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The Impact of Macroeconomics and Financial Variables on Sectors' Index in Indonesia Stock Exchange Market

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Abstract: The main purpose of this study is to know the impact of macroeconomics and financial variables on sectors' index in Indonesia stock exchange market. This main purpose is breakdown into several details in order to know the impact macroeconomics variables and financial variables separately on each sector index. The data use in this study is quarterly data from June 2009 until September 2015 of GDP, inflation rate and interest rate as macroeconomics variables. The financial variables consist of: PER, PBV, NPM and ROE. Consumer goods and financial industries are chosen as sample sectors by using purposive sampling method. Simple random sampling is used to choose the companies in those two sectors as samples. The samples are 9 companies in consumer goods industry and 18 companies in financial industry. In this study, seven regression models were constructed. The regression results of the study showed that the R-square are ranges from .013 up to .577. The highest R-square of .577 is in the impact of financial variables on companies' stock prices in financial sector industry, whereas the lowest R-square of .013 is in the impact of macro economics variable on companies' stock prices in both consumer goods and financial sector industries simultaneously. In all models the interest rate is consistently have negative relation with stock price, while GDP and inflation rate have positive relation with stock price. PBV and ROE have positive relation with stock price. PER and NPM have mixed relation with stock price, in some model it was positive while in other model negative. The test of hypothesis in all models had sig F value of 0.000 to 0.026, which is still smaller than 5% (α). This means that both macroeconomics as well as financial variables had significant effect on sectors' index.

Key words: GDP, inflation rates, interest rate, PER, PBV, NPM, ROE, sector index

INTRODUCTION

The International Finance Corporation, as a part of World Bank, categorize the capital market in Indonesia as a growing rapidly market. Campbell R Harvey in 1995 found out some interest things in the emerging capital market. First, a growing capital market is an attractive investment for investors who have portfolio

investments abroad, since this market has a hedging function for portfolio investment as the return in this market influenced only by local information. Second, the return in emerging capital market are more predictable than that in developed capital market, Campbell R Harvey and Geert Bekaert in 1997 studied the relationship between capital market to economic growth. They found that efficient capital market will drag the discount rate down. Lower discount rate will attract multinational company to make a long term commitment in a direct investment to the country that would be beneficial to the local economy, such as more job opportunities, long term foreign direct investment, and transfer knowledge to the local people. As a result, it will contribute positive impact to economic growth. The other study of King and Levine in 1993 showed countries that have higher indicator financial development in some point will have higher real GDP growth. Indonesia economics growth rate started from 2004 to 2013 showed a moderate growth based on macroeconomics indicator. The highest growth rate reached at 6.5% in 2011. GDP per-capita was Rp33.7 million in 2012 (National Development Planning Agency).

Indonesia stock exchange (IDX) is one experiencing of rapid growing market in Asia. Indonesia's Financial Service Authority statistic data on January 2014 showed the composite index, increased from 2745.83 in 2007 to 4274.18 in 2013; an increased of 55.66% in 7 years. In the same period, the listed companies increased 26.11% from 383 companies to 483 companies. Respectively, the market capitalization is started from US\$ 211.1 billion in 2007 become US \$ 343.85 billion, reached 62.88% increased.

There are 10 sectoral stock indices on the Indonesia Stock Exchange, namely: agriculture, mining, basic industries, various industries, property, consumer goods, infrastructure, finance, trade and manufacturing. On January 3, 2014 the position of the highest sectoral stock indices achieved by the agricultural sector amounted to 2076.66 while the lowest level of 339.04 was the property sector. However, the sectoral index growth from 2013 to 2014 were achieved by positive growth: industrial consumption (1.27%), basic industries (0.77%), property (0.61%), manufacturing (0.53%) and trading (0.13%). While the agricultural sector decreased by 2.95% from 2013 to 2014. (Financial Services Authority capital market statistics).

Based on findings previously mentioned, this research is focusing on study of The Impact of Macroeconomics and Financial Variables on Sectors' Index in Indonesia Stock Exchange Market.

Research problem's formulation in this study is: do macroeconomics and financial variables have significant impact sectors indices in Indonesia Stock Exchange?

The research's objectives are to measure how strong the impact of each macroeconomics and financial variables on companies' stock price in each sector.

RESEARCH HYPOTHESIS

The research hypothesis of the study is to predict that: (i) the macroeconomic and financial variables have significance impact on sector indices, (ii) the macroeconomic variables have significance impact on sector indices, (iii) the financial variables have significance impact on sector indices and (iv) financial variables have more significant impact on sector indices compare to that of macroeconomics variables.

RESEARCH SCOPE

This research is limited to shares listed on the Indonesia Stock Exchange, from 2009 to 2015 This seven year period is selected as it is assumed that the impact of the global economic recession has been overcome in Indonesia, therefore it is expected that the variables used in this research has fairly fluctuations.

The macroeconomic variables used in this research is limited to: GDP, inflation and interest rates. Financial variables used in this study are: price-earnings ratio, market to book ratio, net profit margin and ROE.

Indonesia Stock Exchange (IDX) have 10 sector indices with approximately more than 400 issuers are listed. Because of limited time and funds, this study use a simple random sampling in selecting sectors and companies. The sector index consists of a collection of many companies and it is measured using the weighted average over certain variables to calculate the index number. In this research the price of the companies' stock is used as a proxy to measure sector index.

THEORETICAL FRAMEWORK

Sector indices are formed by weighted the performance of companies' shares which are a component to the sector. Therefore, the performance of sector stock indices implicitly reflects the performance of companies' shares that made those the index. Market value weighted index is measured by calculating the weighted average return of each stock in the index, using proportional weights of outstanding market value.

In the dividend growth model, the stock value is influenced by dividend, required return and dividend growth (Gitman 2006). Constant growth models assume the dividend will grow at a constant growth rate (g), with the assumption that the growth rate is smaller than the required return. This model is most often used.

$$P_0 = \frac{D_1}{k_s - g}$$

Whereas:

P_0 is the current intrinsic stock price

D_1 is the estimated dividend at the upcoming period

K_s is the required return

G is the estimated dividend growth rate that are assumed by constant

In the real world, some discussion about the market valuation over stock is primarily concentrated to *price earnings multiple* or known as P/E ratio, which is a ratio between stock price per-share towards earning per-share. The stock value is obtained by multiplying earning per share projection with calculating the estimated P/E ratio. The earnings of a company depend on an international, macroeconomic, industrial scale and the specific factors of the company itself. (Bodie, Kane, Marcus 2003).

PREVIOUS RESEARCHES

A study by Chengjian Su "An Empirical Investigation of the Multi-factor and Three Factor Pricing model in Chinese Stock Market" empirically shows that EPS has a strong positive impact towards stock price. While the GDP growth rate, money supply, deposit interests and inflation rate has a negative impact towards stock price.

A research conducted by S.U.R. Aliyu, “Does Inflation has an impact on stock and volatility? Evidence from Nigeria and Ghana” shows that in Nigeria, receiving bad information gives a bigger impact towards stock return and its volatility compared to good information. On the contrary, it happened in Ghana. Furthermore, a 3 monthly inflation rate has a significant impact towards stock returns and its volatility.

An empirical reserach by Tarikha Singh, Seema Mehta and M.S Varsha, “Macroeconomic factors and stock returns: Evidence from Taiwan”, empirically shows that GDP and exchange rate gives an impact towards all portfolio returns, while inflation rate, exchange rate and the amount money supply are negatively correlated to portfolio return for big and medium-sized enterprises.

A thesis by Achmad Ath Thobarry, “The Analysis of influence on exchange rate, interest rate, inflation rate and GDP growth rate toward Stock Prices Indices in Property Sector”, found out that exchange rate and inflation rate have significance influence toward property stock price index. On the other hand, interest rate and GDP growth rate effect property stock price index when it was tested partially.

RESEARCH METHODOLOGY

This study is an explanatory research method using quantitative data; to explain the impact of macroeconomics and financial variables on sectors' index in Indonesia stock exchange market. This main purpose is breakdown into several details in order to know the impact macroeconomics variables and financial variables separately on each sector index.

Population and Sample

Population in this study is the data of GDP, inflation rate and interest rate as macroeconomics variables. The financial variables consist of: PER, PBV, NPM and ROE of companies in consumer goods and financial industries listed in Indonesia Stock Exchange market (IDX).

The data use in this study is quarterly data from June 2009 until September 2015 of GDP, inflation rate, interest rate, PER, PBV, NPM and ROE. In this research consumer goods and financial industries were chosen as sample sectors using purposive sampling method. The criteria used in choosing samples are: sectors in IDX that had the biggest capitalization in transaction at January 2nd 2016.

January 2016 was chosen since it was the start of new transactions day for the year and it was the newest year of transaction in IDX. At that date, the financial sector had 25.30% capitalization and consumer goods sector had 19.7%. The capitalization of both sector comprise up to 44.97% capitalization in IDX.

Simple random sampling is used also in choosing the companies in consumer goods and financial industries. Since not all the companies has comply the criteria in this study; therefore some companies chosen have to be dropped from the samples. This study came up with 9 companies in consumer goods industry, they are: KDSI, ULTJ, GGRM, UNVR, TSPC, DVLA, AISA, CEKA. In the financial industry 18 companies were chosen, they are: SMMA, BFIN, MCOR, BBKA, AMAG, BNBA, SDRA, INPC, BMRI, ADMF, MFIN, NISP, ASDM, MREI, BNLI, BACA, BVIC, BBNI. Overall, this research is using data panel with an N of 702.

Sources of the Data

This study uses secondary data. Sources of data in this research are from the central statistic bureau, central Bank (Bank Indonesia), Indonesia stock exchange market and Bloomberg.

Statistical Analysis

This study uses multiple regression analysis technique, using SPSS program. The model is as follows:

$$\hat{Y} = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + e$$

where:

\hat{Y} is companies' stock price

X_1 is GDP at current price

X_2 is inflation rate

X_3 is the rate of interest

X_4 is Price earning ratio (PER)

X_5 is market to book ratio (PBV)

X_6 is net profit margin (NPM)

X_7 is return on equity (ROE)

a is constant

b_i is regression coefficient

e is error term

Seven regression models are designed in this study; each regression model is constructed by using the combination of all the above variables. These models are designed using combination of dependent and independent variables. These specific regressions models are needed in order to be able to answer the research problems. The first regression model is a complete model which includes all the research variables. In the second and third regression models, independent variables are separated into macroeconomics variables and financial variables. In fourth and fifth regression models, stock price of companies in the financial sector is used as dependent variable. In sixth and seventh regression models, stock price of companies in the consumer goods is used as the dependent variable.

The null and alternative hypotheses

The test of the significance of the relationship between the dependent variable and the explanatory variables is as follow:

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0.$$

There is no significant influence of macroeconomics and financial variables on stock price in consumer goods and financial industries

$$H_a: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0.$$

There is significant influence of macroeconomics and financial variables on stock price in consumer goods and financial industries

The null and alternative hypotheses will also be applied to the other six regression models.

RESULT OF THE STUDY

Test of Classical Assumptions

In table below, the Durbin-Watson (DW) for all regression models is in the range of $-2 \leq DW \leq 2$. This means that there is no autocorrelation among variables in all regression models. The result of normal probability plots for all models show that the data are normally distributed. In this study, the scatter diagram as a result of run data show that there are no heteroscedasticity. A multicollinearity exist when the value of Variance Inflation Factor $> 1/\alpha$. With an $\alpha = 5\%$, all VIF values for the independent variables are less than 20. Therefore there is no multicollinearity among independent variables in the regression model

Analysis of Regression Result

The table below shows summary of regression result, R, R square, F sig and DW for the models.

Table
Regression result of the models

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>
	<i>All sector</i>	<i>All sectors</i>	<i>All sectors</i>	<i>Financial sectors</i>	<i>Financial sectors</i>	<i>Consumer goods</i>	<i>Consumer goods</i>
constant	850.48	1,416.54	4,159.08	729.15	-1,916.76	2,791.34	4,159.08
GDP	.002	.002		.001		.005	
Inflation rate	265.42	279.64		94.7		649.51	
Interest rate	-333.32	-342.65		-133.13		-707.69	
PER	1.07		.06		-.01		-.060
PBV	3.58		58.89		1,936.84		58.89
NPM	-30.11		-28.37		3.5		-28.37
ROE	55.14		35.51		68.63		35.51
R	.173	.115	.129	.167	.760	.149	.129
R square	.30	.013	.017	.028	.577	.022	.017
Sig F	.004	.026	.020	.004	.000	.16	.02
DW	.094	.081	.096	.082	.172	.087	.096

Sources: processed data

The first regression model is a regression of stock prices of all 27 companies with all independent variables. The regression result is:

$$Y = 850.48 + .002 X_1 + 265.42 X_2 - 333.32 X_3 + 1.07 X_4 + 3.58 X_5 - 30.11 X_6 + 55.14 X_7$$

The intercept of 850.48 is an estimates value of stock price when all macroeconomics and financial variables are zero. The regression coefficient of X_1 is 0.002; this means that assuming all other independent variables are constants, an increase of one billion of GDP will increase stock price by Rp0.02. The regression

coefficient of X2 of 265.42 means that one percent increase in inflation rate will increase the stock price by Rp265.42 assuming all other independent variables are constant. The regression coefficient of X3 is -333.32; this means that assuming all other independent variables are constants, an increase of interest rate by one percent will decrease stock price by Rp333.32. The regression coefficient of X4 of 1.07 means that an increase of PER by 1 point will increase the stock price by Rp1.07 assuming all other independent variables are constants. The regression coefficient of X5 is 3.58; this means that an increase of PBV by 1 point will increase stock price by Rp3.58 assuming all other independent variables are constants. The regression coefficient of X6 is -30.11; this means that an increase of NPM by 1% will decrease stock price by Rp30.11 assuming all other independent variables are constants. The regression coefficient of X7 of 55.14 means that one percent increase in ROE will increase the stock price by Rp55.14 assuming all other independent variables are constant. The same explanation pattern of coefficient regression for the other six regression models will also apply.

GDP, inflation rate, PBV, ROE in all models have positive correlation to stock price; while interest rate has negative correlation to stock price in all models. PER, on the other hands, has mix correlation with stock price. PER has negative correlation with stock price in fifth and seventh regression model, and it has positive correlation in first and third models. The mix correlation of dependent and independent variable also happened to NPM. The NPM has negative correlation to stock price in first, third and seventh models.

An increase in GDP will increase peoples' income in general; with increasing wealth, people will be able to invest their money in the stock market by buying stock. Increase demand for stock eventually will increase the stock price.

In the condition of very high inflation people will prefer invest in real assets; this is because the monetary value of real assets will increase as inflation increase. A country is considered to have a very high inflation when its inflation rate is two digits (Samuelson, 2005). In the market, the fluctuation of stock price is high. That is why investing in stock is considered to be a high risk investment. In this study inflation has positive correlation with stock price. During the period of observation of this study, range of inflation rate in Indonesia was between -0.35% up to 2.46% quarterly. During that time Indonesia was experienced relatively low inflation rate. In the condition of low inflation rate people still interested in investing in stock. This is the explanation of why result of this study showed that inflation has positive correlation with stock price.

In this study, the finding that interest rate has negative correlation to stock price in all regression model is consistent with the theory of interest rate. During the period of low interest rate, people will prefer to use their money to buy stock as an alternate investment. When the rate of interest is high, people will prefer invest their money in the bank rather than invest it in stock

High price to book value ratio means that the stock has high market value. This high market value will drive people to buy that stock; this increase in demand in turn will increase the stock price. The PBV for companies in consumer goods industry are mostly above one, except for KDSI and CEKA. The PBV of KDSI is 0.4 and for CEKA is 0.99. The highest PBV is for UNVR with an average value of 38.6. The companies in financial industry have average PBV within the range of 0.5 up to 4.3. There are six companies in this industry that have PBV below one, they are: AMAG, BNBA, INPC, ASDM, BACA and BVIC. Overall, average PBV for consumer goods industry is 6.27 and for financial industry is 1.54.

ROE is one of financial ratio use to measure return earned by shareholders for their investment in that company. Average ROE in the consumer goods is 24.54% and that in financial industries is 17.21%. Result of the study showed that the higher the ROE the higher the stock price. This is true, since one of the reasons why people do investment is in order to earn a return.

NPM can be used as a signal whether company's team management has managed the company's day to day operational well. A good NPM mean a signal for good management and a poor NPM mean poor management of a company. In this study NPM is used in four regression model. In the models in which NPM has negative correlation with stock price; they have low coefficient of correlations. Whereas in the model that NPM has positive correlation with stock price, it has high coefficient of correlation. The same case also happened for PER, it has mixed correlation with stock price.

Result of Coefficient of Determination

The coefficient correlation for six regression model are low, it ranges from 0.013 to 0.173. Both macroeconomic variables and financial variables in those six models have low correlation with stock prices. However, in the 5th model, the correlation of financial variable to stock price is strong. It has coefficient correlation of 0.76. The highest R-square is 0.577; this means that PER, PBV, NPM, ROE simultaneously can explain 57.7% of stock price's fluctuation in financial sector, whereas other 42.3% is explain by other factors.

Testing of Hypothesis: Simultaneous Relationship

The test of hypothesis in all models had sig F value of 0.000 to 0.026. Using $\alpha = 5\%$, all sig F value are smaller than 5% (α); H_0 is rejected (accept H_a). This means that GDP, inflation rate, interest rate, PER, PBV, NPM, and ROE had significant influence on companies' stock price in consumer goods and financial industries.

CONCLUSION

In all models, the impact of macroeconomics and financial variables on companies' stock price in consumer goods and financial sector are significant. In general, financial variables have greater impact on stock price compare to that of macroeconomics variables. Macroeconomic variables as well as financial variables are both have higher impact in financial sector compare to that of consumer goods.

REFERENCES

- Aliyu, S.U.R, "Does inflation has an impact on stock returns and volatility ? Evidence from Nigeria and Ghana", JEL Clasification E 3, E 31, E 5, G 15. S.U.R Aliyu, Associate Professor of Economics in the Department of Economics at Bayero University, Kano Nigeria. Available in <http://www.csae.ox.ac.uk/conferences/2011-edia/papers/054-aliyu.pdf>
- Bekaert, Geert and Campbell R Harvey, "Capital markets: An engine for economic growth" *The Brown Journal of World Affairs* 1998 Vol 5 (1) . Available in <https://scholar.google.com/citations?user=cajqjGAAAAAJ&start=80&pagesize=20>
- Berenson, M.L. and Levine, D,M *Basic Business Statistics, Concepts and Applications*, 6th edition, Prentice Hall 1996.
- Bodie, Zvie, Alex Kane, Alan J Markus. "Essentials of Investments" 5th edition Mc. Graw Hill International edition 2003.
- Harvey, Campbell, "Predictable risk and returns in emerging market", *Journal Review of Financial Studies* 1995 Vol 8(3), July 1995. Available in https://scholar.google.com/citations?view_op=view_citation&hl=en&user=cajqjGAAAAAJ&citation_for_view=cajqjGAAAAAJ:hMod-77fHWUC

- King, Robert G., and Ross Levine. "Finance and Growth : Schumpeter might be right". *The Quarterly Journal of Economics*" Vol 108(3), Oxford Journal, 1993.
- Samuelson, P. and Nordhaus. *Economics*. 17 edition, International edition, Mc Graw Hill Irwin 2005.
- Singh, T., Seema Mehta., and M.S Varsha, "Macroeconomic factors and stock returns: Evidence from Taiwan." *Journal of Economics and International Finance* Vol 2(4), April 2011.
- Su, Chengjian. "An Empirical Investigation of Multi-factor and Three-factor Pricing Model in Chinese Stock Market". School of Business at Shanlou University, Shantou City, Guangdong Province, zip code 515063, China. Available in <http://www.cicfconf.org/past/cicf2006/cicf2006paper/20051115105527.pdf>
- Tian, G G., and Ma, S. "The relationship between stock returns and the foreign exchange rate: the ARDL approach." *University of Wollongong Research Online, Faculty of Commerce Papers (Archive), Faculty of Business*. 2010.
- Thobarry, A. A., "Analisis Pengaruh Nilai Tukar, Suku Bunga, Laju Inflasi dan Pertumbuhan GDP Terhadap Indeks Harga Saham Sektor Properti" Kajian Empiris Pada Bursa Efek Indonesia periode pengamatan tahun 2000-20008, Master Thesis, Master Program, Diponegoro University, Semarang.

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www.ojk.go.id