

Chapter -I

Introduction

Introduction:

Truth underlying the stock price movements is yet to be established. For many years this has been a source of continuing controversy, a fertile ground for research in both the academic and in professional financial world.

According to the conventional paradigm financial prices efficiently incorporate available information and that prices can be regarded as optimal estimate of true investment values at all times. This efficiency theory has developed in the backdrop of “rational expectations” revolution in economic theory at around 1960s (Muth 1961). The idea behind the market efficiency is in fact based on such notions of rationality where agents are able to process all available information, update their belief correctly following the Bayesian Paradigm and make unbiased choices that are normatively acceptable and consistent with the Savage’s Notion of “Subjective Expected Utility”(Savage 1954). Investors always exhibit non satiation, more terminal wealth to less terminal wealth and they are risk averse i.e. they reject fair gamble. Investor’s utility function in general is increasing but concave shape towards origin satisfies law of diminishing marginal utility. Expectations in this framework are made on the basis of all available information, where relevant information is not ignored, and systematic errors are not made. Security prices are determined subject to the maintenance of a perfect relation between risk and return. Prices ‘fully reflect all available information’ making it to be always at levels consistent with fundamentals(Fama 1991, 1965). Informationally efficient prices respond only on the arrival of genuinely new information and as the arrival of information cannot be predicted, movement of asset prices also becomes random (Shiller 2002). Variability of prices is equal with the variability of information. Thus histories of asset prices do not have any predictive power for future asset returns. At any point of time, market value reflects the cumulative knowledge of all participating investors. Although each individual investor may err about his opinion of future value, but if the number of opinions is large and if the opinions are developed through independent thinking, the thousands or perhaps millions of individual errors will largely cancel out, so that the resulting consensus becomes a powerful

predictor of future value. Moreover, there remains no free lunch in an efficient market: no investment strategy can earn excess risk adjusted returns, or average returns greater than are warranted for its risk. As soon as there is any deviation from fundamental value (more simply, a mispricing) an attractive investment opportunity is created and rational traders will immediately snap up the opportunity (Friedman 1953). As information arrives in the market infrequently, efficient market theorists suggest, large movement in prices will also be rare. Ordinarily, price will move within a narrow band due to investors' liquidity needs or portfolio rebalancing consideration. Prices may exhibit trends over time; fluctuations in price away from trend will be unpredictable. This strong version of hypothesis can only be literally true if 'all available information' is costless to obtain. If information is instead costly, there must be a financial incentive to obtain it. There would not be a financial incentive if the information is already "fully reflected" in asset prices (Grossman and Stiglitz'1980). A weaker, but economically more realistic, version of the hypothesis is therefore that prices reflect information up to the point where the marginal benefits of acting on the information do not exceed the marginal cost of collecting it (Jensen 1978).

Despite the widespread allegiance to the notion of market efficiency, a number of authors have suggested that certain periodic movements in asset prices can not related to economic realities. Browsing through the finance journals especially from 1970's one can easily find evidences of numerous numbers of furious market failures. If the market truly behaves according to the prescription of rationality driven efficient market hypothesis then, how can we account for the consecutive market bubbles and its devastating crashes around the globe. These findings however, question the basic underpinnings of expectation formation, and thereby rendering the existing paradigm to a much more controversial proposition.

The observed deviations from the prediction of rational expectation often been belittled as worst small departures from fundamental truth. A 'bad model' problem, that with greater diligence in seeking out better data and subjecting it to more sophisticated statistical tests, the anomalies will disappear(Fama 1998). While this may be a logical possibility, it presumably

applies with progressively less force and the violations remain unexplained using models based on rational paradigm. Longer-run asset price misalignments almost certainly represent the most serious manifestation of the failure of the efficient market hypothesis. Thus, urgency has been felt among economic researchers especially after eighties to look beyond the existing paradigm in an attempt to find a more comprehensive and satisfactory explanations of empirical evidences. However, it is a formidable challenge to question basic underpinnings of market efficiency.

In market efficiency, upheavals¹ in prices is an explosive path that increasingly deviates from the fundamental, and continue to satisfy the no-arbitrage condition. Clearly such a definition of upheavals is not interesting in a perfect foresight environment. Either it goes on indefinitely, or if a crash is expected at some future date, it cannot start (because of backward induction). The insight provided by Blanchard and Watson was to formulate a bubble or a price upheavals theory in a stochastic environment, and to assume that when the asset price is on an explosive bubble path, rational agents expect a future crash but do not know its exact timing (see Blanchard 1979, Blanchard and Watson 1982). This analysis came to the conclusion that a bubble, defined as an explosive path of the asset prices, is a theoretical possibility. The analysis of Blanchard and Watson has spurred a large literature extending this initial insight and analyzing the conditions for the emergence of upheavals in rational expectations models. The discovery that bubbles can arise in rational expectations models is important. Yet this "rational bubble" theory is not all together satisfactory. The weak part of the rational bubble theory is in the modeling for crashes. The latter is introduced in an ad-hoc fashion, i.e. agents are assumed to expect a crash, although this expectation does not come from the structure of the model itself. It is based on some "reasonable" but model-exogenous assumption that bubbles cannot go on forever. A further extension of the rational bubble theory consisted in allowing for heterogeneity of traders. Models were developed with the assumption that rational traders interact with 'noise traders' (DeLong, Bradford, Shleifer and

¹ the term upheavals and bubble are used interchangeably throughout the thesis.

Summers,1990),,Shleifer and Vishny,1997). The essence of these models is that some constraints exist on the capacity of the rational traders to exploit the profit opportunities generated by the bubble. These limits to arbitrage arise because of risk aversion or capital constraints. More recently, Abreu and Brunnermeier(2003) have developed models in which the arbitrage failure by rational traders arises because they have different views about the timing of the crash and fail to synchronize their exit strategies. Moreover, further developments in this direction have occurred in the recent past. An increasing number of non linear heterogeneous multi agent equilibrium models have been introduced in the literature which sharply contradicts the rational bubble theory by way of not dividing the market agents in between rational and noise traders. Moreover, the recent models have been developed on more generalized notions of bounded rationality. In these models it is assumed that individual agents have limited capacities to process and to analyse the available information and they select simple forecasting rules. These agents, however, exhibit rational behaviour in the sense that they check the profitability of these rules and are willing to switch to more profitable one. Thus they use the best possible strategy within the confines of their limited ability. This more recent extensions in this field of study have been posited to offer a more parsimonious explanations of socio psychological dynamics of human behaviour towards bubble formation(Hommes and Gounresdorfer ,2007, Gounresdorfer ,2001, Johansen and Sornette 2010,Lux, 1998 ,Lux and Marchesi 2000, Broke and Hommes 1998,1997 etc.)

Going by these recent empirical advancements, in our study of Indian Capital market upheavals, we will try to model it in the backdrop of heterogeneous market framework with bounded rational agents. Simply speaking, our target is to analyse the influences of various psychological antecedents in capital market decisions that restricts rationality and bubble grows in a more cohesive way. Now in the next chapter, we would like to navigate through the literature in behavioural finance that would enrich us more to model investor's behaviour in India.

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