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The Impact of Macro-economic variables on Share Prices: Evidence from Indian Economy

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Abstract

This paper attempts to examine the impact of domestic macro-economic fundamentals on the stock market in the short-run and the long-run period taking major macro-economic variables.

It covers the monthly data for the period 2009 to 2018. The research methodology tools include Augmented Dickey-Fuller (ADF) test as well as Phillips-Perrson (PP) test for testing of stationarity, use of Granger Causality test for finding interdependency between variables in the short-run and Cointegration test in order to find the cointegration among major macro-economic variables in the short run. The results find that there is no short-run causality found between the share market indices and other macroeconomic variables in either direction except one way granger causality between BSE to Exports. The result of Johansen Cointegration test shows the existence of significant long-run association of Indian share markets with macro economic variables.

Keywords: Augmented Dickey-Fuller (ADF), Phillips-Perrson (PP), Granger Causality test. Cointegration and Impulse Response Function

Introduction

Share Market has been traditionally viewed as 'predictor' of the economy. It was strongly believed that a well functioning securities market is conducive to sustained economic growth[1]. Share Market an important constituent of financial market which helps in channelizes savings to investment. Savers and investors are not constrained by their individual abilities but by the economy's ability to invest and save respectively, which enhances saving and investment in the economy and hence promote economic growth.

[1] *www.sebi.gov.in/chairmanspeech/chsp4.pdf*

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However, share market is very volatile and thus sensitive to changes in political environment, economic and international economic environment. Moreover performance of share market is very much sensitive to changes in macroeconomic indicators. **Ibrahim (1999)** found that macroeconomic forces have systematic influences on share prices by influencing their expected cash flows. Similarly, **Chakravarty (2005)** also examined that share exchange prices are highly sensitive to fundamental macroeconomic indicators. Thus, there is significant relationship existed between share price and macroeconomic variables which are highly important and has attracted concern of economists, policy makers and the investment community for a long time **(Kutty, 2010).**

Studies on the relationship between share market return and macroeconomic variables has been a widely debated issue amongst the various stakeholders, researchers and academicians under different times. **Ting, Feng et al (2012)** conducted such study in context of Malyasia and found short run & long run linkages between share market and macroeconomic indicator. Similarly, **Ayodeji (2007)** & **Famma and Gibbons (1982)** founded the long run dynamic relationship between share market and macroeconomic variables for their economies Nigeria and U.S. respectively.

In a similar vein, **Muradoglu, Taskin, and Blgan (2000)** studied the relationship between share prices and macroeconomic variables of the nineteen emerging markets, covering the twenty-year period from 1976 through 1997. For each country, monthly data of share returns, exchange rates, interest rates, inflation and industrial production had been taken. Granger Causality test had been applied. It was found that out of nineteen emerging markets, only twelve markets have found casual relationship between share prices and macroeconomic variables. Similarly, **Ali et al (2010)** found long run relationship existed between share exchange prices in Pakistan and macroeconomic indicators but no casual relationship found between these two.

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In the India Context, **Naik and Padhi (2012)** investigated the relationship between the Indian share market index (BSE Sensex) and five macroeconomic variables, namely, industrial production index, wholesale price index, money supply, treasury bills rates and exchange rates over the period April 1994 to June 2011. Johansen's co-integration and vector error correction model had been applied to explore the long-run equilibrium relationship between share market index and macroeconomic variables. The analysis found that macroeconomic variables and the share market index were co-integrated and, hence, a long-run equilibrium relationship existed between them. Another study conducted by **Ahmed (2008)** investigated the nature of the causal relationships between share prices and the key macro economic variables representing real and financial sector of the Indian economy for the period March, 1995 to March, 2007 using quarterly data. These variables were the index of industrial production, exports, foreign direct investment, money supply, exchange rate, interest rate, NSE Nifty and BSE Sensex in India. Johansen`s approach of cointegration and Toda and Yamamoto Granger causality test have been applied to explore the long-run relationships while BVAR modeling for variance decomposition and impulse response functions has been applied to examine short run relationships. The results of the study reveal differential causal links between aggregate macro economic variables and share indices in the long run. However, the revealed causal pattern is similar in both markets in the short run. Similarly, **Aggrawalla (2006)** found that there was a long run equilibrium relationship between the share price index and the select macroeconomic variables. There was also evidence of causality from economic growth to share price index. However, **Mishra (2004**) examined the relationship between share market and foreign exchange markets using Granger causality test and Vector Auto Regression technique .They used monthly data for share return exchange rate, interest rate and demand for money for the period 1992 to 2002. The study suggested that there is no Granger causality between the exchange rate return and share return. In the same way, **Bhattacharya and Mukherjee (2003)** and **Chakravarty (2005)**

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suggested that there was no causal linkage between share price and the three variables. Thus BSE sensitive index neither leads these three variables nor they lead the BSE sensitive index. But, **Prantik and Vina** found that certain variables like the interest rate, output, money supply, inflation rate and the exchange rate has considerable influence in the share market movement in the considered period, while the other variables have very negligible impact on the share market. Thus, mixed results have been found by different academicians regarding relationship between share market and macroeconomic indicators for different economies.

The significant amount of studies had examined the relationship between share market prices and a range of macroeconomic and financial variables over different countries and time period. But mixed results have been found by different academicians regarding relationship between share market and macroeconomic indicators for different economies. But very few studies had been conducted in India to examine such relationship and thus the conclusion might be inadequate. The relationship of some macro factors could vary from market to market; may change in different sample periods and also in different frequency of the data. Thus, there is need of more in-depth studies to understand the macroeconomic variables that might influence the Indian share market. Moreover, the country like India is particular importance to study such relationship since it is one of the fastest emerging economies of the World.

Hence it becomes imperative to review a study to examine both the short run casual relationship and long term relationship between share market return and macro economic variables. Therefore, the present study attempt to investigate the short run casual relationship and long term relationship between share market return and macro economic variables during 1 April 2009 to 31 March 2018 with special reference to India.

The Data and Variables

This paper studies the impact of domestic macroeconomic fundamentals on the share market in India using monthly data from April 2009 to March 2018. The data are from RBI monthly

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bulletins. The study examines relationships between share market return in India (BSE and NSE) and seven macro-economic variables. These are Foreign direct investment (FDI), Money supply (M3), Exchange rate (EXC), Index of Industrial Production (IIP), Wholesale Price Index (WPI), Exports and Imports. While a number of macroeconomic variables may affect share prices directly or indirectly, in this paper only the most proximate macroeconomic determinants are chosen. In the empirical analysis, the variables are used in their logarithm

Objectives of the Study

The study focuses on the following objectives:

- To know the short-run interdependency of Indian share markets with the macro economic variables considered in the sample.
- To investigate the long term relationship between share market return and macro economic variables with special reference to India.

Methodology

In the current study, the following research tools have been applied to reach at the results:

- **Descriptive statistics** is used to find out the normal distribution of returns of markets. If the distribution is not normal, the stationary aspect of the series is tested. A time series is said to be stationary when its descriptive statistical results are invariant over time. The test had been used by Naik and Padhi (2012), Ayodeji (2007) and Aggrawalla (2006) in their studies.
- **Pearson correlation** is used to find correlation between the share market returns and macro economic variables. It is intended to test for the preliminary investigation of any association in order to set the stage for testing of short-run as well as long-run interdependency. Aggrawalla (2006) had used Corelation matrix in his study.
- **Testing for stationarity**: To avoid the possibility of getting spurious results, the stationary property of all the variables have been tested with both Dickey-Fuller and

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Phillips-Perron tests. As the Granger Causality test and cointegration test are applicable only on stationary series, there is a need to test the stationary property of the series. The test had been supported by studies conducted by Patel (2012), Naik and Padhi (2012), Muradoglu, Taskin & Bigan (2002), Ayodeji (2007) and Aggrawalla (2006)

- **Cointegration test** is used for describing the long run relationships among the share market return and macro economic variables. Patel (2012), Naik and Padhi (2012), Bhattacharya & Mukherjee (2003), Ayodeji (2007) and Aggrawalla (2006) had applied the same test for finding relationships among the share market return and macro economic variables among various countries.
- **Granger Causality test** is used for finding the short run casual relationship among the share market return and macro economic variables. The same test had been used by Naik and Padhi (2012), Aggrawalla (2006), Muradoglu, Taskin & Bigan (2002), Bhattacharya & Mukherjee (2003), Mishra (2004) and Chakravarty (2005) in their studies.

Empirical Results

Table 1 shows the descriptive statistics of the variables under study. The following observations have been made:

- Highest mean generation variable is money supply, followed by BSE Sensex and CNX Nifty.
- FDI has been highest volatile variable followed by Imports and Exports as FDI has the highest standard deviation.
- The values of the skewness and kurtosis shown in Table 2 suggest that the frequency distributions of underlying variables are not normally distributed. The observed distribution is said to be normally distributed if the value of skewness and kurtosis

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are 0 and 3 respectively. The significant values provided by Jarque-Bera statistics also verified that the frequency distributions of underlying variables are not normal.

Table 1: Descriptive Statistics of the variables under study

	LBSE	LEXC	LEXPORTS	LFDI	LIIP	LIMPORTS	LM3	LNIFTY	LWPI
Mean	9.614461	3.864988	6.668705	7.350652	4.998366	7.097595	10.80661	8.408173	4.905152
Median	9.729195	3.837353	6.620861	7.482106	5.030609	7.130468	10.84965	8.519424	4.872518
Maximum	10.01620	4.198317	7.523605	8.728588	5.268889	7.831831	11.46135	8.810489	5.201256
Minimum	8.724929	3.671733	5.787480	4.844187	4.595966	6.206294	10.05618	7.550924	4.629863
Std. Dev.	0.297346	0.122514	0.482447	0.723191	0.165723	0.494709	0.427137	0.294544	0.177226
Skewness	-1.088270	0.737617	-0.002513	-0.855834	-0.744836	-0.156880	-0.216281	-1.005332	0.138807
Kurtosis	3.288540	2.949557	1.804672	3.948491	2.716324	1.751548	1.796285	3.057918	1.714122
Jarque-Bera	21.69263	9.804868	6.429752	17.23249	10.34817	7.456855	7.362173	18.20755	7.787482
Probability	0.000019	0.007428	0.040160	0.000181	0.005661	0.024031	0.025196	0.000111	0.020369
Sum	1038.362	417.4187	720.2201	793.8704	539.8235	766.5403	1167.114	908.0827	529.7564
Sum Sq. Dev.	9.460398	1.606047	24.90480	55.96153	2.938666	26.18681	19.52172	9.282907	3.360764
Observations	108	108	108	108	108	108	108	108	108

Source: Author Own work

Correlation

Table 2 presents the correlation among all underlying variables. It shows that:

- Correlation among the sample variables are high ranging from 0.32 to 0.99. To check interdependency among them, further use of Granger Causality test has been made.
- Money supply is highly correlated with WPI (a measure of inflation), Index of Industrial Production, Imports and Exports. It is so because money supply provides important information about the near-term course for the economy and determines the level of prices and inflation in the long run. Central banks have at times used measures of the money supply as an important guide in the conduct of monetary policy.

The high correlation issue, as discussed above, requires to be further investigated with an aim to find out whether this phenomenon has a short-run implications or long-run aspects. Such decision will help the economists or decision makers to make out various economic policies. Thus, to derive robust and meaningful results there is a need to test the time series properties of the macroeconomic series, as described in the methodology

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Table 2: Correlation among the sample variables

	LBSE	LEXC	LEXPORTS	LFDI	LIIP	LIMPORTS	LM3	LNIFTY	LWPI
LBSE	1.000000								
LEXC	0.325141	1.000000							
LEXPORTS	0.778136	0.726577	1.000000						
LFDI	0.643913	0.265687	0.593732	1.000000					
LIIP	0.840200	0.508491	0.913904	0.668903	1.000000				
LIMPORTS	0.772079	0.692339	0.974749	0.621040	0.900456	1.000000			
LM3	0.782435	0.735417	0.971267	0.616041	0.923288	0.966330	1.000000		
LNIFTY	0.998493	0.339290	0.796081	0.649387	0.856536	0.790571	0.802528	1.000000	
LWPI	0.755148	0.781223	0.982112	0.564681	0.880144	0.974961	0.985251	0.774020	1.000000

Source: Author Own work

Testing of Stationarity

In order to analyse and forecast time series data, it is assumed that underlying time series data is stationary. A stationary return time series will have mean and variance constant over time and the value of the covariance between the two time periods depends only on the distance or gap or lag between the two time periods and not the actual time at which the covariance is computed. Therefore, we can have a reliable prediction about its future behaviour. A stationary time series helps in eliminating the chances of spurious regression effect.

In the present paper, a unit root test has been applied for the identification of stationarity in the sample data. We follow the standard procedure of unit root testing by employing the Augmented Dickey Fuller (ADF) and test and Phillip Perrson (PP) test. Given are the results based on Augmented Dickey-Fuller (ADF) test in Table 3 and Phillip Perrson (PP) test in Table 4:

Table 3 indicates that most of the return time series are found to be non-stationary at the level, hence, needs to be integrated of order d, I (d) process. It has been transformed into a stationary series by first order differencing. The lag length selection criterion is based on Schwarz information criterion. The p values at the level indicated that the null hypothesis of unit root has been rejected at the level but accepted at the first order differencing in all the variables taken under study.

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Table 4 explains about the Phillip Perrson test of stationarity. Table 4 presents the summary of unit root existence in the sample series by PP test statistics. It is found from Table 4 that like the ADF test, all the variables are non-stationary at the level but have got transformed into stationary at first order differencing. The feature of nonstationarity among variables has been tested in their studies by Patel (2012), Naik and Padhi (2012), Muradoglu, Taskin & Bigan (2002), Ayodeji (2007) and Aggrawalla (2006).

Table 3: Unit Root Test of Stationarity by ADF Test Statistics

	At zero-level			At First Order		
Indicators	lag length	ADF statistics	P-value	lag length	ADF statistics	P-value
BSE	0	-2.778997	0.0647	0	-.9.288266	0.0000
Exchange Rate	0	-0.509207	0.8841	0	-8.870917	0.0000
Exports	5	-0.584850	0.8682	4	-5.937696	0.0001
FDI	0	-5.020329	0.0001	2	-9.569161	0.0000
IIP	12	-2.745134	0.0703	11	-8.647535	0.0000
Imports	1	-0.926826	0.7762	0	-13.63155	0.0000
M3	12	-2.731938	0.0724	10	-10.71035	0.0000
Nifty	0	-2.667017	0.0832	0	-9.711812	0.0000
WPI	1	-0.208090	0.9329	0	-7.173791	0.0000

Source: Author Own work

Table 4: Unit Root Test of Stationarity by PP Test Statistics

	At zero-level			At First Order		
Indicators	lag length	ADF statistics	P-value	lag length	ADF statistics	P-value
BSE	5	-2.766811	.0665	5	-9.354787	0.0000
Exchange Rate	5	-0.617348	0.8612	10	-8.829307	0.0000
Exports	17	-0.619010	0.8608	10	-21.44921	0.0000
FDI	5	-4.936754	0.0001	32	-33.10262	0.0001
IIP	12	-2.035137	0.2716	9	-24.97130	0.0000
Imports	4	-1.149745	0.6939	4	-13.46224	0.0000
M3	24	-2.418778	0.1390	11	-10.98460	0.0000
Nifty	5	-2.669583	0.0827	5	-9.741494	0.0000
WPI	4	-0.015799	0.9544	2	-7.160131	0.0000

Source: Author Own work

Test of Cointegration

If two or more variables are integrated of the same order d where d > 0, and there exists a stationary linear combinations of these variables, the variables are said to be cointegrated. The results of unit root tests in Table 3 and Table 4 shows that all variables are individually integrated of the order I(1). Thus a test of cointegration would help in finding the

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existence of any stationary linear combinations of these variables. The test assumes a null hypothesis that there exist no cointegrating equations among sample series.

The Trace test and maximum eigen value test has been applied to test the long-run association among the share markets under study. Tables 5 explains the co-integration test results by using trace test and maximum eigen value test which reveals that there exist eight cointegrating equations at the 0.05 level of significance. It reflects long run interaction of the underlying variables and rejects the null hypothesis of having no co-integration equation among sample variables. The same relationship had been found by Patel (2012), Naik and Padhi (2012), Bhattacharya & Mukherjee (2003), Ayodeji (2007) and Aggrawalla (2006)

Table 5: Results of cointegration test using Trace test and maximum eigen value test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.555550	351.5972	197.3709	0.0000
At most 1 *	0.446899	268.8836	159.5297	0.0000
At most 2 *	0.371169	208.4777	125.6154	0.0000
At most 3 *	0.355264	161.1607	95.75366	0.0000
At most 4 *	0.313062	116.3914	69.81889	0.0000
At most 5 *	0.247035	78.08927	47.85613	0.0000
At most 6 *	0.197690	49.14811	29.79707	0.0001
At most 7 *	0.135679	26.68152	15.49471	0.0007
At most 8 *	0.109322	11.80879	3.841466	0.0006

Trace test indicates 9 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.555550	82.71356	58.43354	0.0000
At most 1 *	0.446899	60.40596	52.36261	0.0062
At most 2 *	0.371169	47.31702	46.23142	0.0381
At most 3 *	0.355264	44.76926	40.07757	0.0138
At most 4 *	0.313062	38.30214	33.87687	0.0139
At most 5 *	0.247035	28.94116	27.58434	0.0333
At most 6 *	0.197690	22.46659	21.13162	0.0323
At most 7 *	0.135679	14.87273	14.26460	0.0400
At most 8 *	0.109322	11.80879	3.841466	0.0006

Max-eigenvalue test indicates 9 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author Own work

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Vector Error Correction Model

It is, therefore, evident from the results that there exists long term association among the variable under study. Assuming one co-integrating vector, the short run and long run interaction of the underlying variables the VECM has been estimated based on the Johansen cointegration methodology. The results confirmed that a long-run equilibrium relationship exists between the share market indices and the macroeconomic variables.

The co-integration relationship between BSE Index and macroeconomic indicators are as follows:

BSE=0.35 +12.18 EXC +4.85 IIP +4.38 FDI +4.38 WPI -37.42M3 +7.95 IMPORTS -10.31 EXPORTS

(1.82) (0.66) (9.33) (0.12) (-1.89) (2.30) (-2.34)

Taking Nifty as Dependent Variables, relationship between Nifty Index and macroeconomic indicators are as follows:

NSE=0.10 +5.66 EXC +1.09 IIP +1.49FDI –3.53 WPI –11.49 M3 +3.47 IMPORTS – 3.35EXPORTS

(2.49) (0.43) (9.17) (-0.30) (-1.66) (2.90) (-2.20)

The significant cointegration equations found in Table 5 are further investigated by Vector Error Correction Model in Table 6. It is observed that all variables have significant effect on both BSE and NIFTY. Share market has positive relationship with Foreign Direct Investment, Wholesale Price Index, Money supply and imports where as other variables, namely Index of Industrial Production, Exchange rate and exports has negative impact on share market. But all relationship is statistically significant as shown by t-values.

The co-integration result reveals that exchange rate is positively related to share market prices (both BSE and Nifty). Exchange rate volatility has negative implication on the share market. Hence for development of the share market there is need to stabilize the exchange rate movement. This is in line with Adjasi and Biekpe (2005) who found that exchange

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rate appreciation increases share market return. Bhattacharya and Mukherjee (2003) and Mishra (2004) also find the similar results.

The results of co-integration shows that share market prices are positive related to Index of industrial production, a measure of short term economic development. The positive relationship indicates that increase in industrial production enhances the earning of corporate which increases the present value of the firm and hence the share prices increase. The positive relationship between BSE Sensex and IIP is consistent with Naik and Padhi (2012) and Aggrawalla (2006). Similarly, positive relationship is found between share prices and FDI. Because more investment increases the production in the economy and hence corporate earnings rises which enhances the share market prices.

Nifty is found to have negative relationship with WPI, a measure of inflation. The intriguing fact is that higher inflation raises the production costs which have negative effect on profitability. This leads to decrease in the corporate earnings and thus an increase in inflation reduces the share price. Pal and Mittal (2011) and Aggrawalla (2006) also found a negative relationship for India. However, contrary to this, BSE is positively related to inflation and this finding is similar to the findings of Naik and Padhi (2012), Maysami et al. (2004) and Ratanapakorn and Sharma, (2007) who also finds a positive relationship between inflation and share price suggesting that equities serve as a hedge against inflation.

Money supply is found to be negative which indicates that increase in money supply raises the inflation in an economy; since inflation is negatively associated with share market prices and thus increase in money supply leads to fall in share market prices. The negative relationship between money supply and the share market price has been supported by Aggrawalla (2006).

Since exchange rate has positive relationship with share market prices and thus when exchange rate rises or currency appreciates then imports get cheaper. Thus more imports will take place and hence imports are positively associated with share market prices. On the

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contrary, appreciate in the value of exchange rate leads to decrease in exports and hence exports have negative relationship with share market. This findings is consistent with the conclusions of Mao and Ka(1990), who found that an appreciation in the currency of export-dominant economies tends to negatively influence the domestic share markets of those economies.

Table 6: Results of Vector Error Correction Model

Error Correction:	D(BSE)	D(EXC)	D(IIP)	D(FDI)	D(WPI)	D(M3)	D(IMPORTS)	D(EXPORTS)
CointEq1	-0.016132	0.003246	0.001097	-0.451056	-0.001131	-0.000423	-0.018646	0.000672
	(0.00840)	(0.00319)	(0.00501)	(0.05283)	(0.00059)	(0.00121)	(0.00908)	(0.00995)
	[-1.92118]	[1.01619]	[0.21897]	[-8.53823]	[-1.92930]	[-0.34832]	[-2.05465]	[0.06755]
Error Correction:	D(NIFTY)	D(EXC)	D(IIP)	D(FDI)	D(WPI)	D(M3)	D(IMPORTS)	D(EXPORTS)
CointEq1	-0.058689	0.008650	0.004841	-1.263379	-0.002809	-0.002116	-0.063324	-0.001754
	(0.02490)	(0.00915)	(0.01438)	(0.15546)	(0.00169)	(0.00347)	(0.02568)	(0.02868)
	[-2.35718]	[0.94515]	[0.33678]	[-8.12677]	[-1.65887]	[-0.60908]	[-2.46557]	[-0.06115]

Note: Standard errors in ( ) and t-statistics in [ ]

Source: Author Own work

Test of Granger Causality

After applying cointegration test, there is a need to find the degree and direction of correlation in short run among share return indices under study, thus, the Granger Causality test is conducted.

The test of Granger Causality is intended to examine whether the underlying macro economic variables have any impact on share market in short run. It assumes null hypothesis of no Granger Causality. Table 7 presents the results of Granger Causality Test. Only one way causality is found between BSE and Imports which shows that BSE have effect on Imports. Except this, there is no short-run causality found between the share market indices and other macroeconomic variables in either direction. The same results of no casuality have been supported by Naik and Padhi (2012).

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Table 7: Results of Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
EXC does not Granger Cause BSE	105	0.41206	0.6634
BSE does not Granger Cause EXC		0.28351	0.7537
EXPORTS does not Granger Cause BSE	105	1.22337	0.2986
BSE does not Granger Cause EXPORTS		0.09024	0.9138
FDI does not Granger Cause BSE	105	0.09887	0.9060
BSE does not Granger Cause FDI		1.17729	0.3123
IIP does not Granger Cause BSE	105	0.02293	0.9773
BSE does not Granger Cause IIP		0.43397	0.6491
IMPORTS does not Granger Cause BSE	105	1.44553	0.2405
BSE does not Granger Cause IMPORTS		3.09107	0.0498*
M3 does not Granger Cause BSE	105	0.00349	0.9965
BSE does not Granger Cause M3		0.24374	0.7842
WPI does not Granger Cause BSE	105	0.22316	0.8004
BSE does not Granger Cause WPI		0.95381	0.3887
NIFTY does not Granger Cause EXC	105	0.50218	0.6067
EXC does not Granger Cause NIFTY		0.67370	0.5121
NIFTY does not Granger Cause EXPORTS	105	0.10930	0.8966
EXPORTS does not Granger Cause NIFTY		0.68435	0.5068
NIFTY does not Granger Cause FDI	105	0.91373	0.4043
FDI does not Granger Cause NIFTY		0.04756	0.9536
NIFTY does not Granger Cause IIP	105	0.42089	0.6576
IIP does not Granger Cause NIFTY		0.09163	0.9125
NIFTY does not Granger Cause IMPORTS	105	2.77643	0.0671
IMPORTS does not Granger Cause NIFTY		1.15309	0.3198
NIFTY does not Granger Cause M3	105	0.20982	0.8111
M3 does not Granger Cause NIFTY		0.00086	0.9991
WPI does not Granger Cause NIFTY	105	0.15318	0.8582
NIFTY does not Granger Cause WPI		0.91333	0.4045

Source: Author Own work

Conclusion

The present study examined the short run and long run relationship between the Indian share market index and seven macroeconomic variables, namely, the industrial production index, the wholesale price index to represent inflation, broad money supply, foreign direct investment, exports, imports and the real effective exchange rate using

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Johansen's co-integration and Granger Causality. The analysis used the monthly data for the period of April 2009 to March 2018 which are obtained from official website of Bombay Share exchange and National Share Exchange and the Hand Book of Statistics on Indian Economy provided by RBI.

The Johansen's co-integration test suggests that the share market index has co-integrated with the macroeconomic variables which are further investigated through VECM. The results of Granger Casuality found that there is no short-run causality found between the share market indices and other macroeconomic variables in either direction. Ali et al (2010) also find the similar results of long run cointegration between share exchange prices and macroeconomic variables and however no causal relationship was found between macro-economic indicators and stock exchange prices in Pakistan.

The present study confirmed that macroeconomic factors continue to affect the Indian share market. However, the one of the main limitation of the study is that study is limited to only seven selected macroeconomic variables. Inclusion of more variables with a longer time period may improve the results.

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