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Technical analysis of Indian stock market with special reference with individual stock

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Abstract

The concept of informational efficiency suggests that the more efficient the market, the more random the sequence of price changes generated by such a market, and the most efficient market of all is one in which price changes are completely random and unpredictable. This is not an accident of Nature, but is in fact the direct result of many active market participants attempting to profit from their information. Driven by profit opportunities, a myriad of investors pounce on even the smallest informational advantages at their disposal and in doing so; they incorporate their information into market prices and quickly eliminate the profit opportunities that first motivated their trades. If this occurs instantaneously, which it must in an "idealized world of frictionless" markets and costless trading, then prices must always fully reflect all the available information. Therefore, no profits can be from information-based trading because such profits must have already been captured.

Keywords: Profit opportunities, dividend, efficient market, trade, India

1. Introduction

The origin of the EMH can be traced back to Paul Samuelson (1965) ^[14], whose contribution is neatly summarized in the title of his article: "Proof that Properly Anticipated Prices Fluctuate Randomly". In an informational efficient market, price changes must be unforecastable if they are properly anticipated, i.e., they fully incorporate the information and expectations of all market participants. Fama (1970) ^[15] operationalized this hypothesis summarized in Fama's well-known epithet "Prices fully reflect all available information" by placing structure on various information sets available to market participants. The important reason for the existence of an efficient market is the intense competition among investors to profit from any new information. The ability to identify over and under-priced stocks is very valuable as it would allow investors to buy some stocks for less than their "true" value and sell others for more than they were worth. Naturally, as more and more analysts compete against each other in their effort to take advantage of over and under-valued securities, the likelihood of being able to find and exploit such mis-priced securities becomes smaller and smaller. In equilibrium, only a relatively small number of analysts will be able to profit from the detection of mis-priced securities, mostly by chance. For the vast majority of investors, the information analysis payoff would likely not outweigh the transaction costs. The most crucial implication of the EMH can be put in the form of a slogan: Trust market prices! At any point in time, prices of securities in efficient markets reflect all known information available to investors. There is no room for fooling investors and as a result, all investments in efficient markets are fairly priced, i.e. on an average investors get exactly what they pay for. Fair pricing of all securities does not mean that they will all perform similarly, or that even the likelihood of rising or falling in price is the same for all securities. Usha, Arora, and Bansal Monika (2008) ^[10] according to capital markets theory, the expected return from a security is primarily a function of its risk. The price of the security reflects the present value of its expected future cash flows, which incorporates many factors such as volatility, liquidity and risk of bankruptcy.

2. Review of Literature

Cootner (1962) ^[1] examined the behaviour pattern of stock prices over the New York Stock Exchange with the help of price data of 45 stocks and tested for their randomness by the use of a mean square successive differences test (Von Neumann Ratio).

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He analysed the status of random and systematic behaviour of stock prices. The result of the study confirm that stock price appeared to move randomly when studied at one week interval and found some evidence of trends in the same data when taken at 14 week interval. Hence, it emphasized the importance of differencing interval while testing for randomness in stock price behaviour. It is concluded that stock price followed a random walk when examined at weekly-interval but generated trends when studies at longer differencing intervals. Moore (1964) ^[2] analysed the behaviour of stock price changes by conducted a study on individual stocks as well as through the market index. It found an average serial correlation coefficient -0.06 on the basis of weekly changes in the prices of 30 randomly selected stocks for the period (1951-58). Bansal Monica (2010) ^[9] suggested that this was an extremely low value indicating that study of weekly changes of shares prices is useless in predicting future share price changes. A market index which was based on the price changes of 25 of these stocks showed a faint pattern over time as the first order serial correlation coefficient was 0.153. The statement made independence in the successive price changes of individual stocks but at the same time also found the predictable patterns in the successive movements of stock indices on the NYSE during the study period. Gupta and Basu (2007) ^[12] tested the weak form efficiency in the framework of random walk hypothesis for the two major equity markets in India for the period 1991 to 2006. The evidence suggested that the series did not follow random walk and there was an evidence of auto correlation in both markets rejecting the weak form efficiency hypothesis. Mishra, Das and Pradhan (2009) ^[13] attempted to provide some empirical evidence on the efficiency of Indian stock market in the context of recent global financial crisis. The study by employing the unit root tests on the sample of daily stock returns, presented the evidence of weak form market inefficiency in India. The study further examined the mean reversion implication of market inefficiency and suggested the existence of mean reversion illusion in India.

3. Objective of the Study

The main objective of this research paper is to perform the Technical Analysis of Indian Stock Market with Special Reference with Individual Stock.

4. Analysis and Interpretation

4.1 Findings of Serial Correlation Test

The serial correlation test is a parametric test and is based on the assumption of normality of the time series. It is a powerful tool to examine whether the successive movement of financial time series is independent from the previous movements or not.

4.2 Empirical Results of the First Phase

The results of autocorrelation for 73 companies for the first phase i.e. from April 1996 to March 2000. There were 1168 autocorrelation matrices for the sub-period. To test the independence of the successive stock return series the autocorrelation co-efficient up to lag 16 were examined throughout the sub-period. Out of 1168 autocorrelation matrices; there were 57 (4.88 per cent) coefficients which showed their value significantly different from zero

throughout various lags for all 73 companies at 5 per cent level of significance and the number of these significant autocorrelation coefficients have fallen substantially to 5 (0.43 per cent) when the level of significance has come down to 1 per cent. Out of the total 1168 serial correlation coefficients, 625 (53.51 per cent) were having negative values, 538 (46.06 per cent) have positive values while the remaining 5 (0.43 per cent) had experienced zero values. Therefore, the results when analyzed for the sub-period; strongly supported the successive independence of the stock return series of the sampled companies.

4.3 Serial Correlation and Bear Market Phenomenon

Reflects serial correlation coefficients computed for lags 1 to 16 by using weekly data of 88 sample companies to examine the weak form of market efficiency for the period (from April 2000 to March 2003). The table depicts that out of 1408 correlation coefficients, 90 (about 6.39 per cent) were found significant. Out of which 76 (about 5.39 per cent) were significant at 5 per cent and 14 (about 0.99 per cent) were significant at 1 per cent level of significance. The table also represents that 729 (about 51.77 per cent) were found negative, 673 (about 47.80 per cent) were positive and 6 (0.43 per cent) were zero. The dominance of negative values signals a depressed stock market conditions during the sub-period. However, the overall insignificance of autocorrelation coefficients points to the efficiency of the markets in weak form. Although the autocorrelation results did not fully support the weak form efficiency but it gave strong evidences in favour of independence in the weekly return series of BSE Sensex index.

4.4 Serial Correlation and Bull Market Phenomenon

Significant dependence (autocorrelation coefficients) in the successive movements for the period April 2003 to March 2008 computed for lags 1 to 16 of 94 sample companies. There were 1504 autocorrelation matrices. Out of 1504 autocorrelation matrices; there were 89 (5.92 per cent) coefficients which showed their value significantly different from zero throughout various lags for all 94 companies. Out of 1504 correlation coefficients, 70 (about 4.65 per cent) were found significant at 5 per cent level of significance and the number of these significant autocorrelation coefficients have fallen substantially to 19 (1.26 per cent) when the level of significance has come down to 1 per cent. The table also signifies that out of the total 1504 serial correlation coefficients, 732 (about 48.67 per cent) were having negative values, 759 (about 50.46 per cent) have positive values while the remaining 13 (0.86 per cent) had experienced zero values. Therefore, the results strongly supported the successive independence of the stock return series of the sampled companies.

4.5 Empirical Results of the Fourth Phase

The correlation coefficients reveals that 194 (about 11.12 per cent) coefficients were noted significant out of total 1744 coefficients under consideration. Out of the total 1744 serial correlation coefficients, 775 (44.43 per cent) were having negative values, 962 (55.16 per cent) have positive values while the remaining 7 (0.40 per cent) had experienced zero values. The examination of the significance of correlation coefficients in relation to its

levels reveals that a handful of 168 coefficients (9.63 per cent) were noted significant at 5 per cent and 26 (1.49 per cent) were found significant at 1 per cent level. However,

the overall insignificance of autocorrelation coefficients points to the efficiency of the markets in weak form.

Table 1: Serial Correlation Test during Overall Study Period (April 1996 to March 2011)

Company Code/Legs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A B B Ltd.	0.079**	0.620*	-0.046	0.065	0.008	0.009	-0.097**	-0.048	0.057	0.016	0.009	-0.057	0.010	0.010	0.023	-0.027
Aban Offshore Ltd.	0.200*	0.040	-0.022	-0.032	-0.032	0.066	0.013	0.156*	0.175*	-0.066	-0.182*	-0.108*	-0.042	0.108*	0.169*	-0.012
A C C Ltd.	0.001	0.088**	-0.045	0.008	-0.059	0.008	0.014	-0.055	0.131*	-0.050	0.001	-0.063	0.067	-0.010	0.054	-0.066
Adani Enterprises Ltd.	-0.031	0.050	0.058	0.030	-0.058	0.017	0.066	-0.068	0.084**	0.074**	-0.117*	-0.041	0.096**	-0.016	0.108*	-0.021
Aditya Birla Nuvo Ltd.	0.165*	0.043	-0.018	0.133*	-0.006	0.121**	-0.027	-0.060	-0.041	-0.124	-0.057	0.040	0.072**	0.086**	0.109	0.017
Ambuja Cements Ltd.	0.067	0.042	0.020	-0.026	-0.066	-0.037	0.096	-0.019	-0.015	-0.008	-0.032	-0.039	-0.004	-0.011	0.098**	-0.019
Apollo Hospitals Enterprise Ltd.	-0.166*	0.064	-0.028	-0.004	0.032	0.037	-0.117*	0.122*	0.014	-0.065	0.019	0.087**	0.002	-0.001	0.081**	0.099**
Apollo Tyres Ltd.	0.074**	0.125*	0.074**	0.066	-0.006	0.091**	-0.055	-0.045	-0.044	-0.024	0.079**	0.059	-0.029	0.055	-0.070	0.023
Areva T & D India Ltd.	-0.522*	0.305*	-0.205*	0.141*	-0.180*	0.130*	-0.053	0.006	0.060	-0.070	0.044	-0.011	-0.028	-0.006	-0.050	0.038
Ashok Leyland Ltd.	-0.002	0.060	-0.022	0.014	0.040	-0.054	-0.006	0.014	0.036	0.074	-0.112*	-0.004	-0.037	0.046	0.063	-0.019
Asian Paints Ltd.	-0.018	0.029	-0.015	0.026	0.022	-0.043	0.099**	0.120*	-0.025	0.055	0.013	-0.057	0.100	0.111	0.051	-0.006
Aurobindo Pharma Ltd.	0.000	0.062	0.026	0.097**	-0.068	-0.034	0.072	-0.019	0.060	-0.053	0.121*	0.129**	0.057	0.044	0.017	-0.047
Bajaj Holdings & Invst. Ltd.	0.100**	-0.012	-0.026	0.031	-0.020	-0.035	0.067	0.011	-0.001	0.089**	0.063	0.058	-0.042	0.075**	-0.061	-0.053
Bharat Forge Ltd.	0.089**	0.059	0.096**	0.042	-0.018	0.000	0.095**	0.011	0.078**	0.009	0.027	0.020	-0.018	0.029	0.023	0.022
Bharat Heavy Electricals Ltd.	-0.010	0.008	0.022	-0.011	-0.049	-0.003	0.049	0.010	0.067	0.034	0.078**	0.004	-0.011	0.097**	0.065	0.020
Bharat Petroleum Corpn. Ltd.	-0.010	-0.019	-0.029	0.092**	-0.032	0.018	0.062	0.044	0.073**	-0.038	-0.054	-0.007	-0.058	0.057	0.005	0.007
Bosch Ltd.	0.011	0.200*	0.186*	0.004	0.219*	-0.012	0.025	0.011	-0.044	0.013	-0.010	0.015	-0.033	-0.004	-0.024	-0.019
Castrol India Ltd.	0.010	0.472	0.023	0.356*	-0.002	0.185*	-0.013	0.041	0.024	0.024	-0.022	-0.018	0.012	-0.016	-0.066	-0.024
Century Textiles & Inds. Ltd.	0.135*	0.056	0.011	-0.048	0.023	-0.021	-0.027	0.075**	0.017	0.029	-0.059	-0.059	0.014	0.020	-0.026	-0.011
Chambal Fertilisers & Chemicals Ltd.	-0.062	0.000	-0.013	-0.045	0.089**	0.059	-0.068	0.007	0.004	-0.047	-0.015	-0.027	-0.022	0.069	0.053	-0.025
Cipla Ltd.	-0.126*	0.090**	-0.027	0.048	-0.060	0.007	0.053	0.030	0.093**	-0.026	-0.012	0.047	0.063	-0.049	-0.012	-0.043
Colgate-Palmolive (India) Ltd.	0.019	0.004	-0.012	-0.065	-0.026	-0.024	0.078**	-0.018	0.044	0.018	-0.030	0.009	-0.026	-0.031	0.003	0.035
Crompton Greaves Ltd.	0.037	0.028	-0.019	-0.014	0.056	0.095**	0.030	0.030	-0.013	0.026	0.071**	0.031	0.013	0.029	0.055	0.074**
Cummins India Ltd.	-0.009	0.004	0.022	0.039	-0.025	-0.021	-0.047	-0.014	0.000	0.011	-0.049	0.009	0.013	-0.048	0.027	-0.039
Dabur India Ltd.	0.093**	0.058	-0.035	0.044	0.023	-0.012	-0.045	-0.044	-0.013	-0.036	0.046	-0.036	-0.038	-0.029	0.065	0.049
Dr. Reddy'S Laboratories Ltd.	0.017	-0.022	0.012	-0.056	-0.003	-0.033	0.043	-0.028	0.036	0.013	-0.004	0.008	0.026	0.046	0.056	-0.028
Exide Industries Ltd.	0.000	0.007	0.048	-0.012	0.062	-0.020	0.007	0.015	-0.020	0.022	-0.007	-0.026	-0.036	-0.020	0.005	0.024
Federal Bank Ltd.	0.042	0.055	-0.023	-0.007	-0.003	-0.002	-0.045	0.011	0.027	-0.007	-0.015	0.076**	0.026	0.035	0.026	-0.028
Glaxosmithkline Consumer Healthcare Ltd.	-0.044	-0.015	0.085**	-0.007	0.026	-0.004	0.028	0.030	0.099**	0.010	-0.030	-0.036	0.026	-0.013	-0.003	-0.038
Glaxosmithkline Pharmaceuticals Ltd.	-0.016	0.004	0.013	0.011	-0.043	-0.049	0.033	0.018	0.023	0.010	0.030	0.079**	0.082**	-0.033	-0.021	-0.012
Grasim Industries Ltd.	0.071	0.085**	0.001	0.107**	0.079**	-0.018	-0.013	0.028	0.102	-0.009	-0.050	-0.039	0.027	0.080**	-0.037	-0.031
H D F C Bank Ltd.	-0.301*	0.569*	-0.189*	0.386*	-0.117*	0.194	-0.043	-0.001	-0.012	-0.002	-0.015	0.006	0.002	-0.008	0.006	-0.010
Hero Honda Motors Ltd.	-0.036	-0.060	0.062	-0.035	-0.067	0.059	0.047	0.000	0.032	0.027	-0.061	0.041	0.002	0.014	0.031	-0.005
Hindalco Industries Ltd.	-0.005	0.020	-0.017	0.038	-0.002	-0.011	-0.012	0.052	0.011	-0.023	0.011	0.046	0.017	0.010	-0.007	-0.003
Hindustan Petroleum Corpn. Ltd.	-0.036	-0.025	-0.006	0.078**	0.009	-0.016	0.028	0.084	0.060	-0.053	-0.007	-0.065	0.094**	0.061	-0.003	0.002
Hindustan Unilever Ltd.	-0.127*	0.095**	0.090**	-0.049	0.003	0.010	0.002	-0.016	-0.015	0.087	-0.077	0.057	-0.059	0.019	0.023	-0.062
Housing Development Financ. Corpn. Ltd.	-0.186*	0.033	-0.060	0.051	-0.008	0.045	-0.060	0.093	0.009	0.011	0.023	-0.047	0.011	0.021	0.001	0.036
I D B I Bank Ltd.	0.065	0.043	-0.043	0.032	0.003	0.007	-0.092	0.060	-0.029	0.004	-0.072	0.071**	-0.029	0.089**	-0.012	0.018
I F C I Ltd.	0.047	0.018	-0.042	0.000	0.015	0.005	-0.038	0.018	0.009	-0.012	0.005	0.093**	-0.007	0.034	0.042	0.075**
I T C Ltd.	-0.051	0.105**	0.089**	0.072	-0.007	-0.093	0.063	0.032	-0.003	-0.085	0.001	-0.038	0.009	0.002	-0.005	-0.052

Indian Hotels Co. Ltd.	-0.032	0.079**	0.023	0.021	-0.018	0.025	0.050	0.027	0.019	-0.034	0.024	-0.004	0.006	0.030	0.044	0.012
Infosys Ltd.	-0.101*	0.034	0.110*	-0.048	0.040	0.054	0.022	0.009	-0.002	0.084	-0.035	0.032	0.093**	-0.056	0.049	-0.042
J S W Ispat Ltd.	0.058	-0.010	-0.006	-0.036	-0.023	0.069	0.043	0.058	0.016	-0.029	-0.071	-0.021	0.010	0.003	0.040	0.004
J S W Steel Ltd.	0.058	-0.010	-0.006	-0.036	-0.023	0.083	0.056	-0.006	0.035	0.026	-0.030	0.008	0.001	-0.009	0.007	0.024
Jindal Saw Ltd.	0.118*	0.091**	0.118*	0.043	-0.004	0.010	0.030	-0.007	-0.056	-0.061	0.009	-0.023	-0.016	0.046	0.029	-0.031
Kotak Mahindra Bank Ltd.	0.071	0.059	0.029	-0.016	0.075**	0.065	0.024	0.042	0.043	0.023	-0.013	0.003	0.008	-0.002	0.041	0.024
L I C Housing Finance Ltd.	0.041	0.019	0.016	-0.029	0.020	0.020	0.080	0.003	0.015	-0.047	-0.006	-0.035	0.021	-0.030	0.042	-0.001
Mahindra & Mahindra Ltd.	-0.024	0.021	0.031	0.040	-0.057	0.059	-0.061	0.037	0.063	0.043	0.026	0.068	-0.016	0.010	0.002	-0.048
Oil & Natural Gas Corpn. Ltd.	0.013	0.024	-0.037	-0.020	0.057	0.012	-0.042	0.051	0.041	0.035	-0.039	-0.028	0.000	-0.031	0.042	-0.046
Oriental Bank Of Commerce	0.025	0.010	-0.042	0.009	-0.021	0.013	0.018	0.045	-0.021	0.032	-0.021	-0.005	-0.023	0.005	0.050	0.011
Piramal Healthcare Ltd.	0.013	0.001	0.059	0.052	-0.012	0.041	0.049	0.031	-0.015	0.076**	-0.033	-0.031	0.066	-0.017	0.001	0.030
Ranbaxy Laboratories Ltd.	0.040	0.012	-0.048	0.028	-0.039	-0.014	0.068	0.035	-0.030	0.064	-0.013	0.003	0.018	0.023	0.029	-0.039
Reliance Capital Ltd.	0.104**	0.056	-0.002	-0.017	-0.028	0.089**	-0.023	0.049	0.020	-0.021	-0.128*	-0.037	0.015	0.054	0.059	0.026
Reliance Industries Ltd.	-0.056	0.024	-0.003	0.073**	-0.029	0.020	-0.035	-0.023	0.007	-0.039	0.036	-0.033	0.071	-0.011	0.060	0.002
Reliance Infrastructure Ltd.	0.026	0.050	-0.017	0.036	0.013	0.016	0.105**	0.088**	0.001	-0.024	-0.047	0.022	-0.028	0.106*	0.023	0.029
Siemens Ltd.	0.029	0.041	0.011	-0.002	-0.014	0.036	0.047	0.001	0.010	-0.006	0.025	0.020	0.002	0.007	-0.021	0.011
State Bank Of India	0.026	0.021	0.011	-0.052	-0.018	-0.005	-0.016	0.019	0.077**	0.007	-0.042	-0.026	-0.017	0.044	0.023	0.018
Steel Authority Of India Ltd.	0.024	-0.009	0.000	0.004	0.001	0.003	0.003	-0.003	-0.001	-0.005	-0.008	-0.009	-0.003	-0.006	0.001	-0.005
Sun Pharmaceutical Inds. Ltd.	-0.115*	0.063	-0.041	0.040	0.051	-0.040	0.039	-0.055	0.120	-0.061	0.044	-0.013	0.006	-0.008	0.021	0.001
Tata Chemicals Ltd.	-0.005	-0.153*	-0.024	-0.013	0.063	0.001	-0.006	-0.019	-0.010	-0.025	0.037	0.056	0.027	-0.046	0.024	-0.003
Tata Global Beverages Ltd.	0.049	-0.013	-0.009	0.020	0.064	-0.029	-0.024	0.011	-0.041	-0.005	0.020	-0.034	-0.004	-0.028	0.006	0.019
Tata Motors Ltd.	0.017	0.101**	0.040	-0.017	0.004	0.073	-0.014	-0.014	0.076**	0.028	0.075**	0.112*	-0.036	0.017	0.050	0.070
Tata Power Co. Ltd.	0.035	0.093	0.002	-0.023	0.004	-0.035	0.088**	0.047	0.003	-0.014	0.006	0.000	-0.029	0.045	-0.010	-0.032
Tata Steel Ltd.	0.038	0.131*	-0.051	0.051	-0.062	0.071	-0.029	0.118*	0.020	-0.034	-0.030	-0.040	-0.028	0.069	0.041	0.014
Thermax Ltd.	0.156*	0.032	0.062	0.037	0.026	0.026	0.080	0.018	-0.024	-0.020	-0.058	-0.018	-0.037	0.024	0.050	0.005
Titan Industries Ltd.	0.013	0.008	0.028	-0.032	0.006	-0.055	0.028	-0.020	-0.016	0.031	-0.025	-0.049	0.019	0.018	-0.042	0.000
Voltas Ltd.	0.041	0.101**	0.053	0.000	-0.029	0.043	-0.025	0.068	0.041	0.064	-0.064	0.037	0.080**	0.034	0.056	0.017
Zee Entertainment Enterprises Ltd.	-0.005	0.089**	0.022	-0.070	0.100**	-0.046	0.041	0.109*	0.003	0.132*	-0.013	0.042	0.013	0.004	0.084**	-0.019

5. Empirical Results of the Overall Study period

The results of autocorrelation for 68 companies for the overall study period i.e. from April 1996 to March 2011. There were 1088 autocorrelation matrices for the whole-period. Out of 1088 autocorrelation matrices, there were 94 (8.63 per cent) coefficients which showed their value significant at 5 per cent level of significance and the number of these significant autocorrelation coefficients have fallen to 60 (5.51 per cent) when the level of significance has come down to 1 per cent. The table also represents that 475 (about 43.66 per cent) were negative and 605 (about 55.61 per cent) were positive while the remaining 8 (0.73 per cent) were zero. Therefore, the autocorrelation analysis showed some dependence in the sequence of stock returns series resulting into lower degree of efficiency in weak form.

6. References

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