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MACROECONOMIC CAUSALITY TOWARD SHARE PRICE OF STATE OWNED ENTERPRISES

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ABSTRAK

Penelitan ini bertujuan untuk mengetahui hubungan kausalitas variabel-variabel makroekonomi terhadap harga saham BUMN (Badan Usaha Milik Negara) yang tercatat di BEI (Bursa Efek Indonesia). Variabel makroekonomi meliputi pertumbuhan ekonomi, inflasi, kurs dan Jumlah Uang Beredar (JUB) dan harga saham BUMN bidang Infrastruktur meliputi PT. Perusahaan Gas Negara, Tbk, harga saham PT. Telekomunikasi Indonesia , Tbk dan harga saham PT. Jasa Marga, Tbk. Penelitian ini menggunakan pendekatan Vector Autoregrresion pada tingkat First Difference dan Kausalitas Granger. Hasil penelitian ini menunjukkan pertumbuhan ekonomi memiliki pengaruh positif signifikan, tidak terjadi hubungan kausalitas terhadap harga saham PT. Jasa Marga, Tbk serta negatif tidak signifikan pada harga saham PT. Perusahaan Gas Negara dan PT. Telekomunikasi Indonesia hubungan kausalitas searah terjadi pada harga saham PT. Perusahaan Gas Negara, Tbk dan PT. Telekomunikasi Indonesia, Tbk. Inflasi memiliki pengaruh postif tidak signifikan terhadap ke tiga harga saham BUMN bidang infrastruktur dan tidak terjadi hubungan kausalitas pada harga saham PT. Telekomunikasi Indonesia, Tbk dan PT. Jasa Marga, Tbk.

Kata kunci : kausalitas granger, harga saham, makroekonomi, infrastruktur

ABSTRACT

This research is aimed to determine causal relationship of macroeconomic variables toward stock prices SOE (State Owned Enterprises) listed on IDX (Indonesia Stock Exchange). Macroeconomic variables include economic growth, inflation, exchange rates and the Money Supply and the price of state-owned shares of PT. *Perusahaan* Gas Negara Tbk, PT. Telekomunikasi Indonesia, Tbk and PT. Jasa Marga Tbk. This research uses Vector Autoregrresion approach at the level of First Difference and Granger Causality. The results of this research shows that, economic growth gives positive effect significantly. There is no causal relationship occured to the price of PT. Jasa Marga, Tbk share and unsignificantly brings negative effect to the stock price of PT. *Perusahaan* Gas Negara and PT. Telekomunikasi Indonesia, Tbk. Direct causality happens to the price of PT *Perusahaan* Gas Negara Tbk and PT. Telekomunikasi Indonesia Tbk shares. Inflation brings positive effect, but does not occur to the price of state-owned shares in infrastructure sector significantly. There is no causal relationship to the price of PT. Telekomunikasi Indonesia, Tbk, and PT. Jasa Marga Tbk share.

Key words: granger causality, stock price, macroeconomics, infrastructure

INTRODUCTIONS

Economic and financial developments of regional and global influence on the financial sector and infrastructure development in Indonesia. According to the annual report of Bank Indonesia's economy in 2008 the global financial crisis has changed the order of the world economy, the global crisis that originated in the United States in 2007, its impact is felt throughout the world, including developing countries such as Indonesia in 2008. A number of policies were very aggressive at the global level has been done to restore the economy. In Indonesia, the

impact of the crisis began to be felt especially towards the end of 2008 economic growth above 6% until the third quarter of 2008, Indonesia's economy started to get severe pressure in the fourth quarter of 2008. This was reflected in an economic slowdown significantly mainly because of the drop in performance export. On the external side, Indonesia's balance of payments deficit has increased and the exchange rate has depreciated significantly.

The Indonesian economy in 2010 shows that progress is quite good. Indonesia is able to achieve positive growth during the global financial crisis and has gained credence in the eyes of the international community. This is evidenced by the growing Indonesia ranked on the Global Competitiveness Index for 2010-2011 issued by the World Economic Forum. Therefore Indonesia also experienced an increase in the investment grade rating, so the trustworthiness of the Indonesian capital market. Indonesia's macroeconomic indicators for 2010 show an improvement in the economy of Indonesia. Indonesia's economic growth managed to advance at a rate of 6.1%, while the rate of inflation until November successfully detained at the level of 6.33% (yoy). This is supported by low interest rates BI maintained at 6.5%.

Increased investment in the Indonesian capital market is an instrument in the eyes of global economic growth can not be separated from the various environmental effects, both environmentally, economically and environmentally non-economic.

Macroeconomic conditions, such as economic growth, inflation, exchange rates, and the Money Supply effect on the growth of capital markets in Indonesia. Similarly, the non-economic factors, such as political unrest, changes in government systems and other factors that interfere with national security, it is closely related to the stability of the economic activities of the country and affect the stock price fluctuation in the Indonesia Stock Exchange (IDX). The greater the role of the stock exchange in the economy of a country, the economic pro- blems will also be more sensitive.

Capital markets have an important role for the economy of a country because the capital markets function as a means of funding for business or a means for companies to obtain funds from investors involving the full potential of public funds. From here it can be seen that the capital market can meet the funding requirements for the private sector, the government and state enterprises. But many people who do not understand and are willing to take advantage of capital market as a source of their financing. It should be wiped out by socializing the community about the importance of the capital market. The main function of the capital market is as a means of capital formation and accumulation of funds for financing a company or issuer.

There are three main goals of the annual capital market. First, accelerate the process of expansion including this sort of society in the possession of the company's shares. Second, the Equalization of income for the community and the third, increase public participation in gathering together the funds productively. One effort so that communities want to make investments is the investment safe and transparency. Indicators that can be used as consideration for investors in investment that is information about the company's success in managing the wealth of the company. The existing capital market in Indonesia is emerging markets (emerging market) which in its development are particularly susceptible to macroeconomic conditions in General (Muklis, 2016).

Presence infrastructure, utilities and transportation is very important in supporting economic and social development as a good infrastructure can improve the effectiveness and efficiency both for businesses and for social. Infrastructure investments are often associated with capital-intensive investment (capital intensive) with a recovery rate (rate of recovery) investment is slow and long. During the recovery period, investors should be prepared to accept the

risk with profiles that constantly change with the project life cycle (Wibowo, 2006), with adequate infrastructure, the cost of production, transportation, communications and logistics getting cheaper, the amount of production increased, operating income increased, thus increasing incomes. The availability of infrastructure is also accelerating equitable development through infrastructure development tailored to the needs of each and between regions so as to encourage new investment, new jobs and increasing incomes and welfare.

Connectivity between a country's population is also getting closer and opened isolated for backward society. There are some government corporations or State-owned Enterprises which is engag- ed in infrastructure among other energy sub-sectors, sub-sectors of highways, airports, ports and the like, the telecommunications sub-sector, the transportation sub-sector, non-construction construction subsector. This research will focus on three sectors, namely energy sub-sectors, sub-sectors and subsectors of toll roads and telecommunications.

Energy subsector is the most important sector in economic development and the need for continued attention. Development of the energy sub-sector is expected to attract investors for this sub-sector has a big opportunity. There are two things that become a barrier to the gas business, the lack of infrastructure and proper pricing policies that have not still continue to be pursued in order to increase gas consumption is higher in the future. Infrastructure for the company has profits but also great risk. When building the infrastructure, the company may not obtain cost recovery for infrastructure development as well as the rules whereby the gas purchased from producers should still be paid even though the gas in the market are not absorbed or not sold. There are several companies in the energy subsectors one of them is PT. Perusahaan Gas Negara (Persero) Tbk. Subsector toll roads, airports, ports and the like have a few companies one of which is PT. Jasa Marga (Persero) Tbk. The company is engaged in the implementation of toll road projects and is the largest toll road company in Indonesia. Companies in the sub-sector toll roads, airports, ports, and the like are at risk in the face that the land acquisition, construction delays and other risks in building highways. Jasa Marga 2015 manages more than 531 km of highways, or 76% of total toll roads in Indonesia.

The third subsector is the telecommunications subsector. One telecommunications company in Indonesia, PT. Telekomunikasi Indonesia (Persero), Tbk. In the telecom companies are a tight competition include service charges, network, service quality and availability of services it raises its own beliefs on society. Provision of telecommunications services diversified capital intensive. Companies are constantly searching for effective fund-owned company rooted in the work of the operational or financial institutions, capital markets, and vendor financing.

There are many examines macroeconomics causality toward share price. Some of them are Singh (2010) aim to find out and study the causality, if any, between stock market and three key macro economic variables in Indian economy. The results that have been found are mixed and ambiguous as there is undoubtedly strong correlation between BSE Sensex and IIP, Sensex and WPI but not between exchange rate and Sensex. Although there is strong correlation between the Sensex and macroeconomic variables even then the causality that has come out is just amongst one macroeconomic variable (IIP) and stock market variable which further strengthens the issue that stock markets in India are in their nascent phase as their impact on macroeconomic variables is less as that in developed countries and moreover effect of macroeconomic variables is weak on stock market index in case of causality.

Poluan (2013) with research The Influence Of Macroeconomic Factors On Stock Return Listed In Composite Stock Price

Index (IHSG) From 2008–2012 concluded that Gross domestic Product, inflation, money supply, interest rates and exchange rates have a relationship that is strong and supported by level significance. This occurs because of investment growth in a country influenced by the economic growth that country. The better the level of the economy countries, the better the welfare level of the its citizens. the level of the higher than prosperity generally characterized with the increased the level of income.

Hosseini *et al*., (2011) examines the relationship between stock market indices four macroeconomic variables (crude oil price, money supply, industrial production, and inflation rate) in China and India. They concluded that all variables are insignificant with stock market indices in China and India.

Saeed (2012) examines the macroeconomic variables (money supply, exchange rate, industrial production, short term interest rate and oil prices) and nine stock sectors in Pakistan. These sectors are oil and gas, textile composite, jute, cement, cable and electrical goods, automobile, chemical and pharmaceutical, leasing and glass, and ceramics. He concluded that macroeconomics variables have significant impact on the returns of sectors but their contribution to bring variation in their return is very small. Only short term interest rate has a significant impact on return of various sector where as exchange rate and oil prices have significant impact on specific sectors like oil and gas sector, automobile, and cable and electronics.

Maghayereh (2003) examines "Causal Relations among Stock Prices and Macroeconomic Variables in the Small, Open Economy of Jordan". The result are Using Johansen's methodology for multivariate cointegration analysis and monthly time-series data, this paper investigates the long run relationships between the Jordanian stock prices and selected macroeconomic variables. The cointegration test and the vector error correction model illustrate that the stock price index is cointegrated with a set of macroeconomic variables-that is, exports, foreign reserves, interest rates, inflation, and industrial production-which provide a direct long-run equilibrium relation with the stock price index. Additionally, the paper concludes that macroeconomic variables are significant in predicting changes in stock prices.

This study will analyze the interrelationship between analyzing the link between macroeconomic variables, exchange rates, inflation and economic growth against money supply stock price-field infrastructure in Indonesia stock exchange (idx). The infrastructure sector was chosen as the object of research because of the quite complex and consists of issuers-issuers with a heterogeneous industry types, some of which such as companies engaged in industrial power plants, the construction of the toll road services provision and telecommunication company.

LITERATUR REVIEW

The economic theory is a theory with regard to all activities of the overall economy, which overall dimensions than the economic life. The purpose of the macro economy is stressed inflation, unemployment and raise and drive economic growth so as to create the prosperity of society. In macroeconomics there is some economic variables that can affect the Indonesian economy which are inflation, economic growth, exchange rates and money supply.

Inflation is a general rise in prices, or inflation may also be regarded as a decrease in purchasing power of money. This index is based on the price of a package of items selected and represent consumer spending patterns. the tendency of prices to rise in general and continuously (Kuncoro, 2001). The price increase of one or two items can not be called inflation, unless the increase is widespread and resulted in an increase to the other items.

The exchange rate is the price of the rupiah against the currencies of other countries. Thus, the exchange rate is the value of

the rupiah currency is translated into another country's currency. Different definitions of the money supply includes a variety of different types of deposits. The money supply is a stock, narrowly defined (M1) includes currency and deposits that can be used as a medium of exchange. The amount of cash required for the purpose of transactions and guard positively influenced by the level of income. That's means the greater the level of income, the greater the amount of cash required for the purpose of transactions and precaution, and otherwise.

Economic growth is as a quantitative measure that describes the development of an economy in a given year when compared with the previous year (Sukirno, 2006). Economic growth is the process whereby an increase in real gross national product or national income riil. So, the economy is said to grow or develop, if there is a growth of output riil. Stock is one securities traded on the Stock Exchange in addition to bonds and certificates. Shares represents deposit a sum of money from the owner as proof of ownership is handed over to the parties that manage the payment of capital, and has the right according to the type of shares held. This study aims to determine causality macroeconomic variables consisting of Inflation, exchange rate, economic growth, and money supply to the price of shares PT. Perusahaan Gas Negara, PT. Telekomunikasi Indonesia, Tbk and PT. Jasa Marga.

Based on a theory that has been described as well as the framework of thought above, the authors propose a hypothesis for the dependent variable testing done against the independent variables in order to know how the relationship of causality of inflation, exchange rate, variable economic growth and stock price against money supply field infrastructure results proposed hypotheses are:

1. Economic growth has causality positive and significant against the state-owned stock price field infrastructure in BEI 2008-2015.

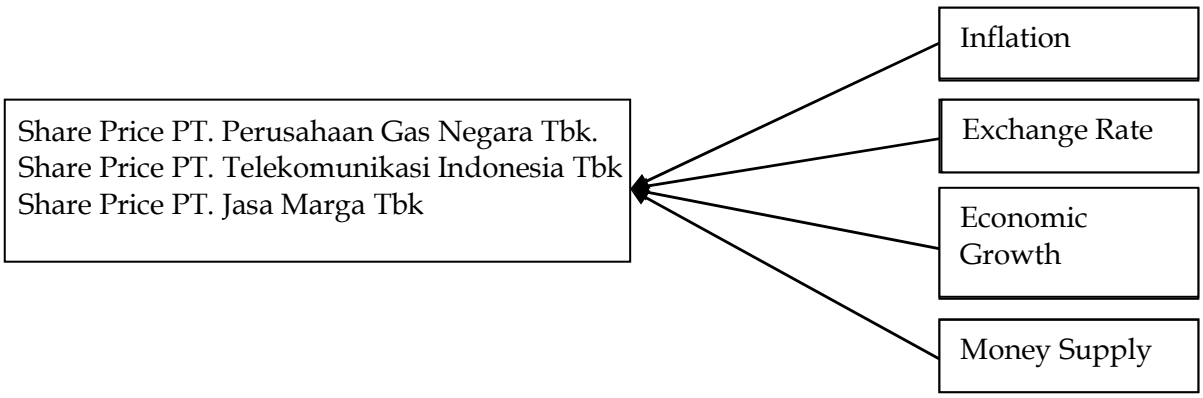

Figure 1
Framework Thinking

2. Inflation has causality positive and significant against the state-owned stock price field infrastructure in IDX 2008-2015
3. Exchange rate has causality and insignificantly to stock price-field infrastructure in IDX 2008-2015
4. Money Supply has causality negative and insignificant against share pricefield infrastructure in BEI 2008-2015

There are many examines the macroeconomic variables correlation to the stock price. Hondroyiannis and Papapetrou (2001) investigated the dynamic interaction between macroeconomics variables and stock market in Greece using five variables (interest rate, exchange rate, real oil prices, industrial production, and real stock returns). They found that there is a signi-

ficant relationship between macroeconomic variables and stock market.

Lu *et al*., (2001) examines the long-term relationship between stock returns and monetary variables in an emerging market through time by using the cointegration technique. In the case of ISE, as the market became more mature, the influence of monetary expansion and interest rates disappeared and foreign currency prices regained their expected significant.

Masih and Masih (2001) investigates the dynamic causal linkages among nine major international stock price indexes. The levels VAR, however, illustrate the Japanese market's influence as an additional long run leader. Findings seem to be plausible given that these three markets (US, UK and Japan) have consistently contributed over 75% of global stock market capitalization over the major part of the sample under conside ration.

Boyd *et al*., (2001) examines the impact of inflation on financial sector performance. They indicates that there is a significant, and economically important, negative relationship between inflation and both banking sector development and equity market activity. Further, the relationship is nonlinear. As inflation rises, the marginal impact of inflation on banking lending activity and stock market development diminishes rapidly. Moreover, they find evidence of thresholds. For economies with inflation rates exceeding 15 percent, there is a discrete drop in financial sector performance.

Maysami and Sim (2001) employed the error-correction modelling technique to examine the relationship between macroeconomic variables and stock returns in Japan and South Korea. The results confirmed the influence of macroeconomic variables on the stock market indices in each of the six countries under study, though the type and magnitude of the associations differed depending on the country's financial structure.

Du (2006) examines monetary policy, stock returns and inflation. He indicates that the positive relationship between stock returns and inflation in the 1930's is mainly due to strongly pro-cyclical monetary policy, while the strong negative relationship of stock returns and inflation during the period of 1952–1974 is largely caused by supply stocks that they are relatively more important in that period.

Das and Pattanayak (2007) examines the role of various corporate fundamental factors on the behavior of the Indian stock market and carries out a comparative analysis between two major stock market indices-SENSEX and NIFTY. The result reveals that few factors are acting as major determinants of stock price movements and thereby has a significant bearing on the entire market. The analysis shows that higher earning, ROI, growth possibility and favorable valuation have favorable impact on share price and stock market movement while higher risk and volatility have negative impact.

Flannery and Protopapadakis (2002) examines macroeconomic factors do influence aggregate stock returns. The result are stock market returns are significantly correlated with inflation and money growth. The impact of real macroeconomic variables on aggregate equity returns has been difficult to establish, perhaps because their effects are neither linear nor time invariant. They estimate a GARCH model of daily equity returns, where realized returns and their conditional volatility depend on 17 macro series announcements. They find six candidates for priced factors: three nominal (CPI, PPI, and a monetary aggregate) and three real (balance of trade, employment report, and housing starts).

Barakat *et al*. (2015) examines impact of macroeconomic variables on stock markets: evidence from emerging markets. The key objective of this study is to shed light on the relationship between the stock market and macroeconomic factors in two emerging economies (Egypt and Tunisia) for the period from January 1998 to January 2014. Results indicated that there is a causal relationship in Egypt between market index and consumer

price index (CPI), exchange rate, money supply, and interest rate. The same goes for Tunisia except for CPI, which had no causal relationship with the market index. Results also revealed that the four macroeconomic are co-integrated with the stock market in both countries.

Büyükşalvarcı (2010) in his study found that there was a negative relationship between ISE-100 index and exchange rate, interest rate, oil price and industrial production index but a positive relationship between index and money supply and no relationship between the index and inflation rate and gold price for the period 2003-2010.

Kewal (2012) in her research about The Influence Of The Inflation, The Interest, Exchange Rate, and GDP Growth Against Composite Stock Price Index said that the level of inflation, interest rates on SBI and growth GDP does not have influence on the Significantly to JCI, while the Rupiah exchange rate effect negative and significantly to JCI.

Nugroho (2008) doing research analysis of the influence of inflation, interest rates, exchange rates and the money supply LQ 45 Index against (case study on BEI Period 2002-2007). This result is showing that only one variable doesn't influence facing perfor- mance of LQ 45 index. Interest rate and money supply have negative influence and support previous research, but forex exchange have positive influence , this result is show anomaly and not suitable with previous research.

Research from Ristati (2014) shows that the variable exchange rate effect negatively to stock price index. Although variable inflation is also significant. If the second condition variable is starting to show increased investors should sell the stock because of the results of this research predicts that the stock price will go down in the event of the exchange rate and inflation has increased. Conversely, if the exchange rate and inflation showed a decline, then the investor does not need to sell stock because the price of the stock will increase.

Kusuma and Badjra (2016) stated inflation has no effect against the composite stock price index, the money supply has no effect against the composite stock price Index, the value of the dollar exchange rate positive effect significantly to price index Joint-stock (JCI), and the growth of Gross Domestic Product a positive significant effect to composite stock price Indeks.

Raharjo (2008) doing research with the title Influence inflation, the value of the Rupiah exchange rate, interest rate and the price of shares in Indonesia stock exchange concluded that Inflation has a positive influence against the stock price because of the significance level 0.000 < 0.05. Exchange rates have no positive influence against the share price because the value significance of 0.808 > 0.05. Interest rates have no positive influence against the share price because the value of significance.

Infrastructure influential power significantly to economic growth road infrastructure significant effect towards growth the economic infrastructure of the telephone effect significantly to economic growth water infrastructure negative effect signi- ficantly to economic growth.

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Sirucek (2012) examines macroeconomic variables and stock market: US review. The result is the model tracking the impact of selected variables on DJIA appears to be statistically significant. This model also confirms the economic theory justifying the impact of variables on share prices. No neutral, but rather negative impact was however found for inflation most significant factor for both models was inflation and unemployment (both with a negative impact). The most significant determinant of the S&P 500 index were interest rates and unemployment, while industrial manufacturing and unemployment, followed by changes to interest rates and oil prices, had the biggest impact on DJIA. This is obvious also in the chart. As a result, the hypothesis about a stronger link of "industrial" variables to the Dow Jones index was confirmed.

Maghayereh (2003) examines "Causal Relations among Stock Prices and Macroeconomic Variables in the Small, Open Economy of Jordan". The result are Using Johansen's methodology for multivariate cointegration analysis and monthly time-series data, this paper investigates the long run relationships between the Jordanian stock prices and selected macroeconomic variables. The cointegration test and the vector error correction model illustrate that the stock price index is cointegrated with a set of macroeconomic variables-that is, exports, foreign reserves, interest rates, inflation, and industrial production-which provide a direct long-run equilibrium relation with the stock price index. Additionally, the paper concludes that macroeconomic variables are significant in predicting changes in stock prices.

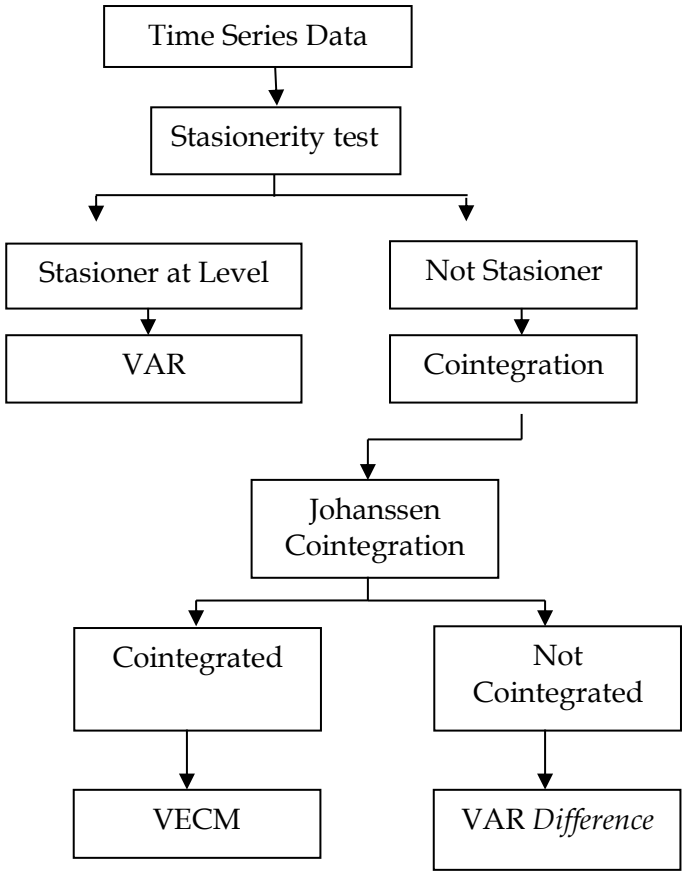
Maysami *et al*. (2004) examines the macroeconomics variables and stock market indices from Stock Exchange of Singapore's All-S Sector Indices. They concluded that the SES All-S Equities Property Index formed significant relationships with all macroeconomics variables identified, while the SES ALL-S Equities Finance Index and SES All-S Equities Hotel Index form significant relationships only with selected variables.

METHODOLOGY

The scope of the research is the price of shares. PT. Telekomunikasi Indonesia, Tbk., PT. Perusahaan Gas Negara Tbk and PT Jasa Marga Tbk. The study analyzes the causality between macroeconomic variables of economic growth, inflation, and exchange rate against the money supply SOE stock price for Infrastructure using quantitative methods. The method used in this study is a quanti-

tative scientific approach to decision making and managerial economics. This approach departs from the data (Kuncoro, 2001). The data used in this research is secondary data time series (time series) quarterly from 2008 to 2015. The variables used in this study include: a variable price of shares. PT. Perusahaan Gas Negara Tbk. PT. Telekomunikasi Indonesia, Tbk. and PT. Jasa Marga Tbk. As the price of the infrastructure sector in BEI. Inflation, economic growth, exchange rates and money supply is a proxy macroeconomic in Indonesia. To test causality between macroeconomic variable and stock price of the State-owned infrastructure field data analysis techniques used:

1. Classical Assumption Test
   Classical Assumption Test regression models used to obtained can produce a good linear estimator. If you already meet the assumptions of a classical regression model, meaning it's been arguably the ideal or unbiased (Best Linear Unbias Estimator/BLUE).



Source : Widarjono, 2009

Figure 2
Steps VAR/VECM

2. Autoregression Vector Model (VAR)
   The analytical tool used in the study is Autoregression Vector Model (VAR). VAR models are often used in macroeconomic policy. VAR models in this empirically is used to examine the relationship and see the response of macroeconomic variables on stock prices SOE infrastructure. In the use of VAR there are steps that must be done is:
   a) Stationary test
      In preparation for cointegration analysis, the univariate properties of the stock index data need to be examined to verify that the data series are nonstationary, or contain a unit root.

The first step, the stationarity of each variable will be tested with unit root test at the level. A stationary result will lead to the use of VARs with standard methods. While nonstationary results will have implications on the two VAR model that is VAR in the model of first difference (VAR in difference) or Vector Error Correction Model (VECM).

b) Determination of Optimal Lag Length
Determination of Optimal Lag Length (Sucahyo, 2008) is a very important stage in the VAR model considering the purpose of building a VAR model is to look at the behavior and relationships of each of the variables in the system. Lag determination is one of the difficulties in using VAR. If the lag is used too little, then it can not estimate precisely, but if entering too much lag then it can reduce degrees of freedom. Determination of optimal lag is done in order to establish an optimal long-term cointegration order. Optimal lag determination can be identified through three criteria: Akaike Information Criterion (AIC), Schwarz Criterion (SC) and Hannan-Quinn Criterion (HQ).

c) Cointegration Test
Cointegration test is a test used to find out a stable relationship in the long run. If there is no cointegration there is not variable between the interconnectedness of the relationship in the long run. Cointegration test can be done through Johansen Cointegration test by using the optimum lag length 1. Johansen Cointegration test result is used to know the number of cointegration equation and long-term determination, that is, if the trace statistic value is greater than the critical value, then the equation is cointegrated, and if the max-eigen value is greater than the critical value then it has a long-term relationship, otherwise the two variables have no long-term relationship.

d) Impulse Response Function (IRF)
Impulse Response Function (IRF) is one of the VAR method used to see the response of the endogenous variables to influence the innovation of other endogenous variables that exist in the model. The Impulse Response Function (IRF) analysis is able to show the response of a dependent variable if it gets shock or innovation from an independent variable of one standard deviation.

e) Analysis of Variance Decomposition
Analysis of Variance Decomposition illustrate the relative importance of each variable in the VAR system for their shock. Variance Decomposition useful for predicting the percentage contribution of each variable variants for their companies in the VAR system. Analysis of FEVD (*Forecasting Error Variance Decomposition)* used to find out how big a role variable explaining other variables.

f) Test Results Causality Granger
Test Results causality Granger is a testing method used to analyze the causal relationship between the observed variables. According to Widarjono (2009) test causality Granger is the testing methods used to analyze the relationship of causality between the variables observed. Test causality was first propounded by Engel and Granger. The purpose of causality Granger is researching whether A precedes B, or B precedes A, or the relationship between A and B reciprocity. The relationship of causality can occur between two variables, if a variable y, i.e. Inflation is affected by the variable x, namely the price of rice. Granger causality test aims to look at the past influence of a variable against other variable conditions at the present. In other words, the causality tests Granger can be used to see if the y can more accurately forecasting with enter lag variable y (Widarjono, 2009).

Variables used in this study include: stock price variables PT. Perusahaan Gas Negara, Tbk. PT. Telekomunikasi Indonesia, Tbk. and PT. Jasa Marga, Tbk. As the price of infrastructure in the IDX. Inflation, economic growth, exchange rate and money supply are macroeconomic proxies in Indonesia. Definition of each variable, namely:

1. Stock Price. The share price is the present value of the income that will be received by the investors in the future. In this study the stock price used is the share price of state-owned infrastructure listed on the IDX. The stock price index reflects/ represents the price movement of SOEs shares in infrastructure. Stock price data used in this research is the closing price every three months/quarterly taken from yahoo finance.
2. Inflation. Inflation is a general price increase, or inflation can also be said to be a decrease in the purchasing power of money. The higher price increases the value of money. The above definition implies that, the increase in the price of a particular good or a price increase because of a failed harvest, for example, does not include inflation. The most inflation measures used are: "Consumer price index" or "cost of living index". In this research the inflation data used using the percentage units formed from Bank Indonesia monetary policy report from 2008 to 2015. The indicator of CPI inflation data (consumer price index).
3. Exchange Rate. Exchange rate between two countries is the price level agreed by the people of both countries to trade each other. Exchange rate is important because it can affect the nutrients of domestic goods to foreign countries and affect import export. In this study, the data used is the middle data of the Indonesian rupiah exchange rate against the US dollar. Quarterly data has been published by annual report from BI and data in the rupiah figure.
4. Amount of Money Supply. The money supply is a stock, narrowly defined (M1) including currency and deposits that can be used as a medium of exchange. money supply is very important in the economy of a State because it will affect the rise of interest rates, often the rise of the tribe can be a turmoil in the economy. In this study the amount of money circulating in the community is M2 or in a broad sense include money supply, demand deposit, and quasi money. Quasi money in the form of deposits, savings and accounts. The data in quarterly form which has been recorded by BI annual report.
5. Economic Growth. Economic Growth is a quantitative measure that describes the development of an economy in a given year when compared to the previous year. In this study economic growth is measured through with growth in GDP expenditure side, using data from BI annual report data taken quarterly from 2008 to 2015.

ANALYSIS AND DISCUSION

Classical Assumption Test

A classical assumption test is done to see if a decent regression models used or unbiased/testing phase conducted on research this is a test of normality, heteroskedasticity, multicollinearity and autocorrelation test among variables and stock prices of PT Jasa Marga. Tbk. (JSMR), the price of the shares of PT. Perusahaan Gas Negara Tbk. (PGAS), the price of the shares of PT Telekomunikasi Indonesia Tbk (TELKOM), exchange rates (exchange rate rupiah/dollar), inflation, economic growth, and the money supply. Fully described as follows:

a) Normality Test

Normality test done to make sure the data is distributed normally. The data is said to be Gaussian if the value is Jacquebera (JB) > 0.05. Study on test of normality can be seen in table 1.

From table 1 JSMR, PGAS and Telkom has JB > 0,05. Thus it can be concluded that the residual normal distributed which means classical assumptions about normally have been met.

b) Heteroskedasticity

Heteroskedasticity is a test aimed at testing whether in regression models had the residual variance of inequality to the other residual. If the value of Prob. F-Statistic > 0,05 (5%) then means it is not the case heteroskedasticity, while if the value Prob. F-Statistic<0,05 (5%) meaning occurs heteroskedasticity. Study on test of heteroskedasticity can be seen in table 2. From table 2 JSMR, PGAS and Telkom has F-Statistic > 0,05. Thus it be concluded that is not going heteroskedasticity on the model.

c) Multicollinearity

This test is used to see if it is on regression models found of the existence of correlations between variables. How to detect it is by looking at the value of the variance Inflation Factor (VIF). According to Ghozali (2005) if the VIF > 10, then the variable have a question of multicollinearity.

Study on test of multicollinearity can be seen in table 3. The table 3 shows that the value of the tolerance of the three variables in the This research value and Variance 1 < Inflation Factor (VIF) 10 < meaning the overall free variables in this research independent of the classical assumptions multicollinearity.

Table 1
Normality Test

	Jacquebera	Significant	Explanation
JSMR	2,628	0,05	Normal
PGAS	0,291	0,05	Normal
TELKOM	0,432	0,05	Normal

Source: Data Processed Eviews

Table 2
Heteroskedasticity Test

	Prob. F-Statistic	Significant	Explanation
JSMR	0,267	0,05	Not heteroskedasticity
PGAS	0,198	0,05	Not heteroskedasticity
TELKOM	0,255	0,05	Not heteroskedasticity

Source: Data Processed Eviews

Table 3
Multicollinearity Test

	VIF	Terms	Explanation
Economic Growth	1.130663	10	Not Multicollinearity
Exchage Rates	1.299869	10	Not Multicollinearity
Amount of Money Supply	1.206345	10	Not Multicollinearity
Inflation	1.083818	10	Not Multicollinearity

Source: Data Processed Eviews

d) Autocorrelation

The data used is the time series data then required the assumption non autocorrelation. Autocorrelation test aimed at testing whether in linear regression models there is a correlation between the error of a bully in the period t of a bully with an error in the period t-1 (earlier). If there is a correlation, then called the autocorrelation. The value of the Prob. F count is larger than the alpha level of 0.05 (5%) so there happen autocorrelation. Conversely, if the value of Prob.

F count smaller than 0.05 autocorrelation occurred can be concluded then. Study on test of autocorrelation can be seen in table 4. From table 4 JSMR, PGAS and Telkom has F-Statistic > 0,05. Thus it be concluded that is not going autocorrelation on the model.

Table 4
Autocorrelation

	Prob. F-Statistic	Significant	Explanation
JSMR	0,217	0,05	Not Autocorrelation
PGAS	0,298	0,05	Not Autocorrelation
TELKOM	0,155	0,05	Not Autocorrelation

Source: Data Processed Eviews

Autoregression Vector Model (VAR)

a. Stationary Test

The methods used in this research is a method of Augmented Dickey-Fuller Test (ADF) and the same degree (at a rate level or different) in this method a value of the t-statistic probability value compared with the ADF value critical McKinnon (1% .5 %, and 10%) so that the data used stationary then the probability value must be smaller than 1%, or 5%, or 10% and t-statistic value or greater than the value of the critical McKinnon.

Table 5
Stationary Test of Level

Variable	Prob	ADF Test (Absolute Value)	Critical Value			Explanation
	Le		1%	5%	10%	
Share Price PGAS	0,4587	-1,6241	-3,66166	-2,96041	-2,61916	not Stasionery
Share Price JSMR	0,6574	-1,20971	-3,66166	-2,96041	-2,61916	not Stasionery
Share Price TELKOM	0,9459	-0,05545	-3,66166	-2,96041	-2,61916	not Stasionery
Economic Growth	0,000	-5,74672	-3,66166	-2,96041	-2,61916	Stationer
Inflation	0,0004	-5,02712	-3,66166	-2,96041	-2,61916	Stationer
Kurs	0,9554	0,04042	-3,66166	-2,96041	-2,61916	not Stationery
The amount of the Money Supply	0,0328	-3,15332	-3,66166	-2,96041	-2,61916	Stationery

Source: Data Processed Eviews

Based on Table 5 shows that the value of the t statistic ADF is stationary on economic growth, inflation and the money supply with the current level. This is evidenced by the resulting value of economic growth with the probability of 0.000 smaller than 0.01 and the value of the t statistic is smaller than the ADF -5.74672 -3.66166. On the value of t statistic ADF inflation of smaller than -5.02712 -3.66166 or inflation 0.0004 probability value smaller than 0.01. And the amount of money in circulation with t statistic (ADF) -3.15332 -2.96041 or less than 0.0328 probability value less than 0.05. And the other variables are the stock price JSMR, PGAS, we, and the exchange rate has no value criteria stationary. So the results are not stationary variables will be tested again with different first level. The results obtained are the following.

At the level of first different that shown in Table 6 indicate that the test statistic ADF at the level of first different that is not stationary with the current level that the stock price JSMR, stock price PGAS, the price of our securities and Exchange rate became

statisoner. This means that stock prices JSMR, stock prices PGAS, the price of our securities and Exchange rate at the level of first difference.

After testing the stationary test can be done with cointegration test. Cointegration test was tested in order to know the existence of a long-term relationship between the variables. At this stage it will be known whether the model will be used VAR model is the level of differentiation, if there is no cointegration and VECM model, or, if there is cointegration test. Cointegration test stated that a linear combination of two or more variables that are not stationary time series can be stationary. Johansen cointegration test for some slightly different equations by the method of Engle Granger who customarily used for one equation only. In cointegration test is absolutely necessary if all variables used in the different levels of the same so it must use the VECM and if there is no cointegration then uses VAR.

The results of this study do not require VECM method. Because these terms are already filled with test unit root because on some variables used i.e. JSMR share price, share price PGAS, stock prices of TELKOM and stationary at the level of the exchange rate first as different. Variables are economic growth, money supply, and stationary at the rate of inflation level. Therefore, this research method using VAR (Vector Auto Regression) further define the Optimal lag.

Table 6
Stationary Test of First Difference

Variable	Prob	ADF Test (Absolute Value)	Critical Value			Explanation
	First Different		1%	5%	10%	
Share Price PGAS	0,0008	-4,66878	-3,67017	-2,96397	-2,62101	Stasioner
Share Price JSMR	0,0007	-4,73126	-3,67017	-2,96397	-2,62101	Statsioner
Share Price TELKOM	0,0000	-6,33928	-3,67017	-2,96397	-2,62101	Stasioner
Kurs	0,0006	-4,75255	-3,67017	-2,96397	-2,62101	Stasioner

b) Determinant *Lag Optimal*

Table 7
Result Level of *Lag Optimal Share Price*

Lag Interval	PT. Telekomunikasi Indonesia	PT. Perusahaan Gas Negara Tbk.	PT. Jasa Marga Tbk
	Test AIC	*Test AIC*	*Test AIC*
0	20,56578	23,14501	24,16690
1	16,99596*	19,39238*	18,31921*

Source: Data Proccesed Eviews 7

In a study conducted by using Akaike Information Criterion approach (AIC). To set the optimal lag used the lowest AIC value as a reference. The results of the tests performed at table 7. Table 7 shows that the minimum value of AIC is able to variables of economic growth, exchange rates, inflation and the money supply. Because it affects the price of shares.

Telekomunikasi Indonesia Tbk. (TEL-KOM), PT. Perusahaa Gas Negara Tbk, and PT. Jasa Marga Tbk. is the first lag.

c) Cointegration Test

Research data has cointegrated if the value of the trace statistics "r = 0 is larger than the critical value with a level of significance of 5%. Table 8 can be seen that the value of the trace statistics "r = 0 is larger than the critical value with a level of significance of 5%, i.e. 152,875 > 68,818 model JSMR, 98,315>69,818 on the model PGAS and 98,315 > 69,818 on Telkom. It means there is a relationship of cointegrated in research data. Test results above indicate that among the movement of JSMR, PGAS, and telkom against variable exchange rates (exchange rate rupiah/ dollar), inflation, economic growth, and the money supply have a relationship of balance and movement in long term and short term in each period, all of the variables tend to mutually adjust to achieve long-term equilibrium.

Table 8
Cointegration Test

	Hypothesized no. of ce(s)	eigenvalue	Trace Statistic	0.05 critical value	prob.**
JSMR	None *	0.946880	152.8785	69.81889	0.0000
	At most 1 *	0.750283	70.69281	47.85613	0.0001
	At most 2 *	0.484539	31.84488	29.79707	0.0286
PGAS	None *	0.805511	98.31544	69.81889	0.0001
	At most 1 *	0.597549	52.46876	47.85613	0.0173
	At most 2	0.374187	26.98364	29.79707	0.1020
Telkom	None *	0.805511	98.31544	69.81889	0.0001
	At most 1 *	0.597549	52.46876	47.85613	0.0173
	At most 2	0.374187	26.98364	29.79707	0.1020

Source: Data Proccesed Eviews 7

Estimation VAR

VAR estimation to give an overview in comparing variables exogenous against endogenous. The object of this research is the STATE-OWNED Company registered in Indonesia Stock Exchange (IDX) which include PT Jasa Marga Tbk. (JSMR), PT Telekomunikasi Indonesia Tbk (TELKOM), and PT. Perusahaan Gas Negara Tbk. (PGAS). Benchmarking is done with the variable exogenous is economic growth, exchange rate, money supply, and inflation, as well as the variable endogen is the stock price, then the analysis that is used with the model VAR. This method is useful for:

a. the relationship of JSMR stock prices with the variables of economic growth, exchange rate, inflation rate, and JUB.
b. Relationship of TELKOM's share price with a variable exchange rate, economic growth, inflation rate, and money supply.
c. Relationship of the PGAS share price with a variable exchange rate, economic growth, inflation rate and money supply.

At the rate of economic growth gives effect to the stock price of SOE companies as being investigated. This result turns out that the economic growth in PGAS responded negatively to the share price of the company, while in JSMR the economic growth was able to respond well showing significant positive and TELKOM was not significantly negative so that economic growth did not affect Telkom's stock price.

This indicates that on economic growth increased by 1% then the price of shares produced in PGAS decreased by 474.6076. JSMR indicates that if economic growth increases by 1% then the price of the stock will be 3616,387. Inflation rate does not give effect to stock price of SOE company as

researched. This result was that Inflation at JSMR, PGAS and TELKOM responded positively insignificant to stock price owned by the company. This indicates that the higher the inflation will be the higher the stock price. Monetary policy of the government by suppressing inflation volatility makes the Indonesian economy can be said to grow strong so that investment activity in the capital market does not experience sluggishness.

Table 9
Result of VAR

	JSMR	PGAS	TELKOM
Economic	3616,387	-4281,477	-474,6076
Inflation	328,1490	7324,751	563,8322
T-Statistic	0,03408	0,74642	0,18853
KURS	0,849581	-0,089358	-0,028991
T-Statistic	2,44890	-0,25275	-0,26904
Money Supply	3049,297	-6960,956	-272,5735
T-Statistic	0,66710	-1,49415	-0,19198

Source: Data Proccesed Eviews 7

JSMR's rate of exchange on JSMR's stock price gives a significant positive effect on the stock price of the SOEs as the research. This result turns out that the exchange rate at PGAS and TELKOM responded negatively to stock price owned by the company. This indicates that for JSMR if the exchange rate increases by 1% then the resulting stock price will be 0.849581. money supply level does not give effect to stock price of SOE corporation as being researched. This result shows that JUB variable in PGAS and TELKOM responded negatively no significant to stock price owned by the company and at JSMR, money supply variable showed positive result is not significant..

Causality Granger Test

Granger causality test is a test method that is used to analyze the relationship of causality between the variables observed. Variable in this research is the price of the shares of PT Jasa Marga Tbk. (JSMR), the price of the shares of PT Perusahaan Gas Negara Tbk. (PGAS), the price of the shares of PT Telekomunikasi Indonesia Tbk (TELKOM), exchange rates (exchange rate rupiah/dollar), inflation, economic growth, and the number of Money Supply. The test results are not that Granger if H_0 interplay and H_1 interplay. The result of the causality test in table 10. From table 10 can be explained by the level of significane (α) of 5%, 1%, 10% of that

1). PT Jasa Marga Tbk. (JSMR)

a) On the economic growth does not statistically significant effect on JSMR stock price (0.1011) and vice versa JSMR share price (0.2477) has no significant effect on economic growth. Thus, the two variables of both economic growth and the share price did not JSMR occur causality.
b) Inflation does not significantly influence JSMR stock price (0.3971) and JSMR stock price (0.1111) does not significantly influence Inflation. Thus, there is no causality between inflation and JSMR stock prices.
c) At a rate not statistically significant effect against the stock price JSMR (0.1383) and otherwise share price JSMR (0.46161) also has no effect significantly to inflation. Thus that is not happening any causality between inflation and stock prices JSMR.
d) On money supply statistically significant effect against the stock price

JSMR (0.0796) and otherwise share price JSMR (0.7662) do not affect significantly to money supply. Thus that there is direct causality between stock price against JUB JSMR stating only JUB influential JSMR stock prices significantly to and not apply otherwise.

Table 10
Result Test Causality Granger

Pairwise Granger Causality Tests
Date: 01/10/17 Time: 03:03
Sample: 2008Q1 2015Q4
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
PERTEKON does not Granger Cause DIHSTELKOM	30	2.56401	0.1210
DIHSTELKOM does not Granger Cause PERTEKON		4.89676	0.0355
INFLASI does not Granger Cause DIHSTELKOM	30	2.22671	0.1472
DIHSTELKOM does not Granger Cause INFLASI		0.76597	0.3892
DIKURS does not Granger Cause DIHSTELKOM	30	2.63385	0.1162
DIHSTELKOM does not Granger Cause DIKURS		3.25831	0.0822
Money supply does not Granger Cause DIHSTELKOM	30	0.50682	0.4826
DIHSTELKOM does not Granger Cause JUB		6.07448	0.0204
PERTEKON does not Granger Cause DIHSPGAS	30	8.86859	0.0061
DIHSPGAS does not Granger Cause PERTEKON		0.39998	0.5324
INFLASI does not Granger Cause DIHSPGAS	30	3.08271	0.0905
DIHSPGAS does not Granger Cause INFLASI		3.28963	0.0808
DIKURS does not Granger Cause DIHSPGAS	30	0.16143	0.6910
DIHSPGAS does not Granger Cause DIKURS		0.82546	0.3716
Money supply does not Granger Cause DIHSPGAS	30	0.06476	0.8011
DIHSPGAS does not Granger Cause JUB		7.62219	0.0102
PERTEKON does not Granger Cause DIHSJSMR	30	1.39569	0.2477
DIHSJSMR does not Granger Cause PERTEKON		2.88069	0.1011
INFLASI does not Granger Cause DIHSJSMR	30	2.71280	0.1111
DIHSJSMR does not Granger Cause INFLASI		0.74035	0.3971
DIKURS does not Granger Cause DIHSJSMR	30	0.68204	0.4161
DIHSJSMR does not Granger Cause DIKURS		2.33347	0.1383
Money supply does not Granger Cause DIHSJSMR	30	0.09026	0.7662
DIHSJSMR does not Granger Cause money supply		3.31793	0.0796

2. PT. Telekomunikasi Indonesia, Tbk (TELKOM)
   a) On economic growth are statistically significant effect against TELKOM'S share price (0.0355) and reverse the stock prices of TELKOM (0.1210) do not affect significantly to economic growth. Thus that there is direct causality between economic growth against TELKOM'S share price which States only influential economic growth significantly to Telkom's share price and not apply otherwise.
   b) On Inflation are statistically not significant effect against Telkom's share price (0.3892) and reverse the stock prices of TELKOM (0.1472) also has no effect significantly to inflation. Thus that is not happening any causa- lity between inflation and stock prices of TELKOM.
   c) At a rate statistically significant effect against Telkom's share price (0.822) and reverse the stock prices of TELKOM (0.1162) do not affect significantly to the exchange rate. Thus that occurs between a direct causality Rate against TELKOM'S share price which stated just exchange rate effect significantly to TELKOM'S share price and not apply otherwise.
   d) On money supply statistically significant effect against Telkom's share price (0.0204) and reverse the stock prices of TELKOM (0.4826) do not affect significantly to money supply. Thus that there is direct causality between the TELKOM share price against money supply stating only money supply effect significantly to TELKOM'S share price and not apply otherwise.

3. PT. Perusahaan Gas Negara Tbk. (PGAS)
   a) On economic growth are statistically not significant effect against the stock price PGAS (0.5234) and otherwise share price PGAS (0.0061) effect significantly to economic growth. Thus that there is direct causality between stock price PGAS against economic growth which States only influential PGAS stock prices significantly to economic growth and is does not apply otherwise.
   b) On Inflation are statistically significant effect against the stock price PGAS (0.0808) and otherwise share price PGAS (0.0905) effect significantly to inflation. Thus that there is two-way causality between stock price PGAS against inflation which reveals influential PGAS stock prices significantly to inflation and also applies vice versa.
   c) At a rate not statistically significant effect against the stock price PGAS (0.3716) and otherwise share price PGAS (0.6910) also has no effect against significant Rate. Thus that is not happening any causality between the exchange rate and stock price PGAS.
   d) On money supply statistically significant effect against the stock price PGAS (0.0102) and otherwise share price PGAS (0.8011) do not affect significantly to JUB. Thus that there is direct causality between stock price against money supply PGAS stating only money supply effect significantly to PGAS and stock prices do not apply otherwise.

CONCLUSION

Based on the results of the estimation of VAR, for economic growth against the stock price. On economic growth provides a significant positive effects against share price JSMR. For the Gas Company PT Perusahaan Gas Negara Tbk. economic growth provide the significant effects of the negative share price against PGAS. At PT Telekomunikasi Indo- nesia, economic growth provide the effect was not significant and also negatively to Telkom's share price. Granger causality results have a relationship in one direction with economic growth and JSMR PGAS has no relationship with the stock price JSMR

and PGAS. Against prices of TELKOM, the economic growth has a relationship. Based on the results of the estimation of VAR, for inflation against the stock price. The results obtained in that inflation turns out to have a positive relationship was not significantly to good share price JSMR, PGAS, and TELKOM. Based on the results of granger causality has a relationship with the stock price JSMR and TELKOM. As for the stock price inflation PGAS influential and have a two-way relationship. VAR Estimation results to the exchange rate against a share price that has a significant and positive influence between the exchange rate with the share prices of JSMR. On the exchange rate effect is negative and insignificant against the PGAS, and the stock prices of TELKOM. Based on the results of the causality relationship also granger also one-way JSMR and PGAS, variable rate has no relationship with the price of stocks and TELKOM have a one-way relationship, exchange rates have a relationship with TELKOM'S share price. On the results of the VAR Estimation on the amount of Money in circulation. For JSMR, money supply has a positive influence and not significantly to stock prices. At the PGAS and TELKOM, giving negative influences and not significantly to money supply. Based on the results of granger causality JSMR, PGAS, and TELKOM to money supply has one direction i.e. JUB have ties against share price JSMR, PGAS, and money supply.

For PT. Jasa Marga Tbk. need to consider the economic growth and the exchange rate because it has a positive correlation to the stock price. This means that this second variable a big impact in the increase in stock prices because investors will be interested to invest their capital as economic growth and the exchange rate is getting better. For PT. Perusahaan Gas Negara Tbk. (PGAS) need to consider the economic growth because it has a significant negative correlation to the stock price. This means that the decline in economic growth variables automatically investors will not be too keen to invest capital when economic growth declines. For PT. Telekomunikasi Indonesia Tbk. need to consider the economic growth, exchange rates and money supply because it has a negative relationship even though not too big impact, the negative impact that continued forward also gives a great effect because of decline in economic growth, exchange rates, and money supply will make the wheels of the macro economy will slow down and the investor not too interested in the movement so that investors do not occur in invested capital which will lower the company's stock price. For investors who want to make stock investments, you should first look at the performance of companies that can be seen from the financial statements.

The financial statements can show operating profit and net profit shares, whether the state of the company in a good condition and prospects or likely to experience decreased performance in the future. In addition, investors should pay attention to how the response of stock prices and corporate performance against economic phenomenon arising from internal and external factors. For further research is recommended to consider the relationship to the unit of analysis different from each company and each study period. Period, the number of population, and the sample longer will produce a response and a better picture and clearer to the response of each company's stock price. In addition, this research is expected to generate interest investor to be able to invest in the capital market.

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