



CALL FOR PAPERS : INDIAN JOURNAL OF RESEARCH IN CAPITAL MARKETS

INDIAN JOURNAL OF RESEARCH IN CAPITAL MARKETS (ISSN 2394 - 3459 ; Included in UGC's List of Recommended Journals) is a double blind peer reviewed refereed journal that aims at the dissemination and advancement of research in Capital Markets. The aim of the Journal is to provide a platform to researchers, practitioners, academicians, and professionals associated with the field of Capital Markets. To encourage and promote research across a wide breadth of areas pertaining to Capital Markets, the Indian Journal of Research in Capital Markets invites submissions of original, empirical, and theoretical papers as well as case studies and book reviews covering diverse areas of Capital Markets that are listed below:

- Analysis and design of trading mechanisms ;
- Behaviour of asset prices in financial sectors ;
- Capital, security, and derivatives markets ; securities and derivatives trading and pricing (stocks, bonds, currencies, commodities) ;
- Corporate governance ;
- Corporate restructuring: Share buybacks, delisting, mergers, and acquisitions ;
- Credit markets and leverage buy outs ;
- Dividends, bonus, and rights issues and rates of return;
- Global integration of Indian capital markets- IDRs, Sponsored ADRs/GDRs, etc.
- Investment and portfolio management ;
- Market efficiency ;
- Market mechanisms ;
- Market micro structure ;
- New issues market and merchant banking;
- Normative theory of financial management ;
- Optimal order placement strategies ;
- Performance and regulations of mutual funds ;
- Private placements: preferential issues, qualified institutions placements ;
- PSU disinvestment ;
- Real estate investment trusts ;
- Securities and Exchange Board of India: rules and regulations ;
- SME issues ;
- The role of information in securities market ;
- Theories of market equilibrium ;
- Valuation of bonds, convertible debentures, and market for debt;
- Valuation of financial and real assets ;
- Valuation of stocks and functioning of the stock markets;
- Valuation, trading, hedging, investing, and pricing issues in global stock, bond, commodity, currency, and derivative markets. It also welcomes studies of market theory, regulation, and investment management ; and
- Value investing .

We firmly believe that your contribution will enrich the academic, intellectual content of the journal, along with opening up of new vistas of research. Please email your papers to: editor@indianjournalofcapitalmarkets.com OR priyanka.gilani@indianjournalofcapitalmarkets.com

Best Wishes,
Priyanka Gilani
Managing Editor
Indian Journal of Research in Capital Markets



INDIAN JOURNAL OF RESEARCH IN CAPITAL MARKETS

S. Gilani

Editor-in-Chief

editor@indianjournalofcapitalmarkets.com

Deepak Sawhney

Director

Associated Management Consultants
Private Limited, New Delhi

Priyanka Gilani

Managing Editor

priyanka.gilani@indianjournalofcapitalmarkets.com

Meenakshi Sawhney

Managing Editor

Meenakshi Gilani

Subscription Manager

meenakshi.gilani@indianjournalofcapitalmarkets.com

Indian Journal of Research in Capital Markets is a Double - Blind Peer Reviewed Refereed Quarterly Journal and is Indexed/ Abstracted in :

- ★ Indexed in Google Scholar
- ★ INCLUDED IN UGC'S LIST OF RECOMMENDED JOURNALS (JOURNAL NO. : 47227)
- ★ Index Copernicus Journals Master List, Index Copernicus International, Poland
- ★ Index Copernicus Value (ICV, 2015) = 5.16
- ★ Ulrich's International Periodicals Directory, USA.
- ★ ISSN (ISSN 2394 - 3459)

Indian Journal of Research in Capital Markets is a double - blind peer reviewed refereed journal that is published quarterly and is available against subscription only.

Subscription Rates for Individuals/Institutions :

One year	-	₹ 1200/-
Two years	-	₹ 2300/-
Three years	-	₹ 3400/-
International Rates	-	US \$ 100 per year

- The views expressed by individual contributions in Indian Journal of Research in Capital Markets are not necessarily endorsed by the Management.
- Copyright©2017.** All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.
- Disclaimer : The views and opinions presented in the research papers/ articles published in Indian Journal of Research in Capital Markets are solely attributable to the authors of the respective contributions. If these are contradictory to any particular person or entity, Indian Journal of Research in Capital Markets shall not be liable for the present opinions, inadequacy of the information, any mistakes or inaccuracies.**
- All disputes are subject to Delhi Jurisdiction only.
- All correspondence relating to circulation and advertisement may be addressed to:-

Indian Journal of Research in Capital Markets

Y-21, Hauz Khas, New Delhi-110 016, India

Phone :+91-011-40586303, +91-011-46026050

Url : <http://www.indianjournalofcapitalmarkets.com>

Email : editor@indianjournalofcapitalmarkets.com

Email : priyanka.gilani@indianjournalofcapitalmarkets.com

Email : meenakshi.gilani@indianjournalofcapitalmarkets.com



INDIAN JOURNAL OF RESEARCH IN CAPITAL MARKETS

EDITORIAL ADVISORY BOARD

DR. RONALD T. SLIVKA
Adjunct Professor
Polytechnic Institute of
New York University
Department of Finance and
Risk Engineering
Brooklyn, New York
USA

DR. AMBRISH GUPTA
Senior Professor - Finance
and Accounting
FORE School of Management
New Delhi

DR. AMARJEET KAUR MALHOTRA
Professor and
Associate Dean
School of Management
Ansal University
Gurgaon

DR. S.VASUMATHY HARIHARAN
Associate Professor and
Head, Department of Finance
SRM School of Management
SRM University
Chennai

DR. ROBERT C. RICKARDS
Director, DBA-Program
Munich Business School
Munich, Germany

DR. N. RAVICHANDRAN
Head of Department
Department of Management
Studies
Jamia Hamdard University
New Delhi

DR. ASHISH AGRAWAL
Director - MBA & PGDM
IIMT Professional College
Meerut



INDIAN JOURNAL OF RESEARCH IN CAPITAL MARKETS

VOLUME : 4

ISSUE NUMBER : 2 ₹ 400/-

APRIL - JUNE 2017

CONTENTS

Performance and Tracking Efficiency of Exchange Traded Funds : An Analysis of Indian Equity Index Funds T. G. Saji 7

Semi-Strong Form of Market Efficiency : Does all Critical Information Affect Stock Price Valuations? Rajesh Deshpande 15

A Study on the Influence of Stock Broker on Investor's Decision Making with Special Reference to Bombay Stock Exchange K. Prabhakar Rajkumar 25
N. Lakshmi Kavitha

The Fama-French Three Factor Model and the Capital Asset Pricing Model : Evidence from the Indian Stock Market Ritika Aggarwal 36

A Study on Dividend Pattern of Indian Corporate Firms Dinesh Kr. Sharma 48
Ritu Wadhwa

Risk and Return Performance of IPOs : An Analysis Mani Jindal 61

Performance and Tracking Efficiency of Exchange Traded Funds : An Analysis of Indian Equity Index Funds

**T. G. Saji*

Abstract

This research, using daily closing values of five leading Nifty exchange traded funds (ETFs), sought empirical evidence for the efficiency of equity ETFs in India to track their benchmark index. The study computed 'standard deviation of differential returns' and 'standard error in regressing the fund return against the Nifty return' to assess the tracking efficiency of funds. The analysis found underperformance of Nifty ETFs relative to their benchmark index coupled with higher level of tracking errors during market downturns. In contrast, I found significant improvement in tracking ability and most funds outperformed the benchmark with lower tracking errors under reverse market conditions. The research ultimately suggested that preferring ETFs to index portfolio investing offered greater opportunities for arbitrage to the investors of emerging markets like India, particularly during the times of market buoyancy.

Keywords : exchange traded funds, benchmark index, tracking efficiency

JEL Classification : C3, G1, G11

Paper Submission Date : March 18, 2017 ; **Paper sent back for Revision :** May 31, 2017 ; **Paper Acceptance Date :** June 6, 2017

The world economies have been moving ahead with the financial innovation and engineering for the past many years (Dahlman, 2008). Responding positively to such advancements, the Indian financial market has started trading in exchange traded funds (ETFs). The benefits of diversification through index based portfolio investment, coupled with the option of ready and continuous trading has attracted a significant number of investors to the scheme (Blocher & Whaley, 2015). Within a short span of time, ETF became accepted among both retail and institutional investors. Of course, like shares, ETFs are permissible for short selling that help investors to capitalize during market downturns.

Tracking error constitutes the prime concern of ETF investors from the beginning (Hassine & Roncalli, 2013). Tracking error, stating simply, denotes the difference between the ETF return and the benchmark index return during a specific period. Many factors contribute to tracking error that include transaction and rebalancing costs, cash drag, differing dividend reinvestment assumptions, dividend taxation, and operational risks. The ability of the fund managers to track their portfolios with the changes in benchmark index determines the tracking error efficiency of the funds they manage (Kostovetsky, 2003). Studies like the ones conducted by Edwin, Gruber, Comer, and Li (2002) and Poterba and Shoven (2002) suggested that ETF pricing did not differ from their net asset values.

The stated investment objective of most ETFs is to track the performance of a specific index. If an ETF's performance deviates from its target index and consequently, from its stated objectives, it is no longer a viable and reliable investment. Tracking error is critical to exchange traded funds because it measures the performance of an ETF relative to its stated investment objective. Exchange-traded funds (ETFs) are, with the exception of certain

* *Assistant Professor*, Sri C Achutha Menon Government College, Kuttanellur, Thrissur - 680 014, Kerala.
Email : sajthazhungal@gmail.com

actively managed products, designed to track the performance of an index. While this concept is easy to understand, putting it into practice is far more difficult than it seems. While indices are typically replicable in theory, index returns are at an unattainable ideal, as they ignore the practicalities of portfolio construction and ongoing management. Investors need to be aware of these realities and manage their expectations accordingly. There will always be factors involved in the replication process that will cause tracking failures.

Review of Literature

ETF is an innovative investment alternative with a benchmark index which aims to return the performance of that index to investors (Bas & Sarioglu, 2015). Many prior studies examined the pricing efficiency of ETFs wherein they assessed the fund managers' ability to track the benchmark index. Gallagher and Segara (2005) observed that classical ETFs pay off investors with returns before expenses in proportion to their benchmark performance. Tracking error volatility, along with other parameters such as performance difference and liquidity spread could guide investors in their fund selection process (Hassine & Roncalli, 2013). Marshall, Nguyen, and Visaltanachoti (2013) provided evidence for the mispricing between two liquid ETFs that tracked the S & P 500 in the U.S. market. With regard to market efficiency, Hrazdil and Chung (2013) empirically proved for the immediate adjustments of new information to prices in ETF markets.

The size of investment and length of time decided the benefits from investing in ETFs (Kostovetsky, 2003). Large investors normally benefitted from investing in ETFs and their amount of investment should be reciprocal to the length of time for maximizing the scale efficiency. Gastineau (2004) suggested that the pretax return of benchmark index ETFs generally displayed inferior records in comparison to the index mutual funds that put its base on same indices. Moreover, frequent liquidating of assets eliminated the tax and cost advantage of ETFs. Dolvin (2009) analyzed the price differences between two most popular ETFs in U.S. market and found that on an average, both funds traded at a premium relative to the benchmark index. The research claimed that the levels of daily premium had sufficient scope for arbitrage and the current day pricing of the ETF influenced the next day market behavior. However, ETFs showed higher volatility than their benchmarks (Valle, Meade, & Beasley, 2014).

Hryciw (2011) examined the relationship between tracking error and market beta in multiple market segments. His research found that ETFs produced excess returns than the benchmark index during market downturns and ETF performance was independent of market beta. Moreover, the tracking error was lowest in the broad market segments and higher in the emerging markets and commodities' segments. Kayali and Ozcan (2012) observed statistically significant mispricing in the Turkish market. According to Chu (2011), tracking error had a positive relation with expense ratio of a fund and negative relation with fund size. Accumulated tracking error significantly affected the long term performance of ETFs (Charupat & Miu, 2013). Cash holdings, dividend yield, and cash distributions from ETFs could significantly affect the tracking error that considerably depended upon the liquidity of underlying assets (Osterhoff & Kaserer, 2016). Frino and Gallagher (2011) found dividend payments as the factor critical in determining the tracking error in passive funds.

In the Indian context, Prasanna (2012) compared the performance of equity ETFs with gold ETFs and found that gold ETFs provided superior returns compared to ETFs in the equity market. Gold ETF market in India showed that random walk behavior and the use of technical trading strategies in earning excess return from markets was dubious (Saji, 2014). In his study, Narend (2014) showed that, in terms of active returns, ETFs outperformed their benchmark indices of BSE SENSEX and CNX Nifty. Singh and Kaur (2016) revealed that ETFs showed significant tracking error in India and the assets under management and volume positively impacted their tracking ability. Using CAPM, Garg and Singh (2013) compared the performance of Indian mutual funds with ETFs and their research found that ETFs showed low tracking error compared to index mutual funds, and they delivered better returns to investors than the index based mutual funds did. The in-kind creation and

redemption mechanism allowed arbitrage opportunities to ETF investors whenever unit prices deviated from the value of the underlying portfolio (Dharani & Natarajan, 2011). Shanmugham (2012) examined the pricing efficiency of Nifty based ETFs during two distinct market conditions (bullish and bearish) in India, and the study identified higher tracking error in bearish conditions with higher risk premium and larger volatility.

Studies on the tracking error performance of ETFs are not quite extensive in India. Moreover, the previous studies have produced mixed results. While some studies found the tracking error of ETFs was lower to that of traditional index funds due to the redemption facility and the low expense ratio, others held opposite views. However, most studies observed fund wise difference in tracking error performance of ETFs in different country contexts. Hence, this research aims to analyze the tracking error performance of Nifty based ETFs in India.

Data and Methodology

(1) Sample and Data : In this research, I examine the efficiency of ETFs that track the CNX Nifty, the benchmark index of India. The study covers a period of 5 years starting from 1st April 2011 to 31st March 2014. ETFs traded in NSE since the inception of this scheme and that have been in operation at least for the last 5 years constitute the rationale for the sample selection. However, data continuity and their accessibility compelled me to focus on five ETFs in the final sample that include BSL Nifty, IFL Nifty, Kotak Nifty, Nifty Bees, and Q-Nifty. The daily closing values of the select funds provide the data inputs and I accessed the same from NSE web sources.

(2) Methodology : I measure the performance of ETFs and Nifty was mainly measured by computing daily returns and market volatility. The tracking error of ETFs and index funds is analyzed to examine how closely the ETFs track their underlying indices.

(i) Return : Return is the gain from the investments. Return here means the price difference relative to the beginning price. Mathematically, it is expressed as :

$$R = \frac{(P_{t-1} - P_t)}{P_t} \times 100 \quad \text{----- (1)}$$

P_{t-1} = closing value as on day $(t-1)$,

P_t = closing value as on day (t) .

(ii) Risk : Risk refers to dispersion of the returns from ETFs. The study used standard deviation to measure the risk.

$$\text{Variance } \sigma^2 = \frac{\sum_{i=0}^N (ri - \bar{r})^2}{N-1} \quad \text{----- (2)}$$

ri = return from the ETF in period $(I=1,2,\dots,n)$,

\bar{r} = Arithmetic return,

n = number of observations.

(iii) Tracking Error : I have used two approaches to estimate tracking error :

Approach 1 : Typically, the tracking error is expressed in the form of the standard deviation between the portfolio's returns and the benchmark's returns. In other sense, standard deviation of the differential return, that is, the difference between fund return and benchmark return.

$$x = \sqrt{\frac{1}{n-1} \sum (D - \bar{D})^2} \text{ ----- (3)}$$

where, D is the differential return.

Approach 2: Standard error of the regression that regress fund returns against the benchmark index return :

$$\hat{r} = \mu + \beta Rm + ei \text{ ----- (4)}$$

$$\sigma_{est} = \frac{\sum (r - \hat{r})^2}{n} \text{ ----- (5)}$$

σ_{est} is the standard error of the estimate, r is the actual return, ' \hat{r} ' is a predicted return, and ' n ' is the number of pairs of returns.

Results and Discussion

The results and findings of this study are discussed in two parts. At first, I make both horizontal and vertical comparisons of the performance of the ETFs within the group and with the benchmark index as well. Later, I deal with the results of tracking error analysis made under the two approaches explained earlier.

↳ **Risk-Return Performance of ETFs and Nifty :** Market based investments brought in huge losses to investors in 2011. All the funds under observation delivered negative returns amidst larger volatility. The loss made by Kotak Nifty was lowest despite it showing fluctuations at par with other funds. BSL Nifty and IFL Nifty produced losses at a rate greater than that of the benchmark index. However, in subsequent years, I could observe market recovery that helped investors to recuperate their previous losses. All the funds gained value appreciation and IFL Nifty delivered returns at a greater scale than the market average. In 2013, most market-based funds produced only marginal returns, while the risk performance of most funds were found uniform and market volatility was fairly low. However, in 2014, the ETF market in India bounced back with outstanding trend that it had never shown before. The rate of return produced by all the fund investments during the year was highest of the period under observation. IFL Nifty out beat all other funds with larger amount of returns but with a moderate risk profile. BSL Nifty exhibited efficiency in generating returns excess of market return.

Table 1. Return and Risk Profile of ETF Investments

Fund	Return (%)				Risk (S.D)			
	2011	2012	2013	2014	2011	2012	2013	2014
BSL Nifty	-3.735	1.040	0.2827	2.945	7.63	6.56	3.74	5.46
IFL Nifty	-3.659	2.359	0.6859	3.133	5.59	5.31	3.86	3.89
Kotak Nifty	-1.837	2.094	0.4505	2.393	5.76	5.02	3.99	3.87
Nifty Bees	-2.438	2.163	0.2576	2.404	5.81	5.19	3.72	3.51
Q-Nifty	-2.488	1.964	0.3506	2.066	5.87	5.18	4.24	3.46
Nifty	-2.311	2.236	0.1870	2.473	5.96	5.31	3.94	3.82

Table 2. Tracking Error of ETFs During 2011-2014

Fund	2011	Rank	2012	Rank	2013	Rank	2014	Rank
BSL Nifty	3.149	2	3.023	1	2.431	1	2.157	2
IIFL Nifty	0.182	5	0.268	5	0.787	3	1.449	3
Kotak Nifty	1.171	3	0.911	3	0.679	4	0.428	5
Nifty Bees	0.554	4	0.397	4	0.322	5	0.324	6
Q-Nifty	3.220	1	0.914	2	0.971	2	1.111	4

(i) Tracking Error Analysis of ETFs - Approach I : Standard deviation of the differential returns measures the tracking error (inversely tracking efficiency) and the results are reported in the Table 2. On looking across the years, one can observe persisting trend in return differentials until 2014, the best performing year for ETFs in India as per the Table 1. The return differentials of BSL Nifty (all years) and Q Nifty (except in 2014) are relatively high. However, the return differentials are found positive for BSL Nifty and negative for Q Nifty. On the other side, the performance deviations of Nifty Bees and Kotak Nifty from the benchmark returns are somewhat low, which can be considered as the sign of efficiency of their fund managers to track the benchmark index.

(ii) Tracking Error Analysis of ETFs - Approach II : While I regress the fund return against the benchmark return, the standard error measures tracking error of ETF investments. The inferences that one could make regarding the efficiency of funds in tracking the benchmark index movement do not contradict with the conclusion that I derived under Approach I. According to this approach also, error is found to be low during later years. BSL Nifty committed such error at higher rate in almost all years. Kotak and Nifty Bees were behind in terms of this measure.

Table 3. Tracking Error of ETFs During 2011-2014

Fund	2011	Rank	2012	Rank	2013	Rank	2014	Rank
BSLNifty	0.209	2	0.244	1	0.141	1	0.180	2
IIFL Nifty	0.020	5	0.021	5	0.049	3	0.131	3
Kotak Nifty	0.073	3	0.074	2	0.034	4	0.037	5
Nifty Bees	0.036	4	0.032	4	0.018	5	0.029	6
Q-Nifty	0.211	1	0.072	3	0.057	2	0.077	4

The time series used for analyzing the tracking efficiency registers inconsistent results. In other sense, performance rating of funds is different on various time scales. In all the years, there are differential returns produced by ETFs schemes under study. The market recorded low error in tracking index performance during the last two years of the study period. Relatively well performers, IFL Nifty and BSL Nifty have been in the market trend in none of the years. In fact, these funds generated return at a rate higher than Nifty return in many years. Tracking error measured by computing standard error in the regression of the fund return on the benchmark return again proved that most funds did not make any close chase of the benchmark. Tracking error according to the approach I followed should not be viewed critically. This is because the funds that showed extreme error were found to be the best performers in the study. Most of the funds did not exhibit consistent performance. This is not only true with regard to risk return performance, but also with respect to tracking efficiency.

Conclusion

This paper assesses the tracking efficiency of exchange traded funds (ETFs) operating in the Indian stock market. The research based on monthly price data of six Nifty based ETFs during the period from 2011-2014 employed the well-accepted tracking error measures : 'standard deviation of differential returns' and the 'standard error' in regression estimating individual ETF returns against the benchmark index return to analyze the tracking efficiency.

The analysis produced mixed results. Interestingly, no fund performed consecutively at an outstanding level throughout the study period. Many funds underperformed the underlying benchmark index and were found to be less profitable than the index portfolio investing during market downturns. However, in the later years, the market registered upward swing and majority of the funds produced excess return for its investors at a rate higher than that of benchmark return. My observation in this regard is quite opposite of Hryciw (2011). In more precise terms, the market for ETF investments in India performed outstandingly at alternate years. Same is true with regard to price volatility and risk conditions also. Tracking error of the funds under study should not be criticized as such. All the funds which registered higher rate of differential return, in fact, out beat the benchmark index. They were able to produce excess return for its investors at a rate higher than that of benchmark return. However, the analysis found diverging performance during later years. However, this is not true for every fund during the later years of study. Ultimately, I suggest that preferring ETFs to index portfolio investing creates greater arbitraging opportunities and yields superior returns to the investors of emerging markets like India, particularly, during the times of market buoyancy. Such findings support the claim of Dolvin (2009).

Research/Policy Implications

This research has practical implications in many ways. The findings revealed by this study would help current and prospective investors to grab deeper insights as to the potentials of ETF investments to make gains through passive investment strategies. The regulators can design apposite policy framework to warrant fairness and level playing field for the investments in the segment that can revive the investor confidence and indirectly overcome the fragility of the financial markets in the country. The fund managers can validate their asset allocation efficiency relative to their peers in the industry that may provide future directions in portfolio revisions through better combinations for asset mix.

Limitations of the Study and Scope for Further Research

This study does not undertake any extensive research and considers the performance of only five ETF investments during a relatively small sample period of four years in the tracking error analysis. I recommend a replication of this study covering longer time period and a larger sample of ETFs to claim for better inferential validity. This research does not investigate the factors determining the tracking efficiency of fund investments. Hence, further research in the area can assess the factors responsible for the return differentials between ETFs and benchmark index before suggesting the relevant strategic framework for fund managers to enhance their asset allocation efficiency.

References

Bas, N. K., & Sarioglu, S. E. (2015). Tracking ability and pricing efficiency of exchange traded funds: Evidence from Borsa Istanbul. *Business and Economics Research Journal*, 6 (1), 19 - 33.

- Blocher, J., & Whaley, R. E. (2015). *Passive investing : The role of securities lending* (Research Paper No. 2474904). Vanderbilt Owen Graduate School of Management.
- Charupat, N., & Miu, P. (2013). The pricing and performance of leveraged exchange-traded funds. *Journal of Banking and Finance*, 35 (4),966 - 977.
- Chu, P. K. K. (2011). Study on the tracking errors and their determinants: Evidence from Hong Kong exchange traded funds. *Applied Financial Economics*, 21 (5), 309-315.
- Dahlman, C. (2008). Technology, globalization and international competitiveness: challenges for developing countries. In Connor & Kjällerström (eds), *Industrial development for the 21st century* (pp. 8 - 29). Hyderabad : Orient Longman, Zed Books and United Nations.
- Dharani, M., & Natarajan, P. (2011). Arbitrage opportunity for exchange traded funds (ETFs) in the Indian stock market -An empirical analysis. *Indian Journal of Finance*, 5 (9), 19-24.
- Dolvin, S. D. (2009). ETFs: Arbitrage opportunities and market forecasting. *Journal of Index Investing*, 1(1), 107-116.
- Edwin, E. J., Gruber, M. J., Comer, G., & Li, K. (2002). Spiders: Where are the bugs? *Journal of Business*, 75 (3), 453 - 473.
- Frino, A., & Gallagher, D. (2002). Is index performance achievable? An analysis of Australian Equity Index Funds. *Abacus*, 38(2), 200 - 214.
- Gallagher, D., & Segara, R. (2005). *The performance and trading characteristics of exchange traded funds* (Working Paper). Sydney : University of New South Wales.
- Garg, S., & Singh, D. Y. (2013). An empirical comparison of ETFs and index funds performance in India. *International Journal of Applied Financial Management Perspectives*, 2 (3), 578 - 589.
- Gastineau, G.(2004). The benchmark index ETF performance problem. *Journal of Portfolio Management*, 30 (2), 96-104.
- Hassine, M., & Roncalli, T. (2013). Measuring performance of exchange traded funds. *Journal of Index Investing*, 4 (3), 57- 85.
- Hrazdil, K., & Chung, D.Y. (2013). Speed of convergence to market efficiency in the ETFs market. *Managerial Finance*, 39(5), 457 - 475.
- Hryciw, M. (2011). *tracking error in exchange traded funds during the recent market downturn (January 2008- March 2009) and recovery period (March 2009- March 2011)* (MBA Thesis). Webster University, Thailand.
- Kayali, M.M., & Ozcan, N. (2012). Does the market misprice real sector ETFs in Turkey? *International Research Journal of Finance and Economics*, 91, 156-160.
- Kostovetsky, L. (2003). Index mutual funds and exchange traded funds. *Journal of Portfolio Management*, 29 (4), 80-92.
- Marshall, B., R., Nguyen, N. H., & Visaltanachoti, N. (2013). ETF arbitrage: Intraday evidence. *Journal of Banking and Finance*, 37, 3486-3498.
- Narend, S. (2014). *Performance of ETFs and index funds: A comparative analysis* (Research Paper No. 15). Mumbai : National Stock Exchange Ltd.

- Osterhoff, F., & Kaserer, C.(2016). Determinants of tracking error in German ETFs – The role of market liquidity. *Managerial Finance*, 42 (5),417-437.
- Poterba, M. J., & Shoven, J.B. (2002). Exchange traded funds: A new investment option for taxable investors. *American Economic Review*, 92, 422 - 427.
- Prasanna, K.P. (2012). Performance of exchange traded funds in India. *International Journal of Business and Management*, 7, 122 - 141.
- Saji, T.G. (2014). Weak form efficiency of Gold ETF markets: An empirical note from India. *Journal of Economic Policy and Research*, 10 (1), 136-149.
- Shanmugham, R. Z. (2012). Pricing efficiency of Nifty BeES in bullish and bearish markets. *Global Business Review*, 13 (1), 109 - 121.
- Singh, J., & Kaur, P. (2016). Tracking efficiency of exchange traded funds (ETFs): Empirical evidence from Indian equity ETFs. *Paradigm*, 20 (2), 176-190.
- Valle, C. A., Meade N., & Beasley, J.E. (2014). Market neutral portfolios. *Optimization Letters*, 8 (7), 1961-1984.

Semi-Strong Form of Market Efficiency : Does all Critical Information Affect Stock Price Valuations?

* *Rajesh Deshpande*

Abstract

Information about company fundamentals, among many things, should determine the prices of stocks. Usually, financial markets operating under a semi strong efficient market (SSEM) hypothesis imply that market prices of equity scrips react to business and environmental information which is available in the public domain. However, the paper established that even though SSEM hypothesis may hold most of the time, all publicly available data may not necessarily be factored to buy or sell stocks. There could be instances where some critical information (say, ratios of business efficiency), which is publicly available, may not be considered in favour of more directly observed or easily derived piece of information, that is, sales or profits. The paper studied correlation of business aggressiveness or strategic intent (expenditure made by the business to improve its competitive position) and historical market value to book value ratio of select scrips. Evidence emanating from the study indicated that vital information, which may affect business performance, in many cases was ignored by the market while deriving stock prices. The paper also proposed a non-econometric technique to assess company fundamentals which could lead to assessing stocks which were likely to improve their valuations in the mid-term (1-2 years horizon). The study concerned five IT stocks listed on the BSE to examine whether market to book valuation behaved in some accordance with the firm's strategic intent (measured as business expenditure, that is, employee cost as a % of sales).

Keywords : semi strong market efficiency (SSME), Tobin's q , core competency strategic intent matrix

JEL Classification : G10, G140

Paper Submission Date : December 6, 2016 ; **Paper sent back for Revision :** March 9, 2017 ; **Paper Acceptance Date :** April 18, 2017

A security's price is an equilibrium price between rational, well-informed, profit seeking decision makers. Buy/sell decisions are based on available information, therefore, price of a financial security is based on available information. The formal hypothesis regarding market efficiency states that all available information in the public domain is discounted into the price of a financial security. Fama(1970) suggested three levels of efficiency :

- ↳ weak form efficiency,
- ↳ semi strong form efficiency,
- ↳ strong form efficiency.

Stock prices reflect all public information - past and present. The test of SSEM theory is to examine whether security prices fully reflect all information in the public domain. If this should not always hold true, it would be theoretically possible to earn returns in excess of the market by studying the company's fundamentals, information of which is readily available. This paper investigates, whether under the SSEM, market value of an underlying asset could be speculated, especially under varying conditions of information availability. The

* *Visiting Professor of Quantitative Modelling*, Symbiosis Institute of International Business, Dist. Pune - 411 057.
E-mail: strateggist@gmail.com

attempt of the paper also extends to examining whether stocks are over or under valued in comparison to their strategic intent (business aggressiveness). Specific objectives of the study are noted below. The primary data pertains to financial years 2011 - 2016.

Objectives

- (i) Does the market factor information, which could be critical, but has to be derived in factoring the price of an underlying asset? This question forms the basis of the null hypothesis.
- (ii) How to identify stocks being over or undervalued purely on the basis of strategic intent or business aggressiveness (investment done by the company to improve its fundamentals) ? This question forms the basis of the alternate model to guide investment decision making for the mid-term (i.e. 2 - 3 years period).

Hypothesis

Since the market builds in all information in discounting the price of a defined asset, it should naturally correct itself for information asymmetry and incompleteness. Such condition implicitly suggests that there must be positive correlation between stock prices and market information availability. Flowing from this premise, the following null hypothesis is proposed for testing :

↪ **H₀**: There exists a positive correlation between market value/book value of a stock and strategic intent (aggressiveness index), that is, spending in a “key success factor” area of a business.

The above hypothesis is framed with a view that any investment in a “key success factor” by a firm should result in improvement in the PAT, and as such, this information must be factored in determining the equilibrium price of an underlying asset even under condition of semi strong market efficiency. This paper studies the relationship between investment in human capital (employee costs as % of sales) and market value to book value of the firm (also popularly known as the Tobin's q) in the IT sector. Explanation for the relevance of the indices used in this analysis is given further in the paper.

The original paper relating to the idea of the q developed by James Tobin and W. Brainard (1968) concerned with the ratio of market value of physical assets to their replacement value at current factor cost. Since then, several interpretations of the q have been formulated to assess valuation. This paper considers price to book ratio interpretation of the Tobin's q as aforementioned.

Rationale for Human Capital Cost Factoring for the Service Sector

The service sector is strongly employee cost dominant and it would be only fair to assume that any increase in this expenditure should impact sales and consequentially, profits. A business manager would or should know the trends which are affecting his/her industry and resultantly decide on expanding or contracting his/her work force. In other words, the impact of manpower build up should, in some way, signal prospects of a growing business. Such knowledge of business prospects, which is private information known to a business manager, eventually would be known to the market and, therefore, should affect the scrip's valuation.

We could further assume that the IT sector continuously trains its work force on new and advanced skill sets and thus, the quality of such human capital should be almost similar. In any case, the factors considered in the hypothesis, that is, human capital investment and price to market value should have positive correlation. Negative or weak correlation between the above mentioned indices, therefore, would indicate that all information is not

necessarily factored in the price of an underlying asset and the possibility of arbitrage exists. The model's further application also attempts to identify over and under-valued stocks in relation to the q and the firm's strategic intent. The commentary at the end of the analysis would indicate this assessment.

In light of the above, it is imperative to examine the role of information availability and its impact on stock valuation. The following section deals with the subject of information and bounded rationality limitations on scrip valuation.

Information Availability

Any piece of information can be examined through several frames, that is, consistency, credibility, completeness, symmetry, etc. Considering this, there are two principal components that are generally involved in any decision process: (a) information availability, (b) information credibility.

If we were to assume that all available information is credible or at least thought so by the investor when he/she wishes to speculate, there could exist a chance of some information being available but not searched or known (i.e. ratios of efficiency etc.). Therefore, possibilities exist of such information not being factored in the price of the underlying asset.

Individual assumptions of information completeness are the basis of *bounded rationality* thinking, where investors ground all their decisions on understandable and available information, which is predominantly "satisfying" rather than "optimizing". This paper deals with the concept of information, though available but complex, of not being used in decision making.

SSEM hypothesis is based on the concept of partial information availability to the investment managers and their ability to derive future prices of an underlying asset. It would be interesting to know whether they (the managers) or the markets notice all or some fundamental pieces of information related with key business changes, and this remains to be tested. If they do not do so, the null hypothesis stated above has to be rejected.

Towards this end, the paper considers the CCSI matrix model developed by Hamilton, Eskin, and Michaels (1998) to perform a historical stock price data based experiment. The model and study is detailed in the next section.

The CCSI Matrix

The CCSI matrix or the core competency strategic intent matrix is a popular tool which could be used to speculate the effects of investment aggression shown by a company to improve its business position. The model is based on two relatively well known ratios in the financial world, that is, (a) the Tobin's q , and (b) aggressiveness index.

The Tobin's q is a ratio of market value of an underlying asset divided by its book value (Book value = total assets minus intangible assets minus liabilities).

The aggressiveness index (AI) is simply any effort considered worth undertaking by the company to improve its market position measurable through sales, shares, or profits.

The CCSI is the derived plot of the above factors of the underlying asset and presented in graphical form. The positions of these stocks at every financial year end (used in this paper) or any such suitable (interval scaled) period depicts the movement of the investigated underlying asset in relation with the factors mentioned above.

(1) The Logic of the CCSI : Companies invest to build competencies and increase their sales and PAT (profit after tax). Such changes are readily reflected in EPS and market valuations, thus, statistically stated, should have a positive correlation with the Tobin's q . The paper, in part, examines these effects of information availability and validation on market valuation.

Table 1. Data Pertaining to Various Indices over Financial Years (31st March or Company Closing)

	Year	Sales (Cr\$) (S)	Price to Book (MV/BV)	Employee Cost (Cr\$) (EC)	Employee cost to sales ratio (EC/S)
TCS	2011	37325	11.88	18806	0.50
	2012	48894	9.23	24683	0.50
	2013	62990	9.48	24040	0.38
	2014	81813	9.46	29860	0.36
	2015	94653	10.98	38701	0.41
Tech M	2011	5092	2.52	1944	0.38
	2012	5311	2.66	2263	0.43
	2013	5907	3.24	2514	0.43
	2014	16485	4.88	6972	0.42
	2015	19349	5.37	7201	0.37
Infosys	2011	25385	7.58	12459	0.49
	2012	31254	5.53	15473	0.50
	2013	36765	4.6	19932	0.54
	2014	44341	4.46	24350	0.55
	2015	47300	5.29	25115	0.53
Oracle	2011	2361	3.23	1052	0.45
	2012	2606	3.52	1253	0.48
	2013	2938	2.94	1442	0.49
	2014	3159	3.07	1576	0.50
	2015	3341	9.22	1597	0.48
HCL Tech	2011	5079	5.8	2138	0.42
	2012	6794	58	3259	0.48
	2013	8907	5.29	3923	0.44
	2014	16497	6.65	5124	0.31
	2015	17153	6.67	5925	0.35

Date Source : Yahoo Finance

(2) The Data : As mentioned, the study was conducted through MV/ BV ratio (Tobin's q) and company spending on employees as a percentage to sales data, which is available publicly. The period of data was considered for five financial years, from 2011 to 2016. The companies considered were in the information technology space, that is, Oracle, Tech Mahindra, Infosys, HCL Tech, and TCS. All stocks are listed on the BSE.

The data was studied across sales, employee cost to sales ratio, price to book ratio (Tobin's q), and year average market price of the stock. A cross summary of the data used for the study is presented below. The Table 1 indicates company wise data. Multiple correlation was used to analyze the strength of the relationship between the various data mentioned above. The market price is the average price of the stock for the financial period considered in the study.

Analysis and Results

The market exhibits a strong correlation between annual sales and year average prices (4 out of 5 scrips in Table 2). For instance, TCS had sales to market price correlation of 0.98 (see Table 2).

Table 2. Correlation Matrix for Relevant Indices for Individual Stocks (Data in Table 1)

		Sales	Price to Book (Tobin's q)	Employee cost to sales ratio (Strategic Intent)
TCS	Price to Book	-0.17		
	Employee cost to sales ratio	-0.78	0.38	
	Market price (average of stock)	0.98	-0.23	-0.88
Tech M	Price to Book	0.99		
	Employee cost to sales ratio	-0.36	-0.27	
	Market price (average of stock)	0.51	0.58	0.50
Infosys	Price to Book	-0.75		
	Employee cost to sales ratio	0.82	-0.84	
	Market price (average of stock)	-0.44	-0.08	0.09
Oracle	Price to Book	0.60		
	Employee cost to sales ratio	0.70	-0.05	
	Market price (average of stock)	0.96	0.67	0.70
HCL Tech.	Price to Book	0.83		
	Employee cost to sales ratio	-0.88	-0.86	
	Market price (average of stock)	0.74	0.44	-0.71

Table 3. Correlation Results of Aggressiveness Index and q , with One Year Forward Lag, that is, Aggressiveness Index of 2011 Correlated with q of 2012

	Correlation Between q and Aggressiveness Index
TCS	0.710
Tech M	-0.678
Infosys	0.201
Oracle	-0.480
HCL	0.645

The market, in this case, used information which was readily available, that is, sales increase. Such behaviour is consistent with the theory of semi-efficient market hypothesis. However, if we consider the correlational values of Tobin's q to strategic intent, we can see that in most of the cases (4 out of 5 companies, Table 2) a negative or weak correlation exists, implying that the markets did not see any direct linkage between the two variables. For instance, TCS has correlational indices of 0.38 for the CCSI matrix parameters. In certain cases, there is a strong positive correlation between average market prices of stocks and sales but negative correlation between the q and strategic intent. For example, in case of HCL Technologies, market price to sales is positive ($\rho = 0.74$), but strategic intent to q is negative ($\rho = -0.86$) (see Table 2).

It can be noticed that the market only considered data that was *readily available and easy to digest*. It seems that immediately unavailable data or data considered as “*above acceptable level of analytical effort*” was not factored. It is observed from the Table 2 that there is a stronger correlation between sales figures and average market price of a stock, rather than q to strategic intent, which determines the intrinsic value of the stock in the future, that is, employee cost. Even if we are to assume that the impact of strategic intent may not be correlated positively with the q in the same year, effect of this should have been seen in the subsequent year. Correlation with one year lag between the above indices is given in the Table 3.

The Table 3 shows a mixed response where only two companies have a positive relationship, that is, TCS and HCL ; whereas, others exhibit weak or negative correlation. Generally stated, the observations of the study

indicate that the condition of “*full information*” factoring is violated, not fully, but substantially for the sample considered. In context of the findings mentioned above, the H0 (null hypothesis) stands rejected as there is evidence of negative or weak positive correlation between the *q* and strategic intent.

The alternate hypothesis, which readily assumes that information does not require being complete or compelling to influence the price of an underlying asset, holds true. Under operant conditions of bounded rationality, sparse and satisfying information becomes relevant for decision making, where the investment manager may ignore how a firm is conducting itself at a strategic level and over weighs easy evidence such as sales or profits in determining the market price of a scrip.

Since most IT stocks are affected by extraneous factors such as change in employment policies in U.S. or Europe, stories of global melt down or growth etc., we can assume that such impact would be more or less uniform for all scrips considered in the sample as a significant portion of IT business is outbound. Instances, as mentioned above, of imperfections result in misspelling stock valuation and raise possibilities of arbitrageur market correction of prices. One possible extension of the above study is where the CCSI model can be employed to assess stocks by their fundamentals and comment on whether they are over or under valued. It must be mentioned here that the CCSI model considers only one factor, that is, employee cost as strategic intent. However, the model is flexible and can be created around multiple factors such as customer loyalty indices, advertising to sales ratio etc., and these could be tested with the *q*.

The following Figures indicate how Tobin's *q* and aggressiveness intent behaved over years for these stocks. The following figures provide a directional sense to the investment managers to examine a stock by its intrinsic worth and base their investment decisions accordingly. The analysis should be a good template for the mid- term investor who is looking to park funds for a year or two in a specific stock.

Figures 1- 4 indicate how the position of Tobin's *q* and the aggressiveness index (strategic intent) perform over the financial years. Index considered for aggressiveness is normalized at 1 and MV/BV is considered as average of all stocks for the financial year. For purposes of comparative convenience, the axis values for both variables are kept constant. The observations are based on year aggregate data considering the movement of price to book values and the aggressiveness index over the years. A working demonstration of the model for the year 2011 is given in the Table 4. The same process is repeated over the next 4 years.

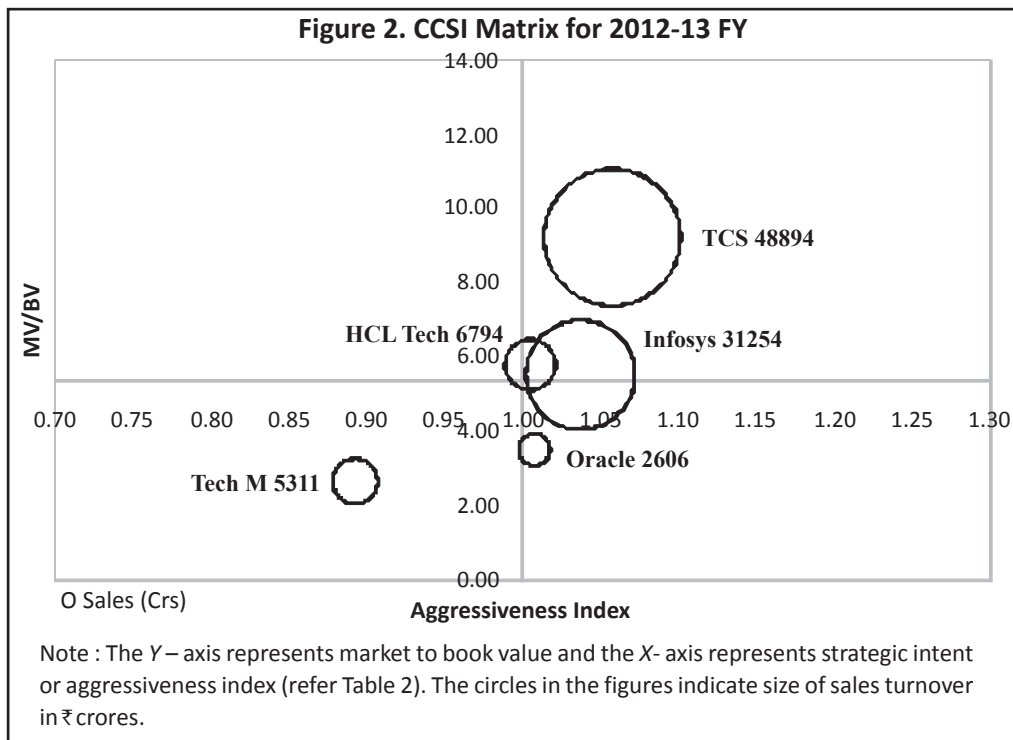
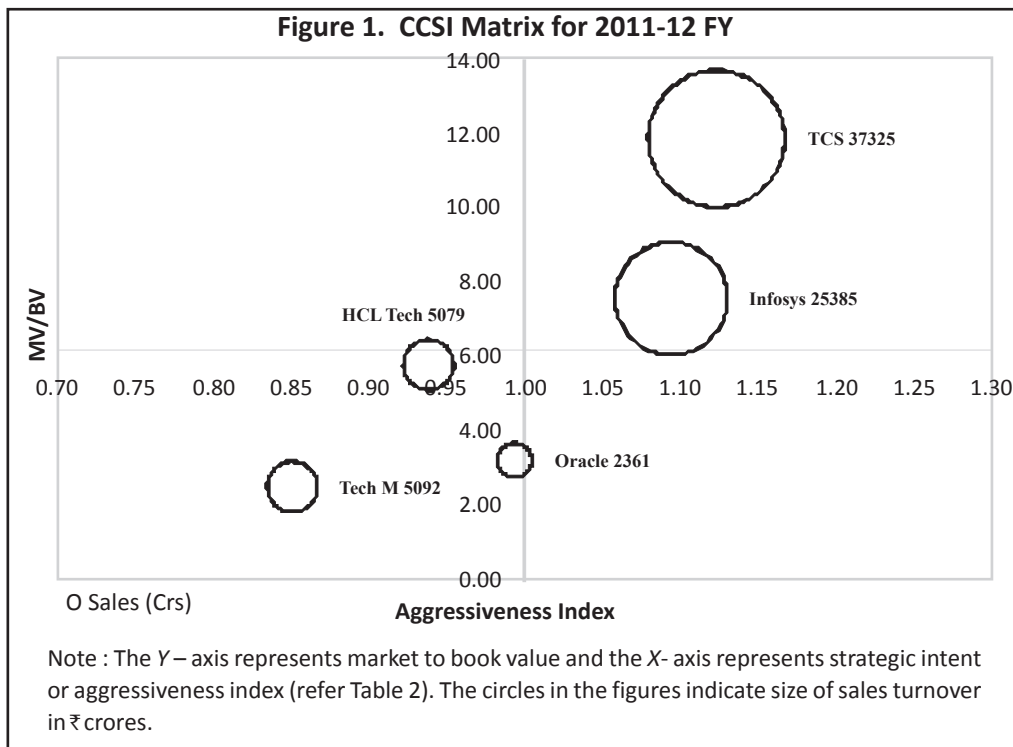
Table 4. Calculation of Plot Values of *q* and Aggressiveness Index

Company	Sales (Crs)	Price to Book	EC/Sales	Index Value	Employee Cost (Crs)
TCS	37325	11.88	0.50	1.12	18806
Tech M	5092	2.52	0.38	0.85	1944
Infosys	25385	7.58	0.49	1.09	12459
Oracle	2361	3.23	0.45	0.99	1052
HCL Tech	5079	5.80	0.42	0.94	2138
Average		6.20	0.45	1.00	

The application of the model is to denote a company's performance versus its *q* through a graphical relationship. This model is normative in nature as opposed to being descriptive. The model makes a strong case for the fund manager to favour particular scrips for holding in the medium term period of say 1 – 2 years based on the fundamentals of the CCSI model. The matrixes shown in Figures 1- 4 are transitional and will help the investor form an opinion regarding current and potential scrip valuation. The model is efficient in analyzing valuation of scrips for the medium term.

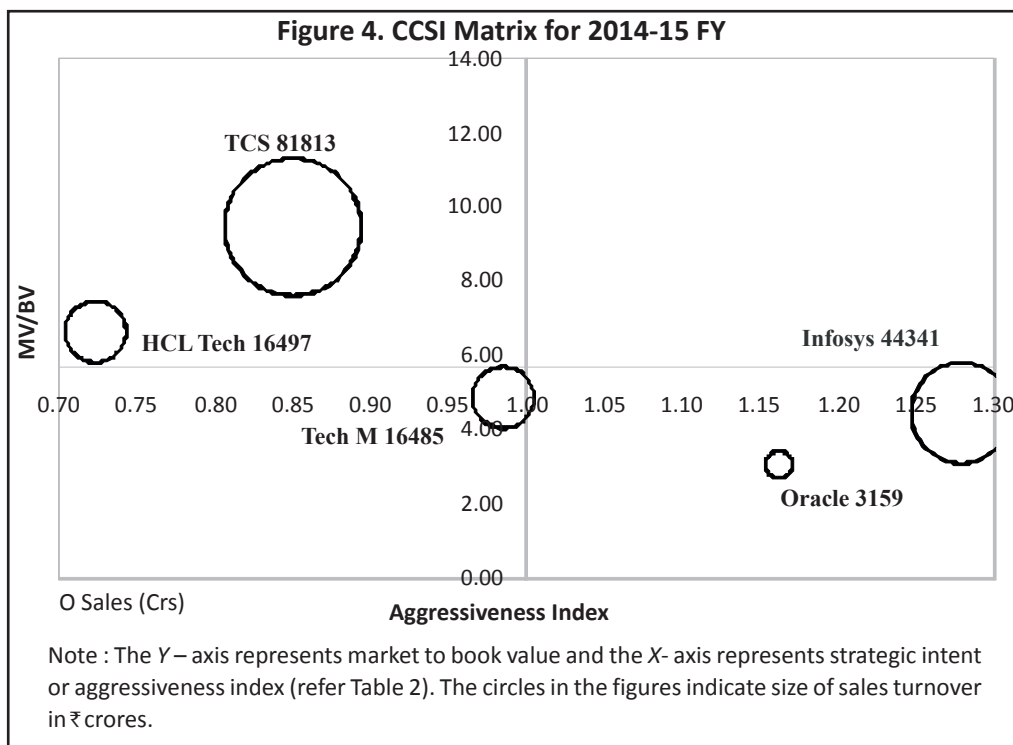
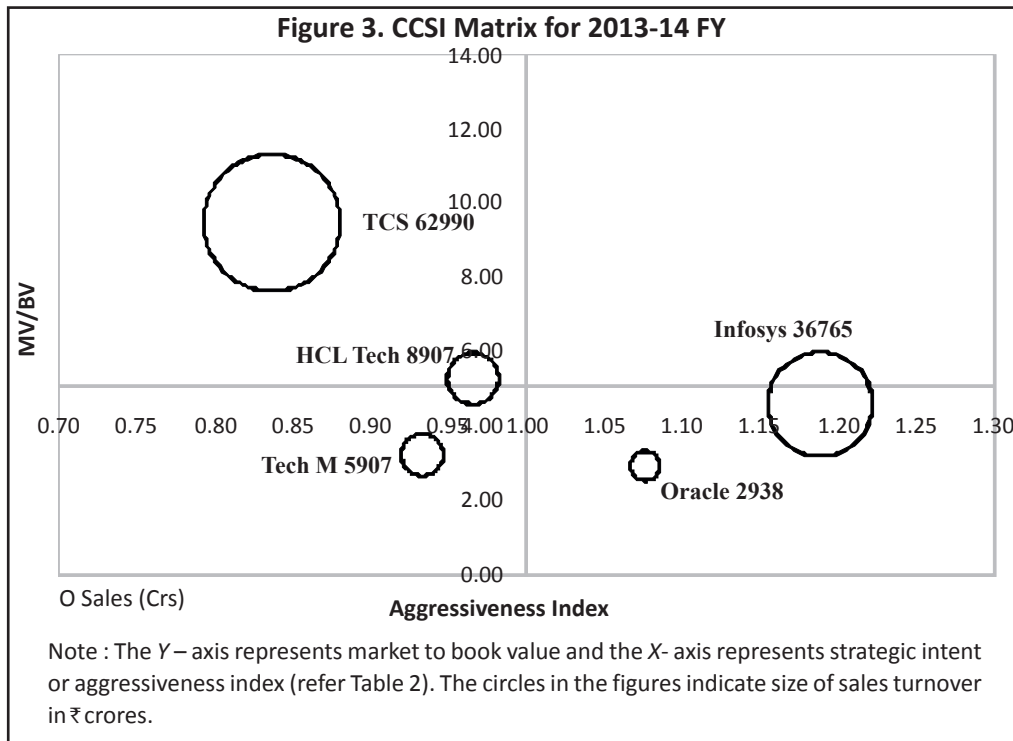
It is clear from the Figure 1 that TCS and Infosys invested strongly to improve their business capability and also enjoy high MV/ BV ratio. Others lag on both indices.

As depicted in the Figure 2, TCS and Infosys reduced their aggressiveness index and Oracle and HCL surged



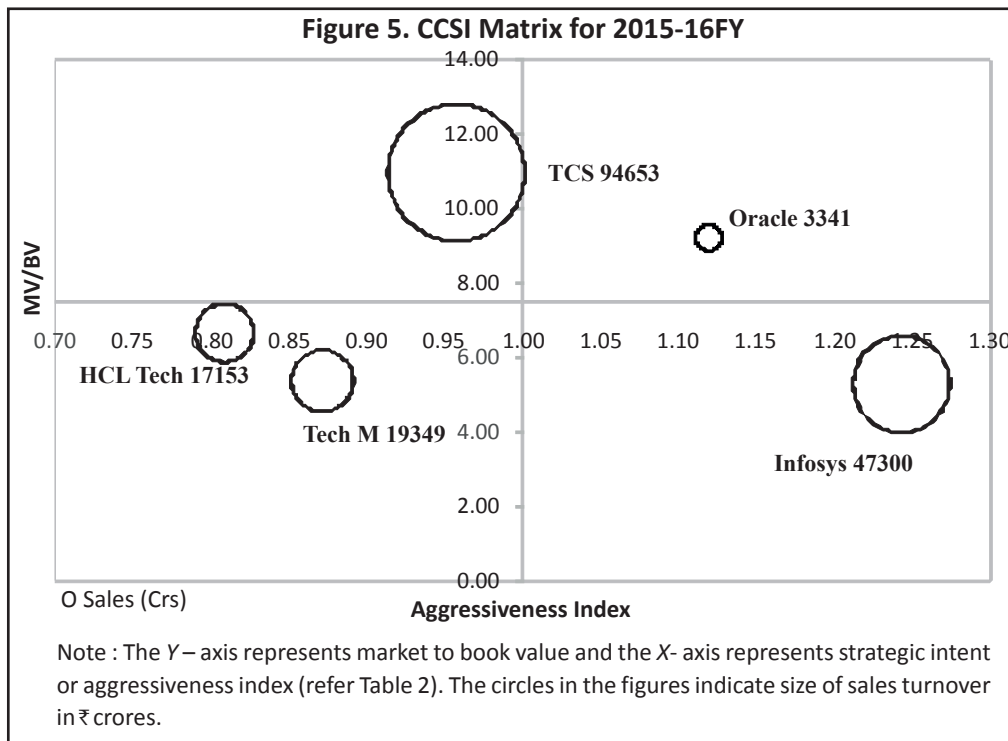
ahead. The logic of the model is that if an investor is looking at fundamentals, Oracle would appear to be a strong growth story script for investments.

As can be inferred from the Figure 3, Oracle and Infosys maintained an aggressive investment posture, but this is not reflected in their q . These are fundamentally strong scrips to buy for the medium term. TCS, on the other hand, reduced spending and yet maintained a high q valuation, indicating overvaluation. TCS, if it corrected its



aggressiveness index, could move towards being a prime scrip in the next 2-3 years.

As can be inferred from the Figure 4, Oracle and Infosys maintained lead in investment in human capital and these are signs of a growing business. A fund manager should note that, there would be indications that business managers, who are privy to internal information, shape their strategic thinking accordingly. These two scrips, that is, Oracle and Infosys should appeal to medium period investors as both scrips are strong on fundamentals. TCS



dropped its aggressiveness index further, yet maintained a relatively high q , indicating overvaluation.

As depicted in the Figure 5, the market seems to correct its valuation for Oracle. If we examine the Figure 4 and the commentary above, it is seen that both Oracle and Infosys were undervalued and in Figure 5, we see that Oracle corrected its valuation in the q . Infosys is still undervalued and has potential to be a strong medium investment opportunity. Also, we see that TCS increased its aggressiveness index (moving towards the right side of the divider line of Figure 5 as compared with Figure 4).

Discussion and Conclusion

- (1) The market does not factor all information in determining the value of an underlying scrip. Information, especially related future business prospects etc., known to business managers is largely disregarded. Rejection of the null hypothesis, as concluded in the above statistical study, is the result of such behaviour.
- (2) The market seems to value immediate sales growth or profit as opposed to medium term business prospects. The Table 1 indicates a mixed correlation response between sales and q .
- (3) The market tends to correct itself over a period of time for valuations driven by pure business fundamentals. The Figure 5 indicates that Oracle, TCS, and Infosys improved their q ratings, and HCL and Tech. Mahindra lagged behind.

The model allows for a macro analysis of business fundamentals and their impact on medium term market valuation. The model would serve as a guide to fund managers who may consider investment horizons of 1 - 2 years for scrips. The model is also effective in assisting risk averse investors who are likely to examine business prospects rather than be guided purely by speculative interests.

Limitations of the Study and Scope for Future Research

The model makes an assumption that the market value of a stock is a reflection of its aggressiveness displayed through investment. However, it is common knowledge that market value is also influenced by several exogenous factors. The model is indicative of business fundamentals and should not be seen as a stock price prediction technique since strategic intent may vary with changes in top management, market forces, etc. The model, though, may provide insights into future valuation possibilities for scrips.

The model could be studied across mid and small cap IT brands to ascertain the strength of the relationship between aggressiveness index and Tobin's q . Also, a multi-factor model could be considered for development with regression weights. It also may be interesting to know the applicability of the model in other sectors with specific systemic indices.

References

- Brainard, W. C., & James, T. (1968). Pitfalls in financial model building. *American Economic Review*, 58 (2), 99 - 122.
- Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work . *The Journal of Finance*, 25 (2), 28 - 30.
- Hamilton, R. D., Eskin, D., & Michaels, M. P. (1998). Assessing competitors: The gap between strategic intent and core capability. *International Journal of Strategic Management-Long Range Planning*, 31(3), 406 - 417.

A Study on the Influence of Stock Broker on Investor's Decision Making with Special Reference to Bombay Stock Exchange

* *K. Prabhakar Rajkumar*

** *N. Lakshmi Kavitha*

Abstract

An investor is the backbone of the securities market in any economy. In the past, investments were confined to the rich class, but these days, investments are very popular among all groups of retail investors. The basic objective of individual investors who buy and sell securities is to get good returns on their investments. There are different factors that influence the investment decision of investors, for example, returns, capital appreciation, safety, liquidity, tax benefits, etc. Of a population of over one billion, barely 18 million invest in Indian equity markets. According to SEBI data, 10 cities contributed over 80% of the trading volume. Nowadays, online stock trading creates worldwide investment opportunities, and as an investor, everything can be understood with the help of a stockbroker. Also, a stockbroker helps investors to take decisions concerned with investment and management of their investments. The pattern of investment differs from investor to investor and is influenced by various factors. With this background, this study was conducted to highlight the dependency level of equity investors on stockbrokers for their investment decisions in the stock market. It brought to light the behaviour of equity investors and services received from stock brokers. For this study, primary data was used to identify the dependency level and services of stock brokers.

Keywords : stock market, investment decision, stock brokers, equity investment, BSE, individual investors

JEL Classification : G1, G2, G11, G190, G200

Paper Submission Date : November 10, 2016 ; **Paper sent back for Revision :** December 5, 2016 ; **Paper Acceptance Date :** April 20, 2017

Every country depends on a financial system for the economic growth and development of the country. The financial system promotes savings by offering a variety of financial assets/investment to the common public. The stock exchanges play a major role in the financial system. The stock market in India is more than a century old. The Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) are the two major players in the securities market. More than 5000 companies with market capitalization of 1, 01, 49,289.97 crores in 2014-2015 were listed on the Bombay Stock Exchange (BSE) (SEBI, 2015a, 2015b). The business of BSE is spread over 100 cities of India. Technology development introduced e-broking and e- trading, and this has brought the stock exchange to the investor's door step, which is evident from the fact that 137.1 lakh Demat accounts were opened at National Securities Depository Limited (NSDL) (2015) and 96.1 lakh Demat accounts were opened at Central Depository Service (India) Limited (CDSL, 2016) as of March 2015 (CDSL, 2016 ; SEBI, 2015a).

The first step in investing in the stock market is choosing the broker who is a registered trading member of stock

*Assistant Professor, Department of Commerce, Periyar University, Salem - 636 011, Tamil Nadu.
Email : kudalkprk6@yahoo.co.in

** Ph.D. Research Scholar (Part Time), Department of Commerce, Bharathiar University, Coimbatore - 641 046, Tamil Nadu.

exchanges. There are a number of sub-brokers who are servicing a cross section of investors as the agent of the main broker. A broker may be an individual or a partnership, or an organized institution. Individual brokers are in direct touch with investors and also deal with them through employees. Corporate brokers don't have personal dealings with their clients. Instead, a company assigns one employee called personal relationship manager who has regular communication with investors. Brokers use technologies for their business and network their activities globally.

A broker is an intermediary between an investor and a market, channelling investments in a diversified manner (Gordon & Natarajan, 2011). Following the liberalization of markets and financial deregulation, the scope for stock brokers to deal in various related markets has increased. The institution of stockbrokers in India is in a growing stage. The role of brokers is quite unique in the development of capital markets (Desai, 2013). Thus, stock brokers are the life line of a financial sector. There were 1339 stockbrokers registered with BSE as of December 2014, who, in turn, had 19,392 sub-brokers. Out of the total turnover of BSE, 52.2% of the turnover was made in Mumbai in 2014 (SEBI, 2015c).

Review of Literature

Bodie and Crane (2000) attempted to find out whether the advice available to individuals from the media and providers of financial products were in line with the economic theory and also checked whether the respondents behaved according to the advice. It was found that such investors were better informed and experienced than others who did not receive such advice. With the decline in age, the percentage of equity in financial assets also declined and there were substantial differences among individuals with a fraction of their total assets invested in equity. Helm (2007) suggested that the initial investment decision was determined by corporate reputation, which led to detrimental stock choices. Investor satisfaction and loyalty were novel research areas and these affected established investor relationships. The study was conducted among German investors of a publicly traded company. The study revealed that diversity of loyalty affected corporate reputation. The study also revealed the detrimental choice effect and the impact of reputation on individual investors.

Grinblatt and Keloharju (2007) mentioned that the extent of past returns determined the decision to buy and sell stocks in the equity market. Shanmugam and Muthusamy (2001) studied the decision process of individual investors. The study covered areas such as the views of individual share investors, the objectives of their investments, the basic approach to investment decisions, and the nature of their equity portfolio. Three groups were formed from the 201 investors who were studied and were divided into groups of tax saver, traditionalists, and risk takers. The data collected from the respondents who were from Coimbatore city of Tamil Nadu were analyzed with the help of chi-square test and analysis of variance. The majority of the shareholders were salaried class people. The shareholders were young and first-generation investors, the time spent on investment analysis was inadequate, and the portfolio diversification was moderate. It was found that the regional industry had its impact on industrial portfolio. Technical analysis was impacted by the educational level, and the occupational category impacted the use of the fundamental approach.

Madhumathi (2005) studied the risk perception of the individual investors, and its impact on their investment decision making was examined. The results revealed that 76% were risk bearers - they had the tendency to use company performance as a basic factor to take decisions, and they depended on the advice of share brokers and investment consultants. On the basis of the market conditions, industrial position, and social changes, the risk seekers took their decisions. On the other hand, the risk avoiders did not have specific traits in terms of information perception processing capacity or situational constraints, and their decisions were mainly based upon the advice of their friends and relatives. In their report, Raut and Das (2015) mentioned that decision making ability of an investor was mostly influenced by influences such as herding, contagion, imitation, and information cascades. Investors also deviated from their rational decisions by psychological factors such as representatives, availability, and anchoring heuristics.

Vedantam and Sriram (2015) tried to understand how effective the role of investment advisors was in instrument selection and studied the drift in saving and investment patterns. They also studied modern means of saving and investment options. Their study revealed that 96.2% of the respondents from Vellore wanted to deal with equity instruments and wished that the commission percentage was less than 0.5%. This indicated that the brokerage firms needed to work on the percentage of commission charged.

Jayanta (2007) talked about BSE trading activity. Equity trading was basically a floor based activity and stock broking was done through stock brokers, telephones, or personally. The study also revealed that competition has increased in the last few decades due to the increase in the number of people trading in shares and the stock brokers. Due to the change in scenario, the existing players are faced with a situation, where either they have to change their product offerings or perish.

Research Gap

As per our observations, there is no full-fledged study of dependence on stock brokers and influence of stock brokers on investment decision making. Hence, this study is not only unique in nature, but is also a pioneering attempt. This study focuses on features of investment preference mode, investment frequency, dependence on stock brokers, services offered by the stock brokers, evaluation of stock broker quality, etc. The study depicts a clear picture about the mentality and attitude of investment decision of investors. As per our research experience, this study brings out the combination of all the features of this research. Such a combination has not been found in any other research work conducted so far in the Indian context. Hence, we can assertively say that this research work will bring out knowledge and awareness among investors of the stock market.

Statement of Problem

In India, the household sector contributes to 75% of the total savings. There are different investment options available in India (Avadhani, 2014). One of the lucrative types is investing in the stock market. In stock market parlance, an investment decision refers to making a decision regarding buying and selling of stocks (Bhalla, 2012). At present, investors mostly depend on hearsay and advice of friends, relatives, brokers, etc. for their investment decisions. Investors make investment in equity shares through brokers. Many a times, the new or the small investor is not aware of the workings of the stock market and invests money at the spur of the moment or on the advice of friends or other investors who have made some profit in the stock market.

Furthermore, many investors are short term investors and are not ready to wait for returns and withdraw money from the market, even if there is a minor loss or profit. Such investors need the advice of brokers, who in turn need to provide right advice to the investors and help them make a correct decision. Stock brokers know how to trade, have up-to-date knowledge of the Indian stock market, and all the financial developments. Therefore, it is very important that investors always seek the advice of good, professional stock brokers. Yet, we cannot predict the pattern of individual investment decisions. With this background, the present study tries to find out the dependency level of investors on brokers for decision making and association or co-relations between investment decisions and guidance of brokers.

Objectives of the Study

The following are the specific objectives of the study :

- (i) To study the behavior of equity investors in general.
- (ii) To identify the various predominant factors for selection of stock brokers by investors.

- (iii) To evaluate the various qualities and services maintained by brokers to retain their investors.
- (iv) To analyze the dependency level of investors on stock brokers and their mutual performance.

Hypotheses

To test the set objectives, the following null hypotheses were considered:

- ↪ H_{01} : There is no significant difference among the experiences of investors regarding suggestion of stock brokers regarding identification of sector.
- ↪ H_{02} : There is no significant relationship between different groups of income regarding dependency level of stock brokers.
- ↪ H_{03} : There is no significant difference among the experience of investors related to the suggestion of stock brokers regarding investment size.
- ↪ H_{04} : There is no significant relationship between gender of investors and services availed from the stock brokers.

Research Methodology

The methodology of the research indicates the general pattern of organization and the procedure for gathering valid and reliable data for the purpose of the research. The study is designed as a descriptive and quantitative one based on both secondary and primary data. Primary data were collected from equity investors in Mumbai using a structured questionnaire. The secondary data was collected from Handbook of BSE & SEBI, books, journals, magazines, and the Internet, etc. Mumbai, the financial hub of the nation, was selected for this study. Due to lack of a sample frame, this study used the two step sample selection procedure to collect data from investors of the equity market. Initially, the sample was selected by adopting simple random sampling without replacement. At the second level, snowball sampling method was used in order to ensure the sample properties. Data and information were collected from 462 equity market investors. The time period of the study was from September 2015 to August 2016. ANOVA and Pearson chi-square statistical methods were used to test the hypotheses. Frequency distribution, mean, percentage, rank, and figures are used to interpret the results of the study.

Analysis and Results

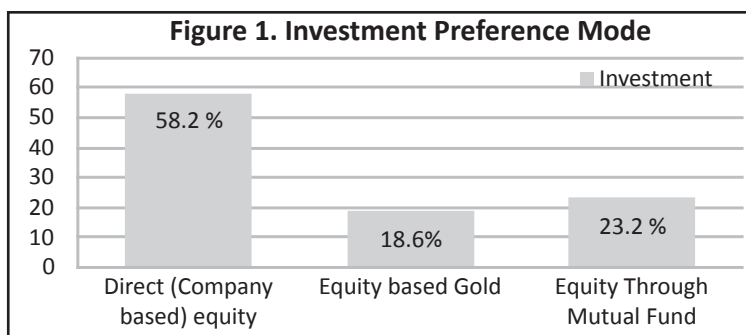
(1) Socioeconomic Profile of the Respondents : The Table 1 shows the summary of details of respondents with respect to gender, age, occupation, monthly income, and experience in trading. For easy understanding, this is expressed in terms of frequency and percentage.

(2) Investment Preference : The preference mode of investors was checked with direct (company based) equity, equity based gold, and equity through mutual funds. It is clearly observed from the Figure 1 that 58% of the investors preferred to directly invest in equity market ; 19% of the respondents preferred to invest in equity market through equity based gold, and the remaining 23% preferred to invest in equity shares through mutual funds.

(3) Frequency of Investment : The Table 2 shows that the frequency of investment and frequency were analyzed

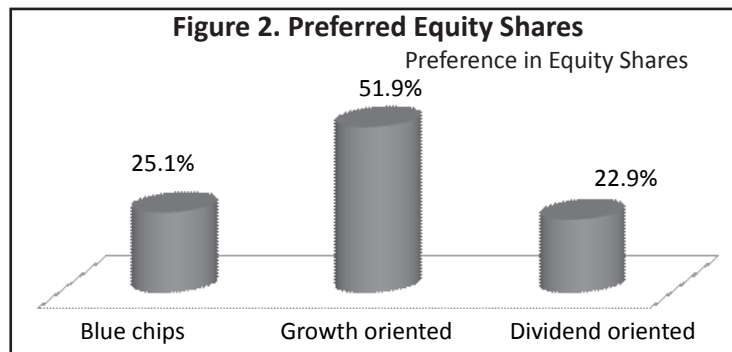
Table 1. Socioeconomic Profile of the Respondents

Particulars	Categories	Frequency	%
Gender	Male	340	73.6
	Female	122	26.4
Age	Below 20	16	3.5
	20-30	153	33.1
	30-40	165	35.7
	40-50	89	19.3
	Above 50	39	8.4
Occupation	Professional	53	11.5
	Self employed	105	22.7
	Service	264	57.1
	Others	40	8.7
Monthly Income (in ₹)	Up to ₹ 20,000	89	19.3
	₹ 20,001- ₹ 50,000	221	47.8
	₹ 50,000- ₹ 100,000	98	21.2
	Above ₹ 100,000	54	11.7
Experience in Trading	Less than 3 years	162	35.06
	3 years to 5 years	162	35.07
	Above 5 years	138	29.87

**Table 2. Frequency of Investment**

	Frequency	%
Periodical investors	131	28.4
Frequent Investors	87	18.8
Market oriented Investors	153	33.1
Rare Investors	91	19.7

in terms of periodical investors, frequent investors, market oriented investors, and rare investors. Around 31% of the investors were investing in the market when it was favourable for investment. Around 18% of the investors invested regularly, and 28.4% of the investors invested at regular intervals ; 19.7% of the investors did not invest regularly in the equity market.



(4) Preferred Equity Shares : The Figure 2 shows preference of respondents regarding type of equity shares they preferred to make investments in. More than 50% of the respondents preferred returns through capital gains because they invested in growth oriented shares ; 25.1% of the respondents invested in blue chip companies to reduce risk ; and 22.9% of the investors invested in dividend oriented shares.

(5) Dependence on Stock Brokers : An attempt was made to find out the purpose and the extent to which an investor depended on the services or suggestions of the stock brokers for various factors in the investment journey. Dependency was analyzed with 20 factors. It can be clearly observed from the Table 3 that investors were dependent on the brokers for awareness programme, Demat account opening, value added services, legal procedure, market condition, benefit comparison, technical and fundamental information. More than 60% of the investors depended on the services of stock brokers. For the rest of the things such as identification of sectors, selection of stock, taking decisions regarding sale or holding shares, 50% to 60% of the investors were dependent on services of brokers, and the rest did not depend on stock brokers. This means that they took their own decisions or depended on the advice of family & friends.

Table 3. Mean Score of Dependency Level

S.No.	Factors	Mean	%	S.No.	Factors	Mean	%
1	Selection of stocks	2.66	53.20	11	Appreciation of stock	2.99	59.80
2	Identification of sectors	2.79	55.80	12	Market condition	3.20	64.00
3	To Sell	2.80	56.00	13	News	2.41	48.20
4	To buy	2.96	59.20	14	Investment size	2.86	57.20
5	To hold	2.83	56.60	15	Awareness programme	3.11	62.20
6	To quit	2.81	56.20	16	Account maintenance	3.18	63.60
7	Diversification	2.94	58.80	17	Demat account- opening	3.25	65.00
8	Benefit comparison	3.04	60.80	18	Value added service	3.23	64.60
9	Dividend rate	2.87	57.40	19	Legal procedures	3.37	67.40
10	Merge	2.95	59.00	20	Technical & Fundamental information	3.51	70.20

Table 4. ANOVA - Dependency Level

	Sum of square	Df	Mean square	F	p - value
Between Groups	4631.141	3	1543.714	5.841	.001
Within Group	121051.162	458	264.304		
Total	125682.303	461			

It is understood from the result of Pearson's chi-square that the calculated value is 0.038 at 5% level of significance and the calculated value is less than the tabulated value. Hence, H_{01} is accepted. Hence, it is inferred that there was no significant difference among the experience of investors related to the suggestion of stock brokers regarding identification of sector.

It is observed from the results of ANOVA as shown in the Table 4 that the calculated p value is 0.001, which is less than 0.005 (at 5% level of significance). As the p - value is less than 0.005, H_{02} is rejected. Hence, it can be inferred that there is a significant relationship between different groups of income on dependency level of stock brokers. The Pearson chi-square is applied to test H_{03} . The computed chi-square value 0.105 is greater than its tabulated value at the 5% level of significance. Hence, H_{03} is rejected. It is inferred that there is a significant difference among the experience of investors regarding the suggestions of stock brokers related to investment size.

(6) Services : It can be seen from the Table 5 that most of the investors availed services from brokers that were related to investments like gainful information, profitable diversification, selection of equity shares of different companies, and financial services such as cash transferred to account of brokers after the investment order. The brokers have to concentrate more on few services such as loss minimization, meaning full risk return association, and financial advice as these were not received by many investors.

It is observed from the results of ANOVA (Table 6) that the calculated p - value is 0.452, which is more than 0.005 (at 5% level of significance). Hence, H_{04} is accepted. It can be inferred that there is no significant relationship between gender of investors and services availed from the stock brokers.

In the next stage, we evaluate the quality of services provided by stock brokers from the point of view of investors. The quality services of stock brokers are assessed on the basis of the following factors (Table 7) :

(i) Integrity : Integrity of stock brokers refers to the ethics of dealings of stock brokers with investors.

(ii) Objectivity : Maintaining impartiality of stock brokers in dealing with investors is one of the main aspects of the quality services of the brokers.

(iii) Fairness : True behaviour and attitude are appreciable qualities of stock brokers.

Table 5. Services Provided by Stock Brokers

Services	Mean	%
Gainful information	3.31	66.20
Profitable diversification	3.07	61.40
Minimize Loss	2.05	41.00
Meaningful risk return association	2.04	40.80
Appreciable portfolio selection	3.18	63.60
Financial advice	2.01	40.20
Financial services	3.19	63.80

Table 6. ANOVA - Services Received from Brokers

Sources of Variation	Sum of square	Df	Mean square	F	p - value
Between Groups	157.807	1	157.807	.568	.452
Within Group	127835.203	460	277.903		
Total	127993.010	461			

Table 7. Evaluation of Qualities of Stock Brokers

Qualities	Mean	%
Integrity	1.90	38.00
Objectivity	3.11	62.20
Fairness	3.29	65.80
Professional	3.49	69.80
Confidentiality	3.20	64.00
Competence	3.33	66.60
Diligence	2.03	40.60

(iv) Professional : Maintaining proficiency and being well-informed are other ways of justification of professionalism and providing quality services.

(v) Confidentiality : Maintaining confidentiality of data of investors through service quality provided by stock brokers.

(vi) Competence : Stock broker competences are measured in terms of their guidelines, advice, and predetermined ability.

(vii) Diligence : Proper follow up on market parameters on a daily basis emphasizes the quality of services provided by stock brokers.

Through the analysis, it is understood that stock brokers were very objective in their core work and were fair in dealing with clients. In Mumbai, the stock broker industry is dominated by corporate brokers. They have proved themselves to be highly professional and competent in their functioning. Also, majority of the investors felt that brokers maintained clients' details and confidentiality of investments. However, some investors felt that the brokers did not make sufficient efforts to reduce the loss for them and were not honest all the time with the clients.

(8) Selection of a Stock Broker : Investors were asked to rank the factors which are considered while selecting stock brokers for their investment in equity market. It will guide an investor who wants to start investing in the security market. Nine factors were considered important for the selection of stock brokers:

(i) Experience helps stock brokers to provide quality tips.

Table 8. Selection of Stock Broker

S.No	Factors	Mean Rank	Rank
1	Experience	3.70	1
2	Successful	4.60	2
3	Recommendation from friends	5.18	4
4	Easy accessibility	4.48	3
5	Scientific approach	5.62	5
6	No importance to luck	6.37	9
7	Frequent correspondence	5.56	6
8	Doubt clearance	5.85	7
9	News updation	5.94	8

- (ii) Successful means how the broker is maintaining relationship with his/her clients.
- (iii) Some investors select the stock broker on the basis of recommendation of friends who are investing in the stock market.
- (iv) Easy accessibility helps investors clear their queries. Therefore, they might consider it.
- (v) Scientific approach while guiding investors influences new clients.
- (vi) Investors expect that brokers should not give importance to the luck factor while guiding them.
- (vii) Investors also consider frequent contact with brokers through e-mail, phone, or in person.
- (viii) Ability to clear doubts and,
- (ix) Providing regular news to investors to help the broker retain existing clients and bring new clients through word-of-mouth.

According to Table 8, experience of broker in this field, followed by success of broker, and easy accessibility are the most important factors. Recommendations from friends who have an experience with a broker, scientific approach of the broker, and possibility of frequent correspondence with the broker are moderately important. Doubt clearance, news updation, and no importance given to luck by the broker are the least important factors for the selection of a broker.

Findings

- ↳ Most of the investors preferred to invest in equity shares directly instead of mutual fund or other means.
- ↳ Compared with periodical and rare investors, market oriented type investors are more in stock market, which shows that if the market condition is favourable and stable, many investors are willing to invest in shares.
- ↳ More than 50% of the investors preferred to invest in growth oriented companies instead of dividend oriented or blue chip companies. This means that they are expecting capital appreciation from their investment.
- ↳ On an average, more than 50% of the investors depended on stock broker services and facilities for various investment related suggestions or recommendations in their journey of equity investment.
- ↳ Around 60% of the investors did not avail broker services from the point of view of loss minimization, which means that they availed the services of brokers for full risk - return association and financial advice.
- ↳ Stock brokers need to be careful about clients' investments. These days, they maintain high professionalism in their work.
- ↳ Experience, success of broker, and easy accessibility of the broker are the prime factors for the selection of a stock broker in an investor's journey in the area of equity investments.

Implications and Conclusion

The study gives directions to all investment advisory firms and stock broking organizations to understand the behaviour of retail equity investors. This study would help investors to choose a good stock broker and understand how the stock brokers are playing an important role in the stock market. Investors can understand when and where they can depend on investment decision making. Next, this study would be more useful for stock brokers to understand the behaviour and expectations of their clients. Practically, big corporate stock brokers can get this kind of information by spending time on research, but the middle level broker and small brokers cannot afford money for research. For them, this study will be useful to understand equity investors, and also the purpose

for what they are depending on stock brokers, through which they can improve their services. The study will also be helpful for the first-time investors in the equity market to understand the working of the brokers and make safe investments.

Limitations of the Study and Scope for Further Research

The study was conducted with the help of secondary and primary data. Primary data was collected through field survey via questionnaires. Hence, the limitations of field survey are applicable to this study also. Depending on one's own experience, interest, will, and pleasure, some respondents might have given biased information. Compared to the population of investors in Mumbai, the sample size is limited because many investors did not want to disclose their income and investment details.

The study is limited to investors who are residing in Mumbai city and is based only on equity market investors. In addition, this study focused only on the behavioral parameters of investors and brokers in the particular time period and it may not be similar to any other condition or time period. The study can be extended to other geographical areas as well as different market investors like debt market and derivative market.

References

- Avadhani, V.A. (2014). *Investment management* (9th ed., pp. 15-25). Mumbai: Himalaya Publishing House Pvt. Ltd.
- Bhalla, V. K. (2012). *Investment management: Security analysis and portfolio management* (18th rev. ed.). New Delhi : S. Chand & Company Ltd.
- Bodie, Z., & Crane, D. B. (2000). Personal investing: Advice, theory, and evidence. *Financial Analysts Journal*, 56(3), 13-23. doi: <http://dx.doi.org/10.2469/faj.v53.n6.2126>
- Central Depository Service (India) Ltd. (2016). *Annual Report (2015-16)* (No. 08-12). Retrieved from https://www.cdslindia.com/downloads/annual_rep/CDSL%20Annual%20Report%202015-16.pdf
- Desai, V. (2013). *Financial markets and financial services* (4th ed.). Mumbai: Himalaya Publishing House Pvt. Ltd.
- Gordon, E., & Natarajan, K. (2011). *Financial markets and services* (7th rev. ed.). Mumbai: Himalaya Publishing House.
- Grinblatt, M., & Keloharju, M. (2007). The investment behaviour and performances of various investor types. *Journal of Financial Economics*, 55 (1), 43 - 67. doi: [https://doi.org/10.1016/S0304-405X\(99\)00044-6](https://doi.org/10.1016/S0304-405X(99)00044-6).
- Helm, S. (2007). The role of corporate reputation in determining investor satisfaction and loyalty. *Corporate Reputation Review*, 10(1), 22 - 37. doi: 10.1057/palgrave.crr.1550036
- Jayanta, K. S. (2007). Changing dynamics of stock trading. *Portfolio Organizer*, October 2007, 17-25.
- Madhumathi, R. (2005). Risk perception of individual investors and its impact on their investment decision. *Financial India*, 10(1), 302-305.
- National Securities Depositories Ltd. (2015). *Annual report (2014-15)*. Mumbai : National Securities Depositories Ltd.

- Raut, R. K., & Das, N. (2015). Behavioral prospects of individual investor decision making process : A review. *Indian Journal of Finance*, 9(4), 44 - 55. doi:10.17010/ijf/2015/v9i4/71457
- Securities Exchange Board of India (SEBI) (2015c). *Handbook of statistics (2014-15), number of stock brokers* (No. 03-08). Retrieved from http://www.sebi.gov.in/reports/handbook-of-statistics/jun-2015/handbook-of-statistics-on-indian-securities-market-2014_29987.html
- Securities Exchange Board of India (SEBI). (2015a). *Annual report (2014-15), Depository statistics of listed company: Number of Demat accounts* (No. 56-58). Retrieved from http://www.sebi.gov.in/cms/sebi_data/attachdocs/1450427865050.pdf
- Securities Exchange Board of India (SEBI). (2015b). *Handbook of statistics (2014-15), BSE listed companies*. Retrieved from http://www.sebi.gov.in/reports/handbook-of-statistics/jun-2015/handbook-of-statistics-on-indian-securities-market-2014_29987.html
- Shanmugam, R., & Muthusamy, P. (2001). Decision process of individual investor. In, *Indian capital markets theories and empirical evidence*. Mumbai: Quest Publications.
- The Bombay Stock Exchange. (2016a). *Equity market capitalization*. Retrieved from http://www.bseindia.com/markets/keystatics/Keystat_maktcap.aspx?expandable=0
- The Bombay Stock Exchange. (2016b). *Listing statistics*. Retrieved from <http://www.bseindia.com>
- Vedantam, S. R., & Sriram, G. (2015). Awareness of saving and investment options in Z category cities of India: A study with reference to Vellore city. *Indian Journal of Finance*, 9 (11), 33 - 44. DOI: 10.17010/ijf/2015/v9i11/81129

The Fama-French Three Factor Model and the Capital Asset Pricing Model : Evidence from the Indian Stock Market

* *Ritika Aggarwal*

Abstract

The study aimed to provide empirical evidence on the validity of various asset pricing models for India. Specifically, it examined the behaviour of stock returns in relation to market beta, firm size (market equity), and book-to-market equity factors. I tested for the capital asset pricing model (CAPM), introduced by Sharpe (1964), Lintner (1965), Mossin (1966), and Black (1972) and then for a well-known extension to CAPM provided by Fama and French (1992), that is, the three factor model which moves away from the oversimplified relation between excess portfolio returns and excess market returns as prophesized by CAPM. I differed from the previous studies on this topic, in the Indian market, in three significant ways. First, I constructed a higher number of portfolios to minimize variability within a portfolio. Second, I considered post-2008 stock market data, so as to exclude any impact of the economic crisis. Third, I also carried out a joint test on the constant term in the portfolio regressions using the GRS test statistic. Given the time period in consideration, the empirical tests conducted support the Fama-French three-factor model in explaining the variation of stock returns better than the single factor CAPM for the Indian stock market.

Keywords : CAPM, stock market, Fama-French model, asset pricing, expected returns

JEL Classification : C58, E44, G11, G12

Paper Submission Date : January 20, 2017 ; **Paper sent back for Revision :** March 25, 2017 ; **Paper Acceptance Date :** May 28, 2017

The fundamental requirement of economic growth and development necessitates the need for funds and hence, it is imperative to have a mechanism in place which ensures smooth transactions amongst the savers (investors) and the dis-savers in an economy so that funds are allocated efficiently. Stock markets lead in fulfilling the place of the above mentioned mechanism.

Stock markets throughout the world are well known for their volatile nature and sudden surges. An investor's lexicon starts and ends with the terms '*risk*' and '*return*'. The relationship between the two is what the investor yearns to understand and master. The capital asset pricing model (CAPM), developed by Sharpe (1964), Lintner (1965), Mossin (1966), and Black (1972), is the first model in asset pricing. It establishes a linear relationship between the asset return and exposure to a single market factor. Even though it is prone to criticism, it is still the most widely used asset pricing model by virtue of its simplicity and sufficient accuracy (Ajao & Igbiosa, 2014).

The relationship, as prophesied by CAPM, offers a benchmark return for judging potential investments by comparing the expected forecast of return with the "fair" return of the security for a given amount of risk. However, due to its excessive simplicity, the empirical record of the model is very poor. Several anomalies of CAPM were ascertained during 1980s and 1990s which challenged the validity of CAPM (Bhatnagar & Ramlogan, 2012).

Over the years, it was argued that it is not the best approach for investors to consider only the market risk (market beta) because in reality, they face several other types of risks as well. According to Fama and French, "the

* *Assistant Professor*, Department of Economics, PGDAV College, Ring Road, Nehru Nagar, New Delhi - 11 0 065.
E-mail: ritika.aggarwal.27@gmail.com

attraction of the CAPM is that it offers powerful and intuitively pleasing predictions about how to measure risk and the relation between expected return and risk. Unfortunately, the empirical record of the model is poor - poor enough to invalidate the way it is used in applications. The CAPM's empirical problems may reflect theoretical failings, the result of many simplifying assumptions” (2004, p.1).

In 1992, the results from the study by Fama and French challenged the predictions of CAPM. The study found that the main prediction of CAPM, that is, a linear cross sectional relationship between mean excess return and exposure to the market factor was violated for the U.S. stock market. Rather, exposures to two other factors - a size factor and a book-to-market equity based factor- explained a significant part of the cross sectional dispersion in mean returns. Fama and French interpreted the risk premiums associated with the size and book-to-market equity ratio as 'distress premiums'. They said that small sized and high book-to-market equity firms were going through financial distress and ,therefore, investors required higher premiums for investing in the stocks of these firms (Connor & Sehgal, 2001).

This paper attempted to test for both the capital asset pricing model (CAPM) and the Fama-French three factor model (FF) in the case of the Indian stock market over the time period from 2009-2015.

Literature Review

The development of CAPM, one of the fundamental tenants in financial theory, marked the birth of asset pricing models and became the most widely recognized explanation of stock prices and expected returns. The model states that the correct measure of the riskiness of an asset is its beta and that the risk premium per unit of riskiness is the same across all assets. Given the risk free rate and the beta of an asset, the CAPM predicts the expected risk premium for an asset. The Sharpe-Lintner CAPM equation, which describes individual asset return, is given by:

$$E(R_i) = R_f + \beta_{im} [E(R_m) - R_f] \quad i = 1, 2, \dots, n$$

where,

$E(R_i)$: Expected return of stock 'i',

R_f : Risk-free rate of return,

$E(R_m)$: Expected return on market portfolio,

$$\beta_{im} = \frac{Cov(R_i, R_m)}{Var(R_m)} \quad : \text{ Measure of systematic risk of stock.}$$

The model asserts that there is a linear relationship between the expected return in a risky asset and its β and also that β is a sufficient measure of risks that captures the cross section of average returns. The CAPM equation shows that given investors are risk averse, high risk (high market beta) stocks should have higher expected returns as compared to low risk (low market beta) stocks.

One of the earliest empirical studies that found supportive evidence for CAPM was that of Black (1972). Using monthly return data and portfolios, the study tested whether the cross-section of expected returns is linear in beta and the data was found to be consistent with the predictions of the CAPM. However, soon, it was concluded that the empirical evidence of the failures of CAPM were numerous. Fama and French (1992) found that the cross section of average stock returns for the period from 1963-1990 for U.S. stocks was not fully explained by the CAPM beta and that stock risks were multidimensional. Two of these dimensions of risk, they suggested, are size and the ratio of book value of common equity to its market value (BE/ME). This made it imperative for the market factor to be included in the regression to explain the above, which led to the formulation of the Fama and French's three-factor model :

$$E(R_i) - R_f = \beta_{im} [E(R_m) - R_f] + \beta_{is} [SMB] + \beta_{ih} [HML]$$

where,

$E(R_i)$: Expected return of stock,

R_f : Risk-free rate of return,

$E(R_m)$: Expected return on market portfolio,

SMB : *Small Minus Big*, that is, difference between the returns on small and big stocks,

HML : *High Minus Low*, that is, difference between the returns on high and low (BE/ME) stocks,

β_{im} : Exposure to market factor,

β_{is} : Exposure to size factor,

β_{ih} : Exposure to value factor.

Fama and French (1993) suggested that HML captures the variation of risk factor that is related to relative earnings performance of the firms. They showed that firms with persistently low earnings tend to have high BE/ME ratio and positive slopes on HML , and firms with persistently high earnings have low BE/ME ratio and negative slope on HML .

Since its introduction in 1992, the Fama-French three factor model has been subject of much academic debate and empirical application. Connor and Sehgal (2001) found that in the three-factor model, the market factor ranked highest in explanatory power, while no clear ranking could be given to the size (SMB) and value (HML) factors. The French case examined by Ajili (2002) provided evidence for the three factor model being of higher explanatory than the CAPM. In the three factor regression, they found the intercept to be close to zero, implying that the model was a good explanation of the cross-section of average stock returns.

Drew and Veeraraghavan (2003) tested the Fama and French three factor model in the Asian region (Hong Kong, South Korea, Malaysia, and the Philippines) and found that size and value effects could be identified in these four markets using a cross section approach and that the Fama-French model explained the variation in returns better than the single index model. Charitou and Constantinidis (2004) empirically examined the Fama-French three factor model using Japanese data over the period of 1992 to 2001. The findings revealed significant relationship between the three factors and the expected stock returns in the Japanese market.

Bundoo (2008) studied the emerging African stock markets for evidence of size and value premium, and found that the three-factor model held for the Mauritius Stock Exchange. Even after taking into account the time-varying betas, the results for size and BE/ME effects were statistically significant. However, the author cautioned that the results may be sample specific, and this model should be tested across other stock exchanges for checking robustness.

Homsud, Wasunsakul, Phuangnark, and Joongpong (2009) found that the Fama and French model was more appropriate to describe the stock exchange of Thailand as compared to the CAPM. Bhatnagar and Ramlogan (2012) ran multiple regression models to compare the performance of the CAPM and the three factor model in explaining observed stock returns and value premium effects in the United Kingdom market. Their findings showed that the three factor model held for the United Kingdom market and was superior to the CAPM in explaining both stock returns and value premium effects. Hence, the real world application of the CAPM was not supported by the United Kingdom data.

Ajao and Igbinosa (2014) conducted a study to determine the risk factors in asset pricing in the Nigerian Stock Market through a comparative analysis of the three factor model and the CAPM. The empirical findings made it very clear that the Fama and French three factor model provided significant improvement over the conventional one factor CAPM in capturing and explaining the cross section of expected returns on quoted stocks in the Nigerian Stock Market.

Based on the empirical review highlighted above, it is obvious that most of the application of Fama-French three factor model has been predominantly carried out in the developed markets. This study, therefore, aims to

contribute to the extant literature through a comparative analysis of the CAPM and the Fama-French three factor model on the Indian stock market.

Methodology

(1) Data Sources : Data were obtained from Centre for Monitoring Indian Economy (CMIE) Prowess- NSE 500, as majority of capitalization is by top 10% of the listed companies and the remaining market is traded thinly, so a market index is a good representative of the entire market. NSE 500 captured 94% of the total market capitalization as of March 2016. Some companies in NSE 500 were listed post the starting period of the study, and hence, the data was missing for them. Excluding these, we are left with a total of 396 companies, for which data was obtained for month end adjusted share prices for the period from 2009-2015. In addition, I took data for number of shares outstanding, price/book ratio, 30-days NSE index returns, and 30-days returns over a period for all the 396 companies from 2009-2015. The price data has been adjusted for capitalization changes such as bonus rights and stock splits. The risk-free proxy has been taken as the implicit yield on 91- day T bill for month end auction (Connor & Sehgal, 2001). This was obtained from the RBI website [1]. Since the yield is published weekly, I considered the simple average of weekly returns to get average risk free return for a given month.

(2) Construction of Portfolios : According to Sharpe (1964), Lintner (1965), Mossin (1966), and Black (1972), the expected excess return on a particular asset under CAPM is equal to the expected return on market portfolio multiplied by its market beta. Hence, if information on expected returns and market beta was available, then empirical testing of CAPM would just involve regressing the expected return against market beta. Such data is, however, not available and hence, estimates of expected return and market beta need to be used. This introduces measurement errors as the ordinary least squares (OLS) estimators will be biased. The empirical testing of Fama-French model also faces similar problems. To cope up with this problem, Fama-French (1995) proposed grouping securities together to form portfolios so that the measurement error is minimised and maximum possible dispersion of market beta is obtained (Bundoo, 2008).

The firm specific risk is diversified by grouping the stocks of companies into portfolios. In other words, rather than directly using the data on individual stocks for estimating the CAPM and Fama-French equations, 16 portfolios of the stocks have been formed and data on the returns and risks of these portfolios has been utilized for the purpose of testing the models. Construction of more number of portfolios helps minimize the variability within a portfolio. The method for constructing these portfolios is explained below.

(3) Sorting on the Basis of Size : The financial year in India begins in April and the stock market is highly volatile for at least some period after the start of the financial year, since investors would be inclined to sell loss-making stocks in March and earlier months, and reposition their portfolios in April (Connor & Sehgal, 2001). In order to ensure that the results did not get affected by such high level of fluctuations, I use size data for September (a gap of 6 months from April) by when such volatility is expected to more or less settle down.

In September of each year t , all the sample stocks are arranged in ascending order on the basis of size. Size, in this context, is defined as the market capitalization of the stock, that is,

$$\text{Size} = \text{Price of stock in September} \times \text{No. of shares outstanding in September}$$

The quartile breakeven points for sizes are then determined and the stocks are divided into four size quartiles. The

[1] URL: <http://dbie.rbi.org.in/DBIE/dbie.rbi?site=statistics>, under the main heading 'Financial Market' and sub-heading 'Government Securities Market'.

bottom 25% of the stocks (the ones with the smallest size) form the first quartile and are denoted '*Small*'. Similarly, the next 25% of the stocks in terms of size form the third quartile, denoted *A*. Third quartile is denoted as *C* and the last quartile, consisting of the largest sized companies, is denoted as '*Big*'.

(4) Sorting on the Basis of Value : In March end of each year $t-1$, all the sample stocks are arranged in ascending order on the basis of value, where value is defined as the ratio of book equity to market equity. The returns are calculated from October of year t , to ensure that value for year $t-1$, that is, March is known to investors at the time of portfolio formation. For the purpose of the present study, I used data on price/ book value per share and inverted it to obtain book equity/market equity (BE/ME), that is,

$$\text{Value} = \frac{\text{Book Equity}}{\text{Market Equity}} = \frac{1}{\left(\frac{P}{B}\right) \text{ratio}} = \frac{B}{P} \text{ ratio}$$

The stocks are once again allocated to four value quartiles with the first quartile (companies having the least value) being denoted as *Low*, the second quartile as *X*, the third quartile as *Y*, and finally, the last quartile (companies with highest values) as *High*.

(5) Forming the Portfolios : The 16 portfolios are then formed from the intersection of these four size groups and four value groups. List of the portfolios formed is as given below :

Small/Low, Small/X, Small/Y, Small/High

A/Low, A/X, A/Y, A/High

C/Low, C/X, C/Y, C/High

Big/Low, Big/X, Big/Y, Big/High

For instance, the portfolio *Small/Low* consists of all stocks which have both (i) a small size (i.e. belonging to the group *Small*), and (ii) a low value (i.e. belonging to group *Low*). The interpretation is similar for all the other portfolios.

Monthly equally - weighted return on the 16 portfolios is then calculated from October of year t to September of year $t+1$. The portfolios are then reformed in September of year $t+1$.

The 16 portfolios are constructed to be equally-weighted, as suggested by Lakonishok, Shliefer, and Vishny (1994). Fama and French (1996) suggested that the three factor model fares better in explaining equally weighted portfolios as compared with value-weighted portfolios.

(6) Factor Portfolios : As a next step, I constructed the explained and explanatory variables to be used for testing the asset pricing models. In all, I required data on the following four variables :

(i) Excess Return of Portfolio i ($R_i - R_f$) : This is the dependent variable to be used in testing both CAPM and Fama-French models. It is the monthly equally weighted return which is calculated for each of the 16 portfolios. From this, I subtracted the risk free return (R_f) to get the excess return of portfolio i .

(ii) Excess Market Return ($R_m - R_f$) : The 30 days NSE 500 index returns is taken as the return over market portfolio (R_m). From this, I again subtracted risk free return (R_f) to get the excess return over market portfolio.

(iii) Small Minus Big (*SMB*) : This is one of the two additional factors proposed by Fama and French. It captures

the risk factor in returns related to size. This is also termed as size-exposure. The simple average of the monthly returns of the four big sized portfolios is subtracted from the average of the four small sized portfolios to get the *SMB* factor (Malin & Veeraraghavan, 2004). This factor is free from BE/ME effects as it has about the same weighted-average BE/ME, and hence, it mainly focuses on different behaviour of small and big stocks.

$$SMB = \{(Small/Low + Small/X + Small/Y + Small/High)\}/4 - \{(Big/Low + Big/X + Big/Y + Big/High)\}/4$$

(iv) High Minus Low (HML) : The *HML* factor is meant to mimic the risk factor in returns which is related to the value. It is calculated as the difference between the simple average of the returns on the four high BE/ME portfolios and the four low BE/ME portfolios. It captures the different behaviour of high and low value stocks and is free from size effects.

$$HML = \{(Small/High + A/High + C/High + Big/High)\}/4 - \{(Small/Low + A/Low + C/Low + Big/Low)\}/4$$

Testing

(1) Model Specifications : A time series is used to test the asset pricing models. Data is taken from October 2009 to September 2015 (72 observations) and standard multivariate regression technique is used to estimate the following equations:

$$R_{it} - R_{ft} = a_i + \beta_{im} [R_{mt} - R_{ft}] + e_{it}$$

(Testing CAPM - equation 1)

$$R_{it} - R_{ft} = a_i + \beta_{im} [R_{mt} - R_{ft}] + \beta_{is} [SMB_t] + \beta_{ih} [HML_t] + e_{it}$$

(Testing Fama-French Model - equation 2)

where,

- R_{it} : Return of portfolio 'i' at time 't',
- R_{ft} : Risk free rate of return at time 't',
- R_{mt} : Return on market portfolio at time 't',
- SMB_t : *Small* minus *Big* at time 't',
- HML_t : *High* minus *Low* at time 't',
- a_i : Abnormal mean return of portfolio 'i',
- β_{im} : Exposure to market factor for portfolio 'i',
- β_{is} : Exposure to size factor for portfolio 'i',
- β_{ih} : Exposure to value factor for portfolio 'i'.

The intercept represents the difference in the expected return of portfolio estimated from its time series average with the expected return predicted by the Fama - French model. Therefore, it can be interpreted as a measure of abnormal performance or pricing error of portfolio. If the model correctly describes the expected returns, the intercepts of all portfolios will be zero. Also, note that the explanatory variables have only time subscripts and no portfolio subscript. This implies that for a given time, the value of, say, *SMB* will be the same for all of the portfolios. A similar statement can be made about the value of *HML*. Different variants of Fama-French model can be estimated by forcing some of the coefficients to be zero.

Since we have constructed 16 portfolios, testing CAPM (Fama-French) will involve estimating equation I (equation II) 16 times, each time for a different portfolio.

(2) Testing the Cross Sectional Restriction on Mean Return : In order to find out whether the risk factors incorporated in a model truly capture cross section of mean returns, I need to examine the zero intercept hypothesis, that is, testing the restriction of setting the intercept equal to zero. The intercept being zero is equivalent to establishing that there are no pricing errors for the particular portfolio. There are two ways in which this can be done.

(i) Using *t*-test : This approach entails checking the significance of the intercept term using the *t*- test. More specifically, in the case of this study, if I wish to do this test for the Fama-French model, then I will have to test the significance of the intercept for each of the 16 regressions done using equation (2). If intercepts are different from zero, then the model does not capture cross-section of expected stock returns. However, *t*-statistic does not tell us about the model as a whole. Therefore, I need to conduct a test which jointly tests intercepts equal to zero. This is the GRS *F*-test.

(ii) Using GRS *F*-test : Since the use of the individual portfolio intercept and associated *t*-tests are not enough to make statistical inference, the GRS *F*-test, which was introduced by Gibbons, Ross, and Shanken (1989) is used to make appropriate statistical inferences (Bahl, 2006). It is described as :

$$\left(\frac{T}{N}\right) \left(\frac{T-N-L}{T-L-1}\right) \left[\frac{\hat{\alpha}' \hat{\Sigma}^{-1} \hat{\alpha}}{1 + \bar{\mu}' \hat{\Omega}^{-1} \bar{\mu}}\right] \sim F(N, T - N - L)$$

where,

T = Number of observations (72 in the present study),

N = Number of portfolios (16 in the present study),

L = Number of factors (3 in the present study),

$\hat{\alpha}$ = *N* × 1 vector of estimated intercepts,

$\hat{\Sigma}$ = unbiased estimate of the residual covariance matrix,

$\bar{\mu}'$ = *L* × 1 vector of the factor portfolios' sample means,

$\hat{\Omega}$ = unbiased estimate of the factor portfolios' covariance matrix.

The larger alphas are in absolute value, the larger is the GRS test statistic and one would tend to reject the null hypothesis that all alphas equal zero. This implies that the factors of the regression model do not explain return variations for the portfolios.

Analysis and Results

(1) Summary Statistics : A comparison on the basis of size indicates that the average returns decrease as I move from small to big size portfolios, as seen in the Table 1. However, this holds true only for the low valued portfolios. For the high value based portfolios, the results are counterintuitive and do not confine with the conjecture of declining average returns as size increases. The average returns fall from the range of 2.98% to 3.29% for small sized portfolios to about 1.59% to 0.33% for high sized portfolios.

With respect to the value effect, there is a clear increase in the average returns both for small sized portfolios as I go from low to high value stocks. However, for the other three sized portfolios, there is a decrease in the average returns. For these portfolios, the results are contrary to the findings of the Fama and French (1992), who found a significantly positive relationship between returns and value as defined by book to market equity for U.S. stocks.

As seen in the Table 2, the correlation coefficient between *SMB* and *HML* is -0.1252. Such a low correlation

Table 1 . Mean Returns for 16 Portfolios

		Value			
		Low	X	Y	High
Size	<i>Small</i>	2.98	3.72	3.38	3.29
	<i>A</i>	1.24	2.02	1.29	0.83
	<i>C</i>	1.90	1.24	0.41	-0.04
	<i>Big</i>	1.59	0.74	-0.07	0.33

Table 2. Coefficient of Correlation

Variable	$R_m - R_f$	SMB	HML
$R_m - R_f$	1		
SMB	0.0213	1	
HML	0.5936	-0.1252	1

Table 3. Fama - French Model Results

Regressions: $R_{it} - R_{ft} = \alpha_i + \beta_{im} [R_{mt} - R_{ft}] + \beta_{is} [SMB_t] + \beta_{ih} [HML_t] + e_{it}$								
Book-to-Market Equity (BE/ME) Quartiles								
	Low	X	Y	High	Low	X	Y	High
Size	α_i				$t(\alpha_i)$			
<i>Small</i>	1.30	1.14	0.73	-0.24	1.11	1.65	1.04	-0.57
<i>A</i>	-1.06	0.13	-0.18	0.57	-1.67	0.20	-0.31	0.93
<i>C</i>	0.48	-0.80	0.05	-1.17	0.81	-1.32	0.09	-1.62
<i>Big</i>	0.10	1.38	-0.22	1.66	0.34	2.95	-0.33	1.90
	β_{im}				$t(\beta_{im})$			
<i>Small</i>	1.19	0.99	1.06	0.90	8.67	12.07	12.84	17.90
<i>A</i>	0.93	0.97	1.02	1.11	12.30	12.98	14.48	15.46
<i>C</i>	1.00	0.89	1.11	0.90	14.15	12.51	15.89	10.53
<i>Big</i>	0.91	1.13	0.98	1.12	25.52	20.35	12.37	10.84
	β_{is}				$t(\beta_{is})$			
<i>Small</i>	0.92	0.78	1.03	1.03	6.25	8.96	11.70	19.15
<i>A</i>	0.45	0.45	0.46	0.43	5.65	5.62	6.12	5.63
<i>C</i>	0.22	0.30	0.32	0.24	2.96	3.95	4.33	2.67
<i>Big</i>	0.00	-0.09	-0.04	-0.11	0.06	-1.51	-0.53	-0.98
	β_{ih}				$t(\beta_{ih})$			
<i>Small</i>	0.12	0.32	0.41	0.70	0.84	3.89	4.99	13.85
<i>A</i>	0.10	0.19	0.35	0.94	1.35	2.56	5.00	13.07
<i>C</i>	-0.17	0.22	0.48	1.08	-2.45	3.12	6.85	12.67
<i>Big</i>	-0.28	0.18	0.59	1.05	-7.93	3.23	7.48	10.23

Note : The t-values in bold represent the ones which are insignificant (between -1.96 and 1.96).

implies that *SMB* provides a measure of size premium which is relatively irrespective of BE/ME effects and vice versa.

(2) Fama-French Model Results : From the Table 3, it can be seen that the excess market return factor ($R_m - R_f$) explains the returns across all the 16 portfolios. All the 16 exposure factors (b) are obtained to be positive and significant at the 95% level of significance, indicating the prime role that the market factor plays in explaining variation in stock market returns.

In case of the size effect, the size exposure comes out to be significant in case of 12 out of 16 portfolios. Four portfolios formed by the intersection of the Big sized portfolios generate insignificant exposure factors. The coefficients decrease as we move from the small to big sized portfolios, keeping the value constant across the value-based portfolios, clearly confirming the existence of the size effect.

In terms of the value effect, the exposure of the value effect comes out to be significant in 14 out of the 16 portfolios. The two portfolios that generate insignificant coefficients are the *A/Low* and the *Small/Low* portfolios. Across all the size-based portfolios, the exposure increases as we move from the low valued to high valued portfolios, again substantiating the existence of the value effect.

The analysis reveals that the excess market factor has 16 significant exposures, the *SMB* factor has 12 significant exposures, and the *HML* factor has 14 significant exposures, clearly attributing the maximum explanatory power to the excess market factor in explaining the stock return variation. Amongst the size and the value factors, an unambiguous supremacy of any of the factors cannot be inferred. Also, it can be seen that Fama-French is explained best in case of 12 portfolios. The Big portfolios and High valued portfolios have adjusted R^2 of more than 90%, as shown in the Table 4.

Table 4. Overall Fit for Fama - French Model

	Adjusted R^2			
	<i>Low</i>	<i>X</i>	<i>Y</i>	<i>High</i>
<i>Small</i>	0.71	0.85	0.88	0.96
<i>A</i>	0.81	0.84	0.88	0.94
<i>C</i>	0.79	0.83	0.91	0.90
<i>Big</i>	0.91	0.92	0.88	0.89

(3) CAPM Results : It can be seen that the significance of the risk factor, β , in case of CAPM is higher than the Fama French model as is evident from the Table 5. If I undertake the analysis using the excess market factor, the CAPM regression alone generates an average adjusted R^2 , which is low as compared to the three factor regression adjusted R^2 , as shown in the Table 6.

Comparing between the CAPM and the Fama-French reveals the superiority of the latter in explaining stock market returns for the Indian stock market if we use the adjusted R^2 as the criterion. Hence, on the basis of these results, it can be inferred that the excess market factor, if modelled along with other risk factors associated with size and value of stocks, better explains the Indian stock market volatility in terms of returns compared to the same being modelled alone as in CAPM.

(4) Testing the Cross Sectional Restriction on Mean Return

(i) t-test : The intercepts in Fama-French model are insignificant. Also, the magnitude of intercepts is higher in CAPM for each portfolio than in the Fama-French model. This implies that there is something unexplained in CAPM which is captured by the intercept term. However, individual *t*-test does not give us a conclusive evidence of whether Fama-French better explains expected returns or CAPM. Hence, I move to the GRS *F*-test.

Table 5. CAPM Results

Regressions: $R_{it} - R_{ft} = \alpha_i + \beta_{im} [R_{mt} - R_{ft}] + e_{it}$								
Book-to-Market Equity (BE/ME) Quartiles								
	Low	X	Y	High	Low	X	Y	High
Size	α_i				$t(\alpha_i)$			
<i>Small</i>	4.25	4.40	5.01	4.98	3.62	5.25	5.01	5.11
<i>A</i>	0.55	2.03	2.28	4.93	0.88	3.25	3.57	5.25
<i>C</i>	0.53	0.79	2.56	3.14	0.98	1.42	3.97	2.95
<i>Big</i>	-0.85	1.74	1.65	4.89	-2.48	4.16	2.23	4.28
	β_{im}				$t(\beta_{im})$			
<i>Small</i>	1.28	1.19	1.33	1.34	9.39	12.28	11.47	11.84
<i>A</i>	0.99	1.09	1.24	1.68	13.83	15.13	16.69	15.46
<i>C</i>	0.90	1.03	1.40	1.55	14.39	15.97	18.78	12.57
<i>Big</i>	0.74	1.24	1.34	1.75	18.87	25.62	15.63	13.21

Note : The *t*-values in bold represent the ones which are insignificant (between -1.96 and 1.96).

Table 6. Overall Fit for CAPM

	Adjusted R^2			
	Low	X	Y	High
<i>Small</i>	0.55	0.68	0.65	0.66
<i>A</i>	0.73	0.76	0.80	0.77
<i>C</i>	0.74	0.78	0.83	0.69
<i>Big</i>	0.83	0.90	0.77	0.71

(ii) **GRS F-test** : The above results in Table 7 reject the null hypothesis of alphas (intercept terms) equalling to zero, jointly for all 16 portfolios for CAPM. However, in case of Fama French model, the test does not reject the null, indicating jointly that the intercepts are zero. This implies that CAPM does not explain cross-section of average stock returns, while the Fama-French model does.

Table 7. GRS F - Test Results

GRS F - test Results		
16 portfolios	GRS statistic	<i>p</i> - value
CAPM (1-factor)	4.0206	0.00004
Fama - French (3-factor)	1.5840	0.1031

Conclusion

In this study, I tested the capital asset pricing model and the three factor model of Fama and French on the Indian stock market, on a sample of 396 stocks over a period of 72 months. The conclusions drawn are in line with the research objectives of this study based on the regressions on each asset-pricing model. I have successfully checked for the efficiency of the Fama and French three-factor model in India, over and above the one factor CAPM. Both the size exposure as well as value exposure are found to be significant for as many as 13 out of 16 portfolios. Using the adjusted R^2 for testing the explanatory power of the three factor model, I see that it has

increased considerably for all 16 portfolios as compared to the one factor (CAPM) model. The GRS F -test for testing intercepts jointly equal to zero rejects the null hypothesis for CAPM but not for Fama-French. Hence, the findings are generally supportive of the Fama-French model applied to Indian equities.

Research Implications, Limitations of the Study, and Scope for Further Research

This paper examines the central findings of Fama and French (1992) on the Indian equity market. The results found using the three factor model provide a good description of the cross-section of average returns and can be used in applications like portfolio selection, portfolio performance evaluation, measuring abnormal returns in event studies, and cost of capital estimation (Fama & French, 1993). However, in the process of achieving this specific empirical research objective, there are several new issues such as extending the study to other indexes of stock return, forming portfolios for larger number of companies sorted on characteristics other than size or value, checking for seasonality effects in portfolio returns, and studying the model's results on different industry categories, which should be given due attention.

In addition, the three factor model can be further extended into a four-factor model suggested by Carhart, which includes an additional factor sorted on momentum. Owing to the limited scope of the study and time constraints, the analysis was restricted only to the level presented above. India is a very large emerging market with a growing and fast maturing equity market. Hence, a better understanding of the risk and return characteristics of this market is an important research problem.

References

- Ajao, M.G., & Igbinsosa, S. (2014). A comparative analysis of the three-factor and the capital asset pricing models in the Nigerian stock market. *Asian-African Journal of Economics and Econometrics*, 14 (2), 237 - 257.
- Ajili, S. (2002). *The capital asset pricing model and the three factor model of Fama and French revisited in the case of France*. Universite de Parise Dauphine, 10, 1 - 26.
- Bahl, B. (2006). *Testing the Fama and French three-factor model and its variants for the Indian stock returns*. DOI: <http://dx.doi.org/10.2139/ssrn.950899>
- Bhatnagar, C.S., & Ramlogan, R. (2012). The capital asset pricing model versus the three factor model: A United Kingdom perspective. *International Journal of Business and Social Research*, 2 (1), 51- 65.
- Black, F. (1972). Capital market equilibrium with restricted borrowing. *The Journal of Business*, 45 (3), 444 - 455. DOI: <http://dx.doi.org/10.1086/295472>
- Bundoo, S. K. (2008). An augmented Fama and French three factor model: New evidence from an emerging stock market. *Applied Economics Letters*, 15 (15), 1213 - 1218. DOI: <http://dx.doi.org/10.1080/13504850601018049>
- Charitou, A., & Constantinidis, E. (2004). Size and book-to-market factors in earnings: Empirical evidence from Japan. *Journal of Managerial Finance*, 8, 574 - 594.
- Connor, G., & Sehgal, S. (2001). *Tests of the Fama and French model in India* (Discussion Paper 379). London : Economic & Social Research Council, London School of Economics.

- Drew, M.E., & Veeraraghavan, M. (2003). Beta, firm size, book to market equity and stock returns : Further evidence from emerging markets. *Journal of the Asia Pacific Economy*, 8 (3), 354 - 379.
- Fama, E.F., & French, K. R. (1992). The cross-section of expected stock returns. *Journal of Finance*, 47 (2), 427- 465. DOI: <http://dx.doi.org/10.1111/j.1540-6261.1992.tb04398.x>
- Fama, E.F., & French, K.R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33, 3 - 56.
- Fama, E.F., & French, K. R. (1996). Multifactor explanations of asset pricing anomalies. *Journal of Finance*, 51(1), 55 - 84. DOI: <http://dx.doi.org/10.2307/2329302>
- Fama, E.F., & French, K.R. (2004). The capital asset pricing model: Theory and evidence. *Journal of Economic Perspectives*, 18 (3), 25 - 46. DOI: <http://dx.doi.org/10.1257/0895330042162430>
- Homsud, N., Wasunsakul, J., Phuangnark, S., & Joongpong, J. (2009). A study of Fama and French three factors model and capital asset pricing model in the stock exchange of Thailand. *International Research Journal of Finance and Economics*, Issue 25, 31- 40.
- Lakonishok, J., Shleifer, A., & Vishny, R.W. (1994). Contrarian investment, extrapolation, and risk. *Journal of Finance*, 49 (5), 1541-1578. DOI: <http://dx.doi.org/10.1111/j.1540-6261.1994.tb04772.x>
- Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *The Review of Economics and Statistics*, 47(1), 13-37. DOI: <http://dx.doi.org/10.2307/1924119>
- Malin, M., & Veeraraghavan, M. (2004). On the robustness of the Fama and French multifactor model: Evidence from France, Germany, and the United Kingdom. *International Journal of Business and Economics*, 3 (2), 155 - 176.
- Mossin, J. (1966). Equilibrium in a capital asset market. *Econometrica*, 34 (4), 768 - 783. DOI: <http://dx.doi.org/10.2307/1910098>
- Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3), 425 - 442. DOI: <http://dx.doi.org/10.1111/j.1540-6261.1964.tb02865.x>

A Study on Dividend Pattern of Indian Corporate Firms

* *Dinesh Kr. Sharma*

** *Ritu Wadhwa*

Abstract

The study undertaken investigated the dividend pattern and trend of Indian corporate firms for the period from 2002-2014. Dividend payment has always been considered as an important decision by corporates. It has been observed that many firms believe that paying dividend does not affect the value of firms, and many assure that dividend payment does enhance the wealth of shareholders. This study attempted to examine what has been the dividend trend of the Indian firms over a period of 12 years. Analysis of dividend trends for a large sample of stocks traded on the Bombay Stock Exchange (BSE) indicated that the percentage of companies paying dividends increased by 28% over a period of 12 years. The number of companies who were in the non-payer group declined by 51%, which indicated that firms moved towards the paying group. *t*-test was also conducted between payer and non-payer groups, and it was observed that paying of dividend does make a difference to the profitability and other related factors to firms.

Keywords : dividends, payer group, non-payer group, profitability

JEL Classification : G30, G32, G35

Paper Submission Date : March 22, 2017 ; **Paper sent back for Revision :** April 17, 2017 ; **Paper Acceptance Date :** May 27, 2017

Numerous studies have anticipated various theories in explanation of the reason of companies paying dividends. From the viewpoint of experts, dividend policy of a firm has implications for investors, managers, lenders, and other stakeholders. For investors, dividends – whether announced today or accrued and provided at a later date - are not the only ways of regular income, but also an imperative effort in valuation of a firm.

There are three fundamental principles that underlie corporate finance, namely, investment, financing, and dividend principle (Stern.nyu, 2015). These are the basic principles that rule the theory of corporate finance and are thus, known as the first principles. Investment principle defines investments made by organizations in order to gain profit that is higher than the hurdle rate which might occur. However, for investment principle to be successful, the hurdle rate is to be efficiently determined.

Financing principle on the other hand focuses on the sources of funding that are used in order to fund projects or to make investments. Debt and equity are the two major types of financing sources and an optimum mix of the two is covered under the financing principles. The third and the last is the dividend principle. This principle is important in order to determine the amount of earnings to be invested back in the business and how much is to be distributed to the shareholders of the company. The dividend principle basically judges as to how much money is needed in order to overcome the hurdle rate. If it is not large enough, then the company might just pay dividends to its shareholders which might help it in building a strong image.

Dividend paying stocks have certain exceptional benefits in the view of their corporate finance. Dividends are a strong signal of the financial health of a firm. Higher earnings imply a higher ability of the firms to make investors feel a part of the profit of the firm. This improves their image in the investor market and hence makes

* *Assistant Professor, Gautam Buddha University, Greater Noida - 201310, Uttar Pradesh. E-mail : dinesh@gbu.ac.in*

** *Assistant Professor, ABS - Amity University, Noida, Uttar Pradesh. E-mail : rwadhwa1@amity.edu*

them more popular. Total return is also higher for the stocks that pay dividend as the dividend and volatility is also found to be low. Moreover, it has been seen historically that dividend payments remain unaffected by interest rate movements. Dividend paying stocks also provide other benefits to investors in the form of shield against turbulent market cycles. This, in turn, is also beneficial for firms that are able to maintain their market prices (Ridgeworth Investments, 2011).

A dividend paying firm also implies a more disciplined management. A firm that has more than it can spend within and on its organization usually has the option to indulge in hoarding of money, pay it out as dividends, or acquire some other firms. Dividend payout thus implies that the firm in question believes in satisfying its investors and excelling in one field rather than trying its luck on everything and excelling in nothing (Koppenheffer, 2015).

Study of the dividend payout pattern tells about the ups and downs that have been reported in the dividend payout of any firm over a time period. Such studies are of grave importance to see the trends that have existed and the reasons that have caused such trends. The effect of certain prominent changes in the environment and those in the policy can also be seen through the study of patterns.

Literature Review

There are very few studies which explain the proper dividend pattern of the firms over a period of time. This study explored the various patterns of firms by dividing them into category of paying and non-paying firms.

Yarram (2002) conducted a study on the combination of BSE and National Stock Exchange (NSE) listed firms. It was reported that the average aggregate dividend payout had increased over the years (from INR 0.99 crore in 1990 to INR 2.93 crore in 2000, and to INR 4.19 crore in 2001). When compared for the years 2000 and 2001, it was also seen that although the number of total firms that paid dividend decreased from 1988 in 2000 to 1531 in 2001, the average aggregate dividend payout rose enormously.

In the context of the trend shown by regular payers, current payers, and initiators, the above study showed that the regular payers paid the highest amount of dividends over the years followed by the current payers and then the initiators. The study also made a comparison among the dividend payout of firms on the basis of whether they were indexed or not. Results showed that the companies belonging to indexes such as NIFTY and SENSEX had a higher dividend payout compared to BSE 100, BSE 200, CNX 500, and other such indices. In absolute figures, majority of both the NIFTY (29 out of 30) and SENSEX (49 out of 50) firms paid dividends during the period of the study (Yarram, 2002).

The study also showed wide differences across industries. The study showed that whereas the textile industry had a stable dividend payout through the years, the financial industry reported a growth in the same. Certain high growth firms such as computer hardware and software firms (which fall under machinery industry) reported low dividend payments (Yarram, 2002). The demographics and industry characteristics were useful for the present study, and trends could be compared with the established results.

A theoretical model was also developed by Lintner (1956) that furnished the results for the study. It was concluded through analysis that the dividend represented by the variable (dividend / share) depended on the target payout ratio (long-term desired ratio of dividend to earning). Bhat and Pandey (1994) along with current earnings and past dividends also recognized the importance of changes in equity base of the firm. Black (1976) stated that when taxes on payouts are introduced, the investors are motivated to prefer less of dividends and are more satisfied if the firm gets more inclined towards retained earnings in such cases. Fama and French (2001, pp. 26-27) showed for U.S. stock that improved liquidity reduced the dividend payout ratios. Now that the trends related to dividend are slightly known, there are certain papers, which noticed the causes of these trends. This question was also noticed in the study by Healy (1988). Jensen and Meckling (1976) concluded that because an increase in dividend payments increases the debts of the firms, therefore, the relation between the two can be established to

be negative. It is, therefore, considered more logical to see the impact of multi-nationality on dividend payout through the concept of existing debt.

Dividend decision holds immense importance from the point of view of organizational management team's perspective. It also needs to be analyzed on a priority basis due to its symbiotic relationship with matters of investment and financial arena. Another reason for the vitality of dividend decision was the dependence of the financial and investment decision on it. One might expect that the dividend payout must increase to make the shareholders happier, but it was rather found to be an anomaly with respect to certain cases. One of the case studies from United States of America registered dividend payout around 30% in 2005 as compared to \$60 30 years ago against shareholder happiness as reported by Singhanian (2005).

Another study carried out in the Indian context is by Mohanty (1999). A total of 200 companies were analyzed over a period of 15 years (1982-1996) which were further divided into two periods for the convenience of the study (1982-91 and 1992-96). This study focused on two types of companies - those that made bonus issues and those who didn't. Results indicated that the companies that issued bonus to allure their shareholders didn't reduce their dividend rates after bonus issue, if not increased.

Singhanian (2005) highlighted this case and conducted a study on 590 BSE (Bombay Stock Exchange) listed manufacturing companies from the years 1992-2004 (i.e. FY 1991-92 to 2003-04). Data was collected from CMIE (Center for Monitoring of the Indian Economy) Prowess database for validating the research propositions. Dividend payout ratio was indicated as the key metric to analyze the trend in dividend decision of variegated companies. The reason that was stated for the choice of BSE over any other index was that the former had the largest number of listed companies around the world after NYSE (New-York Stock Exchange). In the post-era of liberalization, many changes have happened in all spheres of the Indian economy. So, the time period of study was chosen accordingly. The chosen companies were profiled according to their characteristic of being payer or non-payer and according to the industry of operation. It was seen through analysis that the trend in dividend payout ratio was rather volatile. Whereas, it increased in the initial time period of the study (from 25.7% in 1992 to 46.02% in 1997), it had decreased a little after that (37.71% in 2000) and increased thereafter, to reach an all-time high in 2004 (67.86%).

In the study, differences have also been seen amongst the companies belonging to different industries and other profiles. Whereas some industries had companies with stable patterns, others had companies reporting great hike in the dividend payout ratios. Therefore, huge industry wise fluctuations were reported. Trend had also been seen for the payer companies. It was reported that the regular payers shelled out higher payout and were more consistent. On the other hand, the current payers and initiators, when compared to the regular payers, made lower payouts and showed more fluctuations in their payouts, respectively. Singhanian (2005) also stated three approaches that can be followed for forming dividend policy. Firstly, either the companies can distribute 100% of their profits or retain 100% of their profits. The last option is that they follow the technique of part retention and part distribution. The trends reported that the companies following the third approach had decreased over time (from 75% of the companies in 1992 to 56% in 2004). On the contrary, the percentage of companies following the second approach increased from 24% in 1992 to 36% in 2004. Although the companies following the third type of strategy had increased over time in absolute numbers (from 5 in 1992 to 46 in 2004), their percentage had been less than 1% of the total sample. These results are relevant and provided a base for the current research for a comparative analysis.

Sudhakar and Saroja (2010) carried out a study of Indian banks, which were traded on BSE. The time period for this study was 1997-98 to 2006-07. The study focused on judging two relationships. First was profit and dividend relationship. This relationship was important because the profits that were earned by the firms were the source of dividend that will be paid out. It was the inflow of occurrence of profits that instigated the payout of dividends. The second relationship studied was the comparison of banks on the basis of their dividend paid to equity capital relationship. Through analysis of the trends, it was seen that with a hike in the net earnings over

years (from INR 2,500.39 crores in 1997-98 to INR 15,520.14 crores in 2006-07), the dividend payout also reported an increase (from INR 495.25 crores in 1997-98 to INR 3550.43 crores in 2006-07). It was concluded on the basis of the figure for coefficient of variation that though the dividend payout and net profit were both increasing and significant, the dividend payout ratio was insignificant. This implied that the dividend policy, as adopted by the Indian banks, was stable despite the volatility of the profits. The value of 20.17% for the mean payout ratio also revealed the same, that is, the banks reinvested 80% of their earnings in their own business. Data also laid open the fact that 45% of the firms paid upto 24% of their income as dividend while another 45% of the firms paid 25% to 48%. The remaining 10% paid a humongous amount, that is, 60% of their earnings as dividends.

Rizvi and Khare (2011), in their paper, emphasized that the biggest challenge for any organization was to determine the optimal allocation of profits, and the same was applicable to the banking industry. The results of their study showed that earnings per share was a very important determinant of the dividend payout ratio. Stock beta was also found to have a negative but significant association with the dividend payout ratio. Thus, these variables also set the dividend payment pattern for any firm in an industry.

On the lines similar to those of Singhanian (2005), Gayathridevi and Mallikarjunappa (2012) studied the trends in dividend policy of 114 textile companies of India, which are listed on NSE (National Stock Exchange). This study was done in the time period from 1989 - 2009. Therefore, although this study gave the trend analysis of a particular industry, focus had been on a longer time duration. Analysis showed that the number of companies paying dividends decreased during the time period of their study. It fell from 75.86% in 1990 to 35.71% in 2009. This trend can be observed to be in agreement with the trend shown by Singhanian (2005), but it also showed that after 2006 (i.e. after the time period of the latter study), the trend started falling again. Gayathridevi and Mallikarjunappa (2012) reported another important finding in addition to falling percentage. It was seen through the data that although the companies that paid dividends were majorly profit making companies, but even loss-incurring companies paid dividends. It was also seen that profit making companies formed 50% of the total companies which didn't pay dividends (percentage of latter rose from 24.14% in 1990 to 64.29% in 2009). It was, therefore, concluded that loss cannot be the only reason why the companies were not paying dividends. It was an important finding from a research point of view which was utilized for the present research work.

The above reviewed studies showed that studying the trends of dividend policy and payout is of utmost importance. It is vital not only for the formation of dividend policy in the future, but it also determines the pathway for other policies as well. Hence, in this study, the trend analysis of the collected data was explored to get an overview of the existing trends of dividend payout in the collected sample.

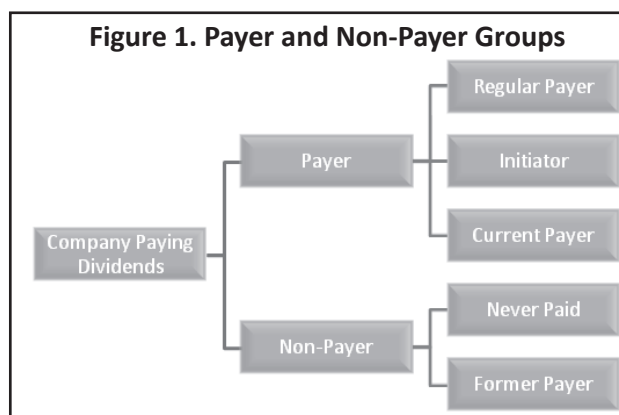
Objectives of the Study

The present study caters to the following objectives:

- (1)** To find out the trend of dividend payment over a period of 12 years.
- (2)** To analyze whether payment of dividend makes a difference to some important variables of the firms, for example, market to book value and profitability.

Research Methodology

The dividend payment patterns of all the companies in India that were listed on the Bombay Stock Exchange (BSE) - 500 during the period from 2002 to 2014 were employed for the purpose of analysis. The data was sourced from Prowess Database of the Centre for Monitoring Indian Economy (CMIE). The companies were



excluded by the software used for analysis and no manual exclusion was done.

Dividend policies of various industries considered over the years were seen through a scatter plot. For this purpose, scatter diagram of the variable of dividend payout ratio was created. The scatter helped in determining the trends that dividend payout ratios of various companies showed over the years.

The categories from Figure 1 are defined as follows:

- ↳ Regular payers are those who have paid dividends regularly from the starting year to the current year and haven't skipped any year in between.
- ↳ Initiators are those who haven't paid dividends ever during the whole duration considered and are paying for the first time in current year.
- ↳ Current payers are those who are paying dividends in the current year and have paid in the years before the current year but have missed out in one of the years.
- ↳ Never paid consists of the companies that have never paid dividends during the whole time duration considered and are not even paying in the current year.
- ↳ Former payers are those who paid dividends earlier but are not paying in the current year.

A line graph of the number of payers and non-payers of dividends over the years was also created. This shows that the fall and rise in their numbers has been reported (Singhania, 2005). Moreover, *t*-test was also conducted between these two groups. This was done to see the impact of paying dividend or dividend payout ratio (DPR) on the profitability, price-book ratios, and market capitalization of the firms in the respective firm years (Mittal & Chopra, 2006).

A categorization of the payer groups into regular payers, initiators, and current payers was done. Moreover, non-payers group was also divided into those who have never paid and former-payers. This categorization was done on the basis of the study conducted by Singhania (2005) and Yarram (2002).

Another way in which dividend payout trends can be seen in the industry is by knowing the number of companies paying a particular range of dividends. This was done with the help of pictorial representation. Help of area graphs was taken to depict these trends. The calculation for the graphs included bifurcation of the companies into four categories according to the percentage of dividend that they provided. The six categories considered are: 0%, 0-25%, 25-50%, 50-75%, 75-100%, and more than 100%.

Another analysis was done for the average percentage dividends paid by the firms belonging to various industries and the trends in the same. The averages were calculated industry and year wise for all the companies considered under any particular industry. The industries having more than 10 companies in the considered samples were the ones that were considered for this analysis. Both these analysis were inspired and adopted from Singhania (2005).

Table 1. Sample Characteristics

Industry	Number of Firms	Industry	Number of Firms	Industry	Number of Firms
Abrasives	2	Fertilizers	4	Other recreational services	2
Agricultural machinery	2	Footwear	1	Other textiles	4
Air transport services	1	Gems & Jewellery	6	Other transport equipment	3
Air-conditioners & refrigerators	3	General purpose machinery	5	Paints & varnishes	4
Aluminium & Aluminium products	2	Generators, transformers & switchgears	2	Paper & newsprint	3
Auto finance services	4	Glass & glassware	2	Paper products	1
Bakery products	2	Health services	2	Passenger vehicles	1
Banking services	39	Hotels & restaurants	4	Pesticides	4
Beer & alcohol	3	Housing construction	3	Plastic films & flexible packaging	2
Boilers & turbines	3	Housing finance services	7	Plastic furniture, floorings & misc. items	2
Business consultancy	7	Industrial construction	9	Plastic packaging goods	2
Castings & forgings	4	Industrial cooling equipment	1	Plastic tubes, pipes, fittings & sheets	3
Caustic soda	1	Industrial machinery	2	Production & distribution of films	1
Cement	13	Infrastructural construction	8	Readymade garments	2
Ceramic products	2	Infrastructure finance services	6	Refinery	7
Cloth	2	ITES	3	Refractories	1
Coal & lignite	1	LNG storage & distribution	5	Retail trading	4
Coffee	2	Lubricants, etc.	1	Shipping transport infrastructure services	3
Commercial complexes	14	Man-made filaments & fibres	2	Shipping transport services	3
Commercial vehicles	2	Media-broadcasting	9	Sponge iron	1
Communication equipment	1	Media-print	3	Steel	5
Computer software	22	Metal products	7	Steel pipes & tubes	3
Consumer electronics	1	Minerals	2	Storage & distribution	1
Copper & copper products	2	Mining & construction equipment	1	Storage batteries	2
Cosmetics, toiletries, soaps & detergents	8	Misc. electrical machinery	2	Sugar	4
Cotton & blended yarn	1	Other agricultural products	5	Tea	2
Crude oil & natural gas	4	Other asset financing services	15	Telecommunication services	7
Dairy products	2	Other automobile ancillaries	6	Tobacco products	3
Diversified	13	Organic chemicals	1	Tourism	2
Diversified cotton textile	1	Other chemicals	10	Trading	15
Diversified machinery	3	Other domestic appliances	2	Transport logistics services	4
Drugs & pharmaceuticals	34	Other electronics	3	Two & three wheelers	4
Dyes & pigments	1	Other fee based financial services	1	Tyres & tubes	5
Education	2	Other financial services	3	Vegetable oils & products	3
Electricity distribution	1	Other fund based financial services	11	Wires & cables	2
Electricity generation	13	Other industrial machinery	1	Wood	1
Engines	3	Other misc services	5		
Exhibition of films	2	Other non-ferrous metals	1		

Analysis, Results, and Findings

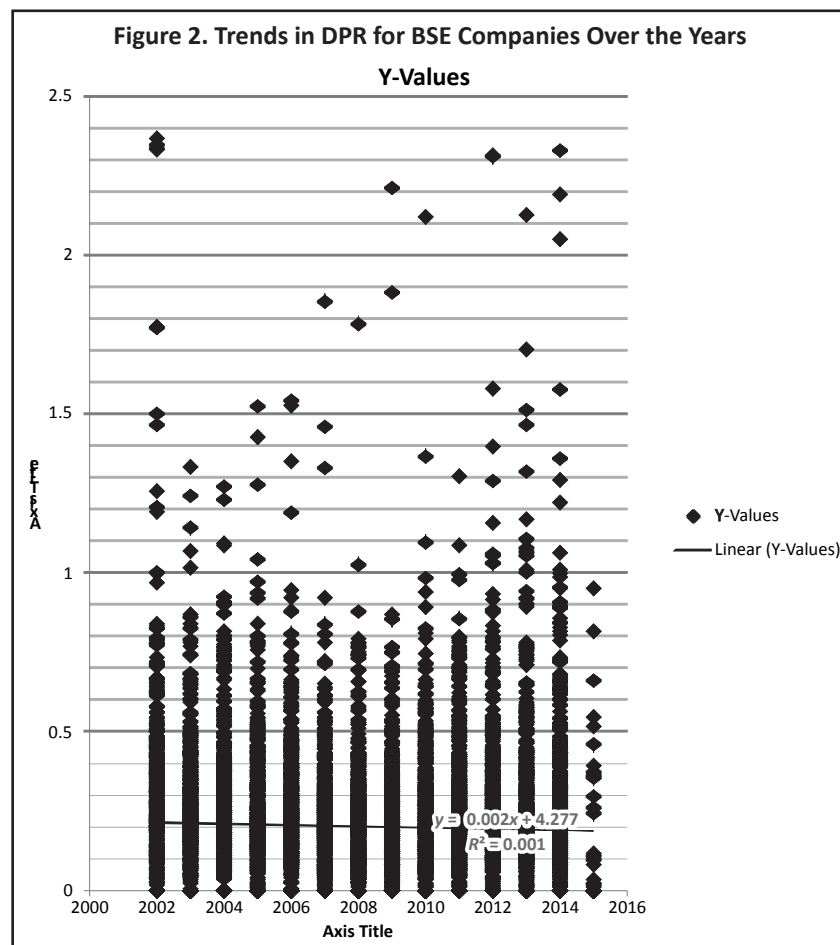
The characteristics of the sample that has been studied is important to be looked through. It helps in deciphering any unusual behavior that the data set might show. As can be seen, the firms belong to a number of different industries, which can be a possible cause of anomalies. Therefore, knowing about the sample characteristics is always a better option.

As shown in the Table 1, the firms that were considered for the study belong to a variety of industries. However, majority of them belonged to banking services industry, other asset financing services industry, cement industry, commercial complexes industry, computer software industry, and trading industry.

The graph shown in Figure 2 depicts the dividend payout trends of all the 500 BSE firms over the years. The outliers in the value of DPR were removed. The graph thus obtained shows that the trend of dividend payout ratio of the companies is stable. However, it is reported to be low through the years. The regression coefficient value ($R^2 = 0.0012$) is also found to be very low, indicating no impact of years on DPR. Therefore, it can also be statistically seen that there is no difference in the dividend payout ratio over the years.

Trends as shown in Figure 3 depict the number of payers and non-payers over the years. It can be seen that whereas the non-payers have decreased over the years, the number of payers have increased. In 2014, the number of payers was found to be 398, 109 more than the 2002 figures. On the other hand, the number of non-payers decreased from 210 in 2002 to 102 in 2014.

As can be seen from Figures 4 and 5 and as discussed above, the number of dividend payers has increased over



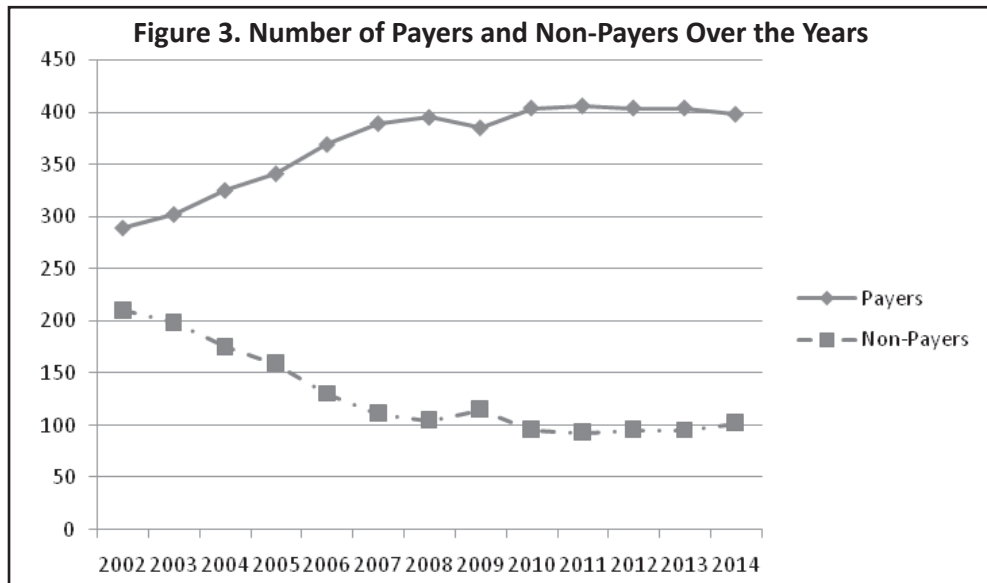
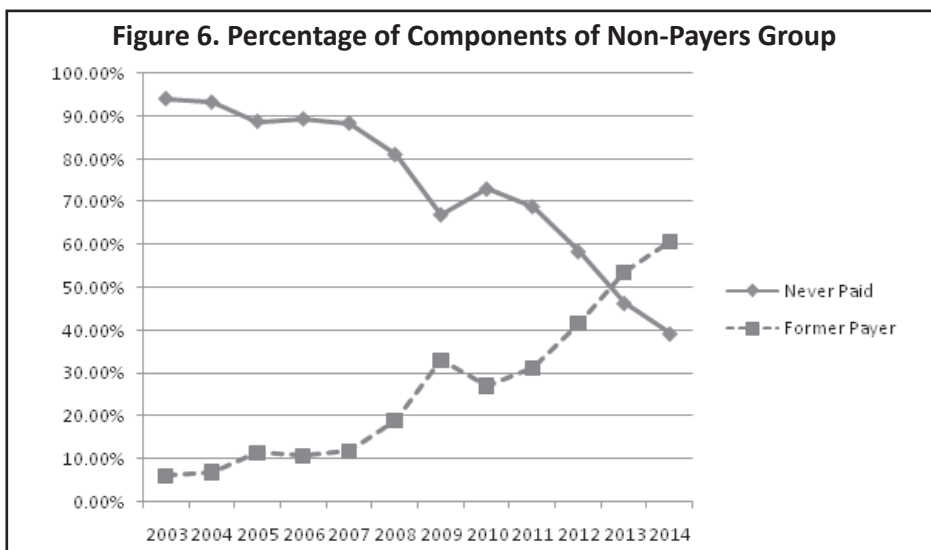
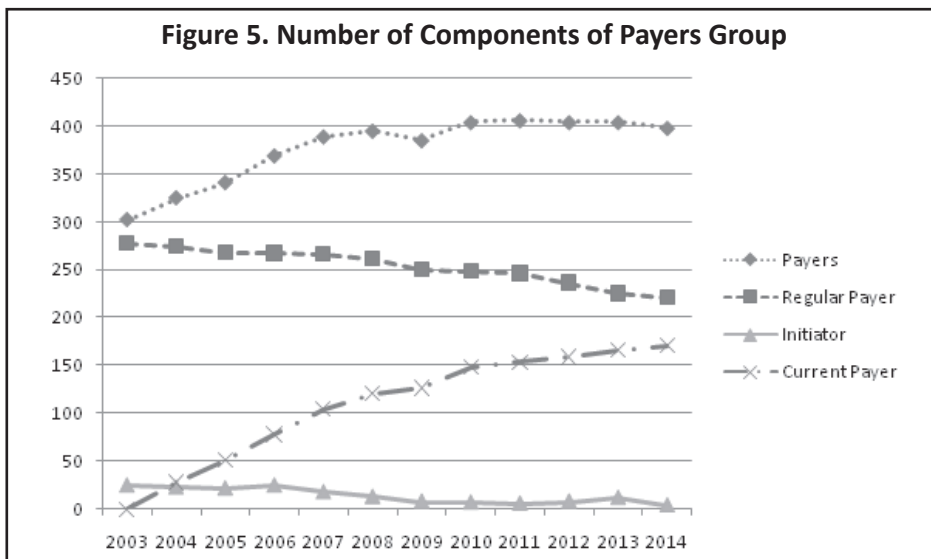
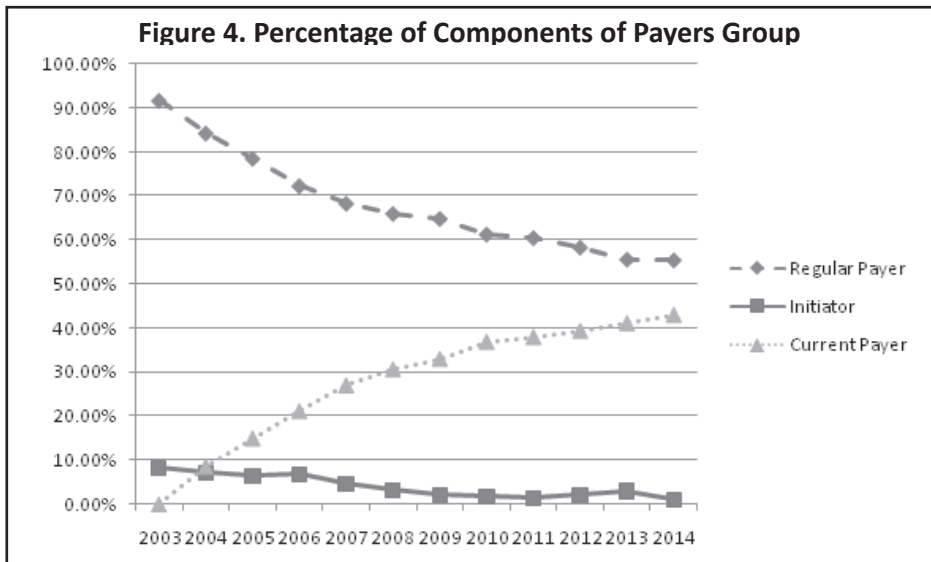


Table 2. Distributions of Dividend Payers and Non-Payers: Number of Firms and Percentages

	Year												
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Payers Group													
Payer	289	302	325	341	369	389	395	385	404	406	404	404	398
Percentage	57.8%	60.4%	65%	68.2%	73.8%	77.8%	79%	77%	80.8%	81.2%	80.8%	80.8%	79.6%
Regular Payer		277	274	268	267	266	261	250	248	246	236	225	221
Percentage		91.7%	84.3%	78.6%	72.4%	68.4%	66.1%	65%	61.4%	60.6%	58.4%	55.7%	55.5%
Initiator		25	23	22	25	18	13	8	7	6	8	12	4
Percentage		8.3%	7.1%	6.5%	6.8%	4.6%	3.3%	2.1%	1.7%	1.5%	2%	3%	1%
Current Payer		0	28	51	78	105	121	127	149	154	159	166	171
Percentage		0%	8.6%	15%	21.1%	27%	30.6%	33%	36.9%	37.9%	39.4%	41.1%	43%
Non-Payers Group													
Non-Payer	210	198	175	159	130	111	105	115	96	93	96	95	102
Percentage	42%	39.6%	35%	31.8%	26%	22.2%	21%	23%	19.2%	18.6%	19.2%	19%	20.4%
Never Paid		186	163	141	116	98	85	77	70	64	56	44	40
Percentage		93.9%	93.1%	88.7%	89.2%	88.3%	81%	67%	72.9%	68.8%	58.3%	46.3%	39.2%
Former Payer		12	12	18	14	13	20	38	26	29	40	51	62
Percentage		6.1%	6.9%	11.3%	10.8%	11.7%	19%	33%	27.1%	31.2%	41.7%	53.7%	60.8%

the years. Amongst these payers, the percent of regular payers and initiators have shown a fall, whereas that of current payers has shown an increase.

Figures 6 and 7 explain that the trends for non-payers group show that the number of non-payers has shown a fall over the years. Amongst these decreasing non-payers, the percentage of those who never paid dividends has decreased ; whereas, those who are former payers have increased from 2003-2014. It can also be noticed that the former payers as a percent of total non-payers showed a sudden fall from 2009 to 2010, after which this figure again started increasing. Similar, but opposite trend was noted for companies which never made any dividend payment. It was seen that the percentage of such companies reported a sudden rise from 2009 to 2010 after which



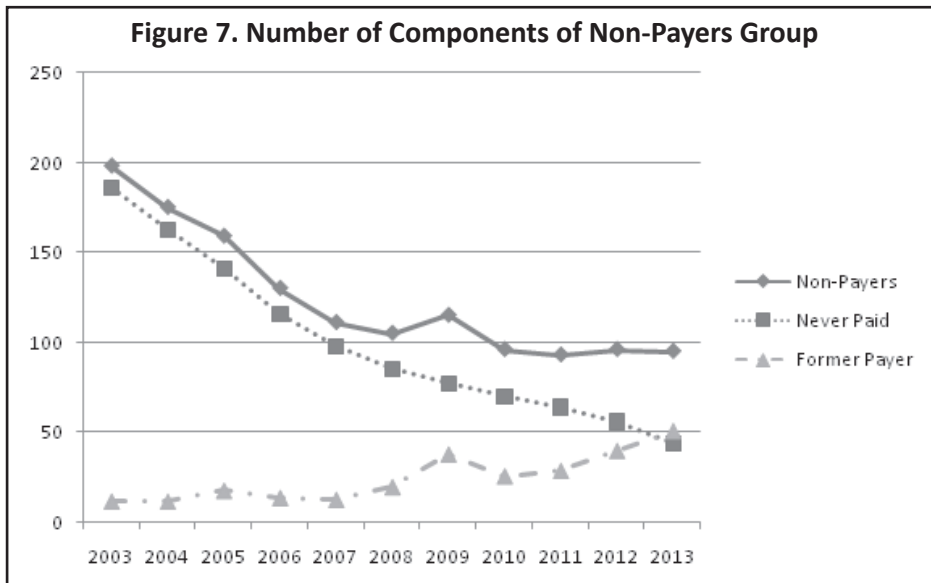


Table 3. Bifurcation of Companies Based on Percentage Dividend Payment

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
0%	208	194	173	157	128	109	103	114	95	93	96	95	102
0% - 25%	123	137	160	171	194	224	242	231	233	231	210	210	202
25% - 50%	109	129	121	130	139	138	123	122	134	129	142	133	132
50% - 75%	34	23	29	25	26	20	20	24	27	33	29	36	37
75% - 100%	11	7	11	9	6	4	8	5	6	10	12	12	13
>100%	12	6	4	6	4	3	2	3	4	3	11	13	14

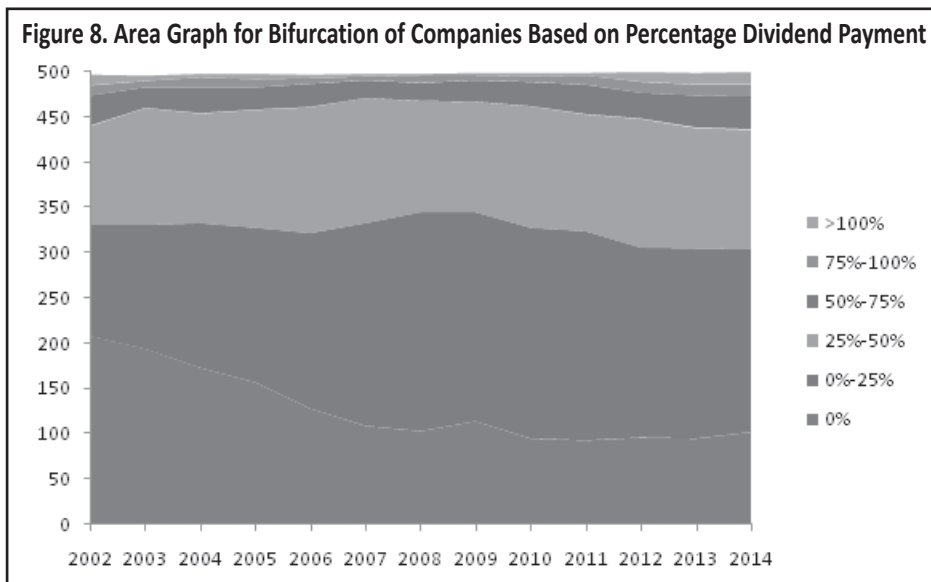


Table 4. Average Dividend Payouts for Certain Industries

Industry Name	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Banking services	17.18%	15.98%	16.01%	16.11%	18.45%	18.80%	18.06%	16.40%	17.93%	18.56%	18.58%	20.24%	16.33%
Cement	28.22%	20.64%	18.85%	38.03%	18.54%	10.71%	11.24%	14.92%	15.11%	25.28%	17.90%	20.26%	20.71%
Commercial complexes	13.29%	6.19%	10.69%	7.11%	9.86%	18.22%	10.86%	7.44%	15.14%	15.88%	18.85%	21.87%	21.89%
Computer software	15.87%	23.07%	32.51%	30.12%	36.27%	21.26%	21.28%	18.65%	20.94%	24.26%	30.95%	35.19%	30.82%
Diversified	28.79%	23.61%	21.23%	20.08%	19.55%	19.02%	16.94%	14.16%	17.15%	15.18%	29.26%	28.30%	26.20%
Drugs & pharmaceuticals	29.48%	22.88%	24.70%	29.98%	23.78%	25%	22.28%	22.12%	22.74%	22.99%	31.72%	25.05%	37.68%
Electricity generation	6.39%	6.57%	7.23%	20.04%	23.27%	20.99%	20.35%	19.48%	15.56%	16.98%	17.93%	18.31%	21.06%
Other asset financing services	4.28%	7.61%	5.76%	14.28%	6.81%	4.64%	13.35%	7.76%	11.99%	13.22%	13.13%	16.32%	15.73%
Other fund based financial services	10.41%	5.23%	12.69%	9.96%	21.33%	22.34%	31.26%	35.75%	28.37%	61.36%	33.96%	45.58%	50.52%
Trading	28.85%	11.55%	13.60%	14.02%	16.72%	13.58%	19.34%	14.93%	16.62%	19.41%	34.65%	13.30%	31.20%

Table 5. t-test with Respect to Payers and Non-Payers

		t-test for Equality of Means						
		t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper	
Return on Equity	Equal variances assumed	-14.061	6128	.000	-4.66280	.33160	-5.31285	-4.01274
	Equal variances not assumed	-19.500	3986.630	.000	-4.66280	.23911	-5.13159	-4.19400
Price to Book Ratio	Equal variances assumed	3.752	5767	.000	4.35955	1.16196	2.08168	6.63743
	Equal variances not assumed	2.018	1282.504	.044	4.35955	2.15985	.12233	8.59678
Market Capitalization	Equal variances assumed	-33.993	6998	.000	-3.30789	.09731	-3.49865	-3.11713
	Equal variances not assumed	-28.642	2937.775	.000	-3.30789	.11549	-3.53434	-3.08144

their numbers again started falling.

The Table 3 clearly gives the bifurcation for the number of companies based on percentage of dividend payment. It has been categorized into different categories ranging from 0%, 0-25%, 25%-50%, and so on. The Figure 8 depicts the number of companies that pay various levels of dividends. It is found that in 2002, 208 companies paid no dividends, by 2011, this number dropped down to 93. However, the number again rose and came upto 102 by 2014. It can also be seen that the companies which paid in between 0 to 25% dividends increased over the years, however, the payment of dividend followed same increasing trend as mentioned in the literature. The number of companies under this category increased from 123 in 2002 to 242 in 2008 after the number started falling and reached a figure of 202 by 2014. The companies paying 25% to 50% dividends also showed a similar trend and ended up at being 132 in 2014 compared 109 in 2002. The companies paying higher dividends also showed similar trends but weren't much in numbers.

The Table 4 shows the prominent industries under the sample and the average dividend payments made by these industries over the years. It can be seen that drugs & pharmaceuticals made the highest average dividend payments (29.48%) in 2002, whereas in 2014, it was the 'Other fund based financial services' industry that made the highest average dividend payments (50.52%). However, the former was the second highest average dividend

paying industry amongst the considered industries.

The Table 5 shows that paying of dividend makes a difference to market capitalization [$t(7000) = -33.993$, $p = 0.000$], profitability (return on equity) [$t(6130) = -14.061$, $p = 0.000$], and price - book ratio [$t(5769) = 3.752$, $p = 0.000$] of the firms. The firm years in which dividend was paid are found having higher means of profitability indicator and market capitalization. However, the mean of price to book ratios are found to be lower in that time period.

Conclusion, Suggestions, and Implications

A general overview of the sample shows that the companies lying in the BSE 500 category belonged to diverse sectors. The major concentration of companies is found in the banking sector, drugs & pharmaceutical sector, computer software sector, and several others. Moreover, on examining the pattern, it is also discovered that almost for all the companies, the cash flow in the company and their dividend payout moved in a similar manner. It can, therefore, safely be assumed that as the cash flow from operating activities, or in short, the liquidity in the company increases, the dividend payouts of the companies also increases. However, there are certain companies which are an exception to this trend.

Upon conducting graphical analysis, it is found that over the years, no significant variation could be seen in the dividend payout ratio. Therefore, it is concluded that more or less, the companies had maintained a stable dividend payout pattern over the years. As for the statistics for the companies that pay dividends, their number is found to have registered an increase over the years. It is seen that from 2002 to 2014, the number of payers increased, and the number of non-payer companies decreased.

Further details regarding the payer and non-payer groups are also examined. The payers are categorized as regular payers, current payers, and initiators. The analysis shows that whereas the number of current payers increased, the number of initiators and regular payers reported a fall. It can, therefore, be concluded that more and more companies are coming up for paying dividends. The companies that had given up dividend payments for some or the other reason are also returning to the dividend-paying category. On the other hand, amongst the non-payers, that were categorized as former payers and never paid companies, the former reported an increase and the latter, a decrease. This also implies a positive change in the trend of dividend-paying companies.

There were two other analyses that were conducted under this study. The companies were divided under categories according to the percentage of dividend payout made by them under a particular year. It is found that most of the companies made zero dividend payment in the year 2002; whereas, by 2014, the majority lie under the '0 to 25%' dividend paying category. Number of companies under the '25 to 50%' category also reported an increase. It can, therefore, be concluded that more and more companies are now jumping onto the dividend paying side.

As for the individual industries, we examined as to what is the average dividend pattern in these industries over the years. The result of this analysis would be useful for knowing about the individual industries. The companies that are planning to get onto the dividend paying side can make use of the information presented in this paper to make decisions regarding dividend payments.

The dividend decisions directly impact the financing and investment decisions of a firm. Therefore, it becomes very important for a firm to decide optimum dividend payout to be given to shareholders. The patterns for dividend policy will help the shareholders to decide a proper payout so as to have a positive impact on the wealth of shareholders.

Limitations of the Study and Scope for Future Research

The study depended more on the empirical and statistical methods rather than theoretical justification in the

anomalies on dividend policy patterns. The research is totally based on the data collected from the Prowess database and limited with respect to the time span and sample size.

A profound analysis of the patterns of dividend shows that there are many companies who initially did not pay the dividends, but eventually started paying the same. The study undertaken focused on the trends of number of companies paying dividend and not paying dividend. The same data set can be used to further look into the effect on dividend policy on value of the firms for paying group as well as non-paying group. The question of whether the dividend payment leads to more profitability or not can be answered by performing further analysis by considering the prominent variables that affect the dividend policy of companies in India.

References

- Bhat, R., & Pandey, I. M. (1994). Dividend decision: A study of managers' perceptions. *Decision*, 21(1 & 2), 47- 80.
- Black, F. (1976). The dividend puzzle. *Journal of Portfolio Management*, 2 (2), 5-8. doi: 10.3905/jpm.1976.408558
- Fama, E. F., & French, K. R. (2001). Disappearing dividends: Changing firm characteristics or lower propensity to pay? *Journal of Applied Corporate Finance*, 14 (1), 67-79. doi: 10.1111/j.1745-6622.2001.tb00321.x
- Gayathridevi, A., & Mallikajunappa, T. (2012). Dividend policy of Indian textile companies - An empirical study. *Journal of Contemporary Management Research*, 6 (2), 14 - 32.
- Healey, P. M. (1988). Earnings information conveyed by dividend initiations and omissions. *Journal of Financial Economics*, 21 (2), 149-175.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3 (4), 305- 360. doi: [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
- Koppenheffer, D. (2015). 3 reasons to buy dividend-paying stocks. *The Motley Fool*. Retrieved from <http://www.fool.com/investing/dividends-income/2015/04/24/6-reasons-to-invest-in-dividend-paying-stocks.aspx>
- Lintner, J. (1956). Distribution of incomes corporations among dividends, retained earnings and taxes. *The American Economic Review*, 46 (2), 97 - 113.
- Mittal, S., & Chopra, M.A. (2006). Study of payer and non-payer firms in India. *Delhi Business Review*, 7 (2), 37-41.
- Mohanty, P. (1999). Dividend and bonus policies of the Indian companies. *Vikalpa*, 24 (4), 35 - 42.
- Ridgeworth Investments. (2011). *Dividend dynamics: Assessing the benefits of dividend-paying stocks*. Ridgeworth Investments. Retrieved from https://www.ridgeworth.com/includes/files/assets/files/1299698779_Dividend%20White%20Paper.Final.pdf
- Rizvi, S., & Khare, S. (2011). Determinants of dividend payout ratio - A study of the Indian banking sector. *Indian Journal of Finance*, 5 (2), 24 - 31.
- Singhania, M. (2005). Trends in dividend payout: A study of select Indian companies. *Journal of Management Research*, 5 (3), 129 - 142.
- Stern.nyu. (2015). *What is corporate finance?* New York University. Retrieved from http://people.stern.nyu.edu/adamodar/New_Home_Page/background/cfin.htm.
- Sudhahar, M., & Saroja, T. (2010). Determinants of dividend policy in Indian banks: An empirical analysis. *IUP Journal of Bank Management*, 9 (3), 63 - 75.
- Yarram, S.R. (2002). *Dividend policy of Indian corporate firms: An analysis of trends and determinants*. DOI : <http://dx.doi.org/10.2139/ssrn.377180>

Risk and Return Performance of IPOs : An Analysis

* *Mani Jindal*

Abstract

Initial public offering (IPO) refers to the sale of new shares in the primary market for the first time to the general public. This study collected IPOs that are listed on the National Stock Exchange. This study focused on the IPO price performance, whether it was overpriced or underpriced. The IPO price performance was calculated by IPOs' post listing data. The IPOs recorded positive returns or negative returns during the study period from January 1, 2014 to November 4, 2015. This study evaluated the IPO risks and return performance by using three different measures, that is, Sharpe's, Treynor's, and Jensen's alpha measures. It also tried to keep an eye on the market index performance during the study period. In this study, it was found that the IPOs were underpriced and the three models also showed superior return performance of IPOs than the market index performance. The investors earned profits from their rational IPO investment decisions. Due to the over-performance of IPOs and risk return analysis, it was concluded that the investments in IPOs was less risky than the benchmark index's performance in the study period.

Keywords : initial public offerings, fixed price method, book building method, risk analysis, investment decisions, portfolio, under-pricing, overpricing

JEL Classification : G1, G110, G170, O16

Paper Submission Date : February 18, 2017 ; **Paper sent back for Revision :** March 9, 2017 ; **Paper Acceptance Date :** May 29, 2017

Initial public offering (IPO) refers to the selling of new shares in the primary market to the general public. The primary market was controlled by the Controller of Capital Issues before 1992. The share prices were also controlled by the CCI and fixed price method was used. But after 1992, SEBI controlled shares prices and IPO issues were freely priced. Two different methods are used to price the IPO shares in the market, that is, fixed price method and book building method. Fixed price refers to the price at which IPO shares are issued at fixed price to the investors, and this IPO price is known in advance by the investors. On the other side, the book-building method refers to the price at which IPO shares are issued at free price to the investors, and this IPO price is not known in advance, only the indicative price band is known by the investors. The issuing company comes out with the prospectus which contains all the information about company shares. This information is submitted to SEBI within 21 days before filing the price band decision into the stock exchange.

In this method, bids are invited (on the basis of indicative price band) for IPO shares from the investors. The investors bid for new shares as they are willing to pay for a share and how many shares they want to buy at a particular price. On the basis of bids of investors, the issuing companies decide the actual issue price of the IPO shares before coming up in the market. The issuing companies appoint mediators as underwriters to evaluate the demand of investors and collect investor bids on new shares before fixing the issue price by the companies. The bidding for investors is open for five days and after five days, IPO share prices are fixed when the book is closed for the investors. Bhanu Murthy and Singh (2008) described the book-building process and described four types of investors who bid for IPO shares as retail individual investors (RII), high networth individual (HNI), non

* *Assistant Professor*, University College of Commerce and Management, Guru Kashi University, Bathinda, Punjab.
E-mail: mani10988@gmail.com

institutional investors, and qualified institutional bidders (QIB). The issue price has been decided after the collection of opinion of investors. In this process, the IPO is issued at a premium; this happens when demand is more than the supply of new shares.

IPO investment is very risky because it is tough to predict IPO price on its listing day and also in the near future as short run or long run. Two anomalies are used to price the IPOs as underpriced and overpriced. Many previous research studies have supported the IPO under-pricing concept. Under-pricing refers to the price in which issue price is less than the listing day price. New companies always want to underprice their shares to encourage investors to invest more in IPOs and more issuing companies come up in the market to go public. The over-pricing of IPO refers to the price when issue price is more than the listing day price. In this case, the issuing companies lose their money due to investors' low interest in getting more shares. Jindal and Chander (2015) described in their study that the IPOs are often underpriced or overpriced due to investors' behavioral contours while making investment decisions like whether to invest or not in IPO shares for making profits.

Research Justification

In recent times, higher incidence of market volatility has been found in India and is more attributed to investor switching behavior. This necessitates deeper understanding of this kind in relation with the IPO investment by investors. Very few studies have been done on IPOs in India, and hardly any study has been done on IPO pricing regarding investor behavior. In view of the above, the study of understanding investor behavior in case of IPO pricing is urgently called for justifying the study of consistency.

Review of Literature

This study extensively reviewed previous research studies which were based on IPO performances in the short run and long run, and their impact on investor behavior. Various studies have been found on the concept of under-pricing phenomena of IPOs.

Studies mentioned in this section have shown both IPO under-pricing and over-pricing phenomena. Adams, Thornton, and Hall (2008) said that IPO share prices were underpriced by 10% - 15 % consistently after public. If IPOs are underpriced, the issuing companies of IPOs lose money on the table. The mean of IPO returns was lower than the median of IPO returns. When an IPO is underpriced, the investors demand more shares. Thus, IPOs were heavily subscribed.

Peng (2008) described the long run IPO performance, and the Shanghai Stock Exchange Index was used as a benchmark. This study analyzed the aftermarket performance by using the cumulative abnormal returns (CAR) and buy and hold abnormal returns (BHAR). It showed IPO over-performance in six months after listing day and recorded underperformance after six months of listing.

Chatzinas, Markopoulou, and Papadopoulos (2009) studied IPO performance, whether it was underpriced and overpriced during the 4-year study period from 2002 to 2005. This study showed a positive performance of only 14 IPOs out of 32 IPOs and the remaining 18 IPOs performed negatively during the study period. Sohail and Raheman (2010) analyzed the short run IPO performances in the study period from 2000 to 2009 which were listed on the Karachi Stock Exchange and analyzed the IPO return performance and market adjusted performance in the short run. This study concluded the positive average market adjusted returns in the short run period. The investors earned returns on sale of new shares in the short run.

Mauskar and Sivasubramaniam (2011) investigated IPO return performance by using the *t*-test method. It concluded that the hot IPOs and IPO issue price listed at higher price band were more underpriced than the cold IPOs and IPO issue price listed at lower price band. It was observed that the investors were more reluctant to enter the market in underpriced situations. Sadaqat, Akhtar, and Ali (2011) studied three different states of economy as

normal, boom, and recession. The investors got reward on the sale of IPO shares in the boom state of the economy. When the IPO market was in the recession stage, the investors failed to sell their shares on the listing day and behaved pessimistically.

Zouari, Boudriga, and Taktak (2011) studied the short run (1st, 2nd, and 3rd day) IPO performances and explored various factors which affected IPO returns by using multiple linear regression models. Various variables such as retained capital, underwriter's price support, oversubscription, listing delay, and offer price showed underprice performance. Joshi, Sabhaya, and Pandya (2013) analyzed IPO price performance by using cumulative abnormal rate of return and wealth relatives. This study found that 107 IPOs were overpriced, that is, showed underperformance and only 43 IPOs were overpriced from listing day to a year after listing day, that is, positive returns were recorded due to investors' increased demand for IPOs and speculative behavior of the investors.

Jindal (2015) analyzed investors' rationality on market momentum and on IPO performance by using tools such as meta analysis. The study found that the investors were irrational in making IPO investment decisions. The investors behaved exuberantly on the over-performance of the IPOs and behaved over-pessimistically on the overpriced IPOs. The IPOs are often underpriced or overpriced due to investors' behavioral contours while making investing decisions like whether to invest or not in IPO shares for making profits.

Pande and Vaidyanathan (2015) described the IPOs which were issued at lower and higher end of the price band. The IPOs which were issued at the higher end of the price band were referred to as more underpriced and the IPOs which were recorded at the lower end of price band were considered as overpriced. The higher end IPOs meant more investor demand for that IPO. When low investors demand was noted for the IPO issue, then the issuing companies decided to fix the issue price at the lower side of the price range.

Research Objective and Hypothesis

This research paper attempts to investigate the price performance of IPOs - whether they are underpriced or overpriced.

On the basis of the aforesaid objective of this study, the hypothesis is formulated as : The IPOs are fairly priced - neither they are underpriced nor overpriced.

Research Methodology

The listed IPOs' share price data were collected from the National Stock Exchange during the study period from January 1, 2014 to November 4, 2015. In this study period, 26 IPOs which were issued at NSE were recorded. This study considered only those IPOs which satisfied the following criteria: a) The IPOs must be listed on the NSE, b) The IPOs must have recorded the issue price, listing date, issue date, price range, issue size, listing day price, and last traded price. The listing price and post listing IPO price data was collected from multiple online databases such as : <http://www.nseindia.com> and <http://www.moneycontrol.com>. Six IPOs were excluded from the sample size due to non availability of the listing date of the IPOs. After exclusion, out of these 26 IPOs, 20 IPOs were used for this study and IPO price performance was measured by using different time spans as listing day return, a week later, a month later, a quarter later, six months later, and a year later of listing day during the study period.

Various tools were used to analyze IPO returns post IPO listing day like market benchmark, aftermarket IPO performance, and three models - Sharpe's, Treynor's, and Jensen's alpha were used to evaluate the risk and return performance of IPOs.

(i) IPO Listing Day Returns : IPO listing day return is measured by differentiating the issue price of the IPO with the listing day closing price of the IPO and dividing it by the issue price of the IPO. This calculated amount is

considered as the listing day return. The formula as given below :

$$R_i = \left(\frac{P_1 - P_0}{P_0} \right) * 100 \quad (1)$$

where,

R_i = IPO listing day return,

P_1 = closing price on the listing day,

P_0 = the issue price.

This IPO listing day return may be positive or negative. If this calculated value is recorded in positive, it is considered as underpriced IPO, but if the measured return is in negative, then it is perceived that the IPO is overpriced.

(ii) Market Benchmark Return : This study uses the CNX Nifty index as the market benchmark. This is calculated by differentiating the closing price of market benchmark on the IPO's listing day with closing price of market benchmark on the closing day of issue and dividing it by the closing price of market benchmark on the closing day of issue. This calculated value is referred to as the market benchmark return and the formula is shown below :

$$R_m = \left(\frac{M_1 - M_0}{M_0} \right) * 100 \quad (2)$$

where,

R_m = market benchmark return,

M_1 = closing price of market benchmark on the IPO's listing day,

M_0 = closing price of market benchmark on the closing day of issue.

This market index return may be positive or negative. If this calculated value is recorded in positive, it is considered that the market on the whole has moved up, but if the measured return is negative, then it is perceived that the whole market has declined. If it is recorded as zero, it means that the market remains unchanged.

(iii) Market Adjusted Excess Return : Bansal and Khanna (2012) described the calculation of market adjusted return on stock. The market adjusted excess return is calculated by differentiating the IPO's return with the market benchmark return. If the market adjusted excess return is recorded positive, then it is underpriced. If market excess return records negative value, it is considered as overpriced, and if market excess return shows zero value, then it indicates fair price.

$$MAER_i = \left(\frac{P_1 - P_0}{P_0} - \frac{M_1 - M_0}{M_0} \right) * 100 \quad (3)$$

$$MAER_i = R_i - R_m$$

The analysis of post listing IPO price performance for a week later, a month later, a quarter later, six months later, and a year later is measured by differentiating the particular day closing price with the issue price of the IPO and dividing it by issue price of the IPO. Sadaqat et al. (2011) showed in their study the return calculation on the end of each trading day. The formulas for IPO return, market benchmark return, and excess return on different time spans are given below:

$$R_{it} = \left(\frac{P_{t1} - P_0}{P_0} \right) * 100 \quad (4)$$

$$R_{mt} = \left(\frac{M_{t1} - M_0}{M_0} \right) * 100 \quad (5)$$

$$MAER_{it} = \left(\frac{P_{t1} - P_0}{P_0} - \frac{M_{t1} - M_0}{M_0} \right) * 100 \quad (6)$$

(iv) Sharpe's Measure : Sharpe's measure was developed in 1960s. It is calculated by differentiating the IPO return with risk free rate and dividing it by total risk of the IPOs which is measured by standard deviation. Sharpe's measure is also called as the variability ratio. It derives from the formula as given below :

$$S_i = \frac{R_i - R_f}{\sigma_i} \quad (7)$$

where,

S_i = Sharpe's measure,

R_i = average of the IPOs return,

R_f = risk free rate of return,

σ_i = standard deviation of the IPOs (total risk).

This Sharpe's value is recorded in positive or in negative. The positive value of Sharpe's measure is considered as favorable performance of IPOs. If the Sharpe's measure records negative value, then it is referred to as inferior or underperformance of IPOs as compared to market index return.

(v) Treynor's Measure : The Treynor's measure was developed in 1965 by Jack L. Treynor. It is similar to Sharpe's measure except the total risk. In Treynor's measure, the systematic risk is involved. It is measured by differentiating the IPO's return from the risk free rate and dividing it by the beta value of the IPO. This Treynor's measure is also called as volatility ratio. It is derived as given below :

$$T_i = \frac{R_i - R_f}{\beta} \quad (8)$$

where,

T_i = Treynor's measure,

R_i = average of IPO return,

R_f = risk free rate of return,

β = beta of the IPOs return.

This calculated value is recorded in positive or negative. The positive value of Treynor's measure refers to higher or superior IPO performance and negative value of Treynor's measure means inferior performance of IPOs.

(vi) Jensen's Alpha Measure : The Jensen measure was developed in 1968 by Michael C. Jensen. Jensen's alpha is measured by differentiating IPO return with the expected return of the IPOs. The expected return of the IPOs is measured by risk free rate of IPOs, beta of IPOs, and risk premium of the IPOs. The computation is used for Jensen's alpha measure as shown below :

$$\alpha_j = R_i - (R_f + \beta * (R_m - R_f)) \quad (9)$$

$$\alpha_j = R_i - R_e$$

where,

α_j = alpha that measures forecasting ability,

R_i = average of IPO return,

R_e = expected return of the IPOs,

R_f = risk free rate of return,

R_m = average of the market index.

β = measure of the systematic risk.

The calculated Jensen's alpha value is positive, negative, or zero. The positive Jensen's alpha value is referred to as the over-performance of the IPOs and issuing companies' ability to provide more return to investors than they had expected from their investments. If Jensen's alpha is recorded as negative, then the IPOs are considered as underperforming and issuers have low ability to provide more return to the investors.

Analysis and Results

The IPO performance has been analyzed by the IPOs' post listing return, market benchmark return, and excess return of IPOs during the study period. If the IPOs are positively recorded, then it is considered that the IPOs are underpriced. If the IPOs are negatively recorded, then it is considered that the IPOs are overpriced. In this study, IPO performance was analyzed in different ways as calculation of IPO return, market index return, and excess return in different time frames. The positive and negative IPO return calculation and three different models' performance in relation to IPOs returns are also examined.

(i) Performance of IPOs' Return, Market Index Return, and Excess Return of the IPOs : This study describes IPOs' prices and their performance from listing day to a year after listing day during the study period from January 2014 to November 2015. The Table 1 describes the IPOs' average return, market benchmark return, and average excess return performance in percentage covering the sample of 20 IPOs during the study period. For this study, the time period used is return on listing day, a week later, a month later, a quarter later, six months later, and a year after listing day. IPO average return increased from listing day to a year later.

As can be inferred from the Table 1, on the listing day, the positive average return is recorded as 8.53% ; a week after, IPO return jumps by 11.88% ; a month after, IPOs' average return rises by 11.92% ; a quarter after, IPOs' return increases by 24.32% ; after six months, IPOs' average return sees a continuous upside by 31.12% ; and a

Table 1. Performance of IPOs' Return, Market Benchmark Return, and Excess Return of IPOs During the Study Period

Time Period	IPOs' Average Return (%)	Market Benchmark Average Return (%)	Average Excess Return (%)
Listing day	8.53	-0.81	9.33
A week later	11.88	-0.07	11.96
A month later	11.92	-0.07	12.00
A quarter later	24.32	0.05	24.26
Six month later	31.12	-0.004	31.13
A year later	86.64	-2.27	88.91

year after, only three IPOs' average return increases by 86.64%. All the positive values show that the IPOs are underpriced or over-performed at all time periods. The market benchmark average return shows negative values in the different time spans during the study period. For the market benchmark return calculation, the CNX Nifty index was taken into consideration as a benchmark for the different time spans.

On the listing day, the benchmark return records a figure of - 0.81%, which means decline in the market ; in a week after listing day, it recovers, but negatively records a value of -0.07% ; in a month after, -0.07% records benchmark return ; in a quarter after, the average market return has recovered and increased by 0.05% ; in six months after, the benchmark average return again drops by -0.004% ; and in a year after, the market index return declines by -2.27%. The negative market benchmark return in Table 1 means the overall market has declined more than the average return of IPOs in this study period. The average excess return is measured by subtracting the average IPOs return with the average of market benchmark return. The excess return is recorded positive in all the different time frames. This positive average return of the IPOs is referred to as under-pricing of the IPOs during the study period.

(ii) IPO Price Performance : The Table 2 shows the pricing performance of the IPOs - whether they are overpriced or underpriced in the study period. The IPOs' return is distributed into different positive and negative return levels as below 10%, below 20%, below 50%, and more than 50% in different time frames as on the listing day, a week later, a month later, a quarter later, six months later, and a year later from the listing day. On the listing day, a total of 20 IPOs are recorded and out of these, 11 IPOs are recorded as positive IPO returns and only nine IPOs perform negatively, and on an average, 8.53% return is recorded.

As it is seen in the Table 2, the sample IPOs perform positively in all the time spans from listing day to a year after the listing day. In a week after listing, the IPOs show positive return performance and record, on an average, 11.88% return. As the time span increases, the IPOs' return also increases. In case of 19 IPOs a month later, the IPOs' return is recorded as 11.92%. In a quarter after, on an average, 12 IPOs record, on an average, 24.32% return. Three IPOs - Sharda Cropchem (61.15% return), Snowman Logistics (116.28% return) issued in 2014 and VRL Logistics (84.41% return) issued in 2015 record above 50% positive return level in a quarter after the listing day.

Six months later, eight IPOs record 31.12% return, and out of these, six IPOs note positive return and the remaining two IPOs show negative return performance. A year later, only three IPOs record positive return, and on average, 86.64% return level is recorded by Shemaroo Entertainment (63.32% return), Sharda Cropchem (83.62% return), and Snowman Logistics (112.98% return) . Out of 20 IPOs, seven IPOs record positive returns from the listing day to a year after the listing day. The seven IPOs are Sharda Cropchem, Snowman Logistics both issued in 2014, IPOs issued in 2015 are Navkar Corporation, Syngene International, Manpasand Beverages, VRL Logistics, and Inox Wind.

Only six IPOs (Monte Carlo Fashions, Coffee Day, Pennar Engineered Building Systems, Power Mech

Table 2. IPOs' Performance (Underpriced and Overpriced) in the Study Period

IPO Return (%)	Number of IPOs																	
	Listing Day			A week later			A month later			A quarter later			Six month later			A year later		
	+ve	-ve	Avg	+ve	-ve	Avg	+ve	-ve	Avg	+ve	-ve	Avg	+ve	-ve	Avg	+ve	-ve	Avg
Below ± 10	06	06	-0.83	04	08	-2.05	03	04	0.26	-	03	-3.01	01	-	8.32	-	-	-
Below ± 20	-	03	-13.32	-	02	-16.55	01	03	-2.29	-	02	-12.64	02	-	12.95	-	-	-
Below ± 50	04	-	37.65	03	-	36.10	04	02	16.75	03	01	16.07	-	02	-29.02	-	-	-
Above ± 50	01	-	69.79	02	-	87.58	02	-	70.64	03	-	87.28	03	-	90.94	03	-	86.64
Avg. of total IPOs	11	09	8.53	09	10	11.88	10	09	11.92	06	06	24.32	06	02	31.12	03	-	86.64

Projects, UFO Moviez India, MEP Infrastructure Developers) show negative performance in the whole time frames. The remaining IPOs show volatility after market performance. However, overall, it is recorded that the IPOs over-performed in all time frames during the study period and the investors earned gains while trading in these IPOs. The IPO - Snowman Logistics recorded highest performance.

(iii) IPOs' Price Performance Analysis in Relation to Three Measures as Sharpe's, Treynor's and Jensen's Alphas : Sharpe's measure refers to the calculation of excess IPO return over to the total risk of the IPOs. The positive value of Sharpe's measure has been considered as good investor investment decision after taking additional risk on shares. The negative value of Sharpe's measure has been considered as the poor investors' investment decision or low return earned due to the high market index value. Treynor's measure refers to the measurement of IPO return over systematic risk. The positive value of Treynor's measure is considered as gains earned on IPOs and negative value of Treynor's measure is considered as low return earned on IPOs' investment by investors.

The Jensen's alpha measure refers to the forecasting of IPOs return over to the expected return of the IPOs by investors. The positive Jensen's alpha has been considered as better forecasting ability of IPO issuers, and investors earn more return than the expected return on IPOs. The negative Jensen's alpha is considered inferior forecasting ability of the issuers of IPOs and these earned less return on IPOs than the expected return from the IPOs.

The Table 3 shows IPOs' performance in relation to Sharpe's, Treynor's and Jensen's alpha measures. These three measures were applied on the IPO return performance during the study period. On the listing day, the Sharpe's measure records (0.36%) a positive performance, which means better IPO return earned than the market index performance after adjusting total risk. The Treynor's measure also records (5.40%) positive performance, which means better IPO performance than the market benchmark performance on the listing day. The Jensen's alpha (9.87%) indicates positive performance, which means that IPO issuers had better forecasting ability and provided higher than expected return to investors from their investments on the listing day. A week later, all three measures show positive IPO return performance and negative benchmark value is recorded, which means IPOs are less riskier than the market index.

It is noted that as the time span increases, the positive performance of Sharpe's measure also increases. It means the IPOs are better performing in a year after than on the listing day. Nineteen IPOs are recorded a month later and all three measures show the positive performance of the IPOs and record inferior (-0.07%) market index performance. Only eight IPOs are recorded six months later and all three measures show positive return on IPOs. Six months after the listing day, the highest performance is recorded by Sharpe's and Jensen's alpha measures, but zero market index performance is recorded, which means the market index performance remains unchanged. In this, the Jensen's alpha measure records highest (31.14%) positive performance, which means that the IPO issuers provide higher return on IPOs than what the investors expected from investments and result in good investment decisions for the IPOs.

The two IPOs out of eight IPOs are VRL Logistics issued in 2015 which recorded 98.59% returns and

Table 3. IPOs' Performance in Relation to Sharpe's, Treynor's, and Jensen's Alpha Measures

No. of IPOs	20	19	19	12	08	03
Measures	Listing Day	A Week after	A Month after	A Quarter after	Six month after	A Year after
Sharpe's	0.36	0.37	0.41	0.56	0.59	3.47
Treynor's	5.40	7.89	115.04	-201.97	10.00	15.95
Jensen's Alpha	9.87	11.99	11.93	24.32	31.14	98.99
Benchmark Value	-0.81	-0.07	-0.07	0.05	0.00	-2.27

Snowman Logistics issued in 2014, which recorded 82.87% gain earned as highest performance in six months after the listing day. It shows that these IPOs are highly subscribed, which means the investors are more interested to invest in IPOs of this sector. A year later, only three IPOs are recorded and all three measures show positive performance. The IPO - Snowman Logistics performed best in a year after the listing day. Overall, it is concluded that the IPOs earned excess returns by taking additional risk on investments and the gain on IPOs, which means, the IPOs over-performed. These three measures' outcomes show positive performance of the IPOs during the study period, which are positively related to the models.

Implications, Discussion, and Conclusion

This study shows that the IPOs are underpriced during the study period from January 2014 to November 2015. Through this result, it is clear that the null hypothesis that IPOs are fairly priced, neither underpriced nor overpriced, is rejected. This study shows that the IPOs record positive IPO returns in different time spans and three measures also conclude that the IPOs' over-performed, which means the investors earned more returns from their investments in the study period under low index performance. The IPOs are less risky than the market benchmark recorded in this study. The IPOs excess returns also shows positive returns after adjusting the negative market index performance. The investors can reduce the total risk by diversifying their investments in different sector IPOs to make more returns on IPOs and also minimize the risk by analyzing the market momentum before making an IPO investing decision. When the investors demand more new shares, the IPOs are underpriced and the IPOs are highly subscribed due to investment decisions for the IPOs. In the underpriced situation of the market, more companies want to enter in the market to go public with new shares. Overall, the IPOs record over-performance from listing day to a year after listing day and the investors are rewarded with positive excess returns.

This study is concerned with the price performance of IPOs which are listed under NSE book-building issues during the study period. This study discovered only percentage and trends of returns in the short as well as in the long run period.

- (1)** This study will be useful for the book building runners, underwriters, and price makers in deciding the issue price of IPOs in boom and slump period.
- (2)** This study will be helpful in understanding investors' reactions with respect to IPO price implications. The exuberant behavior on the listing day of IPOs earned profits. Sometimes, the investors' disposition affects their investing decisions.
- (3)** This study will be helpful in understanding IPO issuers and making their decisions to go public. The IPO issuers always try to go public when the market is in the rising phase. Otherwise, they postpone their decision to go public due to fear of failure of an issue.
- (4)** This research will also be helpful for SEBI while issuing guidelines in the future.

References

Adams, M., Thornton, B., & Hall, G. (2008). IPO pricing phenomena: Empirical evidence of behavioral biases. *Journal of Business & Economics Research*, 6(4), 67-74.

- Bansal, R., & Khanna, A. (2012). Determinants of IPOs initial return: Extreme analysis of Indian market. *Journal of Financial Risk Management*, 1(4), 68 - 74. doi: 10.4236/jfrm.2012.14012
- Bhanu Murthy, K.V., & Singh, A. K. (2008). *IPO market: Under-pricing or overpricing ?* Retrieved from http://www.igidr.ac.in/conf/money/mfc-12/Amit_bhanu_IPO%20Market.pdf
- Chatzinas, G. C., Markopoulou, M. K., & Papadopoulos, D. L. (2009). Initial public offerings under-pricing in Greek Stock Exchange of Athens. *Investment Management and Financial Innovations*, 6 (3), 254 - 263.
- Jindal, M., & Chander, R. (2015). Analyzing investors rationality for IPOs using meta analyses and forest plots in Neyeloff et al. (2012) framework: An investigation. *Asia Pacific Journal of Management Research and Innovation*, 11(1), 9-15.
- Jindal, M. (2015). Short run IPO performance: An analysis. *International Journal of Management, IT and Engineering*, 5 (3), 13 - 34.
- Joshi, Y. C., Sabhaya, R., & Pandya, F. H. (2013). Are IPOs underpriced? Empirical evidence from India. *Pacific Business Review International*, 6 (6), 80 - 89.
- Mauskar, V., & Sivasubramaniam, T. A. (2011). Initial public offerings (IPO) & the under-pricing phenomena. *AMET Journal of Management*, 2 (1), 61 - 69.
- Pande, A., & Vaidyanathan, R. (2015). *A study of initial public offerings on the National Stock Exchange of India*. Retrieved from http://www.researchgate.net/profile/Alok_Pande/publications
- Peng, L. (2008). Empirical study on the performance of initial public offerings in China. *Journal of Services Sciences and Management*, 1, 135-142.
- Sadaqat, S., Akhtar, M. F., & Ali, K. (2011). An analysis on the performance of IPO : A Study on the Karachi Stock Exchange of Pakistan. *International Journal of Business and Social Science*, 2 (6), 275 - 285.
- Sohail, M. K., & Raheman, A. (2010). Examining the short-run IPOs performance in state of economy: Normal, boom & recession. *International Research Journal of Finance and Economics*, 35, 173-186.
- Zouari, S. B. S, Boudriga, A., & Taktak, N. B. (2011). Determinants of IPO under-pricing: Evidence from Tunisia. *The International Journal of Business and Finance Research*, 5 (1), 13 - 32.