Impact Factor (GIF:2017) 2.7342 ISSN 0972-1754

VOLUME 23 • NUMBER 2 • December 2019

INDIAN ACCOUNTING REVIEW

INDIAN ACCOUNTING ASSOCIATION
RESEARCH FOUNDATION

INDIAN ACCOUNTING REVIEW

Annual Subscription Rates
In India : Individual : ₹700; Institution : ₹1000
Abroad : Individual : US $50; Institution : US $100

INDIAN ACCOUNTING REVIEW

Vol. 23 No. 2 December 2019

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Indian Accounting Review
Vol. 23, No. 2, December 2019

Experiments on Microfinance in India – Contributions by Nobel Laureates Abhijit Banerjee and Esther Duflo: A Synoptic and Normative Study

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ABSTRACT

After Abhijit Banerjee, Esther Duflo and Michael Kremer were awarded the Nobel Prize for Economic Sciences in 2019, substantial interest has grown about their contributions to Developmental Economics and Microfinance. This article focuses on the experiments of Banerjee and Duflo carried out in India based on several microfinance institutions, phased over a long period of time between base line surveys and end line surveys and tries to bring out the debates over Randomised Control Trial research methods used by these two laureates.

Key words: Microfinance, Impact, Randomised Control Trials, Experiments

I. THE DECLARATION AND THE RECIPIENTS

On the 14th of October 2019, The Royal Swedish Academy Of Sciences declared (vide a press release) that the Committee for Prize in Economic Sciences had decided to award the Sveriges Riksbank Prize in Economic Sciences, in Memory of Alfred Nobel, 2019 to Abhijit Banerjee, Esther Duflo and Michael Kremer. Abhijit's (also known as Abhijit Vinayak Banerjee) honour as a person of Indian origin has come in the same discipline of Economic Sciences after Prof. Amartya Sen received the Nobel Memorial Prize in 1998 for work on human rights, poverty and inequality that have influenced the way governments deal with famines. In fact, the lineage of Bengalis receiving this esteemed award beginning from Rabindra Nath Tagore, Prof. Amartya Sen, Muhammad Yunus from Bangladesh and recently Abhijit Banerjee is a great source of pride for Bengal. The similarity between the last three Nobel Prize recipients lies in the fact that their pursuits for excellence are centred on the viciousness of poverty and the way to address them. The similarity between laureate Muhammad Yunus, who received the Nobel prize for peace in 2006 and Abhijeet Banerjee is that both of them tried to deal with the problem of poverty through microfinance intervention systems. While the former translated visions into practical action for the benefit of millions of people in Bangladesh and in many other countries, the latter pinpointed the effects and interventions of microfinance programs through experimental research designs.

Born in Kolkata, Abhijit got his undergraduate and graduate degrees from

Presidency College (Kolkata) and Jawaharlal Nehru University (Delhi) respectively, and was awarded Ph.D. from Harvard University, Cambridge, USA in 1988. He is currently the Ford Foundation International Professor of Economics at Massachusetts Institute of Technology, Cambridge, USA. Esther was born in 1972 in Paris, France and got her Ph.D. in 1999 from Massachusetts Institute of Technology. She is the Abdul Latif Jameel Professor of Poverty Alleviation and Development Economics at MIT. Michael was born in 1964 in New York and got his Ph.D. in 1992 from Harvard University. He is the Gates Professor of Developing Societies at Harvard University.

II. THE RAISON D'ÊTRE FOR THE RECOGNITION

The coveted honour was given to the trio for their pioneering works based on experimental approaches on what causes global poverty and how best to combat it. Their research in "*just two decades has turned development economics — into a blossoming, largely experimental field."* The award recipients *"have transformed development economics. Their approach remained guided by microeconomic theory and the use of microeconomic data. But it shifted focus towards identifying workable policies, for which one can make causal claims of impact."* (The Committee for the Prize in Economic Sciences in Memory of Alfred Nobel, October 14, 2019) .

Sharma (2019) expressed that: "Banerjee, Duflo and Kremer together have launched a movement within development economics that seeks to ensure that clear, unambiguous answers can be found to the question of whether a particular policy intervention is effective. This is extremely relevant when it comes to framing policy in low- and middle-income countries, where state capacity is quite limited." Abhijit and Esther largely used randomized controlled trial method to estimate the causal impact of a certain intervention, program or policy trial in which participants could make choices in their normal day-to-day environment. The choice of this research method can be traced back to The Design of Experiments authored by Ronald Fisher, a distinguished British statistician and geneticist in 1935. In this research method, two similar groups are taken and then one group is randomly selected to receive the treatment, which may be an administration of a drug or a microfinance intervention or a financial literacy course. The outcomes of the treatment group are then compared with the outcomes of the control group.

The Nobel Committee pointed out three areas where contributions by the Nobel Laureates are outstanding. First, in the mid-nineties, Kremer and his learned colleagues embarked on a series of field experiments in Kenya for answering the question relating to as to "how to boost human-capital accumulation into smaller, more manageable topics, each of which could be rigorously studied via specifically designed randomized controlled trials" (Kremer, 2003). Banerjee and Duflo immediately joined the bandwagon and in several cases together with Kremer and other co-authors, expanded the set of educational topics and started field experiments on several other issues.

Second, in their pursuit to understand various aspects of the macroeconomic development problems through microeconomic approaches, Banerjee and Duflo came up with several issues which pointed out market and government imperfections resulting in government policy failures, credit constraints, insurance failures, externalities, family dynamics, or behavioral issues and could explain

why some countries are poor (Banerjee and Duflo 2005, 2007, 2011). Among these, the paper that Banerjee and Duflo published in 2005 is a commendable conceptual contribution that could link microeconomic development issues to low aggregate per-capita income in developing countries.

Third, by designing new experimental-research methods to take in hand the principal challenge of external validity (Duflo 2004, 2006; Duflo, Glennerster and Kremer, 2006; Banerjee and Duflo, 2009), the Nobel Laureates decisively instituted a new approach and laid out a path forward for new researchers. The Abdul Latif Jameel Poverty Action Lab at MIT (J-PAL), which Banerjee and Duflo founded together with Sendhil Mullainathan, was the hub of their endeavour and research pursuits. J-PAL has propped up research built on randomized controlled trials in several countries and promoted the acceptance of results from such experiments in the economic-policy commune.

To estimate the causal impact of a certain intervention, program or policy, Abhijit, and Esther mostly used Randomized Control Trial (RCT) method and tried to find answers as to how would the poor, exposed to a program, would have coped in the absence of the program? On the other hand, how other poor individuals, who were not exposed to the program would have fared, had they had the opportunity to participate. The Committee for the Prize in Economic Sciences stated: "*The experimental approach pioneered by Banerjee, Duflo and Kremer has substantially changed our factual knowledge about economic, social and political phenomena in developing countries, as well as the methodological direction of the field."*

The researchers have dealt with a variety of issues in developmental economics and published their works in more than hundred articles and couple of books. The variety and depth of their research makes a comprehensive review of all their work a near impossibility. In their empirical research on education, Banerjee, Duflo and co-authors argued that efforts to get more children into school must be complemented by reforms to improve school quality. Additional inputs may only work when they address specific unmet needs. Duflo's research on female political leaders has greatly influenced subsequent research on gender and politics, both in developing and developed countries. Duflo investigated how the identity of political leaders affects observed policy choices and came up with valuable prescriptions as to how political reforms could strengthen women's political standing in India (Chattopadhyay and Duflo 2004). The distinctive nature of their rigorous field work has been spelt out by them in their book, 'Poor Economics': *"We are academics, and like most academics we formulate theories and stare at data. But the nature of the work we do has meant that we have also spent months, spread over many years, on the ground working with NGO (nogovernmental organization) activists and government bureaucrats, health workers and micro lenders. This has taken us to the back alleys and villages where the poor live, asking questions, looking for data"* (Banerjee and Duflo, 2011, p. 9).

Their contributions on Microfinance has been based on meticulous field work and Randomised Control Trials in different areas in India and coming up with findings not only on a baseline and end line survey, but on multiple end line surveys at different points of time spread over even a decade. The objective of the present paper is to give, apart from the above, some more important contributions of the Noble Laureates in Micro-finance in order to help the accounting academics and

professionals to engage in further inactions and research. It may also serve policy interventions in similar government programs, both State and Central, in India in particular and in some other developing countries in the world, in general, for the benefits of the poor. The remainder of the paper is designed as follows. Section III deals with a Pure Micro-Finance Experiment (SKS Micro-Finance Case). The Evaluation of a Standard Group-Lending Loan Product (Spandana Experiement) is given in Section IV. This is followed by Randomized Evaluation of Microcredit in India and five other countries in Section V. Section VI is on the Bandhan Bank Experiement of targeting the 'hard core poor'. Concluding observations are given in the last Section. In short, these sections are devoted to a brief review of their experiments in India to study the impact of Microfinance on income, consumption, health, women empowerment and other variables using RCT. However, the author will remain responsible for short-comings, if any, in analysis and presentation.

III. A PURE MICROFINANCE EXPERIMENT ON THE SKS MICROFINANCE - FIASCO OF BUNDLING INSURANCE WITH MICROCREDIT

In the year 2006, SKS Microfinance (renamed as Bharat Financial Inclusion in 2016) decided that it should offer health insurance to its clients. While ICICI-Lombard would provide the back-end insurance, SKS would administer enrollment and the initial processing of claims. SKS decided to bundle in a health insurance policy that provided coverage for catastrophic events, hospitalization, and maternal care to new and existing microfinance customers who wanted to renew their loans in rural Karnataka and Andhra Pradesh in India. In June 2007, SKS began requiring loan clients to purchase health insurance across most of their area of operation. Banerjee, Duflo and Hornbeck (2018) decided to "examine the causal impacts of microfinance on experienced borrowers, and these clients' valuation of their ongoing microfinance relationship." Their research objective was primarily based on the impact of increase in clients' fees in randomly selected villages in exchange for a mandatory health insurance policy.

The researchers persuaded the management of SKS Microfinance to let them carry out a randomized evaluation of the insurance product in 201 villages with SKS presence in two districts of Northern Karnataka. The researchers convinced SKS to leave out randomly some villages from the health insurance expansion to enable the evaluation of this health insurance product. In 100 randomly selected villages (the control group), they continued with business as usual. In the remaining 101 villages (the treatment group) insurance subscription would become mandatory for clients at the time of loan renewal. The researchers collected data at baseline (before the introduction of the health insurance requirement) and end line, and also at intervals on a randomly selected sample of existing SKS clients in 101 treatment" villages and 100 control" villages. The researchers treated this as a "pure microfinance experiment, where the increased cost of the loan in some villages generated random variation in the continued use of MFI loans" (Banerjee, Duflo and Hornbeck, 2018). They performed randomization using the Stata random number generator after stratification by branch and number of microfinance clients.

The importance of this experiment lies in its practical findings which were anticipated by the researchers and not by SKS Microfinance. The attempt

by SKS to bundle health insurance with microfinance was a clear failure. The researchers reported that the insurance requirement, and the associated fee, led to a large decline in loan renewal rates. Their empirical findings show that loan renewal rates declined by 22 percentage points (30 percent) in treatment villages compared to control villages where 75 percent renewed. Self-reported data from clients suggested that few of those who left SKS obtained microfinance loans from other organizations, even in villages where they were available, so this led to a net decline of participation in finance. This phenomenon was also highlighted by Abhijit and Esther in their book 'Poor Economics'. They stated: "*SKS started losing clients in the areas where they were offering the insurance. After a few months, renewal rates for SKS loans had fallen from about 60 percent to about 50 percent. A CEO of a competing microfinance institution was asking us about our work with SKS, and when we said we were working on evaluating the impact of offering mandatory health insurance to microcredit clients, she laughed and said, "Oh, I know the effect! Everywhere SKS made this product mandatory, we got many more clients. People are leaving SKS to join our organization*" (Banerjee and Duflo, 2011. p. 291).

IV. THE SPANDANA EXPERIMENT: EVALUATION OF A STANDARD GROUP-LENDING LOAN PRODUCT

Spandana Sphoorty Financial Limited, a large NBFC-Micro Finance Institution (NBFC-MFI) spread over 11 States across the country with over 1,500 branches reaching out to more than 4.1 million clients and an Asset Under Management (AUM) of over Rs.35,000 million has made considerable presence in the Indian microfinance sector in terms of outreach. The MFI started with only 520 borrowers in 1998.

Banerjee, Duflo, Glennerster and Kinnan (2015) took up the first randomized evaluation of the impact of introducing the standard microcredit group-based lending product in a new market**.** The experiment was a collaborative project between the Centre for Microfinance (CMF) at the Institute for Financial Management Research (IFMR) in Chennai. The experiment which started in 2005 and continued over three years yielded a number of results that changed the way for many other researchers and practitioners about the impact of microfinance interventions.

The researchers used experimental research design and randomly selected 52 out of 104 poor neighborhoods in Hyderabad for the opening of a Spandana branch. These 52 neighborhoods were taken as the treatment group and the rest 52 neighborhoods formed the control group. The City for this experiment was of great significance as it is the capital of Andhra Pradesh where the severe microfinance crisis erupted in 2010 with a suicide wave caused by widespread over indebtedness. Fifteen to 18 months after the introduction of microfinance in each area, a comprehensive household survey was conducted on an average of 65 households in each neighborhood, for a total of about 6,850 households. Two years after this first end line survey, the same households were surveyed once more. By that time, both Spandana and other organizations had started lending in the treatment and control groups. This second survey gave the researchers the opportunity to examine some of the longer-term impacts of microcredit access on

households and businesses. They examined the effect on borrowing from various angles i.e., consumption, new business creation, business income, etc., as well as measures of other human development outcomes, such as, education, health and women's empowerment. When the researchers compared the households in these two sets of neighborhoods, some fifteen to eighteen months after Spandana started lending, there was clear evidence that microfinance was working. "*People in the Spandana neighborhoods were more likely to have started a business and more likely to have purchased large durable goods, such as bicycles, refrigerators, or televisions*" (Banerjee and Duflo, 2011, p. 314). They further observed: "*On the other hand, there was no sign of a radical transformation. We found no evidence that women were feeling more empowered, at least along measurable dimensions. …… even when there was detectable impact, such as, in the case of new businesses, the effect was not dramatic*" (Banerjee and Duflo, 2011, p. 315).

The researchers clearly pointed out that "demand for microloans is far from universal", (Banerjee, Duflo, Glennerster and Kinnan, 2015). Their findings were in sharp contrast to the claims generally made by many MFIs .

At the end of their three-year study period, they found only 38% of households (42% in treatment areas and 33% in control areas) borrow from an MFI. Secondly, the researchers pointed out that "for those who choose to borrow, while microcredit succeeds in leading some of them to expand their businesses or choose to start a female-owned business, it does not appear to fuel an escape from poverty based on those small businesses." The researchers also specifically reported that access to microcredit does not have any noticeable effect on education, health, or women's empowerment in the short run or in the long run. They finally commented: "Microcredit therefore may not be the miracle that it is sometimes claimed to be". These results were quite consistent with those of other Randomized Control Trials carried out by researchers like Attanasio *et al.* (2015); Augsburg *et al.* (2015); Crépon *et al.* (2015); Tarozzi *et al.* (2015) and Angelucci *et al.* (2015) to gauge the impact of microfinance in other countries.

V. RANDOMIZED EVALUATIONS OF MICROCREDIT IN INDIA AND FIVE OTHER COUNTRIES

Banerjee, Karlan, and Zinman (2015) experimented in six different countries i.e., India, Ethiopia, Bosnia, Mexico, Morocco, and Mongolia, from 2003 to 2012 to generate causal evidence on the impacts of microcredit on its intended users with research designs that rely on some randomness in the allocation of credit offers by individual micro lenders. The researchers experimented on the premise that the lenders, products, and settings would represent a fairly representative of the microcredit movement worldwide. Out of the six programs, the evaluators worked on, four were traditional group lending, one was individual lending (Bosnia), and the study in Mongolia included both group and individual loans. Group sizes varied across the studies, ranging from 3 or 4 borrowers in Morocco to as many as 50 in Mexico. Though all the studies were based on randomized control trials, there were actually two types of experimental designs used. Five of the studies use randomized program placement, while The Bosnia study used individual-level randomization.

The results of the experiments were not very encouraging for the micro

lenders. The first major finding was that the estimated take-up rates of study-specific loan products ranged from approximately 17 per cent to 31 per cent among their target populations and additional micro lending was unlikely to have much of an effect in a competitive market. Secondly, the researchers could not find clear evidence, or even suggestive evidence, of reductions in poverty or substantial improvements in living standards. None of the six studies could find a statistically significant increase in total household income due to microfinance interventions. Banerjee, Karlan, and Zinman (2015) recommended "*despite its success in numbers, microcredit institutions should innovate more; in particular, discovering lending models that match more closely to cash flow needs of borrowers may prove more transformative*."

VI. THE BANDHAN EXPERIMENT - TARGETING THE HARD CORE POOR

The primary objective of the experiment carried out by Banerjee, Duflo, Chattopadhyay and Shapiro (2011) was to provide beneficiaries with income-generating assets, so as to enable them to create a reliable income stream and allow them to graduate into beneficiaries of microfinance programs and move them out of extreme poverty." As such, this experiment was not directly with microfinance beneficiaries but with the hard core poor to see whether they could be metamorphosed into microfinance beneficiaries. The theory behind the experiment is based on the observations that the hard core poor are ensnared in abject poverty due to their deficiency of assets and incapability to use financial intermediation to acquire assets to fight poverty.

Bandhan's Targeting the Hardcore Poor (THP) Program is a unique grant-based intervention aimed at bringing in economic, social and inspirational changes in the lives of the hardcore poor families. Grants (in the form of free assets, such as, livestock and inventory, and not cash) are offered to destitute women. They start generating income out of these assets and this helps them build sustainable livelihoods.

As stated by Mr. Chandrashekhar Ghosh, MD and CEO, Bandhan Bank, "This programme is run by Bandhan-Konnagar (the not-for-profit entity of Bandhan, engaged in development activities). The program follows a 360 degree-approach. Besides providing free assets, consistent counseling and mentoring support is also extended. A weekly subsistence allowance (considerable amount of cash) is also given to these women to meet their daily basic expenses until the assets begin to yield returns. Financial literacy is imparted so that they can make informed financial decisions. Education on socially relevant issues is also offered to increase their awareness and help them live better lives. Confidence building is worked upon so that they don't fall in the poverty trap again" (Ghosh, 2019).

The initial phase of the intervention began with of Bandhan identifying eligible households, the "Ultra Poor", within each village of Murshidabad in India . A total of 991 eligible households were surveyed at baseline, of which 512 (51.66%) were randomly selected for program participation and 466 did not receive such an offer.

After identification, half of the potential beneficiaries were randomly selected to receive assets. Rather than transferring cash, Bandhan purchased and distributed assets such as livestock and inventory to beneficiaries. The grants were also used

to finance other inputs, such as, fodder and sheds for livestock. The value of the asset transferred was approximately US $100, or Rs. 4,500 at that time.

Abhijit Bannerjee and his co-researchers began the baseline survey in 2006 (after selection of the beneficiaries but before the asset transfer), made the first mid line surveys after 18 months of the asset transfer, the second mid-line survey after 30 months of asset transfer, the third midline survey after 7 years of asset transfer and the end line survey after 10 years .

Mr. Chandrashekhar Ghosh had played an active role in these surveys. In his words, "both of us together visited many villages as part of the research. The findings of the research have been positive and encouraging. After 18 months of the program the two groups (Treatment & Control) were no longer identical; the group that got the THP intervention were 15% richer as measured by consumption per capita and much richer than that in terms of income, in part because they were much less dependent on alms. There was reduced food insecurity, increased assets and improved emotional well-being. After three years, the difference persists and after seven years, the difference is 25% in terms of consumption and significantly more in terms of income" (Ghosh, 2019).

The researchers reported there were statistically and economically meaningful increases in household income after the intervention program. They also reported that the primary drivers of increased total income were additional income generated by livestock and non-agricultural entrepreneurial endeavours. Income from these sources increased by 59.4% and 46%, respectively, relative to the control group mean. These differences are statistically significant at or above a 5% level. For total consumption as well as food and fuel consumption, the findings indicated that the program increased consumption at all levels. The researchers also reported that there was noticeable change in financial behaviour after 18 months. Treatment households appeared to save more than control households, depositing an average of Rs. 22 into savings accounts in the last 30 days compared to the Rs. 19 deposited by control households. Mostly, these savings occur through the accounts held with Bandhan.

VII. CONCLUSION

Out of the sizeable body of work that Abijit Banerjee and Esther Duflo produced in Developmental Economics, the experiments in microfinance carried out in India is only an indication of how field research using RCT can come up with results that can keep policy makers pondering on impacts of microfinance impacts and redesign microfinance delivery systems. In fact, in these experiments, Banerjee and Duflo did not come up with results with which Microfinance Institutions (MFIs) and Non Government Organisations (NGOs) could be very elated with the miracles of microfinance interventions.

The duo had earlier questioned whether microfinance really work in their book "Poor Economics". They were in fact skeptical about the way the Consultative Group for Assisting the Poor (CGAP) and other MFIs use case studies as to show that the availability of financial services for poor households can help achieve the Millenium Development Goals. Banerjee and Duflo (2011, p. 310) commented: "*… for many supporters of microcredit, this appears to be enough…….But anecdotal data do not help with the skeptics out there, including large sections of governments*

everywhere that worry that microcredit might be the 'new usury.' Later, in one of his articles where he took stock of a large body of work on microfinance research, Banerjee found that there is no strong evidence of large sustained consumption or income gains as a result of access to microcredit. In this article Banerjee (2013) commented, "*there is also no evidence of substantial gains along other dimensions of welfare, such as education and health. At least in the one- to three-year horizon, we see no evidence of microcredit transforming the lives of its beneficiaries."* A positive view about the outreach of microfinance movement, however, has come up from the views expressed in their book 'Poor Economic' where they commented: "The *microfinance movement has demonstrated that, despite the difficulties, it is possible to lend to the poor. Although one may debate the extent to which MFI loans transform the lives of the poor, the simple fact that MFI lending has reached its current scale is a remarkable achievement. There are very few other programs targeted at the poor that have managed to reach so many people"* (Banerjee and Duflo, 2011, p. 333).

However, the views about Banerjee and Duflo regarding less reliance on anecdotal data and cases to assess microfinance impact are not accepted universally and many institutions and individual researchers rely on cases to find out the impact of microfinance. One of their key benefits of using cases is their ability to capture what Hodkinson and Hodkinson call 'lived reality'. As they put it, case studies have the potential, when applied successfully, to 'retain more of the "noise" of real life than many other types of research (Hodkinson and Hodkinson, 2001). In a very recent research study conducted by the European Microfinance Network, Microfinanza (2019), case studies were presented across five EU contexts: Bulgaria, Italy, Poland, Spain, and Belgium to examine the role of microfinance to support the creation of jobs, improve working conditions and ensure fairer job opportunities for European citizens.

In fact, the RCT technique for research on impacts is not without criticisms. Researchers are now increasingly accepting that depending on RCTs is a fundamentally imperfect way of assessing impact (Barrett and Carter, 2010; Deaton and Cartwright, 2018). Prominent researchers point out that "the RCT methodology omits downside impact factors that are quite critical to obtaining a genuine assessment of microcredit impact, such as exit, displacement and market saturation" (Bateman, Duvendack and Loubere, 2019). Moreover, Deaton and Cartwright (2018) pointed out that "the results cannot be used to help make predictions beyond the trial sample without more structure, without more prior information, and without having some idea of what makes treatment effects vary from place to place or time to time ."

When Bédécarrats *et al.* (2019), replicated a flagship randomised control trial carried out by Crépon, Devoto, Duflo and Parienté (2015) in rural Morocco that showed substantial and significant impacts of microcredit on the assets, the outputs, the expenses and the profits of self-employment, they questioned the reliability of the data and the integrity of the experiment protocol of the preceding researchers. After they rectified the identified errors, they still found "substantial imbalances at baseline and implausible impacts at the end line."

The debate on adoption of research methods for assessing microfinance impacts will continue possibly over the next decade. What is essential that the research findings should be reliable and should be possible for replication across

different geographic – demographic settings. It is not only desirable that young researchers emulate the RCT methods applied by Banerjee and Duflo, but possibly it would be prudent to supplement the findings with real life cases. Construction of economic and social indices based on scales and supplemented with real life cases can also bring out the impact of microfinance when the interventions are based on larger geographic areas (Dhar, 2005; Sarkar and Dhar, 2011). Further, keeping in mind the constraints of financing research in less developed countries, the researchers should evaluate whether RCTs are the most cost-effective way for impact measurements when they work in multifarious, dissimilar and uncertain situations in comparison to information collected through focus group discussions and individual surveys. This is necessary as all researchers cannot be blessed with the opportunity of working in a J-PAL lab in MIT.

Acknowledgement: The author acknowledges with gratitude the help and information received from Mr. Chandrashekhar Ghosh, MD and CEO, Bandhan Bank, on the experiment of MicroFinance by Banerjee and Duflo with Bandhan.

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Indian Accounting Review
Vol. 23, No. 2, December 2019

Business Risk : A Study on Indian Manufacturing Companies
(2004-05 – 2017-18)

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ABSTRACT

The present paper makes an attempt to analyze the company-specific components of business risk, such as, liquidity risk, cost structure risk and capital productivity risk during the period 2004-05 to 2017-18. The study was based on one hundred companies which were selected by taking ten companies from each of the ten selected industries in the Indian manufacturing sector. The company-specific components of business risk associated with the selected companies were measured by using Gini's coefficient of concentration. Principal Component Analysis was applied in constructing the 'business risk index' (BRI) by taking into account the three company-specific components of business risk. Simple regression model was adopted to investigate the effect of BRI on the return measured in terms of return on capital employed of the selected industries. The study observed that Cement, Pharmaceutical, Fertilizer, Tyre manufacturing and Chemicals industries have kept their risk profiles lower as compared to the Indian Manufacturing industry average in all the dimensions of BRI. The study also revealed that high business risk was well compensated by high return in the selected industries during the period under study.

Key words : Business risk, Liquidity risk, Capital productivity risk, Cost structure risk, Business risk index, Return

I. INTRODUCTION

Managing business risk is an integral component of corporate strategy to mitigate instability in the company's earnings and to create shareholders' wealth. So, in today's challenging and competitive environment, the matter of designing suitable policies for managing business risk in accomplishing the wealth maximization objective of corporates is of utmost importance. In running the business, a company is exposed to various elements of business risk from within or outside. Nothing wrong with that, for risk-taking is intrinsic to growth (Vedpuriswar, 2005). Business risk arises out of dispersion of the company's expected operating profitability. The class and size of business risk depends on

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several factors that are generally categorized as economy-specific factors, industry-specific factors, and company-specific factors. Economy-specific factors, beyond the control of a corporate, affecting all the sectors of an economy, are fluctuations in foreign exchanges, competition, concentration of revenues, inflation, imports, restrictive regulations, etc. Industry-specific factors relate to the industry to which the company belongs while company-specific factors are associated with the concerned company. Business risks stemming from economy-specific, industry-specific and company-specific factors are regarded as economic risk, industry risk and company risk respectively. The company risk emanates from precariousness in one or more fronts of the company, important of which are instability in cost behaviour pattern, dispersion of revenue generating capability using long term funds and variability in short term debt paying capability. These weaknesses lead to cost structure risk, capital productivity risk and liquidity risk (Ghosh, 1997). There is almost no scope to exercise control over the economy risk and industry risk while it is, to some extent, possible to have power over the company risk. Since risks and returns go hand in hand, corporates cannot do away with the associated risks completely. Taking no risk may mean forgoing rewards. Business risk management aims at ensuring that business risk remains at an acceptable level or within an acceptable range. Therefore, for the achievement of entity objectives, corporates should manage business risk associated with them to be within their risk appetite.

The remainder of the paper is structured as follows. Section 2 deals with a review of the related literature. In Section 3, the objectives of the study are identified. Section 4 mentions the sources of the data used in this study. Section 5 narrates the methodology adopted in the study. Sub-section 5.1 is concerned with the development of company risk index. Section 6 makes a discussion on the empirical results obtained from the study. Sub-section 6.1 explains the outcomes derived from the analysis of association between business risk and return. Finally, concluding observations are presented in Section 7.

II. LITERATURE REVIEW

The following paragraphs in this section present a brief description of some of the notable studies carried out in the recent past in India and abroad on the topic addressed in the present paper and the last paragraph in this section deals with the identification of the research gaps.

Singh and Sur (2018) in their study analyzed the company specific components of business risk, namely liquidity risk, cost structure risk and capital productivity risk of one hundred companies selected from each of the twenty selected Indian manufacturing sectors during the period 1994-95 to 2013-14. Gini's coefficient of concentration was used in measuring the company-specific components of business risk while Principal Component Analysis was applied in constructing the business risk index of the selected manufacturing industries.The study observed that eight industries were placed in the category of 'above the Indian manufacturing industry average' whereas the remaining twelve industries found place in the category of 'below the Indian manufacturing industry average'. The analysis of the simple regression of 'business risk index' on 'return on capital employed' as made in the study provided strong evidence of positive influence of the business risk of the selected companies on their operating profitability during

the period under study.

Walls and Dyer (1996) in their study attempted to ascertain the differences in observed risk propensity among petroleum firms and their impact on firm performance. A new risk propensity measure, namely Risk Tolerance Ratio (RTR) was developed in the study. The study made strong inferences about the causal relationship between ex-ante risk-taking and performance and also found that corporate risk propensity seemed to matter and that decisions about corporate risk policy had a significant impact on the petroleum firm's economic performance.

Mallik and Sur (2009) in their study analyzed the business and financial risks in the Indian corporate sector during the period 1995-96 to 2006-07 and also examined whether its findings conformed to the theoretical arguments. In this study fifty companies were selected by taking the top five companies (based on net sales revenue) from each of the ten selected manufacturing industries and coefficient of variation was used as the measure of risk. The study observed that no strong evidence of positive or negative relationship between business and financial risks associated with the selected companies was noticed during the study period. The study also revealed that high risk was not at all compensated by high risk premium during the same period.

Dhanabhakyam and Balasubramanian (2012) in their study analyzed the business and financial risks in three selected industries in India, such as, automobiles, refineries and steel industries. While carrying out the study, the data of five companies taken from each of the three selected industries for the period 1999-2000 to 2008-09 were used. The study revealed that all the three industries under study could not maintain a 'high-low' combination of business and financial risks during the study period. Another significant outcome of the study was that no strong evidence of positive relationship between risk and return of the companies under study was observed during the period under study.

The study conducted by Gupta and Sur (2015) analyzed the business risk associated with some selected industries in India during the period 2001-02 to 2010-11. While making this analysis ten industries were selected following purposive sampling procedure and ten companies were taken from each of the ten selected industries adopting the same sampling technique. This study also examined whether the operating profitability of the selected industries was influenced by their business risk. The study revealed that out of the ten selected industries, FMCG faced the minimum risk in its business operations while the maximum volatility in operating profitability was observed in Textile industry. Though a positive relationship between business risk and operating profitability is theoretically desirable, a strong evidence of negative association between them was observed in this study.

Wani and Dar (2013) in their study examined the relationship between financial risk and financial performance of life insurance companies in India during the period 2005-06 to 2012-13. The study revealed that financial performance of the life insurance companies in India was adversely influenced by the capital management risk, solvency risk and underwriting risk associated with them while liquidity risk, size and volume of capital of the companies made significant positive contribution towards enhancing their financial performance during the study period.

A considerable number of studies on the analysis of business and financial

risks were carried out in India and abroad during the last few decades while a very few studies on the same issue associated with the companies in the Indian manufacturing sector were made during the post-liberalization era. By a careful scrutiny of the studies of business risk analysis in Indian corporate sector, it can be inferred that the issue in connection with the analysis of business risk associated with the manufacturing sector in India during the post-liberalization period was not properly addressed. Moreover, Gini's coefficient of concentration is presently recognized as a reliable measure of risk. A very few studies on the company risk analysis were carried out in India using such a measure in the recent past. However, no significant study on the analysis of company specific components of business risk associated with the Indian manufacturing sector was made during the post-liberalization era applying composite business risk index. In order to bridge the gap, in the present study, a suitable 'business risk index' was designed by applying principal component method, and while making analysis of business risk in the selected industries belonging to the manufacturing sector in India, company specific components of business risk were measured by using such index.

III. OBJECTIVES OF THE STUDY

The present study has the following objectives:

(i) To measure the company-specific components of business risk, such as, liquidity risk (LR), cost structure risk (CSR) and capital productivity risk (CPR) of the selected industries.

(ii) To construct a 'business risk index' incorporating the different company-specific components of business risk.

(iii) To ascertain the Industry-wise pattern of business risk based on business risk index.

(iv) To examine whether there was any significant influence of business risk of the selected industries on their return.

IV. DATA AND METHODOLOGY

The study is based on ten major industries in India which were selected from the manufacturing sector following purposive sampling. One hundred companies were selected by taking the top ten companies (based on market capitalization as per BSE on 31st March, 2017) from each of the ten selected industries. The ten industries and one hundred companies selected for the study are listed in the Appendix. The data of the selected companies as well as industries for the period 2003-04 to 2017-18 used in this study were taken from secondary source, i.e. Capitaline Corporate Database. While designing the business risk index used in this study, variables like liquidity risk, cost structure risk and capital productivity risk were considered.

As the liberalization process started in India during the financial year 1991-92, it is obvious that the effect of it could not be reflected immediately after its inception. Generally, in order to realize the effects of liberalization measures adopted in a country like India where several obstacles are faced while implementing these measures, at least ten to twelve years are required. Thus, in this study the

financial year 2004-05 was considered as the initial year of the post-liberalization period. Ginni's coefficient of concentration was used measuring the company-specific components of business risk of each of the selected industries.

Gini's coefficient of mean difference (ΔI) is an absolute measure of dispersion while Gini's coefficient of concentration (G) is a relative measure of dispersion. Gini's coefficient of mean difference is the ratio of *g* to *m* where *g* represents the sum total of the differences of the values of the observations, and n is the number of observations. Gini's coefficient of concentration (G) = ΔI/2AM where AM is the arithmetic mean. It is well accepted that the relative measure of dispersion is a better measure as compared to its absolute one. So, in this study *G* was used at the time of ascertaining the values of different company-specific components of business risk. *G* of fixed cost to total cost ratio was used in measuring CSR. CPR was ascertained by using *G* of capital turnover ratio and *G* of working capital to sales ratio was considered as the measure of LR. *G* is a pure number and it is independent of units of measurement. It varies between 1 and 0. If *G* is *0*, then it indicates that there is no risk while if it is equal to 1, then it implies that the risk is maximum.

In fact, Gini's coefficient has a theoretical appeal since it is based on all the values of the variable and the differences of values among themselves and not on deviations from some measures of central tendency. Traditionally, coefficient of variation (CV) is used in measuring different components of risk. CV is a relative measure of dispersion. It represents the ratio of standard deviation (SD) to arithmetic mean (AM). SD is the 'root-mean-square deviations from mean'. So, at the time of measuring the value of risk the deviations from AM are considered. Though AM is a popular measure of central tendency, it has certain severe drawbacks. First, AM is highly influenced by extremely high or low values. Recognizing the deviations from such measure of central tendency may, therefore, distort the value of risk. Secondly, in extremely asymmetrical distribution, AM cannot be recognized as a suitable measure of central tendency. Thus, while ascertaining risk if the distribution used is found skewed, the deviations from AM computed on such skewed distribution cannot reflect the true value of risk. Thirdly, in case of qualitative data, AM cannot be regarded as a sound measure of central tendency. In such a case, only median can be considered as the appropriate measure of central tendency. Risk is measured using qualitative data. For example, CV of capital turnover ratio is used in ascertaining the value of CPR while LR can be computed by CV of working capital to sales ratio. So, the data relating to such ratios are qualitative in nature. The use of deviations from AM is not at all tenable in this case. However, Gini's coefficient accounts for only the differences of values among themselves, the deviations from AM are not taken into consideration. Thus, Gini's coefficient can be regarded as a better measure of risk as compared to the traditional one. So, in the present study Gini's coefficient of concentration was used.

Principal Component Analysis (PCA) was used in this study while constructing the business risk index of each of the selected industries. It is a statistical procedure that uses an orthogonal transformation for converting a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components. The relevance of PCA lies in the fact that it transforms the impact of a rather greater number of variables

(which may be correlated) into a smaller set of uncorrelated factors. The number of principal components is less than or equal to the number of original variables. Since a number of indicators are involved in the category of profitability, the use of PCA appears to be most appropriate index to derive a single index reflective of overall risk of each of the selected industries. A primary benefit of PCA arises from quantifying the importance of each dimension for describing the variability of a data set (Shlens, 2009). PCA can also be used in order to compress the data, by reducing the number of dimensions, without much loss of information. While using PCA for the purpose of analyzing a data set, a large percentage of the total variance can generally be explained with only a few components. Principal components are selected so that each successive one explains a maximum of the remaining variance. Though usually the whole set of causal variables is replaced by a few principal components which account for a substantial portion of total variation, in the present analysis all components were considered as the explanatory variables. This was done in order to avoid discarding information that could affect the estimates. Thus, the procedure adopted in the analysis accounted for 100 percent of the total variation in the data (Cámara & Tuesta, 2014).

In particular, a PCA helps in identifying the principal directions in which the data vary by transforming a set of correlated variables into a set of uncorrelated 'components'. The first principal component is selected as the linear index of all the variables that captures the largest amount of information common to all of the variables which may then be used as the index. By applying this approach, the most appropriate weightings for each variable can be ascertained in order to derive an index which captures maximum variation.

In the present analysis, three variables were considered while constructing the index. The principal components were given by the linear combination of the variables, namely, LR, CSR and CPR:

$PC_1 = a_{11}LR + a_{12}CSR + a_{13}CPR$

$PC_2 = a_{21}LR + a_{22}CST + a_{23}CPR$

$PC_3 = a_{31}LR + a_{32}CSR + a_{33}CPR$

Here PCs, i.e., the principal components and values, which are called loadings, are chosen in such a way that the principal components are uncorrelated and the first principal component accounts for the greatest possible proportion of the total variation in the data set.

To investigate the effect of risk on the return of the selected industries during the period under study, simple regression model was applied. Risk was represented by a composite index of business risk, and return of the industry was measured in terms of return on capital employed. Ordinary least squares method with White heteroskedasticity-consistent standard errors and covariance was used in estimating the regression model.

Development of a Business Risk Index

There were large differences across industry specific values of the different risk indicators. In order to ensure better comparability of these data, each indicator was "normalized" using the UNDP goal-post method as used in measuring the initial international Human Development Index. This is as follows :

$$x_i = \frac{\left(x_i - x_{\min}\right)}{\left(x_{\max} - x_{\min}\right)}$$

where X_i is the normalized indicator for company i, x_i is the corresponding pre-normalization figure, and x_{max} and x_{min} are the maximum and minimum values of the same indicator across all companies. The normalized indicator takes a value of 0 representing the lower end of the industry's scale of company risk, while the same takes a value of 1 indicating top end of the industry's degree of business risk for all the individual categories of indicators and it varies between 0 and 1 for all other industries. Based on the aforesaid normalized figures, PCA was applied to construct the business risk index.

The construction of an industry's business risk index on the basis of PCA requires the consideration of diverse individual categories of business risk. The business risk index is considered as a latent or unobserved variable. Here the problem is the weights assignment to the individual indicators, which is critical to maximize the information from a data set included in an index. A good composite index should comprise important information from all the indicators but not be strongly biased towards one or more of these indicators.

In this study, the 'business risk index' was linearly determined by three relevant components. The indicators are LR, CSR and capital productivity risk CPR. In its latent form, the business risk index (BRI) can be expressed as :

$$(BRI)_t = \beta_1 (LR)_i + \beta_2 (CSR)_i + \beta_3 (CPR)_i \quad \text{.....(1)}$$

The corresponding business risk index is obtained according to the following weighted average:

$$BRI = \frac{\sum_j^3 \lambda_j P_j}{\sum_{j=1}^3 \lambda_j}$$

Where (j = 1, 2,....3) denotes the j^{th} eigen value. Subscript *j* refers to the number of principal components that also coincides with the number of corresponding indicators. Noting that the values gradually fall as the suffix increases, (j = 1, 2,.....3) denotes the j^{th} principal component.

V. FINDINGS OF THE STUDY

The values of Liquidity Risk, Cost Structure Risk and Capital Productivity Risk of each of the selected industries are presented in Table 1.

TABLE 1

Industry wise Variation of Different Indictors of Business Risk Index

Company	Liquidity Risk (LR)		Cost Structure Risk (CSR)		Capital Productivity Risk (CPR)	
	Value	Rank	Value	Rank	Value	Rank
Cement	0.097	9	0.109	10	0.183	7
Chemicals	0.256	7	0.137	7	0.149	9
Consumer Goods-Electronic	0.578	2	0.313	1	0.656	1
Engineering – Heavy	0.323	5	0.279	2	0.349	2

Fertilizer	0.220	8	0.123	8	0.151	8
Food Processing	0.465	3	0.207	3	0.239	4
Infrastructure – General	1.011	1	0.142	5	0.191	6
Steel – Large	0.427	4	0.171	4	0.295	3
Tyres	0.260	6	0.139	6	0.131	10
Pharmaceutical	0.078	10	0.121	9	0.221	5
Indian Manufacturing Industry Average	0.404		0.180		0.260	

Source: Calculated from secondary data.

Note: *Kendall's coefficient of concordance = 0.7818 and Computed value of Chi-square value = 21.1086 (Table value of Chi-square at 5 per cent level of significance with 9 d.f.= 16.919)*

The results as shown in Table 1 reveals that in respect of Liquidity Risk, out of the ten selected industries, four industries, namely Consumer Goods-Electronic, Food Processing, Infrastructure-General and Steel-Large were placed in the category of 'above the Indian manufacturing industry average' while the remaining six industries, namely Cement, Chemicals, Engineering-Heavy, Fertilizer, Tyres and Pharmaceutical found place in the category of 'below the Indian manufacturing industry average'. In terms of capital productivity risk, one-third of the sample industries (Consumer Goods-Electronic, Engineering - Heavy and Steel-Large) were able to find place in the category of 'above the Indian manufacturing industry average' while the remaining two-third of the selected industries secured their place in the category of 'below the Indian manufacturing industry average'. With respect to the cost structure risk, three industries namely, Consumer Goods-Electronic, Engineering-Heavy and Food Processing industries, out of the ten industries under study, were placed in the category of 'above the Indian manufacturing industry average' while the remaining seven industries were able to find place in the category of 'below the Indian manufacturing industry average'. It is important to note that Cement, Chemicals, Fertilizer, Tyres manufacturing and Pharmaceutical industries have kept their risk profiles lower as compared to the Indian manufacturing industry average in all the dimensions of business risk index during the period under study.

Food processing, Fertilizer and Steel-Large industries were placed more or less in the same ranks with respect to all the selected company-specific components of business risk during the study period. Consumer Goods-Electronic industry bore the maximum risk on cost structure front and capital productivity front while the industry was placed in the second rank in respect of liquidity risk. Cement industry captured the ninth, tenth and seventh ranks in respect of LR, CSR and CPR respectively. Chemical industry was placed on the back-benches by occupying the seventh rank in respect of both LR and CSR, and ninth rank in respect of CPR. Pharmaceuticals industry enjoyed low degree of risk on liquidity and cost structure fronts by placing itself in the tenth and ninth ranks respectively whereas the fifth rank was captured by it on the capital productivity front during the period under study. This kind of parity was observed in most of the industries under study. The computed value of Kendall's coefficient of concordance among LR, CSR and CPR of the selected industries (0.7818) was found to be statistically

significant at 5 per cent level with 9 degrees of freedom. So, uniformity among LR, CSR and CPR of the selected industries was noticed during the study period.

In the context of the present analysis it is also surmised that there should be a positive relationship among the components of BRI.

TABLE-2

Pair-wise Correlation between the indicators of Business Risk Index

Pearson Correlation Coefficient				Spearman rank Correlation			
	LR	CSR	CPR		LR	CSR	CPR
LR	1.00			LR	1.00		
CSR	0.319 (0.95)	1.00		CSR	0.830* (4.21)	1.00	
CPR	0.285 (0.839)	0.879* (5.22)	1.00	CPR	0.479 (1.54)	0.709** (2.844)	1.00

Source: Calculated from secondary data.

* Indicate 1 per cent level of significance.

** Indicate 5 per cent level of significance.

Table 2 shows that the Pearson correlation coefficient between LR and CSR (0.32) as well as that between LR and CPR (0.29) were positive but found to be insignificant. However, the Pearson correlation between CSR and CPR (0.88) was positive and found to be statistically significant. But the Spearman rank correlation coefficient between LR and CSR (0.83) as well as that between CSR and CPR (0.709) were positive and found to be statistically significant. The rank correlation coefficient between LR and CPR (0.47) was positive which was not found to be statistically significant. The results obtained from this analysis conform to the conjecture regarding the relationship among the components of BRI.

TABLE 3

Business Risk Index across the Selected Industries in India

Industry	Business Risk Index	Rank	Status
Cement	0.049	10	B
Chemicals	0.160	6	B
Consumer Goods-Electronic	1.024	1	A
Engineering – Heavy	0.594	3	A
Fertilizer	0.119	8	B
Food Processing	0.465	4	A
Infrastructure – General	0.618	2	A
Steel – Large	0.423	5	A
Tyres	0.153	7	B
Pharmaceutical	0.090	9	B
Indian Manufacturing Industry Average	0.370		

Note: A' implies 'Business Risk Index above the Indian manufacturing industry average' and 'B' implies 'Business Risk Index below the Indian manufacturing industry average'.

The results as obtained in Table 3 disclose the business risk index associated with each of the selected industries during the period under study. This table shows that the degree of business risk was the maximum in Consumer Goods-

Electric industry (1.052) while it was the minimum in the Cement industry (0.010). It is also observed that out of the ten selected manufacturing industries, five industries, namely Consumer Goods-Electric, Food Processing, Engineering-Heavy, Infrastructure-General and Steel-Large were placed in the category of 'above the Indian manufacturing industry average'.This is due to the fact that most of the components of BRI of these five industries were higher as compared to the concerned industry averages. The remaining five industries, namely Cement, Chemicals, Fertilizer, Tyres and Pharmaceuticals found place in the category of 'below the Indian manufacturing industry average'. In fact, all the three components of BRI considered in this study were lower as compared to the related industry averages in these five sectors.

In order to have a systematic analysis, BRI values greater than 0.5 were considered as the higher level of business risk, BRI values within the range (0.3 - 0.5) were recognized as the medium level of business risk and BRI values less than 0.3 were considered as the lower level of business risk. Table 3 depicts that out of the ten selected industries, three industries, namely Consumer Goods- Electric, Engineering- Heavy and Infrastructure-General were placed in the category of higher level of BRI; two industries, such as Food Processing and Steel- Large found place in the category of medium level of BRI and the remaining five industries, namely Cement, Chemicals, Fertilizers, Tyres and Pharmaceuticals were able to establish themselves in the category of lower level of BRI.

Association between Business Risk and Return

A company with high business risk-low return profile is about to face immense difficulties to rotate its business wheel in the long run. It is, therefore, expected that high business risk can be compensated by high risk premium i.e. high return. But a great deal of controversy has always been persisting over this issue. Even the findings of the relevant studies so far made are conflicting in nature. One school of thought argues that return and business risk are shown to be influenced by various industry conditions and business strategies but not by each other (Oviatt and Bauerschmidt, 1991). Moreover, they also opine that there may be a negative relationship between business risk and return (Betlis and Mahajan, 1985; Singh, 1986; Mallik and Sur, 2009). The other school of thought suggests a positive association between business risk and return (Cootner and Holland, 1970).

In this study, simple regression analysis was made to investigate the effect of BRI on the return as measured in terms of return on capital employed (ROCE) of the selected industries during the period under study. If all the components of BRI like LR, CSR and CPR were considered as the explanatory variables, the problem of multicollinearity might have occurred because all the selected indicators were correlated (as shown in Table 2) with each other. To remove the problem of multicollinearity, a composite index using PCA method, instead of considering all the indicators, was used in the study. PCA is a useful technique of transforming a large number of variables into a smaller and more coherent set of uncorrelated factors, without much loss of variability of the data set.

The simple regression model with robust standard error is represented in terms of the following equation:

Here ROCE denotes the return on capital employed, BRI denotes the business risk index and denotes the random disturbance term which follows *i.i.d*

(individually and identically distributed) normal.

The regression result as shown in Table 4 facilitates the testing of the hypothesized sign of the explanatory variable and its significance as well as overall significance of the model.

TABLE 4

Results of Simple Regression Model

Dependent Variable: ROCE				
Method: Least Squares				
White heteroskedasticity-consistent standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INDEX	24.39451	4.334236	5.628330	0.0005
C	14.39543	4.547934	3.165268	0.0133
R-squared	0.660562	Mean dependent var		27.42522
Adjusted R-squared	0.618132	S.D. dependent var		12.84820
S.E. of regression	7.939600	Akaike info criterion		7.158459
Sum squared resid	504.2979	Schwarz criterion		7.218976
Log likelihood	-33.79230	Hannan-Quinn criter.		7.092072
F-statistic	15.56838	Durbin-Watson stat		1.342678
Prob(F-statistic)	0.004262			

Source: Calculated from secondary data.

The results obtained from the regression analysis as made in Table 4 reveal that BRI had a significant positive influence on the return of the industries during the study period. The sign was also in conformity with the theoretical argument. For one unit increase in business risk, the earning capability of the company measured in terms of ROCE increased by 24.39 percent. The regression model was a good fit as reflected by the value of R^2 (0.66) and value of F-statistic which was found to be significant at 1 per cent level.

VI. SUMMARY AND CONCLUSION

Risk measurement is essential from the angle of corporate management. Without proper measurement of different components of risk, it is next to impossible for the company to take appropriate decisions relating to capital structure, working capital policies, cost structure, etc. But the conventional measures used for ascertaining risk as mentioned in finance literature possess severe limitations. In order to overcome such problems, Gini's coefficient of concentration is used as a measurement of risk. By applying Gini's coefficient of concentration the stakeholders can ascertain the degrees of various components of risk which help them in taking their decisions. After ascertaining the values of the different components of business risk, PCA was applied to construct the 'BRI' of the selected industries.

The present study focuses on the analysis of company specific components as well as composite index of business risk of the ten selected industries belonging to the Indian manufacturing sector for the period 2003-04 to 2017-18. While

tackling the issue, one hundred companies were chosen by taking the top ten companies (based on market capitalization as per BSE on 31st March, 2017) from each of the ten selected industries. The analysis was made on the basis of BRI which was constructed by taking into consideration LR, CSR and CPR. The study reveals a wide variation in the level of BRI across the selected industries in India during the study period. Based on the BRI values, four industries were placed in the category of 'above the Indian manufacturing industry average' whereas the remaining six industries were able to find place in the category of 'below the Indian manufacturing industry average'. The highest volatility in operating profitability due to fluctuations in company specific factors was observed in Consumer Goods-Electric industry while Cement industry had enjoyed the least company risk during the study period.

A 'high-high' combination of business risk and return is theoretically desirable. The empirical results obtained from the analysis of simple regression of BRI on ROCE provides strong evidence of the significant positive influence on operating profitability implying that in the said cases high business risk was well compensated by high risk premium, i.e., high return in the selected industries during the period under study.

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APPENDIX

Industry	Company
Cement	Ultra Tech Cement, Ambuja Cement, Shree Cements, ACC, Ramco Cements, Birla Cement, Dalmia Cement, JK Cement, Star Cement, Prism Jonshon.
Chemicals	AartiIndustries Ltd, BASF India Ltd, Gujarat Alkalies& Chemicals Ltd, GFL Ltd, GHCL Ltd, India Glycols Ltd, Philips Carbon Black Ltd, Pidilite Industries Ltd, Tata Chemicals Ltd, UPL Ltd,
Consumer Goods – Electronic	Videocon Industries, MIRC Electronics Ltd, PG Electroplast, Calcom Vision Ltd, Choksi Imaging Ltd, Dynavision Ltd, IND Renewable Energy Ltd, BPL Ltd, Procal Electronics India
Engineering – Heavy	Action Construction Equipment Ltd, CMI FPE Ltd, Elecon Engineering Company, Garden Reach Shipbuilders & Engineers Ltd, Ircon International Ltd, ISGEC Heavy Engineering, Praj Industries Ltd, Shriram EPC Ltd, TD Power Systems Ltd, Varco Engineering Ltd.
Fertilizer	Chambal Fertilizer, Coromandel International, Deepak Fertilizers & Petrochemicals Corp Ltd, Gujarat Narmada Valley Fertilizer, Gujarat State Fertilizer & Chemicals, Mangalore Chemicals, Nagarjuna Fertilizer & Chemicals, National Fertilizer Ltd, Rashtriya Chemicals & Fertilizers, Zuari Agro Chemicals.
Food Processing	Nestle India, Britannia Industries, KRBL Ltd, Hatsun Agro Products, L T foods Ltd, Varun Beverages Ltd, Future Consumer Ltd, Heritage Foods Ltd, Parag Milk Foods Ltd,Glaxosmithkline Consumer Pvt Ltd.
Infrastructure – General	ABB India Ltd, Adani Ports & SEZ, BHEL, Jaiprakash Associates Ltd, Larsen & Toubro Infrastructure, NBCC Ltd, Punj Lloyd Ltd, Sadbhav Engineering Ltd, Siemens Ltd, Thermax Ltd.
Pharmaceuticals	Sun Pharmaceutical Industries, Lupin, Dr. Reddys Laboratories, Cipla, AurobindoPharma, Cadila Health, Glenmark, Torrent Pharma, Alken Lab, Divis Lab.
Steel-Medium	Jindal Stainless Ltd, Mukand Ltd, Usha Martin Ltd, Balasore Alloys Ltd, Kamdhenu Ltd, Technocraft Industries, Vardhman Industries, Beekay Steel Industries, Adhunik Industries Ltd, Shah Alloys Ltd.
Tyres	Apollo Tyres Ltd, Balkrishna Industries Ltd, CEAT Ltd, Goodyear India Ltd,Govind Rubber Ltd, JKTyre& Industries Ltd, Krypton Industries, MRF Ltd, PTL Enterprises Ltd, TVS Srichakra Ltd.

Indian Accounting Review
Vol. 23, No. 2, December 2019

Corporate Social Responsibility Reporting : An Indian Perspective*

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ABSTRACT

Business and society are mutually dependent as the society creates business and the business caters to the needs of the society. In management of business, it is well recognized that integrating social, environmental and ethical responsibilities into the governance of business ensures their long term success, competitiveness and sustainability. The evolution of CSR Reporting and its present status has been presented in this paper. An empirical analysis of CSR Reporting in the context of Companies Act,2013 and prior to the passing of the Act has also been made. CSR Reporting has now been made mandatory by Companies Act,2013 and the Rules made thereunder.

Key words : Corporate Social Responsibility, CSR Reporting, Companies Act, 2013, GRI, ESG, Integrated Reporting

I. INTRODUCTION

Business and society are mutually dependent as the society creates business and the business caters to the needs of the society. As a part of the society, it is the moral responsibility of business to satisfy the various requirements of the society in aggregate. For the survival of the business, the objective of profit maximization cannot be ignored but the management can no longer remain indifferent to its social responsibilities.

In management of business, it is well recognized that integrating social, environmental and ethical responsibilities into the governance of business ensures their long term success, competitiveness and sustainability. Indian tradition and ancient wisdom suggest wellbeing of all the stakeholders for the activities pertaining to economic growth and development. The great teaching of Upanishad describes that "All that exists in this universe is the abode of the Almighty. Therefore, enjoy the good things in life by sharing them with others. Do not covet the possession of others". Yesterday Shareholders came first and today Customers come first. The role of leadership in institutions in a Knowledge Society is to inculcate sensitivity to the need of all stakeholders (Kalam, 2013).

Business organisations are basically social institutions. They are for the society, by the society and of the society. Almost all civilization is centred around business activities. Despite close bonding of business with society, social objectives of business organisations are not appropriately highlighted in our

*This is the revised version of G. D. Roy Memorial Lecture (2019).

academic literature so far. The focus of business literature towards profit objective with complete disregard to social objective has nurtured a mindset of conflicts on the issue of social objective and profit objective. Basically, social objective and economic objectives are complementary to each other. In the recent years, business and society interrelationship has been gradually recognised and a paradigm shift is observed from the old stockholders' theory to present stakeholders' theory. In the context of growing awareness about the role of business in serving the stakeholders, new areas and issues relating to contribution of business towards the society is developing. It is observed that management institute and business studies are making managers and entrepreneurs without social touch and with an expectation of economic performance as an indicator of business performance.

The economic objectives are so much highlighted so that profit, loss, assets, liabilities, capital, financial management, operation, human resource, marketing, etc. become important areas for studies. Of late, it is seen that Business Ethics, Social Responsibility, Corporate Governance, Environment Management and Reporting, Social Reporting etc. have been taken into consideration for studies focussing on social side of the business.

Business houses are utilising the resources from society like natural resources, human resources and financial resources. In turn, these social resources are converted into utility products and services and are being used by the society to fulfil their need. In the process of use of resources, business organisations are using technology, creating employment and, many a time, causing harm to the environment. Hence, business has a responsibility towards the society not only in terms of providing quality goods and services, creating employment, payment of taxes but they are also expected to participate in other social activities like spread of education, health services, protection of environment, eradication of poverty, etc. Social Contract is implied in the process.

II. OBJECTIVES AND METHODOLOGY

The objective of the paper is to examine the status of evolution of Corporate Social Responsibility and its Reporting in India. The methodology adopted for attaining the objectives is descriptive and empirical in nature. Primary data were collected from the Annual Reports of 57 Companies during one year before the introduction of Companies Act, 2013 and two years later the implementation of the CSR Rules, 2014 under the Companies Act, 2013. The remainder of the paper is organised as follows. Section III gives a brief literature review. This is followed by Historical perspective of CSR in India. Section V is on recent initiatives taken on CSR in India. This is followed by CSR Reporting in India and Global Initiatives in CSR Reporting in Sections VI and VII, respectively. Section VIII is on a case study of Indian practices. Suggestions and conclusions appear in the last section.

III. BRIEF LITERATURE REVIEW

Over the past 50 years, researchers in the area of accounting have diverted their attention to the nature of accounting as a social phenomenon (Burchell, *et al.* 1980 & Tinker, *et al.*1982). There have been calls for further research into the question of social factors influencing the historical development of contemporary accounting practices and social consequences that these have produced (Hopewood

1980 & Burchell, *et al.*1985).

Simultaneously, a series of surveys of Corporate Social Accounting and Reporting in contemporary Annual Reports have been undertaken (Ernst & Ernst, 1979; Trotman 1979; Guthrie & Mathews1985; Cowen, *et al.* 1987 & Guthrie & Parket, 1989). These surveys have presumed that Corporate Social Reporting is a contemporary phenomenon. Very little works were done on the development of Social Reporting prior to 1970. Hogner (1982) examined Social Reporting aspect of the US steel for the period 1901 to 1980. In Australia, a research on Corporate Social Responsibility of Broken Hill Proprietary Company Limited was made by Hughes (1964), Blainey (1968) and Trengove (1975) in different years. This company, engaged in steel production, oil exploration and mining in Australia, has served the society through social development. It could be understood from the study of Annual Reports where in social disclosure practices are found.

Social Accounting has not been widely used in India, as there was no statutory requirement under Indian Companies Act, 1956. The need for disclosing the social information in the Annual Report was first felt by Sachar Committee. In this regard, the pioneer companies are Cement Corporation of India (CCI), Tata Iron and Steel Company (TISCO), Steel Authority of India (SAIL), Minerals and Metals Trading Corporation of India (MMTC), Bharat Heavy Electricals Ltd. (BHEL) etc. (Kumar, *et al.* 2004).

IV. HISTORICAL PERSPECTIVE OF CSR IN INDIA

In India Corporate Social Responsibility is not a new concept. It dates back to 5000 years or even more than that where records are available of CSR activities as a part of social responsibility by business. In Indian context the origin of CSR can be traced from the Vedic literature like Puranas, Ramanyana, Mahabharata and Kautilya's Arthasastra written in Sanskrit. We can quote the Sanskrit Sloka with its meaning below.

Om Sarve Bhavantu Sukhinah
Sarve Santu Niraamayaah
Sarve BHadraanni
Pasyantu ma kascidduh khabhaghaveta
Om santih santih santih !!

Om, May All be Happy,
May All be Free from Illness.
May All See what is Auspicious.
May no one Suffer.
Om Peace, Peace, Peace.

The more of everything you share,
The more you will always have to spare,
For only what we give away
Enriches us from day to day.

'Modhmannam vindante pracheta satyam braveemi vadh it sa tasya.Naaryam pushyati no sakhaayam kevaalado baevati kevalaadi'

Meaning thereby – an individual who consumes money and material all alone without using it for social welfare, he is destined to go to hell (*Indian Rig Veda-*

section on helping the deserving).

CSR in India has traditionally been seen as a Philanthropic activity. In keeping with Indian tradition, it was an activity that was performed but was not documented properly. Those were the Philanthropists who never wanted any publicity. The present day CSR activities are more publicity oriented.

V. RECENT INITIATIVES TAKEN IN CSR IN INDIA

In recent years, the idea of CSR first came up in 1953 when it became an academic topic in the context of publication of Howard R Bowen's (1953) book "Social Responsibilities of the Businessman". Since then, there has been continuous debate on the concept and its implementation. Although the idea has been around for more than half a century, there is still no clear consensus over its definition. One of the most contemporary definitions is from the World Bank Group, stating, "Corporate social responsibility is the commitment of businesses to contribute to sustainable economic development by working with employees, their families, the local community and society at large, to improve their lives in ways that are good for business and for development". Contrary to this, Milton Friedman (1970) advocated profit objective as the only objective of business which is in contradiction of the CSR and created lots of debate in the academic world and within business community.

The CSR activities in modern India have travelled a lot from charity to compulsion. The Companies Act, 2013 has introduced CSR to the forefront and accrodingly it has been much discussed in the recent years. Before Companies Act 2013, an initiative was taken in 2011 to introduce National Voluntary Guidelines containing 9 principles. Moreover Guidelines on CSR for Central Public Sector Enterprises were also issued in 2010. Section 135 of The Companies Act, 2013 states as follows :

1. Every company having a net worth of rupees five hundred crore or more (100 million $ or more) or a turnover of rupees one thousand crore or more (200 million $ or more), or a net profit or rupees five crore or more (1 million $ or more) during any financial year shall constitute a Corporate Social Responsibility Committee of the Board consisting of three or more directors, out of which at least one director shall be an independent director.
2. The Board's report shall disclose the composition of the Corporate Social Responsibility Committee
3. The corporate social responsibility committee shall :
    a. Formulate and recommend to the Board, a Corporate Social Responsibility Policy which shall indicate the activities to be undertaken by the company as specified in Schedule VII;
    b. Recommend the amount of expenditure to be incurred on the activities referred to in clause (a) ; and
    c. Monitor the corporate social responsibility policy of the company from time to time.
    d. The board of every company referred to in sub-section (1) shall:

i. After taking into account the recommendations made by the corporate social responsibility committee, approve the corporate social responsibility policy for the company and disclose the contents of such policy in its report and also place it on the company's website if any, in such manner as may be prescribed; and

ii. Ensure that the activities as are included in corporate social responsibility policy of the company are undertaken by the company.

e. The board of every company referred to in sub-section (1), shall ensure that the company spends, in every financial year, at least two percent of the average net profits of the company made during the three immediately preceding financial years, in pursuance of its corporate social responsibility policy.

Provided that the company shall give preference to the local area and areas around it where it operates for spending the amount earmarked for corporate social responsibility.

The areas where expenditure can be incurred are also specified in the amendment to Schedule VII.

VI. CSR REPORTING IN INDIA

The criteria adopted for reporting and disclosure practices of Indian companies till the introduction of Companies Act, 2013 were generally as follows (Choudhury, 2013) :

1. As a part of the Directors Report/ Chairman's Report/ Management Discussion and Analysis.
2. As a Separate Chapter in the Annual Report.
3. Value Added Statement.
4. Social Overhead Model including both capital and revenue expenditure.
5. Social Overhead Model showing revenue expenditure only.
6. Social income and Expenditure Statement.
7. Social Balance sheet.
8. Stand Alone Website Reports.
9. Stand Alone Sustainability Reports.

The important approaches used for reporting social activities of a concern (Choudhury and Dey, 2012) are as follows :

1. Descriptive Approach;
2. Corcoran and Leininger Model;
3. Linowes' Socio Economic Operating Statement;
4. Seidler's Social Income Statement;
5. Abt Associates' Model;
6. Ralph W. Este's Model;
7. Value Added Statement;

8. The Programme Management Technique;
9. Social Responsibility Annual Report ;
10. Multi-Dimensional Technique ;
11. Goal-oriented Approach ;
12. Social Overhead Model;
13. Lowe and Spark's Social Responsibility Budget;

VII. GLOBAL INITIATIVES IN CSR REPORTING

So far as Corporate Social Responsibility and its reporting is concerned, various initiatives were also taken at the global level and some of the important initiatives are presented below:

Earth Summit Agenda 21

Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System, Governments, and Major Groups in every area in which human impacts on the environment. Agenda 21 contains 40 chapters relating to various issues concerning environmental issues of which one chapter i.e. chapter 30 is exclusively devoted on the role of business and industry in this regard. The annual reporting on environmental issues by the industry and business houses was one of the requirements amongst others.

UN Global Compact 2000

The United Nations had initiated in 2000 a Global Compact to encourage the businesses to adopt sustainable and social responsibility policies and to report on their implementation. This is a framework based on the Principles in the areas of Human Rights, Labour, Environment and Anti Corruption. Under the Global Compact the companies are brought into through the cities program with UN Agencies. In India at present there are 280 members of the UN Global Compact in India.

Social Accountability 8000

SA 8000 is an independent third party verification system covering all the core labour rights. The SA 8000 standards sets out clear and verifiable rules that cover all core labour rights contain in the widely accepted ILO Convention, the United Nations Universal Declaration of Human rights, the UN Convention on child rights and the United Nations Convention to eliminate all the discrimination against women.

Global Reporting Initiative 2002

The Global Reporting Initiative (GRI) aims to make reporting on economic, environmental and social performance as a routine and comparable as financial reporting in all organizations. The idea for developing a framework for sustainability reporting was conceived in 1997, with the draft GRI Sustainability reporting Guidelines released in 1999. Initially twenty organizations based their sustainability reports on the guidelines. In 2006, more than 850 organizations

worldwide released sustainability reports based on the GRI Sustainability Reporting Framework and Guidelines.

Integrated Reporting

The most important initiative in recent years is the Integrated Reporting Framework as implemented through International Integrated Roprting Council (IIRC). IIRC is a global coalition of regulators, investors, companies, standard-setters, accounting professional, academia and NGOs. The coalition promotes communication about value creation as the next step in the evolution of corporate reporting. Over the past decade, Indian Companies have increasingly focussed on investing in managing and reporting on environmental and social aspects. In 2017 the Securities Exchange Board of India (SEBI) endorsed the voluntary adoption of integrated reporting. The increased awareness, investor expectations and perceived benefits have resulted in more than 30 companies adopting integrated reporting in India through the last financial year (integratedreporting.org).

The KPMG International Survey of Corporate Social Responsibility Reporting 2005 (www.kpmg.com) has identified the following drivers of Corporate Responsibility in the order of their importance as stated below :

a. Economic consideration
b. Ethical consideration
c. Innovation and Learning
d. Employee motivation
e. Risk management or Risk reduction
f. Access to capital or increased shareholders value
g. Reputation or brand
h. Improvement in market position (market share)
i. Strengthened supplier relationship
j. Cost saving
k. Improve relationship with governmental authorities
l. Other factors.

VIII. CSR REPORTING : INDIAN PRACTICES

A study was conducted in 2016-17 relating to corporate social responsibility, its nature, pattern of expenditure, CSR reporting etc. and its early impact. From the BSE Top 200 companies, data were collected from Annual reports of 57 companies. Since, the implementation date of CSR Rule according to the Companies Act, 2013 was 1st April 2014 the Annual Reports are segregated into two parts 'before' and 'after' the implementation of CSR rule. The selected companies are categorised into different industry groups and also according to the age, profit and turnover.

TABLE 1

CSR Reporting according to types of companies before and after the Companies Act, 2013

Industries	No. of Companies	Before		After	
		No.	%	No.	%
Banking	7	5	71.43	5	71.43
Petrochemicals	5	5	100	5	100
IT-Software	2	1	50	2	100
Pharmaceutical industries	6	3	50	5	83.33
Electrical, Power Generation & accessories	5	3	60	4	80
Cement & Construction companies	5	4	80	5	100
Automobile & Accessories	6	6	100	6	100
Fast Moving Consumer Goods	4	1	25	3	75
Steel/Sponge Iron/Pig Iron	2	2	100	2	100
Miscellaneous	15	9	60	14	93.33
Total	57	39	68	51	89

Before the Companies Act, 2013 and CSR Rules 2014, 68% of the sample companies had reported their CSR activities in their Annual Reports or stand alone report/web site. However, after the Companies Act and CSR Rules, the reporting has increased to 89%.

TABLE 2

Paired t-test of CSR Reporting before and after the Companies Act, 2013

Paired Samples Test									
		Paired Differences					T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Before Policy – After Policy	-1.20000	1.54919	.48990	-2.30823	-.09177	-2.449	9	.037

It is observed that there is significant difference in CSR reporting before and after the CSR Rules, since the t-value is -2.449 at 9 degrees of freedom is highly significant as the significance value for two tailed test is 0.037. Therefore, the null hypothesis is rejected and hence it can be said that there is significant difference in CSR Reporting before and after CSR rules.

TABLE 3

Website Reporting by the companies after the Companies Act, 2013

Industries	No. of Companies	Reported	% Reported
Banking	7	3	42.86
Petrochemicals	5	5	100
IT-Software	2	2	100
Pharmaceutical industries	6	5	83.33
Electrical, Power Generation & accessories	5	4	80
Cement & Construction companies	5	5	100
Automobile & Accessories	6	6	100
Fast Moving Consumer Goods	4	3	75
Steel/Sponge Iron/Pig Iron	2	2	100
Miscellaneous	15	12	80
Total	57	47	82

One of the requirements of the CSR Rule is the web reporting. The present study observed that 82% of the companies have reported in their website about the CSR performance. In the case of petrochemicals, IT, Cement and Construction, Automobiles and Steel all the companies under study have done web reporting. The banking sector is lagging behind in web reporting. Only 43% of the banks i.e. only 3 out of 7 have done web reporting in the year 2015-16.

Based on the registered office of the sample company, the companies are classified on the basis of five regions i.e. North, North Eastern, Eastern, Western and South Indian. The CSR spending on an average based on 11 companies of North India is 1.86% which is near the mandatory requirement. The North Eastern region although represents the highest CSR spending of 3.05% but cannot be taken as representative since the sample represents one company only. In case of Western India and Southern India the CSR spending of the sample companies in percentages are 1.50 and 1.52 respectively. The situation of companies located in Eastern India is a matter of concern with the CSR spending of 0.18% of the average profit. Sarkar and Sarkar (2015) have also observed to reduce the welfare gap by CSR.

On an analysis on the pattern of CSR expenditure by the sample companies before and after the Companies Act, before the introduction of the CSR Rules the spending pattern indicates that around 61% of the companies spent on 'Health, Hygiene and Sanitation' and 'Education' each. This is followed by spending in the area of environment protection (25%), empowerment and gender inequality (23%), drinking water (19%), sustainable livelihood (19%), community development (19%) and vocational training & skill development (18%).Not a single company has spent under the head 'animal husbandry,' PM's Relief Fund, entrepreneurship, Spirituality and financial literacy before the CSR Rules.

However, after the introduction of CSR Rules, it is observed that most of the companies have spent in the areas of health, hygiene and sanitation and education (79% each). This is followed by vocational training and skill development, environment protection, rural development, drinking water, sustainable livelihood and empowerment and gender inequality at 44%, 39%, 30%, 28%, 26% and 25% respectively.

However, in the areas of disaster relief fund (12%), infrastructure development (14%), sports (14%), national heritage and culture (11%), eradicating hunger, poverty and malnutrition (11%) and community development (9%) have been also spent by the companies. The only area that none of the company has spent on is the armed force welfare after the CSR Rules.

According to data available for 7334 companies, CSR spending during 2014-15 collected by Ministry of Corporate Affairs, out of the total prescribed expenditure of Rs.11883 crores, Rs. 8803 crores have been spent (74%) on CSR. Interestingly the CSR spent by top 10 companies is 32% of the total CSR spent. The same report of the Ministry of Corporate Affairs revealed that the top 5 States on CSR spending (in crore) have been Maharashtra (Rs.1101.71), Tamil Nadu (Rs.446.98), Karnataka (Rs.363.05), Gujarat (Rs.291.65) and Chattisgarh (Rs.275.37) (MCA,2016).

Statutory Annual Report Format for CSR Reporting was introduced for the first time in India in 2014. A survey conducted by KPMG revealed that in the year 2017-2018, 90% of the sample companies had prepared CSR report in the prescribed format (KPMG, 2018).

IX. SUGGESTIONS AND CONCLUSIONS

Based on our case study, some important suggestions may be made.

1. It is to be ensured that the companies required to spend on CSR as per the Companies Act, 2013 must spend the minimum required amount and if they fail to do so, it should be deposited in some common fund to be maintained for the purpose. The details may be worked out by the Ministry of Corporate Affairs, Government of India.
2. In order to avoid manipulation, some more measures are to be taken to check diverting the CSR fund by the company themselves for fulfilling their own objectives.
3. CSR spending should not widen the regional disparities by spending more in developed area and lagging behind the industrially less developed and underdeveloped area.
4. It is necessary to take appropriate measures to ensure that the CSR spending is made by the concerned company under the Rule and if they fail to do so penal provisions should be included in the Rules. Simple explanation is not enough.
5. Comprehensive reporting format should be prepared for CSR Reports indicating all the details. Integrated Reporting may be adopted to minimise the cost of reporting.
6. CSR during the operations of the business should also be reported alongwith report of post profit performance. Now–a-days, CSR is

understood generally in terms of post profit spending. Preventive steps and measures should also be reported in the CSR Reports.

7. CSR spending should not widen the gap between the States and appropriate steps should be taken in this regard.

Social responsibility of business in India has been practised from time immemorial. In recent years, business ethics and CSR are being practised by the companies in the context of National Voluntary Guidelines and other measures adopted by SEBI and Govt of India. In addition to that, the Companies Act 2013 is a landmark legislation in this regard. It will go a long way for companies to participate for the social cause and it is expected that CSR spending will positively influence in solving social problems which will ultimately address the Triple Bottom Line issues. It will also help in sustainable development of business.

The paper is not, however, free from certain limitations, viz., low sample size, simple analysis of data, etc. Still, it is a pointer to undertaking another study on CSR reporting practices in india for further interactions.

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Indian Accounting Review
Vol. 23, No. 2, December 2019

Effect of Shareholding Pattern on Financial Performance: An Empirical Study of Pharmaceutical Companies in India

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ABSTRACT

Shareholding pattern of a firm is considered to be one of the important determinants of firm performance. Indian pharmaceutical industry has been witnessing significant growth over last two decades. This paper aims to examine how different categories of shareholders influence financial performance of a firm. The study uses a data set of 17 pharmaceutical companies listed in Bombay Stock Exchange (BSE) of India for the period from 2001 to 2015. Empirical analyses using panel data regression models shed light on the relation between ownership structure and firm performance. The results indicate that shareholding pattern of pharmaceutical companies in India has no significant impact on its financial performance.

Key words: Shareholding pattern, Firm performance, Pharmaceutical industry India, Panel Data Regression

I. INTRODUCTION

Background and Rationale

The relationship between corporate ownership structure and performance has been an important and ongoing discourse and produced debate in the corporate governance and finance literature during last two decades. It has received considerable attention of policy makers, regulators, business managers, investors, academicians, researchers, and other stakeholders because of two important events that cropped up into the economy throughout the world having influence on corporate governance system. First, globalization led to the integration of financial markets of economies. Second, the proliferation of high profile corporate scandals, collapse of giant companies and stock market crashes that took place both in India and abroad in last two decades. It was further fuelled by Asian Financial Crisis of 1997 and Global Financial Crisis that started in 2007-2008.

Since independence, India largely has followed centrally planned socialistic model of economic growth with strict government control over private sector

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participation, foreign trade and Foreign Direct Investment (FDI). A major balance of payment crisis triggered the economic liberalization process and market reforms in 1991 which made an end to a lot of regulations that hindered the economic growth and restriction on the movement of capital. Thus, in the post-liberalization era because of free flow of capital, abolition of restrictive legislation, reorganization of financial system and market; the participation in the equity market has become much more broad-based, resulting in more diffused ownership structure of the corporate bodies. The promoters of new age information technology and telecom industries become, to a great extent, first generation entrepreneurs. The executive compensation and remuneration pattern like Employees Stock Option Plan (ESOP) also influence the ownership structure. In addition, ownership structure undergoes a huge change due to merger and acquisition and also, a target (for acquisition) may deliberately change its ownership structure through buyback of shares and other strategic moves as a measure of defense. The primary equity market in India has witnessed a tremendous growth during last twenty years. The general perception is that the globalisation process driven by stock market liberalisation, foreign portfolio investments, mergers and acquisitions across borders, and other economic events have resulted in substantial diffusion and alteration of the traditional shareholding pattern of the Indian companies.

With the opening up of economies of countries due to globalization, the quality of corporate governance has become a key factor for survival and success of firms and also a source of competitive advantage to improve the performance of firms and the ability of a firm to raise funds from capital markets. Therefore it is crucial to design and implement a dynamic mechanism of corporate governance, which protects the interests of relevant stakeholders without hindering the growth of enterprises.

Effective corporate governance mechanisms include internal mechanisms and external mechanisms. The corporate governance reforms in India have mainly focused on internal governance mechanisms. Ownership structure is one of the key internal governance mechanisms considered to mitigate governance problems of firms. Ownership structure refers to the shareholding pattern of a company. It means the categories of shareholders who have stake in the company. In the present study, two terms, shareholding pattern and ownership structure have been used interchangeably since they are synonymous.

On the other hand, Indian pharmaceutical industry has been witnessing significant growth over last two decades. India enjoys an important position in the global pharmaceuticals sector. The Indian pharmaceuticals market is the third-largest in terms of volume and thirteenth-largest in terms of value. India is the largest provider of generic drugs globally. Indian pharmaceutical sector supplies over 50 per cent of global demand for various vaccines, 40 per cent of generic demand in the US and 25 per cent of all medicine in UK. Presently over 80 per cent of the antiretroviral drugs used globally to combat AIDS (Acquired Immune Deficiency Syndrome) are supplied by Indian pharmaceutical firms. The drugs and pharmaceuticals sector attracted cumulative FDI inflows worth US$ 15.98 billion between April 2000 and March 2019, according to data released by the Department of Industrial Policy and Promotion (DIPP). Pharmaceutical export from India stood at US$ 17.27 billion in 2017-18, and is expected to grow by 30 per cent to reach US$ 20 billion by the year 2020. The size of the Indian

pharmaceutical market increased from USD 6 Billion in 2005 to USD 33 Billion in 2017. It is expected to expand at a CAGR of 22.4 per cent over 2015–20 to reach US$ 55 billion and become one of the largest pharmaceutical markets in the world by 2020. Against this backdrop, the study particularly seeks to investigate how the shareholding patterns influence the financial performance of the pharmaceutical companies in India.

Statement of the Problem

The central concern of plethora of research in corporate finance is the relationship between ownership structure and firm performance. Theoretical and empirical research analysing this relationship was originally initiated by Berle and Means (1932). They opined that a positive correlation exists between ownership concentration and firm performance. The debate started with the Agency Theory by Jensen & Meckling (1976). Agency Theory posits that separation of ownership and management gives birth to conflict of interests among the managers and shareholders. This is referred to as 'Conflict of Interest Hypothesis'. Further, the debate got a gear when Demsetz (1983) put a counter argument by observing that there is a positive correlation between diffused ownership structure and firm performance.

Moreover, different shareholder types have different incentives, control means and utility functions. Identity of shareholders has important implication for corporate governance as different category of owners have different goals with regard to profit and dividend, capital structure, power and control, and growth of the firm. For each of the shareholders, preferences regarding company strategy will involve a trade-off between the pursuit of shareholder value and other goals. As a consequence, the type of the owner would influence the firm's strategy making, policy implementation and performance. The sensitivity of shareholding pattern to firm performance is expected to vary across different groups of shareholders. For this reason, identification of ownership structure which will enhance the performance and value of the firm is important.

Given the importance of company's shareholding pattern in corporate governance mechanisms, studies on shareholding pattern and performance of firms have yielded non-conclusive empirical findings. Therefore, there is a need to investigate and shed more light on the effect of shareholding pattern on a firm's performance. Against this backdrop, the study seeks to investigate how the shareholding patterns influence the financial performance of the pharmaceutical companies in India.

II. OBJECTIVE AND DESIGN

The objective of the study is to examine the impact of shareholding pattern on financial performance of select pharmaceutical companies listed in India.

The remainder of the paper is organized as follows: Section III contains a review of literature. Section IV explains research methodology. Section V reports the empirical results and provides a discussion of the results. Section VI concludes the paper with policy implications. The last section gives limitations of the study and future research direction.

III. REVIEW OF LITERATURE

There exist plethora of studies on the relationship between shareholding pattern and firm performance around the world. A substantial number of studies that examined the relationship between managerial shareholding and firm performance, like Bhagat and Bolton (2008), Cho (2008), Chung *et al.* (2008), Demsetz and Villalonga (2001), Douma *et al.* (2006), Imam and Malik (2007), Unuigbe and Olusanmi (2012), have found a positive relationship. On the other hand, some studies like Dwivedi and Jain (2005), Belkhir (2005), Irina and Nadezhda (2009), Tsegba and Herbert (2011), Liang *et al.* (2008) found that there is a negative relation while few studies such as Chang (2009), Himmelberg *et al.* (1999), Mohammad (2011), Roszaini and Mohammad (2006) found that there is no relationship between managerial shareholding and firm performance. Xu *et al.* (2005), Imam and Malik (2007), Choi *et al.* (2007), Sarkar and Sarkar (2000), Unuigbe and Olusanmi (2012), Khanna and Palepu (2013), Douma *et al.* (2006), Dwivedi and Jain (2005), Mitra and Sana (2016) etc. found a positive relationship between foreign shareholding and firm performance. Again, Chibber and Majumder (1999), Kumar (2004), Tsegba and Herbert (2011) found that there is no relation between the two. A large number of studies found a positive relationship between institutional shareholding and firm performance**.** Studies done by McConnel and Sarvaes (1990), Xu and Wang (1999), Irina and Nadezhda (2009), Harjoto and Jo (2008), Liang *et al.* (2011), Imam and Malik (2007), Choi *et al.* (2007), Douma et al. (2006), Fazlzadeh *et al.* (2012), Al-najjar (2015) Mitra and Sana (2016) have confirmed it. On the contrary, Mizuno (2010), Mura (2007), Dwivedi and Jain (2005), Unuigbe and Olusanmi (2012), found that there exist a negative relationship between institutional shareholding and firm performance.

The review of available literature shows that the findings are not conclusive and the spectrum of results is wide. Most of the studies are done in the context of foreign countries and there is dearth of literature in Indian context studying the impact of shareholding pattern on corporate performance. Further, there is absence of any sector-specific study in Indian context in general and pharmaceutical companies in particular. Again, in India, hardly any study has considered the categories of ownership as provided under clause 35 and 40A of the Listing Agreement of SEBI. This study, therefore, proposes to bridge the above mentioned gaps.

IV. RESEARCH METHODOLOGY

Sample Selection, Data Sources and Period of Study

The empirical analysis is based on a subset of the 200 companies that are included in the BSE 200 Index listed on Bombay Stock Exchange (BSE) of India. This study is confined to BSE listed companies because all the listed companies are required to follow the norms set by SEBI for disclosing ownership or shareholding pattern and announcing the accounts for financial results. Purposive sampling has been used to select the listed companies from the population of BSE 200 Companies. The sample is selected by applying the following filters:

Firstly, we have selected only pharmaceutical companies due to the reasons mentioned in the introductory part of the study.

Secondly, we have kept out all those companies which were not listed for all

the fifteen years under consideration.

Finally, to have a balanced panel, the number of companies was further reduced due to non-availability of complete data for the period under study.

The above sample selection criteria resulted in a final sample size of 17 pharmaceutical companies.

The firm level panel data for the study has been collated from the corporate database Capitaline Plus. The study spans over a period of 15 years from 2001 to 2015. The present format of disclosure requirement of ownership pattern of listed companies in India as per clause 35 of Listing Agreement of SEBI became effective since March, 2001. This also limits the study of data prior to this period.

Key Variables

Independent variables of the study are based on relevant data available from the mandatory disclosure requirements under Clause 35 and 40A of the Listing Agreement of SEBI. Four major groups of equity shareholders which are Indian Promoters (IP); Foreign Promoters (FP); Non-Promoter Institutions (NPI) and Non-Promoter Non-Institutions (NPNI) are considered as independent variables. Shareholding is calculated by dividing the number of shares held by the respective category of shareholders by the total number of outstanding shares as on 31st March of every year throughout the study period. In order to control for the other possible determinants of performance, some observed company characteristics have been included as control variables. The control variables used in the study have been selected with reference to those employed in earlier empirical studies which are Age, Size and Leverage. Firm age has been calculated as the number of years between the observation year and the firm's incorporation year while firm size is measured using natural logarithm of net sales for each year and debt-equity ratio has been considered as proxy for firm's financial leverage.

Financial performance measured by Return on Assets (ROA) is taken as dependent variable. ROA is an accounting-based measure widely used in corporate finance literature for measuring financial performance. ROA is defined in this study as operating profit before tax (EBIT) at the end of each financial year divided by book value of total assets for the same period. The higher ROA indicates efficiency on the part of management to use firm's assets to maximise shareholders investment. In contrast, lower values of ROA suggest less effective management and governance mechanisms in place. ROA is an indicator of short-term performance. However, it has been criticised on the grounds that this measure is subject to managerial manipulations due to changes of accounting policies relating to depreciation, inventory valuation, treatment of certain revenue and expenditure etc. Again, it may not reflect economic earnings and the book value of assets may not reflect the market values. Notwithstanding these drawbacks, ROA is preferred in this study because it is not influenced by the capital structure and size of a particular firm and therefore allows for straight forward comparison across firms. Hence, it is suitable to use ROA in this study.

Econometric Tools for Analysis

For empirical analyses, panel data analysis has been employed because the data of selected variables consists of 17 firms for a period of 15 years. Panel data analysis is a method used to estimate the economic relationship with cross section

series which has time dimension. The methodology adopted is justified because it allows overcoming the unobservable, constant and heterogeneous characteristics of individual firms and also the potential endogeneity (to some extent) between dependent and independent variables. Therefore, the study employed the panel data regression to analyse the impact of ownership structure on firm performance. The base line econometric model is represented as follows:

$$\text{Performance}_{it} = \alpha + \beta\,(\text{Ownership Variables})_{it} + \Upsilon\,(\text{Control Variables})_{it} + \mu_{it}$$

Where, Performance_{it} = Financial performance is measured by ROA of i-th firm at time period t.

$(\text{Ownership Variables})_{it}$ = Percentage of respective category of ownership (i.e., shareholding) by the firm i at time t, [here, IP, FP, NPI, NPNI are ownership variables which denote shareholding by Indian Promoters, Foreign Promoters, Non-Promoter Institutions and Non-Promoter Non-Institutions respectively];

$(\text{Control Variables})_{it}$ = Variables other than ownership variables (Age, Size and Leverage) that affect the performance of i-th firm at time period t;

α = Intercept or Constant term;

β and Υ = Parameters of the explanatory variables to be estimated;

μ_{it} = Error term.

There are two panel data regression models (fixed effect model and random effect model) having different assumptions for error term. Kohler and Kreuter (2005) stated that the rationale behind random effects model is that unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. Zhou (2001) has argued that fixed effects estimation is not necessary in terms of ownership, as the ownership structure, in general, does not vary over time for a specific firm. According to Oscar Torres-Reyna (2007), fixed-effects will not work well with data for which within-cluster variation is minimal or for slow changing variables over time. Again, since the study is based on a sample drawn from a population, random effects model is more appropriate method. Random effect allows generalizing the inferences beyond the sample used in the model. For the reasons stated above, a large number of studies have used this technique to examine the relationship between ownership structure and firm performance.

V. EMPIRICAL RESULTS AND ANALYSIS

Summary Statistics

Summary statistics of the variables employed in the empirical analysis are displayed in Table 1.

TABLE 1

Summary Statistics (N= 255)

Variable	Mean	Std. Deviation	Min	Max
ROA	21.15	19.43	22.55	222.20
IP	46.41	23.88	0	75
FP	7.69	17.65	0	75
NPI	23.00	12.96	0.01	71.32
NPNI	21.80	11.91	5.96	82.06

Age	35.47	22.27	2	91
Size	3.08	0.45	1.78	4.01
LEV	0.63	0.64	0	3.47

Summary statistics indicates the mean, standard deviation, minimum and maximum values of all the variables for 255 firm year observations. The analysis of mean value clearly depicts that the stake of Indian Promoters (IP) was high (46.41%) during the study period. It means that on an average, the sampled pharmaceutical companies in India were dominated by Indian Promoter holdings and their stake. While the average foreign promoter (FP) holdings was just 7.69% during the study period, the average holdings of non-promoter institution (NPI) was at 23% and the share of non-promoter non-institutions (NPNI) was 21.80%.

Pair-wise Correlations

TABLE 2

Pair-wise Correlation Matrix (N = 255)

	IP	FP	NPI	**NPNI**	**AGE**	**SIZE**	**LEV**
IP	1.0000						
FP	-0.7589	1.0000					
NPI	-0.4444	0.0325	1.0000				
NPNI	-0.3222	0.0413	-0.3457	1.0000			
Age	-0.6454	0.6784	0.2334	0.0784	1.0000		
Size	-0.1347	0.0790	0.5415	-0.5267	0.2827	1.0000	
LEV	0.3269	-0.3726	-0.1751	0.1521	-0.4237	-0.2057	1.0000

Pair-wise correlations are reported in Table 2. Pair-wise correlations among the explanatory variables can serve as a warning regarding multi-collinearity and against simultaneous inclusion of heavily correlated variables in the same regression. The highest pair-wise correlation is that between Indian Promoter (IP) and Foreign Promoter (FP) at 0.7589, so problems arising from multi-collinearity are not envisaged[1].

Partial Correlation

Pearson's Correlation Matrix is used to measure the degree of association between the variables. Result shows that only two independent variables namely, FP and NPI have significant positive correlation with the dependent variable ROA while leverage has a negative correlation with the performance variable ROA. However, the correlation does not prove causation as the causal relationships is analysed using the regression analysis.

TABLE 3

Partial Correlation Matrix (N = 255)

	ROA
IP	0.0987 (0.120)

[1]Rule of thumb is that if the pair-wise correlation coefficient between two regressors is in excess of 0.8, then multicollinearity is a serious problem (Gujarati, 1995).

FP	0.1224* (0.054)
NPI	0.1126* (0.076)
NPNI	0.0794 (0.212)
Age	0.0423 (0.506)
Size	-0.0383 (0.547)
LEV	-0.2436*** (0.000)

***(1% significance level), *(10% significance level) Figures in brackets are p values.

Regression Analysis

For the purpose of regression analyses the effect of ownership structure (each for IP, FP, NPI and NPNI) is first tested as independent variable and firm performance (ROA) as dependent variable. Three variables (Age, Size and Leverage) are then entered as control variables in the subsequent model. The control variables are entered in this way so that the stability of the regression coefficients of the main independent variables can be assessed (Tsui *et al.*, 1992).

TABLE 4

Results of Random Effect Panel Regression

Variables	Model 1 ROA	Model 2 ROA
IP	01.03 (0.301)	1.56 (0.119)
FP	2.10** (0.036)	1.94** (0.053)
NPI	1.42 (0.156)	1.78* (0.075)
NPNI	0.82 (0.410)	1.25 (0.211)
Age	-	0.67 (0.506)
Size	-	-0.60 (0.546)
LEV	-	-3.95 (0.000)***

Variables	Model 1 ROA	Model 2 ROA
Constant	-0.45 (0.656)	-0.52 (0.602)
Wald chi2	Wald chi2(4) =26.06 Prob > chi2 = 0.0000	Wald chi2(7) = 46.94 Prob > chi2 = 0.0000
R-sq: within between overall	0.0011 0.7355 0.0944	0.0604 0.7920 0.1597
N =	255	255

***(1% significance level), **(5% significance level), *(10% significance level). Figures in brackets are *p* values.

The result shows that, in Model 1, only FP has significant positive impact on ROA whereas IP, NPI and NPNI have no significant impact on ROA. Again, when the control variables are included in the regression equation in Model 2, the result shows a positive significant impact of both FP and NPI on ROA but the result failed to detect any effect of IP and NPNI on ROA. The result in model 2 also shows that leverage has a significant negative effect on firm performance while firms' age and size have no effect on ROA.

However, a considerable number of studies have used fixed effects panel data model in analysing the association between ownership and firm performance. Since there is a debate in the literature on whether to use fixed or random effects, despite having a strong justification for the random effects model (as mentioned earlier), this study uses the Hausman Specification Test (Griliches and Hausman, 1986) to determine the appropriate model between the two. The null hypothesis is that individual effects are not correlated with the other regressors in the model. The result of Hausman test is depicted below.

TABLE 5

Hausman Test Results

Model No.	Dependent Variable	Chi-Square Statistics	Degree of Freedom	p- value (Prob >Chi 2)
1 (without control variables)	ROA	24.43	7	0.0010
2 (without control variables)	ROA	11.05	4	0.0260

The results of Hausman test show that Chi-Square statistics is significant ($p << 5\%$) in both the models meaning that the null hypothesis (random effect is appropriate) stands rejected. In other words, it suggests that the fixed effect model is the appropriate panel data estimator for ROA. Therefore, the fixed effects panel regression is now employed to estimate the impact of shareholding pattern on firm performance.

TABLE 6

Results of Fixed Effect Panel Regression

Variables	Model 1 ROA	Model 2 ROA
IP	1.44 (0.151)	1.88 (0.061)*
FP	0.55 (0.586)	0.86 (0.391)
NPI	0.87 (0.384)	1.04 (0.299)
NPNI	0.60 (0.552)	0.92 (0.358)
AGE		-1.02 (0.310)
SIZE		1.23 (0.219)
LEV		-4.14*** (0.000)
Constant	-0.82 (0.414)	-14.422 (0.526)
F-test	F(16, 234) = 1.32 Prob > F = 0.1873	F(7,1239) = 8.28 Prob > F = 0.0000
R-sq: within between overall	0.0384 0.4980 0.0474	0.0447 0.0023 0.0047
Number of groups	17	17
N =	255	255

*** (1% significance level), * (10% significance level), Figures in brackets are *p* values

The results of fixed effect panel regressions are exhibited in Table 5. Following similar approach as earlier (i.e., random effect model), in Model 1 the effect of ownership structure (each for IP, FP, NPI and NPNI) is first tested as independent variable and firm performance ROA as dependent variable. Three variables (Age, Size and Leverage) are then entered as control variables in Model 2 to check the consistency of the regression coefficients of the main independent variables.

Results reveal that none of the ownership variables namely IP, FP, NPI and NPNI have any significant impact on firm performance in Model 1. Again, when the control variables are included in the regression equation in Model 2, the result shows a positive (at 10% level of significance) impact of IP on ROA but the results

fail to detect any effect of FP, NPI and NPNI on ROA. However, the effect of control variables namely Leverage has a significant negative effect on firm performance but age and size has no impact on firm performance. In our study, the arguments of Zhou (2001) and Oscar Torres-Reyna (2007) are not established due to the variation of ownership structure. Since the pooled OLS estimators are biased and inconsistent in fixed effects model and the usual standard errors of the pooled OLS estimator are incorrect in random effects model, only random effects vs. fixed effects estimation have been considered in this study through the Hausman specification test. Therefore, fixed effects model is appropriate for analyze the impact of shareholding pattern on firm performance.

Discussion and Analysis

Fixed effects regression result show that shareholding by Indian Promoters have no significant effect on firm performance measured by ROA in model 1, however, Indian Promoters have a significant effect on firm performance measured by ROA in model 2. This indicates that Promoters have the ability and incentive to monitor and control managers in order to run the company for the benefit of the shareholders.

The fixed effects regression results also reveal that, foreign promoters' shareholding has a significant positive impact on corporate performance. This finding does not support Convergence of Interest Hypothesis. Promoters' main aim is to generate wealth for them and the findings of this study corroborate that foreign promoters' shareholding is having a positive significant effect on firm performance. This finding does not support the Efficient Monitoring Hypothesis and the Resource Based Theory. These indicates that the foreign promoter's managerial expertise and innovative management practices, latest technology and technical collaboration, and links to various other resources are not useful to improve operating efficiency and performance of the company. Our results are not consistent with Douma et al, (2006), Dwivedi and Jain (2005), and Kaur and Gill (2008).

Fixed effects regression result also shows that the shareholding by Non-Promoter Institutions (NPI) has no significant impact on firm performance. Non promoter-institutions are the institutional investors comprising of entities (like banks, mutual funds, pension funds, insurance companies etc.) pooling large amounts of money to in invest in companies. This finding indicates that Non-Promoter Institutions (NPI) in terms of institutional investors are not effective in improving performance due to their incapability to focus on profit objective and monitoring managers to act in the best interest of their clients. Moreover, institutional investors cannot monitor and control management more effectively to increase the firm's valuation. Our results are not consistent with McConnell and Servaes (1990); Han and Suk (1998); Choi *et. al*, (2007); Imam and Malik, (2007); Uwuigbe and Olusanmi, (2012).

Fixed effects regression result also show that Non-Promoter Non-Institutions (NPNI) are small retail investors who are scattered and cannot monitor management because cost of monitoring is higher than benefits expected. Therefore, NPNI have no impact on firm performance. The result of this study confirms it. The results are in line with the findings of Kumar (2004) as well as Mittal and Kansal (2007). These non-institutional investors comprise individual investors, bodies corporate

and others who constitute minority class of shareholders. These non-controlling minority shareholders are not expected to exert any influence on performance of the company.

Fixed effects regression analyses indicate that firm performance is not influenced by its age or size. Again, fixed effects results show that leverage has a significant negative effect on performance. Leverage as a governance mechanism is expected to enhance firm performance through effective monitoring by lending institutions. Modigliani and Miller (1958) stated that, the market value of a firm is independent of its capital structure. However, in presence of corporate tax, firm value should increase with the amount of leverage. Agency Theory suggests that debt is considered a good mechanism to make the managers more disciplined. This may be attributed to passiveness of the role of lending institutions to put pressure on the managers of the firm to enhance performance. The disciplinary effects associated with leverage may also be cancelled out due to increasing costs of borrowing associated with the money markets. The negative impact implies that less levered firms have higher firm value. Possible explanation for this inverse relationship may be that when the firms earn profits, they either reinvest profits to finance new ventures or pay off their debts so that the shareholders may benefit from greater dividend disbursements in the future. This argument is referred to "Pecking-Order Theory" (Myers, 1977).

VI. CONCLUSION

The study has examined empirically the relationship between shareholding pattern and financial performance of pharmaceutical companies in India using a balanced panel of BSE 200 Index companies over 2001 – 2015. It documents that unobserved firm heterogeneity explains a large fraction of cross-sectional variation in firm performance that exists among Indian pharmaceutical companies. The fixed effects regression results show that there is no consistent significant impact of shareholding pattern on firm performance. Therefore, it may be concluded that, shareholding pattern of pharmaceutical companies in India has no significant impact on its financial performance. This has been described by Demsetz and Lehn in the year 1985 and They described that corporate performance depends on environmental constraints; it has nothing to do with the ownership structure. They opined that all structures are equal. So performance has no relationship with the ownership structure and it is dependent on internal and external environment. This theory is known as 'Neutrality Hypothesis' which argues that concentrated or diffused ownership is not associated with better operating performance or higher valuation of a firm. Again, the plausible explanation for this insignificant effect may be due to "natural selection argument". The argument is that, corporations perform equally well under different ownership structures because market competition will eliminate all inefficient forms in the long run. Thus the selection of optimal ownership structure depends on the environment and there is no effect of ownership structure on performance. Another argument put forth to describe the non observable effect is "mutual neutralization argument". According to this argument, the positive and negative effects of different mechanisms offset each other and result in neutralization (Himmelberg et al. 1999). The results of the study support as well as contradict some of the conventional wisdom. Our study does not support the Convergence of Interest Hypothesis, Efficient Monitoring Hypothesis

and the Resource Based Theory. The sensitivity of ownership structures to firm performance is expected to vary across different groups of ownership owing to a number of reasons. Differences in the prevailing corporate governance practices, the origins of the legal system, the estimation techniques employed, control for potential endogeneity, measurement of ownership structures and performance variables, selection of sample size and sample periods are some of the reasons for the diversity of the empirical findings on this topic.

VII. LIMITATIONS AND FUTURE RESEARCH DIRECTION

Limitations of the Study

Limitations are the constraints on the ability to generalize the result. Like other empirical studies, this study may suffer from many limitations which need to be acknowledged. The following are the limitations of the study:

The study is based on 17 pharmaceutical companies in India. Therefore, the results of the study cannot be generalized.

The present study considers four major groups of equity ownership which is based on the mandatory disclosure requirements under Clause 35 and 40A of the Listing Agreement of SEBI, whereas there are other categories of ownership such as family ownership, managerial ownership and state ownership that have not been considered. The study has employed only one measures of performance. There are other forms of measures that can also be used as proxy for companies' performance.

There are several factors that may influence firm's performance. However, their effect on the results of the research has not been examined. Only three control variables namely age, size, and leverage have been considered.

The study is primarily based on the assumption that ownership and performance variables are not endogenous variables. Therefore, this study does not resolve the problem of endogeneity which require different econometric tools for analysis.

Last, but not the least, limitations relating to measurement of performance on accounting-based return may also impair the findings of the study.

Potential Avenues for Future Research

The above limitations caution in generalisation of results of the study. Additionally, these limitations open up avenues for further improvement and research. The following issues have been felt to be explored further and hence been suggested for future research.

Given the diversity of empirical works, clearly additional research is needed to further test both the nature and the consistency of the relationship between shareholding pattern and performance considering a larger sample size and in other developing economies also.

The present study can be replicated by including all the companies in the population so that the effect of ownership on firm performance could be an area for further analysis.

Future research may investigate the ownership-performance relationship in respect of other industries to ascertain whether the current findings are sensitive or robust to different sample specifications.

Furthermore, to improve this study, additional control variables, such as, research and development expenditure, capital expenditure, growth, advertising expenses, etc. can be used in the model to ensure the robustness of the results. Other performance measures can also be used as proxy for financial performance, such as, Economic Value Added (EVA), Earnings per Share (EPS), Market to Book Value Ratio (M/B Ratio) and Return on Capital Employed (ROCE), Return on Equity (ROE), Tobin's Q Ratio, etc. Then, the results can be compared with this study. In addition, further study can compose the sample by including all the companies in the BSE 200 Index throughout the period; even the dropped out, merged, disappeared and taken over companies; to test the role of shareholding pattern in these unsuccessful companies.

It will be very much interesting to examine the impact of ownership structure on firm performance considering the endogeneity factor and thereby employing the methodology of Instrumental Variables (IV), Dynamic Panel Data (DPD), Generalized Method of Moments (GMM), etc. to analyse the same.

Finally, this study proposes to explore other way of relationship, i.e., the impact of the performance measures on the ownership structure of the companies. This may help to enhance the current understanding of how corporate shareholding pattern impact financial performance in a developing country.

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Indian Accounting Review
Vol. 23, No. 2, December 2019

Event Analysis of Carbon Disclosure Project India : A Step Towards Environmental Sustainability

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ABSTRACT

Currently worldwide economies consider that climate change is probably to impact their business and financial performance, market and investors. Now companies are increasingly disclosing carbon-related information. Carbon Disclosure Project (CDP) is started in 2000 with the aim of encouraging firms to measure and disclose their own greenhouse gas emissions, climate change risks, strategies, and actions. Since 2007 a number of Indian companies listed on the BSE 200 have joined the voluntary global CDP. In the present study, Event Study Methodology was used to find out whether carbon disclosure related to share price movements of sampled companies. It was concluded that investors cannot take advantage of Carbon Disclosure Project Report announcement.

Key words : Carbon Disclosure, CDP, Event Study, AAR, CAAR

I. INTRODUCTION

Nowadays worldwide economies recognize climate change and GHG emissions as a major challenge. The impact of climate change in the world include rising temperatures, rising sea levels, flooding, erosion and increasingly melting snow. The major cause of climate change is the greenhouse gas effect. It considers that climate change is probably to impact their business and financial performance, market and investors. Carbon emission has become an essential element in analyzing a company's risk profile, potential liabilities, and financial performance (Matsumura, Prakash, & Vera-Muñoz, 2010). Due to this, investors are increasingly interested in environmental, social and governance information about a company. For this purpose, in recent years other than securities market regulation, many initiatives have been taken to improve firms' reporting of this kind of information. Now companies are increasingly disclosing carbon emission related information. Carbon Disclosure Project was started with the aim of encouraging firms to disclose more information about their exposure to climate change in the year 2000. Under this, firms measure and disclose their own greenhouse gas (GHG)

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emissions, climate change risks, strategies, and actions.

The **Carbon Disclosure Project** (**CDP)** is an organization based in the United Kingdom which provides a coordinating secretariat and innovative forum for investor and corporate collaboration on Climate Change. Carbon Disclosure Project was established in 2000. CDP provides information regarding corporation's greenhouse gas emissions and Climate Change management strategies based on responses to its questionnaire. Responding to the CDP questionnaire by companies is absolutely voluntary. The first CDP report was published in 2003 and was based on responses from the 500 largest global firms. CDP has brought together the quantitative and qualitative disclosures in a database since 2005, explicitly referring to the distinction introduced in the Green-house Gas Protocol between Scope 1, Scope 2, and Scope 3 for the first time in 2006 (CDP, 2006).

CDP's supports investors to step up for carbon reduction in high emitting industries and to implement emissions reducing projects that generate positive return on investment (CDP, 2017). Major CDP programs are: Climate Change, Water, Supply Chain, Forests and Cities.

- CDP's questionnaire was focused on the information of companies related
- Management: Strategy, Targets, Communications
- GHG Inventory: 3 years, Scopes 1, 2 and 3
- Energy use
- Emissions reduction activities - quantify
- Identification of risks and opportunities

This facilitates a better understanding of company actions towards environmental risk, opportunity and impact and is essential for better comparability of data. Each company responses are assessed across four consecutive levels which represent the steps a company moves through as it advancement towards environmental stewardship.

In 2018, over 7,000 companies, worth more than 50% of global market capitalization, disclosed environmental data through this platform; it is more than 11% from the previous year. It represents 650 investors with US$87 trillion in assets (CDP India, 2019).

In 2007, CDP extended to India in collaboration with the World Wide Fund for Nature- India (WWF, India) and the Confederation of Indian Industry (CII) ITC Centre of Excellence for Sustainable Development (CESD) (CDP, 2007). The first CDP India Project targeted 110 of India's largest companies. On 1st February 2007 First Carbon Disclosure Project (CDP) Report Provides summary of responses of 39 Indian companies to the first information request sent by CDP5. CDP report, 2007 India represents a positive response of Indian companies to measuring, reporting and managing greenhouse gas emissions.

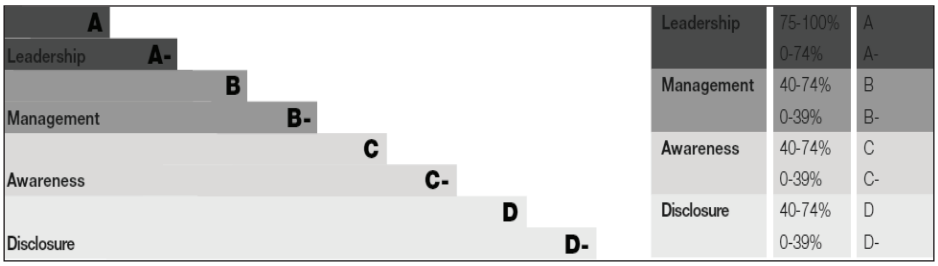
Indian companies have showed increased awareness and action on management of climate change issues. In 2018, 52 Indian companies responded to CDP's questionnaire, out of which 8 companies came forward on their own volition to disclose their climate impact to the CDP. 50 out of 52 companies stated having board-level oversight of climate-related issues and 44 of them provide incentives to the management for achieving targets. In 2018, the 52 reporting companies account a total reported emissions (Scope 1+2 [location-based]) of 299.7 MtCO2e.

This is over 14% of the national GHG emissions from the industrial and energy sectors (CDP India, 2019).

CDP identified companies with high-quality disclosure in its annual scoring process. Scores are calculated according to a standardized methodology which measures whether and how well, a company responds to questionnaire. Since 2016, CDP present scores evaluate a company's progress towards leadership using a 4 step procedure : **Disclosure** which measures the completeness of the company's response; **Awareness** considers the extent to which the company has assessed environmental issues, risks and impacts in relation to its business; **Management** which is a measure of the extent to which the company has implemented actions, policies and strategies to address environmental issues; and **Leadership** which looks for particular steps a company has taken which represent best practice in the field of environmental management"(CDP, 2016). A high CDP score company represents a company's high environmental awareness, advanced sustainability governance and leadership to address climate change.

FIGURE 1

Scoring level under CDP



F: Failure to provide sufficient information to CDP to be evaluated for this purpose.

Source : CDP, 2016.

TABLE 1

Top Indian Companies in CDP Index 2018

Companies	Sector	Scoring
CDP India Climate Change Leader 2018		
Infosys Limited	Information Technology	A
Climate Change Rising Stars		
IndusInd Bank	Financials	A-
Tata Motors	Consumer Discretionary	A-
Tech Mahindra	Information Technology	A-
Wipro	Information Technology	A-

Source : CDP India, 2019.

The above discussion makes it very clear that India is an emerging country when one talks about reporting and disclosure practices about activities related to carbon emission reduction and strategies to handle climate change. In this light, it becomes necessary to explore the impact of such activities on stock prices as

various stakeholders are also becoming aware of such activities. Thus, the present paper is an attempt to explore the impact of environmental reporting on stock prices.

II. OBJECTIVE AND DESIGN

The present study aims at exploring the speed and accuracy of reflection of announcement of Carbon Disclosure Project Report which contains information regarding corporation's greenhouse gas emissions and Climate Change management strategies and discloses CDP score that indicate a company's environmental awareness, sustainability governance and leadership to address climate change.

The rest of the paper has been organized as follows: next section presents review of literature followed by research methodology. Thereafter, results and findings along with conclusions have been presented.

III. REVIEW OF LITERATURE

Literature available regarding carbon disclosure, carbon disclosure project and event analysis were reviewed intensely and a summary of the same has been presented below:

(Herold, 2018) showed that overall shifts to more transparent corporate carbon disclosure strategies between 2010 and 2015 with an increase of applied carbon management practices in both internal and external actions. (Kumar & Firoz, 2018) found that the market perceives the voluntary climate change disclosure as a positive corporate initiative and ROE will be higher for companies having higher environmental disclosure scores comparatively the companies having low environmental disclosure scores.

(Oktris & Sitardja, 2018) found that global competitiveness index influence positively on the disclosure of carbon emissions. Also showed that the environmental performance and intensive carbon industry moderate the relationship between global competitiveness index on the disclosure of carbon emissions. (Bimha & Nhamo, 2017) by using event study, found that the share prices of companies that report voluntarily and participate on a regular or irregular basis in the CDP had experience nearly the same impact in terms of share price movements.

(Blanco, Caro, & Corbett, 2017) found that firms regularly achieve greater emission reductions than they anticipate. These unexpected outcomes can be operational as well as strategic in nature, and can result from measurement as well as from disclosure. (Ennis, et al., 2014) not found visible sign of a link between carbon emissions performance (as measured by position in the league table) and either the quality of carbon disclosure or the financial performance of a company. (Kamat & Kamat., 2012) found that significantly large number of firms in NSE Nifty demonstrated their concern for the environment and indicated their voluntary willingness to address the ill-effects of carbon emissions.

(Zhang, McNicholas, & Birt, 2012) investigated the relationship between CDP respondents and firm characteristics such as size, leverage, and membership of a polluting industry. It found that both size and membership of a polluting industry are determinants of a firm's decision to respond to the CDP questionnaire. (Luo, Lan, & Tang, 2010) concluded that the economic factor is significantly associated

with the voluntary carbon disclosure decision and companies that face direct economic consequence are more likely to disclose carbon related information.

(Matsumura, Prakash, & Vera-Muñoz, 2010) showed that there was a negative association between carbon emission levels and firm value. On average, for every additional thousand metric tons of carbon emissions sample of S&P 500 firms, firm value decreases by $202,000. (Cheung, 2009) by using event study methodology concluded that there was not any strong evidence that announcement had any significant impact on stock return and risk. Though, on the day of change, index inclusion (exclusion) stocks experience a significant but temporary increase (decrease) in stock return.

Some important researches have studied the impact of Environmental, climate change and Carbon Disclosure practices. However, very few researchers have studied the impact of carbon disclosure project report on share price (Bimha & Nhamo, 2017) and no single study was found by researchers, which has been done particularly in Indian context by using event study. Hence, to fill this research gap, the present analysis is done.

IV. RESEARCH METHODOLOGY

Hypotheses

The study has following two specific hypotheses:

1. CDP Report announcements do not affect stock prices. In other words:

   (a) Investors are not able to earn abnormal returns by trading in stock markets after CDP Report announcements.

   (b) All AARs and CAARs are not significantly different from zero.

Here, AARs are average abnormal returns and CAARs are cumulative average abnormal returns.

Data Collection

The study is based on two sets of data- the first set consists of daily close, open, high and low prices of sample companies for the sample period and second set includes the daily close, open, high and low prices of Sensex. The population of the study comprised all companies listed on BSE 200 that are targeted to participate in CDP, out of which 25 companies from 5 different sectors were taken who regularly responded to CDP questionnaire during the reporting period 2014 to 2018 and those companies were excluded which are not responding regularly in sample period.

The study period consisted of 2014 to 2018. All dates for the publishing CDP India report were collected whereas daily different prices were collected for sample companies as well as Sensex. These prices were averaged on daily basis. Thus it consisted of a total of 70500 (5 Events x 25 Companies x 141 Days per event x 4 kind of prices i.e. open, high, low, close) observations.

All the data have been collected from the https://in.finance.yahoo.com and dates of publishing CDP India Annual Reports were collected from https://www.cdp.net/en. The sample consisted of 25 companies from 5 different sectors were taken which regularly responded to CDP questionnaire for the sample period have been shown in Appendix 1. Sector wise classification of sample has been shown in Table 2:

TABLE 2

Sample of the study

Sector	**No. of Companies in Sample**
Consumer Discretionary	4
Financials	5
Information Technology	5
Materials	9
Utilities	2
Total	25

V. EVENT STUDY METHODOLOGY

The event study methodology is used to investigate the effect of an event, here CDP report announcement, on stock prices which are taken as dependent variable. The event study used in this paper is based on market model which comprises following five steps as mentioned in the paragraphs that follow.

Defining an event window

In the present paper, publishing of CDP India Annual Report has been taken as an event and the date of publication of this report has been called the event date. Event window defines how many days preceding and following the event date to be included in the study. It was decided to include 10 days before and after in the event window.

TABLE 3

CDP Reporting Events Dates During 2014–2018

Reporting Year	Event Date*	Estimation Period	Event Window
2014	15-Oct-14	2-Apr-2014 to 25-Sep-2014	26-Sep-2014 to 31-Oct-2014
2015	4-Nov-15	30-Apr-2015 to 20-Oct-2015	21-Oct-2015 to 23-Nov-2015
2016	25-Oct-16	13-Apr-2016 to 6-Oct-2016	7-Oct-2016 to 9-Nov-2016
2017	24-Oct-17	17-Apr-2017 to 6-Oct-2017	9-Oct-2017 to 7-Nov-2017
2018	22-Jan-19	10-Aug-2018 to 6-Feb-2018	7-Feb-2018 to 11-Mar-2018

*Event date is the date of publishing of CDP India Annual Report.

Therefore, it was proposed to have an event window consisting of:

- Event date (t=0)
- Ten trading days prior to event date (t-1, t-2, ...t-10)
- Ten trading days after the event date (t+1, t+2, ...t+10)

Since during the sample period, there were 5 reports of CDP, hence there were 5 event dates. Accordingly, the number of event windows also comes to 5 for each of the sample companies. Table 3 shows the dates of publishing the CDP report, Estimation period and Event Window.

Defining estimation period

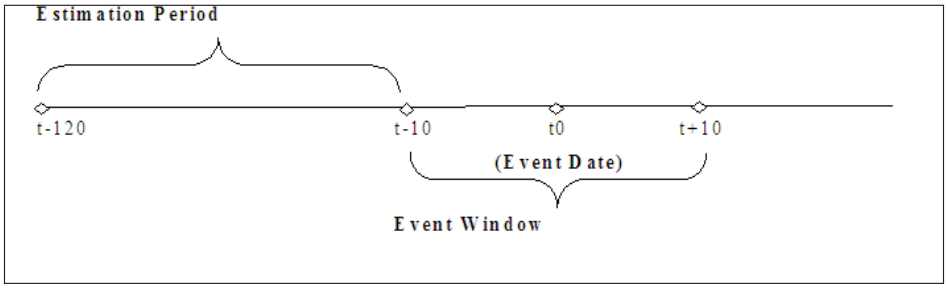
Estimation period refers to the period used to estimate the returns of the company using the market model, assuming that the event has not occurred. In order to nullify the impact of the event, estimation period does not include event window. Generally estimation period is prior to the event window. Returns of a company are regressed on market returns such as Sensex to find intercept and slope coefficients (alpha and beta values respectively). Then these alpha and beta values are used during event window to estimate returns of the company during event window.

For the present research, an estimation period of 120 Days prior to the event window was considered to be appropriate. There is a separate estimation period for each of the event window. Thus 5 estimation periods were there.

Figure 2 Gives an overview of event window and estimation period

FIGURE 2

Time Line of the Estimation Period and Event Window



Estimating Expected Returns

To start with, it is necessary to make the time series data stationary and therefore, returns have been calculated as follows:

- Security Returns $R_{it} = log(P_{it} - P_{it-1})$ ... (1)
- Market Returns $R_{mt} = log(P_{mt} - P_{mt-1})$ ... (2)

Here, R_{it} is return from security *i* at time *t*, P_{it} is the price of security *i* at time *t*, P_{it-1} is price of security *i* at time *t-1*, R_{mt} is the return from market index *m* at time *t*, P_{mt} is the value of market index *m* at time *t* and P_{mt-1} is the value of market index *m* at time *t-1*.

These calculated returns for both individual stock and for market index are realized or actual returns. These returns are to be compared with expected returns or normal returns. The normal returns have been calculated on the basis of estimation period using market model. The market model uses the following OLS regression equation:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad \text{... (3)}$$

The E (R_{it}) is the expected or normal return from security *i* at time *t*, α_i is intercept coefficient, β_i is the slope coefficient (or sensitivity of the stock to market returns), R_{mt} is return on market index *m* at time *t* and ε_t is residuals.

The α and β coefficients are estimated by regressing individual stock returns on market index returns for each of the estimation period. These coefficients

have been used to estimate expected or normal returns from the security over the relevant event window on the basis of actual market index returns during the same window (Lodha & Soral, 2015).

Abnormal Returns, Average Abnormal Returns and Cumulative Average Abnormal Returns (AR, AAR and CAAR)

After calculating expected or normal returns, it has to be confirmed whether actual returns deviate from the expected ones. So, abnormal returns have been calculated by taking the difference of actual returns and expected returns for the security over the event window.

$$AR_t = R_{it} - E\left(R_{it}\right) \quad \text{... (4)}$$

Where AR_t is Abnormal Returns from security *i* at time *t*, R_{it} is Actual Returns from security *i* at time *t* and E (R_{it}) is the Expected or normal returns from security *i* at time *t*

These abnormal returns are then averaged first yearly and then cross-sectionally to give out Average Abnormal Returns (AAR) for a particular day in the event window.

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_i \quad \text{... (5)}$$

While computing the average abnormal returns (AAR) it is to be remembered that instead of testing abnormal returns individually, they are looked at collectively because other events occurring and averaging across all companies should minimize the effect of other events, thereby allowing a better examination of the event under study.

For computation of cumulative average abnormal return, the individual day's average abnormal return (AAR) is added together from the beginning of the period to some specified period and is tested for significance. Average abnormal returns are then cumulated to have Cumulative Average Abnormal Returns (CAAR) as follows:

$$CAAR_{(t1,t2)} = \sum_{t=t1}^{t2} AAR_{it} \quad \text{... (6)}$$

Significance Testing

The procedure by Brown & Warner (1985) was followed in the statistical analysis to test the significance of the cumulative average abnormal returns in terms of the null hypothesis that such returns are equal to zero. It follows a *t*-distribution and is formulated as:

$$t_{(AAR)} = \frac{AAR_{i,t}}{\sigma_{(AAR)}/\sqrt{N}} \quad \text{... (7)}$$

Here, $\sigma_{(AAR)}$ is the standard deviation of AAR and *N* is the number of earnings announcement on day *t*. Significance testing of CAAR can also be done in a similar way:

$$t_{(CAAR)} = \frac{CAAR_t}{\sigma_{(CAAR)/\sqrt{d}}} \quad \ldots (8)$$

Here, $\sigma_{(AAR)}$ is the standard deviation of CAAR and *d* stands for number of days for which the AAR is cumulated. These calculated *t* values were tested at 5 % level of significance.

VI. RESULTS AND FINDINGS

After estimating returns for individual companies and Sensex, the returns of companies during estimation period were regressed on returns of Sensex and the obtained Alpha and Beta values have been shown in Table 4. It is observed that majority of alpha and beta values are positive showing positive correlation of returns of companies and returns of Sensex. Table 4 reveals that all the alpha values are low, which show that any of the stocks did not under-perform nor outperform the market. As far as beta values are concerned, that except few companies, all have high value of beta which is close to one. This shows that stocks of companies have similar volatility as of Sensex.

TABLE 4

Alpha and Beta Values of the Sample Companies obtained from Regression

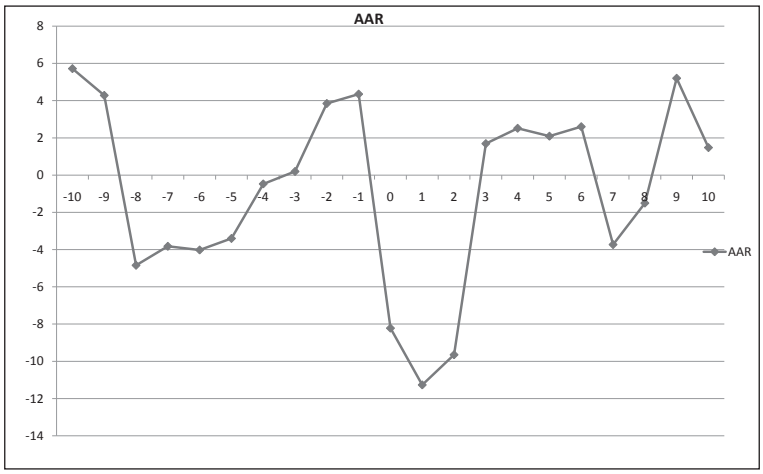
Year	2014		2015		2016		2017		2018	
Company	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
Bharat Forge	0.374	1.075	0.000	1.000	0.002	1.166	0.071	1.281	-0.204	1.238
Indian Hotels Co.	0.145	0.540	0.033	0.771	0.122	0.651	-0.140	0.918	0.109	0.677
Mahindra and Mahindra	0.123	0.955	0.097	0.097	-0.034	1.054	-0.031	0.834	-0.228	1.335
Tata Motors	-0.024	1.456	-0.219	-0.219	0.124	1.704	-0.163	1.715	-0.280	-0.280
Induslnd Bank	0.016	1.099	0.141	0.073	0.104	0.899	0.079	0.948	-0.187	1.228
Kotak Mahindra Bank	0.118	0.941	0.012	0.075	0.038	0.796	0.081	0.819	0.018	0.845
Mahindra and Mahindra Financial Services	-0.096	1.154	-0.086	0.113	0.178	1.365	0.090	1.579	-0.135	1.848
State Bank of India	-0.008	1.484	-0.021	0.112	0.105	1.735	-0.196	1.362	-0.046	1.230
YES BANK Limited	-0.014	1.805	-0.038	0.121	0.220	1.060	0.024	1.185	-0.046	1.230
Infosys Limited	0.027	0.403	0.131	0.059	-0.175	0.753	-0.073	0.941	0.095	0.095
Mindtree Ltd	0.444	0.140	0.176	0.086	-0.340	0.816	0.009	0.995	-0.026	1.030
Tata Consultancy Services	0.139	0.250	0.028	0.050	-0.093	0.543	0.017	0.385	0.046	0.638
Tech Mahindra	0.226	0.226	-0.087	-0.087	-0.169	1.006	0.035	0.359	0.194	0.912
Wipro	0.009	0.176	0.069	0.059	-0.204	0.446	0.106	0.259	0.250	0.506
ACC	-0.126	1.095	-0.035	-0.035	0.021	0.945	0.051	1.050	-0.062	1.394

Year	2014		2015		2016		2017		2018	
Ambuja Cements	-0.154	1.347	0.122	0.122	0.011	1.015	0.055	0.746	-0.037	1.371
Godrej Industries	-0.189	1.139	0.079	0.118	0.105	0.724	-0.024	1.931	-0.175	1.029
Hindustan Zinc	-0.008	1.304	-0.029	0.067	0.290	0.951	0.032	1.152	-0.082	0.517
JSW Steel	-0.057	1.348	0.190	0.907	0.179	0.932	0.133	1.540	-0.150	1.086
Shree Cement	0.256	0.473	0.392	0.824	0.221	0.711	-0.028	1.271	-0.044	1.358
Tata Chemicals	0.080	0.976	-0.003	0.092	0.201	0.979	-0.014	1.365	-0.069	0.782
Tata Steel	-0.063	1.322	-0.293	0.154	-0.001	1.683	0.237	1.311	-0.141	1.176
Ultratech Cement	-0.007	1.206	0.291	0.835	0.107	0.848	-0.071	0.929	-0.145	1.261
GAIL	-0.033	1.270	-0.076	0.054	0.020	0.818	0.032	1.264	-0.061	0.825
Tata Power Co	-0.235	1.637	-0.048	0.076	0.056	0.611	-0.114	1.110	0.026	1.320

These alpha and beta values were used in estimated normal returns of companies during event window. The difference between normal and actual returns was termed as abnormal returns. The calculated abnormal returns were averaged cross-sectionally to obtain Average Abnormal Returns (AARs) which have been plotted in Figure 2.

FIGURE 3

Plot of Average Abnormal Returns



It is clear from Figure 3 that average abnormal returns are showing wide fluctuations. Particularly on event date, AARs are negative which gradually become positive in post event window. This shows that CDP reporting and disclosures certainly have a positive impact on stock prices of companies and lakes the average abnormal returns positive. Surprisingly the volatility in abnormal returns is almost the same in pre-event and post-event period. On event date it seems that investors reap out or bear losses immediately.

Then CAARs were calculated using Equation 6. The obtained CAARs have plotted in Figure 4. It is revealed that CAARs are initially positive, although with

some fluctuations, and then it becomes negative in the pre-event period. In the post event period, particularly on event date, CAAR show a drastic fall and the trend continues in the post event period.

FIGURE 4

Plot of Cumulative Average Abnormal Returns

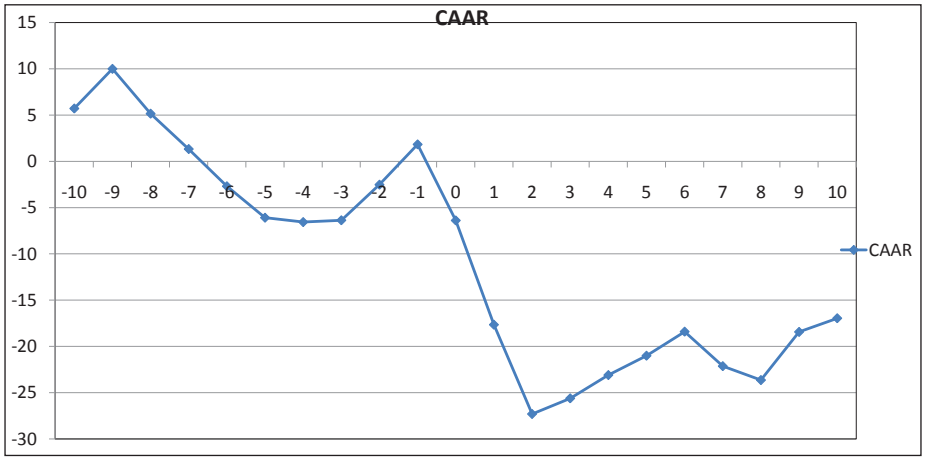


Table 5 shows the AARs and CAARs (averaged on time) and their t-statistics.

TABLE 5

AAR, CAAR and t-statistics

Days	AAR	t statistics	P Value	CAAR	t statistics	P Value
-10	5.719289	3.669711	.210	5.719289	3.669711	.210
-9	4.283135	1.109267	.330	10.00242	1.109267	.310
-8	-4.84389	-1.69333	.166	5.158539	-1.69333	.335
-7	-3.82289	-1.131	.321	1.33565	-1.131	.836
-6	-4.02082	-1.12428	.324	-2.68516	-1.12428	.632
-5	-3.40141	-1.16061	.310	-6.08658	-1.16061	.227
-4	-0.47278	-0.17717	.868	-6.55935	-0.17717	.061
-3	0.196242	0.057442	.957	-6.36311	0.057442	.259
-2	3.846975	0.715538	.514	-2.51614	0.715538	.788
-1	4.352275	0.981006	.382	1.836138	0.981006	.872
0	-8.21892	-1.81991	.143	-6.38278	-1.81991	.641
1	-11.2672	-1.76227	.153	-17.65	-1.76227	.393
2	-9.64746	-1.22646	.287	-27.2975	-1.22646	.298
3	1.691004	0.344231	.748	-25.6065	0.344231	.384
4	2.515907	0.569771	.599	-23.0906	0.569771	.440
5	2.091651	0.730477	.506	-20.9989	0.730477	.509
6	2.601209	0.444203	.680	-18.3977	0.444203	.600

Days	AAR	t statistics	P Value	CAAR	t statistics	P Value
7	-3.73037	-0.83875	.449	-22.1281	-0.83875	.562
8	-1.50379	-0.7078	.518	-23.6319	-0.7078	.518
9	5.202769	1.219199	.290	-18.4291	1.219199	.579
10	1.477749	0.247722	.817	-16.9514	0.247722	.627

It is revealed from Table 5 that while AARs show wide fluctuations in the event window, CAARs are close to zero and show less variability. When the significance of these AARs and CAARs were tested using t test, it was found that none of the AARs and CAARs is significant at 5% level of significance. Therefore both of the null hypotheses cannot be rejected. Thus it can be concluded that all AARs and CAARs are not different from zero. Investors are not able to take advantage of Carbon Disclosure Project Report announcement.

VII. SUMMARY AND CONCLUSION

Carbon Disclosure Project is to enhance firms' climate change strategies by encouraging them to measure their emissions and corresponding risks and opportunities (Blanco, Caro, & Corbett, 2017). In India, there has been mixed response regarding the carbon disclosure, some companies provide detailed and adequate disclosure while some companies provide general information. Companies should disclose their climate change strategies with investors, financial analysts and other stakeholders. The present paper is an attempt to explore the impact of environmental reporting on stock prices of the companies using Event Study Methodology. CDP report announcement was taken as an event.

Using AAR and CAAR and their significance testing, it was revealed that none of the AARs and CAARs was significant at 5% level of significance. Hence, it was concluded that investors cannot take advantage of Carbon Disclosure Project Report announcement. The probable reason behind this could be that in India, environmental reporting and disclosure is still on voluntary basis. Further various stakeholders are still not aware and concerned about this aspect of reporting. There is no fixed format of reporting and disclosures that can be used to compare the performance of various companies. Although the sample used in the research consisted of the companies which are regularly responding to CDP questionnaire, but these companies are very few in number. Therefore, more strict and mandatory provisions should be made for such reporting and disclosure as well as investor awareness programmes should also incorporate such aspects.

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APPENDIX 1

Companies included in Sample

Consumer Discretionary	Financials	Information Technology	Materials	Utilities
Bharat Forge	Induslnd Bank	Infosys Limited	ACC	GAIL
Indian Hotels Co.	Kotak Mahindra Bank	Mindtree Ltd	Ambuja Cements	Tata Power Co
Mahindra and Mahindra	Mahindra and Mahindra Financial Services	Tata Consultancy Services	Godrej Industries	
Tata Motors	State Bank of India	Tech Mahindra	Hindustan Zinc	
	YES BANK Limited	Wipro	JSW Steel	
			Shree Cement	
			Tata Chemicals	
			Tata Steel	
			Ultratech Cement	

APPENDIX 2

Event-wise AAR

Days	AAR	AAR	AAR	AAR	AAR
	Event 1	Event 2	Event 3	Event 4	Event 5
-10	2.796635	2.159325	4.906388	9.153946	9.580153
-9	16.15906	1.156857	9.543812	0.560605	-6.00466
-8	-6.82445	-0.68638	3.151019	-6.26932	-13.5903
-7	-11.603	-5.45628	6.926971	-9.43322	0.451117
-6	-2.22642	-4.38482	-10.1985	-11.7224	8.428067
-5	-0.00279	-2.65659	-14.1793	-3.36333	3.194944
-4	-5.67885	3.587302	0.979949	6.326126	-7.57842
-3	-11.3177	-2.60881	5.93735	1.076598	7.893785
-2	-3.66555	11.04194	-1.40731	-7.97471	21.24051
-1	6.174724	4.473423	-10.4617	4.152476	17.42243
0	-2.75571	-20.4898	-17.1858	-3.69783	3.03456
1	-23.7221	-21.5723	-7.27692	-15.3763	11.61149

2	-17.1798	-4.28675	-36.6178	4.991166	4.855873
3	1.988846	-3.33291	4.235593	-12.1924	17.75592
4	6.082145	-15.0247	7.923357	8.146544	5.452224
5	7.015879	-0.3966	-2.13716	-4.5635	10.53964
6	9.070473	11.30057	-9.31298	-13.5356	15.48361
7	9.429231	-12.3528	-8.62947	-11.4241	4.325354
8	1.863825	-0.50412	3.372914	-3.73502	-8.51656
9	6.351906	18.51374	8.055638	0.267659	-7.1751
10	0.811168	14.28392	-20.6794	8.240155	4.732888

APPENDIX 3

Event-wise CAAR

	CAAR	CAAR	CAAR	CAAR	CAAR
Days	Event 1	Event 2	Event 3	Event 4	Event 5
-10	2.796635	2.159325	4.906388	9.153946	9.580153
-9	18.9557	3.316182	14.4502	9.71455	3.575497
-8	12.13125	2.629798	17.60122	3.44523	-10.0148
-7	0.52821	-2.82648	24.52819	-5.98799	-9.56368
-6	-1.69821	-7.2113	14.32967	-17.7104	-1.13562
-5	-1.701	-9.86788	0.150379	-21.0737	2.059329
-4	-7.37985	-6.28058	1.130328	-14.7476	-5.51909
-3	-18.6976	-8.88939	7.067678	-13.671	2.374693
-2	-22.3631	2.15255	5.660363	-21.6457	23.6152
-1	-16.1884	6.625973	-4.80132	-17.4932	41.03763
0	-18.9441	-13.8638	-21.9872	-21.191	44.07219
1	-42.6662	-35.4362	-29.2641	-36.5674	55.68368
2	-59.846	-39.7229	-65.8819	-31.5762	60.53956
3	-57.8572	-43.0558	-61.6463	-43.7686	78.29548
4	-51.775	-58.0806	-53.7229	-35.6221	83.7477
5	-44.7591	-58.4772	-55.8601	-40.1856	94.28734
6	-35.6887	-47.1766	-65.1731	-53.7212	109.7709
7	-26.2594	-59.5294	-73.8025	-65.1454	114.0963
8	-24.3956	-60.0335	-70.4296	-68.8804	105.5797
9	-18.0437	-41.5198	-62.374	-68.6127	98.40464
10	-17.2325	-27.2359	-83.0534	-60.3726	103.1375

Financial Reporting and Business Communication 24th Annual Conference

University of Cagliari (Sardinia, Italy),
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- The effectiveness of financial reporting standards
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- Corporate reporting and accountability in the public sector
- The role of financial reporting and corporate governance in capital markets
- Historical perspectives on accounting or corporate reporting

Papers are invited on these topics and on other aspects of financial and non-financial reporting and business communication. Papers may take empirical, theoretical and conceptual approaches, including case studies or experiments.

Abstracts or full papers could be submitted by **1st April 2020** by emailing frbc@unica.it. For informal queries you can email melisa@unica.it OR michaeljohn.jones@bristol.ac.uk . Please submit an abstract and full paper (up to 12,000 words) for parallel sessions. Discussants will be allocated to full paper submissions and we expect that all presenters of full papers will be prepared to act as discussants on other papers. Please submit an abstract (maximum 500 words) or short developmental paper (up to 5,000 words) for developmental paper sessions. Exceptionally good papers are welcomed for submission for a **fast-track review in European Management Journal**.

For doctoral students wishing to present in the doctoral stream, a 500 word abstract should be submitted by 29 March 2020 to richard.slack@durham.ac.uk. A Sue Hrasky Scholarship is available for 2020 to doctoral students in the doctoral stream. This comprises a doctoral fee waiver, receipted travel in Italy to the conference, subsistence and accommodation costs related to the conference. Applications should be in the form of a structured abstract and email entitled FRBC Scholarship/authors name. The award of the Scholarship will be announced by the end of April 2020.

Andrea Melis
melisa@unica.it

Mike Jones
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China Accounting and Finance Review (CAFR)

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The Editors of Australian Accounting Review (AAR) invite presenters of papers at the conference to submit, post the conference, their paper for publication in AAR. Normal criteria for publication will apply but conference papers will receive a fast track review. If there are a sufficient number of papers, the Editors will consider producing a special issue for the papers from the conference. The scope of AAR is accounting professional practice and it includes articles on audit and assurance, communication and information systems, ethics and governance, financial reporting, management accounting, taxation, and treasury practices.

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The Editors of Accounting Research Journal (ARJ) invite presenters of papers at the conference to submit, post the conference, their paper for publication in ARJ. Normal criteria for publication will apply but conference papers will receive a fast track review. If there are a sufficient number of papers the Editors will consider producing a special issue for the papers from the conference. ARJ embraces a range of methodological approaches in identifying and solving significant emergent problems and accounting issues. Submissions are encouraged across all areas in accounting, finance and cognate disciplines.

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- Accounting as a tool of decision science for Value Optimization for new age Corporations
- Artificial intelligence in accounting and finance
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- Future of accounting and finance
- Issues in Behavioural Finance

[1]Confirmation awaited.

- Accounting for MSMEs
- CSR accounting and reporting
- Corporate governance and profitability
- Sustainability Practices of Micro-entrepreneurs
- Collection of Revenue and Enforcement of Tax Laws
- International Business Topics

Submission Guidelines

(1) Two hard copies and one soft copy of the paper should be submitted. The text of the paper will be in double space, 12 font, Times New Roman, keeping a margin of one inch in three sides. MS Word (.doc format) is required. Each paper should be preferably within 5000 words including tables and references, in addition, **an abstract** of not more than 500 words in a separate page.

(2) There should be a **separate title page** on each paper giving details of author/s, affiliation, address, telephone numbers and e-mail.

(3) A declaration must be made, along with the paper, by the author(s) mentioning that the manuscript is not copyrighted, and has not been submitted / published elsewhere.

(4) Paper presentation will take place in **concurrent sessions** and abstract of each accepted paper will be published in the Conference Proceedings.

(5) Papers must be submitted within **September 30, 2020.**

(6) Notification about the acceptance or otherwise of a paper will be made by **November 30, 2020.**

(7) Papers submitted for presentation will be subject to blind review and the decision of the Scientific Committee will be final.

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	For payment on or before **December 09, 2020**	For payment after **December 09, 2020**
Member of IAARF / IAA	₹ 2500	₹ 3000
Non-member	₹ 3000	₹ 3500
Corporate	₹ 4000	₹ 4500

- **Deadline for Registration: December 20, 2020 (no spot registration).**
- Accommodation Charges for delegates from outside West Bengal only (for 3 nights, i.e., January 08, 09 & 10): ₹ **2000 per delegate on a double occupancy basis.**

(*Only a few rooms at State Guest House, International Guest House of Ramakrishna Mission, Gol Park, etc. will be available on a first come, first served basis.)

- Registration fees will cover 3 breakfasts, 2 luncheons, 2 dinners, copy of Conference Proceedings and transport facilities within the city (for attending Conference only).

In December–January, the weather in Kolkata is pleasant, with temperature varying between 12°C and 22°C. There are many beautiful places and monuments of tourist attraction in the City. Popularly known as the Cultural Capital of India, the City is famous for the warm hospitality of Kolkatans. Kolkata is well connected by air (Netaji Subhas Chandra Bose International Airport) and rail (Howrah Station, Shalimar Station, Sealdah Station and Kolkata Station).

PARTICIPANTS

Distinguished academics and practitioners from different parts of the world are expected to attend the Conference. Besides, members of the IAA Research Foundation, representatives of Deloitte, members of Indian Accounting Association (IAA) and its key office-bearers, academic heads and deans of many reputed business schools and universities in India, representatives of three professional bodies, viz., the Institute of Chartered Accountants of India, the Institute of Cost Accountants of India and the Institute of Company Secretaries of India, will grace the occasion by their kind presence and active participation in different sessions. About 225 delegates are expected to attend the Conference.

BRIEF PROGRAMME

On 9th January, 2021, at the inaugural session, the Vice-Chancellor / Pro-Vice Chancellor (Academic), University of Calcutta, one of the past Presidents of the American Accounting Association, Present and Past Presidents of Indian Accounting Association, and Chairman, Deloitte India, are expected to grace the occasion among others. In the First Plenary Session, Professor Shyam Sunder, Yale School of Management, and past President of American Accounting Association, USA, will give the keynote address on a contemporary issue and there will be Concurrent Sessions on different business topics in the post-lunch session. On 10th the Conference will be resumed with Concurrent Sessions followed by post-lunch Plenary Sessions. Valedictory Address is expected to be delivered by Professor Arup SenGupta of Lehigh University, Pennsylvania, USA. There will be many more distinguished academics and professionals (from India and abroad) who will either chair a concurrent session or speak in a Plenary Session. Interested participants may visit the Foundation's website (www.iaarf.in) from time to time for updated information in this respect.

Some of the Eminent Scholars/Professionals who attended the previous conferences

- Professor Stephen A.Zeff, Past President, AAA, Rice University, USA
- Professor Sidney J. Gray, Professor of International Business and Co-Director of the Entrepreneurship and Innovation Research Group at the University of Sydney Business School. The University of Sydney
- Prof. Kazuo Hiramatsu, Past President, JAA (Kwansei Gakuin University)

and Past President International Association for Accounting Education and Research (IAARF)

- Donna L.Street, Past President, IAAER (University of Dayton)
- Professor Andrew D. Bailey, Past President, AAA, University of Illinois at Urbana Champaign
- Professor Stefano Zambon, Italy (10th Conference)
- Professor Belvered E. Needles, Jr., DePaul Univertsity, Chicago
- Professor Tony Kang, Member, AAA(USA)
- Professor Shyam Sunder, Past President, AAA (Yale School of Management)
- Professor Rajendra P. Srivastava, The University of Kansas, USA
- Professor Bruce K. Behn, Past Pesident, AAA (Deloitte LLP Professor, The University of Tennessee)
- Professor Bikki Jaggi, Former Chair, Rutgers University, New Brunswick, USA
- Professor S. Gupta, Former Chair, Department of Accounting, Lehigh University, USA
- CA P. R. Ramesh, Chairman, Deloitte India
- CA Dipankar Chatterjee, Partner L.B.Jha & Co.
- Professor Asis Kumar Banerjee, Former Vice-Chancellor, University of Calcutta
- CMA Souren Dutt, Direcrtor of Finance, Damodar Valley Corporation of India
- Dr. Bhaskar Banerjee, Chairman, The Calcutta Stock Exchange Ltd.

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INDIAN ACCOUNTING REVIEW

Statement of Policy, Requirements & Guidelines

Policy

Indian Accounting Review (IAR) is a bi-annual research journal published by the Indian Accounting Association Research Foundation. It is published in June and December each year. It is a refereed international journal with the review process being double blind. The scope of the journal encompasses all areas of accounting including auditing, taxation, management accounting and information systems. IAR seeks to publish high quality, research-oriented and original articles. It encourages both fundamental and applied research works.

Submission requirements

Two copies of manuscripts along with a C.D, should be submitted for consideration for publication in IAR. Manuscripts from abroad should be accompanied by a US $100 non-refundable submission fee payable by cheque in favour of 'IAA Research Foundation[1]. For authors from SAARC countries, non-refundable submission fee is ₹ 600 but for each published article, ₹ 1,200 will be awarded.

All manuscript should be typed one and half-spaced. A separate list of references should be used, not made a part of the footnotes. Footnotes, also one and half spaced, should be listed at the end of the paper. Manuscripts should not normally exceed 20 pages including figures, tables, footnotes and references, printed on 8.5" x 11" paper.

Each manuscript should contain a non-mathematical abstract of not more than 100 words. There should be a title page containing the name of the article, authors' names (without designations), affiliations and corresponding author's address. The names of the authors should not appear on the first page of the manuscript to facilitate blind review. **Manuscripts must be prepared strictly following the guidelines.**

The submission of a manuscript to IAR means that the author certifies that the manuscript is not copyrighted, nor has it been accepted for publication (or published) by any refereed journal; nor is it being submitted elsewhere, at the same time.

Manuscript-preparation guidelines

The following guidelines should be followed.

Heading : Bold, centred and 14 point. Each word should start with a capital letter.
Author Name : Centred 12 point, with affiliation below the name in 10 point but no designation,
Abstract : Indented from both sides in 10 point.
Headings : Bold, upper case only centred in 12 point.
Sub-headings : Bold, upper-lowers, 10 point, from left margin.
Text: In 12 point and there should be one-inch margins on all four sides.
Tables and Figures : Table in capital and centred in 10 point, and the table description in bold, upper lower 12 point.

For further details see Journal Section of the Foundation's Website (www.iaarf.in).

References: Samples:

(i) **Book :** Choi, F.D.S., Frost, C.A. & Meek, O.K. (1999). *International Accounting*, Upper Saddle River, N.J.: Prentice Hall, 24-31.

(ii) **Journal :** Rivera, J.M. (1991). Prediction performance of earnings forecasts : the case of U.S. multinationals. *Journal of International Business*, 22, 265-288.

Submission address :

Manuscripts from the U.S.A., Canada, Mexico, South-American and European countries should be submitted to : **Professor Shyam Sunder**, Yale School of Management, Connecticut, USA.
Email: shyam.sunder@yale.edu

Manuscripts from other countries should be submitted to : **Professor Dhrubaranjan Dandapat**, Editor IAR, Department of Commerce, University of Calcutta, Kolkata - 700 073.
Email : dhrubacal@yahoo. co.in

INDIAN ACCOUNTING REVIEW

[Vol. 23, No. 2, December 2019]

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Printed by Dr. Dhrubaranjan Dandapat, on behalf of IAA Research Foundation, at Rohini Nandan, 19/2, Radhanath Mallick Lane, Kolkata - 700 012 (Ph.: 9231508276)