



EFFECT OF ECONOMIC VARIABLES OF INDIA AND USA ON THE MOVEMENT OF INDIAN CAPITAL MARKET: AN EMPIRICAL STUDY

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ABSTRACT

Economic variables like FII, exchange rate, gold price, fiscal deficit, IIP & inflation are the important factor which affects the Indian capital market. In addition to the Indian economic variable, the USA economic variables like interest rate, inflation and GDP also affect the Indian capital market. There is also a linkage between USA capital market movement and its affect on the Indian capital market. The monthly data between 1994 to 2011 has been taken to find that the Nifty 50 index is significantly affected by US GDP, S&P index, gold prices, Indian WPI, its fiscal deficit, IPI and exchange rate.

KEYWORDS: Economic variable, Capital Market, Inflation, GDP.

INTRODUCTION

Globalisation and financial sector reforms in India have ushered in a sea change in the financial architecture of the economy. In the contemporary scenario, the activities in the financial markets and their relationships with the real sector have assumed significant importance. Since the inception of the financial sector reforms in the beginning of 1990's, the implementation of various reform measures including a number of structural and institutional changes in the different segments of the financial markets, particularly since 1997, have brought in a dramatic change in the functioning of the financial sector of the economy (Agrawalla 2006). Altogether, the whole gamut of institutional reforms concomitant to globalisation programme, introduction of new instruments, change in procedures, widening of network of participants call for a reexamination of the relationship between the stock market and the foreign sector of India. Correspondingly, researches are also being conducted to understand the current working of the economic and the financial system in the new scenario. Interesting results are emerging particularly for the developing countries where the markets are experiencing new relationships which are not perceived earlier. The analysis on stock markets has come to the fore since this is the most sensitive segment of the economy and it is through this segment that the country's exposure to the outer world is most readily felt.

The Efficient Markets Hypothesis (EMH), in its strong form, assumes that everyone has perfect knowledge of all information available in the market. Therefore, the current price of an individual stock (and the market as a whole) portrays all information available at time t . Accordingly, if real economic activity affects stock prices, then an efficient stock market instantaneously digests and incorporates all available information about economic variables. The rational behaviour of market participants ensures that past and

current information is fully reflected in current stock prices. As such, investors are not able to develop trading rules and, thus may not consistently earn higher than normal returns. Therefore, it can be concluded that, in an informationally efficient market, past (current) levels of economic activity are not useful in predicting current (future) stock prices (Chong and Koh 2003).

The present study is an endeavor in this direction. It analyses the relationship between stock prices and macroeconomic variables in India and US with implications on efficiency of Indian stock market. This paper makes use of the latest available econometric techniques and examines efficiency of Indian and US stock market. Economic variables like foreign institutional investment (FII), exchange rate, gold price/(10 gm), fiscal deficit, industrial production index (IIP) & inflation measured with whole sale price index (WPI) are the important factor which affect the Indian capital market. In addition to the Indian economic variable, the USA economic variable like interest rate, inflation and gross domestic product (GDP) also affect the Indian capital market. There is also a linkage between USA capital market movement and its affect on the Indian capital market (i.e. S&P index). The monthly data between 1994 to 2011 has been taken to find the effect of these variables on Nifty 50 index.

The rest of the paper is organized as follows. A survey of the existing literature including empirical evidences on the nature of the causal relationship between macroeconomic aggregates and stock prices is conducted in Section II.

Section III discusses the methodology to be employed and presents the variables and data descriptions. Section IV reports the empirical results followed by conclusion in Section V.

Review of Literature

In modern economy the role of stock exchange is very important. It can be very helpful to diversify the domestic funds and channels into productive investment, however to perform this important task it is very necessary that stock market have significant relationship with the macroeconomics variables. Nowadays capital market became a key element of modern market based economy. They transfer the long term funds from savers to borrowers and then from the capital borrowers to capital investors which is very essential for economic development. Economic growth and prosperity is possible only when capital market works efficiently. In other words the stock market is very significant to speed up economic growth through increasing liquidity of financial assets and diversification of global risk easier for investors to make a wiser investment decision. After the globalization international capital markets are integrated rapidly. This integration has positive affects on economic growth, reducing the risk and especially contagion impact on financial crises.

Studies on the relationship between macroeconomic variables and national stock market have been the cornerstone of most economic literature for quite some time. During the last decade and a half, it has been recognized that external sector indicators like exchange rate, foreign exchange reserves and value of trade balance can have an impact on stock prices. Early studies (Aggarwal, 1981; Soenen and Hennigar, 1988) in the area of exchange rates – stock prices considered only the correlation between the two variables. Theory explained that a change in the exchange rates would affect a firm's foreign operation and overall profits. This would, in turn, affect its stock prices. The nature of the change in stock prices would depend on the multinational characteristics of the firm. Conversely, a general downward movement of the stock market will motivate investors to seek for better returns elsewhere. This decreases the demand for money, pushing interest rates down, causing further outflow of funds and hence depreciating the currency. While the theoretical explanation was clear, empirical evidence was mixed.

Aggarwal (1981) found a significant positive correlation between the US dollar and US stock prices while Soenen and Hennigan (1988) reported a significant negative relationship. Soenen and Aggarwal (1989) found mixed results among industrial countries. Ma and Kao (1990) attributed the differences in results to the nature of the countries i.e. whether the countries were export or import dominant. Morley and Pentecost (2000), in their study on G-7 countries, argue that the reason for the lack of strong relationship between exchange rates and stock prices may be due to the exchange controls that were in effect in the 1980s. Bahmani-Oskooee and Sohrabian (1992) were among the first to use cointegration and Granger causality to explain the direction of movement between exchange rates and stock prices. Since then various other papers analyzing these aspects and using this technique have appeared covering both industrial and developing countries (for example, Granger et.al. [2000]; Ajayi et.al. [1998]; Ibrahim [2000]).

The direction of causality, similar to earlier correlation studies, appears mixed. For Hong Kong, Mok (1993) found that the relationship between stock returns and exchange rates are bidirectional in nature. For the United States, Bahmani-Oskooee and Sohrabian (1992) point out that there is a two-way relationship between the U.S. stock market and the exchange rates. However, Abdalla and Murinde (1997) found out that the results for India, Korea and Pakistan suggest that exchange rates *Granger cause* stock prices, which is consistent with earlier study by Aggarwal (1981). But, for the Philippines, Abdalla and Murinde found out that the stock prices lead the exchange rates. This is consistent with Smith's (1992) finding that stock returns have a significant influence on exchange rate in Germany, Japan and the United States. For the Indian Economy, work in this area has not progressed much. Abhay Pethe and Ajit Karnik (2000) has investigated the inter – relationships between stock prices and important macroeconomic variables, viz., exchange rate of rupee vis - a - vis the dollar, prime lending rate, narrow money supply, and index of industrial production. The analysis and discussion are situated in the context of macroeconomic changes, especially in the financial sector, that have been taking place in India since then.

Hussain and Masood (2001) used variables investment, GDP and consumption employing granger causality test to define the relationship among the selected variables and stock prices, finding shows at two lags of all variables are highly significantly effect on stock prices.

Ahmed (2003) empirically investigated on SENSEX index price affects due to real and financial sector performance in Indian economy, the data has been chosen from the period 1997 to 2003. The study consists variables export, foreign exchange rate and foreign direct investment. Granger causality test is used to find out the causal relationship between the variables. All the variables are Granger cause to stock prices. Speculation in the market was analyzed with the help of AR (Auto Regressive) which was highly significant according to the result.

Nishat (2004) evaluates long term association among macroeconomic variables, stock prices and employed money supply, CPI, IPI, and foreign exchange rate as explanatory variable. The result shows that there are causal relationships among the stock price and macroeconomics variables. The data used in this study from 1974 to 2004. Most of the time series data is nonstationary therefore unit root technique is used to make data into stationary. The result also indicates that industrial production is significantly affects to macroeconomic variables. Nishat used Karachi stock exchange 100 index price from 1974 to 2004. Grange causality test is used to find the correlation among the variables the result of granger causality shows that interest rate is not granger cause by stock price.

Dimintrova (2005) used multivariate model and try to find out link among stock prices, exchange rate and economics policy (fiscal and monetary policy). The study defines the interest parity condition affects on stock prices. The result shows that ambiguous affects of deprecation on stock prices.

Shahbaz (2006) investigated the association between stock prices and rate of inflation using ARDL approach for dynamics analysis. Result of this study depicts that stock hedges are not in favor of inflation in long run as well as in short run and found that black economy effects long run and short run prices of the stock. The study used variables CPI, (inflation) and share of black economy the sample size of the study is 1971-2006.

Sharma (2007) used interest rate, exchange rate and reserve, industrial production index, monetary growth and inflation as independent variables with AR and MA to nullify the effects of non stationary in the variables. The result shows that lags values are highly connected with current share prices which recommend the speculation in market. Exchange rate and reserve, industrial production index and monetary growth are significantly associated. The study took data set from 1986 to 2004.

Ali and Ahmed (2008) used data from 1971 to 2006 and try to find out the relationship of economic growth with stock market prices and study shows that there are dynamics association between stock prices and economic growth employing DF-GLS test first time in case of Pakistan.

Shahid (2008) investigates the nature of the causal relationships between stock prices and the key macro economic variables (index of industrial production, exports, foreign direct investment, money supply, exchange rate, interest rate) representing real and financial sector of the Indian economy. The study indicates that stock prices in India lead economic activity except movement in interest rate which seems to lead the stock prices.

Robert D. gay (2008) evaluated the association among stock prices and macro economics variables in cases of China, India, Brazil and Russia which are emerging economies of the world using Oil price, exchange rate, and moving average lags values as explanatory variables employing MA (Moving Average) method with OLS (Ordinary least square) and found insignificant results which postulate inefficiency

in market. Finally they concluded that in emerging economies the domestic factors influence more than external factors i.e. exchange rate and oil prices.

Keshava (2008) analyzes the impact of FDI on growth in India, exports, GDI, FOREX and other macro variables. The paper also compares India's FDI with Chinese FDI and attempts to learn from the Chinese experience. The paper distinguishes between hard factor that affect FDI and soft factors that affect FDI. Hard factors mainly include transportation, telecommunications, energy supply, public utilities and infrastructure. Soft factors include parameters related to political regime and culture. The paper concludes that India is far behind China in becoming an attractive FDI destination as it still suffers from power shortage, poor infrastructure, security consideration and the absence of an exit policy. If India has to reach its target of attracting more FDI for its development, aggressive third generation reforms are needed along with good planning and intentions.

A discussed above, literature reveals differential causal pattern between key macro economic variables and stock prices. This relationship varies in a number of different stock markets and time horizons in the literature, This paper will add to the existing literature by providing robust result, about causal inks for the longer period i.e. 1994-2010 (monthly data).

Research Methodology

Economic variables like foreign institutional investment (FII) ,exchange rate, gold price/(10 gm), fiscal deficit, industrial production index (IIP) & inflation measured with whole sale price index (WPI) are the important factor which affect the Indian capital market. In addition to the Indian economic variable, the USA economic variable like interest rate, inflation and gross domestic product (GDP) also affect the Indian capital market. The current study, using modern non-linear techniques, has resulted in showing that there is a significant causal relationship between the real economic variables and the capital market.

Symbol	Variable	Definition
FII_ind	Foreign Institutional Investor	Monthly Data in Rupees(Cr.)
Exchnge_rate	Exchange Rate	Monthly Dollar-Rupee rate
Gold_10gm	Gold Price/10 gm	Monthly Data in Rupees
Fiscl_defit	Fiscal Deficit	Monthly Data in Rupee(Cr.)
IP_ind	Industrial Production Index	Monthly Index of Industrial Production
WPI_ind	Inflation	Monthly wolesale Price index
Inst_us	US_ Interest Rate	Monthly Interest rate of USA
SnP_Data	S&P	Monthly S&P Data of USA
US_GDP	US_ Gross Domestic Product	Monthly GDP Of USA
Nifty	Nifty 50 Index	Monthly Nifty50 Data

$$\text{Nifty} = \beta_1 + \beta_2 \text{ exchnge_rate} + \beta_3 \text{ FII_ind} + \beta_4 \text{ Fiscl_defit} + \beta_5 \text{ Gold_10gm} + \beta_6 \text{ SnP_Data} + \beta_7 \text{ inst_us} + \beta_8 \text{ US_GDP} + \beta_9 \text{ WPI_ind} + \beta_{10} \text{ IP_ind}$$

All the in a form of monthly data are taken from Reserve Bank of India, SEBI and Bureau of Economic Analysis website. The sample size of data is taken from the period 1994-2011. The logic behind of it that the era of reforms of financial sector and liberalization of stock markets in India started from 1991 and it got the peak from 1994.

RESULT & ANALYSIS

The empirical result or evidence provided by the various studies mentioned in the section of review literature shows that macroeconomics variables have strong effect the stock market. SPSS software is used for the testing the correlation between the movement of Nifty50 with Indian microeconomic variable and USA micro economic variable. The Result is shown in Table 1, Table2, Table3 and Table4.

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Indian stock market movement is found to be significantly correlated with respect to the most macroeconomics variables. It is shown in Table 2 that R-square is 0.968, which means that microeconomic variable of India and USA account 96.8% of the variation of Nifty50 movement.

The adjusted R-square is 0.967, which measure of how well our model generalizes and ideally we would like its value to be the same, or very close to, the value of R-square. So, the assumption has certainly been met.

Table 1 Variables (Entered/Removed)

Model	Variables Entered	Variables Removed	Method
1	exchnge_rate, FII_ind, Fiscl_defcit, Gold_10gm, SnP_Data, intst_us, US_GDP, IP_ind, WPI_inda	.	Enter

a. All requested variables entered.

b. Dependent Variable: Nifty

Model	R	R Square	Adjusted R Square
1	.984a	.968	.967

Model		Sum of Squares	df
1	Regression	3.831E8	9
	Residual	1.258E7	184
	Total	3.957E8	193

b. Dependent Variable: Nifty

		Unstandardized Coefficients		Standardized Coefficients
Model		B	Std. Error	Beta
1	(Constant)	896.876	322.421	
	US_GDP	.491	.077	.834
	SnP_Data	1.410	.149	.283
	intst_us	-11.297	20.418	-.016
	Gold_10gm	.284	.026	.718
	WPI_ind	-18.560	5.942	-.523
	FII_ind	.006	.004	.020
	Fiscl_defcit	-.004	.001	-.041
	IP_ind	1.965	2.836	.058
	exchnge_rate	-110.546	7.104	-.406

a. Dependent Variable: Nifty

Further analysis also reported in table-4 exhibits. Exchange rate, USA GDP, S&P, USA interest rate, Gold Price, WPI, Fiscal Deficit, IIP is highly significance at 5% level. It is also found that there is a negative relationship of Nifty with WPI and USA interest rate. It has been also seen that foreign institutions investment has been also affecting the stock market prices.

CONCLUSION

The main objective of this research paper is to study the association between macroeconomics variables and Indian stock market's shares prices. For this purpose the monthly data of foreign Exchange rate, USA GDP, S&P, USA interest rate, Gold Price, WPI, Fiscal Deficit, IIP, FII and USA interest rate have been taken.

The result shows that Exchange rate, USA GDP, S&P, USA interest rate, Gold Price, WPI, Fiscal Deficit, IIP highly affect the stock prices. It has been observed since the liberalization from 1994 to 2011 of stock markets in India has largely affected by microeconomic variable.

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