CHAPTER-2

REVIEW OF LITERATURE

2.1 OVERVIEW

Review of literature is the effective evaluation of selected literature on a research topic. It is an essential part of the research process. It provides a background to the study being proposed. It describes, compares, contrasts and evaluates the major theories, arguments, themes, methodologies and approaches on a research subject. It is not merely an annotated bibliography or a summary of the sources or descriptive summary of the historical background to the research subject.

In a literature review, the central focus is on examining and evaluating what has been said earlier, on the research subject, and establishing the relevance of this information to the present research. The review helps to identify the gap that exists in the area of research. It also provides a chance to discuss the methodologies that have been used in the literature and how these relate to the chosen method.

Some of the relevant studies undertaken for review have been classified into the following categories:
(a) Studies on stock market volatility.
(b) Studies on relationship between stock market and macroeconomic variables.
(c) Studies on stock prices and company specific factors.
(d) Studies on other factors that affect the stock market.
(e) Studies on the relationship between volatility and stock price returns.
(f) Studies on modelling and forecasting conditional volatility of the Indian stock markets.

2.2 STUDIES ON STOCK MARKET VOLATILITY

Schreder (1962) found that during the months of 1961, there was a record level of overall business activity in the stock market. He studied whether this trend would continue strongly in 1962, especially during the first-half of the year. He indicated some probabilities for the stock market which mainly include (1) the cyclical upturn in business was still in its most vigorous stage; (2) bank- credit position and policy were still very favourable to business expansion; (3) a sharply
rising trend of earnings and dividends, especially in the basic or cyclical-type industry areas should continue; and (4) a continuing strong demand for stocks, because investors generally were still thoroughly inoculated with the expectations of long-term inflation and with the belief that well-selected common stocks still provide the best-hedged method of achieving long-term growth of capital and income.

Poterba and Summers (1984) examined the potential influence of changing volatility in stock market prices on the level of stock market prices. It demonstrated that volatility is only weakly serially correlated, implying that shocks to volatility do not persist. These shocks can, therefore, have only a small impact on stock market prices, since changes in volatility affect expected required rates of return for relatively short intervals. These findings lead us to be skeptical of recent claims that the stock market's poor performance during the 1970s can be explained by volatility induced increases in risk premia.

Schwert (1989) analyzed the behaviour of stock return volatility using daily data from 1885 through 1988. The October 1987 stock market crash was unusual in many ways. October 19 was the largest percentage change in market value in over 29,000 days. Stock volatility jumped dramatically during and after the crash. Nevertheless, it returned to lower, more normal levels more quickly than past experiences predicted. He used data on implied volatilities from call option prices and estimates of volatility from futures contracts on stock indexes to confirm this result.

Karamakar (1993) measured stock market volatility for the period 1935 to 1992. He focused on two key issues: (a) What is the current level of stock market volatility and whether it has increased in the current period; (b) Whether the present trend of share price movement is likely to impair the development process of economy. His analysis showed that out of a total of 25 volatile months, only two pertain to the calm period of the 60s and the 70s. In the 90s, the year 1992 is the most current and volatile year in the history of the Indian capital market. He concluded that the stock market volatility has increased in the current period. He also suggested some policies to be followed by the government to immune the market from occurrence of such unwarranted events in future.

Chowhan and Shukla (2004) examined the burning issue of volatility in the Indian stock markets. They studied fundamentalist view put forward by economists who argue that volatility can be explained by Efficient Market Hypothesis. They also
tested that volatility is caused by psychological factors. They found that no fundamental factors emerge for the existence of such high volatility and perceptual factors have led to this mad rush for stocks leading to volatility.

Porwal and Gupta (2005) also investigated the issue of volatility in the Indian stock markets. The study is based on daily prices of S&P CNX Nifty for the period 1995-2004. They brought out that 1996 was the most volatile year in the past 10 years. This is due to the political instability and absence of proper regulation. They further provided that volatility rose in 2004 because of the impact of increased investment by FIIs.

Sinha (2007) focused on equity market volatility in 13 developed and emerging markets, including India for a 15 year period from 1985 to 1999. He concluded that Asian markets are more volatile than the developed markets. For the developed markets, 1987 was the most volatile year. For the emerging markets, the year 1997 was of the highest volatility, with exception of India and Chile. India showed the highest volatility in 1992, when major irregularity took place in the banking system which severely affected the securities market.

Singh et al. (2010) tried to find out the historical volatility of the CNX S&P Nifty and Nikkie 225 stock exchanges of India and Japan respectively. They also made an effort to know the the impact of Treasury bond rates changes on insurance companies in Japan and banking companies in India. The study based on the secondary data was descriptive in nature. Purposive sampling technique was used for sampling insurance and banking companies. The sample size consisted of 8 insurance companies from Nikkie225 and 15 banking companies from NSE CNX S&P Nifty stock exchanges (used in the formulation of index). The study investigated the volatility of Indian Nifty and Japanese Nikkie225 stock exchanges. A high-frequency volatility was found in Nikkie225 exchange. Similarly, it was found that insurance companies of Japan are more volatile to Treasury bond rate changes as compared to Indian banking companies.

Dash et al. (2011) studied the interplay between the month-of-the-year effect and market crash effects on monthly returns in Indian stock markets. The study used dummy variable multiple linear regression to assess the seasonality of stock market returns and the impact of market crashes on the same. The results of the study provide evidence for a month-of-the-year effect in Indian stock markets, particularly positive
November, August and December effects, and a negative March effect. Further, the study suggests that the incidence of market crashes reduces the seasonal effects.

2.3 STUDIES ON RELATIONSHIP BETWEEN STOCK MARKET AND MACROECONOMIC VARIABLES

Response of stock prices to macroeconomic events such as announcements of changes in money supply, real economic activity measured by GDP, industrial production, foreign institutional investment, inflation, interest rate, and union budget has received considerable attention of the researchers. The interpretation of daily stock price movements as reaction to announcements of economic events is commonplace in the media. Commentators often report that stock prices fell because of disappointing unemployment figures or rose because of encouraging news on the inflation front (Roley, 1985).

The review of empirical evidence of market response to economic events is organized as follows:

1. FII and Stock Market
2. Inflation and Stock Market
3. Interest Rate and Stock Market
4. Union Budget and Stock Market.

These categories are covered under the studies which explored the response of stock prices to release of macroeconomic performance related information such as interest rate and inflation announcements, and disclosures or forecasts of macroeconomic aggregates.

2.3.1 Studies Finding the Impact of FII on Stock Market

Two main philosophies exist in the literature about relationship between FIIs investment and stock market and both are contradictory to each other. According to the first view, FIIs enter the foreign market to reap the benefits and thereafter they withdraw their money which increases the volatility in the stock market, while the other view is based on the belief that introduction of the FIIs enhances information flow and thus improves the investment choices for the investors, and brings transparency in the market, hence, puts no impact on the volatility. Some of the important studies are presented below:

Josef et al. (1991) presented evidence on the herding and trend-chasing behaviour of institutional money managers. They concluded that there is no solid
evidence in their data that institutional investors destabilize prices of individual stocks. Instead, the emerging image is that institutions follow a broad range of styles and strategies, and their trades offset each other without having a large impact on prices.

Sellin (1996) investigated the relationship between a price index of Swedish stocks and the net purchases of Swedish stocks by foreign investors, and found that net purchases of stocks by foreign investors lead to temporary price effects in a small stock market. On average, foreign investors' net purchases of stocks look like noise trading and seem to create some amount of excess volatility in the market.

Rao et al. (1999) conducted a study of developed market by taking the data for a period of eight years, i.e., 1990 to 1998. They suggested that FII investments would help the stock markets directly through widening investor base and indirectly by compelling local authorities to improve the trading systems. They analyzed the investment exposure of five US-based India specific funds that suggested a close resemblance between FII investments and trading pattern at the BSE. On this basis they interpreted that the net FII investment influences stock prices in India.

Mukherjee et al. (2002) examined the relationship of foreign institutional investment (FII) flows to the Indian equity market with its possible covariates based on a daily data-set for the period January 1999 to May 2002. The set of possible covariates (any of two or more random variables exhibiting correlated variation) considered comprises two types of variables. The first type includes variables reflecting daily market return and its volatility in domestic and international equity markets as well as measures of co-movement of returns in these markets (viz., relevant betas). The second type of variables, on the other hand, are essentially macroeconomic ones like exchange rate, short-term interest rate and index of industrial production (IIP) - viz., variables that are likely to affect foreign investors' expectations about returns in Indian equity market. They found returns in the Indian equity market is, indeed, an important factor that influences FII flows into the country, and returns from exchange rate variation and fundamentals of the Indian economy may have influence on FII decisions, but such influence does not seem to be strong.

Batra (2003), using both daily and monthly data attempted to understand the trading behaviour of FIIs and returns in the Indian equity market. He used the BSE
Index for that purpose and the time period of the study was 1979 to 2002. He considered all the three components of FII flows, purchase and sales and the net flows to find out which of these has more impact on the stock market returns. He found strong evidence of FIIs chasing trends and adopting positive feedback trading strategies. However, he didn’t find having any destabilizing impact on the equity market.

Chakrabarti (2003) made an empirical investigation to see the interrelationship between FII flows and equity returns in India using monthly data. He came with the evidence that the FII flows are highly correlated with the equity returns in India but this high correlation is not necessarily evidence of FII flows causing price pressure-if anything, the causality is likely to be other way around. His study found that the beta of the Indian market with respect to S&P 500 Index seemed to affect the FII flows inversely but the effect disappears in the post-Asian crisis.

Bohl and Brzeszczynski (2005) provided empirical evidence on the impact of institutional investors on stock market returns dynamics in Poland. However, the findings do not support the hypothesis that institutional investors have destabilized stock prices. The results are interpretable in favour of a stabilizing effect on index stock returns induced by institutional trading. Herding and positive feedback trading by institutions, thus, does not necessarily imply that institutional traders destabilize stock prices.

Mohan (2006) concluded that FII flows into the Indian stock market have conferred several benefits on the economy. They helped augment capital flows at a time when the Balance of Payment situation was not comfortable. They allowed Indian firms to access overseas capital at a cost that was lower than the domestic cost of capital. They ushered in major reforms in the working of securities markets and in corporate governance. He also commented that volatility in FII flows does not pose systemic risks. The downside to FII flows is principally the potential volatility in the study suggest to drive the benefits of FII flows without having to put up with the uncertainties created by the Participatory Notes (PN) component. Eliminating the uncertainties that go with PN will also help reduce or eliminate the costs of sterilization incurred in the process of having to deal with potentially volatile FII flows.
Tripathy (2007) examined the dynamic relationship between stock market, market capitalization and net FII investments in India during the period from June 2002 to June 2005 by using Granger Causality Test and Vector Auto Regression Model. The results indicate that there is a unidirectional causal relationship between market capitalization and stock market, net FII investment with stock market. Again, the VAR analysis shows that stock return and market capitalization have an impact over net FII investment in the expected direction over a short horizon.

Gangadhar and Reddy (2008) examined the investment trends and patterns of FIIs and their impact on stock market liquidity and volatility by taking the market capitalization and stock indices respectively. They found that there is high degree of positive correlation between FIIs investment and market capitalization, and also revealed that liquidity as well as volatility were highly influenced by FII flows.

Ray (2009) identified whether there exists a causal relationship between net investment made by FIIs and the equity return in the Indian stock market. He analysed the relationship between foreign institutional investment and stock returns in India (BSE) with the aid of daily data from January 2006 to June 2008. The Stationarity condition for the time series data considered for analysis has been tested using Augmented Dicker Fuller (ADF) test and Phillips-Perron (PP) test. The Granger Causality test suggests that the equity returns granger cause FII investments, but not the reverse.

Sujit (2010) observed the relationship between FIIs and Indian stock market using VAR analysis. The study used two major indices to represent Indian stock market, i.e., BSE Sensex and NSE Nifty for the period 1st November, 2007 to 21st November, 2008. The study confirmed that Sensex affects the FII during bull run as well as in bear run. Stock returns can predict the flow of FIIs and are found to follow positive feedback strategy and have return chasing tendency.

Kumar and Raju (2011) examined the interaction between FII flows and returns of various indices of National Stock Exchange, using daily data for the variables from 2000 to 2009. The results indicate that there is evidence of positive feedback trading in Indian context in four selective indices, viz. Bank Nifty, CNX Midcap, CNX Nifty Junior, and S&P CNX 500 out of fifteen sampled indices. It is also observed that FIIs are not only causating agents but also the effects of the stock return; and there is selective bidirectional relationship between net FII flows and
returns of selected indices, viz. CNX Midcap, CNX Nifty Junior, S&P CNX 500 and S&P CNX Nifty out of the fifteen sampled indices.

### 2.3.2 Studies on Relationship between Inflation and Stock Market

The relationship between inflation and stock market has attracted the attention of many economists and finance experts. They have regressed stock returns on measures of expected and unexpected inflation using different proxies and concluded that the market reacts negatively to both expected and unexpected components of inflation [e.g. Litner (1975), Bodie (1976), Fama (1981), Cohn and Lessard (1981), Gultekin (1983), Geske and Roll (1983), Solnik (1983) and Kaul (1990). This evidence of a negative relationship between stock return and inflation has been reported from various countries, developed as well as developing, using data from different periods. Mayya (1977), Barua and Raghunathan (1982), Prabhakaran (1989), and Rao and Bhole (1990) analyzed the data over different periods from 1953 to 1987 to examine the relation between return on equity and contemporaneous inflation in India. They concluded that investment in Indian stock markets provided either a partial hedge or no hedge against inflation. Some of the studies on inflation are:

Mayya (1977) studied the movement of share prices with a view to assessing the extent to which investment in stocks and shares can act as a hedge against inflation. Data over the period April 1961 to November 1973 had been taken. He observed that in some years of inflation, the equity prices decreased and in some years of inflation, they increased and therefore he concluded that shares are not a reliable hedge against inflation. In fact, investment in gold and silver, traditional 'frozen investment', has been a better hedge than investment in securities.

Firth (1979) studied the relationship between inflation and rates of return of British stocks over the period from 1955-1976. The monthly index of retail prices (I.R.P) and WPI of U.K. were used. Both sets of data produced identical results. The study found that the regression coefficients were statistically significant and positive for overall period, indicating that the investors were more than compensated for the expected rate of inflation. However, over the longer period (1935-1976) the regression coefficient was close to zero and hence not statistically significant. The study proved that in U.K., superior returns could not be earned from models using publicly available inflation indices. These results were exactly opposite to the American study where past rates of inflation could be used to predict future stock
prices. However, no ready explanation was given for the differences although the institutional arrangements were quite similar in the USA and UK.

Cohn and Lessard (1981) investigated the effect of inflation on corporate profits and stock prices of eight industrialized countries during the period 1969 to 1979. They estimated two models - one based on reported earnings (i.e. noiseful) and another based on fully adjusted earnings (i.e., noiseless). They analyzed that the stock prices were negatively related to nominal interest rates and inflation in a number of countries. However, it proved difficult for researchers to trace these results to a specific view of investor behaviour. A rise in inflation rate leads to decline in after-tax profits which, in turn, erode stock prices. However, it was found that fall in stock prices was more than that could be explained by inflation and vice-versa.

Gultekin (1983) investigated the relation between common stock returns and inflation in twenty-six countries for the post-war period. The results did not support the Fisher Hypothesis, which states that real rates of return on common stocks and expected inflation rates are independent and that nominal stock returns vary in one-to-one correspondence with expected inflation. There was a consistent lack of positive relation between stock returns and inflation in most of the countries.

Solnik (1983) provided empirical evidence on the relation between stock returns and inflationary expectations for nine countries over the period 1971-80. The Fisherian assumption that real returns are independent of inflationary expectations is soundly rejected for each major stock market of the world. Using interest rates as a proxy for expected inflation, data provides consistent support for the Geske and Roll model whose basic hypothesis is that stock price movements signal (negative) revisions in inflationary expectations. Finally, a weak real interest rate effect was found for some of these countries.

Kaul (1990) analyzed the impact of change in monetary policy regimes on the relation between stock return and changes in expected inflation. Post-war evidence from four countries (the U.S., Canada, U.K., and Germany) reveals a direct link between these relations and central banks' operating targets (i.e., money supply or interest rate). Specifically, the post-war negative relations between stock returns and changes in expected inflation are significantly stronger during the interest rate regimes as compared to money supply regimes.
Rao and Bhole (1990) examined the relation between return on equity and inflation in India. The real rate of return for each year and all multi-year holding periods between 1933 and 1987 are taken. It was found that over longer periods of time, positive real rate of return was being provided by equities, but in the short run, the real return was often negative especially in years of high and extraordinary inflation. The simple regression analysis revealed that nominal return on equities in India increased, but not in proportion to the rate of inflation, thereby providing only a partial hedge against inflation. These findings remain true whether one measures inflation with the wholesale price index or the consumer price index.

Adrangi and Chatrath (1999) investigated the relationship between real stock returns and inflation for the developing markets of Peru and Chile. The period of this study covers from January 1985 to December 1995 for Chile, and January 1990 to March 1996 for Peru. The empirical tests are conducted within Fama's proxy hypothesis framework, which states that (i) there is a negative relationship between inflation and real activity, and (ii) the relationship between the real stock returns and real activity is positive. Their findings support the negative relationship between inflation and real stock returns in both markets.

Henry (2002) concluded that the stock market appreciates by an average of 24 per cent in real dollar terms when countries attempt to stabilize annual inflation rates that are greater than 40 per cent. In contrast, the average market response is 0 when the pre-stabilization rate of inflation is less than 40 per cent. These results suggest that the potential long run benefits of stabilization may dominate short run costs at high levels of inflation, but at low to moderate levels of inflation, benefits may be offset by costs in a present value sense. Stock market responses also help to predict the change in inflation and output in the year following all 81 stabilization efforts.

Knif et al. (2003) studied how inflation news affects the aggregate stock market by breaking down such news into positive, neutral, and negative inflation shocks, examining both daily and monthly event results, and defining economic states using both changes and levels of manufacturing capacity utilization. Their results demonstrate large market responses to both positive and negative inflation shocks in the post-event month, whereas smaller market responses occur with respect to neutral inflation shocks. They concluded that inflation shocks are important news events that can produce a variety of stock market reactions depending on economic state and type.
of inflation shock. Their evidence also suggested that inflation shocks can generate stock market overreactions in some cases.

Saryal (2007) used GARCH models to estimate conditional stock market volatility using monthly data from Turkey and Canada. He further analysed the impact of inflation and found that the rate of inflation has high predictive power for stock market volatility in Turkey, whereas it is weaker, but still significant for Canada. His findings suggested that higher the rate of inflation, greater the stock market volatility, that is, higher rates of inflation are coincident with greater stock market risk. These results were also supported when the change in the rate of inflation is used as explanatory variable for predicting conditional volatility.

Bordo et al. (2008) examined the association between inflation, monetary policy and U.S. stock market conditions during the second-half of the 20th century. They estimated a latent variable VAR to examine how macroeconomic and policy shocks affect the condition of the stock market. Further, they examined the contribution of various shocks to market conditions during particular episodes and found evidence that inflation and interest rate shocks had particularly strong impact on market conditions in the post-war era. Disinflation shocks promoted market booms and inflation shocks contributed to busts. They concluded that central banks can contribute to financial market stability by minimizing unanticipated changes in inflation.

Habibullah et al. (2009) examined the impact of inflation and output growth on stock market returns and volatility in selected Asian countries, viz. India, Japan, Korea, Malaysia and Philippines. By using monthly data from 1991 to 2004 and by employing GARCH (1, 1) model, it has been found that macroeconomic volatility, which is measured by movement in inflation and output growth, has a weak predictive power for stock market returns and volatility in these countries. The movements of the inflation rate have significant impact to the stock market returns, either positive or negative depending on the inflation rates and their fluctuation in that country. While output growth movements have significant effect on stock market volatility, countries with relatively higher output volatility are associated with higher conditional volatility of stock returns, which is positive effect but is negative for countries which have relatively lower output volatility.
Shehu (2010) applied the generalized autoregressive conditional heteroskedasticity (GARCH) model to assess the impact of inflation on stock market returns and volatility using monthly time series data from two West African countries, that is, Nigeria and Ghana. Results for Nigeria show weak support for the hypothesis which states that bad news exert more adverse effect on stock market volatility than good news of the same magnitude, while a strong opposite case holds for Ghana. Furthermore, inflation rate and its three month average were found to have significant effect on stock market volatility in the two countries. Measures employed towards restraining inflation in the two countries, therefore, would certainly reduce stock market volatility, improve stock market returns and boost investor confidence.

Mishra and Singh (2011) studied whether the stock market in India is driven by macroeconomic fundamentals. They employed a non-parametric approach to determine whether any variables were non-linearly related with stock returns and the variability of stock returns by taking monthly observations from 1998 to 2008. They considered exchange rate, interest rate, industrial production, inflation and foreign institutional investments as macroeconomic factors. Further, they employed a semi-parametric approach to see whether any of the macrovariables have a significant non-linear impact on the stock returns and on the variability of stock returns. The results suggested that of the Ordinary Least Square (OLS) and semi-parametric approaches, the semi-parametric approach better explains the stock returns and volatility.

2.3.3 Studies on Interest Rates and Stock Market

Some of the studies on the relationship between interest rates and stock market are given below:

Flannery and James (1984) examined the relation between the interest rate sensitivity of common stock returns and the maturity composition of the firm's nominal contracts. Using a sample of actively traded commercial banks and stock savings and loan associations, common stock returns are found to be correlated with interest rate changes. The co-movement of stock returns and interest rate changes is positively related to the size of the maturity difference between the firm's nominal assets and liabilities.

Chen et al. (1986) investigated whether innovations in macroeconomic variables are risks that are rewarded in the stock market. Financial theory suggests that the following macroeconomic variables should systematically affect stock market
returns: the spread between long and short interest rates, expected and unexpected inflation, industrial production, and the spread between high- and low- grade bonds. They found that these sources of risk are significantly priced. Furthermore, neither the market portfolio nor aggregate consumption are priced separately. They also found that oil price risk is not separately rewarded in the stock market.

Shiller (1987) observed that true investment value of the aggregate stock market changes through three indicators: changes in dividends, in real interest rates, and in a direct measure of intertemporal marginal rates of substitution. The study is based on United States from 1871 to 1986 and concluded dividend changes appear to contribute very little toward justifying the observed historical volatility of stock prices. The other indicators contribute some, but still most of the volatility of stock market prices appears unexplained.

Titman and Warga (1989) investigated whether stock returns provide forecasts of changes in interest rates and inflation. They found a reliable positive relation between stock returns and future inflation and interest rate changes. Real estate investment trusts, which are particularly interest and inflation sensitive securities, provide better forecasts than a broad market index. Finally, they found that most of the evidence supporting the forecasting ability of stock returns occurred in October 1979 to October 1982 period when the Federal Reserve Board chose not to counteract interest rate changes.

Binder and Merges (2000) examined a relationship between economic factors and stock market volatility using monthly data from January 1929 to April 1989. They developed a simple model of the economy under uncertainty which links stock market volatility to four economic factors, i.e., uncertainty about the price level, the riskless rate of interest, the risk premium on equity and the ratio of expected profits to expected revenues. They found that in initial tests these variables have significant explanatory power and account for over 50 per cent of the variation in market volatility from 1929 to 1989. When the regression coefficients are allowed to vary over time using cluster regression, the four factors explain over 90 per cent of the variation in market volatility. The results are useful in explaining the past behaviour of stock market volatility and in forecasting future volatility.

Scharler (2004) studied the reaction of stock market returns to monetary shocks in a general equilibrium model. In the model, the transmission of monetary
policy shocks into stock prices works primarily through changes in current and expected interest rates and dividends. A monetary contraction leads to higher nominal interest rates which, in turn, increase the opportunity cost of holding stocks and at the same time decreases dividend payments since firms have to borrow working capital. Both these effects put downward pressure on stock prices. It is found that the model generates responses that broadly match the empirical counterparts, although the magnitudes are somewhat too small. Moreover, the results suggest that the increased exposure of bank-dependent firms to liquidity shocks cannot fully account for the heterogeneous responses of returns that are observed across firms. In the model, monetary policy shocks have a substantial impact on the stock market.

Chakradhara (2008) observed the nature of relationship and the direction of causality between interest rates and stock prices in India for the period from April 1996 to June 2006. The monthly averages of the BSE Sensex and Nifty are used to measure stock prices. The month-end yields on 10-year government security and TB-15-91 are used to proxy for long-term and short-term interest rates respectively. He found that there is a long run relationship between interest rates and stock prices. Both long-term and short-term interest rates affect stock prices. The long-term interest rates are found to affect stock prices negatively, whereas short-term interest rates affect stock prices positively. In addition, the Sensex is found to be more responsive to changes in interest rates than the Nifty.

Leon (2008) investigated the effects of interest rate changes on the stock market returns and volatility in Korea using weekly returns on the KOSPI 200 and the NCD 91-day yield over the period from 31 January, 1992 to 16 October, 1998. A GARCH(1,1) augmented with interest rates and assuming a student’s t-distribution for error terms is used to test these relationships. Conditional market return was found to have a negative and significant relation with interest rates, while the conditional variance of returns has a positive but not significant relationship with interest rates. These results indicated that interest rates have a strong positive power for stock returns, and a weak predictive power for volatility.

Muthukumaran and Rengasamy (2011) estimated causality relationship between equity returns and select economic variables like inflation and interest rate. The data consisted of 72 months from April 2005 to March 2011. Macro variables considered for the study included Wholesale Price Index (WPI) and 91-Treasury bills.
The study reveals short-term and long-term relationship among the macroeconomic variables and equity returns through Granger causality technique. However, the interest rate found to influence stock returns and not the vice versa. Finally, the Vector Error correction model establishes that the equity returns are significantly influenced by all the economic variables in India. Thus, the study empirically proved that the macroeconomic variables played a significant role on Indian stock markets during the study period.

**2.3.4 Studies on Union Budget and Stock Market**

Rao (1997) studied the impact of macroeconomic events like union budgets and the credit policy announcements on stock prices from 1991-95. He found that budgets increased the volatility of stock prices of the market portfolio. However, the credit policy announcements were found to have no impact on stock price behaviour.

Thomas and Shah (2002) examined the interplay between the Union Budget and the stock market. They concluded that the stock market appears to be fairly efficient at information processing about the Union Budget.

Kaur (2004) studied the extent and pattern of stock return volatility of the Indian stock market during the years 1990 to 2000. She found that the month of April has been most volatile followed by March and February. This could probably be due to the effect of Union Budget, which is usually presented in the month of February.

Mohanty (2004) examined the stock price reaction to announcement of various policy issues by Government of India. The results show that the stocks generally react to public news quite quickly, but the first adjustment is not always the correct one.

Verma and Agarwal (2005) carried out an event study using budget as an event window for four years. The returns on CNX nifty index prior to and subsequent to the budget have been compared to assess the impact of the event. The findings of the study indicate that the event has a significant impact on the stock market.

Gupta and Kundu (2006) analyzed the impact of Union Budgets on stock market considering the returns and volatility in Sensex. They found that budgets have maximum impact in short-term post-budget period, as compared to medium-term and long-term average returns and volatility does not generally increase in a post-budget situation as the time period increases.

Porwal (2009) investigated to what extent the budget is responsible for fluctuations in the stock prices and found that out of 7 budgets, 4 have witnessed a fall
in the volatility from the normal. Secondly, after the budget date, volatility dies down or rises up to the normal volatility.

Sharma and Mehta (2010) examined the impact of union budget announcement on the performance of banking sector stocks. The empirical evidences showed that some significant patterns existed in the daily return series of the banking stocks resulting informational asymmetry in the Indian stock market.

2.4 STUDIES ON IMPACT OF COMPANY-SPECIFIC FACTORS ON STOCK RETURNS

Company-specific variables like dividend per share, earning per share, company size and book value per share are also held responsible for the movement in share prices.

Gordon (1959) analysed a set of regression equations to study the impact of various variables in the market prices of shares. The equations analysed by him were:

\[ P = a_0 + a_1 D + a_2 Y \]  
\[ P = a_0 + a_1 D + a_2 (Y-D) \]  
\[ P/W = a_0 + a_1 D/W + a_2 (D/W-D) + a_3 g + a_4 (g-g') \]

Where,

\( P \) = price per share, \( D \) = dividend per share, \( Y \) = earning per share, \( W \) = book value per share, \( g \) = growth measure.

The above equations were studied for four industry samples for two years. The main findings of the study were (i) In equation (1) \( a_1 \) are high and stable; \( a_2 \) are very low; (ii) In equation (2) \( a_1 \) are much higher than \( a_2 \) and \( a_3 \) are very low (they are insignificant in two cases); (iii) In equation (3) there is slight improvement in dividend coefficient, both in statistical significance and in the range of fluctuation. The growth coefficient, however, is disappointing.

Fisher (1961) examined the effects of four variables on the share prices prevailing in the market for different companies. These were the last declared dividend per share, last declared undistributed profits per share, the past average annual growth in dividend per share and the sizes of the companies to which share corresponds. Five industry samples for five years were used. Main findings of the study were (i) Variation in the last declared dividend per share account for a considerable part of the variation in share price between companies. (ii) The last declared undistributed profit per share has a significance influence on share prices.
However, in relation to dividend, undistributed earnings have a weak influence. (iii) The influence on dividend and undistributed profits appear to be fairly stable from year to year. (iv) The influence of the past rate of growth in dividend per share on share price appears to be small and uncertain.

Desai (1965) examined the impact of dividend per share, retained earnings per share and earning per share on the market price per share by using linear regression model. He used a sample of 31 Indian companies during the year 1960. The results indicated that current dividends were the best explanatory variable for stock prices, while earnings and retained earnings were found to be satisfactorily insignificant.

Srivastava (1968) studied the influence of dividend and retained earnings on the share prices of the joint stock companies. The study has been confined to six industries, viz. cotton, tea, electricity, sugar, coal and paper for the year 1961. He concluded that dividend has a strong but retained earnings have no significant influence on share prices in India.

Chandra (1981) conducted a study relating to two group of companies; across the broad group which consisted of 50 shares drawn at random from a group of 110 shares of firms in all industries except banking, insurance, and textile; and 30 shares of cotton–textile group. The main findings of the study indicate that returns, growth and size had a positive influence on share price, while risk and leverage had no influence on share price.

Dixit (1986) conducted a study of 42 companies for a period of 20 years i.e., 1961-82. Dividend and earnings turned out to be most significant predicative variables (a variable that can be used to predict the value of another variable), whereas growth and leverage appeared to be redundant variables. Return on investment had comparatively weak influence on share price.

Dhillon and Johnson (1994) examined the impact of dividend changes on both the stock and bond markets. They found the positive response of stock market to dividend increases and it has several potential explanations, two of the more commonly discussed being information content and wealth redistribution between stockholders and bondholders. The evidence presented supports the wealth redistribution hypothesis but does not rule out the information content hypothesis. Typically, they find that the bond price reaction to announcements of large dividend changes is opposite to the stock price reaction.
Singh (1995) undertook an empirical study of 120 companies for a period of ten years from 1983 to 1992. Dividend per share and earning per share had positive and significant impact on share price. Growth and return on investment had weak influence, whereas bonus issue had a positive and significant effect on share price. Performance and growth were the broad indicators of quality of management.

Sharma and Singh (2006) examined the empirical relationship of explanatory variables, namely, dividend per share, earnings per share, book value per share, size, cover, return on capital employed and payout ratio on the market price of shares in the post-reform era. The relationship between independent and dependent variables of 160 companies is studied over a period of five years spanning from 2001 to 2005. The results reveal that earnings per share and book value per share are important determinants of share price as they are indices healthy for financial position of companies. Dividend per share is the important indicator of share price which shows that the companies should adopt a liberal dividend policy to activate the primary as well as secondary market.

Singhania (2006) studied the various determinants of equity share prices with reference to Indian stock market. The mean values have shown that during the period 1997 to 2004, the market price was far lower due to various uncertainties prevailing in the country. The correlation analysis shows positive significant (1%) association of only price earnings ratio with market price. Book value, dividend cover, dividend per share, earning per share and growth are positive but insignificant. At the same time, there is negative insignificant association of yield with Market Price (MP). While regression analysis depicts that book value, dividend per share, earnings per share and price earnings ratio are significant determinants, whereas dividend cover and yield are insignificant with negative value. Growth remained insignificant but with positive value.

Das and Pattanayak (2007) determined and analyzed empirically the factors that significantly affect the stock price movements and thereby influence the entire market movement. This study considered only Sensex as representative of the entire market for a period of 5 years, i.e., 2001-05. The various explanatory variables, which are acting as major determinants of stock price movements, are condensed into a few critical factors by the factor analysis and the relevance of these factors in influencing the stock market movements is explained in detail. The results reveal that few factors
are acting as major determinants of stock price movements and thereby have a significant bearing on the entire market.

Nirmala et al. (2011) identified the determinants of share prices in the Indian market. The study uses panel data pertaining to three sectors, viz. auto, healthcare and public sector undertakings over the period 2000-09 and employs the fully modified ordinary least squares method. The results indicated that the variables dividend, price-earnings ratio and leverage are significant determinants of share prices for all the sectors under consideration. Further, profitability is found to influence share prices only in the case of auto sector.

Sharma (2011) examined the empirical relationship between equity share prices and explanatory variables such as book value per share, dividend per share, earning per share, price-earning ratio, dividend yield, dividend payout, size in terms of sale and net worth for the period 1993-94 to 2008-09. The results revealed that earning per share, dividend per share and book value per share have significant impact on the market price of share. Further, results of the study indicated that as dividend per share and earning per share are found to be the strongest determinants of market price, a liberal dividend policy needs to be followed by the companies.

Shukla and Devani (2011) analyzed the interrelation between the equity prices and some explanatory variables, i.e., book value per share, dividend per share, dividend yield, dividend cover, growth, price-earning ratio and earning per share. The period of the study was from 2005-09. It could be concluded from the correlation and regression analysis that price-earning ratio, earning per share, dividend per share and dividend cover were the variables which contributed significantly in determining the share prices followed by dividend yield and book value.

Gill et al.(2012) examined variables that explain the variance of equity share prices in America. A sample of 333 American firms listed on New York Stock Exchange (NYSE), USA for a period of 3 years (from 2009-11) was selected. This study applied co-relational and non-experimental research design. The overall findings of this study show that book value per share, earnings per share, dividend per share, price-earning ratio, the Chief Executive Officer (CEO) duality, and the internationality of the firm explain the variance of equity share prices in America.
2.5 STUDIES ON OTHER FACTORS AFFECTING THE STOCK MARKET

Galeotti and Schiantarelli (1984) suggested that movements in stock prices cannot be satisfactorily explained purely in terms of changes in fundamentals. This paper is based on the simple idea to obtain proxies for the fundamental and fad components of movements in stock prices. They found that changes in investment are significantly associated with movements in both components of stock prices. The point estimates suggest that changes in fundamentals have a greater effect than changes in non-fundamentals. The statistical significance of the difference between their coefficients depends upon the financing regime. These conclusions are shown to be robust to modifications and extensions of the model.

De Bondt and Thaler (1985) investigated whether people tend to overreact to unexpected and dramatic events and thus affect stock price movements. The study used monthly stock return data from NYSE during the period from 1926 to 1982. The study, thus, emphasized the notion the investors overreact and push stock prices to extreme ends on both sides and that the market may be efficient in the short run but not in the long run.

Lockwood and Linn (1990) examined the variance of hourly market returns on the Dow Jones Industrial Average during 1964-89. Results indicate that return volatility falls from the opening hour until early afternoon and rises thereafter, and is significantly greater for intraday versus overnight periods. Market variance is also shown to change significantly over time, rising after NASDAQ began in 1971, and rising after trading in stock options began in 1973, falling after fixed commissions were eliminated in 1975, rising after trading in stock index futures was introduced in 1982, and falling after margin requirements for stock index futures became larger in 1988.

Jones and Kaul (1996) studied the reaction of international stock markets to oil shocks can be justified by current and future changes in real cash flows and/or changes in expected returns. They found that in the post-war period, the reaction of United States and Canadian stock prices to oil shocks can be completely accounted for by the impact of these shocks on real cash flows alone. In contrast, in both the United Kingdom and Japan, innovations in oil prices appear to cause larger changes in
stock prices than can be justified by subsequent changes in real cash flows or by changing expected returns.

Bushee and Noe (2000) investigated whether a firm's disclosure practices affect the composition of its institutional investor ownership and, hence, its stock returns volatility. The findings indicate that firms with higher AIMR (Association for Investment Management and Research) disclosure rankings have greater institutional ownership, but the particular types of institutional investors attracted to greater disclosure have no net impact on return volatility. However, yearly improvements in disclosure rankings are associated with increases in ownership primarily by "transient" institutions, which are characterized by aggressive trading base.

Mohanty (2004) examined the stock price reaction to announcement of various policy issues by Government of India. The study covered the three industries, viz. the telecom sector, the banking and financing sector and the pharmaceutical sector. He used the event study methodology to assess the speed and accuracy of stock price reaction to public announcement. The results show that the stocks generally react to public news quite quickly, but the first adjustment is not always the correct one. There is also a mild evidence of presence of learning lag.

Gogineni (2008) studied stock market's reaction to oil price changes and found that the direction and magnitude of the market's reaction to oil price changes depend on the magnitude of the price changes. The sample period spans from April 1983 to December 2006. Oil price changes most likely caused by supply shocks have a negative impact, while oil price changes most likely caused by shifts in aggregate demand have a positive impact on the same day market returns. In addition to the returns of oil-intensive industries, returns of industries that do not use oil to any significant extent are also sensitive to oil price changes. Finally, he shows that both the cost-side dependence and demand-side dependence on oil are important in explaining the sensitivity of industry returns to oil price changes.

Lazaros et al. (2010) investigated the empirical association between stock market volatility and investor mood-proxies related to the weather (cloudiness, temperature and precipitation) and the environment (night time length). Overall, results suggested that cloudiness and length of night time are inversely related to historical, implied and realized measures of volatility. The strength of association seems to vary with the location of an exchange on Earth with respect to the equator.
Weather deviations from seasonal norms and dummies representing extreme weather conditions do not offer additional explanatory power in datasets.

Muthukumaran and Senthamil (2011) measured the impact of Global Financial Crises on Indian economy in general and on the Indian Stock Market in particular. Additionally, discussed the role of RBI in the present context and examined the relationship between the Indian stock market and US stock markets. They employed the data from January 1, 1999 to December 31, 2008 to investigate the impact on Indian stock market and the integration of Indian stock market and US stock market. The results suggested that the Indian Stock market was affected by the Global financial crunches.

2.6 STUDIES ON THE RELATIONSHIP BETWEEN VOLATILITY AND STOCK PRICE RETURNS

Numerous empirical studies have been conducted to investigate the relationship between stock market returns and volatility. However some of the important contributions are as follows:

French et al. (1987) examined the relation between stock returns and stock market volatility. They found that the expected market risk premium is positively related to the predictable volatility of stock returns. There is also evidence that unexpected stock market returns are negatively related to the unexpected change in the volatility of stock returns. This negative relation provides indirect evidence of a positive relation between expected risk premiums and volatility.

Baillie and DeGennarro (1990) summarized most asset pricing models postulate a positive relationship between a stock portfolio's expected returns and volatility. They used GARCH-in-mean models to examine the relationship between mean returns on a stock portfolio and its conditional variance or standard deviation. After estimating a variety of models from daily and monthly portfolio return data they concluded that any relationship between mean returns and own variance or standard deviation is weak. The results suggested that investors consider some other risk measures to be more important than the variance of portfolio returns.

Glosten et al. (1993), using a modified GARCH-M model, concluded that there was a negative relation or no relation at all between expected returns and anticipated volatility. They also showed that monthly conditional volatility may not be as persistent as was thought. Positive unanticipated returns appear to result in a
downward revision of the conditional volatility whereas negative unanticipated returns result in an upward revision of conditional volatility.

Qi et al. (2005) examined the relationship between expected stock returns and volatility in the 12 largest international stock markets during January 1980 to December 2001. They found a positive but insignificant relationship during the sample period for majority of the markets based on parametric EGARCH-M models. However, using a flexible semi-parametric specification of conditional variance, they found evidence of a significant negative relationship between expected returns and volatility in 6 out of the 12 markets.

Athanasios and Nicholas (2006) studied the relationship between stock price returns and volatility for industrialized countries (Australia, Canada, France, Japan, the US, the UK, Germany, and Italy) taking into account two models, the GARCH-M and the E-GARCH. They found through the use of the two models that the relationship between stock price returns and volatility is weak for the specific stock markets of industrialized countries.

Dimitrios and Theodore (2011) investigated the relationship between expected stock returns and volatility in the twelve European Monetary Union (EMU) countries as well as five major out of EMU international stock markets. Based on parametric GARCH in mean models they found a weak relationship between expected returns and volatility for most of the markets. However, using a flexible semi-parametric specification for the conditional variance, significant evidence of a negative relationship in almost all markets. Furthermore, they investigated the asymmetric reaction of volatility to positive and negative shocks in stock returns confirming a negative asymmetry in almost all markets.

Dutt and Humphery (2012) studied the link between stock return volatility, operating performance, and stock returns. They found that low volatility stocks earn higher returns than high volatility stocks in emerging markets and developed markets outside North America. They emphasized the importance of controlling for stock return volatility when analyzing operating performance and stock performance.

2.7 STUDIES ON MODELLING AND FORECASTING CONDITIONAL VOLATILITY OF THE INDIAN STOCK MARKETS

The focus of the studies is on the time series behaviour of stock return volatility. Extensive empirical research has been carried out with the main focus on
modelling and forecasting volatility using variety of applications of ARCH, GARCH, EGARCH, TGARCH and many more models to stock market return in the context of emerging economies. Some of the important contributions are as follows:

Philip and Dick (1996) studied the performance of the GARCH model and two of its non-linear modifications to forecast weekly stock market volatility. They found that the QGARCH model is best when the estimation sample does not contain extreme observations such as the 1987 stock market crash and that the GJR (Glosten, Jagannathan and Runkle) model cannot be recommended for forecasting.

Karmakar (2006) measured the volatility of daily returns in the Indian stock market over the period 1961 to 2005 by using the GARCH model and observed that the market is tranquil and volatile. The level of volatility is modest for the first two decades of the 1960s and 1970s. Almost from the beginning from 1980s there were indications of change in the mood of the market. Volatility touches new high from 1985 and during the year 1992, it surpassed all previous records and continued to increase till the end of the decade. During the last two years volatility has declined and this period is accompanied by increasing price rise, mainly fuelled by the investments made by the FIIs.

Joshi and Pandya (2008) examined the nature of volatility in the Indian stock market, namely, the BSE and NSE. Various volatility estimators and diagnostic tests suggest certain stylized facts about volatility such as volatility clustering and mean reverting. This study used 16 years of daily data (July 1990 - October 2006) on Sensex and Nifty to capture these facts. The results revealed that the GARCH (1, 1) model satisfactorily explains volatility and is the most appropriate for the series under analysis. The model with large value of lag coefficient shows that the volatility in the both markets is highly persistent and is predictable. The relatively small value of error coefficient of GARCH (1,1) implies that large market surprises induce relatively small revisions in future volatility.

Srivastava (2008) developed models to elucidate the volatility of the stock of the major indices of India, i.e., Bombay Stock Exchange (SENSEX) and National Stock Exchange (NIFTY) from April 2000 to March 2008. He used the Autoregressive Conditional Heteroskedasticity (ARCH) model and its extension, the Generalized ARCH, EGARCH and TARCH models to find out the presence of the stock market volatility on Indian stock market. The findings suggested that both the
Indian stock exchanges have significant ARCH effects and it is appropriate to use ARCH/GARCH models to estimate the process.

Hung and Yen-Hsien (2009) investigated how specifications of return distribution influence the performance of volatility forecasting using two GARCH models (GARCH-N and GARCH-SGED). Daily spot prices on the Shanghai and Shenzhen composite stock indices provide the empirical sample for discussing and comparing the relative out-of-sample volatility predictive ability, given the growth potential of stock markets in China in the eyes of global investors. Empirical results indicate that the GARCH-SGED model is superior to the GARCH-N model in forecasting China stock market’s volatility, for all forecast horizons when model selection is based on MSE or MAE.

Srinivasan and Ibrahim (2010) examined modelling and forecasting the volatility (conditional variance) of the SENSEX Index returns of Indian stock market, using daily data, covering a period from 1st January, 1996 to 29th January, 2010. The forecasting models that were considered in this study range from the relatively simple GARCH (1, 1) model to relatively complex GARCH models (including Exponential GARCH (1, 1) and Threshold GARCH (1,1) models). Based on out-of-sample forecasts and a majority of evaluation measures, results show that the symmetric GARCH model do perform better in forecasting conditional variance of the SENSEX Index return rather than the asymmetric GARCH models, despite the presence of leverage effect.

Rastogi and Srivastava (2011) used time varying based GARCH process to capture the change in the volatility and study its impact on the Indian securities market. Further, change in the volatility of US securities market has been compared with change in volatility of Indian securities market at different times of uproar in the Indian economy. It had been found that co-movement in terms of conditional volatility in both the markets is not prominent.
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