Macroeconomic Factors as a Predictor of Stock Market: Empirical Evidences from India, U.S. and U.K.

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Abstract: *The study investigated the impact of Macroeconomic variables such as: Gross Domestic Product (GDP), The Index of Industrial Production (IIP), Consumer Price Index (CPI), Foreign-exchange reserves (also called forex reserves or FX reserves), International Crude Price (CP) on selected stock market, namely Indian Stock Market (S&P BSE SENSEX (BSE 30) index, S&P CNX Nifty index (NIFTY 50), London Stock Exchange (Financial Times Stock Exchange 100 Index (FTSE 100) and New York Stock Exchange Dow Jones Industrial Average (Dow 30). The data sets of all variables have been considered from April, 2001 to March, 2018 on a monthly basis. The study reveals long run relationship among the variables and the results of Granger Causality test reveals unidirectional, bilateral relation (Feedback) and exogeneity (Independence) among the variables.*

Keywords : *FDI, RBI.*

I. INTRODUCTION

The segment of a financial market of an economy from long- term capital is raised via instruments such as shares, securities, bonds, debentures, mutual funds is known as the security market of that economy. A security market has components such as a security regulator (Like SEBI in India), stock exchanges, different share indices, brokers, FIIs, jobbers, etc. There are different kinds of transactions which take place in a security market such as badla, reverse badla, future trading, private placement, etc.

Stock Market refers to the market provided by different stock exchanges to the securities which include share, debenture, bond and other government securities. It is a market place where buyers and sellers of shares and securities admitted to dealings, can do business and competitive open prices.

The Stock Exchange is an organized market for purchase and sale of listed industrial and financial securities. The securities traded on Stock Exchange include shares and debentures of public limited companies, Government securities, etc. It serves the following major functions:

• Makes a floor available to the buyers and sellers of stocks and liquidity comes to the

stocks. It is the single most important institution in the secondary market for securities.
• Makes available the prices of trading as an important piece of information to the investors.
• By following institutionalized rules and procedures, it ensures that the participants in the stock market live up to their commitments.
• Passes updated information to the enlisted companies about their present stockholders (so that they can pass on dividends etc., to them).
• By publishing its 'Index', it fulfills the purpose of projecting the moods of the stock market.

II. MOTIVATION FOR RESEARCH

The Stock market is an important element of the economic structure of a country. The stock market plays a critical role in the development of the industry and commerce of the area that eventually affects the economic structure of the country to a great extent. The Stock market is viewed as a very significant element of the financial sector of any economic structure. Furthermore, it plays a crucial role in the mobilization of capital in many of the emerging economies. There are many factors which affect the stock market behaviour rapidly. The variation due to the different factors reflects its impact on the economy also. It is said that if one wants to discover the economic structure of the country, he/she should read out the behaviour of the securities markets. So, in the above context, there is a need to conduct present research to investigate the relationship between stock market and economic financial factors.

III. REVIEW OF LITERATURE

(FranciscoJareño and LoredanaNegrut2015)analyzed the relationship between the US stock market and US macroeconomic factors, namely, gross domestic product, the consumer price index, the industrial production index, the unemployment rate and long-term interest rates, found statistically significant relationships

with the stock market except for the consumer price index.

(Mahmoud Ramadan Barakat, Sara H.Elgazzar and KhaledM.Hanafy2015) to shed light on the relationship between the stock market and macroeconomic factors, namely, Consumer Price Index, Exchange Rate, Money Supply and Interest Rate in two emerging economies (Egypt and Tunisia) for the period from January 1998 to January 2014, found that there is a causal relationship in Egypt between market index and Consumer Price Index (CPI), Exchange Rate, Money Supply, and Interest Rate and the same goes for Tunisia except for CPI.

(SadiyeÇiftçi2014)"Investigated the influence of four macroeconomic variables, namely, crude oil, interest rate, exchange rate and gold, on stock returns of ten U.S. industries, used monthly data from January 1997 to September 2014, divided into a pre-crisis and post-crisis period along with whole. By applying the ordinary least squares approach, found, the impact of some macroeconomic variables differs between industry sectors, whereas one variable has a homogenous impact".

(ChanHong Zoa, Farn Wei Chet, Hum Yan Sheng, Wong Hui Lin and Yip Jia Shen 2014)"examined the dynamic relationship between macroeconomic variables namely real interest rate, industrial production index, inflation, government debt and stock market index (Nikkei 225) in Japan, By applying Augmented Dickey Fuller test, Philip Peron Test, Johansen cointegration test, Granger Causality Test and ECM (Error Correction Model), found that all the variables are significantly impacted on Nikkei 225 in long run, during post Asian financial crisis.

(Joseph TagneTalla2013) investigated the impact of changes in selected macroeconomic variables (Consumer Price Index, Interest Rate, Exchange Rate and Money Supply) on stock prices of the Stockholm Stock Exchange (OMXS30). By using unit root test, Multivariate Regression Model computed on Standard Ordinary Linear Square (OLS) method and Granger causality test, all tests are conducted on monthly data (1993-2012), found a significant relationship.

(Martin Sirucek 2012) focused on the effect, implication, impact and relationship between selected macroeconomic variables, namely, inflation, interest rates, money supply, producer price index, industrial production index, oil price and unemployment and wider US indices S&P 500 and industrial Dow Jones Industrial Average (DJIA), found statistically significant relation.

(EmrahOzbay2009) investigated the causal relationship between stock prices and macroeconomic factors, namely, interest rate, inflation, exchange rates, money supply and the real economy. "By applying Granger causality model, this study found, that interest rate (OIR),

inflation (CPI), CD/GDP, and foreign sale do Granger cause stock returns, while stock returns do Granger cause money supply (M1, M2, and M2Y), exchange rate, interest rate (OIR and TIR) inflation (PPI), foreign transactions. Industrial production is indicated as neither the result variable nor the cause variable of stock price movement".

(Andreas Humpe and Peter Macmillan 2007) examined whether a number of macroeconomic variables (Industrial Production, Consumer Price Index, Money Supply and long term interest rate) influence stock prices in the US and Japan. By applying cointegration analysis, found data are consistent with a single cointegrating vector in case of US (means, stock prices are positively related to industrial production and negatively related to both the consumer price index and a long term interest rate and insignificant (although positive) relationship between US stock prices and the money supply) and two co integrating vectors in case of Japan (means, "one vector that stock prices are influenced positively by industrial production and negatively by the money supply, second co integrating vector, means, industrial production to be negatively influenced by the consumer price index and a long term interest rate").

(Hondroyiannis et al 2004) investigated, financial development/economic growth relationship for Greece, by using vector auto-regressions (VAR) model (1986-1999), found a two-way causal relationship between the financial development proxies and growth in the long run.

(A. Beltratti, et, al 2002) investigated the relationship between the stock market volatility (S&P500) and macroeconomic variables, namely, supply, interest rate, inflation and industrial production by applying GARCH and structural breaks researcher found significant stock market volatility.

(Herriott,2001) investigated, the connection between financial development and economic growth in Switzerland, used quarterly data from 1990-1999, used real GDP as proxy for economic growth and three measures of stock market development (market capitalisation, stock market volume divided by market value and stock market volume divided by GDP) and one measure of banking sector development(M1) and found positively impact of financial development on economic growth.

IV. RESEARCH OBJECTIVES

Researcher aimed at achieving the following objectives:
1. To investigate the relationship among India, U.S. and U.K. stock markets on macroeconomic variables.

2. To analyse the impact of macroeconomic variables on selected stock markets.

V. RESEARCH METHODOLOGY

The study investigated the impact of macroeconomic variables such as: Gross Domestic Product (GDP), The Index of Industrial Production (IIP), Consumer Price Index (CPI), Foreign-exchange reserves (also called forex reserves or FX reserves), International Crude Price (CP) as Independent Variables on selected stock market, namely Indian Stock Market (S&P BSE SENSEX (BSE 30) index, S&P CNX Nifty index (NIFTY 50), London Stock Exchange (Financial Times Stock Exchange 100 Index (FTSE 100) and New York Stock Exchange Dow Jones Industrial Average (Dow 30) as Dependent Variables. The data sets of all variables have been considered from April, 2001 to March, 2018 on a monthly basis. All the required information for the study has been retrieved from the International Financial Statistics (IMF Data Base).

VI. RESEARCH ASSUMPTION

The researcher hypothesized that selected macroeconomic variables and selected stock markets are independent.

TABLE 1: DESCRIPTION OF DATA

Name of Variables	Symbol Used	Proxy Used	Source	Unit
Bombay Stock Exchange-Sensitive Index (SENSEX), NIFTY 50	SENSEX, Nifty	As a proxy to Indian Stock Market	IFS (Data Base)	Index
Financial Times Stock Exchange 100 Index (FTSE 100)	FTSE_100	As a proxy to United States Market (New York Stock Exchange NASDAQ)	IFS (Data Base)	Index
Dow Jones Industrial Average (Dow 30)	DJI	As a proxy to United Kingdom Market (London Stock Exchange)	IFS (Data Base)	Index
Consumer price index	CPI	As a proxy to inflation	IFS (Data Base)	Index
Crude Oil Price	CP	As a proxy to International Crude Oil Price	IFS (Data Base)	US Dollars per Barrel (Average)
Gross Domestic Product	GDP	As a proxy to economic growth	IFS (Data Base)	National Currency Millions
Index of Industrial Production	IIP	As a proxy to economic growth	IFS (Data Base)	Index
Foreign-exchange reserves	FX	As a proxy to Reserve Assets	IFS (Data Base)	USD Millions

The justification of variables selection is supported by the table 2.

Table 1.2

Justification of macroeconomic Variables' Selection

S. No.	Variables	Variables
1.	**GDP**	Francisco Jareño and LoredanaNegrut, EmrahOzbay, Hondroyiannis et al, Herriott, Dr.Venkatraja.B, Charles Barnor, Samveg Patel, SezginAcikalin, RafetAktas,

		SeyfettinUnal, Çil and Yavuz, San-Diego, Mahmood and Dinniah,Sikalao-lekobane, et, al.
2.	IIP	Francisco Jareño and Loredana Negrut, Chan Hong Zoa, Martin Sirucek, Emrah Ozbay, Andreas Humpe and Peter Macmillan, Hondroyiannis et al, A. Beltratti, et, Dr.Venkatraja.B, Charles Barnor, Samveg Patel, Pramod Kumar Naik, Puja Padhi, Olowe, Rufus Ayodeji, Sangeeta Chakravarty, Mohsen Mehrara, Maghayereh, Hosseini,et,al,Alam.
3.	FXRE	Maghayereh, Sikalao-lekobane, et, al.
4.	CPI	Francisco Jareño and LoredanaNegrut, Chan Hong Zoa, Joseph TagneTalla, Martin Sirucek, Emrah Ozbay, Andreas Humpe and Peter Macmillan, A. Beltratti, et, Mahmoud Ramadan Barakat, Sara H.Elgazzar and Khaled M.Hanafy, Wycliffe NdugaOuma and Dr. Peter Muriu, Dr.Venkatraja.B, Charles Barnor, Ahmad Monir Abdullah and BuerhanSaiti and Abul Mansur M. Masih, HarunaIssahaku, YaziduUstarz and Paul Bata Domanban, Samveg Patel, Olowe, Rufus Ayodeji, Sangeeta Chakravarty, Maghayereh, San-Diego, Mahmood and Dinniah, Hosseini,et,al,Alam.
5.	CP	Sadiye Çiftçi, Martin Sirucek, Samveg Patel, Olowe, Rufus Ayodeji, Robert D. Gay, Jr., Hosseini,et,al.

VII. TOOLS FOR ANALYSIS

Descriptive statistics (to know the subject knowledge of the variables considered in the whole research work), Augmented Dickey Fuller Test (ADF) (to check the stationary of data) Ordinary least square (to test the relationship between the selected macroeconomic variables and the stock price index), Granger Causality test (to examine the relation between individual explanatory variables and selected indexes, either unidirectional, bidirectional or no relation have been employed to examine the objectives of the study.

VIII. DATA ANALYSIS, RESULTS, FINDINGS AND CONCLUSION

By Augmented Dickey Fuller Test (ADF), In case of India (Table: 1) researcher found all selected variables are stationary at I(1) except LGDP (log of Gross Domestic Product) and LIIP (log of Index of Industrial Production), these variables are stationary at I(2) because t- statistics is less than the critical value (5% level) at I(1). In case of United State (Table: 2), all selected variables are stationary at I(1) except LGDP (log of Gross Domestic Product) and LIIP (log of Index of Industrial Production), these variables are stationary at I(2) because t- statistics is less than the critical value (5% level) at I(1). In case of United Kingdom (Table: 3) , all selected variables are stationary at I(1) except LCPI (log of Consumer Price Index), LGDP (log of Gross Domestic Product) and LIIP (log of Index of Industrial Production), these variables are stationary at I(2) because t-statistics is less than the critical value (5% level) at I(1).

Constraints	Augmented Dickey Fuller Test	
TABLE 3:		
Unit Root Test		
India		

	(ADF)	
	Level	**1st Difference**
Panel A – LSENSEX		
Intercept	-1.089626	-10.72620
Intercept & Trend	-1.402553	-10.70887
None	1.814510	-10.53178
Panel B - LNifty 50		
Intercept	-1.090061	-11.06868
Intercept & Trend	-1.613166	-11.04539
None	1.699672	-10.88905
Panel C – LCP		
Intercept	-1.180663	-6.449550
Intercept & Trend	-2.407284	-6.482958
None	1.086138	-6.142600
Panel D – LCPI		
Intercept	4.197789	-9.885072
Intercept & Trend	-1.358016	-7.660126
None	9.232156	-0.192069
Panel E –LFX		
Intercept	-3.371368	-3.879486
Intercept & Trend	-0.627568	-8.846986
None	1.894449	-3.257337

Panel F – LGDP			
Constraints	**Level**	**1st Difference**	**2nd Difference**
Intercept	-0.815476	-2.068728	-41.32673
Intercept & Trend	-2.473406	-1.731308	-41.44653
None	1.915001	-0.382493	-41.49922
Panel G – LIIP			
Intercept	-1.323133	-2.776293	-9.806107
Intercept & Trend	-1.830696	-2.983034	-9.804836
None	2.272409	-1.061397	-9.853605
*Significant at 5% level			
Source: Researcher's Computation			

TABLE 4:

Unit Root Test

United State (U.S.)

Constraints	Augmented Dickey Fuller Test (ADF)	
	Level	**1st Difference**
Panel A – LDJI		
Intercept	-1.129707	-10.27788
Intercept & Trend	-1.947695	-10.31611
None	0.567514	-10.29437
Panel B – LFX		
Intercept	-1.928090	-11.18192
Intercept & Trend	-1.362057	-11.33499
None	1.703584	-11.00114
Panel C – LCPI		
Intercept	-0.541679	-7.802220
Intercept & Trend	-2.764500	-7.776383
None	3.551010	-6.665874

Panel D – LGDP			
Constraints	**Level**	**1st Difference**	**2nd Difference**
Intercept	-1.628039	-3.290337	-43.21843
Intercept & Trend	-1.809241	-3.479403	-43.09166
None	2.618001	-1.928363	-.43.37301
Panel E – LIIP			
Intercept	-3.287039	-1.840326	-8.660840
Intercept & Trend	-3.395501	-1.822843	-8.610909
None	0.376383	-1.803290	-8.698380

*Significant at 5% level

Source: Researcher's Computation

TABLE 5:

Unit Root Test

United Kingdom (U.K.)

Constraints	Augmented Dickey Fuller Test (ADF)	
	Level	**1st Difference**
IX. PANEL A - LFTSE 100		
Intercept	-1.704996	-10.85333
Intercept & Trend	-2.372763	-10.86147
None	-0.052774	-10.89206
Panel B – LFX		
Intercept	-0.141254	-11.12147
Intercept & Trend	-2.4939949	-11.15767
None	1.581612	-10.99239

X. PANEL C– LGDP			
Constraints	**Level**	**1st Difference**	**2nd Difference**
Intercept	-1.856012	-2.525990	-11.85089
Intercept & Trend	-2.188792	-2.840337	-11.80285
None	1.888174	-1.630913	-11.89756
XI. PANEL D – LIIP			
Intercept	-0.450346	-2.091120	-10.07013
Intercept & Trend	-1.955837	-2.206998	-10.02543
None	-1.350358	-1.921319	-10.11693
XII. PANEL E – LCPI			
Intercept	1.971646	-2.576237	-5.939377
Intercept & Trend	-1.723389	-4.120421	-5.925899
None	2.582206	-0.641105	-5.950814
*Significant at 5% level			
Source: Researcher's Computation			

Ordinary Least Square (OLS) method, show the impact of the financial (economics) variables on stock market. Here, "Both the predicted and all the predictor variables are log-transformed. This is associated with the price elasticity meaning that the percentage change in Y is caused by one percentage change in X". For example in the case of this study, 1% change in IIP will cause stock prices to decrease by 6.69%.

The coefficient of determination (R^2) are 0.5956(SENSEX), 0.5765(Nifty), 0.5957(DJI), 0.4283(FTSE_100) which are considered as 59%, 57%, 59%, and 42%. This indicates that about 59%, 57%, 59% and 42% of the total systematic variations in the SENSEX, Nifty, DJI and FTSE_100 are explained by the variation in the explanatory variables, namely CPI, GDP, IIP, CP and FX. The remaining 41 %(SENSEX), 43 %(Nifty), 41 %(DJI) and 58 %(FTSE_100) could be attributed to the some other factors and stochastic error term which are not included in the model.

TABLE 6:

OLS Estimation Results

No. of Observations:142

Dependable Variable	Constant	DLCPI	DLCP	DDLIIP	DDLGDP	DLFX	$\tilde{R}$	Adjusted $\tilde{R}$
DLSENSEX	0.636093	0.260086	0.488796	-0.066973	0.031948	0.550058	0.5956	0.5747
DLNIFTY	1.574826	0.329004	0.444976	-0.083740	0.045026	0.516858	0.5765	0.5547
DLDJI	71653.35	-655.3788	4399.762	1305.039	6585.121	-7087.18	0.5957	0.5808

OLS Estimation Results

No. of Observations:142

Dependable Variable	Constant	DDLCPI	DLCP	DDLIIP	DDLGDP	DLFX	$\tilde{R}$	Adjusted $\tilde{R}$
DLFTSE_100	5.942223	-0.845906	0.081280	0.003510	-0.111391	0.215957	0.4283	0.4073

Source: Researcher's Computation

Through granger causality test, researcher, found unidirectional relation, bilateral relation (Feedback) and Exogeneity (Independence) among the variables.
Granger Causality Test for DLDJI and Selected Variables: - By seeing Table: 5, researcher found DDLGDP does not granger cause DLDJI, DLJI does not granger cause DLCP, DLDJI does not granger cause DLCPI, means have Unidirectional relation, DLDJI and DDLIIP have Bilateral relation (Feedback) and DLFX and DLFX have Exogeneity (Independence).
Granger Causality Test for DLNIFTY and Selected Variables: - By seeing table: 6, researcher found, DDLIIP, DLCPI and DDLGDP have Exogeneity (Independence), DLNIFTY does not granger cause DLFX and DLNIFTY does not granger cause DLCP, means have Unidirectional relation.
Granger Causality Test for SENSEX and Selected Variables: - By seeing Table: 7, researcher found, DDLGDP, DDLIIP and DLCPI have Exogeneity (Independence), DLCP and DLFX have Bilateral (feedback) relation with DLSENSEX.
Granger Causality Test for FTSE_100 and Selected Variables: - By seeing Table: 8, researcher found, unidirectional relation among the variables.

Table 7: Granger Causality Test for DLDJI and Selected Variables				
Null Hypotheses	**F- Statistics**	**P-Value**	**Ho Rejected/ Not Rejected**	**Causality Conclusion**
DLDJI does not Granger Cause DDLGDP	1.478	0.201	Ho not Rejected	Unidirectional DDGDP →DLDJI
DDLGDP does not Granger Cause DLDJI	2.505	0.033*	Ho Rejected	
DLDJI does not Granger Cause DDLIIP	3.068	0.012*	Ho Rejected	Feedback (Bilateral)
DDLIIP does not Granger Cause DLDJI	1.143	0.004*	Ho Rejected	
DLDJI does not Granger Cause DLCP	2.784	0.020*	Ho Rejected	Unidirectional DLDJI →DCP
DLCP does not Granger Cause DLDJI	0.772	0.570	Ho not Rejected	
DLDJI does not Granger Cause DLCPI	3.022	0.013*	Ho Rejected	Unidirectional DLDJI →DLCP
DLCPI does not Granger Cause DLDJI	1.064	0.383	Ho not Rejected	
DLFX does not Granger Cause DLDJI	1.062	0.384	Ho not Rejected	Exogeneity (Independence)
DLDJI does not Granger Cause DLFX	0.585	0.711	Ho not Rejected	
[*] denotes the rejection of null Hypotheses at 5% confidence level				
Source: Researcher's Computation				

Table 8: Granger Causality Test for DLNIFTY and Selected Variables				
Null Hypotheses	**F-Statistics**	**P-Value**	**Ho Rejected/ Not Rejected**	**Causality Conclusios**
DLNIFTY does not Granger Cause DDLGDP	1.119	0.343	Ho not Rejected	Exogeneity (Independence)
DDLGDP does not Granger Cause DLNIFTY	0.140	0.935	Ho not Rejected	
DLNIFTY does not Granger Cause DDLIIP	0.237	0.870	Ho not Rejected	Exogeneity (Independence)
DDLIIP does not Granger Cause DLNIFTY	0.784	0.504	Ho not Rejected	
DLNIFTY does not Granger Cause DLCP	7.176	0.000*	Ho Rejected	Unidirectional DLNIFTY →DLCP
DLCP does not Granger Cause DLNIFTY	0.994	0.397	Ho not Rejected	
DLNIFTY does not Granger Cause DLCPI	0.507	0.677	Ho not Rejected	Exogeneity (Independence)
DLCPI does not Granger Cause DLNIFTY	1.072	0.362	Ho not Rejected	
DLNIFTY does not Granger Cause DLFX	2.445	0.054*	Ho Rejected	Unidirectional DLNIFTY →DLFX
DLFX does not Granger Cause DLNIFTY	0.886	0.450	Ho Rejected	
[*] denotes the rejection of null Hypotheses at 5% confidence level				
Source: Researcher's Computation				
Table 9: Granger Causality Test for SENSEX and Selected Variables				
Null Hypotheses	**F-Statistics**	**P-Value**	**Ho Rejected/ Not Rejected**	**Causality Conclusion**
DLSENSEX does not Granger Cause DDLGDP	0.580	0.714	Ho not Rejected	Exogeneity (Independence)
DDLGDP does not Granger Cause DLSENSEX	0.577	0.717	Ho not Rejected	
DLSENSEX does not Granger Cause DDLIIP	0.425	0.830	Ho not Rejected	Exogeneity (Independence)
DDLIIP does not Granger Cause DLSENSEX	0.677	0.614	Ho not Rejected	
DLSENSEX does not Granger Cause DLCP	5.664	0.000*	Ho Rejected	Feedback (Bilateral)
DLCP does not Granger Cause DLSENSEX	3.556	0.004*	Ho Rejected	
DLSENSEX does not Granger Cause DLCPI	0.535	0.749	Ho not Rejected	Exogeneity (Independence)
DLCPI does not Granger Cause DLSENSEX	0.724	0.606	Ho not Rejected	
DLSENSEX does not Granger Cause DLFX	3.199	0.009*	Ho Rejected	Feedback (Bilateral)
DLFX does not Granger Cause DLSENSEX	2.337	0.045*	Ho Rejected	
[*] denotes the rejection of null Hypotheses at 5% confidence level				
Source: Researcher's Computation				
Table 10: Granger Causality Test for FTSE_100 and Selected Variables				
Null Hypotheses	**F- Statistics**	**P-Value**	**Ho Rejected/ Not Rejected**	**Causality Conclusion**
DLFTSE_100 does not Granger Cause DDLCPI	0.993	0.424	Ho not Rejected	Unidirectional DDLCPI → DLFTSE_100
DDLCPI does not Granger Cause DLFTSE_100	2.125	0.054*	Ho Rejected	

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DLFTSE_100 does not Granger Cause DDLGDP	2.155	0.053*	Ho Rejected	Unidirectional DLFTSE_100 →DDLGDP
DDLGDP does not Granger Cause DLFTSE_100	0.700	0.623	Ho not Rejected	
DLFTSE_100 does not Granger Cause DDLIIP	0.214	0.955	Ho not Rejected	Unidirectional DDLIIP → DLFTSE_100
DDLIIP does not Granger Cause DLFTSE_100	2.471	0.035*	Ho Rejected	
DLFTSE_100 does not Granger Cause DLCP	4.506	0.000*	Ho Rejected	Unidirectional DLFTSE_100 →DLCP
DLCP does not Granger Cause DLFTSE_100	0.797	0.553	Ho not Rejected	
DLFX does not Granger Cause DLFTSE_100	1.430	0.217	Ho not Rejected	Unidirectional DLFTSE_100 →DLFX
DLFTSE_100 does not Granger Cause DLFX	3.094	0.011*	Ho Rejected	
[*] denotes the rejection of null Hypotheses at 5% confidence level				
Source: Researcher's Computation				

IX. CONCLUSION

The study investigated the impact of financial (economic) variable such as: Gross Domestic Product (GDP), The Index of Industrial Production (IIP), Consumer Price Index (CPI), Foreign-exchange reserves (also called forex reserves or FX reserves), International Crude Price (CP) on selected stock market, namely Indian Stock Market (S&P BSE SENSEX (BSE 30) index, S&P CNX Nifty index (NIFTY 50), London Stock Exchange (Financial Times Stock Exchange 100 Index (FTSE 100) and New York Stock Exchange Dow Jones Industrial Average (Dow 30). The data sets of all variables have been considered from April, 2001 to March, 2018 on a monthly basis. All the required information for the study has been retrieved from the International Financial Statistics (IMF Data Base).

Descriptive statistics (to know the subject knowledge of the variables considered in the whole research work), Augmented Dickey Fuller Test (ADF), to check the stationary of data, Ordinary least square (to test the relationship between the selected financial economic variables and the stock price index), Johansen Co – integration test (to check the long run relationship between selected variables), Granger Causality test (to examine the relation between individual explanatory variables and selected indexes, either unidirectional, bidirectional or no relation have been employed to examine the objectives of the study. The study reveals long run relationship among the variables and the results of Granger Causality test reveals unidirectional, bilateral relation (Feedback) and exogeneity (Independence) among the variables.

FUTURE RESEARCH POTENTIAL

In the present research work, an attempt has been made by the researcher to apply various econometric techniques for analyzing impact of financial (economic) variables on stock market. But, there are some areas of research which could not take up in the study. It would be worthwhile for the future researches to investigate these areas as listed below:

There is a scope for further research by extended the study period.

• Data collected for the present study is completely secondary in nature. Researcher could not incorporate the views and opinions of the stock market practitioners, investors, dealers etc. So, there is a scope for further research by collecting views on the sphere of impact of financial (economic) variables on stock market of these parties.

• The study is focused only on long term variables. So there is a wide scope of further research by considering the long term as well as short term.

• Additional researches can be done using some other linear or non-linear mathematical modeling techniques, namely, Hidden Markov Models, Wavelet Neural Networks etc.

• Presently researches about only developing and developed country. So, there is a wide scope of further research for grouped countries as well.

REFERENCES

1. Mehrara, M. (n.d.). The Relationship between Stock Market and Macroeconomic Variables: a Case Study for Iran. Iranian Economic Review, Vol.10. No.17, Fall 2006, 138-148.
2. Anayochukwu,O.B.TheImpact of Stock Market Returns on Foreign Portfolio Investment in Nigeria.Journal of Business and Management(IOSRJBM),2(4),10-19
3. Asai, M.and Shiba,T.(1995)'The Japanese stock market and the macro economy: an empirical investigation', Financial Engineering and the Japanese market, Vol. 2 pp259-267.
4. Ahuja, H. L. (n.d.). Macroeconomics: theory and policy (17th Rev. ed.). New Delhi, India: S. Chand and Company Ltd.

5. Mishra, C. (n.d.). mpact of Macro Economic Variables on the Stock Price Index: An Empirical Study on Indian Stock Market after Post Liberalization period. LAP LAMBERT Academic Publishing.
6. Amadi,S.N.,Onyema,J.I.,&Odubo,T.D.(2002).Macroeconomic Variables and Stock Prices.A Multivariate Analysis. Africa Journal of Development Studies, 2(1), 159-164.
7. Dwivedi, D. N. (2007). Macroeconomics Theory and Policy. Tata McGraw-Hill Publishimg Company Limited.
8. OLOWE, R. A. (n.d.). The relationship between stock prices and macroeconomic factors in the Nigerian Stock Market. African review of money finance and banking – 2007.
9. Abugri, B. A. (2008). Empirical Relationship between Macroeconomic Volatility and Stock Return: Evidence from Latin American Markets, International Review of Financial Analysis, 17: 396-410.
10. Ahmed,S.(2008).Aggregate Economic Variables and Stock Market in India,International Research Journal of FinanceandEconomics,14:14-64.
11. Aisyah, A.R., Noor,Z.M.S.,& Fauziah,H.T.(2009). Macroeconomic determinants of Malaysian stock market. African Journal of Business Management,3(3), 095-106.
12. Alam, M.M.,& Uddin,M.G.S.(2009).Relationship between interest rate and stock price: empirical evidence from developed and developing countries. International journal of business and management,4(3), P43.
13. Adjasi,C.K.(2009).Macroeconomic uncertainty and conditional stock-price volatility in frontier African markets: Evidence from Ghana. Journal of Risk Finance,the10(4),333-349.
14. Antonios A.(2010)'Stock market and economic growth: an empirical analysis for Germany', Business and Economics Journal, Vol. 2010: BEJ-1.
15. Ali,I.,Rehman,K.U.,Yilmaz,A.K.,Khan,M.A.,&Afzal,H.(2010).Causal relationship between macro-economic indicators and stock exchange prices in Pakistan. African Journal of BusinessManagement,4(3), 312-319.
16. Asaolu,T.O.,& Ogunmuyiwa,M.S.(2011).An Econometric Analysis of the Impact of Macroeconomic Variables on Stock Market Movement in Nigeria.Asian Journal of BusinessManagement,3(1).
17. Adaramola, A.O.(2011).The Impact of Macroeconomic Indicators on Stock Prices in Nigeria. DevelopingCountryStudies,1(2),1-14
18. Aduda,J.,Masila,J.M.,&Onsongo,E.N.(2012).The Determinants of Stock Market Development: The Case for the Nairobi Stock Exchange. International Journal of Humanities and SocialScience,2(9),2221-0989.
19. Asma,A.R.,Naseem,M.A.,Sultana,N.(2013)Impact of Macroeconomic Variables on Stock Market Index (ACase of Pakistan) www.elixirpublishers.com International journal. Fin. Mgmt. 57(2013) 14104
20. Alam,N.(2013).Macroeconomic Variables ,Firm Characteristics and Stock Returns during Good and Bad Times: Evidence from SEA .Asian Journal of Finance&Accounting,5(2), 159-182.
21. Abdullah,A.M.,Saiti,B.,&Masih,A.M.M.(2014).Causality between Stock Market Index and Macroeconomic Variables: A Case Study for Malaysia. Munich Personal RePEc Archive Paper No.56987.Onlineathttp://mpra.ub.uni-muenchen.de/56987/
22. Al-Majali,A.A.,&Al-Assaf,G.I.(2014).Long-run and short-run relationship between stock market index and main macroeconomic variables performance in Jordan. EuropeanScientificJournal,10 (10).
23. Banik, N. (2015). The Indian Economy A Macroeconomic Perspective. SAGE Publication India Pvt Ltd.
24. Banik, N. (2015). The Indian Economy A Macroeconomic Perspective. SAGE Publication India Pvt Ltd