A Study on Causality and Long Run Association between BSE Indices and Macroeconomic Indicators

Dr. P. Arun Prakash Ms. V. Sindhu***

** Asst Prof, School of Management Studies, Bannari Amman Institute of Technology, Sathyamangalam.*
***Asst Prof, Department of Commerce, Sri Krishna AditHya College of Arts and Science, Coimbatore.*

ABSTRACT

This empirical study investigates the relationship between BSE indices and macroeconomic determinants for the period 2004-2005 to 2015-2016. The study aims to find the causality and long run association between BSE indices and macroeconomic factors with the help of econometrics tools such as Unit Root Test Analysis, Johanson Cointegration Test, and Granger Casualty Test. The bivariate cointegration (Johanson Cointegration Test) results revealed the long term relationship between BSE Indices (comprising BSE Sensex, BSE 100, BSE 200, BSE 500 and BSE All Cap) and macroeconomic factors during the study period. It is found that all the macroeconomic variables are cointegrated with BSE Indices and exogenous variables such as Cash Reserve Ratio (CRR), Gross Domestic Formation (GCF) and Index of Industrial Production (IIP) granger caused BSE Indices of Bombay Stock Exchange in bi-directional mode. It is also observed from the results that exogenous variables such as Gross Domestic Product (GDP), Inflation, Rate (IR), Gross Domestic Savings (GDS), and statutory liquidity ratio (SLR) granger caused with BSE Indices in uni-directional mode.

1. INTRODUCTION

Stock market performance is keenly watched by various stakeholders such as potential investors, market players, global investors and Government. The best parameter for measuring the stock market movement is its indices. Stock market are interconnected with global markets in the sense that fluctuations in the international market are reflected in Indian Stock Markets. The movement of indices or the level of volatility is determined by various internal and external factors. Apart from this, critical episodes like global financial meltdown, BREXIT, Chinese currency devaluation, and policy rates by Federal Banks have considerable impact on the performance of the indices. With this few introductory notes, the paper has been organised as follows: Section 2 reviews the existing literature related to BSE Indices and macroeconomic variables. Section 3 presents the research design and methodology. Section 4 discusses the results and Section 5 concludes.

2. REVIEW OF LITERATURE

Kiran Kumar Kotha1 (2001) paper deals with the long and short run relations between selected macroeconomic indicators and stock market returns with reference to India. The study discloses the presence of long run relation between the BSE Sensex and select macroeconomic indicators viz., Exchange Rate, wholesale price index, T-bill rates and M3. As a concluded with macroeconomic stock returns with Since the time series analysis can only analysed only through with a stationary data series so as to avoid spurious results, Augmented Dickey Fuller (ADF) test is employed to check for stationarity. **Peter Mazuruse (2008)** in his paper dealt with the experiences of tool of canonical correlation analysis(CCA)model for the Zimbabwe stock exchange (ZSE). It refers to the effect of the reforms on the level macroeconomic variables on stock returns for the Zimbabwe Stock Exchange using the various analysis tool to calculate the stock returns canonical and analysis by through handling the various problem by drawing on experiences from Zimbabwe countries. The paper shows an impact of the importance of indulgent of the macroeconomic variables and methodical issues to be pertaining the stock exchange returns. Concluded Results of the CCA model show a set of stock returns and a set of macroeconomic variables being correlated with two or more variables. **Anokye M. Adam and George Tweneboah (2008)** scrutinized the role of macroeconomic variables on stock prices movement in Ghana. They observed that the Databank stock index to represent

Ghana stock market and (a) inward foreign direct investments, (b) the treasury bill rate (as a measure of interest rates), (c) the consumer price index (as a measure of inflation), and (d) the exchange rate as macroeconomic variables. The study also identified the relationship between variable of co integration between macroeconomic variables identified and Stock prices in Ghana indicating long run relationship. The study finally observes that the Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) indicate that interest rate and Foreign Direct Investment (FDI) are the key determinants of the share price movements in Ghana. **Emrah Ozbay(2009)**in their study on the causal relationship between stock prices and macroeconomic factors such as interest rate, inflation, exchange rates, money supply and real economy, applying monthly data. Analysis of the results infers that interest rates (CPI and PPI) are the negative determinants of stock prices, while foreign transactions are the positive determinants of stock prices in Turkey**Sagarika Mishra (2010)** the paper which deals with the exchange rate, interest rate, industrial production, inflation and foreign institutional investments these are the major macro-economic factors. Accounting patterns which have been modified by through substantially and mechanisms are takes place for decline of bad loans. The discussion with banks, however, with impact on shows such decline is mainly due to the awareness of variables. This shows a significant of nonlinear impact on the stock return and on the variability of stock return. Our results recommend that of the Ordinary Least Square and semi-parametric approaches, which reveals the semi-parametric approach better explains the stock returns and volatility. In this context, the suggests that exchange rates can be equated to the supply and demand for financial assets. **Tarika Singh (2010)** paper endeavors to analyse relationship between share prices and the macroeconomic variables by both economists and finance specialists. The economic reforms which induces increasing integration of the financial markets and implementation of various stock market reforms, the activities of stock markets and their relationships with shows a macro economy have made an significant importance. Increased economic agents use information in forming their expectations of future returns from holding stock securities. The investors have a enchance to develop profitable investment strategies according to the changes in macroeconomic variables. **Mohamad Atkin Hamzah(2012)** paper highlights the most significant factors relationship between macroeconomic variables and stock market returns, some stock markets and the measures required for management of macroeconomic variables and includes various some stock indices like finance index, the property index, and the hotel index . This paper deals with Singapore's stock market and the property index form cointegrating relationship with changes in the short and long-term interest rates, industrial production, price levels, exchange rate and money supply. **Adam Abdullah (2013)** paper inducements with some policies and conclusions from stock exchange market are link with the variables of changes in macroeconomic variables as a result of macroeconomic stocks. Stock exchange market that in allocated with the problem of causal relationship between stock market returns and macroeconomic variables in order to enhance the ability of economic agents in the analysis of stock market performance in Nigeria. , So it is recommended with India financial institutions and private investors need to take the macroeconomic indicators into consideration when formulating financial and economic policies, diversification strategies, portfolio allocation and rebalancing. **Vanita Tripathi (2014)** made an endeavour to know that what is stock exchange? The factors which made causalty relationship between stock returns in most of BRICS markets. It is tending to be returns of Stock returns generally lead to be rather than follow GDP and inflation. Besides negative impact of interest rate, exchange rate and the oil prices on stock returns which shows a positive impact of money supply. The eternal solution to the problem interest rate has been achieved through only with valuable addition to the growing body of empirical information on the subject besides being useful to policy makers, regulators and investment community. **Pooja Joshi (2014)** study which shows relationship between the long run and the short run relationship between stock price and a set of macroeconomic variables. VECM method is used to analysis the short and long run causality and Variance. Decomposition (VDC) is also used to investigate the study which shows an empirical result on forecast error variance of a conditional stock market. The VECM specifies that only long run causality running from all the variables used in the study to stock prices in India. The result of the variance decomposition shows that stock market development in India is mostly explained by its own stocks.

3. RESEARCH DESIGN

3.1. Statement of the Problem

Financial markets are the major pillars of an economy. Stock markets are more specifically representing a nation's economic activities. Companies approach stock markets for fund raising and prime source of diversifying their risks through well-constructed portfolio. Besides business entities, foreign institutional investors, retail investors and many other stakeholders heavily depend on stock markets for earning regular return and capital appreciation. Stock markets are integrated with the global stock markets due to the presence of foreign investors and depository receipts issued by domestic companies in international stock

markets. Stock market volatility is considered to be barometer of market performance for the existing players and potential investors. But, stock market performance is effected by various factors such as dividend announcements, CEO appointments or exits, signing an MoU, collaborations or new undertaking by the company. However, these factors alone do not account for market volatility. Macroeconomic factors are also having their paramount share in deciding the volatility level. Macroeconomic indicators like GDP growth rate, changes in inflation rate, fluctuating exchange rate, RBI's monetary policy, savings and investment pattern of investors influence the stock market volatility to a considerable extent. In this backdrop, the researcher has taken a maiden effort to analyze the long term association between BSE Indices and macroeconomic indicators.

3.2. Objectives of the Study

The study has framed the following objectives.

1) To assess the presence of stationary of the major indices of Bombay Stock Exchange (BSE) and macroeconomic time series data.
2) To analyse the long run relationship between BSE Indices and macroeconomic variables.
3) To examine the causality relationship between macroeconomic indicators and BSE indices

3.3. Statement of Hypotheses

Based on the above mentioned objectives, the following hypotheses are formulated and tested.

1. $\mathbf{H_0}$ Macroeconomic time series data do not have stationarity.
2. $\mathbf{H_0}$ BSE indices are not cointegrated with macroeconomic indicators.
3. $\mathbf{H_0}$ macroeconomic indicators do not granger cause BSE Indices and vice versa.

3.4. RESEARCH METHODOLOGY

3.4.1. Nature of the Study

The study is descriptive and analytical in nature. The study analyses the causality and long run relationship between macroeconomic indicators and BSE Indices.

3.4.2. Sources of Data

The study heavily depends on secondary data. BSE indices are taken from "Historical Data of Stock Prices" in Bombay Stock Exchange website. The required macroeconomic data have been taken and combined from "Handbook on Statistics of Indian Economy", published by Reserve Bank of India. Macroeconomic Data compiled from RBI website are collated with various issues of Economic Survey starting from 2005 to 2016.

3.4.3. Sampling Framework

The most robust BSE indices are considered for the analysis. They are as follows:

- BSE Sensex
- BSE 100
- BSE 200
- BSE 500 and
- BSE All Cap

3.4.4. Research Instruments

The study has employed the following econometrics tools for analysis of macroeconomic data.

1. Unit Root Test
2. Johanson Cointegration Test and
3. Granger Causality Test

3.4.5. Period of the Study

The present study uses the latest available secondary data published by BSE and RBI for the 12 years starting from 2004-2005 to 2015-2016.

3.4.6. Limitations of the Study

1. The study has primarily dependent on secondary data which does not reflect the psychological aspects of investors.
2. The study has taken select indices of Bombay Stock Exchange, which do not represent the entire market.

3.4.7 Summary of Variables and Codes used in the Analysis

ENDOGENOUS VARIABLE	EXOGENOUS VARIABLES
BSE Indices – BSE I	Gross Domestic Product
	Inflation Rate
	Gross Capital Formation
	Gross Domestic Savings
	Money Supply
	Index of Industrial Production
	Nominal Effective Exchange Rate
	Prime Lending Rate
	Repo Rate
	Statutory Liquidity Ratio
	Cash Reserve Ratio

4. ANLAYSIS AND DISCUSSION OF EMPIRICAL RESULTS

4.1 – Econometrics Analysis of New Private Sector Banks

The empirical evidence on the Cointegrating and causality relationship between macroeconomic determinants and BSE indices for the period 2005-2016 is presented in this section. This section highlights the Descriptive Statistics of the selected variables, the Correlation Matrix, Unit Root Test, Johanson Cointegration Test and finally the Granger Causality test.

4.1.1 –Descriptive Statistics of BSE indices and Macroeconomic indicators

	BSE I	GDP	IR	GCF	GDS	MS	IIP	NEER	PLR	RR	SLR	CRR
Mean	9.794	2.034	2.018	9.957	10.015	6.120	5.011	1.811	2.389	1.925	3.165	1.606
Median	9.896	1.986	1.873	10.009	10.082	6.154	5.069	1.817	2.364	1.992	3.178	1.609
Maximum	10.221	2.258	2.706	10.541	10.626	5.352	4.854	1.854	2.579	2.140	3.218	2.014
Minimum	9.148	1.722	1.591	9.138	9.259	5.281	1.605	1.754	2.251	1.609	3.068	1.386
Std. Dev.	0.361	0.715	0.342	0.467	0.438	0.195	0.217	0.032	0.106	0.175	0.060	0.202
Skewness	-0.653	-0.093	0.611	-0.389	-0.309	-0.317	-0.524	-0.354	0.747	-0.828	-0.678	0.464
Kurtosis	2.346	1.843	2.258	1.888	1.908	1.916	2.433	1.943	2.406	2.468	1.899	2.347
Jarque-Bera	1.067	0.685	1.023	0.921	0.786	0.788	0.709	0.809	1.295	1.512	1.526	0.644
Probability	0.586	0.709	0.599	0.630	0.674	0.674	0.701	0.667	0.523	0.469	0.466	0.724
Sum	117.530	24.419	24.224	119.494	120.181	73.447	60.134	21.734	28.675	23.106	37.99	19.279
Sum Sq. Dev.	1.441	0.337	1.288	2.401	2.117	0.422	0.521	0.011	0.125	0.338	0.040	0.452

Table 4.1.1 presents the summary of descriptive statistics of the endogenous and exogenous variables used in the Johanson Cointegration and Granger Causality Test. The key descriptive measures are the mean, standard deviation, the minimum and the maximum values of the variables over the period under consideration. Mean explains the average value of observations and standard deviation indicates deviation/ change of data from mean. It is particularly noted from the table that BSE Indices present a least disparity with a minimum of 9.148 % and a maximum of 10.221%. Concerning the macroeconomic variables, Gross Capital Information (GCF) has the highest standard deviation and it has a mean value of 9.957%. The economic growth as denoted by GDP shows a moderate growth in terms of mean by 2.034% and it records a minimum of 1.722% and maximum of 2.258%. Additionally, for the same period, inflation rate presents a minimum of 1.591% and a maximum of 2.706%. The average money supply of the country is 6.120 % during the study period and it has minimum and maximum of 5.281% and 5.352 % respectively. The gross domestic savings has an average of 10.015% and its data has deviated to the extent of 0.438 times from the mean value. The nominal effective exchange rate shows a high disparity of 1.754 % and 1.854 % in its minimum and maximum values during the study period and the average exchange rate is 1.811 %. The average of repo rate is 1.925% and its minimum and maximum ranges from 1.609 % to 2.140 %. The annual growth rate of index of industrial production (AGRIIP) describes a high disparity of 1.605 % and 4.854 % in its minimum and maximum values and the average of AGRIIP is 5.011 %. The standard deviation of Prime Lending Rate (PLR) is 0.106 times and its minimum and maximum

ranges from 2.251 % and 2.259 %. The summary statistics indicate that the macroeconomic series are normally distributed with the Jarque-Bera statistics probability value greater than the benchmark of 0.05 (values ranges from 0.644 to 1.526) and no essential variables are omitted from the endogenous variables.

4.1.2 – Correlation Matrix of Macroeconomic Indicators

	GDP	**IR**	**GCF**	**GDS**	**MS**	**IIP**	**NEER**	**PLR**	**RR**	**SLR**	**CRR**
GDP	1										
IR	-0.2442	1									
GCF	-0.5032	0.0125	1								
GDS	-0.4542	-0.0513	0.7960	1							
MS	0.4782	-0.0291	0.7969	0.7968	1						
IIP	-0.7337	-0.1353	0.4365	0.4325	0.4381	1					
NEER	-0.4754	-0.0190	0.7972	0.7967	0.7000	0.4316	1				
PLR	0.1992	0.6854	-0.4410	-0.4671	-0.4568	-0.3878	-0.4500	1			
RR	-0.0995	-0.3300	0.3867	0.4044	0.3492	0.0314	0.3471	-0.4796	1		
SLR	0.5510	0.3021	-0.7495	-0.7546	-0.7640	-0.5242	-0.7581	0.5469	-0.3645	1	
CRR	0.7576	0.2331	-0.5791	-0.5547	-0.5857	-0.5623	-0.5781	0.5643	-0.1800	0.7963	1

Table 4.1.2 exhibits the correlation matrix for all the variables incorporated into the model. The coefficient of correlation provides an index of the direction and the magnitude of the relationship between two set of scores without implying causality. The sign of the coefficient is an indication of the direction of the relationship. The absolute value of the coefficient indicates the magnitude. Correlation matrix is useful to the extent that it reveals it reveals that whether there are elements of multicollinearity in the data. Multicollinearity is the situation when some or all of the explanatory variables are highly related making it difficult to tell which of them is influencing the dependent variable. The severity of multicollinearity would be manifested in a situation where all p-values of regression coefficients are insignificant but overall model having significant F statistic. Table 4.1.2 indicates the results of correlation matrix of nine macroeconomic variables. GDP has been negatively associated with inflation rate (IR), Gross Capital Formation (GCF), Money Supply (MS), Index of Industrial Production (IIP), Nominal Effective Exchange Rate (NEER) and Repo Rate (RR) which are -0.0244, -0.5031, -0.4542, -0.4782, -0.7337, -0.4753 and -0.0995. The correlation coefficient of all macroeconomic variables implies the absence of multicollinearity problem as correlation co-efficient of all the variables are less than 0.80. Money Supply (MS) has high correlation coefficient with Gross Capital Formation (GCF) followed by Nominal Effective Exchange Rate (NEER). But, these two variables do not exceed the limit of 0.80.

4.1.3 - Unit Root Test of BSE indices and Macroeconomic indicators

Variables	**Augmented Dickey Fuller Test**		
	Level	**First Difference**	**Order of Integration**
BSE Indices	-3.366169*	-7.261459*	I (0)
Gross Domestic Product	-8.534348*	-27.19256*	I (0)
Inflation Rate	-9.740191*	-13.06363*	I (0)
Gross Capital Formation	-10.63516*	-12.52302*	I (0)
Gross Domestic Savings	-9.014464*	-13.52574*	I (0)
Money Supply	-8.459137*	-19.07390*	I (0)
Index of Industrial Production	-9.419162*	-14.34738*	I (0)
Nominal Effective Exchange Rate	-15.69047*	-18.01561*	I (0)
Prime Lending Rate	-10.82381*	-18.05809*	I (0)
Repo Rate	-6.132025*	-8.678623*	I (0)
Statutory Liquidity Ratio	-9.040334*	-13.52224*	I (0)
Cash Reserve Ratio	-8.415937*	-19.09730*	I (0)

Note: The * indicates significance at 1%, ** at 5% and *** at 10%

Table 4.1.3 displays the unit root test results of all the public and private sector commercial banks. It is important that macroeconomic variables used in the study must be stationary. If the variables are not stationary, it is assumed that they include stochastic or deterministic trends. In order to check whether the time series data are stationary or non-stationary, Augmented Dickey-Fuller (ADF) Unit Root test has been applied. The analytical results reveal that all the endogenous and exogenous variables are stationary at level. The rejection of null hypothesis against the alternative hypothesis implies that all the time series variables are stationary and integrated the order of zero i.e., 1(0). To further validate and strengthen the results, first difference of the series has been taken to ensure stationary of the data.

Table 4.1.4
Johanson Cointegration Test of BSE indices and Macroeconomic indicators

Pairwise	**Eigen Value**	**Trace Statistic**	**Critical Value (5%)**	**Max-Eigen Value**	**Critical Value (5%)**
BSE I - GDPGR	0.241193	19.52143	15.49471	15.73242	14.26460
	0.241193	3.789008	3.841466	3.789008	3.841466

BSE I – IR	0.349545	29.54148	15.49471	24.51478	14.26460
	0.084411	5.026698	3.841466	5.026698	3.841466
BSE I- LGCF	0.342320	27.24367	15.49471	23.88510	14.26460
	0.057220	3.358577	3.841466	3.358577	3.841466
BSE I- LGDS	0.328154	34.68504	15.59471	23.06812	14.26460
	0.181508	11.61692	3.841466	11.61692	3.841466
BSE I- LGMS	0.913239	25.61625	15.49471	22.00140	14.26460
	0.330785	3.614849	3.841466	3.614849	3.841466
BSE I- LIIP	0.464666	39.47218	15.49471	35.61731	14.26460
	0.065393	3.854872	3.841466	3.854872	3.841466
BSE I- LNEER	0.324803	25.64346	15.49471	22.38682	14.26460
	0.055533	3.256641	3.841466	3.256641	3.841466
BSE I- PLR	0.260300	20.82600	15.49471	17.18610	14.26460
	0.061862	3.639898	3.841466	3.639898	3.841466
BSE I- RR	0.508356	192.4733	15.49471	158.3303	14.26460
	0.141962	34.14295	3.841466	34.14295	3.841466
BSE I – SLR	0.374097	35.62146	15.59471	27.17650	14.26460
	0.135499	8.444957	3.841466	8.444957	3.841466
BSE I - CRR	0.193645	15.41928	15.49471	12.26821	14.26460
	0.053782	3.151076	3.841466	3.151076	3.841466

Table 4.1.4 represents the bivariate cointegration results of new private sector bank. Johansen Cointegration analysis helps to determine whether there is a cointegrating relationship between the variables or not. The study has applied Johansen Maximum Likelihood method of cointegration to find whether there is more than one cointegration relationship among the variables. In order to accept the cointegrating relationship between variables, Trace and Max-Eigen Statistics value should be higher than the critical value at 5% significance level. The results indicate that all the variables are cointegrated with endogenous variable BSE indices. Hence, it can be concluded that there are 9 cointegrating equation among the variables based on Maximum-Eigen value.

4.1.5 – Granger Causality Test of BSE indices and Macroeconomic indicators

Null Hypothesis H_o	**F- Statistic**	**P - Value**	**Conclusion**
GDP does not Granger Cause BSE I	8.30181	0.0257	Rejected H_o
BSE I does not Granger cause GDP	4.05492	0.6717	Accepted H_o
IR does not Granger Cause BSE I	5.53884	0.0539	Rejected H_o
BSE I does not Granger cause IR	0.63322	0.5686	Accepted H_o
GCF does not Granger Cause BSE I	3.98155	0.0923	Rejected H_o
BSE I does not Granger cause GCF	7.15623	0.0341	Rejected H_o
GDS does not Granger Cause BSE I	3.69883	0.1032	Accepted H_o
BSE I does not Granger cause GDS	7.15623	0.0341	Rejected H_o
GMS does not Granger Cause BSE I	3.69883	0.1032	Accepted H_o
BSE I does not Granger cause GMS	0.76220	0.5141	Accepted H_o
IIP does not Granger Cause BSE I	12.1042	0.0121	Rejected H_0
BSE I does not Granger cause IIP	22.9257	0.0030	Rejected H_o
NEER does not Granger Cause BSE I	3.43905	0.1149	Accepted H_o

BSE I does not Granger cause NEER	0.78603	0.5048	Accepted H_o
PLR does not Granger Cause BSE I	0.11037	0.8976	Accepted H_o
BSE I does not Granger cause PLR	0.89377	0.4657	Accepted H_o
RR does not Granger Cause BSE I	0.66711	0.5535	Accepted H_o
BSE I does not Granger cause RR	2.34494	0.1912	Accepted H_o
SLR does not Granger Cause BSE I	5.28442	0.0584	Rejected H_o
BSE I does not Granger cause SLR	1.18394	0.3793	Accepted H_o
CRR does not Granger Cause BSE I	23.2221	0.0029	Rejected H_o
BSE I does not Granger cause CRR	15.8092	0.0068	Rejected H_o

Table 4.1.5 indicates the results of Granger Causality Test between BSE Indices and macroeconomic indicators. Granger Causality Analysis is a statistical hypothesis test for determining whether one times series data is useful in predicting another. Granger causality test results have shown the bi-directional relationship between BSE Indices (BSE I) and cash reserve ratio (CRR), Index of Industrial Production (IIP) & Gross Capital Formation (GCF). Whereas other macroeconomic variables such as Gross Domestic Product (GDP), Inflation, Rate, Gross Domestic Savings (GDS), and statutory liquidity ratio (SLR) have shown a uni-directional relationship with BSE Indices. Exogenous Variables such as Money Supply (MS), Nominal Effective Exchange Rate (NEER), Prime Lending Rate (PLR) and Repo Rate (RR) do not exhibit any causality relationship with BSE Indices.

5. Concluding Remarks:

This analytical study has analysed the causality and long run interaction between BSE indices and macroeconomic indicators using the econometrics tools for the period 2005-2016. The bivariate cointegration results revealed that all the macroeconomic variables are cointegrated with BSE indices of Bombay Stock Exchange in India. It is also found from the analysis that exogenous variable cash reserve ratio (CRR), Index of Industrial Production (IIP) & Gross Capital Formation (GCF). have showed a bi-directional causality relationship with BSE Indices (BSE I). Macroeconomic variables such as Gross Domestic Product (GDP), Inflation, Rate (IR), Gross Domestic Savings (GDS), and statutory liquidity ratio (SLR) have shown a uni-directional relationship with BSE Indices. It can be concluded that macroeconomic variables like Gross Domestic Product (GDP), Inflation, Rate (IR), Gross Domestic Savings (GDS), statutory liquidity ratio (SLR), cash reserve ratio (CRR), Index of Industrial Production (IIP) and Gross Capital Formation (GCF) are the macroeconomic determinants those explain the movement of BSE indices.

REFERENCES

1. Ali Umar Ahmad, Adam Abdullah, Zunaidah Sulong, Ahmad Tijjani Abdullahi (2013), **Causal Relationship between Stock Market Returns and Macroeconomic Variables in Nigeria** IOSR Journal Of Humanities And Social Science (IOSR-JHSS)Volume 20, Issue 5, Ver. II (May. 2013), PP 74-96
2. Anokye M. Adam, George Tweneboah (2008) **Macroeconomic Factors and Stock Market Movement: Evidence from Ghana.**
3. Kiran Kumar Kotha, Bhawna Sahu (2001)**, Macroeconomic Factors and the Indian Stock Market: Exploring Long and Short Run Relationships.** International Journal of Economics and Financial Issues ISSN: 2146-4138
4. Mofleh Ali Mofleh Alshogeathri (2012), **Macroeconomic determinants of the stock market movements: Empricial evidence from the Saudi stock market.**
5. Peter Mazuruse (2008), **Canonical Correlation Analysis Macroeconomic Variable Versus Stock Returns. Journal of the emerald insight.(1757-6385)**
6. Pooja Joshi, A K Giri (2014)**, Dynamic Relations between macroeconomic variables and Indian Stock Price: an application of ARDL Bounds Testing Approach Asian Economic and Financial Review ISSN(e): 2222-6737/ISSN(p): 2305-2147**
7. Ramin Cooper Maysami Lee Chuin Howe Mohamad Atkin Hamzah (2009)**, Relationship between Macroeconomic Variables and Stock Market Indices: Cointegration Evidence from Stock Exchange of Singapore's All-S Sector Indices-** Jurnal Pengurusan 24(2004) 47-77.
8. Sagarika Mishra Harminder Singh (2010), **Do macro-economic variables explain stock-market returns? Evidence using a semi-parametric approach.**
9. Tarika Singh, Seema Mehta, M. S. Varsha (2010). **Macroeconomic factors and stock returns: Evidence from Taiwan,** Journal of Economics and International Finance Vol. 2(4), pp.217-227, April 2011.
10. Vanita Tripathi, Arnav Kumar (2014)**, Do Macroeconomic Variables affect stock returns in brics Markets? an ARDLapproach.**