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Relationship between Inflation and Stock Market Returns: Evidence from Bangladesh

Sayed Farrukh Ahmed[1]
K.M. Zahidul Islam[2]
Md. Rahat Khan[3]

Abstract : *The linkage between stock prices and inflation has been intensively investigated since the 1990s. Most of the studies in the industrialized economies have shown a negative relationship between stock market return and inflation. Thus there is considerable interest surrounding the relationship between stock markets and inflation. This paper investigates the relationship between inflation and stock market returns in Bangladesh using monthly data for the period 2004 to 2013. To test for the order of integration of the variables, ADF and PP tests were used and the results show that all the variables are integrated in the same order I(1). The Johansen test procedure confirmed that there is single cointegration equation at 5 percent significance level and thereby indicating the long run equilibrium relationship between the variables. The findings of the study have showed that the speed of adjustment in the Vector Error Correction model (VECM) is significant and relatively very high. The value of the ECM is -0.9373 which implies that, on average, the system corrects the disequilibrium errors annually by about 94%. The results also indicate that there is a uni-directional short run causal relationship between inflation and stock price index.*

Keywords: *Inflation, Stock market, VECM, Co-integration test, Bangladesh.*

JEL Classification: *E31, G11*

1. Introduction

The relationship between stock market prices and inflation has important implications from the policy point of view. The adaptive expectation school (Birol, 2013) assumes that there is a short –run trade-offs between inflation and unemployment rate in the short run. On the other hand, the rational expectation school (Muth, 1961) rules out this positive impact of price rise on production and employment. Understanding the dynamic linkages between stock prices and monetary variables such as money supply, interest rate and inflation rate are important to policy makers, investment professionals as well as academics. In the developed world, the stock market controls the real sector to a large extent. On the other hand, in the developing economies stock market seems to be quite superfluous as it is controlled by only a few players (Chakravarty and Mitra, 2010).

[1] Assistant Professor, Faculty of Business & Economics, Daffodil International University, Dhaka-1207. E-mail: farrukh@daffodilvarsity.edu.bd

[2] Associate Professor, Institute of Business Administration, Jahangirnagar University, Savar, Dhaka-1342.E-mail: jahid558@yahoo.com

[3] Lecturer, Department of Business Administration, City University, Khagan, Birulia, Savar, Dhaka-1216. E-mail: rahatkhan.mrk14@gmail.com.

The early survey on the behavior of stock market return was initiated by Fama (1981) who posited that markets are efficient as they fully reflect the fundamental macroeconomic behavior. By the term efficiency, Fama (1981) implied that a financial market incorporates all relevant information in the market and thus the observed outcome is the best possible one under the circumstances. He investigated the relationship between stock prices and inflation and his study revealed that there is a negative relationship between the two. Based on this negative association between inflation and stock market return, the study envisaged that high inflation predicts an economic downturn and keeping in view this, the firms start selling off their stock. According to the law of supply, an increase in the supply of stock is expected to reduce the stock prices. As stocks reflect firms' future earning potential, an economic downturn may encourage firms to sell off the financial stocks and thus high inflation and low stock prices tend to go together. On the contrary, we may find a positive relationship between inflation and stock prices as unexpected inflation raises the firms' equity value assuming that the firms' are net debtors (Ioannidis *et al.*, 2005).

Monetary policy also may have a profound impact on the stock market as well. In a study, Ioannidis and Kontonikas (2008) pointed out that monetary policy influences stock returns by influencing the discount rate as well as the future stream of cash flows. If Central Bank tightens the monetary policy by reducing supply of bank loans, it would cause rate of interest to rise and thereby reducing net profits of firms. Given these facts, we may infer that tightening of monetary policy may reduce the inflation rate and also stock prices since under this contractionary monetary policy investors would have less money to demand goods or to buy stocks. From this point of view, inflation and stock prices may move in the similar direction.

In a study, Khan and Yousuf (2013) examined the relationship between stock prices of Dhaka Stock Exchange (DSE) and different macroeconomic forces such as deposit interest rates, exchange rates, consumer price index (CPI), crude oil prices and broad money supply (M2) and their results concluded that inflation does not show any significant impact on stock prices. Our analysis is based on monthly data on inflation rate and stock market return from the period of November, 2004 to July, 2013. Using the data, this paper investigates the relationship between inflation rate and stock market returns. More specifically, we explore the distinct impacts of inflation on the stock market. The outcomes of the study are expected to be of enormous importance to investors to take rational decisions on stock market and advancement of the literature on financial economies.

The rest of the paper is organized as follows: Section 2 briefly reviews some related literatures. Section 3 presents the objectives of the study. Section 4 discusses the methodology and sources of data. Empirical results are presented in section 5. The last section concludes the paper.

2. Literature Review

Many studies have been conducted around the world to investigate the relationship between stock market return and inflation rate. Fisher (1930) proposed that the expected rate of return should comprise a real return plus an expected rate of inflation. He

predicted positive relationships between stock market returns and expected inflation and changes in the expected inflation. On the contrary, Fama (1981) claimed that stock returns are negatively related to inflation. He proposed that high inflation may lead to an economic downturn and may encourage firms to start selling off their stock. An increase in the supply of stock then reduces the stock prices. Since stocks reflect firms' future earning potential, an expected economic downturn prompts firms to sell off the financial stocks and thus high inflation and low stock prices tend to go together.

Choudhry (1999) discovered a positive relationship between stock market returns and inflation rate in four high inflation countries: Argentina, Chile, Mexico and Venezuela and concluded that the stock returns act as a hedge against inflation. Zhao (1999) found a significant negative relationship between stock prices and inflation in Chinese economy which is consistent with the conclusion of Fama (1981).

Using cointegration analysis and error correction model to analyze the impact of the inflation rate on the Egyptian stock market, Omran and Pointon (2001) found that the inflation rate has a long term impact on the Egyptian stock market.

Spyrou (2001) examined the relationship between stock returns and inflation rate of Greece by using monthly data from January, 1990 to June, 2000. The result for the period 1995-2000 showed a negative but insignificant relationship, while for the period 1990-1995 there was a significant negative relationship between the variables.

Wongbampo and Sharma (2002) investigated the relationship between stock market prices and macroeconomic variables including inflation in five Asian countries (Malaysia, Indonesia, Philippines, Singapore and Thailand) and the study reported that there is a negative relationship between stock prices and inflation in all the five Asian countries.

Gunasekarage *et al.* (2004) investigated the impact of macroeconomic variables including inflation on stock equity values in Sri Lanka with the Colombo All Share Index as proxy for stock market and consumer price index as proxy for inflation. Using annual data from 1985 to 2001, the study reported that inflation exerts a negative influence on the stock market in Sri Lanka.

Sohail and Hussain (2009) investigated the relationships between Lahore Stock Exchange and several macroeconomic variables in Pakistan by using monthly data from December, 2002 to June, 2008. The study found a negative relationship between inflation (proxied by consumer price index) and stock returns.

Bhattarai and Joshi (2009) examined the relationship between the stock market and macroeconomic factors in Nepal and reported that there is unidirectional positive short run causal relationship running from inflation (proxied by consumer price index) to stock index but reverse causality in the long run (from stock index to inflation).

Naik and Padhi (2012) examined the relationship between stock index and five macroeconomic variables (industrial production index, wholesale price index, money

supply, treasury bills rates and exchange rates) of India from April, 1994 to June, 2011 and they found that short-term inflation is negatively and significantly related to stock market index.

Dasgupta (2012) applied the Johansen and Juselius co-integration test to examine the relationship between stock market returns and macroeconomic variables using data from Indian stock market and concluded that inflation (proxied by wholesale price index) is negatively related to Indian stock market returns in the long run. The study, however, failed to establish short-run relationship between the Indian stock market and inflation.

Akbar *et al.* (2012) explored the relationship between the Karachi Stock Exchange Index and macroeconomic variables for the period spanning from January, 1999 to June, 2008 using cointegration and Vector Error Correction Model (VECM) and reported that there is a negative relationship between inflation and stock prices.

Saleem *et al.* (2013) found a long run relationship between KSE 100 index return and inflation rate of Pakistan by using quarterly data from January, 1996 to December, 2011. Their evidence from cointegration test showed a negative relationship between KSE 100 index return and inflation rate.

Using monthly data from January, 1992 to June, 2011, Khan and Yousuf (2013) investigated the relationship between different macroeconomic forces and stock prices of Dhaka Stock Exchange (DSE) and concluded that inflation does not show any significant impact on stock prices.

The literatures reviewed above regarding the relationship between inflation rate and stock market return of different countries thus exhibited mixed findings. Some literatures showed positive relationship between the variables while the others posited negative relationship. Even, some studies found no significant impact of inflation on stock return. In this backdrop, this paper investigates the relationship between inflation rate and stock market return of Bangladesh.

3. Objectives of the study

The objectives of the present study are as follows:

(a) To examine the relationship between inflation rate and stock market return of Bangladesh using time series data.

(b) To understand the response of return of DSE General Index to changes in inflation rate.

(c) To provide some policy implications that may be helpful in formulating policies.

4. Methodology and Data

4.1 Methodology

In the present study, Johansen's (1988) cointegration and vector error correction model (VECM) have been employed to examine the long run equilibrium relationships between DSE stock return (RDGEN) and inflation rate (INF). Before implementing the cointegration and vector error correction model, econometric methodology needs to

verify the stationarity of each individual time series variable used in the study. The cointegration approach requires that all variables in the system are to be integrated of same order. The first step in the analysis is to test for stationarity property of the data series. For this purpose, Augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1979) and Phillips and Perron (PP) test (Phillips and Perron, 1988) have been used to verify the stationarity of the data series and to determine the order of integration of each of the data series studied. If the selected data series are found to be integrated of same order, Johansen's cointegration test can be employed to examine the long-run (cointegrating) relationship among the selected variables. Johansen and Juselius (1990) provided two likelihood ratio tests to obtain the number of cointegrated vectors which are insignificantly different from unity.

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{n} \ln(1-\hat{\lambda}_{r+1}) \quad (1)$$

$$\lambda_{max}(r,r+1) = -T \ln(1-\hat{\lambda}_{r+1}) \quad (2)$$

where, $\hat{\lambda}_{r+1}$ equals the estimated eigen value of the characteristic roots, r= 0,1,2… and T= number of observations. The null hypothesis of the first test (trace) is to test if the number of distinct cointegrated vectors is less or equal r against the alternative. The null of the second (max) test is the number of cointegrating vectors r against the alternative of $r+1$ cointegrating vectors. The results obtained from this test are used in applying the VECM which measure the long run relationship.

After identifying the cointegration vector among the selected variables, the vector error correction model (VECM) can be employed to establish the modeling of both the short-run and long run dynamics for the variables involved in the model. When these variables are found to be cointegrated then the speed of adjustment of short run dynamics which converge towards long run equilibrium can be tested by applying Vector Error Correction Model (VECM). Engle and Granger (1987) showed that changes in the dependent variable are a function of the level of the disequilibrium in the cointegrating relationships (captured by error correction term) and changes in other independent variables. Assuming that variables in our case are cointegrated, the VECM can be written as:

$$\Delta RDGEN_t = a_1 + \sum_{i=1}^{k} \alpha_{1i} \Delta RDGEN_{t-i} + \sum_{i=1}^{k} \beta_{1i} \Delta INF_{t-i} + \rho_1 ECT_{t-i} + u_{1t} \quad (3)$$

In equation (3), RDGEN and INF represent DSE stock return and inflation rate respectively. Δ is the first difference operator. $\Delta RDGEN$ and ΔINF are the differences in these variables that capture their short-run disturbances. ECT_{t-i} is the lagged error correction term, that captures the long-run effects. It refers to the speed of adjustment or

correction from the deviation of the dependent variable that will adjust to minimize the long-run equilibrium error. The error correction coefficient, ρ_1, measures the speed with which deviations from the long run relationships are corrected by changes in DSE stock return and inflation rate. In addition, u_{1t} is a pure white noise disturbance term.

Besides this, the Impulse Response Function (IRF) has been used to understand the response of RDGEN in the VAR system to one-unit shock in INF. It helps to visualize the behavior of a time series in response to various shocks in the system (Enders, 1995). It shows how changes in one variable resulting from external shocks may affect the other variables over time. The IRF equation can be written as follows:

$$\Omega_i = \phi_i \mathrm{B}^{-1} \Lambda^{1/2} \qquad (4)$$

where, B^{-1} is the coefficients matrix of all the variables at time t, $\Lambda^{1/2}$ denotes lower Cholesky decomposition of the variance-covariance matrix of error term, and ϕ_i shows the effects of a one unit increase in error term at time t on other variable.

4.2 Data

In the present study, we use stock return data from monthly closing stock price indices of Dhaka Stock Exchange (DSE) in terms of DSE General Index (DGEN) and monthly data of inflation rate that spans from the period of November, 2004 to July, 2013. The data of the chosen time periods show some fluctuations in inflation rate, even double digit in some periods. For this reason we have considered the data of the mentioned period in order to investigate the relationship between the variables. The series of DGEN have been transformed into stock market returns, R_t, which is the natural log difference in the closing market price index between two dates: $\mathrm{R}_t = \ln\left(\frac{\mathrm{PI}_t}{\mathrm{PI}_{t-1}}\right) \times 100$ where PI_t is the price index at time *t* and PI_{t-1} is the price index at time *t-1*. The data of DGEN have been collected from different publications of Dhaka Stock Exchange (DSE) and the data of inflation rate have been collected from monthly economic trends published by Bangladesh Bank.

5. Empirical Results

The results of the descriptive statistics of the variables used are presented in Table 1.

From Table 1, it is evident that average inflation rate over the study period is 8.00 percent. It ranges from 2.25 percent to 11.59 percent. The volatility is comparatively high, 1.88 percent. The skewness is negative with test statistic of -0.04 which means that the normality shape is relatively symmetric.

Table 1: Descriptive statistics of RDGEN and INF

Statistics	**RDGEN**	**INF**
Mean	0.033000	8.005143
Median	0.043662	7.690000
Maximum	1.320283	11.59000
Minimum	-2.138510	2.250000
Std. Dev.	0.459522	1.882560
Skewness	-1.052186	-0.040614
Kurtosis	7.444857	2.914964

The kurtosis is positive with the test statistic of 2.91. On the other hand, regarding RDGEN, average RDGEN during investigating period is 0.033 percent. It ranges from -2.14 percent to 1.32 percent. The volatility is comparatively low, 0.46 percent. The skewness is negative with test statistic of -1.05 and, the kurtosis is positive with the test statistic of 7.44.

Results of the unit root test for RDGEN and INF are presented in Table 2. The ADF and PP tests are performed to check the possible unit root.

Table 2: Results from the Unit Root Tests

Variables	ADF Test				PP Test				Order of Integration
	Intercept		Trend and Intercept		Intercept		Trend and Intercept		
	Level	1st diff.	Level	1st diff.	Level	1st diff.	Level	1st diff.	
RDGEN	-9.59**	-9.60**	-9.54**	-9.55**	-9.61**	-84.31**	-9.56**	-86.97**	I(0) /I(1)
INF	-2.78	-10.72**	-2.81	-10.69**	-2.79	-10.79**	-2.81	-10.77**	I(1)

Note: **denotes the rejection of null hypothesis that the time series is non-stationary with 5% significance level

Based on the ADF test and PP test, RDGEN is found to be stationary in both level and first difference (integrated of order zero, I(*0*) and integrated of order one, I (*1*)). The variable INF are found to be non-stationary in level, but stationary in first difference (integrated of order one, I (*1*)) on the basis of ADF test and PP test. In sum, results from unit root tests reveal that both the variables are stationary in first difference, I (*1*).

As both the series are integrated of same order, I(*1*), the Johansen cointegration test has been performed to examine the presence of long-run relationship between the variables. In Table 3, trace statistics and maximum Eigen value statistics reveal that two variables

(RDGEN and INF) have one cointegrating relation or long-run equilibrium relationship at 5 percent level. After confirming the existence of single cointegrating vector among RDGEN and INF, we search for proper Vector Error Correction Model (VECM) which contains the co-integrating relations in order to assess the long-run behavior of the endogenous variables to congregate for their equilibrium with short-run speed of adjustment.

Table 3: Results from the Johansen Cointegration Tests

Hypothesized No. of Co-integrating Equation (CE)	H_0:	H_1:	Eigen Value	Trace Test			Maximum Eigen Value Test		
				λ_{trace}	5% critical value	Prob.	λ_{max}	5% critical value	Prob.
None	r=0	r>0	0.325278	48.575	20.262	0.000	40.526	15.892	0.000
At Most 1	$r \leq 1$	r>1	0.075174	8.049	9.165	0.081	8.049	9.165	0.081

Source: Authors' calculation.

Note: The '*r*' denotes the number of cointegrating vectors. Trace test indicates 1 cointegrating equation(s) at the 0.05 level. Max-eigenvalue test indicates 1 cointegrating equation(s) at the 0.05 level.

However, the VECM is sensitive to the selection of optimal lag length and the necessary lag length of RDGEN and INF is determined by LR, AIC, FPE, SC and HQ criterion and it reveals that optimal lag is one.

In Table 4, the VECM result shows that the coefficient of the error correction term (ECT_{t-1}), is found to be negative (-0.937) and statistically significant at one percent level and thereby indicating the validity of long-run equilibrium relationship among RDGEN and INF. More specifically, we can say that there is a long run causality running from INF to RDGEN. It also implies that 93.73 percent of disequilibrium in the long run relationship is corrected each period into its equilibrium.

Table 4: Results of VECM

Dependent Variable	Sources of Causation			Short-run Relationship	Long-run Relationship
	Short-run		Long-run		
	Δ RDGEN	Δ INF	ECT_{t-i}		
Δ RDGEN	-	0.082999* (0.0770)	-0.937315*** (0.0000)	INF causes RDGEN	Yes

Diagnostic tests	Result	Remark
Test for Heteroscedasticity	5.290421[1] (0.2588)	There is no heteroscedasticity in the residuals
Test for Serial correlation	0.00000[1] (1.000)	There is no serial correlation in the residual
Jarque-Bera test for normality	109.0643[2] (0.000)	Residuals are not normally distributed

Note: * and *** denote that the coefficient is significant at 10% level and 1% level respectively; [1]denotes the non-rejection/acceptance of null hypothesis at 5% level of significance; [2]denotes the rejection of null hypothesis at 5% level of significance; corresponding p-values are in parentheses

The coefficient for INF is positive and significant at 10% level of significance. This finding suggests that a short-run causal relation is running from inflation rate (INF) to stock market return (RDGEN). The result is consistent with Fisher (1930), Choudhry (1998) and Bhattarai & Joshi (2009). The diagnostic tests of the model disclose that there is no problem of heteroscedasticity and no serial correlation in the model but the residuals are not normally distributed which is not desirable.

Figure 1 shows the Impulse Response Functions. This function can produce the time path of dependent variable (DGEN), in the system of equation developed within the VECM framework, to shocks from inflation. The figure reveals that the inflation rate shock causes RDGEN to be negative from 3rd month.

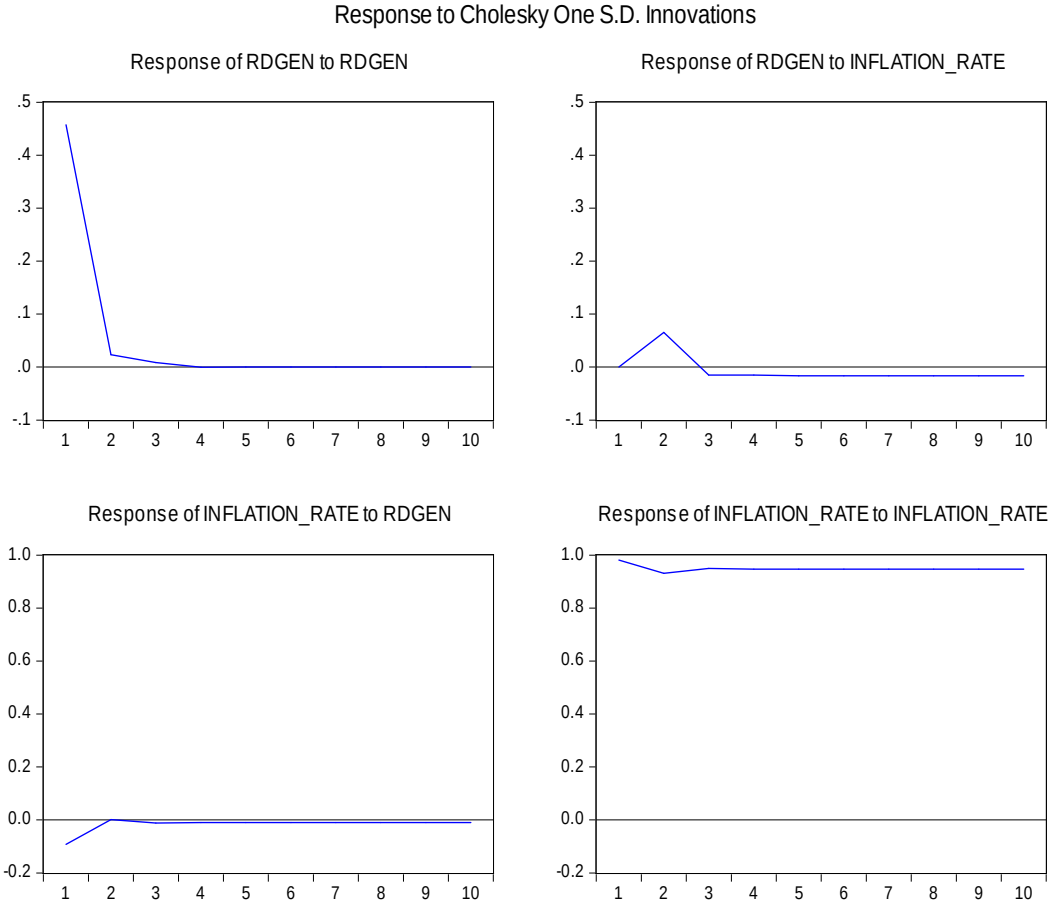

Figure 1: Impulse Response function

6. Concluding remarks

This study investigates the relationship between stock market and inflation rate using monthly data of Bangladesh for the period from 2004 to 2013. To test for the order of integration of the variables (RDGEN and INF) ADF and PP tests were used and the results show that all the variables are integrated in the same order I(*1*). The Johansen test procedure confirmed the existence of single cointegration equation at 5 percent significance level and thereby indicating the long run equilibrium relationship between the variables. More specifically, the results of this study suggest that there is significant long-run equilibrium relationship between RDGEN and INF. In other words, we can say that there is a long run causality running from INF to RDGEN. It also implies that 93.73 percent of disequilibrium in the long run relationship is corrected each period into its equilibrium. We also find a short run positive relationship between inflation rates with stock market in Bangladesh.

The implication of this positive short-run casualty is that unexpected inflation may raise the firm's equity value if they are net debtor. On the other hand, if the Central Bank

tightens the monetary policy it may reduce inflation and stock prices both which may in turn oblige the investors to buy less goods or stocks as they may be left with less money. We may also hypothesize that stock market returns may be adversely affected by inflation since inflationary pressures may threaten future corporate profits. As nominal discount rate rises under inflationary pressures, it would reduce current value of future profits and thus to stock market return. In view of the above, the government may revise and improve its monetary policy which is consistent with low inflation and inflation expectations. The outcomes of the present study are expected to be of immense importance to investors to reach rational decisions on asset allocation and advancement of the literature on financial economies. At the policy level, the findings of the study may provide some insights of the distinct impacts of inflation on the stock market of Bangladesh so that policymakers especially Bangladesh Bank, the Central Bank, can give special attention on the inflation rate and the behavior of stock market.

However, the present study suffers from some limitations. In the study, data of 9 years have been considered. The study can be more exhaustive if the longer time periods are used. The study can be moved forward further by considering data of longer time periods and the results can be compared to the other countries of the same region as well as developed countries which are left for future research. Moreover, the study comprises only two variables and thereby more variables may be incorporated to bring diversified outcomes in future.

References

1. Akbar, M., Ali, S., & Khan, M.F. (2012). The Relationship of Stock Prices and Macroeconomic Variables Revisited: Evidence from Karachi Stock Exchange, Africa. *J. Bus. Manage.*, 6(4), 1315-1322.
2. Bhattarai, C., & Joshi, N.K. (2009). Dynamic Relationship among the Stock Market and the Macroeconomic Factors: Evidence from Nepal. *South Asia Econ. J.*, 10(2), 451-469.
3. Birol, Ö. H. (2013). "Adaptive Expectations" of Milton Friedman and Monetarists and Phillips Curve; And the Comparison of them with Other Macroeconomic Schools. *GSTF Journal on Business Review (GBR)*, 3(1), 1-13.
4. Chakravarty S. and Mitra A (2010), "Growth, Prices and Poverty," *Journal of Modelling and Simulation of Systems*, Vol.1, Iss.4, pp 235-251.
5. Choudhry, T. (1999). Inflation and Rates of Return on Stocks: Evidence from High Inflation Countries. Discussion Paper, University of Wales Swansea, Department of Economics.
6. Dasgupta, R. (2012). Long-run and Short-run Relationships Between BSE Sensex and Macroeconomic Variables. *Int. Res.J. Finan. Econ.*, 95, 135-150.
7. Dickey, D.A., & Fuller, W.A. (1979). Distribution of the estimations for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 47, 427-31.
8. Enders, W. (1995). *Applied Econometric Time Series.* John Wiley & Sons, New York, NY.
9. Engle, R.F., & Granger, C.W.J. (1987). Co-integration and error correction: representation, estimation and testing. *Econometrica*, 55(5), 286-301.

10. Fama, E. (1981). Stock Returns, Real Activity, Inflation and Money. *American Economic Review*, 71, 545-565.

11. Fisher, I. (1930). The Theory of Interest. New York: Macmillan.

12. Gunasekarage, A., Pisedtasalasai, A., & Power, D.M. (2004). Macroeconomic Influence on the Stock Market: Evidence from an Emerging Market in South Asia. *J. Emerg. Market Fin*, 3(3), 285-304.

13. Ioannidis, C. and Kontonikas, A. (2008) The impact of monetary policy on stock prices. *Journal of Policy Modeling*, 30 (1). pp. 33-53.

14. Ioannides, Dimitris , Costas Katrakilidis and Andreas Lake (2005), "The relationship between Stock Market Returns and Inflation: An econometric investigation using Greek data", http://conferences.telecom-bretagne.eu/asmda2005/IMG/pdf/proceedings/910.pdf

15. Johansen, S. (1988). Statistical analysis and cointegrating vectors. *Journal of Economic Dynamics and Control*, 12(2-3), 231-54.

16. Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and statistics*, 52(2), 169-210.

17. Khan, M.M., & Yousuf, A.S. (2013). Macroeconomic Forces and Stock Prices: Evidence from the Bangladesh Stock Market, *MPRA Paper No. 46528.*

18. Muth, J. F. (1961). Rational Expectations and the Theory of Price Movements. *Econometrica*, 29(3), 315-335.

19. Naik, P.K., & Padhi, P. (2012). The Impact of Macroeconomic Fundamentals on Stock Prices Revisited: Evidence from Indian Data. *Eurasian J. Bus. Econ.*, 5(10), 25-44.

20. Omran, M., & Pointon, J. (2001). Does the Inflation Rate Affect the Performance of the Stock Market? The Case of Egypt. *Emerging Markets Review*, 2, 263-279.

21. Phillips, P., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrica*, 75(2), 335-46.

22. Saleem, F., Zafar, L., & Rafique, B. (2013). Long Run Relationship between inflation and stock return: Evidence from Pakistan. *Social Sciences and Humanities*, 4(2), 1-9.

23. Sohail, N., & Hussain, Z. (2009). Long-run and Short-run Relationship between Macroeconomic Variables and Stock Prices in Pakistan: The Case of Lahore Stock Exchange, Pak. *Econ. Soc. Rev*., 47(2), 183-198.

24. Spyrou, S. I. (2001). Stock Returns and Inflation: Evidence From an Emerging Market. *Applied Economics Letter*, 8, 447-450.

25. Wongbampo, P., & Sharma, S.C. (2002). Stock Market and Macroeconomic Fundamental Dynamic Interactions: ASEAN-5 Countries. *J. Asian Econ.*, 13, 27-51.

26. Zhao, X. Q. (1999). Stock Prices, Inflation and Output: Evidence from China. *Applied Economics Letters*, 6, 509-511.