

MACROECONOMIC VARIABLES AND SECTORAL INDICES: CASE IN THE INDONESIAN STOCK EXCHANGE

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Abstract.

This study aims to examine the effect of macroeconomic variables on sectoral indices in the Indonesian Stock Exchange. The difference in sensitiveness among sectors is an interesting issue to investigate this relationship in an emerging market, such as Indonesia. This study employs ordinary least square (OLS) as an estimation method with monthly time-series data from January 2005 to December 2014. The results document that the interest rate, inflation rate, and exchange rate simultaneously have a significant effect on sectoral indices in Indonesia. The interest rate partially shows a significant negative influence on all sectors except basic industry and chemical, finance, infrastructure, utilities, and transportation, and miscellaneous industry sectors. The inflation rate partially has no significant effect on all sectors. The exchange rate partially has a significant negative impact on all industries.

Keywords: macroeconomic variables, sectoral indices, Indonesia stock exchange

Abstrak.

Penelitian ini bertujuan untuk menguji pengaruh variabel makroekonomi terhadap indeks sektoral di Bursa Efek Indonesia. Perbedaan sensitivitas antar sektor merupakan isu yang menarik untuk menginvestigasi hubungan ini di suatu pasar berkembang, seperti Indonesia. Penelitian ini menggunakan OLS sebagai metode estimasi dengan data time series bulanan dari Januari 2005 hingga Desember 2014. Hasil penelitian menunjukkan bahwa tingkat suku bunga, inflasi, dan kurs secara simultan berpengaruh signifikan pada indeks sektoral di Indonesia. Tingkat suku bunga secara parsial menunjukkan pengaruh negatif signifikan pada semua sektor kecuali sektor industri dasar dan kimia, keuangan, infrastruktur, utilitas, dan transportasi, dan aneka industri. Tingkat inflasi secara parsial tidak berpengaruh signifikan pada semua sektor. Kurs berpengaruh negatif signifikan pada semua industri.

Kata Kunci: variabel makroekonomi, indeks sektoral, bursa efek Indonesia

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INTRODUCTION

The existence of Indonesia stock market adds alternative financial instruments in the form of marketable securities to the investor. The stock is the most sensitive financial assets to economic condition. It has higher fluctuation in price compared to other financial assets. The internal and external factors determine the fluctuation of the stock price. The internal factors are controllable because the management of a firm can manage them. On the other hand, the external factors are uncontrollable especially macroeconomic factors which affect the whole economy. Therefore, the external factors are riskier than the internal factors. The firms should take more attention on the fluctuation of macroeconomic movements for their sustainability (Barakat et al., 2016).

Stock price movements are highly sensitive to macroeconomic factors such as interest rate, inflation, and exchange rate (Shafana, 2014). The interested parties of stock market focus on what factors and at which level their impact on stock price. Policy makers can predict the effect of current and upcoming policies and regulations. Investors can make a better decision when they understand this relationship and take action to decrease their exposure to risk.

Many previous studies have examined the impact of macroeconomic variables on stock market performance in developed countries. Fama (1981) and Chen et al. (1986) examined the long-term relationship between the macroeconomic variables and changes in stock price in the United States. They found that there is a long-term relationship between macroeconomic variables and stock market performance. Fama (1981) revealed that there is a strong positive correlation between stock returns and real economic variables like industrial production, money supply, real GNP, capital expenditures, lagged inflation, and interest rate. Chen et al. (1986) found that the economic variables that affect stock market performance are inflation, aggregate production, short-term interest rates, default risk premium, and the maturity risk premium. Mukherjee and Naka (1995) showed that there is a significant relationship between inflation, money supply, exchange rate, and industrial production and stock prices in Japanese stock market.

Some recent studies investigate the impact of macroeconomic variables on stock market performance in emerging equity markets. The nature of the relationship between macroeconomic variables and stock market performance in developed countries may differ from developing countries. Barakat et al. (2016) investigate the relationship between macroeconomic factors and the stock exchange in Egypt and Tunisia for the period from

January 1998 to January 2014. They find that there is a causal connection between the market index and interest rate, consumer price index (CPI), exchange rate, and money supply. The same results go for Tunisia except for CPI.

Shafana (2014) shown that exchange rate, interest rate, and inflation rate are standard variables to explain the variability of all sectoral indices except for Telecom sector. Tangjitprom (2012) finds that macroeconomic variables can explain stock return significantly after adjusting for some lags. These studies conclude that macroeconomic variables can explain the stock market performance. The impact of some macroeconomic variables could differ from one market to another and from one period to another (Barakat et al., 2001). Pramod-Kumar and Puja (2012) states that reinvestigating the nature of the relationship between the stock market and the macroeconomic factors will be appropriate and essential for investors. Investors should be aware of the relationship between macroeconomic variables and the stock market so that they can invest more prudently and efficiently.

This study employs three macroeconomic variables, namely the interest rate, inflation rate, and exchange rate because these three variables are monetary variables. The difference in sensitiveness among sectors will be an interesting point to examine this relationship in other emerging markets. Given such motivations, this paper gives the useful insight to the government and investor. A deeper understanding of the relationship between macroeconomic variables and sectoral indices in Indonesia will provide direction for the government to stabilize the stock market and the economy as a whole.

METHOD

The macroeconomic variables in Indonesia are collected based on a monthly basis from January 2005 to December 2014. This study raises the sectoral indices for the same period. The interest rate of Bank Indonesia Certificates (SBI) represents the level of interest rate. Monthly consumer price index represents the inflation rate. The exchange rate between Rupiah and US Dollar is used in the form of Rupiah/US Dollar. According to IDX Statistics 2015, Indonesia stock market has ten sectoral indices, namely 1) agriculture (AGR); 2) basic industry and chemicals (BAS); 3) consumer goods industry (CON); 4) finance (FIN); 5) infrastructure, utilities, and transportation (INFRA); 6) manufacturing (MAN); 7) mining (MIN); 8) miscellaneous industry (MIS); 9) property, real estate, and building construction (PRO); and 10) trade, service, and investment indices (TRA).

This study employs ordinary least square as an estimation method. Following Shafana (2014), the research model of this study takes the following equation.

$$SI_t = \beta_0 + \beta_1 INT_t + \beta_2 INF_t + \beta_3 EXC_t + \varepsilon_t$$

SI_t is the sectoral index at time t , INT_t is the Bank Indonesia Certificates (SBI) rate at time t , INF_t is the consumer price index at time t , EXC_t is the exchange rate between Rupiah and US Dollar at time t , and ε_t is an error term. All research variables are in the form of the natural logarithm.

RESULTS AND DISCUSSION

The descriptive statistics for the research variables during the period from January 2005 to December 2014 are presented in Table 1. The mining sector has the highest average sectoral index over the investigation period, while the property, real estate, and building construction holds the lowest average sectoral index. The mean of the interest rate is 7.6%, while the inflation rate has an average of 7.4%. The average of the exchange rate between Rupiah and US Dollar is 9,766.9.

Table 1. Descriptive Statistics

No.	Variables	Mean	Median	Max	Min	Std. Dev.
1	AGR	1,716.443	1,853.331	3,387.687	299.560	712.268
2	BAS	304.212	275.788	627.306	92.827	162.952
3	CON	940.630	685.544	2,177.919	259.289	642.807
4	FIN	363.796	302.084	731.640	118.559	188.310
5	INFRA	741.732	738.865	1,184.967	299.999	206.918
6	MAN	663.795	538.569	1,357.511	192.441	407.342
7	MIN	1,817.821	1,778.213	3,554.738	535.147	854.611
8	MIS	732.660	614.000	1,399.529	190.480	450.639
9	PRO	219.740	193.504	565.295	60.689	127.352
10	TRA	456.803	373.357	945.065	137.783	250.374
11	INT	0.076	0.072	0.128	0.038	0.022
12	INF	0.074	0.065	0.184	0.024	0.037
13	EXC	9,766.900	9,375.000	12,380.000	8,495.000	1,030.090

Source: processed data

The aim to conduct stationarity test is to determine whether the research variables have a unit root or not. Table 2 presents the results of stationarity test using Augmented Dickey Fuller (ADF) Test. The results indicate that the null hypothesis is rejected for all

research variables. Hence, all research variables are stationary on the data level. (Dickey and Fuller, 1979)

Table 2. Stationarity Test with ADF Test

No.	Variables	t-stat	Conclusion
1	AGR	-8.642	Stationary
2	BAS	-9.415	Stationary
3	CON	-9.488	Stationary
4	FIN	-10.151	Stationary
5	INFRA	-5.612	Stationary
6	MAN	-8.989	Stationary
7	MIN	-6.845	Stationary
8	MIS	-9.756	Stationary
9	PRO	-9.016	Stationary
10	TRA	-7.721	Stationary
11	INT	-5.699	Stationary
12	INF	-7.576	Stationary
13	EXC	-9.160	Stationary

Source: processed data

In Table 3, this study presents the correlation structure of the independent variables. The exchange rate has no significant correlation with inflation. On the other hand, the interest rate has a significant correlation with the inflation rate and exchange rate. The correlations are lower than 0.8. Therefore, the correlation analysis between independent variables clearly reveals that no multicollinearity exists among independent variables.

Table 3. Correlation Analysis

	INT	INF	EXC
INT	1		
INF	0.275**	1	
EXC	0.245**	0.107	1

Source: processed data (** indicates significance at the 5% level)

Table 4 reports the regression results. The values of the R^2 range from 20.9% to 43.8%. The agricultural sector holds the lowest R^2 , while the finance sector has the highest R^2 . The F-stat is significant at the 5% level for all industries. It can be statistically concluded that the model fits to explain the impact of selected macroeconomic variables on sectoral indices. The interest rate, inflation rate, and exchange rate simultaneously have a significant effect on sectoral indices in Indonesia.

The partial effect of each macroeconomic variable is tested by looking at their coefficients and significance values. At the 5% significance level, the coefficients of interest rate are significantly negative for all sectors except basic industry and chemical, finance, infrastructure, utilities, and transportation, and miscellaneous industry sectors. The range of coefficients of interest rate is less than one, between -0.064 and -0.542. It indicates that the interest rate is not a powerful variable on all sectors and when the interest rate rises by one unit the sectoral indices will drop by less than one unit when other variables are held constant. The interest rate has a maximum influence on the agricultural sector with a significant coefficient of -0.542, while it has a minimum impact on finance sector with an insignificant coefficient of -0.064. This finding is consistent with Geske and Roll (1983), French et al. (1987), Wasserfallen (1989), Gjerde and Sættem (1999), and Shafana (2014). When raising the interest rate on Treasury securities, investors wish to switch off the investment in shares and invest in Treasury securities causing the stock price fall. It means that increase in interest rate leads to lower stock price.

The coefficients of inflation rate show that inflation rate shows the negative relationship for all sectoral indices, but they are insignificant at the 5% level. It means that the variability of all sectoral indices is not determined by the variation of inflation rate in Indonesia over the period from January 2005 to December 2014. In another word, the inflation rate is unimportant for all sectors. When the inflation rate increase or decrease, it does not have an impact on all sectoral indices. This result may be specific to the research period. This finding is consistent with Tangjitprom (2012). Majid (2016) also found that inflation had an effect to Islamic stock return in Indonesia.

The coefficients of exchange rate show a significant negative effect on all sectors at the 5% level with a range of values between -0.763 and -1.753. It means that when the exchange rate rises by one unit the sectoral indices will decrease by the contribution of the coefficient when other variables are held constant. The exchange rate has the highest impact on the mining sector, while it has the lowest effect on consumer goods industry. The range of coefficients of the exchange rate is greater than one in all sectors except consumer goods industry. Mining sector involves on import and export activities. Therefore, the exchange rate shows the highest impact on this industry. It means that the stock price experiences a larger change in this area. On the other hand, the exchange rate has a lower effect on consumer goods industry. Consumers desire to get the best quality without a care about changes in exchange rate. This finding is consistent with Solnik

(1987), Bilson et al. (2001), Ibrahim and Aziz (2003), Kim (2003), Shafana (2014), and Majid (2016)

Table 4. Regression Results

No.	Sector	INT	INF	EXC	F-stat	R ²
1	AGR	-0.542**	0.052	-1.400**	10.122**	20.9%
2	BAS	-0.187	-0.030	-1.624**	25.053**	39.5%
3	CON	-0.209**	-0.021	-0.763**	13.518**	26.1%
4	FIN	-0.064	-0.053	-1.581**	29.896**	43.8%
5	INFRA	-0.098	0.017	-1.100**	14.234**	27.1%
6	MAN	-0.211**	-0.040	-1.227**	24.747**	39.2%
7	MIN	-0.392**	-0.066	-1.753**	17.295**	31.1%
8	MIS	-0.234	-0.087	-1.485**	16.730**	30.4%
9	PRO	-0.377**	-0.037	-1.396**	16.669**	30.3%
10	TRA	-0.366**	-0.024	-1.462**	28.263**	42.4%

Source: processed data (** denotes significance at the 5% level)

The phenomenons that should observe in stock exchange are bearish and bullish. Usman (2016) found that there were 61 bearish (38.85%) and 96 time bullish (61.15%) patterns in IDX composite. Sutrisno (2017) found that there are a positive relationship between volatility and trading frequency in the Indonesian stock exchange. Beik and Fatmawati (2014) found that macroeconomics variables such as M2 and Islamic Certificate of Bank Indonesia (SBIS) had an affect on Jakarta Islamic Index. Majid (2016) show that there is cointegration between Islamic stock prices and macroeconomics variables. Besides that, Majid (2016) also found that money supply had an impact on Islamic stock return in Indonesia. Tanjung (2014) shows that the return of Jakarta Islamic index is much volatile than the theory predicted. Tulasmi and Trihariyanto (2016) Islamic stock index performance in Indonesia better than in Malaysia by using Treynor and Jensen methods. Otherwise, using the Sharpe method shows that Islamic stock index in Malaysia is better than in Indonesia.

CONCLUSION

The purpose of this study is to investigate the impact of macroeconomic variables on sectoral indices in the Indonesian Stock Exchange from January 2005 to December 2014. The results reveal that the interest rate, inflation rate, and exchange rate simultaneously show a significant influence on sectoral indices in Indonesia. The interest rate partially has a significant negative effect on all sectors except basic industry and

chemical, finance, infrastructure, utilities, and transportation, and miscellaneous industry sectors. The inflation rate partially has no significant effect on all industries. On the other hand, the exchange rate partially shows a significant negative impact on all sectors.

This study has the policy implication for the government. Since the three macroeconomic variables simultaneously show a significant effect on sectoral indices, the government of Indonesia should consider this association to create a more stable stock market. Specifically, the government should take more attention to the impact of exchange rate on all industries. Investors should consider the exchange rate for their investment strategy because it has a significant negative effect on all sectors.

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Macroeconomics Variables and Sectoral Indices
Bambang Sutrisno

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