

Capital Market Efficiency in India: Micro- and Macro-Level Implications

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Abstract

The concept of capital market efficiency occupies the central place in the theory of asset pricing, fund allocation and portfolio management. The supporters of the efficient market hypothesis argue that the stock returns are basically random and thus, any speculation based on past information is fruitless. So we wanted to know whether such a claim holds in the Indian context, especially in the aftermath of financial recession. This paper examined the weak form of efficient market hypothesis in a random walk framework. The results indicate that the Indian capital market is not weak form efficient. This has implications both for the investors and the economy as a whole. The investor can use fundamental as well as technical analyses to beat the market and earn excess returns. And, the economy may experience mal-allocation of resources which has negative effects on long-run growth of the nation. Therefore, the institutions, market operations and market micro-structure need to be strengthened to have an efficient capital market.

Keywords: Efficient market hypothesis, weak form efficiency, India

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INTRODUCTION

In this 21st century, the waves of globalization, liberalization and technological revolution have brought the emerging market economy status to India. Among the key determinants, the role of the capital market is at the centre place of this market economy. The capital market by mobilizing the domestic savings and foreign capital for capital accumulation, not only deepens itself, but in an important way contributes to the sustained economic growth of the nation. Its role in increasing the productivity of capital and allocating the risks is noteworthy. Realizing the importance of the capital market in the long-run growth process of the country, the economic architects of India implemented a set of reforms in the early 1990s to prevent unfair trade practices, make the price discovery process efficient, and to ensure its transparent functioning/governance at par with international standards. As a consequence, the capital market of India has emerged as the most sought-after intermediary of investments both at the national and international levels. Particularly, the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) of India have been emerged

to be counted among the largest stock exchanges in the world in terms of the number of listed companies, comprising many large, medium-sized and small firms. As regards transaction cost, the Indian stock market compares with some of the developed and regional economies (Raj & Dhal, 2008) [1]. Although the global financial slowdown of the recent past had dented the Indian capital market, it has been recovered showing a marvellous resilient.

In an emerging capital market, a study of the efficient market hypothesis is often noteworthy. An efficient capital market follows random walk behaviour and forbids the occurrence of any systematic pattern helpful for accurate prediction of future stock prices and/or returns. In other words, an efficient capital market prohibits the market participants from making abnormal gains on their investments. The efficient market hypothesis has three different forms, viz., weak form, semi-strong and strong form (Fama, 1970) [2]. In its weak form, the efficient market hypothesis denies the possibility of technical prediction of the future

stock prices, knowing the dynamics of the past prices. In the semi-strong form, the efficient market hypothesis prevents the possibility of making abnormal gains from trading based on publicly available information. Finally, in the strong form, the efficient market hypothesis prevents the possibility of beating the market from knowing all the publicly and/or privately available information.

In the literature, the efficient market hypothesis has been given a priority because of the assumptions of the perfect capital market and rational behaviour of investors. Thorough knowledge of the concept of capital market efficiency helps investors in making optimal investment decisions. It also helps the firms in maximizing the present value of productive investments (Fisher, 1961) [3]. Since the capital market is an intermediary between the savers and the investors, the concept of market efficiency is critical in the process of optimal/profitable allocation of investible funds. This is possible only when the current security prices absorb all the information available to the market participants.

Therefore, researchers and academicians have interest in the concept of efficient market hypothesis. And, there are two strands in the literature – one group of people who supports efficient market hypothesis (e.g. see Su & Fleisher, 1998 [4]; Abdel-Khalik *et al.* 1999 [5]; Chow *et al.* 1999 [6]; Mookerjee & Yu, 1999 [7]; Mobarek & Keasey, 2000 [8]; Kanget *et al.* 2002 [9]; Ma, 2004 [10]; Groenewold *et al.* 2004a [11]; Chen & Li, 2006 [12]; Balsara *et al.* 2007 [13]; Chen *et al.* 2010 [14]; Angelo *et al.* 2018 [15], and another group of people who do not support this hypothesis (e.g. see Bailey, 1994 [16]; Cai *et al.* 1997 [17]; Liu *et al.* 1997 [18]; Long *et al.* 1999 [19]; Xu, 2000 [20]; Darrat & Zhong, 2000 [21]; Chen & Li, 2006; Chakraborty, 2006 [22]; Dorina & Simina, 2007 [23]; Mishra *et al.* 2011 [24]; Nisar & Hanif, 2012 [25]; Rabbani *et al.* 2013 [26]; Ahmed & Hossain, 2019 [27].

In the Indian context several studies have been conducted which support the weak-form of efficient market hypothesis and conclude that

the future stock prices cannot be predicted on the basis of the historical prices to make abnormal gains (Sharma & Kennedy, 1977 [28]; Barua, 1980 [29]; Sharma, 1983 [30]; Ramachandran, 1985 [31]; Gupta, 1987 [32]; Barua, 1987 [33]; Srinivasan, 1993 [34]; Vaidyanathan & Gali, 1994 [35]; Prusty, 2007 [36]; Vidya, 2018 [37]. However, it was argued in early years of reforms that despite the reforms, removal of barriers for equity and rising trend in investments, the capital market is not weak-form efficient and hence, did not follow the random walk behaviour (Choudhury, 1991 [38]; Poshakwale, 1996 [39]; Madhusudan, 1998 [40]). The studies which were conducted in the late 1990s and early 2000s also do not support the weak form of the efficient market hypothesis (Pant & Bishnoi, 2002; Pandey, 2003 [41]; Gupta & Basu, 2007 [42]; Gupta & Bothra, 2015 [43]. The studies which examined the random walk hypothesis including the period of global financial crisis, also conclude the weak-form inefficiency of the Indian capital market (Mishra & Pradhan, 2009 [44]; Mishra, 2009 [45]; Mishra *et al.* 2009 [46]; Jain *et al.* 2013 [47]; Sarkar, 2014-15 [48]; Dsouza & Mallikarjunappa, 2015 [49]; Parthasarathy, 2016 [50]. Furthermore, the studies which were conducted for the post-crisis period, in the similar tone, rejected the efficient market hypothesis in its weak form in the Indian context (Mishra, 2013a [51]; Mishra, 2013b [52]; Patel *et al.* 2018 [53].

Hence, the literature provides mixed evidence about the validity of the weak form of efficient market hypothesis in the Indian capital market. So, the controversy does exist concerning the role of historical security prices determining the future stock market returns. Moreover, the studies conducted in the aftermath of the crisis are only a few. In addition, there is a dearth of studies undertaken in a random walk framework. For this reason, this paper has been designed to examine the weak form of the efficient market hypothesis in the Indian capital market.

DATA AND METHODOLOGY

Specifically, this paper focuses on the investigation of the weak form of the efficient market hypothesis in the context of the Indian

capital market. The Indian capital market has been considered to comprise BSE, Mumbai and NSE, New Delhi. These two stock markets have been chosen because (i) almost all the significant firms are listed in these two markets; (ii) most of the trading takes place in these two stock markets; (iii) both of these follow the same trading mechanism, trading hours and settlement process; (iv) these two markets have the benefits of reduced transaction costs, trading efficiency and innovations; and (v) the presence of arbitrageurs keeps the prices in these two markets within a very tight range.

In its weak form, the efficient market hypothesis presumes that an efficient capital market, in its price discovery or return prediction process, absorbs all information available to market participants contained in the historical prices of securities thereby making stock prices or returns to follow a random-walk which forbid abnormal return gains by the traders (Fama, 1965, 1970 [54], 1991 [55]; Fama & French, 1988 [56]. In other words, the weak form of efficient market hypothesis envisages that the inefficiency of a capital market is an opportunity to the traders to make a systematic prediction of the future stock prices or returns, and to make abnormal return gains.

Having such economic implications in mind, the historical data concerning daily closing stock price indices of BSE Sensex and NSE Nifty for the period from Jan 2010 to May 2019 (consisting of 2328 observations) (Figure 1) have been compiled from the respective online database of BSE and NSE stock markets. The rationale behind choosing this time period is quite straight –(i) the trading process adopted improved technology; (ii) the capital market strengthened by the inclusion of financial innovations; (iii) the market recovered from global financial crisis; (iv) the Indian economy weathered demonetization and implementation of GST; (v) increase in the inflow of FDIs and reverse flow of FPIs; (vi) two seasons of parliamentary elections; and (vii) the influence of cross border economic and geo-political dynamics.

The series of 2328 units of historical daily stock price indices of BSE Sensex and NSE

Nifty have been converted to the stock market returns series (Figure 2 and Figure 3) using the continuously compounded formula (Laurence

et al. 1997): $R_t = \ln \left(\frac{P_t}{P_{t-1}} \right)$ where P_t is the

daily stock price index at time t , $\ln$ is the natural logarithm and R_t is the natural logarithm of the stock market return series.

In order to test the weak-form of efficient market hypothesis in Indian capital market, first a non-parametric test, Wald-Wolfowitz Runs test has been used in which a run is nothing but a sequence of consecutive positive or negative stock market returns. In this test, the positive value of test statistic Z indicates the presence of too many runs in the sample which means there is negative serial correlation or mean-reverting process in stock market returns, i.e., returns are predictable, and the market is not weak-form efficient. On the contrary, the negative value of test statistic Z indicates the presence of too few runs in the sample which means there is positive serial correlation or random-walk in stock market returns, i.e., returns are not predictable, and the market is weak-form efficient.

In addition, the variance ratio test of Lo and Mackinlay (1988) [57] has also been used to test the weak form of the efficient market hypothesis in the Indian capital market. The

variance ratio is the ratio of $\frac{1}{q}$ times the

variance of q -period to that of one period where q is any positive number. The test statistic under variance ratio test is given by

$$VR(q) = \frac{\frac{1}{q} \text{Var}(P_t - P_{t-k})}{\text{Var}(P_t - P_{t-1})} = \frac{\sigma^2(q)}{\sigma^2(1)} \text{ where } P_t$$

is the stock price index, $\sigma^2(1)$ is the variance of the first difference of stock price indices and $\sigma^2(q)$ is the one q th of the variance of the q -difference. Under this variance ratio test, the null and alternative hypotheses are:

$H_0 : VR(q) = 1$ i.e., the capital market is weak-form efficient

$H_1 : VR(q) \neq 1$ i.e., the capital market is not weak-form efficient

STATISTICAL FINDINGS

At the outset, the descriptive statistics of both the stock price-based return series have been calculated and presented in Table-1. The most important observation is from the Jarque-Bera(JB) normality test. In both the stock markets, the JB statistic is statistically significant at 1% level which rejects the hypothesis that the distribution of the stock return series under consideration are normal. In other words, the daily closing price-based stock return series in India does not exhibit

random walk. Thus, the *prima facie* conclusion is that the Indian capital market is not weak form efficient.

Table 1: Descriptive Statistics of Stock Return Series.

Statistics	BSE	NSE
No. of Observations	2327	2327
Mean	0.000343	0.000346
Standard Deviation	0.009552	0.009707
Jarque-Bera (JB) Statistic (p-value)	314.663* (0.000)	309.125* (0.000)

Source: Author's Own Estimation

Table 2: Results of Wald-Wolfowitz Runs Test.

Specification	Sensex Based Daily Stock Market Return	Nifty Based Daily Stock Market Return
Test Value (Median)	0.000555	0.000460
Cases < Test Value	1163	1163
Cases >= Test Value	1164	1164
Total Cases	2327	2327
No. of Runs	1118	1114
Z	-1.928***	-2.094**
Asymptotic Sig. (2-tailed)	0.054	0.036
Monte Carlo Sig. (2-tailed)	0.056	0.039

Source: Author's Own Estimation ** and *** significant at 5% and 10% levels respectively

Table 3: Results of Variance Ratio Test—BSE Stock Market

Period in Individual Test	Variance Ratio V(q)	Std. Error	Z-stat	p-value
2	0.5331*	0.020	-22.513	0.0000
4	0.2718*	0.038	-18.770	0.0000
8	0.1366*	0.061	-14.075	0.0000
16	0.0678*	0.091	-10.212	0.0000
32	0.0333*	0.132	-7.309	0.0000
64	0.0158*	0.189	-5.198	0.0000
128	0.0079*	0.269	-3.684	0.0002
256	0.0038*	0.381	-2.608	0.0091
Joint Test				
Specification	Test Statistic	d.f	p-value	
Wald (Chi-Square)	508.3304*	8	0.0000	

Null Hypothesis: Sensex Based Daily Stock Market Return is a Random Walk

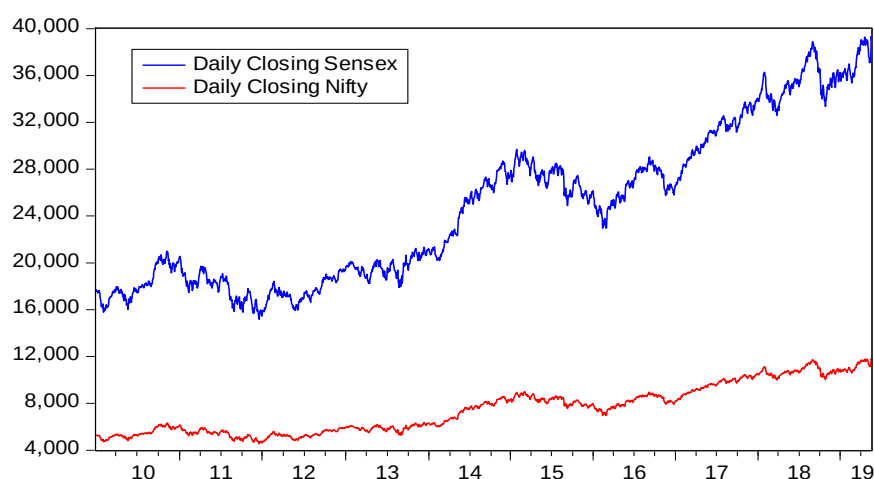
Source: Author's Own Estimation*significant at 5% and 10% level

Table 4: Results of Variance Ratio Test—NSE Stock Market.

Period in Individual Test	Variance Ratio V(q)	Std. Error	Z-stat	p-value
2	0.5332*	0.020	-22.509	0.0000
4	0.2722*	0.038	-18.761	0.0000
8	0.1362*	0.061	-14.082	0.0000
16	0.0678*	0.091	-10.212	0.0000
32	0.0332*	0.132	-7.309	0.0000
64	0.0159*	0.189	-5.198	0.0000
128	0.0079*	0.269	-3.684	0.0002
256	0.0038*	0.381	-2.608	0.0091
Joint Test				
Specification	Test Statistic	d.f	p-value	
Wald (Chi-Square)	508.1243*	8	0.0000	

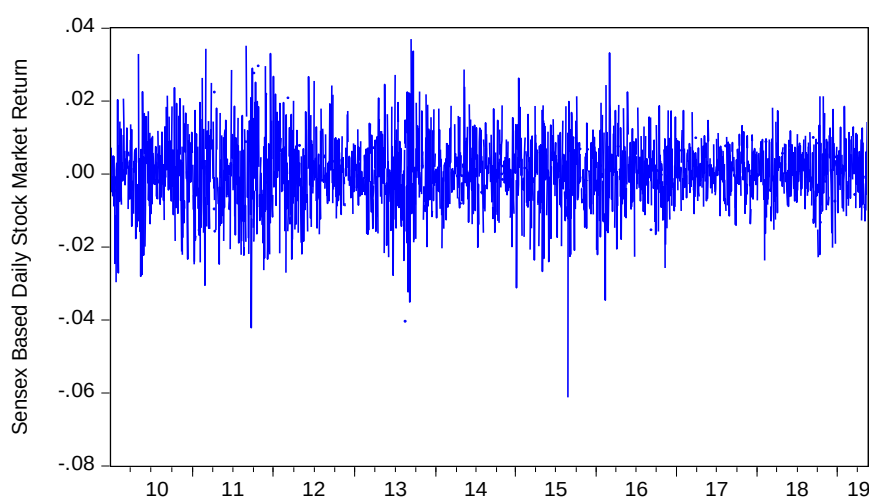
Null Hypothesis: Nifty Based Daily Stock Market Return is a Random Walk

Source: Author's Own Estimation *significant at 5% and 10% level



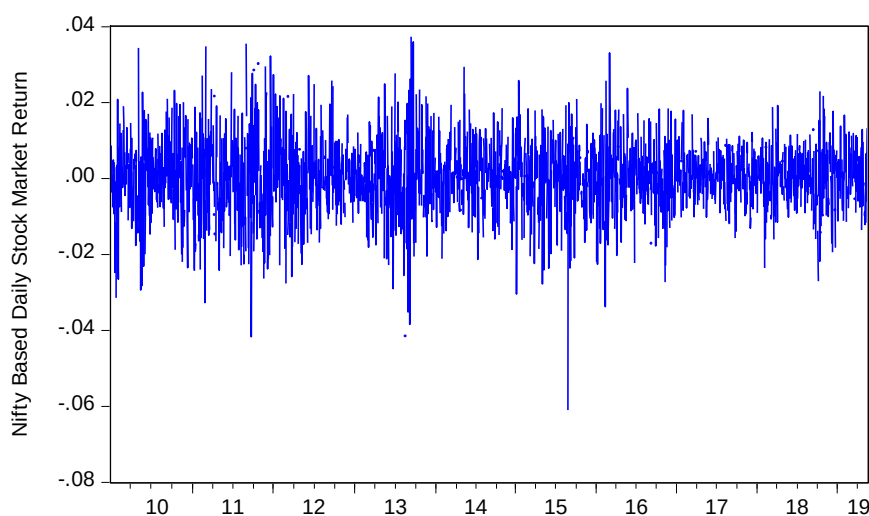
Time Period from Jan 2010 to May 2019

Fig. 1: TS Plot of Stock Price Indices.



Time Period from Jan 2010 to May 2019

Fig. 2: TS Plot of BSE Stock Return Series.



Time Period from Jan 2019 to May 2019

Fig. 3: TS Plot of NSE Stock Return Series.

Subsequently, the Wald-Wolfowitz Runs test has been conducted and the outcomes are presented in Table-2. It is inferred from this table that the total numbers of runs are 1118 and 1114 for BSE and NSE stock markets respectively. The Z-stats for these two markets are -1.928 and -2.094 respectively. The Monte Carlo significance of these Z-stats are 0.056 and 0.039 respectively. It means the null hypothesis of random walk is rejected at 10% and 5% levels respectively. In other words, the Indian capital market is not weak form efficient.

Finally, the Lo and Mackinlay Variance Ratio test has been conducted and the results are summarized in Table-3 and Table-4. The joint tests in both cases are based on the joint null hypothesis of random walk for all periods. The p-values associated with the chi-square Wald statistics are 0.0000 which strongly rejects the null hypothesis of random walk in stock return series in the Indian capital market. Thus, it is inferred that the Indian capital market is not weak form efficient. Furthermore, the individual statistics in both the stock markets reject the null hypothesis over the considered periods at 1% level of significance. It is also inferred from the Table-3 and 4 that all the variance ratios are smaller than one thereby indicating the fact that the variances decline proportionately with time. So, the null hypothesis of random walk is rejected in the Indian capital market. Hence, it is concluded that the Indian capital market does reveal some pattern contained in the historical prices that can be used to predict the future prices applying both the fundamental and technical analyses. This is nothing but the mean-reverting tendency of stock market prices/returns which may provide an opportunity to the traders for predicting the future prices and earning abnormal profits (Pant & Bishnoi, 2002) [58].

DISCUSSION AND IMPLICATIONS

Hence, it is evidenced that the Indian capital market is not weak form efficient. This finding corroborates to the earlier findings of Mishra (2013a, 2013b) and Patel *et al.* (2018) for India and Elango & Hussein (2008) [59] for emerging market economies. The extant literature assigns certain reasons for weak form inefficiency of a capital market, viz.

imperfect capital market, stock market anomalies, relatively less liquid and more volatile market, delay in trading, settlement and reporting, relatively higher transactions cost, and slacks in information disclosure (Errunza & Losq, 1985 [60]; Butler & Malaikah, 1992 [61]; Khababa, 1998 [62]). These reasons are equally applicable to the Indian capital market.

The finding of this research work has several implications both at the micro and macro levels. At the micro level, the implications are for the investors and market analysts. At the macro level, the implications are for the economy as a whole. At the micro level, the implications are: (i) the weak form of market inefficiency implies the presence of possibility of a systematic way to exploit trading opportunities and acquire excess profits which provide opportunities to investors for predicting the future prices and making abnormal profits; (ii) mean reversion or negative autocorrelation of stock prices is likely to cause the expected stock market returns to vary leading to sub-optimal selection of portfolio by the investors; (iii) a sizeable amount of stock prices can either be undervalued or overvalued. Thus, security analysts, if able to identify those securities that are undervalued, can consistently outperform the market averages; and (iv) since the security prices can either over-react or under-react to the information contained in historical prices, the traders can choose to use the trading strategies so as to maximize their returns.

At the macro level, the implications are: (a) since changes in security prices are likely to be more than the value of the new information, market inefficiency results in excess price volatility in the short-run thereby denting the investment scenario of the country; (b) the prices need not necessarily reflect the true value of the assets. So the firms with lower true values will be able to mobilize a large volume of capital while the firms with higher true values will find it difficult to raise the capital. This has strong potential to disturb the investment pattern of the country in the long-run; (c) informationally inefficient capital market cannot mobilize savings optimally which will adversely affect the total

productivity of the economy in the long-run; (d) the expectations of making excess profit is likely to stimulate the short-term investments in the country which would act as an incentive for introducing financial innovations by firms. This process can make the market and force it to move towards efficiency in the long-run; (e) in an inefficient capital market, investible funds are not channelled to the projects where they are most useful. This resource mal-allocation would hold back the sustainable development of the economy.

CONCLUSION

This paper examined the validity of the weak form of efficient market hypothesis in the context of the Indian capital market. The statistical results reject the random walk behaviour of stock market returns which provide the evidence that the Indian capital market is not weak form efficient. This implies that returns over some securities can be predicted and thus, opportunities exist for making abnormal arbitrage profits by manipulating the portfolios in the short run. It necessitates the intervention by regulatory and policy makers to improve the market conditions. It is required to make necessary arrangements to improve timely corporate disclosures so that security prices appropriately and quickly reflect all available information. It is necessary to take appropriate steps to ensure correct pricing of securities by incorporating all relevant information. The regulators and policy makers should work to improve the institutional framework of the Indian capital market so as to make it an efficient one in the long run.

REFERENCES

1. Raj, J. & Dhal, S. (2008). Integration of India's stock market with global and major regional markets. *BIS paper No. 42*, 202-236
2. Fama, E. (1965). Random Walks in Stock Market Prices, *Financial Analysts Journal*, 21, 55-59.
3. Fisher, Irving N. (1961). *A Bibliography of the Writings of Irving Fisher*. Yale University Library
4. Su, D. & Fleisher, B. M. (1998). Risk Return and Regulations in Chinese Stock Markets. *Journal of Economics and Business*, 50, 239-256
5. Abdel-Khalik, A. R., Wong, K. A. & Wu, A. (1999). The information environment of China's A and B shares: Can we make sense of the numbers. *International Journal of Accounting*, 34, 467-489.
6. Chow, G. A., Fan, Z. Z. & Hu, J. Y. (1999). Shanghai stock prices as determined by the present-value model, *Journal of Comparative Economics*, 27, 553-561.
7. Mookerjee, R. & Yu, Q. (1999). An Empirical Analysis of the Equity Markets in China, *Review of Financial Economics*, 8, 41-60
8. Mobarek, A. & Keasey, P. K. (2000). *Weak-form market efficiency of an emerging Market: Evidence from Dhaka Stock Market of Bangladesh*. Oslo: ENBS Conference.
9. Kang, J., Liu, M. H. & Ni, S. X. (2002). Contrarian and momentum strategies in the China Stock Market. *Pacific-basin Finance Journal*, 10, 243-265.
10. Ma, S. G. (2004). *The Efficiency of China's Stock Market*. Ashgate.
11. Groenewold, N., Tang, S. H. K., Wu, Y. & Fan, X. M. (2004). *The Chinese Stock Market: Efficiency, Predictability and Profitability*. Edward Elgar Publishing, Cheltenham, UK.
12. Chen, K. J. & Li, X. M. (2006). Is technical analysis useful for stock traders in China? Evidence from the SZSD component A-share Index. *Pacific Economic Review*, 11(4), 447-488
13. Balsara, N. J., Chen, G. & Zheng, L. (2007). The Chinese stock market: An Examination of the Random Walk Model and Technical Trading Rules. *Quarterly Journal of Business and Economics* 22, 43-63
14. Chen, H., Chong, T. T. L. & Li, Z. (2010). Are Chinese stock market cycles duration independent? *Financial Review*, 46, 149-162
15. Angelovska, J. (2018). Testing Weak Form of Stock Market Efficiency at the Macedonian Stock Exchange, *UTMS Journal of Economics*, 9(2), 133-144
16. Bailey, W. (1994). Risk and return on China's new stock markets: Some preliminary evidence. *Pacific-Basin Finance Journal*, 2, 243-260

17. Cai, F., Laurence, M. & Qian, S. (1997). Weak-form Efficiency and Causality Tests in Chinese Stock Markets, *Multinational Finance Journal*, 1, 291-307
18. Liu, X., Song, H. & Romilly, P. (1997). Are Chinese Stock Markets Efficient? A cointegration and causality analysis, *Applied Economics Letters*, 4, 411-415
19. Long, D. M., Payne, J. D. & Feng, C. (1999). Information Transmission in the Shanghai Equity Market. *Journal of Financial Research*, 22, 29-45
20. Xu, K. C. (2000). The microstructure of the Chinese Stock Market. *China Economic Review*, 11, 79-97
21. Darrat, A. F. & Zhong, M. (2000). On Testing the Random-walk Hypothesis: a Model-comparison Approach. *The Financial Review*, 35(3), 105-124.
22. Chakraborty, M. (2006). Market Efficiency for Pakistan Stock Market: Evidence from Karachi Stock Exchange. *South Asia Economic Journal*, 7(1), 67-81.
23. Dorina, L. & Simina, U. (2007). Testing Efficiency of the Stock Market Emerging Economies, Faculty of Economics and Business Administration, *BabesBolyai University Working Paper*, Romania
24. Mall, M., Pradhan, B. B., & Mishra, P. K. (2011). The Efficiency of India's Stock Index Futures Market: An Empirical Analysis, *International Research Journal of Finance and Economics*, 69, 178-184
25. Nisar, S. & Hanif, M. (2012). Testing Weak Form of Efficient Market Hypothesis: Empirical Evidence from South-Asia. *World Applied Sciences Journal*, 17(4), 414-427
26. Rabbani, S., Kamal, N. & Salim, M. (2013). Testing the weak-form efficiency of the stock market: Pakistan as an emerging economy. *Journal of Basic and Applied Scientific Research*, 3(4), 136-142
27. Ahmed, R. & Hossain, M. D. (2019). Testing Weak Form Market Efficiency and Its Impact on Stock Valuation: Empirical Evidence from Stock Market in Bangladesh, *Jurnal Ekonomi dan Studi Pembangunan*, 11(1), 1-13
28. Sharma, J. L. & Kennedy, R. E. (1977). A Comparative Analysis of Stock Price Behavior on the Bombay, London, and New York Stock Exchanges. *Journal of Financial and Quantitative Analysis*, September, 391-413
29. Barua, S. K. (1980). Valuation of Securities and Influence of Value on Financial Decision of a Firm, *Doctoral Dissertation*, Indian Institute of Management, Ahmedabad.
30. Sharma, J. L. (1983). Efficient Capital Markets and Random Character of Stock Price Behaviour in a Developing Economy, *The Indian Journal of Economics*, 31(2), 53-70
31. Ramachandran, J. (1985). Behaviour of Stock Prices: Trading Rules, Information, and Market Efficiency. *FPM Thesis*, Indian Institute of Management, Ahmedabad
32. Gupta, R. (1987). Is Indian Capital Market Inefficient of Excessively Speculative? *Vikalpa*, 12(2), 21-28.
33. Barua, S. K. (1987). Some Observations on the Report of the High-Powered Committee on the stock Exchange Reforms, Annual Issue of ICFAI, Dec.
34. Srinivasan, R. (1993). Security price behavior associated with rights issue related events, *Doctoral Dissertation*. Indian Institute of Management. Ahmedabad.
35. Vaidyanathan, R. & Gali, K. K. (1994). Efficiency of the Indian Capital Market, *Indian Journal of Finance and Research*, 5(2), 35-38
36. Prusty, S. (2007). Market Efficiency and Financial Markets Integration in India. *Indian Journal of Economics and Business* 6(1), 45-60
37. Vidya, A. (2018). An Empirical Study on Weak Form Efficiency of Indian Stock Market, *International Journal of Management Studies*, 5(2), 94-98
38. Choudhury, S. K. (1991). Short-run Share Price Behaviour: New Evidence on Weak form of Market Efficiency, *Vikalpa*, 16(4) 17-21
39. Poshakwale, S. (1996). Evidence on Weak Form Efficiency and Day of the Week Effect in the Indian Stock Market. *Finance India*, 10(3), 605-616.
40. Madhusudan, T. P. (1998). Persistence in the Indian Stock Market Returns: An application of Variance Ratio Test. *Vikalpa* 23(4), 61-73

41. Pandey, A. (2003). Efficiency of Indian Stock Market, *Indian Economic Journal*, 36(4), 68-121
42. Gupta, R. & Basu, P. K. (2007). Weak Form Efficiency in Indian Stock Markets, *IBER Journal*, 6(3), 57-64
43. Gupta, S. & Bothra, N. (2015). Variance Ratio Test of Random Walk in Indian Stock Market, *Journal of Business Management and Information Systems*, 2(2), 89-107
44. Mishra, P. K. & Pradhan, B. B. (2009). Capital Market Efficiency and Financial Innovation – A Perspective Analysis, *The Research Network*, 4(1), 1-5
45. Mishra, P. K. (2009). Indian Capital Market – Revisiting Market Efficiency, *Indian Journal of Capital Market*, 2(5), 30-34
46. Mishra, P. K., K. B. Das, & Pradhan, B. B. (2009). Empirical Evidence on Indian Stock Market Efficiency in Context of the Global Financial Crisis, *Global Journal of Finance and Management*, 1(2), 149-157
47. Jain, V. & Roy, A. (2013). A study on weak form of market efficiency during the period of global financial crisis in the form of random walk on Indian capital market, *Journal of Advances in Management Research*, 10(1), 122-138
48. Sarkar, S. (2014-15). Revisiting Random Walk Hypothesis in Indian Stock Market – An Empirical Study on Bombay Stock Exchange, *Business Studies*, 35 & 36, 55-70
49. Dsouza, J. J. & Mallikarunappa, T. (2015). Does the Indian Stock Market Exhibit Random Walk? *Paradigm* 19(1), 1-20
50. Parthasarathy, S. (2016). Test of Weak Form Efficiency of the Emerging Indian Stock Market using the Non-Parametric Rank and Sign Variance Ratio Test, *Global Journal of Finance and Management*, 8(1), 49-64
51. Mishra, P.K. (2013a). Random Walk Behaviour: Indian Equity Market, *SCMS Journal of Indian Management*, 10(3), 55-66
52. Mishra, P. K. (2013b). Has Stock Market Efficiency Improved in India? A Post-Crisis Study, *Disseminate Knowledge – International Journal of Research in Management, Science and Technology*, 1(2), 45-58
53. Patel, A., Rajpal, R. & Modi, A. (2018). Testing Weak Form of Market Efficiency: A Study on Indian Stock Market, *International Journal of Management and Business Studies*, 8(4), 9-11
54. Fama, E. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work, *The Journal of Finance*, 25, 383-417.
55. Fama, E. (1991). Efficient Capital Markets: II. *Journal of Finance*, 46(5), 1575-1617
56. Fama, E. F. & French, K. R. (1988). Dividend yields and expected stock returns, *Journal of Financial Economics* 22, 3-25.
57. Lo, A. W. & MacKinlay, A. C. (1988). Stock Market Prices do not Follow Random Walks: Evidence from a Simple Specification Test. *The Review of Financial Studies*, 1(1), 41-66.
58. Elango, R. & Hussein, M. I. (2008). An Empirical Analysis on the Weak-Form Efficiency of the GCC Markets Applying Selected Statistical Tests. *International Review of Business Research Papers*, 4(1), 140-159.
59. Errunza, V. R. & Losq, E. (1985). The Behaviour of Stock Prices on LDC Markets. *Journal of Banking and Finance*, 9, 561-575
60. Butler KC, Malaikah SJ. Efficiency and Inefficiency in Thinly Traded Stock Markets: Kuwait and Saudi Arabia. *Journal of Banking and Finance*. 1992;16(1), 197-210
61. Khababa N. Behaviour of stock prices in the Saudi Arabian Financial Market: Empirical Research Findings. *Journal of Financial Management and Analysis*, 1998; 11(1), 48-55.
62. Pant B, Bishnoi TR. Testing Random Walk Hypothesis for Indian Stock Market Indices. *Working Paper series*, Indian Institute of Management, Ahmadabad. 2002.

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