

Zimbabwe Industrial Equity Index Determinants in the Multiple Currency Regime

**Chikoko L and ¹Samu A*

**Department of Banking and Finance
Midlands State University
Gweru, Zimbabwe*

*¹Community Development Trust Prospect
Harare, Zimbabwe*

Abstract

The objective of this paper is to determine the sensitivity of the Zimbabwean Industrial equity index to fluctuations in macroeconomic variables. The research used an explanatory research design, through quantitative analysis employed on historical monthly time series from March 2009 to December 2011. Empirical results point to the existence of a long-run relationship between Zimbabwe Stock Exchange (ZSE) performance and interest rates, oil prices and the manufacturing index. Interest rates and international oil prices had a positive significant impact on the ZSE performance. However, the manufacturing index showed a significant negative relationship with the ZSE industrial index. The findings point to the fact that ZSE investors and potential investors should pay more attention to the trends of the aforementioned variables for them to consistently beat the market in the multiple currency era. Qualitative factors that are not incorporated in the study should be considered in making investment decisions, since the aforementioned variables are reported to account for only 67.09 percent of the variations in ZSE performance. Overall, the model exhibited that macroeconomic variables have a significant long run relationship with the ZSE performance; hence they are the leading indicators of the stock market performance.

Key Words: *Zimbabwe Stock Exchange, Industrial Equity Index, Performance, Sensitivity*

1 Introduction

The stock exchange has been perceived by many as the backbone of most contemporary economies, serving a critical need of raising capital funds for companies at a reasonably low cost as compared to other sources of finance such as borrowing. The Zimbabwe Stock Exchange (ZSE) has become very important as an investment vehicle for both local and international investors especially after the introduction of the Economic Structural Adjustment Program (ESAP) in 1991 when borrowing rates increased to levels above 100%, (Sunde and Sanderson, 2009).

The Zimbabwean dollar lost its power as a legal tender in late 2008 at the height of macro-economic instability and hyperinflation which peaked at 231million percent in July 2008, (RBZ, 2008). The ZSE had become the epicentre of economic destruction as it allowed some stock brokers to falsely bid up stock prices when in fact the same stock brokers had absolutely no money to pay for the shares. The end result was that some counters grew by, as high as 2 million percent in a single day (Techfin Research, 2009). Figure 1. depicts the trend followed by the industrial index from the period 1999 to 2008.

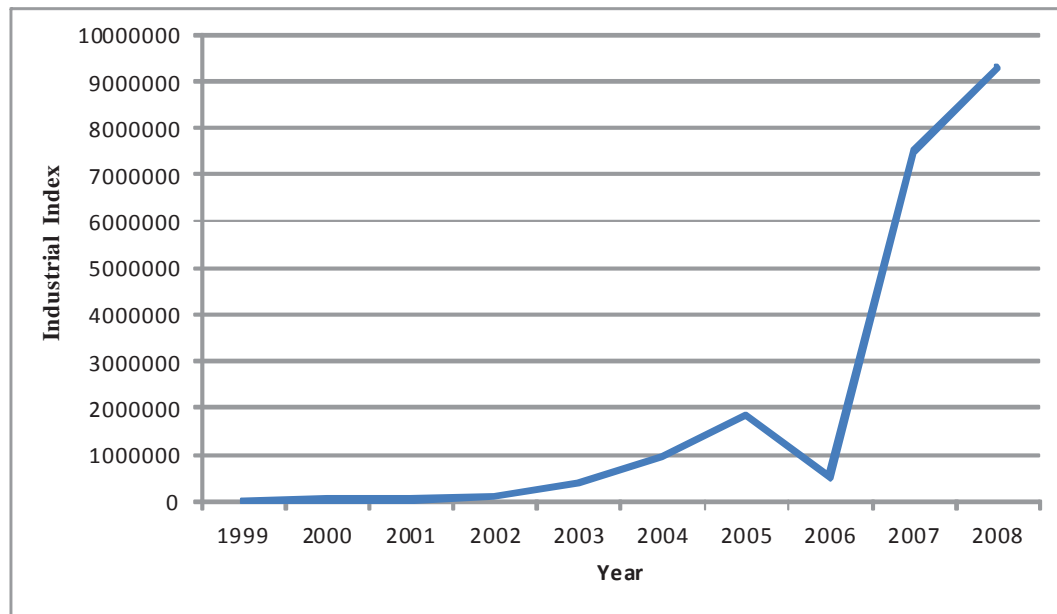


Figure 1: Zimbabwe Industrial Index Trends

Source: Techfin Research (2009)

There was a steady rise of the industrial index from 1999-2005. In 2006, Zimbabwe experiencing problems of high inflation with the industrial index rising sharply. Inflation rates galloped during the period 2007 and 2008 and this caused the ZSE industrial index to astronomically reach high levels. In this case inflation played a profound role in determining the stock market returns.

In 2009, the government of Zimbabwe introduced a multiple currency regime. The use of the multiple currencies and the suspension of the Zimbabwean dollar from the monetary system resulted in curing the problem of hyperinflation which stabilised the

economy. Regardless of this, stock values were not revalued to match the current value of the prevailing currency. This led to investors being sceptical of whether to invest or withdraw investments. The resulting effect has been the ZSE performance dropping considerably. The ZSE has not been performing well compared to the international stock exchanges such as the Johannesburg Stock Exchange, All Share and the Standard & Poor 500. The question therefore is whether macroeconomic variables had a bearing on the ZSE performance in the multiple currency system. It is against this background that the main objective of the study is to determine the sensitivity of the Zimbabwean industrial equity index to fluctuations in macroeconomic variables.

Literature Review

There are many theories and models that predict an association between macroeconomic variables and stock market returns. Theories and models that predict an association between macroeconomic variables and stock market performance are given below.

(i) *The Dividend Discount Model (DDM)*

The Dividend Discount Model (DDM), proposed by Gordon (1962), predicts that the price of a share of common stock is the present value of all future cash flows (dividends) that it is expected to provide over an infinite time horizon. Mathematically, this relationship can be represented as follows:

$$P_j = \frac{D_t}{k - g} \dots\dots\dots (i)$$

Where: P_j^S - is the price of common stock j, D_t - is the dividend during period t, k - is the required rate of return on stock j,

After simplification, equation (i) decomposes to:

$$P_j = \frac{D_1}{k - g} \dots\dots\dots (ii)$$

Where: D_1 - is the dividend in period 1 and g - is the constant growth rate of dividends.

Equation (ii) denotes that the share price depends on future dividends (D_1) and the required rate of return (k) on that share.

Any macroeconomic variable that may have an influence on future dividends or the required rate of return (discount rate) should have an influence on the share price. The model is applicable especially in the case of ZSE when the multiple currency system was introduced in 2009.

To the best interest of researcher’s knowledge, The stocks held during that time were not revalued to match the current value of the prevailing currency , hence all the stocks lost their values significantly. Therefore the investors were sceptical of whether to invest or withdraw their investments. This contributed to the poor performance of the ZSE and this confirms the idea that any economic variable, (such as foreign exchange) which impact future cash flows and the required returns, is expected to influence stock market performance. Miller and Modigliani (1961) supported this school of thought that the determinants of share prices are the required rate of return and expected cash flows suggesting that economic factors that influence the expected future cash flow and required rate of return also affect the share price. This assertion lends weight to the idea that macroeconomic variables are the major determinants of stock market performance.

(ii) *The Arbitrage Pricing Theory (APT)*

The Arbitrage Pricing Theory (APT), which was developed by Ross (1976), contends that returns on an individual stock will depend upon a variety of variables in an economy. It is built on the premise that investors take advantage of arbitrage opportunities, though they are short-lived. This means that the return of any asset can be written as follows:

$$R_i = E_i + \mu \dots\dots\dots (iii)$$

Where: R_i - is the total return on asset i , E_i - is the expected return component and μ - is the unexpected return component.

The surprise in return (μ) comes from market-wide (m) and firm specific (ϵ) sources, such that equation (iii) can be rewritten as:

$$R_i = E_i + m + \epsilon_i \dots\dots\dots (iv)$$

The market-wide risk (m) under the APT is measured by economic fundamentals and can therefore be decomposed to specific economic factors as follows:

$$R_i = E_i + (\beta_{i1}\delta_1 + \beta_{i2}\sigma_2 + \dots\dots + \beta_{ik}\sigma_k) + \epsilon_i \dots\dots\dots (v)$$

For $i = 1-N$

Where: \hat{a}_{ik} - Reaction in asset is return to movement in a common factor, \hat{o}_k – multiple factors expected to have an impact on the returns of all assets (economic fundamentals) and N - number of assets.

The APT essentially seeks to measure the risk premium attached to various factors that influence the returns on assets, whether they are significant or whether they are priced into stock market returns. While the APT focuses on individual security

returns, it may also be used in an aggregate stock market framework, where a change in macroeconomic variables could be seen as reflecting a change in an underlying risk factor regarding future returns. This theory is relevant to the case of ZSE as the macroeconomic environment gradually stabilised after the introduction of the multiple currency system in the economy. Macroeconomic variables such as inflation dropped to a single digit and as a result, national output improved among other things. It is apparent that the current multiple currency era presented investors with minimum risk regarding future stock returns. Therefore economic variables are essential in determining stock market performance as they are the ones that influence future stock returns.

(iii) The Efficient Market Hypothesis (EMH)

The Efficient Market Hypothesis (EMH) championed by Fama (1970) in particular the semi-strong form efficiency which states that stock prices must contain all relevant information including publicly available information, has important implications for policy makers and the stock broking industry alike. Policy makers should feel free to conduct national macroeconomic policies without the fear of influencing capital formation and the stock trade process. However, this is contrary to what happened on the ZSE as the mere announcement of the immediate use of multiple currency system affected the market's future stock returns significantly and ultimately the performance.

Moreover, economic theory suggests that stock prices should reflect expectations about future corporate performance, and corporate profits generally reflect the level of economic activities. If stock prices accurately reflect the underlying fundamentals, then the stock prices should be employed as leading indicators of future economic activities, and not the other way around. As for the effect of macroeconomic variables on stock market performance, the EMH suggests that competition among the profit-maximizing investors in an efficient market, will ensure that all the relevant information currently known attract changes in macroeconomic variables are fully reflected in current stock prices, so that investors will not be able to earn abnormal profits through prediction of the stock market movements. Empirically, studies investigating the relationship between macroeconomic variables and stock returns have been carried out in a number of stock markets using varying types of datasets. However, the results are not conclusive. Some of the studies are outlined below.

Maysami *et al* (2004) studied the relationship between macroeconomic variables and stock market indices for Singapore for the period January 1989 to December

2001. The researcher used the Vector Error Correction Model (VECM) to test the relationship between macroeconomic variables and the various sector indices. The results from the study confirmed that stock returns were positively and significantly related to the industrial production index. The general conclusion held was that the Singapore Stock Market and the equities property index formed significant relationships with many macroeconomic variables. The research supports the theory that macroeconomic variables are the driving forces towards stock market performance.

The effects of macroeconomic variables on stock returns were also examined by Buyuksalvara (2010) in relation to the Turkish Stock Exchange Market. The study embraced seven macroeconomic variables (consumer price index, money market interest rate, and industrial production index, among others). A multiple regression model was designed to test the relationship between the Turkish Stock Market Index (Istanbul Stock Exchange Index (ISE) returns and seven macroeconomic factors. The results of the study indicated that interest rate, industrial production index, oil price and foreign exchange rate have a negative effect on ISE index returns while money supply positively influenced ISE Index returns. On the other hand, inflation rate and gold price did not appear to have any significant effect on ISE index returns.

In their study, Sohail and Hussain (2009) investigated the long-run and short-run relationship between macroeconomic variables and stock prices in Pakistan Lahore Stock Exchange using monthly data for the period December 2002 to June 2008. The results revealed that there was a negative impact of consumer price index on stock returns, while industrial index, real effective exchange rate and money supply had a significant positive effect on the stock returns in the long run. The results are in line with the assertion that inflation, industrial performance and foreign exchange can determine stock returns. In Zimbabwe, prior to dollarization, inflation and foreign exchange rate fluctuations played a major role in eroding stock returns.

Frimpong (2011) examined the speed of adjustment of stock prices to macroeconomic information for the case of Ghanaian Stock Exchange using monthly Databank Stock Index (DSI) from November 1990 to December 2007. The researcher used the Granger causality test to show unidirectional causality from macroeconomic information with exchange rate being the slowest. The researcher also argued that the speed of adjustment of exchange rate reflects the behaviour of foreign investors. This confirms the theory that macroeconomic variables determine stock market performance.

Scholars investigated the long run equilibrium relationship between the major stock indices of Singapore and United States and selected macroeconomic variables by means of time series data for the period January 1982 to December 2002. The results suggested that Singapore's stock prices generally displayed a long- run equilibrium relationship with interest rate and money supply (M1) but the same type of relationship did not hold for the United States. To capture the short-run dynamics of the evolving relationship between stock indices and macroeconomic variables, they applied the same methodology for different subsets of data covering shorter time periods.

Njanike *et al* (2009) assessed the factors that influenced the Zimbabwe Stock Exchange's performance from 2002 to 2007. The study sought to identify and define the major drivers of the bourse during this period and use them to guide an investor on the ZSE or any other stock exchange in a developing economy. High inflation rates as documented by various researchers e.g proved to have a positive relationship with the stock market performance. From the research conducted, it shows that there is much credit given to the inflationary influence among others. Interest rates showed a significant impact on the price fluctuation on the ZSE had it has an effect of reducing or increasing price of stocks. The ZSE was also affected by information announcements and other various activities taking place. This included political news, monetary and fiscal policies that saw the stock market reacting to such. This is in line with the assertions of the EMH.

Acikalin *et al* (2008) looked at the relationship between returns in Istanbul Stock Exchange (ISE) and macroeconomic variables of Turkish economy. The researchers employed the Cointegration tests and vector error correction model (VECM) on a quarterly data set and found a long-term stable relationship between ISE and four macroeconomic variables namely, GDP, exchange rate, interest rate, and current account balance. They then carried causality test and found a unidirectional relationship between macro-indicators and ISE index. This is consistent with the existing literature which demonstrates that; changes in GDP, foreign exchange rate and current account balance have an effect on stock returns. However, contrary to expectations, changes in the stock market index proved to affect interest rates.

Methodology

The research uses an explanatory research design, through quantitative analysis employed on historical monthly time series from March 2009 to December 2011. The researcher employed econometric procedures to estimate the resultant

equation for the dependent variables. A linear regression model was used. The econometric views package was used to estimate the equation.

Model Specification

Adam and Tweneboah (2008) in the study on the effects of macroeconomic variables on stock market movement in Ghana employed a model of the following form:

$$LDSI_t = \beta_0 + \beta_1 LCPI_t + \beta_2 LXR_t + \beta_3 LTB_t + \beta_4 LFDI_t + \varepsilon_t$$

Where: LDSI is the log of Databank Stock Index,

LCPI is the log of Consumer Price Index,

LFDI is the log of Net Foreign Direct Investment Inflows,

LXR is the log of Exchange Rate,

LTB is the log of Interest Rate.

\hat{a}_t is the error term

The above model has been modified by replacing the net foreign direct investment inflows with the manufacturing index and international oil price. Apart from that, the consumer price index was removed as it involved some negative values in the multiple currency regime of which there were no natural logarithmic values for negative numbers. The estimation of the relationship is expressed in natural logarithms. The model that is used to explain the determinants of ZSE performance in the multiple currency regime is specified as follows:

$$LZII_t = \beta_0 + \beta_1 Llr_t + \beta_2 LOP_t + \beta_3 LMI_t + \varepsilon_t$$

Where $LZII_t$ - is the natural log of stock market price in period t and the industrial index is

the proxy for the ZSE performance,

Llr_t - is the natural log of interest rate in period t and monthly negotiable certificate of deposit (NCDs) is used as proxy for interest rate,

LOP_t - is the natural log of international crude oil price in period t,

LMI_t - is the natural log of the manufacturing index and is a proxy for economic growth,

ε_t - is the error term during period t, is assumed to be normally distributed with zero mean and constant variance.

Where \hat{a}_0 , \hat{a}_1 , \hat{a}_2 and \hat{a}_3 are estimation parameters and \hat{a}_0 is the intercept.

A priori conditions: $\hat{a}_0 > 0$, $\hat{a}_1 < 0$, $\hat{a}_2 < 0$ and $\hat{a}_3 > 0$.

Empirical Results

Stationarity and Cointegration Test Results.

The unit root tests were undertaken to ascertain the level of stationarity for each of

the variables in the model using the Augmented Dickey- Fuller (ADF) test. The results are presented in Table 1 below:

Table 1: Summary of Unit Root Tests Results

Variable	ADF test statistic	Critical values	Order of integration
LZII	-6.438333***	1% -2.6756 5% -1.9574 10% -1.6238	I(1)
LIR	-4.621112***	1% -2.6756 5% -1.9574 10% -1.6238	I(1)
LOP	-4.219017***	1% -2.6756 5% -1.9574 10% -1.6238	I(1)
LMI	-7.697146***	1% -2.6756 5% -1.9574 10% -1.6238	I(1)
Residual b	-6.221392***	1% -2.6700 5% -1.9566 10% -1.6235	I(0)

Note: *** indicates statistical significance at 1 percent.

These results confirm the generally held wisdom that most economic time series are difference stationary. Therefore in the case of industrial index, interest rate, oil price and manufacturing index, H_0 must not be rejected.

Cointegration Tests

Cointegration means that despite the fact that the series are individually nonstationary, a linear combination of two or more time series can be stationary. In general, if Y_t is $I(d)$ and X_t is also $I(d)$, where d is the same value, these time series are said to be cointegrated. However, the researcher still proceeded to carry out cointegration test employing the Engle-Granger's residual based unit root test to

verify this. The residuals from the cointegrating equation were found to be stationary at level, confirming that the time series are cointegrated. This implies that the coefficients of the cointegrating equation can be interpreted as the long run coefficients, measuring the long run relationship between the variables. In effect, there exists a long run relationship between industrial index, interest rate, oil price and manufacturing index under the study.

Table 2: Summary of Regression Results

Variable	Coefficient	Std. Error	T-statistics	Probability
L I_r_t	0.293812	0.119178	2.465314	0.002
L O_P_t	0.719591	0.180708	3.932077	0.0007
L M_I_t	-0.888651	0.268280	-3.312399	0.0035
C	4.344306	0.965190	4.500987	0.002

$R^2 = 0.670868$

F Statistic = 13.58865

Adjusted $R^2 = 0.621498$

Prob (F-statistic) = 0.000046

DW statistic = 2.038993

T- statistic from the tables is 1.725

The t-statistic of 1.725 is the critical value for the t-ratios and was extracted from Tables at 5 percent level of significant and 20 as degrees of freedom. The decision rule is to reject the null hypothesis that the variable is insignificant if its t-statistic is greater than the critical value from tables. Since all the t-statistic values are greater than the critical value, it can be concluded that all the variables including the intercept are significant at 5% level. The estimated model is:

$$LZII_t = 4.344306077 + 0.2938120665Llr_t + 0.7195913902LOP_t - 0.8886507517LMI_t$$

Where LZII $_t$ is the natural logarithm of the industrial index

L I_r_t is the natural logarithm of interest rate

L O_P_t is the natural logarithm of international oil price

L M_I_t is the natural logarithm of manufacturing index

A coefficient of determination (R^2) of 0.670868 means that around 67% of the variations in industrial index, a proxy for ZSE performance are determined by the explanatory variables in the model and about 33% are accounted for by the residual. Whereas, the adjusted R^2 of 62.1498% shows the percentage of the ZSE performance which is still explained by the explanatory variables even if the degrees of freedom are taken into consideration. The model in question has an F-statistic of 13.58865, hence the model specified, is therefore a good fit. All the explanatory variables were found to be significant even using the t-statistic from the tables.

The exogenous variable or the autonomous component of 4.344306077 shows the returns on riskless assets which investors can invest in such as treasury bills. This means that if there is zero impact from the macroeconomic variables investors could still enjoy returns from zero risk assets. The findings of this research renders the constant term useful since it has a statistically significant t-statistic of 4.500987. The coefficients of the natural logarithms are interpreted as elasticities and they show the degree of responsiveness or sensitivity. Interest rate is significantly positively related to industrial index, a proxy for ZSE performance. The coefficient of 0.2938120655 implies that a proportionate rise in interest rate will cause 0.2938120655 proportionate change in ZSE stock prices. This means that as interest rates rises, investors tend to invest more in stocks, causing stock prices to rise. The t-statistic results of 2.465314 shows that interest rates were positively significant in determining ZSE performance. This means that the null hypothesis that interest rate does not determine ZSE market performance must be rejected. Again, the sign of coefficient ($\hat{\alpha}_3 > 0$) is contrary to theory. Wong *et al* (2005) found that interest rates in Singapore moved in tandem with stock prices, but the pattern was not observed after the Asian crisis of 1997. This might explain what happened to Zimbabwe after the 2008 economic crisis.

The coefficient of oil price was found to be statistically significant and positive. Although contrary to theory, this means that in Zimbabwe, oil is an important factor in determining production costs of firms. However, in theory, increase in oil prices will be beneficial to oil-exporting countries and as such a positive relationship between stock and oil prices is expected in such countries. On the other hand, oil-importing countries (like Zimbabwe) are expected to experience a negative relationship between stock and oil prices. The findings documented in this study were contrary to theory. A study found a negative relationship between oil price and stock market performance for the case of Turkey.

An interesting finding is the relationship observed between the manufacturing index (a proxy for economic growth) and industrial index (a proxy for ZSE

performance). The effect of the manufacturing index on ZSE performance is statistically significant as expected, but with an unexpected sign. It had a coefficient of -0.8886507517 implying that a proportionate rise in the manufacturing index would lead to 0.8886507517 proportionate fall in the ZSE performance which is contrary to existing theory.

Conclusions and Recommendations

Interest rate, international oil price and the manufacturing index (a proxy for economic growth) were found to be significant in determining the ZSE performance. Macroeconomic variables such as interest rates, international oil prices and the manufacturing index (a proxy for economic growth) have a long run linear and significant relationship between macroeconomic variables and the ZSE performance. During the period under study, interest rates and international oil prices proved to have a positive and significant association with the industrial index, a proxy for ZSE performance. The manufacturing index exhibited a significantly negative relationship with the industrial index. The aforementioned variables account for 67.09 percent of the variations in ZSE performance, hence investors should also consider other risk factors not discussed in the study when making their investment decisions.

The significance of interest rates in determining the ZSE performance shows that interest rates are an effective policy instrument. Low interest rates regimes entail increased profitability due to decreased cost of servicing loans. This will lead to enhanced productivity by companies, resulting in increased profit expectations of investors. This in turn leads to an upward movement of the expected stock market returns and therefore stock market performance.

If the government intends to increase the level of investments on the stock exchange, it can make use of the interest rate since there is no time lag on the response of investors to changes in interest rates. Interest rates on the local bourse can be used as a tool for decision making with more certainty by investors because of the relationship that was found to exist. Low interest rates in the absence of inflationary pressures make stock market investments more profitable in comparison to the money market investments. Governments should continuously review their interest regimes so that they promote savings and investments.

The manufacturing sector was estimated to have grown by 10.2% in 2009 and the sector was projected to post a lower growth of 4.5% in 2010 (RBZ, 2010). However,

the growth of the manufacturing sector shows the growth potential of the whole economy. Therefore, the growth of the manufacturing sector can be enhanced through duty reduction on capital equipment, access to lines of credit, stabilisation of the macroeconomic environment which fosters long term planning and a sustainable power supply. An improvement in the manufacturing sector performance would ensure an increased level of investment on the ZSE through an increase in liquidity.

The government should provide an enabling environment for investment. Investors should always be on the watch for monetary policy changes because the impact of the monetary transmission mechanisms are significant and necessary quick portfolio changes are needed to curb for losses. Again, the ZSE as an organization should make strategies that will encourage strong form efficiency by ensuring that stock prices reflect all the available information at all times. This will eliminate the spirit of arbitrage and speculation on the part of investors since stock markets will now be reflective of the actual economic activity.

Finally, investors who are interested in investing on the ZSE should pay more attention to the trend followed by the interest rates, manufacturing index and international oil prices. Since the aforesaid variables account for 67.09 percent of the variations in ZSE returns, investors should also consider other risk factors not discussed in the study when making their investment decisions.

References

- Acikalin, S.; Aktas, R. and Unal, S. (2008). Relationship between Stock Markets and Macroeconomic Variables: An Empirical Analysis of the Istanbul Stock Exchange. *A Journal of Investment Management and Financial Innovations*. 5 (1):8-16
- Adam, A.M. and Tweneboah, G. (2008). Macroeconomic factors and Stock Market Movements: Evidence from Ghana, Mpra Paper No.14079.
- Adjasi, C. Harvey, S.K., Agyapong, D. (2008). Effect of Exchange Rate Volatility on the Ghana Stock Exchange. *African Journal of Accounting, Economics, Finance and Banking Researc*. 3 (3): 28-47.
- Buyuksalvara A (2010). The Effects of Macroeconomics Variables on Stock Returns: Evidence from Turkey, *European Journal of Social Sciences*. 14 (3):

Chen, N. F., Roll, R. and Ross, S. (1986). Economic Forces and the Stock Market. *Journal of Business* 59(3): 383-403.

Fama, E. (1970). Efficient Capital Markets, A Review of Theory and Empirical Work. *A Journal of Finance*, N25; 385-417.

Frimpong, S. (2011). Speed of Adjustment of Stock Prices to Macroeconomic Information: Evidence from Ghanaian Stock Exchange (GSE), *A Journal of International Business Management*, 2 (1); 1 – 6.

Gujarati D. (2004). *Basic Econometrics*, 4th edition. The McGraw Hill Companies, New Delhi.

Karamustafa, O. and Kucukkale, Y. (2002) *Long Run Relationship between Stock Market Returns and macroeconomic Performance: Evidence from Turkey*.

Karekwaivenani, G. (2003). *History of Stock Exchange*, University of Zimbabwe.

Maysami, R.C; Howe, L.C. and Hamzah, M.A. (2004). *Relationship between Macroeconomic Variables and Stock Market Indices: Cointegration Evidence from Stock Exchange of Singapore's All – S Sector Indices*, *Journal of Pengurusan*, 24: 47 – 77.

Miller, M. H. and Modigliani, F. (1961). Divided Policy, Growth, and Valuation of Shares, *Journal of Business* 34: 235- 264.

Njanike, K., Katsuro, P. and Mudzura, M. (2009). Factors Influencing the Zimbabwe Stock Exchange Performance (2002 to 2007), *Annals of the University of Petrosani Economics Journals*, Vol. IX –Part II, 161 - 172.

Reserve Bank of Zimbabwe (2008). *Monetary Policy Statement*, The First Quarter to 31 March 2008, RBZ Publications.

Reserve Bank of Zimbabwe (2010). *Monetary Policy Statement*, Mid Year Monetary Policy to July 2010, RBZ Publications.

Ross, S. A. (1976). Theory of Capital Asset Pricing. *Journal of Economic Theory*, 13 (2); 341-360.

Sohail, N. and Hussain, Z. (2009). Long Run and Short Run Relationship between Macroeconomic Variables and Stock Prices in Pakistan; The case of Lahore Stock Exchange: *Pakistan Economic and Social Reviews* 47 (2); 183 – 198.

Sunde, T. and Sanderson, A. (2009). A Review of the Determinants of Share Prices. *Journal of Social Sciences* 5(3); 188-192.

Techfin Research (2011). *Electronic Database-Bardnet*, Techfin Research Publications 2011.