Share Prices and Macroeconomic Variables in India:

An Approach to Investigate the Relationship

Between Stock Markets and Economic Growth

By

Raman K. Agrawalla

Business Systems and Cybernetics Centre
Tata Consultancy Services Limited
6th Floor, Khan Lateef Khan Estate, Fateh Maidan Road
Hyderabad – 500 001

Phone: 040 – 5567 1037
Mobile: 91- 9849591947
E-mail:raman_a@rediffmail.com
raman.a@tcs.com

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Abstract

Of late increasing attention is being paid to the relationship between share prices and the macroeconomic variables both by economists and finance specialists. It is in fact hard to imagine an economy without stock markets now. In the contemporary scenario, which can be described by increasing integration of the financial markets and implementation of various stock market reform measures in India, the activities in the stock markets and their relationships with the macro economy have assumed significant importance. The present paper is an attempt to examine for India the causal relationships between the share price index and industrial production in a multivariate vector error correction model which involved certain other crucial macroeconomic variables namely money supply, credit to the private sector, exchange rate, wholesale price index, and money market rate for the reason of right and robust model specification. The purpose is to make a finer point with respect to the relationship between economic growth and stock market especially in terms of stock prices. The present study thus proceeds with a single point investigative agenda- what is the relationship between the health of the real economy and the health of the stock market? Does a rally in share prices reflect better health of the economy or is it the pink economic health that causes share prices to rise? The present study reports causality running from economic growth proxied by industrial production to share price index and not the other way round. It may therefore be stated that the state of the economy has a bearing on the share prices but the health of the stock market in the sense of a rising share price index is not reflective of an improvement in the health of the economy. This finding has lot of implications for the kind of rally we witness in the Indian stock market in the recent years and the Sensex crossing 10000 marks provides a lot of food for thought and research, both theoretical and empirical, in the future.

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1. Introduction

Of late increasing attention is being paid to the relationship between the stock market and the real economy both by economists and finance specialists. We see headlines almost daily on the wild gyrations of the Sensex, S&P CNX Nifty, NASDAQ, the Dow Jones Industrial Average and the like. It is in fact hard to imagine a world without stock markets now. In the contemporary scenario, which can be described by increasing integration of the financial markets and implementation of various stock market reform measures in India, the activities in the stock markets and their relationships with the macro economy have assumed significant importance. The present paper is an attempt to examine the interaction between stock prices and a few important macroeconomic variables for India using cointegration analysis. The purpose is to make a finer point with respect to the relationship between economic growth and stock market especially in terms of stock prices[1]. The present paper is arranged as follows: In section 2 we introduce the topic and describes the theoretical framework. In section 3 we present a brief review of literature and describe the data sources and the methodology used in the present study. Section 4 discusses the econometric results and Section 5 concludes.

2. Theoretical framework

The stock market is a market where the shares in publicly owned companies (the titles to business firms) are bought and sold. The stock market, like many other financial intermediaries, helps transfer funds from surplus spenders (economic agents with excess current income over spending) to deficit spending units (economic agents with current income falling short of spending) and perhaps with higher efficiency. The stock market helps such transmutation of funds to take place through a range of complex financial products called 'securities'. In fact, the stock market (i.e. the secondary market) deals in outstanding or existing securities, the securities

that have already been issued to surplus spenders by the deficit spending real or financial sector units in the primary or new issues market. Thus, the stock market mobilizes and channels idle resources in the economy to most productive use leading to efficient allocation of savings. According to Galbraith (1955), the stock market is but a mirror, which provides an image of the underlying or fundamental economic situation.

It is said that the stock market is a critical cog in the wheel that smoothens the transfer of funds for economic growth. Broadly speaking, stock exchanges are expected to accelerate economic growth by increasing liquidity of financial assets, making global risk diversification easier for investors, promoting wiser investment decisions by surplus spending units based on available information, forcing corporate managers to work harder for shareholders interests, and channeling more savings to corporations, usually to the more efficient ones. In principle, a well functioning stock market may help the economic growth and development process in an economy through the following means:

- Growth of savings

- Efficient allocation of investment resources

- Alluring foreign portfolio investment.

The stock market encourages savings by providing households having investable funds an additional financial instrument, which meets their risk preferences and liquidity needs better. It in fact provides individuals with relatively liquid means for risk sharing in investment projects. For instance, firms need long-term capital and investors usually hesitate to relinquish control over their money for a longer period. And the stock market brings a compromise between the liquidity needs of both the players providing the facility for trading of stocks.

It is argued that FII investment though has no real contribution in terms of resource mobilisation, yet it could have a crowding in effect on domestic savings and investment mobilisation. This is based on the presumption that foreign investment inflows raises the share prices up and reduces the cost of capital to the corporations of the host country via lowering the price earning ratio.

The pricing of shares in the market is critical to how well the stock market performs its allocative role. In fundamental valuation sense, an efficient pricing process rewards well-managed and profitable firms by highly valuing their shares. It lowers the cost of capital for such firms. It leads to greater and better allocation of resources in the economy through channelisation of funds to well-managed and profitable firms in comparison to unprofitable and unsuccessful firms. For this

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[1] See Agrawalla. 2005 for an econometric investigation of the relationship between stock market developments in India and its economic growth in the tradition of Levine and other scholars who published their research in the special

efficient capital allocation to materialise the market forces must be allowed to work without official interference and market players must be guaranteed all the information they need, without distortion, to take rational market decisions. Relative share prices of firms in an efficient pricing system should reflect their relative expected profitability. That is, relative share prices of companies always reflect their true long-term expected earnings, in the fundamental valuation of sense. According to the efficient pricing process in information arbitrage sense all new information is immediately reflected in share prices.

In a perfect market environment (i.e. in a symmetric information environment with zero transaction costs, perfect competition and no problems of contract enforcement) the price of an asset will reflect its so-called fundamental value and will change only when fundamental economic data change. A stock market with asymmetric information, but where prices aggregate information fully, is said to be informationally efficient in the sense that prices of securities or financial claims reflect their fundamental value. Keynes (1936) and many of his followers, however argue that in stock markets prices do not aggregate or communicate information well. According to Keynes (1936) this is because speculative and strategic factors dominate the stock market and the following often-quoted statement illustrates his view:

> "Professional investment may be likened to those newspaper competitions in which the competitors have to pick out the six prettiest faces from a hundred photographs, the prize being awarded to the competitor whose choice most nearly corresponds to the average preferences of the competitors as a whole; so that each competitor has to pick, not those faces which he himself find the prettiest, but those which he thinks likeliest to catch the fancy of the other competitors, all of whom are looking at the problem from the same point of view. It is not a case of choosing those which, to the best of one's judgement, are really the prettiest, nor even those which average opinion genuinely thinks the prettiest. We have reached the third degree where we denote our intelligence to anticipating what average opinion expects the average opinion to be. And there are some, I believe, who practice the fourth, fifth and higher degrees" p.156 Keynes (1936).

Indeed, when expectations are widely divergent, strategic factors may have an important impact on trading, so that market prices of financial assets may provide biased measures of fundamental values (Aivazian, V A, 1998).

It can therefore be argued that efficient prices in the fundamental valuation sense are a necessary condition for stock markets to perform its developmental tasks. It is suggested in the literature that the sufficient condition requires an efficient takeover mechanism to exist as a market based disciplinary device. The issue therefore is how well the pricing mechanism works in

volume of the World Bank Economic Review, 1996, Levine and Zervos, 1996, 1998, Levine, 1997, Levine et al, 2000.

practice and how successfully the various stock market functions are performed in practice in the real world.

The stock market is thus in the focus of the economists and policy makers because of the perceived benefits it provides for the economy. The stock market provides the fulcrum for capital market activities and it is often cited as a barometer of business direction. An active stock market may be relied upon to measure changes in general economic activities using the stock price index.

3. Research Methodology and Sources of Data

The empirical analysis in the present study is based on multivariate Granger-Causality tests within an error correction framework[2]. The first step in the analysis is to subject the macroeconomic series to unit root tests or tests the series for stationarity. After testing the series for stationarity, the next step is the testing for cointegration. This helps check whether the series are co-integrated i.e. whether there is any long-run relationship among the variables chosen. The present study uses Johansen Cointegration Tests for the purpose. Finally the causality tests among the cointegrated variables are undertaken.

Causality tests in the present study are preceded by cointegration testing as it is now known that the existence of cointegration has implications for the way in which causality testing is carried out (Granger (1988); Sims et al. (1990); Toda and Phillips (1993)). The additional advantage of carrying out cointegration testing is that it provides evidence on the existence of a stable long-run equilibrium relationship between the macro economic variables and stock prices, which is interesting from a theoretical perspective. The present study employs a vector error correction model to avoid potential misspecification biases that might result from the use of a more conventional VAR modeling technique (see Naka, Mukherjee and Tufte, 2001).

Sources of Data

The present study uses relatively longer time series of monthly data for the period 1965:11 (November 1965) to 2000:10 (October 2000) for India on the following macroeconomic variables, namely, share price index, industrial production, money supply, credit to the private sector, exchange rate, wholesale price index, and money market rate. The data for the macroeconomic variables were extracted from the IFS database (International Financial Statistics (IFS) CDROM). In the empirical analysis, the variables are used in their logarithm. Since the study uses the monthly data, we deseasonalise all the data series by the X-11 method.

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[2] The detail exposition of the methodology is not presented here to save space.

4. Review of Literature

There are various ways in which the stock market and the macro economy have been related in the literature. One important approach in this regard has been from the asset-pricing perspective. In this approach, the framework used for the analysis was the Arbitrage Pricing Theory[3] (APT) to address the question of whether risk associated with particular macroeconomic variable is reflected in expected asset returns. According to Chen, Roll and Ross (1986) economic variables have a systematic effect on stock market returns. That is, economic forces affect the discount rates, the ability of firms to generate cash flows and future dividend payments. It is through this mechanism that macroeconomic variables become part of risk factors in equity markets. In fact, a greater part of research in this line has been mostly for developed countries[4].

More recently, empirical models without any specific theoretical structure have been applied in a more pragmatic fashion to the two-way relationship between share prices and macroeconomic variables (Groenewold, 2004). A particularly popular model in this area is the vector auto-regression (VAR) model. Lee (1992) is a pioneering application of the VAR model to the relationship between share prices and the macro economy. The more recent examples in this respect are found in Cheung and Ng (1998) and Gjerde and Saettem (1999).

Hondroyiannis and Papapetrou (2001) investigate whether movements in the indicators of economic activity affect the performance of the stock market for Greece. The study performs a VAR analysis to analyse the dynamic interactions among indicators of economic activity. It uses the monthly data for the period 1984:1 to 1999:9 for Greece. The following variables are taken as the indicator of economic activity, viz., industrial production as a measure of output, real oil prices (Consumer price index (CPI) for fuels deflated by CPI), interest rate, exchange rate, the performance of the foreign stock market (difference between the continuously compounded return on S & P 500 index and the USA inflation rate) and domestic real stock returns (difference between the continuously compounded return on the Athens general stock market index and Greek inflation rate).

The major finding of the study is that the domestic market economic activity affects the performance of domestic stock market. Impulse response analysis carried out in the study shows that all the macroeconomic variables are important in explaining stock price movements. Growth in industrial production responds negatively to a real stock return shock, implying that an increase in real stock returns does not necessarily lead to a higher level of industrial production. The

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[3] The APT essentially seeks to measure the risk premia attached to various risk factors and attempts to assess whether they are significant and if they are priced into stock market returns.

[4] For examples or references of such studies based on country like the USA, the UK, Singapore, Australia etc., see Groenewold (2004).

empirical results suggest that the Greek stock market returns do not rationally signal changes in the overall macroeconomic activity. Real stock returns respond negatively to interest rate shocks, while a depreciation of the currency leads to higher real stock market returns.

Habibullah et al (2000) determines the lead and lag relationships between Malaysian stock market and five key macroeconomic variables. It employs the methodology of Granger non-causality proposed by Toda and Yamamoto (1995) for the sample period 1981:1 to 1994:4 to test whether the Malaysia stock market can act as a barometer for the Malaysian economy. The study includes five macroeconomic variables namely broad divisia money supply aggregate, nominal income (Gross National Product), price level (Consumer Price Index), interest rate (3-month Treasury bill rate) and the exchange rate (Real Effective Exchange Rate). The study used Gandolfo's (1981) technique to interpolate quarterly data series from annual observations of GNP. The results reported in the study indicate that stock prices lead nominal income, the price level and the exchange rate, but money supply and interest rate lead the stock price.

Naka, Mukherjee and Tufte (2001), analyses long-term equilibrium relationship among selected macroeconomic variables and the Bombay Stock Exchange index. The study uses data for the period 1960:1 to 1995:4 for India on the following macroeconomic variables; namely, the Industrial production index, the consumer price index, a narrow measure of money supply, and the money market rate in the Bombay inter bank market. It employs a vector error correction model to avoid potential misspecification biases that might result from the use of a more conventional VAR modeling technique. The study finds that the five variables are cointegrated and there exists three long-term equilibrium relationships among these variables. One is long-run monetary neutrality, the second relates interest rates to output (i.e., an IS function), and the third relates nominal stock prices to nominal GDP and a downward trend. The signs on these relations are consistent with macroeconomic theory. The results of the study suggest that domestic inflation is the most severe deterrent to Indian stock market performance, and domestic output growth as its predominant driving force. After accounting for macroeconomic factors the Indian stock markets still appear to be drawn downward by residual negative trend.

Shah and Thomas (1997) argue that because of the enabling government policies stock market in India is more efficient than the Indian banking system both in terms of quality of information processing and imposition of transaction cost. Their research support the idea that stock prices are a mirror which reflect the real economy, and are relatively insensitive to factors internal to the financial system such as market mechanisms. However the arguments require more explanation.

Pethe and Karnik (2000), using Indian data for April 1992 to December 1997, attempts to find the way in which stock price indices are affected by and affect other crucial macroeconomic variables in India. But this study runs causality tests in an error correction framework on non-cointegrated

variables, which is inappropriate and not econometrically sound and correct. The study of course avers that in the absence of cointegration it is not legitimate to test for causality between a pair of variables and it does so in view of the importance attached to the relation between the state of economy and stock markets. The study reports weak causality running from IIP to share price index (Sensex and Nifty) but not the other way round. In other words, it holds the view that the state of economy affects stock prices

5. Discussion of Results

Descriptive Statistics and Correlation Matrix

Table 1 and Table 2 report descriptive statistics and the correlation matrix involving the variables under study. As expected the share price index is more volatile than the industrial production, though the mean of the share price index is less than the mean of the industrial production. Further, Table 2 reports very high positive correlation among different pairs of macroeconomic variables. The positive trend in the data set can be seen from Chart 1 and Charts[5] 2 to 5 depicts the share price index and returns on it.

However, to derive robust and meaningful results we proceed, as described in the methodology chapter, to test the time series properties of the macroeconomic series. In the empirical analysis firstly, we test for the order of integration of the macroeconomic variables. For this purpose, the variables are subjected to unit root tests of Augmented Dickey and Fuller (ADF) and Phillips and Perron (PP), both without and with trends. The unit root results are presented in Table 3(a) and Table 3(b).

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[5] The charts 1 to 5, which are available with the author, are not produced here to save space.

Table 1: Descriptive Statistics

	LSPI	LIP	LMS	LEXR	LCP	LWPI
Mean	2.648506	3.812938	6.114826	2.529222	5.876013	3.521891
Median	2.241279	3.700084	6.146732	2.236236	5.929725	3.563370
Maximum	4.931137	4.905571	8.910231	3.755517	8.438453	4.777399
Minimum	1.312449	2.955014	3.383373	1.560647	3.233173	2.195777
Std. Dev.	1.157404	0.553454	1.649428	0.594516	1.545282	0.771923
Skewness	0.639298	0.256871	-0.021132	0.770409	-0.077710	-0.007460
Kurtosis	1.876549	1.818726	1.747427	2.202639	1.734016	1.790499
Observations	399	399	399	399	399	399

Note: LSPI = Log of share price index, LIP = Log of industrial production, LMS = Log of money supply, LCP = Log of credit to the private sector, LEXR = Log of exchange rate, LWPI = Log of wholesale price index.

Table 2: Correlation Matrix

	LSPI	LIP	LMS	LEXR	LCP	LWPI
LSPI	1.000000	0.953401	0.938442	0.972598	0.931989	0.941074
LIP		1.000000	0.987457	0.947028	0.985616	0.982117
LMS			1.000000	0.922234	0.999459	0.996705
LEXR				1.000000	0.914506	0.926914
LCP					1.000000	0.995875
LWPI						1.000000

Note: LSPI = Log of share price index, LIP = Log of industrial production, LMS = Log of money supply, LCP = Log of credit to the private sector, LEXR = Log of exchange rate, LWPI = Log of wholesale price index.

Unit root tests results

As evident from the unit root results presented in Table 3(a), only Money market rate variable is stationary in level but the other macroeconomic variables namely share price index, industrial production, money supply, credit to the private sector, exchange rate, and wholesale price index

are nonstationary in level. However, as shown in Table 3(b), all the variables namely share price index, industrial production, money supply, credit to the private sector, exchange rate, and wholesale price index are stationary on first differencing at 1 per cent level of significance, on the basis of both the ADF and the PP tests. Thus, it is concluded that all the variables considered here, except the Money market rate (MMR) are I(1), while the MMR is I(0). So for the testing of cointegration among the variables, the MMR is dropped from the further analysis.

Table 3(a): Unit Root Tests

	On Levels			
	Constant & No Trend		Constant and Trend	
Variable	ADF	PP	ADF	PP
LSPI	-0.097	-0.100	-1.821	-1.922
LIP	0.707	-0.118	-2.340	-11.025***
LMS	-0.232	-0.058	-1.261	-2.074
LCP	-1.404	-1.401	-0.625	-1.795
LEXR	-1.726	0.162	-1.594	-1.235
LWPI	-0.203	-0.716	-2.722	-2.838
MMR	-3.885***	-8.313***	-4.856***	-9.454***

Note:

1. LSPI = Log of share price index, LIP = Log of industrial production, LMS = Log of money supply, LCP = Log of credit to the private sector, LEXR = Log of exchange rate, LWPI = Log of wholesale price index, MMR = Money market rate
2. The critical values for unit root tests at 1%, 5% and 10% significance levels are-3.47, -2.88 and -2.57 (without trend) and -4.02, -3.44 and -3.14 (with trend) respectively for both the Augmented Dickey Fuller (ADF) and Phillips Perron (PP) tests.
3. The optimal lag selected for LSPI, LIP, LMS, LCP, LEXR and LWPI are 3, 16, 12, 14, 10 and 20 respectively on the basis of the Akaike Information Criterion (AIC).

4. ***, ** and * indicate statistical significance at 1 per cent, 5 per cent and 10 per cent respectively

Table 3(b): Unit Root Tests

Variable	On First Differences			
	Constant & No Trend		Constant and Trend	
	ADF	PP	ADF	PP
LSPI	-10.190***	-14.224***	-10.192***	-14.214***
LIP	-4.060***	-48.354***	-4.156***	-48.742***
LMS	-4.412***	-33.862***	-4.381***	-33.805***
LCP	-4.205***	-34.582***	-4.374***	-35.131***
LEXR	-6.902***	-18.984***	-7.261***	-18.973***
LWPI	-6.010***	-13.049***	-5.991***	-13.032***

Note:

1. LSPI = Log of share price index, LIP = Log of industrial production, LMS = Log of money supply, LCP = Log of credit to the private sector, LEXR = Log of exchange rate, LWPI = Log of wholesale price index, MMR = Money market rate
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4. ***, ** and * indicate statistical significance at 1 per cent, 5 per cent and 10 per cent respectively

Cointegration tests results

Table 4 presents the results of the Johansen Cointegration tests.

Table 4: Johansen Cointegration Test

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.085131	99.10926	94.15	103.18	None *

0.065663	66.45585	68.52	76.07	At most 1
0.051231	41.53008	47.21	54.46	At most 2
0.039550	22.22952	29.68	35.65	At most 3
0.018976	7.419873	15.41	20.04	At most 4
0.001059	0.388773	3.76	6.65	At most 5

* denotes rejection of the hypothesis at 5% significance level.
Note: Likelihood Ratio test indicates one cointegrating equation at 5 % significance level.

The Johansen test[6] indicates that there is one cointegrating equation at 5 % significance level. Note that in this model we allow for a non-zero intercept in the cointegration relationship and a linear trend in the data, and the optimal lag length is selected to be 9 for the vector error correction model.

The estimated cointegrating vector, normalised on the LSPI is:

    LSPI   Constant   LIP   LMS   LEXR   LCP   LWPI

[1.000   -14.226   6.239   -3.286   -4.161   -3.144   10.469]

Causality tests results

The result of the estimated multivariate VECM (vector error correction model) is presented in Table 5. As already indicated, the share price index and the macroeconomic variables are cointegrated. That is, there is a long run equilibrium relationship between the share price index and the select macroeconomic variables. The results in Table 5 clearly show significant error correction terms for the variables namely share price index, exchange rate and the wholesale price index only. That is, the variables share price index; exchange rate and the wholesale price index adjust to disequilibrium from the long-run relationship, while the industrial production, money supply and credit to the private sector do not significantly respond to deviations from the long-run relationship.

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[6] The first row in the Table 4 tests the hypothesis of no cointegration, the second row tests the hypothesis of one cointegrating relation, the third row tests the hypothesis of two cointegrating relations, and so on, all against the alternative hypothesis of full rank, i.e. all series in the VAR are stationary. The critical values for the trace statistic reported are from Osterwald-Lenum (1992).

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Table 5: Vector Error Correction Estimation

Independent Variable	Dependent Variable					
	ΔLSPI	**ΔLIP**	**ΔLMS**	**ΔLEXR**	**ΔLCP**	**ΔLWPI**
Constant	0.010	0.014	0.024	0.005	0.026	-0.002
	(0.735)	(1.064)	(5.292)	(1.164)	(4.427)	(-0.881)
EC_{t-1} term	-0.013	-0.001	-0.0006	0.0039	0.0032	-0.0034
	(-2.639)	(-0.204)	(-0.355)	**(2.192)**	(1.469)	**(-3.069)**

Note:

1. LSPI = Log of share price index, LIP = Log of industrial production, LMS = Log of money supply, LCP = Log of credit to the private sector, LEXR = Log of exchange rate, LWPI = Log of wholesale price index.
2. Δ is the change operator.
3. t-statistics are reported in the parenthesis.

Table 6 presents the results of causality tests in a cointegration framework for the multivariate model. We here present the causality findings involving only the SPI and IP as the dependent variable because the objective of the present study is to test the causality relationship between stock market and economic growth where the latter is proxied by industrial production only. As seen from the results, there is evidence of causality from economic growth to stock price index. Because in the equation 1 in Table 6 which involves share price index as the dependent variable, not only the lag values of industrial production are significant (see that the p-value is 0.003 in the Table 6, in the bold font), but also the error correction term is significant at the 5 per cent significance level (see the p-value of the ECM term in equation 1 which is 0.010). In other words, at the conventional level of significance, causality runs from economic growth (proxied by industrial production) to stock price index both through past changes in economic growth and past levels of economic growth. In contrast, the findings in equation 2 of Table 6 indicate absence of causality from stock prices to economic growth.

Table 6: Causality Tests in the VECM

Eq. No.	Dep. Variable	Coefficient of ECM_{t-1}	Coefficients of Independent Variables				
			ΔLIP	ΔLMS	ΔLEXR	ΔLCP	ΔLWPI
1.	ΔLSPI	t-stat= - .586 p-value=0.010	**F-stat = 3.508 p-value=0.003**	F-stat = 1.227 p-value=0.276	F-stat = 1.435 p-value=0.171	F-stat = 1.193 p-value=0.298	F-stat =1.007 p-value=0.433
Eq. No.	Dep. Variable	Coefficient of ECM_{t-1}	Coefficients of Independent Variables				
			ΔLSPI	ΔLMS	ΔLEXR	ΔLCP	ΔLWPI
2.	ΔIP	t-stat= -0.198 p-value=0.842	F-stat =1.059 p-value=0.392	F-stat = 2.069 p-value=0.031	F-stat = 0.647 p-value=0.755	F-stat = 2.184 p-value=0.022	F-stat =3.267 p-value=0.0008

Now we present the Causality test result between economic growth and share prices in Table 7; in a more candid manner[7].

Table 7: Causality test between economic growth and share prices

Null Hypothesis	F-Statistics with P-value for Short-run Non-causality	t-Statistics with P-value for Long-run Non-causality
Economic growth does not cause share prices	3.51 (0.003)***	-0.58 (0.01)***
Share prices does not cause economic growth	1.06 (0.39)	-0.19 (0.84)

Notes:
    1. *** indicate statistical significance at 1 per cent level of significance.
    2. P-values are in the parentheses.

Our finding categorically rejects the null hypothesis "economic growth does not cause share prices" as evident from the table 7. It shows that causality runs from economic growth (proxied by industrial production) to share price index implying that the state of the economy affects share prices in India, but not the other way round. In other words, there is no evidence of causality, either in the short run or in the long run, running from share price index to industrial production which implies that the revival of stock market, in the sense of rising share prices could not be taken to be a leading indicator of the revival of the economy in India. That is, the stock price index

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[7] The basis of such presentation is the arguments that the lagged coefficients on the independent variables in the error correction model represent short run Granger causality, while the coefficient on the error correction (EC) term in the error correction model reflects long run Granger causality relationships (Jones and Joulfaian, 1991 and Perman, 1991).

cannot be considered as a barometer of business direction or it cannot be relied upon to measure changes in the general economic activities in India. Pethe and Karnik (2000) report similar results. Our results are also consistent with Hondroyiannis and Papapetrou (2001), which indicate that the domestic economic activity affects the performance of domestic stock market in Greece. However, our findings contradict Habibullah et al (2000), which find evidence in support of the fact that the Malaysia stock market acts as a barometer for the Malaysian economy.

5. Concluding Comments

To sum up, the present study attempts to investigate whether share price index can be considered as a mirror or reflection of economic activities in India. The purpose is to make a finer point with respect to the relationship between economic growth and stock market especially in terms of stock prices. The present study thus proceeds with a single point investigative agenda- what is the relationship between the health of the real economy and the health of the stock market? Does a rally in share prices reflect better health of the economy or it is the pink economic health that causes share prices to rise? We examined the causal relationships between the share price index and industrial production in a multivariate vector error correction model which involved certain other crucial macroeconomic variables namely money supply, credit to the private sector, exchange rate, wholesale price index, and money market rate for the reason of right and robust model specification.

The present study reports causality running from economic growth proxied by industrial production to share price index and not the other way round. It may therefore be stated that the stock markets in India are demand driven and industry led which means that demand for greater equity finance is led by higher and improved industrial performance. That is, the state of the economy has a bearing on the share prices but the health of the stock market in the sense of a rising share price index is not reflective of an improvement in the health of the economy. In other words, a Bull Run or rising prices in the stock market cannot be taken to be a leading indicator of the revival of the economy in India. This finding has lot of implications for the kind of rally we witness in the Indian stock market in the recent years and the Sensex crossing 10000 marks provides a lot of food for thought and analysis, both theoretical and empirical, in the future.

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