

INDIAN STOCK MARKET: AN EMPIRICAL ANALYSIS OF INFORMATIONAL EFFICIENCY

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Springer Publisher, New Delhi

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A market characterized by informational efficiency is one where the “relevant information is impounded into the price of financial assets” (Dimson and Mussavian 2000). So, if capital markets are efficient then investors cannot earn supernormal profits or return on investments. Quite naturally, the thesis on informational efficiency has become central to the study of financial markets. The large literature on the subject either provides evidence in favour of market efficiency, or to the contrary. Hiremath’s book under review revisits the informational efficiency theory in an emerging market setting, viz. India, where the institutional and structural framework, liquidity, nature of market competition and transparency may not be sufficient to support market efficiency.

Written in a simple and lucid style, the book is divided into six chapters. The first chapter is an introduction to the efficient market hypothesis, which provides the theoretical background to the empirical analysis that follows in the next five chapters. The analysis is based on daily price data on eight indices on NSE and six indices on BSE. The analysis covers a period of about 14 years from June 2, 1997 to March 31, 2010.

In the second chapter, the author examines the hypothesis of weak form efficiency or random walk in Indian stock markets. The Runs test (Bradley 1968), Brock, Daechert and Scheinkman (BDS) test (Brock et al 1996), variance ratio test (Lo and MacKinlay 1988 and Chow and Denning 1993) are used to test for independence of the prices. While the Runs test does not assume that the distribution is normally distributed, it only looks at the number of positive or negative changes and ignores the degree of change relative mean (Gupta and Basu 2007). The variance ratio test, proposed by Lo and MacKinlay (1988), is mainly criticized for being based on the selection of maximum order of serial correlation (Faust, 1992). But the use of the Runs test and Variance ratio test, despite the limitations, can be justified in this context, since the objective of the chapter is to merely examine the presence of random walk.

The third chapter of the book provides evidence in support of non-linear dependences. It makes use of non-linear tests like the bispectrum test (Hinich and Patterson 1989) and bicoherence tests (Mcleod and Li 1983, Tsay 1986, Broch et al 1996 and Hinich 1996). The characteristic feature of these tests is that the alternative hypothesis suggests non-linear dependence but does not specify the form of non-linearity. The results indicate that stock returns

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follow a non linear dependent structure. The author also employs the Lim and Hinich (2005) Window test to align the non-linear dependence with specific events. The chapter provides evidence of the non-linear dependencies being associated with national events like government budgets, scams, and policy reforms. It also covers international events like crises in other countries/parts of the world, oil prices, and policy changes in major countries. The distinction between the national and international events is important in case of an open economy like India which exhibits strong trade and financial linkages with the rest of the world. Interestingly, a lot of the literature in this field deals only with the likely impact of news pertaining to monetary policy announcements on stock market returns. This often leads to biased estimates. In this context, this book makes a commendable attempt to cover a wide array of events.

The fourth chapter builds on the non-linear dependence characteristics of the returns of the market indices to specifically address the issue of mean reversion and structural breaks. The chapter applies the Zivot and Andrews (1992) sequential break test and the Lee-Strazicich (2003) LM unit root multiple breaks test. The Zivot-Andrews test allows for the structural breaks to be endogenously determined, however, the test only allows for a single structural break. Lee-Strazicich (2003), on the other hand, allows for multiple structural breaks and even allows for breaks in the null hypotheses.

The next two chapters delve further into the non-linear dependent structures by focusing on a specific characteristic, i.e., long memory. In the fifth chapter, the book provides evidence in support of long memory in stock returns. Drawing from the ARFIMA model which allows for fractional integration, the author employs the Geweke and Porter Hidak (1983), Andrews and Guggenberger (2003) and Robinson's (1995) semi-parametric test. The fractionally integrated processes are characterized by a hyperbolically decaying autocorrelation function in contrast to the ARMA models which are characterized by a faster decaying exponential function. Hence the ARFIMA models capture long memory better. The results for the fourteen indices are mixed so far as the Geweke and Porter-Hidak and Robinson tests are concerned. These tests, however, are not consistent and efficient. In order to improve on the consistency, Andrew and Guggenberger (2003) suggest modelling the logarithm of the spectral density of the short-run dynamics in the vicinity of the origin by a polynomial instead of a constant. This test, in turn, provides strong and definitive evidence in favour of long memory in stock returns. All three tests are semi parametric tests in the frequency domain and are based on the log periodogram analysis which makes them robust.

Long memory in market volatility is analyzed in the sixth chapter. The author employs GARCH and FIGARCH models to analyze the long memory property of the log of squared return. Anderson and Bollerslev (1997), however, show that squared returns are noisy estimators of daily volatility and advocate the use of sum of intraday squared returns as a better estimator of daily volatility. Using Baillie et al's (1996) FIGARCH model based on the quasi-maximum likelihood estimate, the results in the chapter suggest presence of long memory in volatility of returns in the Indian market. ARFIMA models provide better forecast, not only compared to the GARCH models as shown in the book, but also compared to the implied volatility models (Pong et al 2004).

As evident from the discussion above, the book in general focuses on latest developments in econometric techniques applicable to a given set of topics and presents the analysis in a simple yet comprehensive manner. However, there are three potential areas where the book could have been improved.

First of all, for the benefit of the reader the book should have included a discussion on the relative advantages and disadvantages of the econometric techniques and the conditions under which the different methodologies could be applied.

Secondly, the author confines the discussions of the results to Indian market alone. Although there is discussion of previous work in every chapter, the book does not try to link the findings back to the international literature. It also does not draw policy implication for Indian and other emerging countries, barring a brief section in the summary and conclusions.

Thirdly, the book could have added value by devoting a chapter on linking its findings to the existing body of research and potential new areas of research. The book instead restricts itself to a passing mention of the same in the summary and conclusions.

Nonetheless the book contributes to the literature in emerging market through its rigorous analysis of the Indian securities market. It is going to be a very useful resource for a course in financial econometrics and for researchers interested in working in the Indian securities market. Results drawn from the book have implications for the literature on the asset pricing and management, risk management and market microstructure in emerging markets.

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