

## Malaysian Sectoral Indices VS Macroeconomic Factors, Any Correlation? :

Evidence From Malaysia

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**Abstract**—Movements of stock market indices illustrate the overall market sentiment. Investors use it to forecast the future market trend. In Malaysia, the consumer product and industrial product sector play an important role in driving the growth of the Malaysian economy; whether as a strategic sector or as a mobiliser of funds for investment. The aims of this research is to examine the relationship between the consumer product and industrial product index with macroeconomic variables namely Interest Rate (Base Lending Rate), Inflation Rate (Consumer Price Index), and Money Supply (M2). The methodology used was Multiple Regression Analysis which to identify the relationship between both of the stock market indices and the macroeconomic variables. The sample data taken for the period of 15 years was then computed using SPSS. Results show that all variables have significance correlation with the indices. Whilst BLR and CPI have negative relationship with consumer product and industrial product index in Bursa Malaysia. Results also show that M2 has a positive relationship with consumer product and industrial product index in Bursa Malaysia which means that all variables have significant relationship with the stock market indices.

**Keywords**—Stock Market; Interest Rate, Inflation Rate; Money Supply

### I. INTRODUCTION

The dramatic changes in all sectors such as manufacturing, industrial, consumer product, property, finance and many more; due to globalization and liberalization concept applied by Malaysian government have influence the stock return by all the companies that listed in the Main Market. Performance of all companies listed in the Main Market which has been fluctuated based on

the market condition had affected several factors such as economic, financial, business and liquidity.

The sectoral indices served as an indirect measure of the performance of the economy. The reason is; a well-formulated stock market index can be sensitive barometer of short-run political and economic developments. On the other hand, the investors have expressed their interest in the performance of the ten sectors in the Bursa Malaysia stock market. Such interest has resulted in the growth of all sectors becoming alternatives for agents looking to diversify their risks in choosing the right investments in the financial market. The investor or portfolio holder's expectations on future values of macroeconomic variables can impact the stock prices and macroeconomic variables become risk factors in their portfolio substitution. Thus, it is important to study the effect of macroeconomic variables on stock market indices.

Arguments about macroeconomic variables such as inflation, interest rate and money supply have significant impact on stock prices were among the popular topics debated. The researches believed that government financial policies and macroeconomic events have influence on general economic activities including the stock market and have motivated them to investigate the dynamic relationship between stock returns and macroeconomic variables.

### II. PAST RESEARCHES

Stock prices are generally believed to be determined by some fundamental macroeconomic variables such as interest rate, exchange rate and inflation rates. Several studies have attempted to capture the effect of economic forces on stock returns in different countries. Fama (1981, 1990) and Chen, Roll and Ross (1986) tested the relationships between

macroeconomic variables and stock prices with US economic data. Fama (1981) documents a strong positive correlation between common stock returns and real economic variables like capital expenditures, industrial production, real GNP, money supply, lagged inflation and interest rates. Chen, Roll and Ross (1986) find that the changes in aggregate production, inflation, the short-term interest rates, the maturity risk-premium and default risk-premium are the economic factors that explain the changes in stock prices.

The relationship between stock prices and interest rates has received considerable attention in the literature. According to Asprem (1989), Fama (1990), Bulmash and Trivoli (1991) show that there is a negative relationship between interest rates and stock returns in Korea. Zordan (2005) found historical evidence illustrates that stock prices and interest rates are inversely correlated.

Omran (2003) who focused on examining the impact of real interest rates as a key factor in the performance of the Egyptian stock market found a significant long-run and short-run relationship between the variables, implying that real interest rates had an impact upon stock market performance.

Uddin and Alam (2007) found that Interest Rate has significant negative relationship with Share Price and Changes of Interest Rate has significant negative relationship with Changes of Share Price.

For decades, it was generally believed that inflation and stock returns exhibited a negative correlation. However, there are conflicting inferences in the literature about the relationship between inflation and real stock returns. Nelson (1976), Fama and Schwert (1977), and Schwert (1981) report evidence of an inverse relationship between inflation and real stock returns. On the other hand, Boudoukh and Richardson (1993) find strong support for a positive relationship between nominal stock returns and inflation at long horizons while Choudhry (2001) finds that current stock market returns are positively correlated with current inflation in high inflation countries.

Rapach (2002) disputes the findings of an inverse relationship between real stock prices and inflation. Using the King and Watson (1997) methodology of testing for long-run neutrality, Rapach (2002) finds no evidence of a long-run inverse relationship in a study involving sixteen industrialized countries. Shiller and Beltratti (1992) find little correlation between inflation and stock returns, but do find an inverse relationship between stock returns and interest rates. Such a relationship is supported by Campbell and Ammer (1993) among others.

Authors provide explanations for an inverse relationship between inflation and stock returns in several ways. Fama (1981), Feldstein (1980), Modigliani and Cohn (1979) and Pindyck (1984) are among those researchers who have proposed explanations to the anomalous findings stating negative relationship between inflation and stock returns.

More recently, researchers started analyzing this relationship for developing countries. Apergis and Eleftheriou (2002) found that in the high inflation country Greece, stock returns seem to be linked to inflation rather

than interest rates. Omran and Pointon (2001) uncovered negative relationship between inflation and stock market activity in Egypt.

Mukherjee and Naka (1995) argue that if an increase in money supply leads to economic expansion via increased cash flows, stock prices would benefit from economic growth lead by such expansionary monetary policy. In the case of Japan, the study shows that money supply is positively related to stock market. Consistently, Maysami and Koh (2000) support the view of Mukherjee and Naka (1995) for both long run and short run dynamic interaction between money supply and stock returns for the case of Singapore.

### III. DATA AND METHODOLOGY

Data were collected from secondary sources such as books, internet, database and journals that are related to this topic. The sampling size was based on monthly basis for each variable from January 1995 until December 2009. This research had tried to look at the possibility of the significance correlation between dependent variables; Stock market indices (Consumer Product and Industrial index in Bursa Malaysia) and independent variables; Interest rate (BLR), Inflation rate (CPI), and Money supply (M2).

The Multiple Regression Analysis has been adopted to identify the relationship between both of the stock market indices and the three independent variables. The actual computation on sample data on all variables (dependent and independent) which consist of a period of 15 years was computed using SPSS.

Multiple Linear Regression Model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon \quad (\text{Equation 1})$$

Where;

Y = Dependent variable which represent stock market index (Consumer Product and Industrial Product Index in Bursa Malaysia)

$\beta_0$  = The constant number of equation

$\beta_1$  = Coefficient Beta value

$X_1$  = Independent variable which represent Interest Rate (BLR)

$X_2$  = Independent variable which represent Inflation Rate (CPI)

$X_3$  = Independent variable which represent Money Supply (M2)

$\epsilon$  = Error

### IV. HYPOTHESIS

There are several hypotheses that had been tested in this research. Below are the hypotheses tested :

#### A. Hypothesis 1

H<sub>0</sub>: None of the three independent variables of interest rate, inflation rate, and money supply will significantly explain the variance in stock market indices (consumer product and industrial product index) in Bursa Malaysia.

$(H_0: \beta_1, \beta_2, \beta_3=0)$

$H_1$ : The three independent variables of interest rate, inflation rate, and money supply will significantly explain the variance in stock market indices (consumer product and industrial product index) in Bursa Malaysia.  
(At least one of the  $\beta$  is not equal to zero)

In order to test whether this is applicable in Bursa Malaysia stock market indices, it is hypothesized that:

*B. Hypothesis 2*

$H_0$ : There is no significant correlation between interest rate and consumer product index in Bursa Malaysia.

*C. Hypothesis 3*

$H_0$ : There is no significant correlation between inflation rate and consumer product index in Bursa Malaysia.

*D. Hypothesis 4*

$H_0$ : There is no significant correlation between money supply and consumer product index in Bursa Malaysia.

*E. Hypothesis 5*

$H_0$ : There is no significant correlation between interest rate and industrial product index in Bursa Malaysia.

*F. Hypothesis 6*

$H_0$ : There is no significant correlation between inflation rate and industrial product index in Bursa Malaysia.

*G. Hypothesis 7*

$H_0$ : There is no significant correlation between money supply and industrial product index in Bursa Malaysia.

V. RESULTS

Results were derived from SPSS output. The results were discussed according to the hypothesis and the models.

*A. Multiple Linear Regression Models 1*

TABLE I. ANALYSIS OF VARIANCE

F-stat	P-value
222.283	0.000

From Table I, the result for Hypothesis 1 shows that the calculated value of the F-statistic is 222.283 and the significant F at p-value of 0.000. As p-value is less than 0.05,

the null hypothesis is rejected and alternate hypothesis ( $H_1$ ) is accepted for hypothesis 1. There is a significant correlation between BM Consumer Product Index with BLR, CPI and M2 at 5% significant level.

TABLE II. MODEL SUMMARY

Dependent Variable	R	R-Square	Adjusted R-Square
BM Industrial Product Index	0.889	0.791	0.788

From Table II, the result meant for Hypothesis 2 shows that there is significant correlation between BLR and BM Consumer Product Index since p-value stand at 0.007, which is less than 0.05. Therefore, the established of null hypothesis ( $H_0$ ) is rejected for hypothesis 2 since the variables is significant correlated.

TABLE III. COEFFICIENTS FOR THE MODELS

Dependent	Independent	$\beta$	t	P-value
BM Consumer Product Index		1029.102	13.129	0.000
	BLR	-5.314	-2.712	0.007
	CPI	-11.450	-	0.000
	M2	0.001	17.711	0.000

The result for Hypothesis 3 can be seen from Table III which shows that there is significant correlation between CPI and BM Consumer Product Index since p-value stand at 0.000, which is less than 0.05. Therefore, the established of null hypothesis ( $H_0$ ) is rejected for hypothesis 3 since the variables is significant correlated.

The findings for Hypothesis 4 can be seen from Table III, which is there is a significant correlation between M2 and BM Consumer Product Index since p-value stand at 0.000, which is less than 0.05. Therefore, the established of null hypothesis ( $H_0$ ) is rejected for hypothesis 4 since the variables is significant correlated.

The overall result shows that there is a negative relationship between BLR and BM Consumer Product Index movements as the beta is  $-5.314$ . It means that an increase of 1 unit in BLR, the BM Consumer Product Index will decrease by 5.314 units. The result also shows that there is a negative relationship between CPI and BM Consumer Product Index movements as the beta is  $-11.450$ . It means that an increase of 1 unit in CPI, the BM Consumer Product Index will decrease by 11.450 units. The result then shows that there is a positive relationship between M2 and BM Consumer Product Index movements as the beta is 0.001. It

means that an increase of 1 unit in M2, the BM Consumer Product Index will increase by 0.001 units.

### B. Multiple Linear Regression Models 2

TABLE IV. MODEL SUMMARY

Dependent Variable	R	R-Square	Adjusted R-Square
BM Industrial Product Index	0.857	0.734	0.729

Referring to Table IV, R is 85.7% which explains that there is a strong relationship between BM Industrial Product Index BLR, CPI and M2 because the value is close to 1.0. R-square which is 0.734, indicates that 73.4% of the total variation in BM Industrial Product Index could be explained by the variation in BLR, CPI and M2. The remaining 26.6% could be explained by the other factors. The adjusted R-Square shows a result of 0.729. This indicates that 72.9% of variation of industrial product index in Bursa Malaysia is influenced by independent variables. Since the value of adjusted R-Square is strong, then this could be explained that the relationship between those variables does exist.

TABLE V. ANALYSIS OF VARIANCE

F-stat	P-value
161.708	0.000

The result for Hypothesis 1 by referring at Table V, the output shows that F-statistic is 161.708 and the significant F at p-value of 0.000. As p-value is less than 0.05, the null hypothesis is rejected and alternate hypothesis ( $H_1$ ) is accepted for Hypothesis 1. Therefore, there is a significant correlation between BM Industrial Product Index and BLR, CPI and M2 at 5% significant level.

TABLE VI. COEFFICIENTS OF THE MODELS

Dependent	Independent	$\beta$	t	P-value
BM Industrial Product Index		10494.498	15.050	0.000
	BLR	-74.312	-4.263	0.000
	CPI	-115.252	-	0.000
	M2	0.006	17.731	0.000

From Table VI, there is a significant correlation between BLR and BM Industrial Product Index since p-value stand at 0.000, which is less than 0.05. Therefore, the established of null hypothesis ( $H_0$ ) is rejected for Hypothesis 5 since the variables is significant correlated.

From Table VI, it is found that there is a significant correlation between CPI and BM Industrial Product Index since p-value stand at 0.000, which is less than 0.05. Therefore, the established of null hypothesis ( $H_0$ ) is rejected for Hypothesis 6 since the variables is significant correlated.

From Table VI, there is a significant correlation between M2 and BM Industrial Product Index since p-value stand at 0.000, which is less than 0.05. Therefore, the established of null hypothesis ( $H_0$ ) is rejected for Hypothesis 7 since the variables is significant correlated. The analysis of the overall result shows that there is a negative relationship between BLR and BM Industrial Product Index movements as the beta is -74.312. It means that an increase of 1 unit in BLR, the BM Industrial Product Index will decrease by 74.312 units. The result also shows that there is a negative relationship between CPI and BM Industrial Product Index movements as the beta is -115.252. It means that an increase of 1 unit in CPI, the BM Industrial Product Index will decrease by 115.252 units. The result then shows that there is a positive relationship between M2 and BM Industrial Product Index movements as the beta are 0.006. It means that an increase of 1 unit in M2, the BM Industrial Product Index will increase by 0.006 units.

The result from both model of regression Model 1 and Model 2 shows that there is a negative relationship between interest rate (BLR) with consumer product and industrial product index in Bursa Malaysia. This finding was consistent with the empirical results done by Aspren (1989), Fama (1990), Bulmash and Trivoli (1991).

The result also shows that there is negative relationship between CPI with consumer product and industrial product index in Bursa Malaysia. This inverse relationship is supported by Fama (1981), Feldstein (1980), Modigliani and Cohn (1982) and Pindyck (1984). According to Fama (1981) the increase in rate of inflation decrease the future expected profit, which ultimately impacts the decrease in stock prices. Rapach (2002) found inverse relationship between real stock prices and inflation.

The overall result shows that there is a positive relationship between M2 with consumer product and industrial product index in Bursa Malaysia. The positive correlation between money supply changes and stock returns is consistent with the findings of Mukherjee and Naka (1995) that attributed a rise in the discount rate to the expansionary effect of money supply increase. In addition, Maysami and Koh (2000) similarly observed a positive relationship between the Singapore stock market and short-term interest rates.

## VI. CONCLUSION

An index is a tool which enables investors to measure the performance of a group of stocks from a defined market. As there are numerous indices, investors can use them to compare which sectors are moving more and in what direction. It is also could help investors to spread their risk by constructing a portfolio and diversify share in which those with high risk (high returns) are balanced with those that are less risky (low returns). This research focus on the significant correlation between the dependent variables and

independent variables since both consumer product and industrial products market price are linked to the macroeconomic and business conditions. Therefore, the outcomes of this research will be beneficial and useful information to various parties especially to investors as they are able to know the relationship between macroeconomic variables and stock market indices in Bursa Malaysia.

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