THE KUALA LUMPUR STOCK EXCHANGE COMPOSITE INDEX (KLSE CI) AND ECONOMIC FORCES

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ABSTRACT

An economic climate is a major factor in determining the primary trend of a stock market. The stock market, on the other hand, is often regarded as a reliable barometer of a country's financial market or economy. In this study, a multi-regression model is used to empirically examine the impact of M1, M2, M3 money supply, inflation rate, oil price, interest rate, gold price, industrial gross production index (IP), the Dow Jones Stock Exchange Index and consumer price index (CPI) on the Kuala Lumpur Stock Exchange Composite Index (KLSE CI). The s study uses monthly time-series data from May 2004 until April 2015. The empirical findings using Linear Regression, Stepwise method, Pearson Correlation Matrices and Scatter Plots indicate that coefficient of inflation, money supply M1, interest rate, oil price changes and the Dow Jones Index are significant, meanwhile, IP, M2, M3, gold price and CPI are insignificant. This study also indicates that IP, inflation rate, and interest have a negative impact on the KLSE index.

Keywords: Economics, Kuala Lampur exchange index, Equity, Regression.

Introduction

Since financial markets and their development play an important role in the economic growth of countries, studying these markets and the factors influencing it can produce useful results for planning and achieving the specified aims. The Stock Exchange market works as one of the subdivisions of the capital market and it provides the financial resources. In this market and in the light of the Arbitrage Pricing Theory (APT), stock purchasers (investors) will attempt to make profits. One of the factors that the stockholders take into consideration, are stock prices of the active companies. On the other hand, different factors, such as economic variables affect the price of stocks of different companies. Thus, clarifying the rate and the direction of economic variables that influence the stock market's total price index, will help managers of active companies and investors.

An economic climate is a major factor for determining the primary trend of a stock market. As such, the stock market is often regarded as a reliable barometer of a country's economy; stock prices are deemed to be a reflection of future expectations concerning the economic well-being of the country. Due to this factor, it is necessary to know the cause-and-effect of economic variables and their relationship with stock market performance.

In Malaysia, the stock market contributes to the best allocation of capital resources among numerous users. The roles of the stock market are mainly to facilitate and encourage the mobilization of funds, direct them towards efficient economic activities, provide adequate liquidity for investors and encourage the creation of large-scale enterprises.

The Kuala Lumpur Stock Exchange Composite Index (KLSE CI) is the most popular indicator of the Kuala Lumpur stock market's performance. The KLSE CI represents share prices of 100 corporations. These companies are chosen because their operations cover a broad spectrum of economic performance in Malaysia and more significantly, reflect stock market activities with fair accuracy.

However, it is possible to use changes in some macroeconomic variables and foreign stock indices in order to predict and forecast changes in the local index, both in the long-run and in the short-run. Therefore, investors can use information obtained from the stock market to predict the behavior of the KLSE CI. Moreover, authorities in Malaysia can use the stock prices as a policy tool to attract foreign portfolio investments by stabilizing the stock market.

Therefore, the stock market is often regarded as a reliable barometer of a country's economy. In this paper, Multiple-Linear Regression model is used to examine empirically the impact of M1, M2, M3 money supply, inflation rate, oil price, interest rate, gold price, Industrial Gross Production Index (IP), the Dow Jones Stock Exchange Index and Consumer Price Index (CPI) on the KLSE CI. Pearson Correlation Matrices and Scatter Plots indicate that multicollinearity and heteroscedasticity exist among the selected independent variables. Many studies have documented the relationship between macroeconomic variables and stock returns. Some of these studies have examined this relationship for developed markets, such as in the USA, Japan and Europe. On the other hand, some other studies have investigated this situation for developing markets, particularly in East Asia. There are

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also studies that have compared this phenomenon for groups of countries. These studies have provided different results. The results change according to the macroeconomic factors used, the research methodology employed and the countries examined.

This paper investigates the role of macroeconomic factors to explain Malaysian stock returns. Regression models are constructed in the light of previous studies. By using monthly-based data covering time period from May 1995 to April 2009, this study employs some important macroeconomic factors. These macroeconomic factors are growth rate of IP, change in CPI, gold price, interest rate, rate of international crude oil price, returns on the Dow Jones Equity Index and the money supply (M1, M1 and M3). The analysis is based on the KLSE rather than single stocks. In the regression models, the stock index, KLSE CI, is used as the dependent variable and macroeconomic variables are used as independent variables. Empirical findings suggest that M1, inflation, interest rate, oil price and Dow Jones world market seem to affect returns of the KLSE CI. On the other hand, IP, gold price, M2, M3 and CPI do not appear to have any significant effect on stock returns. Finally, inflation and interest rate are significantly and negatively correlated to the KLSE CI.

The main purpose of this paper is to examine the relationship between Malaysian stock index, KLSE CI, exchange rate returns and macroeconomic variables. It also aims to predict the future stock price value that can help investors in the stock exchange market make better decisions.

Literature Review

Roll and Ross (1986) said, "No satisfactory theory would argue that the relation between financial markets and the macro-economy is entirely in one direction. However, stock prices are usually considered as responding to external forces (even though they may have a feedback on the other variables). It is apparent that all economic variables are endogenous in some ultimate sense".

Roll and Ross (1986) studied the relationship between the stock exchange index and selected macroeconomic variables. They tried to estimate the returns of the stock index using the APT. They found that interest rate, inflation and IP significantly influence market returns. However, some of the macroeconomic variables they selected did not show any significant change when they examined the relationship between stock returns and consumers' consumption index. Surprisingly, although Roll and Ross emphasized on the influence of oil price on stock returns, they found that oil price was insignificant at that period of time.

Shanken and Weinstein (2005) retested the pricing in Chen, Roll and Ross' paper on economic forces and the stock market. However, they found that by making a reasonable change in the methodology used by Chen, Roll and Ross, the percentage change in industrial production, is the only variable significantly influencing stock returns.

Hondroyiannis (2001) studied the dynamic interactions among indicators of economic activity, such as IP, interest rate and exchange rate, the performance of the foreign stock market, oil price and stock returns to test their effect on the performance of the stock market in Greece. The empirical results show that oil price changes are significant and explain stock price movements inversely (negatively). Other macroeconomic variables seem not to have an influence, except for the foreign stock market changes which appear to only partially explain stock market movements.

On the other hand, Fama (1991) examined the relationship between inflation, CPI, money supply and capital expenditure and stock returns. He used the stock returns on the New York Stock Exchange which is the annual continuously compounded nominal returns on a value weighted portfolio of all New York Stock Exchange common stocks less the annual continuously compounded inflation rate calculated for the USA. CPI. Fama found that M1 and M2 money supply are both significantly correlated to stock returns. Inflation is found to be inversely correlated to stock returns, which increases as capital expenditure increases.

Naka (1998) examined a group of macroeconomic variables that might influence the returns on the Bombay Stock Exchange Index. The independent variables are the IP, the CPI, M1 and the value of an investment earning the money market rate. Naka implemented a vector error correction model to avoid misspecification biases. Naka found that IP is the largest positive determinant of the other variables. Meanwhile, inflation is found to be the largest negative predictor of the rest of the macroeconomic variables (Naka, 1998). Also, Friedman (1988) found that the money supply M2 and real quantity of money is positively related to real stock prices of Standard and Poor's composite index during the period of 1961 to 1986.

Wongpmango and Sharma (2002) investigated the relationship between stock exchange returns of the ASEAN countries, including the KLSE CI of Malaysia; they selected macroeconomic variables, including money supply M1, foreign exchange rate, gross national production, CPI and interest rate. They found that in the long-run, the interest rate has an inverse relationship with stocks in the Philippines, Singapore and Thailand. In contrast, Malaysia and Indonesia record a positive relationship with interest rates on stocks. While inflation has a negative influence on stock returns in Indonesia and Philippines, the influence is positive in Malaysia, Singapore and Thailand. Finally, the exchange rate positively affects stocks in Indonesia, Malaysia and Philippines but negatively in Thailand and Singapore.

Abdul Rahman, Sidek and Hanim (2009) found that Malaysian stock market has stronger dynamic interaction with reserves and industrial production index as compared to money supply, interest rate, and exchange rate.

Lastly, Bekhet and Mugableh (2014) assessed the long term and short term relationships between the industrial production index (IP), the producer price index (PPI), the consumer price index (CPI), exchange rates (ER), narrow money supply (M1), broad

money supply (M2) and the Malaysian Stock Market Index (SMI) using annual time-series data for the 1977-2011 period. He concluded that IP and M1 are positively associated with SMI in the long term, while PPI and M2 are negatively associated. Moreover, IP and M2 are negatively associated with SMI in the short term, while PPI and M1 are positively associated.

Data and Methodology

In this paper, the analysis is conducted by using monthly data for the period from May 204 to April 2015. The data used in the study is divided into two sub-groups: the first data set consists of stock data and the second data set consists of macroeconomic factors.

$\hat{R}$ (KLSE) = the return on the KLSE Stock Index,
M1= money supply, including funds that are readily accessible for spending
M2= money supply of M1 + savings deposits
M3= money supply of M2 + large time deposits, institutional money-market funds, short-term repurchase agreements
IP = the growth rate of industrial production index
INF = Inflation
Gold = the change in gold prices
IR = the 12-month time deposit rate

This study uses data for the KLSE. Monthly stock returns (adjusted) for the period from May 2004 through April 2015 are obtained from Yahoo Finance. For accounting variables, we match the accounting data for all fiscal year-ends in calendar year t-1 with the returns for May of 2004 to April of 2015. The purpose of matching accounting variables with t to KLSE returns is to ensure that the accounting variables are known before the returns are used to explain them.

Findings

First Model Regression:

Table 2: Variables Entered/Removed (b)

Model	Variables Entered	Variables Removed	Method
1	CPI, DJ, IP, INFL, GOLD, IR, OIL, M1, M2, M3(a)	.	Enter

a All requested variables entered.
b Dependent Variable: LOGKLSE

The distribution of log-transformed sales is closer to normal than sales in thousands, and the linear regression model works better with normal variables.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.684(a)	.668	.661	.01552

a Predictors: (Constant), CPI, DJ, IP, INFL, GOLD, IR, OIL, M1, M2, M3

Table 4: ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.343	10	.034	142.260	.000(a)
	Residual	.011	47	.000		
	Total	.354	57			

a Predictors: (Constant), CPI, DJ, IP, INFL, GOLD, IR, OIL, M1, M2, M3
b Dependent Variable: LOGKLSE

The ANOVA table reports a significant F statistic, indicating that using the model is better than guessing the mean.
As a whole, the regression does a good job of modeling sales. Nearly all the macroeconomic variables in KLSE (Returns) are explained by the model.

Table 5: Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.332	.093		25.085	.000					
	INFL	-.008	.003	-.188	-2.632	.011	-.107	-.358	-.069	.133	7.503
	IP	.001	.001	.059	.978	.333	.024	.141	.026	.186	5.370
	OIL	.000	.000	.105	1.223	.227	.657	.176	.032	.092	10.871
	DJ	4.422E-05	.000	.812	9.499	.000	.857	.811	.248	.093	10.728
	GOLD	-1.945E-05	.000	-.044	-.305	.761	.629	-.044	-.008	.033	30.604
	IR	-.053	.013	-.270	-3.967	.000	.714	-.501	-.103	.147	6.820
	M1	8.680E-07	.000	.279	1.298	.201	.602	.186	.034	.015	67.726
	M2	1.773E-07	.000	.308	.998	.323	.594	.144	.026	.007	140.304
	M3	5.077E-08	.000	.073	.186	.853	.577	.027	.005	.004	225.920
	CPI	.001	.001	.040	.674	.504	.248	.098	.018	.195	5.118

a Dependent Variable: LOGKLSE

Even though the model fit looks positive, the first section of the coefficients Table shows that there are too many predictors in the model. There are several non-significant coefficients, indicating that these variables do not contribute much to the model. The second section of the coefficients Table shows that there might be a problem with multicollinearity. For most predictors, the values of the partial and part correlations drop sharply from the zero-order correlation. This means, for example, that much of the variance in KLSE that is explained by inflation, is also explained by other variables.

The tolerance is the percentage of the variance in a given predictor that cannot be explained by the other predictors. Thus, the small tolerances show that 80%-90% of the variance in a given predictor can be explained by the other predictors. When the tolerances are close to 0, there is high multicollinearity and the standard error of the regression coefficients will be inflated. A variance inflation factor greater than 2 is usually considered problematic, and the smallest VIF in the Table is 5.118 while the highest is 225.920.

Table 6: Collinearity Diagnostics(a)

Collinearity Diagnostics(a)

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions										
				(Constant)	INFL	IP	OIL	DJ	GOLD	IR	M1	M2	M3	CPI
1	1	9.863	1.000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
	2	.875	3.357	.00	.00	.15	.00	.00	.00	.00	.00	.00	.00	.00
	3	.169	7.646	.00	.13	.02	.00	.00	.00	.00	.00	.00	.00	.00
	4	.068	12.047	.00	.05	.00	.06	.00	.01	.00	.00	.00	.00	.00
	5	.015	25.997	.00	.00	.34	.14	.03	.05	.01	.00	.00	.00	.00
	6	.007	37.378	.01	.05	.02	.21	.01	.01	.14	.00	.00	.00	.01
	7	.002	75.830	.01	.05	.31	.05	.08	.26	.23	.05	.03	.00	.02
	8	.001	108.928	.00	.52	.01	.42	.72	.62	.53	.05	.00	.00	.00
	9	.001	133.859	.12	.07	.10	.02	.10	.01	.00	.28	.19	.00	.05
	10	.000	225.179	.85	.03	.00	.00	.05	.05	.07	.40	.07	.02	.61
	11	7.082E-05	373.182	.00	.10	.04	.08	.02	.00	.01	.23	.71	.97	.32

a Dependent Variable: LOGKLSE

Therefore, the collinearity diagnostics confirm that there are serious problems with multi-collinearity. Several eigenvalues are close to 0, indicating that the predictors are highly inter-correlated and that small changes in the data values may lead to large changes in the estimates of the coefficients. The condition indices are computed as the square roots of the ratios of the largest

eigenvalue to each successive eigenvalue. Values greater than 15 indicate a possible problem with collinearity; and greater than 30, a serious problem. Six of these indices are larger than 30, suggesting a very serious problem with collineari

We tried to fix the collinearity problems by rerunning the regression using z scores of the dependent variable and the stepwise method of model selection. This is in order to include only the most useful variables in the model.

Second Model Regression

Table 7: Model Summary(f)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.657(a)	.734	.729	.04101
2	.664(b)	.628	.626	.02147
3	.679(c)	.659	.657	.01640
4	.681(d)	.663	.660	.01580
5	.683(e)	.666	.662	.01531

a Predictors: (Constant), z score(DJ)
b Predictors: (Constant), z score(DJ), z score(M1)
c Predictors: (Constant), z score(DJ), z score(M1), z score(IR)
d Predictors: (Constant), z score(DJ), z score(M1), z score(IR), z score(INFL)
e Predictors: (Constant), Z score(DJ), z score(M1), z score(IR), z score(INFL), z score(OIL)
f Dependent Variable: LOGKLSE

The new model's ability to explain sales compares favorably with that of the previous model. We can see that in the Model 5, the Adjusted R-Square is .962. When we look in particular, at the adjusted R-Square statistics, which are nearly identical, a model with extra predictors will always have a larger R-Square, but the adjusted R-Square compensates for model complexity to provide a more fair comparison of model performance.

Table 8: ANOVA(f)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.260	1	.260	154.630	.000(a)
	Residual	.094	56	.002		
	Total	.354	57			
2	Regression	.329	2	.164	356.623	.000(b)
	Residual	.025	55	.000		
	Total	.354	57			
3	Regression	.340	3	.113	420.930	.000(c)
	Residual	.015	54	.000		
	Total	.354	57			
4	Regression	.341	4	.085	341.249	.000(d)
	Residual	.013	53	.000		
	Total	.354	57			
5	Regression	.342	5	.068	291.889	.000(e)
	Residual	.012	52	.000		
	Total	.354	57			

a Predictors: (Constant), z score(DJ)
b Predictors: (Constant), z score(DJ), z score(M1)
c Predictors: (Constant), z score(DJ), z score(M1), z score(IR)
d Predictors: (Constant), z score(DJ), z score(M1), z score(IR), z score(INFL)
e Predictors: (Constant), z score(DJ), z score(M1), z score(IR), z score(INFL), z score(OIL)
f Dependent Variable: LOGKLSE

Table 9: Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.006	.005		556.537	.000		

	z score(DJ)	.072	.006	.857	12.435	.000	1.000	1.000
2	(Constant)	3.008	.003		1061.075	.000		
	z score(DJ)	.065	.003	.768	20.853	.000	.961	1.041
	z score(M1)	.036	.003	.450	12.217	.000	.961	1.041
3	(Constant)	3.010	.002		1379.942	.000		
	z score(DJ)	.083	.004	.980	22.436	.000	.398	2.510
	z score(M1)	.047	.003	.581	16.637	.000	.622	1.608
	z score(IR)	-.028	.004	-.322	-6.346	.000	.294	3.399
4	(Constant)	3.010	.002		1431.929	.000		
	z score(DJ)	.076	.005	.903	16.726	.000	.242	4.132
	z score(M1)	.049	.003	.602	17.247	.000	.578	1.730
	z score(IR)	-.022	.005	-.256	-4.493	.000	.217	4.608
	z score(INFL)	-.007	.003	-.088	-2.269	.027	.471	2.122
5	(Constant)	3.010	.002		1478.142	.000		
	z score(DJ)	.068	.006	.806	11.619	.000	.137	7.276
	z score(M1)	.046	.003	.564	14.696	.000	.449	2.227
	z score(IR)	-.019	.005	-.223	-3.880	.000	.201	4.983
	z score(INFL)	-.013	.004	-.164	-3.158	.003	.244	4.100
	z score(OIL)	.009	.004	.117	2.120	.039	.217	4.607

a Dependent Variable: LOGKLSE

The stepwise algorithm chooses DJ, M1, IR, INFL and OIL. KLSE is negatively affected by IR and INFL and positively affected by DJ, M1 and OIL

Table 10: Eigenvalue

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	z score(DJ)	z score(M1)	z score(IR)	z score(INFL)	z score(OIL)
1	1	1.079	1.000	.46	.46				
	2	.921	1.082	.54	.54				
2	1	1.195	1.000	.01	.41	.38			
	2	1.036	1.074	.81	.03	.11			
	3	.769	1.247	.18	.55	.52			
3	1	2.016	1.000	.00	.07	.06	.06		
	2	1.037	1.394	.78	.01	.09	.00		
	3	.776	1.611	.20	.16	.42	.00		
	4	.171	3.433	.02	.77	.43	.93		
4	1	2.073	1.000	.00	.03	.07	.04	.01	
	2	1.421	1.208	.02	.05	.06	.00	.16	
	3	.991	1.446	.93	.00	.00	.00	.02	
	4	.404	2.264	.04	.01	.82	.05	.35	
	5	.111	4.324	.00	.90	.05	.91	.45	
5	1	2.812	1.000	.00	.01	.03	.02	.01	.02
	2	1.443	1.396	.03	.04	.03	.01	.07	.00
	3	.991	1.685	.93	.00	.00	.00	.01	.00
	4	.420	2.586	.04	.01	.72	.01	.12	.03
	5	.272	3.215	.01	.01	.00	.33	.05	.38
	6	.062	6.750	.00	.94	.22	.63	.74	.56

Collinearity Diagnostics (a)
a Dependent Variable: LOGKLSE

There are no eigenvalues close to 0, and all condition indices are much less than 15. The strategy has worked, and the model built using stepwise methods does not have problems with collinearity.

Casewise Diagnostics(a)

Table 11: LOGKLSE

Case Number	Std. Residual	LOGKLSE	Predicted Value	Residual
26	2.257	3.10	3.0613	.03454

a Dependent Variable: LOGKLSE

Table 12: Residual Statistics(a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.9194	3.1613	3.0104	.07709	59
Std. Predicted Value	-1.186	1.937	-.011	.995	59
Standard Error of Predicted Value	.002	.010	.005	.002	59
Adjusted Predicted Value	2.9192	3.1627	3.0103	.07739	59
Residual	-.02747	.03454	-.00031	.01469	59
Std. Residual	-1.794	2.257	-.020	.960	59
Stud. Residual	-1.909	2.341	-.016	1.014	59
Deleted Residual	-.03111	.03718	-.00026	.01661	59
Stud. Deleted Residual	-1.961	2.451	-.015	1.027	59
Mahal. Distance	.221	21.947	5.099	4.313	59
Cook's Distance	.000	.264	.024	.041	59
Centered Leverage Value	.004	.385	.089	.075	59

a Dependent Variable: LOGKLSE

Table13: Coefficients(a) of the Regression Tests

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-103.282	100.755		-1.025	.310
	INFL	-35.533	9.659	-.319	-3.679	.001
	IP	-8.664	1.718	-.268	-5.043	.000
	OIL	3.371	.811	.403	4.158	.000
	DJ	.094	.016	.685	5.963	.000
	GOLD	.184	.070	.183	2.625	.011
	IR	-34.436	45.064	-.070	-.764	.448

a Dependent Variable: KLSE

Since the null hypothesis of a unit root is rejected at the 5% and 1% levels in all cases, all of the series are accepted except interest rate is rejected because the significance is above 5%. Having concluded that all of the series are stationary, the effect of macroeconomic variables on the KLSE returns is examined by the regression model estimation. The regression model estimation results are reported in Table 13 The results show that IR, IP, OIL, GOLD, and DJ seem to affect the KLSE index returns. On the other hand, IR of long-term deposits does not appear to have significant effect on stock returns. IR and IP give more than one result, since it is significant and both are negatively correlated with the KLSE index. On the other hand, OIL does affect the KLSE, but surprisingly, positively.

This finding is not totally consistent with the literature review. Studies have documented a positive relationship between stock returns and real economic activity. However, not finding a relationship between interest rate and stock returns is surprising for the Malaysian case. Financial deepening and development of the Malaysian stock market have always been under question. Thus, whether the Malaysian stock market plays the role of transferring resources to the real sector continues to be a well debated topic.

In the course of empirical analyses, cases like the case of multicollinearity above is frequently encountered when the variances of individual estimated parameters are considerably increased as compared to the variance of the error term. Most studies on multicollinearity deal with this case. However, multicollinearity could mean a much more general phenomenon, namely the covariance of explanatory variables.

The recognition of multicollinearity and the identification of its cause often present a serious problem in empirical examinations, as on the one hand, the negative consequences of multicollinearity do not always occur, and on the other hand, multicollinearity

can be caused not only by one variable but also by a group of variables. Thus, it can be describing this phenomenon properly. The success of the method used for reducing or eliminating the negative effects of multicollinearity, can largely depend on the exact recognition of multicollinearity, despite the use of most of these methods. However, a stepwise multilinear regression model was generated for both data sets (Drake and Loveland). It gave an R-square of 0.662, which is less than the initial model generated for the Drake data sets.

Table 14: Comparison between two models:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Multiple-Linear	.684(a)	.668	.661	.01552
Stepwise	.683(e)	.666	.662	.01531

From the Table above, we can see how our Adjusted R-square improves from 66.1% to 66.2% when we use the stepwise method.

Table 15: Stepwise Regression

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
First Step: Multiple Linear Regression								
1	(Constant)	2.332	.093		25.085	.000		
	INFL	-.008	.003	-.188	-2.632	.011	.133	7.503
	IP	.001	.001	.059	.978	.333	.186	5.370
	OIL	.000	.000	.105	1.223	.227	.092	10.871
	DJ	4.422E-05	.000	.812	9.499	.000	.093	10.728
	GOLD	-1.945E-05	.000	-.044	-.305	.761	.033	30.604
	IR	-.053	.013	-.270	-3.967	.000	.147	6.820
	m1	8.680E-07	.000	.279	1.298	.201	.015	67.726
	M2	1.773E-07	.000	.308	.998	.323	.007	140.304
	M3	5.077E-08	.000	.073	.186	.853	.004	225.920
	CPI	.001	.001	.040	.674	.504	.195	5.118
Second Step: Stepwise Regression								
	DJ	.068	.006	.806	11.619	.000	.137	7.276
	m1	.046	.003	.564	14.696	.000	.449	2.227
	IR	-.019	.005	-.223	-3.880	.000	.201	4.983
	INFL	-.013	.004	-.164	-3.158	.003	.244	4.100
	OIL	.009	.004	.117	2.120	.039	.217	4.607

In Table 15, it is clear that when we use the multiple regression model in the first step, there are only four variables which are significant but some insignificant variables records a very high VIF (more than 10), while their existence –the insignificant variables - in the model causes it to be unacceptable. However, the stepwise method gives us advantage in the other step by eliminating the variables that are insignificant and counting only the significant ones.

Also, from the VIF, we can see that when we use the Stepwise Regression, the scores of all five variables are less than 10, which is an optimistic result. On the other hand, in the first Multiple Linear Regression, the VIF scores are not optimistic and some are way higher than 10.

Analysis And Discussion

A number of studies have found that a relationship exists between macroeconomic variables and equity market returns. The relationship between stock returns and macroeconomic factors is well documented for developed nations (Chen, Roll and Ross, 1986; Shanken and Weinstein, 2005; Hondroyiannis, 2001; Fama, 1991; Friedman, 1988; Chen, 1991); East-Asia (Wongbangpo and Sharma, 2002); and for the Kuala Lumpur Composite Index (Abdul Rahman, Sidek and Hanim, 2009). These studies have provided different results. The results of the previous studies have changed according to the macroeconomic factors used, the research methodology employed and the countries examined. This paper extends the literature by considering the effects of firm characteristics on this relationship within an emerging market context, namely Malaysia.

In this study, a regression model is employed to test the effects of selected macroeconomic variables on stock returns for the period May 2004 to April 2015. Macroeconomic variables used in this study are growth rate of IP, change in CPI, inflation, money supply (M1, M2 and M3), change in exchange rate, interest rate, gold prices exchange rate, international crude oil price, money supply: M1, M2 and M3 and return on the KLSE Composite Index. This study uses data for all firms listed on the KLSE. The analysis is based on stock exchange index for all stocks. A multiple regression model is designed to test the relationships between the stock exchange index returns and six macroeconomic factors. In the regression model, stock index returns are used as the dependent variable, while the macroeconomic variables are used as independent variables. Empirical findings reveal that inflation, oil prices, interest rate, M1 and DJ Index seem to affect all of the KLSE stock returns significantly. On the other hand, M2, M3, IP, gold price and CPI seem to not have significant impact on the KLSE.

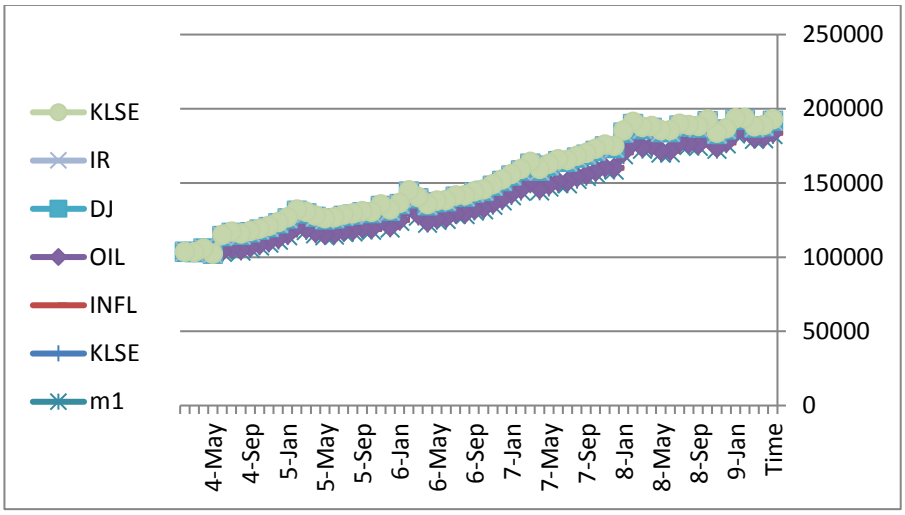

Chart 3 : KLSE with significantly correlated variables

The M1 money stock consists of funds that are readily accessible for spending: currency in circulation, traveler's checks, demand deposits and other checkable deposits. There is a reliable relationship between historical variation in M1 and stock market returns. However, M2 and M3 cannot be an accurate money supply measure because both include non-cash investments, such as money market mutual funds. When the stock market corrects and people are exchanging their stocks (including mutual fund shares), M1 rises, as new cash occurs in the investors' hands and then they can buy new stocks. Obviously, an increase in the rate of growth of cash supply strengthens the rate of increase in stock prices. Conversely, when cash rate of supply shortens, the growth momentum of stock prices slows down.

The conventional wisdom that higher oil prices depress stock returns applies only to demand shocks specific to the crude oil market, such as increases in the precautionary demand for crude oil that reflect fear about the availability of future oil supplies. Precautionary crude oil demand shocks explain the negative relationship between stock returns and inflation over the sample period. In contrast, positive crude oil price shocks driven by wider global demand for industrial commodities (real global economic expansion) lead to higher real oil prices and higher stock prices. Regarding specific industries: oil and natural gas industry stocks and gold and silver mining stocks, they respond positively to oil demand shocks specific to the crude oil market, while the automobile industry and the retail sector respond negatively.

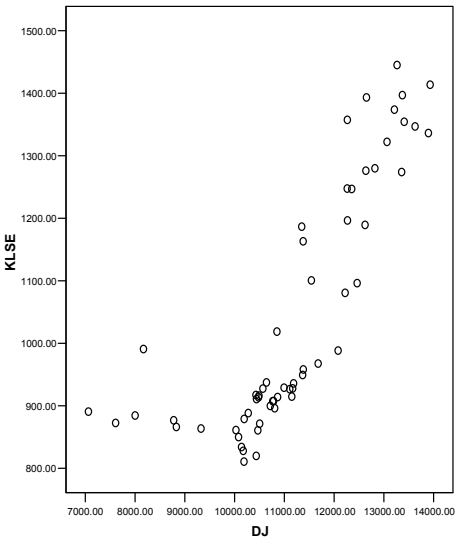

Chart 5: DJ Scatter Plot.

Undoubtedly, when monitoring the KLSE for a few weeks, there have been several times when the Dow Jones Industrial Average (DJIA) was down a lot, and the KLSE stock index followed it down the next day. How reliably does the KLSE follow the US stock market represented by Dow Jones Industrial Average (DJIA)?

Our results suggest a substantial relationship between the two indices with beta coefficient of 0.806, meaning for every 10% rise in the Dow Jones, there has to be an 8% rise in the KLSE returns. However, an 8% drop in the KLSE returns meets every 10% drop in the Dow Jones index. Previously, studies have shown a close relationship between the Dow Jones and the Asian stock markets. But what we wanted to investigate is the influence of the Dow Jones on the KLSE, and the impact of international market represented by the Dow Jones on the KLSE.
The above scatter plot relates the monthly change in the KLSE and the prior day's change in DJIA over the entire sample period. The chart shows correlation between these two series, indicating that the KLSE index follows the DJIA to some degree. The findings, with regards to inflation rate, are consistent with the bulk of empirical evidence.

Chen, Roll and Ross (1986) found inflation rate negatively affects stock returns. Similar to these studies, inflation rate is found to negatively affect the KLSE index returns. Their rationale for this pattern is related to the inflation illusion hypothesis, or a two-regime hypothesis. The former proposes that the typical investor irrationally raises (lowers) the required rate of returns from equities (discount rate) as the inflation rate rises (falls), thereby undervaluing (overvaluing) stocks. The latter proposes that aggregate demand (supply) shocks drive a positive (negative) relationship between the inflation rate and stock returns.

This indicates that interest rate represents alternative investment opportunities. As the interest rate rises, investors tend to invest less in stocks, causing stock prices to fall.

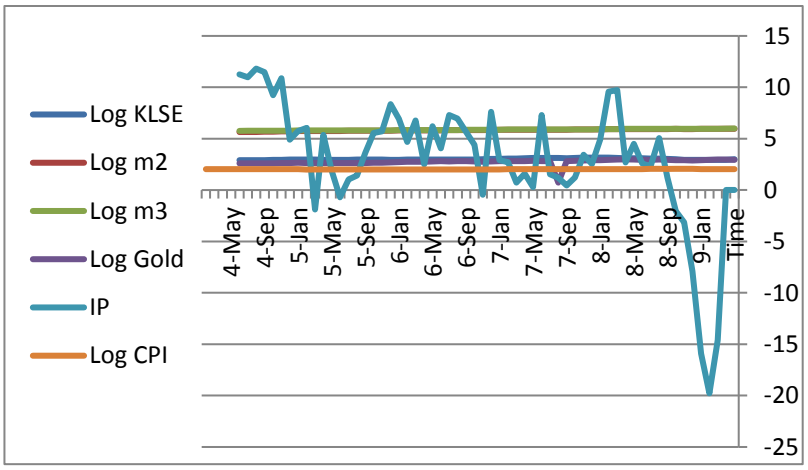

Chart 6: KLSE with insignificant variables

Investors typically include investments in their portfolios that have historically exhibited inverse relationships with stock market movements as risk insurance. Gold investments, both direct and indirect, have fit this requirement for many years. Gold historically combated losses that occurred during periods of inflation, social unrest and war when stock prices fell. During crises

such as these, gold prices soar as stock prices tumble. Indirect gold investments, such as gold mining stocks often fare even better than direct gold investments during these times as rising gold prices could turn many unprofitable or marginally profitable gold mines into moneymakers. Financial advisors are often quick to advise investors to maintain a position in gold during trying times. Conversely, during boom times, gold investments often decrease in value as stock prices increase as evidenced by the early 1990's when inflation was minimal or non-existent. Some investors dropped gold investments on the belief that gold has no portfolio risk aversion value and treated it as any other commodity whose price changes are strictly determined by supply and demand. In our study we try to investigate how much this reality is true regarding the KLSE investors.

The results indicate that gold price's influence on the KLSE is insignificant. Therefore, investors of the KLSE market do not maintain a position in the gold market for hedging or speculation.

Specifically, we find that IP is slightly insignificant to help explain stock returns of the KLSE market. However, the empirical results based on the data show that the KLSE stock indices largely follow an autoregressive process, and they are not entirely independent from some key macroeconomic variables. This implies that investors do not significantly give attention to the industrial production index when deciding to invest in the KLSE market.

Some investing experts track change in money supply as a potentially important indicator of future stock market behavior. When the money supply grows (shrinks), they theorize that asset prices go up (down); or, money supply growth drives inflation, thereby elevating discount rates and depressing equity valuations. One measure of money supply is the M2 and M3 money stock, which consists of currency, checking accounts, saving accounts, small certificates of deposit, retail money market mutual funds, bank notes and large deposits. Is there a reliable relationship between historical variation in M2, M3 and stock market returns? Using monthly data, we find that: M2 and M3 have an auto-regression influence on our independent system. The stepwise model we use suggests excluding M2 and M3 and considering them as insignificant.

Finally, from the investment viewpoint, we argue that inflation at the consumer level is fundamentally a wealth discount rate important for determining the value of equities to investors. Do investors therefore reliably react over the intermediate term to changes in CPI as a measure of the wealth discount rate? Using monthly historical CPI data (for all items not seasonally adjusted) from the Bank Negara Statistics and contemporaneous KLSE index data for the period May 2004 through to April 2015, we find that:

Both indices do not tend to rise over time, with stock prices more volatile than consumer prices. Visual inspection suggests there may be a negative correlation between them, with aggregate stock prices tending to advance (decline) when CPI falls or rise slowly (rises quickly) though it is insignificant. The government regulations and interventions do have a role in the investors' mind and expectations.

Conclusion

The stock market index not just mirrors the equity market of a country where we want to invest our money in but also mirrors the financial and economic stability of the host nation. in normal conditions, other the macroeconomic factors, there many macroeconomic variables that mostly have the considerable impact on the stock market. Therefore, acknowledging these macroeconomic variables can help financial regulators, investors, and other shareholders to take the proper decision. In this paper, selected macroeconomic variables are used in a regression model against the Kuala Lumpur Stock Exchange Composite Index (KLSE CI). Out of nine variables, four variables have a significant impact on the KLSE CI index.

First, the significance of inflation in Malaysia is reasonable; purchase power if affected by the rise of inflation is reduced, hence, decreasing the extra liquidity (savings) in hand. That is why we find a negative correlation between the KLSE index and inflation rate. Second, the KLSE index is found to be related positively to the global stock market returns, like the Dow Jones. This finding complies with many studies that argue about integration between global stock markets and emphasize mostly on the role of the American market index. Third, since interest rate represents alternative investment opportunities (i.e. bank deposits or bonds). As a result, the IR variable is negatively significant to KLSE index. Fourth, although Malaysia is not an exporter of oil, oil does seem to be important for Malaysian companies. The oil price has always been associated with production costs and has a negative impact on the equity market of countries that import oil. However, that is not the case od Malaysia, where the country has its own supply of oil and fuel is subsidized by the government. In addition, the nation largest company, which listed in KLSE, is Petronas that invest in oil fields of many nations in the world. Other selected macroeconomic variables of gold prices, CPI, M2, M3, and IP appear not to influence the Malaysian stock index.

Finally, although a rich set of macroeconomic variables are used in this study and outstanding findings are obtained, different methods, time series or area can lead to different findings. Overall, this paper is expected to be useful for stock investors, financial markets regulators, governments and economic researchers in understanding the macroeconomic variables that has influence on the Malaysian stock index.

References

Chen, N., Roll, R., & Ross, S. (1986). Economic Forces and the Stock Market. *Journal of Business,* 59 (3): 383-403.
Fama, E. F.(1981). Stock Returns, Real Activity, Inflation, and Money. *The American Economic Review,* 71 (4): 545-65.
Friedman, M. (1988). Money and the Stock Market. *The Journal of Political Economy,* 96 (2): 221-245.

Hair, J., Black, W., Babin B. & Anderson R. (2009). Multivariate Data Analysis. *Upper Saddle River: Pearson Education, Inc.* New Jersey, (7): 155-234.

Hondroyiannis, G., & Papapetrou, E. (2001). Macroeconomic Influences on the Stock Market. *Journal of Economics and Finance,* 25 (1): 33-49.

IMF International Financial Statistics, http://www.imfstatistics.org/imf/

Monthly Bulletins, http://www.tradingeconomics.com.

Monthly Gold Statics http://goldinfo.net/londongold.html

Monthly Statistics, Yahoo Finance, http://finance.yahoo.com

Naka, A., Mukherjee, T. & Tufte, D. (1998). Macroeconomic Variables and the Performance of the Indian Stock Market. *Department of Economics and Finance Working Paper*. University of New Orleans.

Shanken, J. & Weinstein, M. (2005). Economic forces and the stock market revisited. *Journal of Empirical Finance* , 13 (1): 129-144.

Wongbangpo, P. & Sharma, S. (2002). Stock market and macroeconomic fundamental dynamic interactions: ASEAN-5 countries. *Journal of Asian Economics,* 13 (1): 27-51.

Abdul Rahman, S. 2009. Macroeconomic determinants of Malaysian stock market. *African Journal of Business Management,* 3 (3): 095-106.

Bekhet, A. & Mugableh, M. (2014). Assessing The Equilibrium Relationships Between Macroeconomic Variables And The Malaysian Stock Market: Bounds Statistics Methodology. *Journal of Business Management,* 3 (1:): 3-12.