THE INFLUENCE OF INFLATION AND INTEREST RATES ON STOCK PRICES IN INDONESIA

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ABSTRACT

This study aims to understand the impact of inflation and interest rates on stock prices in Indonesia. Central Bank of Indonesia has an inflation targeting framework, so inflation is a very important variable in this country. Theoretically, inflation will have an impact on stock price because it will determine the decision of production for companies. Interest rate is one of the tools used by central bank to control inflation. Theoretically inflation will have impact to stock price because it will determine the investment decision of investors. The results showed that in Indonesia, none of these variables has an impact on stock price. In Indonesia, its stock price is affected by the stock price in the past. Therefore investors in Indonesia are more likely to use technical analysis in measuring stock prices than fundamental analysis.

Keywords*: Stock prices, inflation, interest rates, Indonesia, technical, fundamental, macroeconomic, monetary*

Research on what factors that affect stock prices in Indonesia up until now has not been much done, except during periods of monetary crisis in 1997. Results of previous studies were vary and can't explain what factors that affect stock prices in this country. Atmadja (2004) examine the causal relationship between macroeconomic variables and stock prices in ASEAN during the period of the financial crisis in Indonesia, stating that there is no causal relationship between macroeconomic variables and stock prices in the ASEAN.

While Harjito (2004) found no causality between exchange rates and stock prices in the ASEAN and Singapore is where the exchange rate is the most dominant nature. Kirativanich (2000) also found no association between macroeconomic variables and stock prices in ASEAN except for Indonesia whose share price is affected by inflation and the money supply. After the end of the financial crisis, there has been no studies that discuss again what are the variables that influence share prices in ASEAN countries.

Knowing the factors that affect stock price movements are very important for an investor. If an investor wants to earn profit, an investor must be able to read the market and understand what are the factors that affect the stock price, so that the investors could predict the stock price and make a profit.

Questions about the factors that influence stock price, was tried to explain with a theory by some economists, for example with the theory of one-period valuation models, Generalized Dividend Valuation Model, The Gordon Growth Model, The Efficient Market Hypothesis but then they

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were challenged by a number of arguments . But these models can't explain the factors that affect the stock price. To explain the factors that affect stock prices in ASEAN, one of the initial ways that can be done is to look at the characteristics of capital markets in ASEAN. Characteristics of the stock market in ASEAN, of course, in contrast to other countries in the world, so the conventional theory may not be able to explain the pattern of stock price movements in countries that had twice experienced a crisis is severe enough.

Liberalization of financial markets in the ASEAN countries including Indonesia in the 1980s resulted in a large amount of capital inflows in these countries. There were expansion of financial markets and capital markets. But this liberalization was not supported by regulation and supervision of the financial system so that it triggers the monetary crisis in 1997. The crisis is not only attacking the financial markets and stock markets in ASEAN but also attacked the macroeconomic fundamentals of these countries that are characterized by inflation and high interest rates, exchange rate depreciation and stock markets are in a recession (Atmadja, 2004). Capital market conditions and financial markets since 1999 began to improve. Currency appreciation occurs as well as the decline in inflation and interest rates in these countries. In 2008, once again the global crisis that began in the United States and spread throughout the world, including to ASEAN countries, although in plain view, the impact is not as wide as the 1997 monetary crisis

In every crisis, every time there is a weakness in the financial markets and capital markets, then there is also a weakening in the macroeconomic variables in these countries. This indicates a relationship between the stock market and macroeconomic variables ASEAN countries. The movement of the stock price index is very sensitive to changes in economic fundamentals and changes in expectations about future prospects. Expectations will be influenced by micro and macro fundamentals that can be formed in a rational or adaptive to the economic fundamentals are subjective and unpredictable and calculated (Ahmad and Ahmed, 2006)

Macroeconomic variables can be linked to the stock price through the Arbitrage Pricing Theory (APT) (Ross, 1976), in which some risk factors can explain asset returns. Empirical studies based on APT linking macroeconomic variables to stock prices, using the model of short-term relationships such as research conducted by Fama (1981), Fama and French (1989), Schwert (1981), Ferson and Harvey (1991) and Fraser and Power (1997). In general, these studies found a significant relationship between the stock price changes of macroeconomic variables (Humpe and Mc Millan, 2007)

The weakness of this model is because it is essentially a historical data then this model is only suitable if the conditions are relatively stable, whereas in times of instability, the beta coefficients are estimated, may not be related to the expected value (Goetzmann, 2006). Also in this model does not explain

where the economic variables that will affect the stock price (DeStefano, 2000, Kim, 1987)

Monetary policy can affect the economy through its impact on stock assessment. This is explained by Tobin's q theory. Monetary policy affect stock prices in a way when monetary policy is expansionary, the public will have more money and increase spending. One of the places to spend money is the stock market (by buying shares). This will increase the demand for the stock and raise the price of the stock.

Another alternative approach is the Discounted Cash Flow (DCF) or Present Value Model (PVM). Formally, the DCF method was first used by John Burr Williams in 1938 in his work entitled "The Theory of Investment Value". This model linking stock prices to expected cash flows and the discount rate of this cash flow. Then the variables that affect the expected cash flows or affect the discount rate will affect the stock price (Humpe and Mc Millan, 2007).

If we look from an economic standpoint, when the stock of financial assets is claimed as a saving tool for consumers, so there may be a relationship between the stock price with macroeconomic variables (DeStefano, 2000). This relationship has been widely studied in developed countries. But in developing countries that have emerging capital markets, there were very little research on this because of its small market size and geographical location. These last few years, research has begun on this subject in developing countries such as India, Ghana, Sri Lanka and Turkey. Although the relationship between stock prices and macroeconomic variables has been studied, the results are inconsistent and the relationship is not well understood (DeStefano, 2000). The influence of monetary variables on stock prices in the Asian countries that are not as advanced as the capital market of developed countries is also not so clear (Kwon, 1999), so further research is still needed in this area.

There are many previous studies linking macroeconomic variables to stock prices. Started by Fama in 1981, which found that the movement of macroeconomic variables can be used to predict stock price movements. Each researcher uses different macro-economic variables because there is no consensus about macroeconomic variables that have influence on stock prices. Research on emerging markets, are primarily due to the expansion of international trade and the liberalization and in addition, the need for diversification by international portfolio managers. Liberalization in these countries is expected to increase the integration of these countries into the world economy and reduce capital costs. The process of integration will be highly correlated with macroeconomic policies adopted in these countries. Running a macroeconomic policy is also related to the level of a country's global integration. Then the relationship between macro-economic variables and stock prices in emerging markets is important to understand (Muradoglu et al., 2001)

One macroeconomic variable that is often used is inflation.

Several studies have found a significant relationship between inflation and stock prices. Among them is research conducted by Fama (1981), Schwert (1981), Gultekin (1983), Geske and Roll (1983), Mukherjee and Naka (1995), Adrangi (2000) in Brazil, Udegbunam et al. (2001) in Nigeria, Wongbangpo and Sharma (2002) in the ASEAN countries, Gunasekarage et al. (2004) in South Asia, Maysami et al. (2004) in Singapore, Islam et al. (2004) in Thailand, Chakravarty (2005) in India, Haruman et al. (2005) in Indonesia, Nishat and Shaheen (2005) in Pakistan, Erbaykal et al. (2006) in Turkey. While research conducted by Rapach (2001) in sixteen industrialized countries found no significant relationship between inflation and stock prices. Unstable relationships found by Graham (2006) who studied in the United States in the period 1953-1990. The relationship is negative before 1976 and after 1982, but it is positive between the two years. This instability might be due to a shift of monetary policy counter cyclical to pro-cyclical in 1976 and returned to the counter-cyclical in 1982 Laopodis (2006) found a weak negative relationship between inflation and stock prices in the United States in the period 1970-1980.

Although a lot of researches found significant relationship between inflation and stock prices, the direction of the relationship of inflation and stock prices still need to be further investigated. Theoretically, unanticipated inflation negatively affects stock prices through changes in the price level that is not anticipated. Inflation uncertainty also affects the discount rate that would reduce the present value of the cash flow of the company. According DeFina (1991), an increase in inflation has a negative impact on corporate earnings due to higher costs of the company and the slow adjustment of output prices, reduce profits and then lower the price of the stock. But there are also studies that found a positive relationship between inflation and stock prices, including research conducted by Bulmash and Trivoli (1991), Abdullah and Hayworth (1993).

Another variable that is often used is the interest rate. Theoretically, changes in interest rates directly change the discount rate and affect the company's current cash flow and future. High interest rates is a negative signal to the stock price. The increase in interest rates may cause investors to withdraw their investment in the stock and move it to the other investment instruments. Several studies found significance between the interest rate and stock prices, among others are Wongbangpo and Sharma (2002) in the ASEAN countries, Islam et al. (2004) in Thailand, Gunasekarage et al. (2004) in South Asia. Hinda and Kuroki (2006) found no relationship between interest rate policy in Japan with the stock price. On the average interest rate of 1% will trigger a share price increase of 3%. Some researchers have also found a positive relationship between the direction of interest rates and stock prices. This is quite contrary to the initial theory so further research on this variable is possible. The researchers include Fama (1981), Wongbangpo and

Sharma (2002) in Malaysia, Islam et al. (2004) in Thailand. Some researchers also found significance between the exchange rate with the stock price. Among them are Wongbangpo and Sharma (2002) in the ASEAN countries, Maysami (2004) in Singapore.

There are also studies that do not find a significant relationship between the macro-economic variables such as the price is the research conducted by Atmadja (2004) in five ASEAN countries. So research on the relationship of macroeconomic variables, especially monetary macro variables to stock prices are still needed to fill the void of research especially in Indonesia.

METHODOLOGY

The object of this study is stock price in Indonesia. The sample data started in 2001-2013. Stock price data in this country used the Composite Stock Price Index (CSPI) or the Jakarta Composite Index (JCI). While the variable interest rate used is the interest rate on the money market of this country. Inflation variable used is the monthly inflation rate which is a change in general prices rise continuously, which is calculated from the change in Composite Consumer Price and expressed in percent.

The data used in this study is a secondary data, the data obtained from the official website of the International Monetary Fund Statistics, World Development Indicators, the Capital Market in this country, central banks in this country and Bureau of Statistics in this country. The analysis method used was Vector Auto Regression (VAR). There are several advantages of the VAR (Gujarati, 1995: 387), namely: VAR is able to see a lot more variables in the analysis of economic phenomena of short-term and long-term, the VAR is able to assess the consistency of empirical models with econometric theory, VAR is able to find solutions to the problem of time series variables not stationary (non-stationary) and spurious regression or spurious correlation in the econometric analysis.

The data used to estimate prior research is necessary to test a series of stages, namely: stationarity test, the determination of the lag length, Granger causality test, Impulse Response Function and Variance Decomposition. Determination of the amount of lag in the VAR model is determined on the information criteria recommended by the Final Prediction Error (FPE) or Aike Information Criterion (AIC) or Schwarz Criterion (SC) or Hannan-Quinn (HQ). Granger causality test is used to see the direction of the relationship of a variable with another variable.

RESULTS AND DISCUSSION

VAR Model - Substituted Coefficients:
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BUNGA =
1.383511672*BUNGA(-1) -
0.4311737832*BUNGA(-2) +
0.06989914522*INFLASI(-1) -
0.05636412858*INFLASI(-2) -
0.0004576889121*SAHAM(-1) +
0.0008720212453*SAHAM(-2)

INFLASI =
1.473651053*BUNGA(-1) -
1.367930799*BUNGA(-2) +

0.888855741*INFLASI(-1) - 0.09715288326*INFLASI(-2) - 0.000578777408*SAHAM(-1) + 0.000610760612*SAHAM(-2)

SAHAM = - 37.33960327*BUNGA(-1) + 29.0443012*BUNGA(-2) - 9.8970976*INFLASI(-1) + 11.44072877*INFLASI(-2) + 1.293688434*SAHAM(-1) - 0.282299908*SAHAM(-2)

For Indonesia, it can be concluded that in the long term in Indonesia, the share price is affected by the stock price of the previous period and the stock prices of two previous periods while interest rates are influenced by the interest rate of the previous period, the interest rate two previous periods, the inflation of the previous period, inflation two previous period and the share price two previous periods.

While inflation is affected by the interest rate of the previous period, interest rates and inflation two periods the prior period. Stock prices in Indonesia was not influenced at all by the monetary variables. It is affected by stock prices stock prices in the past. This could be due to economic conditions in Indonesia were less good and stable so that investors tend to invest in short-term and expect to benefit from market changes. So that investors are more likely to see the stock price in the past to estimate the stock price in the future. It also implies that the monetary variable is not an appropriate indicator to predict the stock price index. It also indicates that investors in the Indonesian capital markets are not intensively use information about changes in monetary variables when deciding to trade in the stock market.

This supported the studies that do not find a significant relationship between the macro-economic variables such as the price is the research conducted by Atmadja (2004) in five ASEAN countries. We can say that in Indonesia, investors use technical analysis instead of fundamental analysis to predict the stock price movements.

CLOSING

In Indonesia, the share price is more influenced by past stock prices. This suggests that the investors in Indonesia tend to perform technical analysis in the stock price and tend to look at short-term profit-oriented. In Indonesia, the investors don’t use any macroeconomic indicators to affect their decision in investing in stock market. This due to the instability of macroeconomic condition.

Theoretically, unanticipated inflation negatively affects stock prices through changes in the price level that is not anticipated. Inflation uncertainty also affects the discount rate that would reduce the present value of the cash flow of the company. An increase in inflation has a negative impact on corporate earnings due to higher costs of the company and the slow adjustment of output prices, reduce profits and then lower the price of the stock. But this doesn’t seem to be the case in Indonesia. Theoretically, changes in interest rates directly change the discount rate and affect the company's current cash flow and future. High

interest rates is a negative signal to the stock price. The increase in interest rates may cause investors to withdraw their investment in the stock and move it to the other investment instruments. But this also not happened in Indonesia.

REFERENCES

Abdullah, A.D.,Hayworth,S.C. 1993, Macroeconometrics of stock price fluctuations, *Quarterly Journal of Business and Economics vol* 32.

Ahmad, N., Ahmed, F. 2006. The long-run and short-run endogeneity of money supply in Pakistan: An empirical investigation, *State Bank of PakistanResearch Bulletin,* 2.

Atmadja, A. 2004. The Granger causality Tests for The Five ASEAN Countries Stock Markets and Macroeconomic Variables During and Post the 1997 Asian Financial Crisis. *Jurnal Universitas Petra*

Bulmash, S.B., Trivoli, G.W., 1991. Time Lagged Interactions between Stock Prices and Selected Economic variables. *Journal of Portfolio Management*

Chakravarty, S. 2005. Stock Market and Macroeconomic Behavior in India

DeFina, R. H. 1991. Does Inflation Depress the Stock Market. *Federal Reserve Bank of Philadelphia Business Review*

DeStefano, M.R. 2000. Macroeconomic Determinants of US Stock Prices: Are the Business Cycle and the Level of Economic Activity Moderating factors.

Erbaykal, E. 2006. Real Macroeconomic Variables and Stock Prices: Test of Proxy Hypothesis in Turkey

Fama, E.F. 1981. Asset Returns and Inflation. *Journal of Financial Economics vol 5*

Geske, R., Roll, R. 1983. The Fiscal and Monetary Linkage Between Stock Returns and Inflation. *Journal of Finance vol 38*

Graham, F.C. 2006. Inflation, Real Stock Returns and Monetary Policy. *Applied Financial Economics vol 6*

Gujarati, D. 1995. *Basic Econometrics.*3rd edition.Singapore:McGraw-Hill Book Co.

Gultekin, N. 1983. Stock market Returns and Inflation: Evidence from other Countries. *The Journal of Finance vol 38*

Gunasekarege, A. 2004. Macroeconomic Influence on the Stock Market : Evidence from an Emerging Market in South Asia. *Journal of Emerging Market Finance*

Gwartney, J., and Lawson, R. 2004. *Economic Freedom of the World: 2004 Annual Report.* Vancouver, B.C.: Fraser Institute.

Hinda, Y. Kuroki, Y. 2006. Financial and capital Market's Responses to Changes in the Central Bank's Target Interest rate:

The Case of Japan. *The Economic Journal vol 116*

Humpe, A.2007. Can macroeconomic variables explain long term stock market movements? A comparison of the US and Japan.*Centre for Dynamic Macroeconomic Analysis Working paper Series*

Islam.2004. A Time Series Analysis and Modelling of The Thai Stock Market. *International Business Management Conference*

Laopodis, N. 2006.Dynamic Interactions among the Stock Market, FederalFunds Rate, Inflation and Economic Activity.*The Financial Review 41*

Li, K. 2002. What Explains the Growth of Global Equity Markets?*Canadian Investment Review*

Maysami, R.C. 2004. Relationship between macroeconomic variables and stock market indices: Cointegration Evidence from Stock Exchange of Singapore's All-S Sector Indices. *Jurnal Pengurusan*

Mukherjee, T. K. , Naka, A. 1995. Dynamic Relations between Macroeconomic Variables and the Japanesse Stock market: An Application of a VECM. *The Journal of Financial Research vol 18*

Muradoglu. 2001. Is there a long run relationship between stock returns and monetary variables: evidence from an emerging market. *Applied Financial Economics vol 11*

Muradoglu , Metin. 1998. Are there trends toward efficiency for emerging markets? Cointegration between stock prices and monetary variables at Istanbul Stock Exchange. *Applied Financial Economics*

Rapach, D.E. 2001. The Long Run Relationship between Inflation and Real Stock Prices. *Journal of Macroeconomics*

Schwert, W.G. 1981. The Adjustment of Stock Prices to Information about Inflation. *The Journal of Finance vol 36*

Udegbunam, R, Eriki, P.O. 2001. Inflation and Stock Price Behaviour: Evidence From Nigerian Stock Market. *Journal of Financial Management and Analysis vol 14 no 1*

Wongbangpo, P., Sharma, S.C. 2002. Stock Market and Macroeconomic Fundamental Dynamic Interactions: ASEAN Countries

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