Macroeconomic Variables and Stock Indices *(Islamic and Conventional): Evidence from Indonesia*

Raditya Sukmana

Islamic Economic Department, Faculty of Economic and Business, Universitas Airlangga, Indonesia
raditya-s@feb.unair.ac.id

Keywords: Jakarta Composite Index (JKSE), Jakarta Islamic Index (JII), IPI, CPI, Exchange Rate, Money Supply.

Abstract: The aims of this study is to comprehensively investigate the influence of macroeconomic indicators to equity markets (both Islamic and conventional Indices) in Indonesia as an emerging market. It relies on the unit root and co-integration test, focusing on the period from 2003:1 to 2016:12. Two indices of Jakarta Composite Index (JKSE) and Jakarta Islamic Index (JII) are adopted and Industrial Production Index (IPI), Consumer Price Index (CPI), Money Supply (M2) and Currency Exchange (EXC) are also utilized as the determinants. The result suggests that both indices share their long run movement among the variables. IPI, and CPI seem to be following the theory by indicating positive effects on JKSE and JII.

1 INTRODUCTION

Studies on the factors affecting stock price remain a popular area of financial research. Over the past few decades, the interaction of stock price and the macroeconomic variables has been a subject of interest among academics and practitioners. Previous studies have documented significant relationship between stock price with selected macroeconomic variables such as industrial production index (IPI), exchange rate, money supply, and consumer price index (CPI). Theoretically, the influence of macroeconomic variables such as IPI, exchange rate, CPI or money supply can be explained by the stock valuation model .It argues that macroeconomic forces may have systematic influences on stock prices via their influences on expected discounted future cash flows. This means that any change in the economic variables that have an impact on the future cash flows or the discount factors will affect the stock prices. In addition, the concept of demand and aggregate supply also plays a role in determining the stock market, not only through the transmission mechanism of monetary policy through interest rates but also through other channels such as asset price channel.

For the last few years, we have seen the studies conducted in developing countries such as Mohd Hussin at al. (2012), Hosseini, S. M and Ahmad, Zamri (2011), Abbas (2011), Hussainey K. And Ngoc Khan (2009), Asmy at al. (2009), Ibrahim And Yusoff (2001), Maysami and Koh (2000), Kwon et al. (1999), Mookerjee and Yu (1997), Habibullah and Baharumshah (1996).These studies identify such factors as industrial production index, money supply, consumer price index, interest rate, exchange rate, international stock price and so forth being the important factors in explaining stock returns.

Using vector auto regression, Abbas (2011) notes significant interactions between consumer price index, money supply, foreign exchange rate and stock prices for the case of Iran. Meanwhile, Maysami and Koh (2000) mentions that there exist a significant contribution of interest rate and exchange rate in the long-run relationship between Singapore's stock prices and various macroeconomic variables.

Hussin at al. (2012) employ vector auto regression (VAR) analyses to investigate relationship between Islamic stock market and macroeconomic variables covers from April 1999 to October 2007. The findings shows that Islamic stock prices are co-integrated with the selected macroeconomic variables. Particularly the stock price is positive and significant to IPI and CPI variables but negative and significant M3 and exchange rate variables. Meanwhile, its relation with Islamic interest rate variables is found negative but insignificant.

This study examines the relationship between selected macroeconomic variables and stock indices (Jakarta Composite Index and Jakarta Islamic Index) in Indonesia. Specifically, this paper investigates whether there exist evidence of long run relationship

between each indices of Jakarta Composite Index (JKSE) and Jakarta Islamic Index (JII) and a set of selected macroeconomic variables namely industrial production index, money supply, consumer price index, and exchange rate.

The remaining of the paper is organized as follows: After the introduction, it describes the data and methodology. Then, in the next two sections, estimation results are presented on the interactions among the variables. Finally, it ends with concluding remarks and some discussion on the findings.

2 DATA AND METHODS

This study basically examines both long term relationships dynamics between Indonesian equity indices (JKSE and JII) and four macroeconomic variables including Industrial Production Index (IPI), Consumer Price Index (CPI), Money Supply (M2), and Exchange Rate (EXC). The monthly data are from the period of January 2003 to December2016.The data on macroeconomic variables are obtained from the central beareu of statistics (BPS) official website while the stock price data are from yahoofinance.

To measure stock indices, we use end-of-the-month values of both the Jakarta Composite Index (JKSE) and Jakarta Islamic Index (JII). The index, which is normally used to reflect the Indonesian equity market performance, is based on a sample of 100 component stocks for Jakarta Composite Index (JKSE) and 30 component stocks for Jakarta Islamic Index (JII) which are value-weighted. We employ the consumer price index (CPI), an index that is often cited to represent price or inflation.Real output is measured by real industrial production index (IPI).Meanwhile, the money supply is represented by monetary aggregate (M2).Finally, we use the bilateral Rupiah exchange rate vis-a` -vis the US dollar as a measure of the exchange rates(EXC). We choose a variable exchange rate because these variables proved have an effect on stock prices in some countries.

This study starts with identifying the order of integration of all the variables by applying Augmented Dickey-Fuller (ADF) Test and Phillips-Parron (P-P) Test. When they are found to have the same order of integration then continue to conduct cointegration test (Johansen and Juselius) to identify the number of cointegrating vectors and cointegrating equation among the variables. Cointegrating equation actually implies the long run equilibrium relationship among the variables.

3 EMPIRICAL RESULT AND ANALYSIS

It reports the ADF and PP unit root tests for all the serieswhich the tests are conducted without and with a time trend. With the exception of JII and IPI, the ADF and PP tests with and without the time trend for the variables in levels indicate that they are non-stationary. The PP test with the time trend, however suggests that IPI is stationary. When first differenced, we find evidence that the variables are stationary. Namely, the PP tests suggest stationarity I(1) in all variables considered.

Cointegration methodology by Johansen and Juselius (1990) is utilized in this study. This test is to identify the number of cointegrating vectors among the variables.The lag length used in conducting the cointegration test is based on several criteria which are commonly used in many empirical studies such as AIC, SC, LR as well as FPE. According on the optimal lag length selection criteria, the chosen lag length for JKSE is two and JII is three.

The cointegration test results suggest that there exist long run co-movement among the variables. According to the value of trace statistic, there exist two cointegrating equations for JKSE and three cointegrating equations for JII as shown by the value of Trace statistics which is greater than the 5 percent critical value. The Trace statistic value of JKSE (104.0168 > 69.81889, and 56.07896 > 47.85613) and JII (103.9959 > 69.81889, 53.96119 > 47.85613, and 4.571229 > 3.841466). Furthermore, the Max-Eigen statistics show that JKSE and JII there are two cointegrating equations since the values are greater than the 5 percent critical value. The Max-Eigen statistics value of JKSE (47.93783>33.87687, and 28.84564>27.58434) and JII (50.03470>33.87687, and 4.571229> 3.841466). The normalized cointegration equation is represented as follows:

LJKSE = 7.2034LIPI - 5.7371 LM2 - 2.5680LEXC +11.3983LCPI

LJII = 6.4122LIPI - 5.6408 LM2 - 2.4965LEXC +11.2883LCPI

From the model above, the long-run relationship between stock prices (JKSE and JII) and industrial production is positive, similar to results obtained for the Vietnam (Hussainy and Ngoc, 2009), USA (Fama, 1990), Japan (Mukherjee and Naka, 1995), South Korea (Kwon and Shin, 1999), Malaysia (Hussin *at al*, 2012), and Singapore (Maysami and Koh, 2000).These results indicates that the real sector

of the economy provides a direct impact on the company's performance in general which are represented by the indices (JKSE and JII).The obtained result also indicates a negative relationship between exchange rate and both stock prices are JKSE and JII in the long run, which is consistent with the work of Ibrahim and Aziz (2003), Asmy *at al* (2009), Maysami and Koh (2000), Kwon and Shin (1999), and Abbas (2011). It means that when exchange rate increases, it will be followed by reduction in the JKSE and JII stock prices. This can be explained by the fact that Indonesian economy is currently highly dependent on international trade especially on imports. When a currency depreciates, it will increase the price of imported raw materials (from the local currency perspective), which lead to high production costs.Certainly the company's profit got affected and translated into selling more of the company's shares (by investors) which if it happens massively it will lower the indices

The result we obtained also indicates a positive relationship between CPI and both stock prices are JKSE and JII in the long run, which is consistent with the work of Ibrahim and Aziz (2003), Khil and Lee (2000), and Hosseini and Zamri (2011). This can be explained that when inflation is reflected in the high prices, but at the same time followed by high stock prices, so the issue can be an alternative to cover the high prices.

Interestingly, this study found a negative relationship between M2 and both stock prices are JII and JKSE. According to research conducted by Ibrahim and Aziz (2003) and Kwon and Shin (1999).These results are in contrast to studies conducted by Maysami and Koh (2000), Mukherjee and Naka (1995), Cheung and Ng (1998) which states there is a positive relationship between M2 and stock prices. Effect of money supply on stock prices can be negative and positive (Ibrahim and Aziz, 2003).When the money supply increases will affect the purchasing power of people to buy more goods and services, thus a positive impact on the real economy (Mukherjee and Naka, 1995).The increase in the money supply will affect cash flow and profits, so as to effect the stock price. Conversely, when the money supply causes inflation it will make investors choose to invest in the banking sector with a smaller risk. Bulmash and Trivoli (1991) argue that the continued increase in money supply may exert a negative effect on the stock prices due to increasing inflationary pressures and subsequent policy orientation to contain the pressure. Our negative long-run coefficient seems to indicate the dominance of these negative channels.

An interesting finding to be discussed is that money supply is negatively related to stock prices while consumer prices are positively related to stock prices. Generally, monetary expansion by increasing the money supply is inflationary or lead to inflation thus the expected relationship between the money supply and stock prices is positive. However, according to Ibrahim and Aziz (2003) mentioned that the relationship between M2 and stock prices are not only determined by inflationary pressures due to monetary expansion. But still there are some other variables that can affect inflation. Variables that can affect inflation besides M2 is the increase in fuel, electricity, imbalance between the amount of labor with the demand for goods production, etc. In the context of Indonesia, the increase of oil in May 2008 caused inflation continued to increase from 1.47 in April to 2.46 in May. Moreover, an inflation in June 2013 due to again the increase in fuel prices. As a result of the increase in fuel prices, it creates inflation to 3.29 in the month of June which was originally only 1.03 in the month of July. This causes have intended effects in the short run but generates risk premiums and uncertainty in the long term, prompting a negative relation between money supply and stock prices.

4 CONCLUSIONS

This paper attempts to seek whether macroeconomic factors can explain the performance of stock markets of both Islamic and conventional indices. The macroeconomic variables used in this study include Industrial Production Index, money supply, exchange rate, and consumer price index. The analysis relies on standard and well-accepted techniques of cointegration and VARs to uncover the long-run relationship and short-run interactions among the variables using the data that span for about 14 years. The inclusion of the macroeconomic variables certainly help to improve the predictability of the Indonesian equity prices.

Notice that stock indices can be regarded as expected future economic activities. Stock indices are important indicators for the overseas investors who are keen to make investments. At a time when there exist increasing trend of the stock indices, it is a signal that the economy in the particular country is growing and hence investment can be conducted, vice versa. For that reason, it is of important to analyse the factors which could influence the stock indices.

These findings shall provide suggestion to the government that real sector as represented by GDP or

IPI and Exchange rates behaviour are some of the important macroeconomic indicators that need to be taken into account. It evidences that these variables are influencing stock indices especially in the long run. The need to focus on the stock indices is important since it contains hot money whereby money flows in and out very abruptly. Flows in due to good economic performance and flows out otherwise. Ensuring the real sector and stabilizing the exchange rate would lead money to rigidly flow out. This is important given the fact that Indonesia still significantly import raw material from abroad and certainly it affects the overall price of good and services

The existing Islamic Stock Index is composed of stocks which are also traded in the general index (JKSE) which means the stocks are within two or more indexes. For the further recommendation, it is a need to think about specific Islamic index whereby it composes stocks within that islamic index and not part of general index. This index allow us to seek its pure contribution of Islamic index to the economy in general.

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