

MACROECONOMICS FACTOR: THE IMPACT ON STOCK PRICE INDEX

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Abstract

The objective of this study is to determine the link between macroeconomic variables and JCI, STI, and KLSE which are the stock price indexes of Indonesia, Singapore, and Malaysia stock price indexes. Multiple linear regression is used to investigate the influence of four macroeconomic factors on the stock market composite index, namely GDP growth, broad money (money supply), inflation, and interest rate spread. The finding indicates that inflation has a negative effect, while interest rate spread positively affecting the stock price Indexes. Investors may profit from this situation by purchasing blue chips when inflation and interest rates are rising.

Keywords: *GDP growth, inflation, interest rate spread, money supply, stock price indexes*

INTRODUCTION

Capital markets determine the stability and effectiveness of a country's financial system. As an investment vehicle, the capital market offers investors a variety of investment possibilities to choose from. According to Samsul (2006), capital market securities comprise stocks, bonds, rights certificates, warrant certificates, and derivatives (derivatives). With so many alternatives available, investors may arrange their assets in accordance with the desired effect, taking into account the level of risk and rate of return.

Investors must be careful, vigilant, and able to assess market conditions while conducting investment operations (Samsul, 2006). One indicator that may be used to monitor market conditions is the stock price index. The stock index is an indicator that illustrates the volatility of stock prices and acts as a guide for investors participating in the capital market, especially those investing in stocks.

Numerous local and global factors have direct or indirect impacts on the stock market's performance. The association between macroeconomic conditions and a mature stock market has been exhaustively studied in the literature. This study contributes to the existing body of knowledge. This research examines four macroeconomic variables, including GDP growth, money supply, inflation, and interest rate.

Academics and industry experts have long questioned the influence of economic fundamentals on stock prices and returns. According to the Efficient Market Hypothesis (proposed by Fama in 1970), all essential information on the changes in macroeconomic parameters is completely represented in current stock prices in an efficient market. Consequently, investors cannot generate anomalous profits in these markets. Changes in macroeconomic factors should not have a significant impact on stock returns, according to the Efficient Market Hypothesis. Notwithstanding, after the investigations of Fama and Schwert (1977), Nelson (2005) and a number of other academics have questioned the Efficient Market Hypothesis' conclusion that

macroeconomic factors have no effect on stock returns through stock price movements. APT further provides a framework for the relationship between stock prices and macroeconomic variables (Ross, 1976; Chen et al., 1986).

Decades of prior research has investigated the connection between macroeconomic data and the stock market. Dritsaki (2005) was published in Athens; Hosseini et al. (2011) were published in India; Izedonmi and Abdullahi (2011) were published in Nigeria; Issahaku et al. (2013) were published in Ghana; Boonyanam (2014) was published in Thailand; and Khan et al. (2014) were published in Pakistan. These studies have offered a more precise depiction of the impact of macroeconomic difficulties on the capital markets of various nations. However, based on the study's findings, it was determined that the research had varying outcomes. This indicates that the consequences of macroeconomic circumstances vary depending on the capital market of a nation. Examining the impact of macroeconomic concerns on Southeast Asian financial markets is thus intriguing.

This study aimed to explain the link between macroeconomic conditions, as proxied by GDP growth, money supply, inflation, and interest rates, and the expansion of important Southeast Asian markets, such as Indonesia, Malaysia, and Singapore. This research is anticipated to be useful to capital market investors as a component of their investment policy in the capital markets, particularly in terms of the impact of macroeconomic variables such as inflation, interest rates, exchange rates, GDP, oil price, primary commodity price, and wages on the aggregate stock price index. This study differs from past Indonesian research in that it also investigates the influence of macroeconomic variables on the Southeast Asian stock market index as a whole. This study use multiple regression analysis to assess the impact of macroeconomic variables on the stock market index of each nation.

Utilizing multiple regression analysis, Boonyanam (2014) analyzed the effect of macroeconomic factors on the Pakistani stock market between 1998 and 2009, concentrating on the period between 1998 and 2009. The investigation found that the GDP and exchange rate positively influenced stock prices. CPI had a negative effect on the stock price, but the value of exports, money supply (M2), Foreign Direct Investment, and oil price had no significant effect.

The next part describes the concept behind this study, followed by the methods used in this inquiry. All of the study's findings are presented and discussed in the "Results and Discussion" section. In the ending part, you will find the conclusion and advice.

LITERATURE REVIEW

The APT theory addresses topics like as a suitable investment profit margin and how the market determines a product's price. According to APT, the assets of two investment possibilities must be comparable and unable to be sold at a different price. The law of one price is a concept used in APT; when assets with the same characteristics are offered at different prices, there is an opportunity to engage in arbitrage by purchasing extremely inexpensive assets and simultaneously selling them at a higher price in order to generate profits without risk (Hersugondo et al., 2015). A plethora of economic and industrial elements, according to APT, influence the profit margin. Due to the fact that the profit margins of both securities are impacted by the same variables, there is a correlation between them.

Understanding signaling is crucial to financial management. The signal is often seen as a communication from the firm (management) to other parties (investors). These signals may manifest in a variety of ways, some of which are immediately discernible and others of which need

more investigation (Gumanti, 2009). The macro fundamental components to which capital market participants pay the most attention are macroeconomic issues. Because changes in macroeconomic factors have a tendency to affect the capital market, shrewd investors would study the anticipated future trend of these variables before investing. This is because the volatility of the macroeconomic climate will have a significant impact on the growth of future investments.

According to Tandelilin (2010), the stock market index provides information on the performance and price fluctuations of the stock market. The stock index was also highlighted as a potential source of information for capital market investments. The stock market index serves as a gauge of the nation's overall economic health. Multiple approaches may be used to generate the stock index. The stock index is computed using Price Weighted Index, Value Weighted Index, and Unweighted Index (Reilly & Brown, 2012). The Price Weighted Index was also described as the arithmetic mean of current stock prices, indicating that the movement of the index is influenced by the price difference between each component and that substantial stock price movements may have an impact on the index as a whole. The second method is the Value Weighted Index, which computes the stock index by considering both price and company size. When market capitalization is significant, a little price change may affect the whole index. The final option is the Unweighted Index, which distributes all shares equally regardless of price or market size. Consequently, shares with a small market capitalization and low prices have the same value as shares with a large market capitalization and high prices (Budidarma, 2012).

Real economic activity is believed to have the biggest influence on the performance of the stock market. The usual measure of economic activity, according to Pramod and Puja, is the gross domestic product (GDP) or gross national product (GNP) (2012). The definition of GDP may also include the value of the finished products and services produced by the different production units of a nation in a given year. A commodity is a tangible object that is generally simple to trade, can be physically displayed, can be stored for a limited period of time, and can be traded for other commodities. On futures markets such as the Chicago Mercantile Exchange, investors may generally purchase and sell commodities.

H1: Actual economic activity (GDP_ influences stock market index fluctuation.

Changes in inflation and stock market indices are influenced by interest rates. Understanding the effect of interest rates on index movements is vital, since these fluctuations have a considerable impact on economic growth (Carneiro et al., 2002). A rise in short-term interest rates has a negative effect on stock market returns, according to economic theory. Ajayi and Mougoue (1996) argue that a rising stock market price indicates that inflation expectations are growing. This rise in interest rates increases borrowing costs, so lowering the future profitability of a corporation (Mukherjee and Naka, 1995).

H2: Inflation has a substantial influence on the movement of the stock price index.

According to Alatiqi and Fazel (2008), the hypothesized causal link between money supply and stock prices is formed in two steps: a negative causal relationship between money supply and interest rates, followed by a negative causal relationship between interest rates and stock prices. Therefore, the lack of a causal relationship between money supply and stock prices may be partly attributable to uncertainty over whether interest rates would fall (raise) in response to an increase (reduction) in money supply. Frequently, the negative causal relationship between money supply and interest rates focuses on the impact of short-term liquidity. According to the liquidity effect, an increase in the money supply results in an excess money supply at the existing income, interest

rate, and price levels. As nominal interest rates reflect the opportunity cost of keeping cash, there is an inverse relationship between money demand and nominal rates. For the money market to remain in equilibrium, a rise in the money supply must be accompanied by a decline in interest rates. In the absence of a change in the money demand curve, a shift to the right in the money supply curve will result in a decline in the equilibrium interest rate. If both the money supply curve and the money demand curve simultaneously shift to the right, the new equilibrium interest rate might be the same as or greater than the previous equilibrium rate. A higher price level or an increase in actual production may cause a shift to the right in the money demand. For instance, if the economy undergoes stagflation, households may need more cash due to rising costs. This causes a shift to the right of the money demand curve. In this scenario, an expansionary monetary policy might result in a rise or no change in interest rates.

H3: The money supply is an essential factor in affecting the stock price index fluctuations.

Interest rates effect inflation and stock market index fluctuations. Understanding the influence of interest rates on index movements is crucial since these variations have a substantial impact on economic expansion (Carneiro et al., 2002). According to economic theory, an increase in short-term interest rates has a negative impact on stock market returns. According to Ajayi and Mougoue (1996), a rising stock market price suggests a rise in inflation expectations. This rise in interest rates raises borrowing expenses, hence decreasing a company's future profitability (Mukherjee and Naka, 1995).

H4: Inflation is a significant element influencing the movement of the stock price index.

DATA AND METHODOLOGY

The scope of this study is the three major stock market in Southeast Asian countries such as Singapore, Malaysia, and Thailand. Those stock markets are chosen because their market capitalization is the three top market capitalization in Southeast Asian countries, making it one of the largest in Southeast Asia. This study drew its information from Yahoo Finance for stock index prices and the World Bank database for macroeconomic factors. The data is the yearly data from 2002 to 2021.

Kuncoro (2003) explains that the population is a complete group of elements which are usually in the form of people, objects, transactions, or events where researchers are interested in researching them and make them objects of research. In this study, the data used is the population, namely the stock price indexes of Southeast Asian countries (JCI, STI, and KLSE), inflation data, money supply data, interest rate data, and GDP growth.

This study uses secondary data. The data used in this study were collected from several sources, namely LQ45 stock index price data, inflation data, money supply data (M2), BI rate data, and Rupiah exchange rate data against the US Dollar which were downloaded from the yahoo finance website, the Indonesia Stock Exchange, website of the Central Bureau of Statistics, and data released by Bank Indonesia.

In this study, there are four factors are considered. The stock price index (INDEX) is the dependent variable, while the independent variables are GDP growth (GDPG), money supply (BROAD), inflation (INFLATION), and the difference between deposit interest rate and lending interest rate (SPREAD). The consumer price index (CPI) is utilized to determine the level of inflation. The interest rate spread serves as the interest rate variable, whereas wide money represents the money supply.

The purpose of this study is to determine whether macroeconomic indices (GDP growth, money supply, inflation, and interest rate spread) have a substantial impact on the stock price index of three major Southeast Asian Capital Markets. As noted in the preceding section, this study explored four hypotheses, which were tested using multiple regression analysis. This model of this study can be formulated as follows:

$$\text{INDEXES} = \alpha + \beta_1\text{GDPG} + \beta_2\text{BROAD} + \beta_3\text{INFLATION} + \beta_4\text{SPREAD} + \varepsilon$$

RESULTS AND DISCUSSION

Displaying the quantiles of the model residuals against the quantiles of a Chi-square distribution, sometimes known as a Q-Q scatterplot, was used to assess the normality assumption (DeCarlo, 1997). For the assumption of normality to be satisfied, the quantiles of the residuals must not deviate considerably from their theoretical counterparts. The appearance of considerable deviations may be a signal that the parameter estimations are erroneous. Figure 1 illustrates a Q-Q scatterplot displaying the model's residuals.

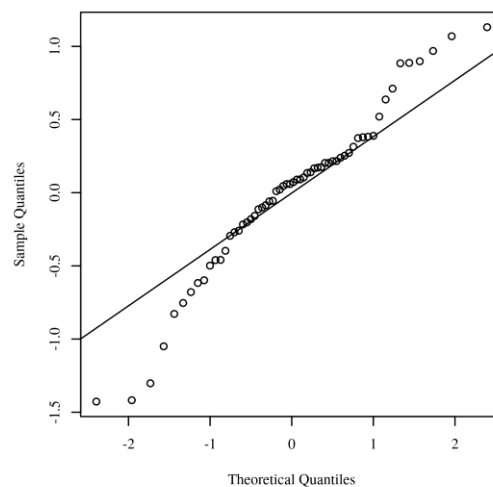


Figure 1

Q-Q scatterplot for normality of the residuals for the regression model.

Homoscedasticity was identified by comparing residuals to expected values (Bates et al., 2014; Field, 2017; Osborne & Walters, 2002). The homoscedasticity criteria is met if the points seem to be randomly distributed with a mean of zero and no visible curvature. Figure 2 depicts a scatterplot of expected values and model residuals.

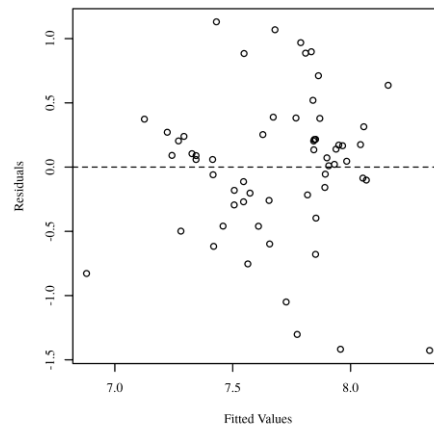


Figure 2
Residuals scatterplot testing homoscedasticity

To determine the presence of multicollinearity among predictors, Variance Inflation Factors (VIFs) were computed. The model exhibits strong multicollinearity effects if the VIFs are high. VIFs over five are reason for worry, whereas VIFs exceeding ten should be regarded as the upper limit (Menard, 2009). In the regression model, all predictors had VIFs of less than 10. The VIF for each predictor model is shown in Table 1.movement.

Table 1
Variance Inflation Factors for GDPG, BROAD, CPI, and SPREAD

Variable	VIF
GDPG	1.14
BROAD	1.95
CPI	1.60
SPREAD	1.81

The mean of the LNINDEX observations was 7.69 (standard deviation = 0.63, standard error of the mean = 0.08, minimum = 6.05, maximum = 8.80, skewness = -0.23, kurtosis = -0.42, mode = 6.05, median = 7.67). The median GDPG value was 5.00 (SD = 3.01, SEM = 0.39, Min = -5.65, Max = 14.52, Skewness = -0.81, Kurtosis = 3.95, Mode = 4.50, Mdn = 5.00). The BROAD observations averaged 2.69 (Standard Deviation = 1.05, Standard Error of the Mean = 0.14, Minimum = 1.07, Maximum = 4.42, Skewness = -0.19, Kurtosis = -1.29, Mode = 3.48, Median = 3.0). Standard Deviation = 3.04, Standard Error of the Mean = 0.39, Minimum = -1.14, Maximum = 13.11, Skewness = 1.29, Kurtosis = 1.63, Mode = 11.90, Median = 2.22). The average number of SPREAD observations was 4.16 (Standard Deviation = 1.49, Standard Error of the Mean = 0.19, Minimum = 1.43, Maximum = 7.68, Skewness = -0.36, Kurtosis = -0.71, Mode = 3.44, Mdn = 4.16). When the absolute value of the skewness is more than 2, a variable is considered asymmetrical with respect to its mean. When the kurtosis is higher than or equal to 3, the variable's distribution has a significantly different propensity than a normal distribution to produce outliers (Westfall & Henning, 2013). The statistical summary is shown in Table 2.

Table 2
Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
LNINDEX	7.69	7.67	8.80	6.05	0.63	60
GDPG	4.78	5.03	14.52	-5.65	3.01	60
BROAD	2.69	3.02	4.42	1.07	1.05	60
CPI	3.22	2.33	13.11	-1.14	3.04	60
SPREAD	4.16	4.73	7.68	1.43	1.49	60

Table 3 and Table 4 display the correlational results. Using the Holm correction to account for multiple comparisons based on an alpha value of 0.05, the results of the correlations were analyzed. A negative correlation of -.51 was detected between BROAD and SPREAD, indicating a strong effect size ($p < .001$, 95% confidence interval = [-.68, -.29]). This indicates that when BROAD expands, SPREAD tends to contract. There were no other significant relationships detected.

Table 3
Correlation of variables

	LNINDEX	GDPG	BROAD	CPI	SPREAD
LNINDEX	1				
GDPG	-0.020	1			
BROAD	-0.182	-0.149	1		
CPI	-0.167	0.236	0.291	1	
SPREAD	0.339	0.116	-0.510	0.258	1

Table 4
Pearson Correlation Results Among LNINDEX, GDPG, BROAD, CPI, and SPREAD

Combination	<i>r</i>	95.00% CI	<i>n</i>	<i>p</i>
LNINDEX-GDPG	-.02	[-.27, .24]	60	.880
LNINDEX-BROAD	-.18	[-.42, .08]	60	.822
LNINDEX-CPI	-.17	[-.40, .09]	60	.822
LNINDEX-SPREAD	.34	[.09, .55]	60	.072
GDPG-BROAD	-.15	[-.39, .11]	60	.822
GDPG-CPI	.24	[-.02, .46]	60	.419
GDPG-SPREAD	.12	[-.14, .36]	60	.822
BROAD-CPI	.29	[.04, .51]	60	.191
BROAD-SPREAD	-.51	[-.68, -.29]	60	< .001
CPI-SPREAD	.26	[.00, .48]	60	.327

Note. *p*-values adjusted using the Holm correction.

The linear regression model yielded significant findings, $F(4,55) = 3.58$, $p = .012$, $R^2 = .21$, showing that GDPG, BROAD, CPI, and SPREAD explain roughly 20.64% of the variation in

LNINDEX. GDPG did not predict LNINDEX substantially, $B = 0.008$, $t(55) = 0.29$, $p = .773$. A one-unit rise in GDPG has no meaningful influence on LNINDEX based on this sample. BROAD did not predict LNINDEX substantially, $B = 0.12$, $t(55) = 1.23$, $p = .223$. Based on this sample, an increase of one unit in BROAD has no significant impact on LNINDEX. CPI predicted LNINDEX strongly, $B = -0.08$, $t(55) = -2.46$, $p = .008$. This means that, on average, a one-unit rise in CPI will result in a 0.08-unit fall in LNINDEX. SPREAD predicted LNINDEX strongly, $B = 0.23$, $t(55) = 3.32$, $p = .002$. This suggests that, on average, a one-unit increase in SPREAD will result in a 0.23-unit rise in LNINDEX. Table 4 provides a summary of the regression model's outcomes.

Table 5
Results for Linear Regression with GDPG, BROAD, CPI, and SPREAD predicting LNINDEX

Variable	<i>B</i>	<i>SE</i>	95.00% CI	β	<i>t</i>	<i>p</i>
(Intercept)	6.62	0.50	[5.62, 7.61]	0.00	13.34	< .001
GDPG	0.008	0.03	[-0.05, 0.06]	0.04	0.29	.773
BROAD	0.12	0.10	[-0.08, 0.33]	0.21	1.23	.223
CPI	-0.08	0.03	[-0.14, -0.01]	-0.37	-2.46	.017
SPREAD	0.23	0.07	[0.09, 0.37]	0.54	3.32	.002

Note. Results: $F(4,55) = 3.58$, $p = .012$, $R^2 = .21$
Unstandardized Regression Equation: $LNINDEX = 6.62 + 0.008*GDPG + 0.12*BROAD - 0.08*CPI + 0.23*SPREAD$

The result implies that the macroeconomics variables are simultaneously affecting stock price indexes. However, only CPI and SPREAD has a statistically significant influence on the stock price indexes. CPI has negative effects on stock price indexes. In contract, interest rate spread has positively impacted stock price indexes. Consequently, the finding confirms hypotheses H3, and H4. The conclusion is consistent with the findings of Sukamto (2016); Rahmawati and Bainsi (2019); and Nawindra and Wijayanto (2017). It suggests that investors should be cognizant of macroeconomic conditions, including inflation, and interest rate.

CONCLUSION AND FUTURE RESEARCH

This study examines the effect of macroeconomic factors on stock price indexes. The finding demonstrates that inflation reduce stock price index, whereas interest rate spread tends to raise stock price index. As a result, investors should be wary of inflation and the rise in the interest rate, as they can affect stock price index.

Other macroeconomic variables and commodities such as world oil prices, and the exchange rate, should be included in the investigation of factors affecting stock price index for future studies. In addition, future research can extend the duration of the study in order to get even more accurate results.

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