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       INTRODUCTION

       REVIEW OF LITERATURE

       NEED/IMPORTANCE OF THE STUDY

       STATEMENT OF THE PROBLEM

       OBJECTIVES

       HYPOTHESES

       RESEARCH METHODOLOGY

       RESULTS & DISCUSSION

       FINDINGS

       RECOMMENDATIONS/SUGGESTIONS

       CONCLUSIONS

       SCOPE FOR FURTHER RESEARCH

       ACKNOWLEDGMENTS

       REFERENCES

       APPENDIX/ANNEXURE

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BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

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WEBSITE

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

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MARKET EFFICIENCY AND INTERNATIONAL BENCHMARKS IN THE SECURITIES MARKET OF INDIA – A STUDY

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ABSTRACT

The transformation catapulted all sectors of the economy leaving no stones unturned including the Indian capital and securities market. The change is aghast, vivid and irreversible. The sweep changes in the capital market put efficient players safely on the sea-shore and inefficient firms were immersed in the ocean due to hurricane and tsunami like waves and water current. The methodologies involved in the present study are both analytical & survey. The study is based on both primary and secondary data. The findings are that on the basis of analysis of the first objective, it is inferred that average closing price is highly volatile, when compared to average opening price and to know whether market prices of the stocks are random in nature the study used runs test. The numbers of runs for BSE and NSE are 8 and 5 respectively. The BSE and NSE Stock prices in relation to Sensex and Nifty as well as external factors, the amount of randomness were determined by using runs test. As per the findings of the year 2005, it is concluded that the available private and public information will have only partial influence on stock trading. Hence it is suggested that the company related matters like declaration of dividend, announcement of bonus shares, major changes in the top management, risk management strategies of the company, influence of political and economic parameters etc must be handled very carefully while communicating the same to the public about its effects on the company.

KEYWORDS

Securities market, Market efficiency, Sensex, International Benchmarks, Random walk, BSE, NIFTY.

INTRODUCTION

The greatest and engendering event in the Twenty first century is capital and financial market revolution and reformation especially for India. The sea-change in the global order dismantled the world rules of the game in every sphere of economic and human activity. The transformation catapulted all sectors of the economy leaving no stones unturned including the Indian capital and securities market. The change is aghast, vivid and irreversible. The sweep changes in the capital market put efficient players safely on the sea-shore and inefficient firms were immersed in the ocean due to hurricane and tsunami like waves and water current. The Indian capital market regained its true position after shaking the tree by winds of change wherein feeble and phony leaves like firms fell off. The players with vision forward and onward looking, vigor, proactive and pragmatic ones are ruling the roost in the new spectrum of the game with renewed vigor.

Indian capital markets have witnessed radical transformation during the last two years, wherein, the sensex catapulted to 20,000 mark. What Indian stock market cannot witnessed in the past sixty years has been achieved tremendously in the last two years in terms of value, volume, market capitalization, vitality and market growth. There is hardly any country in the world, which has witnessed such massive changes in its capital market during such a short period.

The Indian securities market is in transition. There have been changes over a period of time. In fact, on all almost all the operational and systemic risk management parameters, settlement system, disclosures, accounting standards, the Indian Securities Market is at par with the global standards, for instance, the anonymous order matching system adopted by NSE is perhaps one of the best in the world. The New York Stock Exchange (NYSE) for example, would has remained free from the bad name the floor specialists brought to NYSE had it adopted NSE's automated trading system. In terms of geographical reach of the real time trading facilities to the nooks and corners of the country, the Indian capital market is way ahead of most of the global capital markets. Investors can trade from close to 400 cities/towns across the length and breadth of the country on a real time basis

REVIEW OF LITERATURE

The perusal of past research programmes is very important in order to comprehend the concepts of stock market efficiency and international benchmarks. The literature survey phenomenon is morefully arrayed in this below.

Barua (1980)[1] and Chaudhury (1991)[2] in their research work identified three types of market efficiency. They have segmented the efficiency has information efficiency in the field of capital markets throughout the world. The informational efficiency are grouped into three categories namely weak, semi-strong and strong. According to the authors, the "weak efficiency" states that the current prices fully reflect all the information contained in the history of past prices and denies the utility of charting and technical analysis. They conclude that the uses and prepares accounting information in India do not believe that the market is efficient in any of its three forms.

Semi-strong form of efficiency deals with the speed with which publicly available information is assimilated by the market and incorporated market prices. The third of market efficiency is "strong form" that asserts that even inside information which is not publicly available is reflected in market prices very rapidly.

Pradeep Gupta (2000)[3] in his study on stock market efficiency in India fundamentally aims at enquiring into certain aspects to market efficiency with respect to the Indian stock market. The reference period of the study was 1986-1995. The natures of data are secondary. The yearly time series data have been used to verify semi-strong form and Efficient Market Hypothesis (EMH). The daily data have been used by the author for weak form EMH.

To test the weak form of EMH, short term data of dependent variables have been plotted to verify whether share prices depict any reversal effect. The findings of the research program are: dividend has a powerful and positive impact on the stock market share price. Profitability (as measured by earning after interest and taxes) has a positive influence on the market share prices. Leverage had no significant effect on market share prices.

R. Vaidyanathan and Kanti Kumar Gali (1994)[4] attempted at testing for weak form of efficiency of the Indian capital market. The test was based on the daily closing prices of ten shares actively traded on the Bombay Stock Exchange over four different periods of time, namely 1980, 1985, 1989 and 1990. In each year the period from April to November was covered so that at least 120 daily data point are available for each company. They used the runs test, serial correlation test and the filter test using daily data. For all these periods, the runs test provides supportive evidence for the weak-form of the Efficient Market Hypothesis (EMH).

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1 Barua S.K.(1980) *Valuation of Securities and Influence of Value on Financial Decisions of a Firm.* Doctoral dissertation, Indian Institute of Management, Ahmedabad.

2 Chaudhury.S.K. (1991) *Short Run Behaviour of Industrial Share Price Indices: An Empirical Study of Returns, Volatility and Co-variance Structure,* Prajanan, Vol. XX, Apr-Jun No. 2, pp 99-133.

3 *A Study of Stock Market Efficiency in India*, Finance India Vol. XV No. 2, June, 2000 pp 665-673

4 R. Vaidyanathan and Kanti Kumar Gali, *Efficiency of the Indian Capital Market*, Indian Institute of Management, Bangalore, Library, E 7718, No2, 1994, PP 1-19.

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Fama(1970)[5] summarises the early random walk literature, his own contributions and other studies of the information contained in the historical sequence of prices, and concludes that "the results are strongly in support" of the weak form of market efficiency. He then reviews a number of semi-strong and strong form tests and concludes that "in short, the evidence in support of the efficient markets model is extensive, and (somewhat uniquely in economics) contradictory evidence is sparse." He concedes, however, that "much remains to be done" and indeed Fama (1991) subsequently returned to the fray with a reinterpretation of the Efficient Markets Hypothesis in the light of subsequent research.

Paul Tetlock's (2006)[6] measures liquidity and expected returns for various securities, and show that the two are linked. In an efficient market, the benchmark is that all securities should have zero expected returns. The author finds that the liquid securities markets have (close to) zero expected returns, implying that these markets are efficient. But the liquid securities show certain mispricing patterns. The nature of these patters suggests that individuals' probability misperceptions are the cause of the mispricing in liquid securities.

Kathy Yuan (2005)[7] demonstrates that benchmarked Securities allow heterogeneously informed investors to create trading strategies that are perfectly aligned with their signals. Investors who are inform about security-specific risks but uninformed about systematic risks can take an offsetting position in benchmark securities to eliminate experts to adverse selection in systematic risks. He further shows that introduction of benchmark securities encourages more investors to acquire security-specific and systematic-factor information, while leads to increased liquidity price informativeness for all individual securities.

RESEARCH GAP

Several research works on efficient market hypothesis comprising weak form, semi-strong form and strong form have already conducted by the earlier researchers all over the globe including India.

Their research results are mind-boggling, intriguing and realistic. However, the present study was justified in narrowing down the research gap on the following grounds.

- In India the adoption of sophisticated information technology tools in trading and settlement (T+2) mechanisms helped to create a new international benchmarks.
- The National Stock Exchange has played an important role in the transformation of stock market that acted as a milestone for undertaking the present research programme.

STATEMENT OF THE PROBLEM

Stock market efficiency has received a new vigor and vitality in the Indian capital market. The burgeoning sensex is unstoppable, inexorable and ineffable. The new scale of 15,000 mark has astonished the *pundits*, stock brokers, finance ministry, foreign institutional investors, the regulator SEBI and of course the common man. The proliferation of sensex is quite intriguing and mind-boggling in that, it changed the rules of the game in the securities market of India, which was never expected and predicted.

The Indian securities market is in transition. There have been revolutionary changes over a period of time. In fact, on almost all the operational and systemic risk management parameters, settlement systems, disclosures, accounting standards, Indian Securities Market is at par with the global standards. Indeed, on a few paradigms, it is ahead of the global benchmarks. They are – T+2 settlement cycle, online monitoring of positions and margins and automatic disablement of terminals, Corporate governance index as a measure of wealth creation, management and distribution, central counterparty and commencement of Straight Through Processing.

OBJECTIVES OF THE STUDY

Among the other objectives, the study embarked upon the following

- ➢ To test the BSE and NSE stock market efficiency (in a semi-strong form) by investigating the relationship between aggregate stock returns and important macro variables.
- ➢ To test for weak-form of efficiency of the BSE and NSE between 2005 and 2007.
- ➢ To study the degree of random walk in daily prices for 20 Group 'A' stocks on the BSE from 1998 to 2007
- ➢ To analyse Indian international benchmarks such as transaction cost, settlement mechanisms, information technology, and corporate governance on the efficiency of stock markets.

HYPOTHESES

The present study relied on the following conjectures or the tentative statements, which form the hypotheses of the study.

Hypothesis – 1
H0: There is no relationship between stock prices and their intrinsic values to determine the market efficiency
H1: There is a strong relationship between stock prices and their intrinsic values to determine the nature of market efficiency
Hypothesis – 2
H0: The turbulence in stock prices due to extraneous factors is nothing to do with efficiency of the stock market.
H1: The turbulence in market prices of stocks due to extraneous variables influence stock market efficiency.
Hypothesis – 3
Indian international benchmarks are better than international stock market benchmark.

METHODOLOGY

The methodology involved in the present study is

- ➢ Analytical
- ➢ Survey

The study is also analytical one in that the researcher critical evaluated the market efficiency hypothesis macro-economic variables. By analyzing the attributes of sample, a generalization was drawn and the researcher portrays the fact about what has happened and what is happening in stock market in regard to informational efficiency and random walk theory.

RESULTS

The analysis and Interpretation in the following paragraphs is all about knowing whether BSE and NSE operated on Semi-strong or weak-form of market efficiency. The study revolves around 20 group 'A' stocks of BSE and 10 group 'A' Stock of NSE during the periods from 2005 to 2007. The entire gamut of analysis relies on rigorous statistical treatment with the use of descriptive statistical phenomenon, correlation, regression and ANOVA.

To measure the consistency in the price behavior between opening and closing prices, the statistical tool of co-efficient of variation was used. This mechanism highlights whether there exists consistency or otherwise in the price behavior of Stocks. Higher the percentage of variations, lower the consistency and vice-versa.

5 Fama, Efficient Capital Markets: *A Review of Theory and Empirical work*, Journal of Finance, 25, 1970, PP 383-417,

6 Paul Tetlock's, *Does Liquidety Affect Securities Market Efficiency?* Midas oracle.ORG. 2006-11-XX at www.google.com.

7 Kathy Yuan, *The Liquidity Service Of Benchmark Securities*, Journal of Economic Association, SPARC, Vol. 3, No. 5, Sep 2005, PP 1156-1180.

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ANOVA RESULTS

To test the conjecture or surmise in the form of null hypotheses that there is no relationship between stock prices and their intrinsic values in the determination of market efficiency, the ANOVA model was used. The results are shown in the following table

ANOVA AMONG VOLUME OF TRANSACTIONS OF AVERAGE OPENING AND CLOSING PRICES OF 30 GROUP 'A' STOCKS OF BSE AND NSE FOR THE YEAR 2005

Model	Sum of Squares	df	Mean Square	F-Ratio
Regression between Companies	75354845355444700.000	2	37677422677722370.000	.307
Residual Error Within Companies	3312021858960568000.000	27	122667476257798800.000	
Total	3387376704316012000.000	29		

Predictors: (constant) Close, Open

Dependable variable: Volume

SPEARMAN'S RANK CORRELATION

The Second null-hypotheses is in respect of market prices of the stocks and past and publicly available information of those stocks relationship. The second null-hypotheses prophecies the fact as follows.

Ho: The market prices of the stocks are not related to past and publicly available information.

The investors on BSE and NSE acted both on the past and publicly available information of 30 listed companies which are categorized group 'A' Stocks. The stringent norms of SEBI goaded the listed companies to publicise their privately held information so as to enable the investor community to act judiciously and not on the probability. The rise or the fall of the price influenced market capitalization value. The listed companies from time to time intimated the stock exchanges about their mergers, acquisitions, dividend declaration, right issue, acquisition of new technology, foreign collaborations so on the so forth.

To test the above hypotheses the stock used rank correlation co-efficient which are shown in the following table

THE TABLE SHOWS THE COMPUTATION OF SPEARMAN RANK CORRELATION CO-EFFICIENT FOR THE YEAR 2005

Sl.No	Name of the Company	Ranks		
		R_1	R_2	$D^2 = (R_1 - R_2)$
1	ACC	28	21.5	42.25
2	Ambuja Cements Pvt Ltd	27	18	81
3	BHEL	13	21.5	72.25
4	Cipla	24	12	144
5	Grasim Industries Ltd	26	10.5	240.25
6	HDFC Bank	17	24	49
7	Hindalco Industries Limited	23	10.5	156.25
8	Hindustan Unilever Limited	09	06	09
9	ICICI Bank	05	19	196
10	Infosys technologies limited	4	4	0
11	ITC LTD	8	8	0
12	Jaiprakash Associates Limited	30	28.5	2.25
13	Larsen & Toubro	14	01	169
14	Maruti Suzuki India Limited	18	25.5	56.25
15	NTPC Limited	03	28.5	650.25
16	Oil and Natural Gas Corporation Limited	01	07	36
17	Ranbaxy Laboratories Limited	22	13	81
18	Reliance Industries Limited	02	16.5	210.25
19	Tata Steel Limited	12	14	04
20	Wipro Limited	06	09	09
21	Asea Brown Boveri Limited (ABB)	11	21.5	110.25
22	Bharti Airtel Limited	07	30	729
23	Bharat Petroleum Corporation Ltd	25	15	100
24	Dr. Reddy's Laboratories	29	16.5	156.25
25	GAIL (India) Limited	15	21.5	42.25
26	HCL Technologies Limited	19	05	196
27	Hero Honda Motors Ltd,	20	03	289
28	National Aluminium Company(NALCO),	21	25.5	20.5
29	Steel Authority of India Limited (SAIL)	16	27	121
30	Tata Consultancy Services	10	02	64
∑D²=				4036

(Source: Computed)

Since some of the companies are repeated more than one time we have to calculate the Adjustment Factor [AF] and is given by m (m²-1)/12. Here companies 24, 40, 100 and 200 are repeated twice and companies 80 repeated four times. Hence the value of A.F is 7

Rank correlation co-efficient is given by

$$Rk = 1 - [\sum \frac{\{D^2 + AF\}}{n(n^2 + 1)}]$$

= [6{4036+7}/30(900-1)]

= 1-0.89

= 0.11

Ho: The market prices of the stocks are not related to past and publicly available information

H1: The market prices of the stocks are related to past and publicly available information.

Sample size (n) = 30

Level of Significance ($^\llcorner$) = 0.05

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The table value or critical value of rs is ±0.3620 (accept)

The null hypotheses was tested the help of ANOVA results. The null hypothesis stated was that there existed no relationship between the stock prices and their intrinsic values. The results are exhibited at table.

ANOVA AMONG VOLUME OF TRANSACTIONS OF AVERAGE OPENING AND CLOSING PRICES OF 30 GROUP 'A' STOCKS OF BSE AND NSE FOR THE YEAR 2006

Model	Sum of Squares	df	Mean Square	F-Ratio
Regression between Companies	13725853113364990.000	2	6862926556682500.000	.041
Residual Error Within Companies	4547142102708300000.000	27	168412670470677800.000	
Total	4560867955821670000.000	29		

Predictors: (constant) Close, Open, Dependent variable: Volume

ANALYSIS

The above table shows that the F calculated value 0.041 and F table value is 3.01. Since calculated value is less than that table value, null hypotheses of no relationship between stock price and its intrinsic value is accepted. In the year 2006 too, there existed the significant relationship among average opening and Closing stock prices as well as the average volume of transactions of sample 30 group 'A' Stocks. The relationship between intrinsic value and Market efficiency of BSE and NSE are influenced by extraneous and outside factors as stated previously.

SPEARMAN'S RANK CORRELATION

The second null hypotheses of that the market prices of stocks are not related to past and publicly available information was tested with the help of Spearman Rank correlation co-efficient. The information is projected at table

THE TABLE SHOWS THE COMPUTATION OF SPEARMAN RANK CORRELATION CO-EFFICIENT FOR THE YEAR 2006

Sl.No	Name of the Company	Ranks		
		R_1	R_2	$D^2=(R_1-R_2)$
1	ACC	21	13	64
2	Ambuja Cements Pvt Ltd	19	12	49
3	BHEL	11	14	09
4	Cipla	30	18.5	132.25
5	Grasim Industries Ltd	17	08	81
6	HDFC Bank	15	23.5	72.25
7	Hindalco Industries Limited	23	10	169
8	Hindustan Unilever Limited	13	05	64
9	ICICI Bank	07	18.5	132.25
10	Infosys technologies limited	02	09	49
11	ITC LTD	10	06	16
12	Jaiprakash Associates Limited	25	27	04
13	Larsen & Toubro	22	02	400
14	Maruti Suzuki India Limited	16	23.5	56.25
15	NTPC Limited	06	26	400
16	Oil and Natural Gas Corporation Limited	03	06	09
17	Ranbaxy Laboratories Limited	26	11	225
18	Reliance Industries Limited	01	16	225
19	Tata Steel Limited	12	15	09
20	Wipro Limited	08	07	01
21	Asea Brown Boveri Limited (ABB)	09	18.5	90.25
22	Bharti Airtel Limited	05	30	625
23	Bharat Petroleum Corporation Ltd	29	28	01
24	Dr. Reddy's Laboratories	28	21	49
25	GAIL (India) Limited	18	18.5	0.25
26	HCL Technologies Limited	20	04	256
27	Hero Honda Motors Ltd,	24	03	441
28	National Aluminium Company(NALCO),	27	25	04
29	Steel Authority of India Limited (SAIL)	14	29	225
30	Tata Consultancy Services	04	01	09
	∑D²=			3867.5

(Source: Computed)

The null hypothesis was accepted at 5 percent level of significance. The t-Statistic critical value is ± 0.3620 for the sample size of 30 companies. The correlation co-efficient is 0.05. Since the acceptance region (95 percent), the null hypothesis is accepted. It can be inferred that, the market price of Stocks at any day is influenced by the nature of Industry, Corporate image, investors propensity to buy or sell flow of foreign money, economic environmental factors, technology, transaction cost, attitude and behaviour of investors, international economic phenomenon so on and so forth. It can be inferred that since the two stated hypotheses have been accepted, the BSE and NSE together is the year 2006 operated under semi-strong from of market efficiency.

To test the null hypotheses F-Statistic values using regression equations at 2, 27 degree of freedom, means squares values are used in ANOVA table. The figures are shown at table

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ANOVA AMONG VOLUME OF TRANSACTIONS OF AVERAGE OPENING AND CLOSING PRICES OF 30 GROUP 'A' STOCKS OF BSE AND NSE FOR THE YEAR 2007

Model	Sum of Squares	df	Mean Square	F-Ratio
Regression between Companies	29550601079647230.000	2	14775300539823620.000	.071
Residual Error Within Companies	5657003040803850000.000	27	209518631140883400.000	
Total	5686553641883500000.000	29		

Predictors: (constant) Close, Open
Dependent variable: Volume

ANALYSIS

From the above ANOVA table, it can be seen that the F-Statistic value is 0.071, which is less that the F table value .071. Hence null hypotheses stating that there is no relationship between opening price, closing price and volume of transactions is accepted.

SPEARMAN'S RANK CORRELATION

To test the second null hypotheses that market prices of stocks are not related to past and publicly available information about companies in the year 2007, the Spearman Rank Correlation was used (See table below)

THE TABLE SHOWS THE COMPUTATION OF SPEARMAN RANK CORRELATION CO-EFFICIENT FOR THE YEAR 2007

Sl.No	Name of the Company	R1	R2	$D^2 = (R_1 - R_2)$
1	ACC	25	12	169
2	Ambuja Cements Pvt Ltd	23	13	100
3	BHEL	12	11	001
4	Cipla	27	21.5	30.25
5	Grasim Industries Ltd	18	9.5	72.25
6	HDFC Bank	13	11	121
7	Hindalco Industries Limited	22	14.5	53.25
8	Hindustan Unilever Limited	15	02	169
9	ICICI Bank	07	19.5	156.25
10	Infosys technologies limited	10	04	36
11	ITC LTD	01	07	36
12	Jaiprakash Associates Limited	14	27	169
13	Larsen & Toubro	08	05	9.0
14	Maruti Suzuki India Limited	21	23	4.0
15	NTPC Limited	05	28	529
16	Oil and Natural Gas Corporation Limited	03	08	25.0
17	Ranbaxy Laboratories Limited	28	14.5	182.25
18	Reliance Industries Limited	02	18	256
19	Tata Steel Limited	17	17	0
20	Wipro Limited	11	9.5	2.25
21	Asea Brown Boveri Limited (ABB)	19	19.5	0.25
22	Bharti Airtel Limited	06	30	576
23	Bharat Petroleum Corporation Ltd	26	16	100
24	Dr. Reddy's Laboratories	30	25.5	20.25
25	GAIL (India) Limited	16	21.5	30.25
26	HCL Technologies Limited	24	06	324
27	Hero Honda Motors Ltd,	29	03	676
28	National Aluminium Company (NALCO),	20	25.5	30.25
29	Steel Authority of India Limited (SAIL)	09	29	400
30	Tata Consultancy Services	04	01	9.0
	$\sum D^2 =$			4289.0

(Source: Computed)

ANALYSIS

The level of Significance is at 5 percent. The t-statistic value is ±0.3620 for the sample size of 30 companies. The value of Spearman Rank Correlation co-efficient is 0.05. See the value of the correlation lies in the acceptance region, the null hypotheses is accepted. The investing Community in the BSE and NSE are happy with past and publicly available information of group 'A' stocks during the year 2007 because of the advanced technology used as a international benchmark in NSE and BSE. Therefore, at 5 percent level of t-table value the null hypotheses is accepted. From these it can be concluded the BSE and NSE operated under semi-strong from of Market efficiency in the year 2007. In the same year, the BSE Sensex was set to rise steeply and it happened.

ANALYSIS OF INTERNATIONAL BENCHMARKS IN GLOBAL SECURITIES MARKET INCLUDING INDIA

Global best practices practiced in the leading securities market of both developed and developing countries need to be looked at in the context of Indian securities markets scenario. Of late, it is interesting and intriguing to record the awesome achievements made by the securities market of our country which are guided and governed by both self regulation as well as the principles proactively provided by the regulator SEBI. The areas of best practices are – Information Technology (IT) intervention, settlement mechanisms, transaction cost, and corporate governance governing transparency and corporate disclosure and the like. The details are, morefully interacted in the following pages.

INFORMATION TECHNOLOGY

The deafening noise of an out-cry trading system has been replaced with a silence of a summer through the Electronic Consolidated Anonymous Limit Order Book, with price time priority matching being accessed through more than 10,000 terminals spread in over 400 cities and towns across the Indian sub-continent, something perhaps without a parallel in the world.

Information technology has been effectively utilized in the collection and dissemination of corporate disclosures on the lines of the EDGAR system in the United States.

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Technological advancements and extended reach have catapulted Indian capital market in a different league altogether. The vast geographical network created by stock exchanges along with brokers and sub-brokers throughout India is unparalleled in the world. More than 1700 members of NSE covers total of 452 cities through a network of 4126 Very Small Aperture Terminals (VSATs) and about 1336 leased line connections.[8]

Electronic trading eliminates the need for physical trading floors. Brokers can trade from their offices, using fully automated screen-based processes. Their workstations are connected to a Stock Exchange's central computer via satellite using Very Small Aperture Terminals (VSATs). The orders placed by brokers reach the Exchange's central computer and are matched electronically.

The Stock Exchange, Mumbai (BSE) and the National Stock Exchange (NSE) are the country's two leading Exchanges. There are 20 other regional Exchanges, connected via the Inter-Connected Stock Exchange (ICSE). The BSE and NSE allow nationwide trading via their VSAT systems.

SETTLEMENT CYCLE

The accounting period for the securities traded on the Exchange. On the NSE, the cycle begins on Wednesday and ends on the following Tuesday, and on the BSE the cycle commences on Monday and ends on Friday. At the end of this period, the obligations of each broker are calculated and the brokers settle their respective obligations as per the rules, bye-laws and regulations of the Clearing Corporation. If a transaction is entered on the first day of the settlement, the same will be settled on the eighth working day excluding the day of transaction.[9] However, if the same is done on the last day of the settlement, it will be settled on the fourth working day excluding the day of transaction. Table shows the different settlement cycle prevailing in the major stock exchanges of the globe.

SETTLEMENT CYCLE PREVAILING IN THE MAJOR STOCK EXCHANGES OF THE GLOBE

Name of the Stock Exchange	Settlement Cycle
NSE	T+2
BSE	T+2
NYSE	T+3
Korean Stock Exchange	T+3
Tokyo Stock Exchange	T+3
Hong Kong Stock Exchange	T+2
Russian Stock Exchange	T+4

(Source: Greate Lake Herald, April, 2007, Volume 1)

ROLLING SETTLEMENT

The rolling settlement ensures that each day's trade is settled by keeping a fixed gap of a specified number of working days between a trade and its settlement. At present, this gap is five working days after the trading day[10]. The waiting period is uniform for all trades. In a rolling settlement, all trades outstanding at end of the day have to be settled, which means that the buyer has to make payments for securities purchased and seller has to deliver the securities sold. In India, for rolling settlement, the benchmark is T+5 settlement cycle, which means that a transaction entered into on Day 1 has to be settled on the day 1 + 5 working days, when funds pay in or securities pay out takes place.

CORPORATE GOVERNANCE

The three-legged corporate compliance stool - disclosure, accounting standards and board room practices has lifted India to the global pedestal in corporate governance. In a study titled "What works in Securities Laws? '' Professors Rafael La Porter, Florencio Lopez - de- Silanes and Andrei Shleifer have commented: "India scores 100 percent as far as disclosure standards are concerned". The Indian accounting standards are aligned with international accounting standards and are 'principle based'. In terms of consolidation, segmental reporting, deferred tax accounting and related party transactions, the gap between Indian and US GAAP is minimal.

On corporate governance it might be worthwhile to recall what the Economic Intelligence Unit 2003 study said: The Asian Experience incorporates - "Top of the Country class, as might be expected is Singapore followed by Hong Kong and somewhat surprisingly, India where overall disclosure standards have improved dramatically, accounting differences between local and US standards have been minimized and the number of companies with a majority of independent directors has risen significantly."

CLSA Emerging Markets Study on Corporate Governance gives India a score of 6.2, which is next only to 7.5 for Singapore and 6.7 for Hong Kong. None of the Indian companies listed on the NYSE or NASDAQ to the public knowledge has sought the benefit of transition time for the implementation of SOX requirements. What could possibly be more comforting is the CLSA – Emerging Market Study comment: "The Securities and Exchange Board of India (SEBI) continues to raise the bar for good corporate governance."

FINDINGS

The study is based on both primary and secondary data. The findings are enumerated below

- On the basis of analysis of the first objective, it is inferred that average closing price is highly volatile, when compared to average opening price.
- On the basis of analysis of the first objective, it is inferred that volume of transaction, average opening price and average closing price have negative correlation. Whereas, average opening and average closing price of group 'A' 30 stocks of BSE and NSE have positive relationship.
- On the basis of co-efficient of determination, the relationship of average opening price and volume of transaction is little higher than average opening closing prices of 30 stocks. Whereas, the co-efficient of determination between average opening and closing price is very high of 30 stocks of BSE and NSE.
- Combined Results of Correlation Co-efficient, Co-efficient of determination and their t-values of BSE and NSE Sample Stocks for the year 2005 were calculated.

For BSE the t-calculated value is 1.3825 and t-table value is 2.101. Similarly the t-calculated value for NSE is 2.101 and t-table value is 2.306. In both the cases the t-calculated values are less than t-table values. Therefore, the hypothesis that population correction is significant in respect of correlation co-efficient in accepted beyond doubt.

The stock prices are not only influenced by the past, present, public and private information but also due to changes in the macro economic variables. These results read along with corresponding runs test for BSE and NSE indicate that the former operated under semi- strong form and the latter under weak- form of market efficiency during the year 2005.

- On the basis of analysis for the year 2006 and 2007, it is inferred that average opening price less volatile and closing prices having highly volatile, when compared to average opening price.
- In the year 2006 and 2007, as per analysis of correlation co-efficient between the volume of transaction of average opening and closing price of group 'A'30 stocks of BSE and NSE. It shows that volume of transaction, average opening price and average closing price have negative correlation which is similar to the year 2005. Whereas, average opening and average closing price of group 'A' 30 stocks of BSE and NSE have positive relationship.
- To know whether market prices of the stocks are random in nature the study used runs test. The numbers of runs for BSE and NSE are 8 and 5 respectively.

Since observed number of runs falls within the acceptance region the null hypothesis is accepted that is the market prices of the 20 group 'A' Stocks of BSE for the year 2005 is randomly behaved.

Similarly in respect of NSE the market prices of 10 Stocks for the year 2005 were random in nature as per the data calculation.

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8 Quoted in The Financial Express, Indian Capital Market-A Global Benchmark, July 06, 2003
9 Quoted in Business Line, Hindu, Sunday, Jan 05, 2003

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- The BSE and NSE Stock prices in relation to Sensex and Nifty as well as external factors, the amount of randomness was determined by using runs test. The runs are 14 and 5 respectively for BSE and NSE. Since observed number of runs falls within the acceptance region, the null hypothesis that market prices of 20 stocks at BSE and 10 stocks of NSE are random in nature is accepted. In the year 2007, as per the runs test, it has been observed that, the behaviour of stock prices in BSE and NSE exhibited randomness.
- The autocorrelation results based on averages quarterly opening and closing stock prices of 20 select organizations under BSE for the period 1998 to 2000 reveals that the reliance industries limited and HDFC bank were extremely consistent (0.9999) while ONGC, Grasim industries and BHEL values ranged from 0.995 to 0.996. The degree of randomness does not exist in the stock prices of many select companies.
- International benchmarks in securities market are concerned, our country stands first as far as Information technology, transaction cost and settlement cycle (T+2). In respect of corporate governance–comprising disclosure, accounting standards and board room practices, we have to go a long way.
- The deafening noise of an out-cry trading system has been replaced with a silence of a summer through the Electronic Consolidated Anonymous Limit Order Book, with price time priority matching being accessed through more than 10,000 terminals spread in over 400 cities and towns across the Indian sub-continent, something perhaps without a parallel in the world.
- Electronic trading eliminates the need for physical trading floors. Brokers can trade from their offices, using fully automated screen-based processes. Their workstations are connected to a Stock Exchange's central computer via satellite using Very Small Aperture Terminals (VSATs). The orders placed by brokers reach the Exchange's central computer and are matched electronically.
- Another revolution which is taking place in the market is Straight-through-Processing (STP). It is a move to automate trade processes from initiation to execution to settlement. It involves electronically capturing and processing transactions in one pass.
- SEBI worked to establish the integrated source of company information, which would be accessible through SEBI's website on lines similar to that of Electronic Data Gathering, Analysis and Retrieval (EDGAR) system of the US Securities Exchange Commission. Because this the levels of disclosure in the Indian markets is at par in the US. At present, companies file various information with the stock exchanges as a part of the listing agreement.

SUGGESTIONS

The constructive suggestions incorporated below will go a long way in assisting the policy makers, investors, stock brokers, fund managers, general public, investment consultants and academicians. The suggestions are based on the intensive research on the topic – "Market efficiency and International Benchmarks in the securities market of India". The list of suggestions in inclusive but not the exhaustive.

- As per the findings of the year 2005, it is concluded that the available private and public information will have only partial influence on stock trading. Hence it is suggested that the company related matters like declaration of dividend, announcement of bonus shares, major changes in the top management, risk management strategies of the company, influence of political and economic parameters etc must be handled very carefully while communicating the same to the public about its effects on the company.
- As per the research findings, the average opening and closing prices of BSE and NSE are moving in the same direction. The statistical result reveals a negative correlation between the average opening and closing prices. Hence, it is suggested that the portfolio must be built by investing in variety of stocks belonging to different companies operating in different sectors.
- Statistical calculation reveals that the market efficiency of both NSE and BSE are similar, that is, semi-strong or high level semi strong. It is suggested that the investors must make use of the available information in market to invest in the other, so that the risk forecasting can be optimized.
- By using the t-test and ANOVA, it is suggested that, the available information in the securities market will have a direct bearing on the prices, accordingly the null hypothesis (H0) is accepted. However, it does not indicate the strength of the market hence it cannot be concluded as strong and efficient market. Whereas we can comfortably group 'A' stocks of BSE and NSE in high level semi-strong market during the year 2005.
- As per the results of the Run's test, the prices of the stocks are determined based on its own parameters. However, it is found that it is influencing the level of public and private information of certain companies to some extent. It is suggested that the investors must keep a close watch on prices of the stocks, so that they can make an informed choice.
- For year 2006 and 2007 statistical findings reveal that the available private and public information will have little influence on stock trading. Hence it is suggested that the company related matters like declaration of dividend, announcement of bonus shares, major changes in the top management, risk management strategies of the company, and exogenous factors like influence of political factors, micro and macroeconomic issues etc, must be handled carefully while communicating the same to the share holders about its effects on the company.
- Similar to the findings of the year 2005, the average opening and closing prices of BSE and NSE are moving in the same direction. The statistical calculation reveals that, a negative correlation exists between the average opening and closing prices. Hence, it is suggested that the portfolio must be built by investing in variety of stocks belonging to different companies operating in different sectors, so that the risk can be minimized.
- Research finding reveals that the market efficiency of both NSE and BSE are analogous, that is, semi-strong or high level semi strong. It is suggested that the people who are interested in the investment in stocks must make use of the trend in the one market to invest in the other markets, so that the returns on investment is maximized.
- By using the t-test and ANOVA for the year 2006 and 2007, it is found that, the available information in the securities market will have a direct bearing on the prices, accordingly the null hypothesis (H0) is accepted. Though, it does not indicate the strength of the market hence it cannot be concluded as strong and efficient market. Whereas we can comfortably group 'A' stocks of BSE and NSE in high level semi-strong market during the year 2005.
- Run's test reveals that the prices of the stocks are determined based on endogenous parameters. However, it is found that in certain cases it influences the level of public and private information to some extent. It is suggested that the investors should keenly study the price and volume trend of the stocks, so that they can minimize the risk of volatility and maximize the returns.
- Even in the random walk study of daily prices of 20 group 'A' stocks of Bombay Stock Exchange (BSE), it is suggested that the behavior of prices are randomly visible in the Bombay Stock Exchange. Thereby, not only null hypothesis but also high level semi-strong situation is witnessed.

Abnormal security performance prior to an announcement may – but does not necessarily – imply that the market is inefficient. The market would be considered to be inefficient if this apparent "anticipation" effect was the result of purchasers or sales by investors who have access to relevant information. The market would not be considered to be inefficient, however, if the apparent anticipation effect was the result of the previous announcements that are related to or correlated with the favorable or unfavorable news conveyed by a dividend announcement. The investors must act prudently to avoid abnormal security performance prior or after the announcement of the dividend.

CONCLUSIONS

The quantitative knowledge of market efficiency allows the past progress in financial development to be assayed, and gives direction on suitable national benchmarks for policymakers and others in the future. The policy outcomes of this analysis are less certain. This is because while market efficiency has been measured, no attempt has been made to link this with market breadth, depth and liquidity or with the underlying pace of deregulation and liberalization. However, depending upon the test employed, some markets are obviously more efficient than others and this provides useful benchmarks, both regionally and globally. Such benchmarks include Hungary in Europe, Egypt in Africa, Argentina in Latin America, Israel and Jordan in the Middle East and Malaysia and Korea in Asia. Closer examination of the developments in these markets is then warranted. One common feature is their relatively long tenure when compared to other emerging markets. This suggests that institutional maturity is an important determinant of market efficiency. These markets are also generally larger and this could also be linked with their efficiency.

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Finally, at the level of the investor, frequent and wide stock market variations cause uncertainty about the value of an asset and affect the confidence of the investor. Risk averse and risk neutral investors may shy away from the market with frequent and sharp price movements. An understanding of the market efficiency is thus important from the regulatory policy perspective. When the total volatility of individual stock is decomposed into systematic volatility and idiosyncratic volatility, it is clearly evident that idiosyncratic volatility has trended up.

International benchmarks in securities market are concerned, our country stands first as far as Information technology, transaction cost and settlement cycle (T+2). In respect of corporate governance–comprising disclosure, accounting standards and board room practices, we have to go a long way.

DIRECTIONS FOR FUTURE STUDY

There are, of course, a number of ways in which this research could be extended. One possible extension would be to use the multiple variance ratio test procedure in conjunctions with intraday data. While the single variance ratio test is not robust and can be misleading in a high-frequency context, no such evidence concerns the more developed multiple variance ratio test. A second extension would be to examine more fully the relationship between the evolving characteristics of emerging stock markets and market efficiency. It is generally known that weak-form inefficiency is linked with the newer, small capitalization markets with low levels of liquidity and turnover but little is known about how quickly markets approach a random walk as they become more liquid and institutionally mature.

The topic "Market efficiency and International benchmarks in the securities market" is a fertile ground for young researchers to pursue furthermore. The topics suggested are-

- "A Global Comparison of Market Efficiency in Securities Market- A Study"
- "Animal instincts drive Stock Markets across the Globe- An Empirical study"
- "Primitive Emotions, Herd Mentality and Hormones Determine Investment Moves- An Exploratory Study"
- "Stock Market Efficiency and International Financial Reporting System – An Interface Study"
- "The randomness of individual scripts with respect to Market Index of BSE and NSE – An Empirical Study"

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