomenon. Of the several models proposed in this study, the first step and the way to solve an analysis in identifying the less comprehensive submodel. The model proposed in this study is expected to answer and explain the problem of the variables in the study. The following parsimony on the model proposed in this study, as presented in Table 2-5.

Table 2: Result for Regression Model 1

Dependent Variable: IHSG				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	931664.9	206089.2	4.520688	0.0001
INF__IND_	35572.50	59460.64	0.598253	0.5547
PDB	1.860911	1.804905	1.031030	0.3117
US_$_RP	-1.140852	13.74360	-0.083010	0.9345
WP	-14191.28	4090.725	-3.469136	0.0018
BI_RATE	-18356.42	9101.752	-2.016801	0.0538
IHK	-1374.929	511.3924	-2.688599	0.0121
R-squared	0.645249	Mean dependent var		189422.3
Adjusted R-squared	0.566415	S.D. dependent var		217125.1
S.E. of regression	142970.7	Akaike info criterion		26.75991
Sum squared resid	5.52E+11	Schwarz criterion		27.07416
Log likelihood	-447.9184	Hannan-Quinn criter.		26.86708
F-statistic	8.184945	Durbin-Watson stat		1.433045
Prob(F-statistic)	0.000042			

Sourced: Proceed by author with statistic software.

Table 3: Result for Regression Model 2

Dependent Variable: D(IHSG)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-22006.54	21639.45	-1.016964	0.3185
D(INF__IND_)	-31401.05	41218.73	-0.761815	0.4530
D(PDB)	0.807131	2.627756	0.307156	0.7612
D(US_$_RP)	21.02362	13.30532	1.580091	0.1262
D(WP)	5787.063	3908.818	1.480515	0.1508
D(BI_RATE)	61.00628	6580.962	0.009270	0.9927
D(IHK)	127.6550	476.4565	0.267926	0.7909
R-squared	0.214206	Mean dependent var		-4184.580
Adjusted R-squared	0.032869	S.D. dependent var		112057.9
S.E. of regression	110200.9	Akaike info criterion		26.24383
Sum squared resid	3.16E+11	Schwarz criterion		26.56127
Log likelihood	-426.0232	Hannan-Quinn criter.		26.35064
F-statistic	1.181258	Durbin-Watson stat		1.523367
Prob(F-statistic)	0.346685			

Sourced: Proceed by author with statistic software

Table 4: Result for Regression Model 3

Dependent Variable: LOG(IHSG)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	62.58834	25.52610	2.451935	0.0219
LOG(INF__IND_)	0.648668	0.651470	0.995699	0.3293
LOG(PDB)	-0.700617	2.193776	-0.319366	0.7522
LOG(US_$_RP)	-1.368536	0.972368	-1.407427	0.1721
LOG(WP)	-3.302149	1.198394	-2.755479	0.0110
LOG(BI_RATE)	-1.522132	1.258064	-1.209900	0.2381
LOG(IHK)	-3.465321	1.536127	-2.255881	0.0335
R-squared	0.707919	Mean dependent var		10.08619
Adjusted R-squared	0.634899	S.D. dependent var		2.860399
S.E. of regression	1.728356	Akaike info criterion		4.127898
Sum squared resid	71.69314	Schwarz criterion		4.451701
Log likelihood	-56.98242	Hannan-Quinn criter.		4.233450
F-statistic	9.694838	Durbin-Watson stat		1.415950
Prob(F-statistic)	0.000019			

Sourced: Proceed by author with statistic software.

Table 5: Result for Regression Model 4

Dependent Variable: IHSG(-1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	934461.7	209831.8	4.453384	0.0001
INF__IND_(-1)	35817.33	60488.77	0.592132	0.5589
PDB(-1)	1.816141	1.841722	0.986110	0.3332
US_$_RP(-1)	-1.142355	13.98003	-0.081713	0.9355
WP(-1)	-14225.32	4162.569	-3.417438	0.0021
BI_RATE(-1)	-18077.59	9302.659	-1.943271	0.0629
IHK(-1)	-1381.300	520.6025	-2.653273	0.0134
R-squared	0.638100	Mean dependent var		195106.8
Adjusted R-squared	0.554584	S.D. dependent var		217907.2
S.E. of regression	145430.2	Akaike info criterion		26.79861
Sum squared resid	5.50E+11	Schwarz criterion		27.11605
Log likelihood	-435.1771	Hannan-Quinn criter.		26.90542
F-statistic	7.640494	Durbin-Watson stat		1.439144
Prob(F-statistic)	0.000085			

Sourced: Proceed by author with statistic software.

In designing a regression model, the predictor variable is considered as a continuous variable that will be used as the main effect tool of an ANOVA design model. The ANOVA model is an analysis model for predictor variables in a multiple regression analysis, which contains 2 and more variables that will be predicted in a model. Multiple regression analysis model is designed with the

form of equation in which there are some continuous predictor variables that are considered as the main effects of an ANOVA model design. The ANOVA design model is the result of predictor variable analysis containing simple regression design for 2 and more continuous predictor variables. The form of the first-order effect equation of three continuous predictor variables is considered as P, Q, R, which becomes an equation as below:

Y = b0 + b1P + b2Q + b3R of the 4 models of simple regression design proposed, can be viewed the results as the form of equation below, with the form of modeling simple regression analysis for models 1 to model 4 as follows:

Estimation Command:
=========================
IHSG = 931664.893432 + 35572.502404*INF__IND_ + 1.86091088973*PDB - 1.1408524187*US_$_RP - 14191.2820081*WP - 18356.4193235*BI_RATE - 1374.92910422*IHK

Estimation Command:
=========================
D(IHSG) = -22006.5424873 - 31401.0499252*D(INF__IND_) + 0.807131172632*D(PDB) + 21.0236240156*D(US_$_RP) + 5787.06332204*D(WP) + 61.0062770192*D(BI_RATE) + 127.654978358*D(IHK)

Estimation Command:
=========================
LOG (IHSG) = 62.5883446178 + 0.648667568836*LOG(INF__IND_) - 0.700616627611*LOG(PDB) - 1.36853606771*LOG(US_$_RP) - 3.30214890386*LOG(WP) - 1.52213246081*LOG(BI_RATE) - 3.4653205096*LOG(IHK)

Estimation Command:
=========================
IHSG(-1) = 934461.744437 + 35817.327621*INF__IND_(-1) + 1.81614147678*PDB(-1) - 1.14235491935*US_$_RP(-1) - 14225.320961*WP(-1) - 18077.5852146*BI_RATE(-1) - 1381.30033962*IHK(-1)

There are 4 model estimates of multiple regression equations generated from 4 models of simple regression analysis proposed, first with simple simple regression models, simple regression with Different modeling, three simple regression modeling with log form analysis, and last simple regression modeling with model one year off. With this proposed model, in a simple regression analysis, there are 4 analysis results for economic factors and composite stock price indexes analyzed.

5. Conclusion

In doing simple regression modeling, analysis technique with modeling can be done by gradually making the form of regression design analysis using single

dependent variable modeling, but in this study different model of regression modeling analysis is used, as described in Darlington , (1990); Hocking, (1966), Lindeman, et, all, (1980); Morrison, (1967); Neter, et, all, (1985); Pedhazur, (1973); Stevens, (1986); Younger, (1985). In their regression analysis model, using the basic procedure model by involving the initial identification model, then performing a recurring step for the proposed model by adding or omitting one component of the predictor variable considered the outlier. And last use the analysis model of stepping criteria for the determination that has been achieved. In the analysis of this study has a number of implications for policymakers in economic and capital markets, but this study has provided evidence that the relationship between macroeconomic variables and the composite stock price index over time as shown in the 4 models propose.

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