Chapter – III

LITERATURE SURVEY
The investment in the stock market covers a wide spectrum. The issues like efficiency and inefficiency of the short-term and long-term market, the pattern of the share prices, the return analysis and strategy formulation are some of the very important issues associated with the subject. There are several works related to that. Some found the independence of share price and its randomness. Some found dependencies in the share price. While discussing dependencies with prior price we put emphasise on 'over-reaction hypothesis and literature related to price reversals. Finally, the research gap has been discussed.

3.1 Independence of Share Price

Long ago, in the year 1900, Mr. L.J.M.A. Bachelier first developed the theory of independence of security prices. Later on Mr. M.F.N. Osborne empirically supported the model of Mr. Bachelier. The most convincing and popular arguments in favour of independence of the share prices were put by Fama (1965). The theorists say that the price changes from transaction to transaction in an individual security are independent. The occurrence and nature of the news flows are unpredictable. The share market is such efficient that all the information is instantaneously incorporated in the share prices. So, the share prices move on unpredictably depending on news flows. Thus the Efficient Market Hypothesis (EMH) was developed. Because of the unpredictability of the share price, EMH

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2 Ibid
3 Ibid
sometimes synonymously called Random Walk Hypothesis as well. There are hundreds of studies supporting the EMH and independence of share price. Poterba & Summers (1988) observed that random walk hypothesis cannot be rejected at conventional statistical level. Basu (1977) noticed that the security prices during the period April 1957 to March 1971 and found that price behaviour is consistent with semi strong version of the "fair game" model cannot be rejected unequivocally. The empirical evidence in support of random walk hypothesis rests upon statistical tests. The result has been unanimously in support of random walk hypothesis. Lorie & Hamilton (1973) commented that due to the efficiency in the stock market, the prices would be 'appropriate' at the current knowledge and investors are less likely to make unwise decisions on investments and a corollary is that investors are less likely to earn high rate of returns. The Efficient Market Hypothesis (EMH) is the most discussed issue in the Capital Market. There are several studies on stock market of the developing nations that empirically tested the efficiency of the stock market. Dickinson & Murugu (1994) attempted to find out whether there is weak form efficiency in the stock market of the developing countries. The result from individual serial correlation coefficient indicated that the majority of them are not statistically different from zero at five percent level of significance. The study concluded with the evidence that developing market like Nairobi Stock Exchange may provide empirical result consistent with weak form efficiency.

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3.1.1 Independence in Indian Context

In Indian context, Dhankar (1991) empirically tested the efficiency of Indian stock market taking 43 companies covering period from July 1989 to June 1990.\textsuperscript{10} The analysis carried out indicates that share price movements over the short periods do not display any systematic or recognisable pattern and the share prices are not predictable from their own historical price behaviour. He found independence in the Indian stock market after carrying out serial correlation and run test analysis and concluded that the random walk model hold good in Indian stock market, hence can be described as weak form efficient market.\textsuperscript{11} Later on, Dhankar (1993) tested the efficiency on the non-specified group of scrips that tends to demonstrate semi-strong form of efficiency.\textsuperscript{12}

\textit{Daterao & Madhusoodanan} (1996) applied Fractal and Chaos theory on RBI index and concluded that Indian market is not inefficient rather it is chaotic.\textsuperscript{13} The information are not immediately priced, it takes time. \textit{Bhole & Pattnaik} (2002) conducted the study for the period 1983-84 to 1999-2000 and concluded that share price behaviour is not explained by relevant economic fundamentals like profitability, sales, dividend of the company and the industrial output.\textsuperscript{14} In a way, they did not find any logical dependency between macro or micro factors and the


\textsuperscript{11} Ibid


share prices. This only supports the evidences of unpredictability and randomness.\textsuperscript{15}

These theories led us to believe that share prices are random and unpredictable. As such, none can gain extraordinary profit. In fact, due to this prevailing uncertainty Keynes (1957) termed the stock market as ‘Casino’.\textsuperscript{16} The discussions include hundreds of debate over EMH among the academicians and practitioners as regards independence or otherwise of the share price and the debate is still on. Now let us discuss the other side of the Efficient Market Hypothesis. Some very important works that show dependencies among share prices would be discussed in this regard.

3.2 Dependencies in Share Prices

These dependencies are of two types: (1) dependency of share price with micro and macro level fundamental and (2) dependency of share price with previous price itself.

3.2.1 Dependency of Share Price with respective Fundamentals

Long ago, a very important study on dependencies was carried out by Graham & Dodd (1962).\textsuperscript{17} They observed that dividend policy affects share price, higher the dividend payout ratio higher would be the price, other things remaining equal. They argued that the strategies of investing in value stocks outperform the market.\textsuperscript{18} Fama & French (1988) concluded that dividend yield predicts 25% of variation in

\textsuperscript{15} Ibid
\textsuperscript{18} Ibid
three to five year horizon. Mandelbrot (1966) was of the opinion that it is possible to develop a model showing independencies and it is also possible to develop a model showing dependencies of the share price as well. But, at the same time, he argued that even if dependencies of the share prices can be detected, that would not help the investors to increase their profits. Basu (1977) observed that low p/e stocks may outperform high p/e stocks. But after considering brokerage and tax the low p/e stocks yields only marginal excess profit which is not statistically significant. So the study supported Mandelbrot (1966) only.

On the other hand, most of the works on dependencies shows that an investor can exploit the situation by adopting a suitable strategy. Jegadish (1990) and Lehmann (1990) rejected the existence of efficiency in the market. Summers (1986) observed that the pricing analysis suggests that certain types of efficiency in market valuations are not likely to be detected by standard methods. This means evidence found by many studies that the hypothesis of efficiency can not be rejected should not lead us to conclude that market prices represent the acceptance of EMH. Shen (2003) was of the opinion that investment based on p/e ratio may not earn excess profit. But strategies developed on the basis of the difference between p/e and interest rate may prove to be fruitful. He surveyed data

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22 Ibid


from 1962 through 2000 indicated that the negative monthly return in the S&P 500 index are more likely to occur when (e/p – int. rate) at the end of the prior month were at extremely low levels. He concluded that investment at low level of (p/e – interest rate) might outperform the market consistently. Sometimes ago, Daniel & Titman (1997) indicated that high book-to-market stocks and stocks with low capitalisation may earn higher return. Agarwal, Monem & Ariff (1996) considered price to book ratio as valid valuation model for the Singapore Market. Rechenstein & Rich (1993) observed risk premium can predict long horizon return.

3.2.1.1 Dependencies with Fundamentals in Indian Context

Indian stock market is highly inefficient. Krishnan (1984) shows that higher dividend may lead to improve stock price of particular scrip. Mahapatra & Sahu (1993) concluded that dividend per share is very important guide for taking investment decision. There was no major study showing book value as the criteria for taking investment decision in Indian Market. Sen (1996) carried out regression analysis of Sensex as dependant variable and Industrial Production and Foreign Exchange Reserve as independent variable. He found both the factors are very

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important for influencing stock market. Joshi (1994) using time series regression found reliable positive and significant relation between nominal stock return and inflation during the period 1971-1991.

3.2.2 Dependency of Share Price with Previous Price Itself

There are some studies like De Bondt & Thaler (1985) which suggest that if stock prices of any particular pattern can be estimated then future price may also be indicated at least to some extent from the past data alone, without any sorts of accounting data such as earnings. De Bondt and Thaler (1985, 1987) observed that investors might earn excess return in the month of January. Jegadish (1991) concludes US and UK stock market exhibit higher return in January, specially for the loser portfolios. Pan, Liano & Huang (2004) studied sources of profits to momentum strategies of buying past winner industry portfolio and selling past loser industry portfolios. The authors found that industry momentum strategy can generate significant, positive profit specially in the short horizon (less than 4 weeks). Jegadish & Titman (1993) documents that share

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39 Ibid
prices may follow similar trend for a holding period of 3 to 12 months.\textsuperscript{40} Fisher and Jordon (1977) concluded that random walk model shows nothing about trends in the long run; it exhibits only the phenomenon of short-run price changes independence.\textsuperscript{41} Gencay (1996) predicted security returns with moving averages rules in the situation of non-linearity.\textsuperscript{42} A specific pattern was observed by the researchers. The pattern was after initial ups and downs the prices tend to revert to mean.

Fitzpatrick (1995) observed that even if market gets informationally efficient, this would not create an efficient market because investors over long periods of time tend to follow the crowd.\textsuperscript{43} So, at least in the long-run market is inefficient. Mills (1996) was of the view that traditional efficient market --- random walk paradigm is fast becoming obsolete as more and more example of successful non-linear forecasting models and accompanying trading schemes are uncovered.\textsuperscript{44} Jorion & Goetzmann (1999) studied 39 countries for very long period from 1939 to 1996 to estimate long-term expected return on equities. They computed compounded growth rate in nominal term, real term and dollar term.\textsuperscript{45}

3.2.2.1 Dependencies and Inefficiency in Indian Context


There were some studies in India in this field. Sharma (2004) demonstrated seasonal effect in the Indian Stock Market. He had taken three stock index --- Sensex, NATEX and BSE 200 from the period 1996 to 2002 and showed highest variance and average return on Mondays.\textsuperscript{46} Lamba (1999) concluded that Indian stock market has been isolated in general. But he further concluded that bullish and bearish phases of external market influence Indian Market. The influence remains for 0-15 days.\textsuperscript{47} Later on, Mathew (2000) is of the opinion that Indian Stock prices are co-integrated with UK stock prices.\textsuperscript{48} Nath (2003) concludes that their result shows significant amount of interlinkage among the stock market of different countries in the short run.\textsuperscript{49} The developed markets like US, UK and France have significant causal effect on emerging markets.\textsuperscript{50} Indian market is being increasingly explained by regional foreign market like Hong Kong and Singapore along with other developed market.\textsuperscript{51} Marisetty & Vedpurishwar (2002) states the BSE 500 data during 1991-2001 and found asymmetry in return distribution and observed significant positive skewness in Indian Stock return. They found positive skewness in the return distribution.\textsuperscript{52} The positive skewness demonstrates that mode of the distribution is less than the mean indicating tendency of share prices to move below the mean. Bhole (1995) has taken Sensex data for the period 1985-86 to 1993-94 and demonstrated trends in secondary


\textsuperscript{50} Ibid

\textsuperscript{51} Ibid

market. Dhankar (1991) examined the efficiency or otherwise of the Indian Market and concluded that Indian Stock Market is weak form efficient. Madhusoodanan (1997) concluded that his findings do not support that risk and expected returns are really positively related. The analysis indicated that higher risk is not priced and hence investing in higher risky securities expecting higher returns will be of no use. He argued that someone could exploit the inefficiency of the stock market. Mallik (1992) demonstrated that the share price has two components -- transitory and permanent component. He showed effect of transitory component in short-term decision-making. The result in fact points out the ranges in which a share price could move around and thus he also supported the inefficiency of the Indian Stock Market. Pandey and Bhatt (1989) in a survey of one hundred and sixty respondents including CFO, accounting teachers, CAs, investors and brokers found Indian Stock Market is not efficient in any of the three forms.

The discussion and debate regarding EMH is on for more than a century. But after mid eighties there are several academic work on a particular aspect of dependencies in the share market i.e. over reaction and price reversals. There are several studies like De Bondt & Thaler (1985, 1990), Fabozzi (1995), Bremer

and Sweeney (1991), Lehmann (1990), all over the world regarding the evidence of over-reaction and under reaction. Some academicians like Hirschey (2003), observed that the share price reversal either in short term or in the long-term, some like Poterba & Summers (1988), Jegadish (1991), Barberis (2000) found mean reversion in particular. There are again some studies, which not only showed over-reaction and under-reaction of the investors but also developed successful strategies to exploit those situations in favour of investors.

3.2.2.2 Over Reaction and Price Reversal
There are several studies all over the world regarding the evidence of over-reaction and under-reaction. Some observed share price reversals either in short-term or long-term. Some observed mean reversion in particular. There are again many studies that not only showed disproportionate reaction of the investors but also developed successful strategies to exploit this situation in favour of investors.

De Bondt & Thaler (1985) popularised the ‘Over-Reaction’ hypothesis in the Investment Management.\textsuperscript{67} The research in experimental psychology suggests that most people ‘Overreact’ to unexpected and dramatic news events. They observed in the CRSP monthly return data that due to over reaction and under reaction ‘past losers’ portfolio out perform ‘past winner’ portfolios in the US market. As a result, there would be extreme movements in stock prices.\textsuperscript{68} It is not only novice investors overreact but also the professional fund managers and expert analysts also react too much.\textsuperscript{69} Fama (1998) comments that people give too much weight to recent pattern in the data and to little to the preparation the population that generate data.\textsuperscript{70} So, it can be said that long-term return normalizes after unjust ups and down. Recently, Fung & Lam (2004) supported the overreaction in the stock market showing the price anomaly between share prices and their derivatives.\textsuperscript{71}

Fabozzi et. al. (1995) state that an individual tends to de-emphasise prior information and over emphasise current information in estimating likelihood of a future.\textsuperscript{72} The authors were of the opinion that a preference reversal behaviour of the investors that is consistent with empirical anomalies documented in the financial market. Based on the above background, the authors observed the evidence that large intra-day price movements are often followed by price reversals within the same day. Bremer and Sweeny (1991) concluded that

\textsuperscript{68} ibid
extremely large (10% or more) negative rates of return are followed on average by larger than expected positive rates of return over following days. The price adjustment lasts approximately for two days. Lehmann (1990) observed that the portfolio of securities that had positive returns in a week typically had negative return in the next week, while those with negative returns in one week had positive return in the next week. Goetzmann (1993) studied LSE and NYSE data for a very long period from 1700-1989 and found tendency for long-term mean reversion. Jegadish (1991) found that NYSE and UK exhibit mean reversion over sample period 1926-88. However, they observed that the phenomenon of stock price mean-reversion is entirely concentrated in the month of January. Jegadish & Titman (1993) observed past winners may earn excess profit in short-term. They further commented that there is evidence of consistency with delayed price reaction to firm specific information. If stock prices overreacts and under reacts to information, the profitable investment strategies based on past data would exist. The stock market takes several months to adjust this over or under reaction. As a result, however, long-term preferences of these past winners and losses reveal that half of their excess return in the year following the portfolio formation date dissipates within the following two years. Hirschey (2003) is of the opinion that without correlation between historical and forward-looking market returns knowledge of historical returns give us absolutely no information about forward-

74 Ibid
looking returns. In this event, an investor's best guess as to how the market do during any future period, irrespective of historical bear and bull markets as the population average rate of return. Further, Hirschey (2003) concludes that the return series after 12 months shows 'return reversal' and not 'mean reversion'. If the investors systematically overweight recent bad news about negative market returns, investor fear can push stock prices far below fundamental values. Similarly, if investors systematically overweight recent good news about positive market returns, investor greed can push stock price above fundamental economic values. In both instances, cognitive bias among investors can lead to predictable mispricing. He further added that the high degree of negative autocorrelation evident in annual return for the S&P 500 and NASDAQ suggests that long-term return in the stock market is not random. Instead, he commented, this evidence is consistent with the notion that, in the short run, stock price may in fact be susceptible to extraordinary swings driven by investor sentiments of greed and fear.

Fama & French (1988) concluded that the auto correlation among share prices is weak for daily and weekly data. But there is strong negative autocorrelation for long horizon returns. This large negative autocorrelation for 3-5 year return data suggests that predictable price variation even up to 40% is due to mean reversion. Poterba & Summers (1988) studied stock data of seventeen countries

79 ibid
82 Ibid
83 Ibid
85 Ibid
including India and conclude that the stock return shows positive serial correlation over short period and negative serial correlation over longer intervals.\textsuperscript{86} That means the stock return follows the trend over short-term and follows the opposite trend in the long-term. The study suggests, in recent years, mean reversion is more pronounced in developing foreign equity market than in the US.\textsuperscript{87} They opined that a transitory component in the price account for a substantial part of the variance in return. The presence of the transitory component infers that the desirability of investment strategies involving the purchase of securities that have recently declined in value.\textsuperscript{88} \textit{Lakonishok, Shleifer and Vishny} (1994) concluded that their result establish an investment strategies which involve buying out-of-favour (value) stocks that have outperformed glamour (popular) stocks.\textsuperscript{89} They pointed out that a likely reason of these value strategies (investment in value stocks) working so well is that fact that the actual growth rate of earnings, cash flow etc. of glamour stocks relative to value stocks turned out to be much lower than they were in the past. But market participant appears to have consistently overestimated future growth rates of glamour stocks relative to value stocks.\textsuperscript{90} \textit{Barberis} (2000) concluded that time variation in expected returns induces mean reversion in returns, slowing the growth of conditional variances of long-horizon returns.\textsuperscript{91}


\textsuperscript{87} Ibid

\textsuperscript{88} Ibid


\textsuperscript{90} Ibid

\textsuperscript{91} Ibid
3.2.2.3 Mean Reversion and Over Reaction in Indian Context

In Indian context, Madhusoodan (1997) concludes that in general volatility in Indian Stock Market is a bounded set. This indicates that there is some limit as to how far market can wander as random walker before it comes back to normalcy. Bounded Volatility implies reverting behaviour. A mean reverting process is nothing but the behaviour of a series that had given higher (lower) return in one period to revert back and give lower (higher) return in the next period. Indian shares are found to be overreacting and mean reverting. So, one can opt for contrarian Strategy of selling winners and buying losers of one period for getting extra ordinary returns in the next period.

3.3 Effect of Economic Liberalisation in Indian Context

It is also to be noted that the history of Indian stock market may be traced even before the start of the previous century. But there are hardly sufficient studies on the subjects. Only recently i.e. after 1980s, we found some serious literature on Indian Stock Market. In India, there are some works on short-term return in the stock market. But there is very few work on long-term return. In this background, we kept our focus on the analysis of Indian Stock Market from long-term viewpoint. Let us check some of the studies that have demonstrated the effect of economic liberalisation on different aspect of the stock market. Kaur (2005) studied the volatility of the Indian stock market taking Nifty and BSE 30 for the period 1991 to 2003. He found the magnitude of volatility using different types of Auto Regressive Conditional Heterodescity (ARCH) model and compare with the volatility of US

93 Ibid
market.\textsuperscript{95} Sharma (2004) found evidences of seasonality in Indian stock index using log return data as the popularly used indices in India from the period.\textsuperscript{96} Nath (2003) concluded that significant amount of linkages among different stock markets in the short run but no long run equilibrium relationship.\textsuperscript{97} He further commented that Singapore and Hong Kong have been playing leading roles and affecting other market in Asia.\textsuperscript{98} Lamba (1999) using vector auto regression model concluded that some countries Hong Kong, Japan, Singapore exert some influence to Indian market during bear phase and UK market exert influence to some extent on Indian Market bull phase.\textsuperscript{99} It is further observed that such influence lasts for a period of 0-15 days.\textsuperscript{100}

Mathew (2000) concludes that high correlation of Indian Stock price and interest rates with that of other sample countries proved the point that slowly and merely the Indian Capital Market is getting integrated into global market.\textsuperscript{101} Sen (1996) found foreign exchange reserve and industrial production both are very important for influencing stock market.\textsuperscript{102}

\textsuperscript{94} ibid
\textsuperscript{97} Golaka C. Nath (2003), ‘Interlinkages among Global Equity Market, Decision, July – December, Vol. 30, no. 2
\textsuperscript{98} ibid
\textsuperscript{100} ibid
3.4 Research Gap

From the above discussion it would be important to note that there are two apparently opposite view in the stock market world wide as regards the return to be derived from it. Some authors are of the opinion that the stock market is efficient and no one can predict the positive return from it. They argue that the market is too volatile and absorbs all information instantaneously. Some of the authors found mean reversion or price reversals in the share prices in the short term and in the long term. These authors lead us to believe that the growth of the market is almost zero. On the other hand, there are authors those demonstrated the inefficiency in the stock market. They showed that the investors could reap profit by adapting some suitable strategy. Some advocated that EMH is meant for short term only and has nothing to do with long term investment. These lead us to believe that there must be some growth component in the share prices at least in the long term. In this context it would not be irrelevant to note that there is lack of adequate literature for the long horizon return. Jorion (2003) points out recently that there is scant history of long-term equity return. In this background, the present study is intended to find out the long-term return from stock market. Bhole & Pattnaik (2002) found annual change in Sensex has varied over a wide range of -46.8% to 266.9% during 1983-84 to 1999-2000. But his research method lack statistical power. We understand calculation of year-wise annual return for a long period might not be representative in a stock market. Annual return data on the basis of point-to-point return calculation would be high and low depending upon the bull and bear phase and would certainly be misleading. The calculation of point-to-point

stock market annual return could not be considered as representative long-term return in a volatile place like stock market. There was one international study on long-term return by Jorion & Goetzmann (1999). They found compound growth rate of stock indices from different countries for a long period. But compounded growth rate can not help in finding representative return for the share price that are too volatile. Here also the problem of point-to-point growth rate calculation was overlooked. There is, in fact, no serious studies demonstrating the long term return from the Indian stock market. To bridge this research gap, the study is attempted to check whether there is any growth component in the stock prices and if affirmative then what is the rate of return in Indian context.