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A Study on Corporate Integrated Reporting¹

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ABSTRACT

Corporate reporting has witnessed paradigm shift and continues to evolve from traditional financial reporting to sustainability reporting to, more recently, Integrated Reporting (IR). IR is a concise communication about how an organization's strategy, governance, performance and prospects lead to creation of value over short, medium and long-term. It is expected to bring greater transparency on corporate commitment to sustainability by showing the links between financial and sustainability performance in single document. It takes a wider view of the six capitals, i.e., financial, manufactured, intellectual, human, social and relationship, and natural capital. IR is emerging as an innovative reporting tool for companies for integrating environmental and social thinking into their business. This paper has reviewed the recent literature in the field of integrated reporting to study the progress of IR research. Content analysis of the annual reports of the companies has been undertaken to find out the IR practices in India.

Key words: Corporate Reporting, Financial Reporting, Sustainability Reporting, Integrated Reporting.

I. INTRODUCTION

Corporate reporting over the years has witnessed paradigm shift to meet the information needs of the stakeholders. Corporate disclosure practices in the world continue to evolve from traditional financial reporting to sustainability reporting to, more recently, Integrated Reporting (IR). The accounting profession has challenged the traditional financial reporting model, arguing that it does not adequately satisfy the information needs of stakeholders for assessing a company's past and future performance (Flower, 2015). Organisations are increasingly disclosing financial and nonfinancial performance as they are encouraged to become more accountable and transparent to the providers of capital, and towards other interested parties (Camilleri, 2018). Initially, the idea of managing, measuring and reporting the three elements of an organisation's social, environmental and

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economic impacts gained prominence during the late 1990s and early 2000s (Dumay *et al.*, 2016). However, these reports, known as sustainability reports, often suffer from weaknesses as they appear disconnected from the organisation's financial reports and fail to make a link between sustainability issues and the organisations core strategy (Clayton *et al.*, 2015). IR, the latest development in corporate reporting reform, promises to address criticisms and shortcomings of sustainability reporting (Stubbs and Higgins, 2018). Companies also want to enhance their visibility and control their triple bottom-line through innovative reporting practices.

Integrated reporting in corporate communication is a new model of corporate reporting for many global multinational corporations and is gaining momentum in many countries. In its simplest form, IR can be understood as the convergence of the sustainability report and the financial report into a single "narrative" – a communication intended mainly for investors in which top management provides its views on how sustainability issues and initiatives are expected to contribute to the long-term growth strategy of the business (Churet *et al.*, 2014). It is a concise communication about how an organization's strategy, governance, performance and prospects lead to creation of value over short, medium and long-term (Wikipedia). It is an integrated representation of a company's performance in terms of a company's financial and other value relevant information, which helps stakeholders in their decision-making (IIRC,2013).

IR aims at connecting different functions to form an integrated and holistic view of the business, recognizing the value, risks, and opportunities represented in the long-run. It takes a wider view of the six capitals with which it operates and applying the reporting to the core business model and strategy of the organization. IR is emerging as an innovative reporting tool for companies for integrating environmental and social thinking into their business to bring transparency and accountability. Hence, IR sought to offer a broad picture of modern organizations by shifting away from stand-alone financial statements, sustainability or social responsibility reports, towards a document that communicated a holistic picture of the organisations' value creating activities (Camilleri, 2018).

II. EVOLUTION

The evolutionary phase of IR is presented briefly as follows:

- 1994: The journey began in South Africa with the release of first King Code of Corporate Governance Principles (Dumay *et al.*, 2016).
- 2002: The first company to prepare IR is Novozymes, a Danish enzyme company (Spun off from Novo Nordisk in 2000).
- 2009: High level meeting was conducted to establish International Integrated Reporting Council (IIRC). South Africa became the first country where IR became mandatory for all listed companies.
- 2013: IIRC designed the IR framework and many companies participated in the IIRC pilot programme.

In December 2009, the Prince of Wales convened a meeting of investors, standard setters, companies, academic bodies, UN representatives, representatives of IFAC and GRI to establish IIRC, a body to oversee the creation of a globally accepted integrated reporting framework. On December 9, 2013, the draft of the

internationally recognized integrated reporting framework was released. IIRC has prescribed guiding principles for preparation of an IR, specifying the content of the report and how information is to be presented. The objective of merging conventional financial reports and reports on environmental, social and corporate governance (ESG) into one integrated report is to improve information available to investors qualitatively. By providing a principles-based guidance, companies are left with both flexibility and the incentive to take account of individual circumstances during the IR process and the production of an integrated report. The international IR framework does not specify key performance indicators (KPIs), measurement methods, or datasets that need to be disclosed (IIRC, 2013b). The International IR Framework aims to simplify company reporting and improve its effectiveness by focusing on value creation “as the next step in the evolution of corporate reporting” (IIRC, 2015). IR is widely promoted by the IIRC and several other professional bodies who see it as a source of new business. In the words of Richard Howitt, CEO of the IIRC who came to India to promote IR, “Integrated reporting is a vehicle for long-term value creation for and by the business itself. It helps them think, plan and report the story of their business” (ET, January 17, 2018).

Leading professional accountancy organisations, advisory bodies and business leaders have provided impetus and support for IR, including the World Business Council for Sustainable Development, the World Resources Initiative, the United Nations Conference on Trade and Development (UNCTAD), the Global Reporting Initiative (GRI), the International Corporate Governance Network, the International Federation of Accountants (IFAC), the International Integrated Reporting Council (IIRC), the Federation of European Accountants (FEE), and large global accountancy firms, such as, Deloitte, Ernst and Young, KPMG, and PwC (Owen, 2013). IR has been described as the ‘future of corporate reporting’ (IIRC, 2014a).

Over 1600 organisations in 62 countries have adopted IR (KPMG, 2018). Many countries and their regulators (Japan, India, the UK and many European countries) have taken initiatives to implement integrated reporting. South Africa is the only country which made IR mandatory for all listed companies in the Johannesburg Stock Exchange. Due to discretionary disclosure of IR in India, it is yet to take full momentum.

III. OBJECTIVES AND METHODOLOGY

The specific objectives of this article are as follows:

- To present an overview of the current state of research on integrated reporting to set an agenda for future research; and
- To study the IR practices in selected Indian companies and a detailed case to find out the determinants of IR.

The study is an exploratory one, mainly dependent on secondary sources of data. A number of recent research articles have been reviewed to find out the progress in IR research and determinants of integrated reporting. Content analysis of annual reports of Nifty 50 companies has been undertaken in this research study to find out the IR practices. The remainder of the paper is organised as follows. Section IV deals with literature review. It is followed by a conceptual study

in Section V. IR reporting in India is captured briefly in Section VI which is followed by an Indian case study (Section VII). Benefits and challenges are contained in Section VIII. The last section gives concluding observations.

IV. REVIEW OF LITERATURE

A structured review of literature in the area of 'integrated reporting' has been undertaken to develop understanding into how IR research is progressing. This literature review evaluated 25 good articles on IR which are published especially after the adoption of IR framework in 2013 by IIRC. The research papers have been critically examined to find out the determinants of IR and opportunities for future research.

Owen (2013) reviewed the developments of IR and its implications for the accounting curricula of the University and professional studies. The author observed that IR will impact the education and training of the accountants and managers as it involves integrated thinking and approach. They have to be prepared for a much more challenging role in the corporate sector in the near future.

Eccles and Serafeim (2014) of Harvard Business School in their research paper on "Corporate and Integrated reporting: A Functional Perspective" presented two primary functions of corporate reporting, i.e., information and transformation. He observed that financial reporting is more focused on the information function, sustainability reporting on the transformation function and IR is an attempt to accomplish both these functions. They have also discussed, through a series of case studies, what constitutes an effective integrated report.

Churet *et al.* (2014), in their analytical article, studied the relationship between IR and quality of management, and IR and financial performance. They took Rebeco SAM database for two years, i.e., 2011 and 2012, and found statistically significant relationship between practice of IR and quality of ESG management which they argued is indicative of the overall quality of management over the long term. But they found no statistically significant relationship between IR and financial performance.

Frias-Aceituno *et al.* (2014), in their analytical paper on explanatory factors of integrated, sustainability and financial reporting, analysed the reports of 1590 international companies for the years 2008-2010. The research revealed the negative impact of industry concentration on the development of a more pluralist report, simultaneously taking into account stakeholders, sustainability and the long-term view point, as well as questions of responsible investment, business ethics and transparency. They observed that IR is required for a sustainable strategy and for facilitating stakeholder engagement.

Adams (2015) outlined the case for IR and benefits to organisations and other stakeholders of the integrated thinking needed to develop an IR. This paper discussed the potential of IR to change the thinking of corporate sector leading to further integration of sustainability actions and impacts into corporate strategic planning and decision making. It called for academics to engage with the process and suggested areas of further research to facilitate this.

Clayton *et al.* (2015) made a comparative study on integrated reporting and sustainability reporting for corporate responsibility in South Africa. The content

analysis of the corporate reports revealed that the key drivers of sustainability and integrated reporting were regulatory requirements, industry of the company, the environmental and social impact of the company, and stockholder perceptions and pressure. It is disclosed that the actual drivers of sustainability reporting and integrated reporting did not differ significantly from the King Code II sustainability era (up until 2010) to the King Code III integrated reporting era (post 2010).

Serafeim (2015), in his research article on integrated reporting and investor clientele, found out that companies producing integrated reports, show a clear tendency to have more long-term “dedicated” holders and fewer transient holders. His study provides evidence that suggests a causal relationship between the corporate practice of IR and investor base with longer-term shareholders.

Lai *et al.* (2016) empirically tested whether the decision to adopt IR stems from the need to repair legitimacy threats. They focused their attention on the relation between IR adoption and sustainability rating, here considered as proxies of corporate legislation on sustainability. They found out that legitimacy pressures did not play a role in explaining IR adoption. Overall, their evidence suggested that corporate engagement in IR is not a ‘mechanism’ of strategic legitimation.

Lee and Yeo (2016), in their analytical research article, examined the association between IR and firm valuation using a sample of listed companies in South Africa. They found that firm valuation is positively associated with IR disclosure. Their analysis indicated that firms with high IR outperform those with low IR both in stock market and accounting performance. They observed that IR improves the information environment in complex firms such as firms with high intangible assets, firms with multiple business segments and large firms.

Dumay *et al.* (2016) reviewed the field of integrated reporting to develop insights into IR research and outline future research opportunities. They observed that there is little research examining IR practice. They argued that the ‘eco-system approach’ to researching IR is important because the IIRC (2013, p. 2) advocates leveraging “financial, manufactured, intellectual, human, social and relationship, and natural” capital as part of creating value.

Perego *et al.* (2016) studied IR and observed that IR has fast emerged as a new accounting practice to help firms understand how they create value and be able to effectively communicate this to external stakeholders. The study has contributed to this field by reframing the existing implementation challenges of IR into promising and inclusive research opportunities that align the priorities of both academia and business. From the expert interviews, the researchers found that there is need for more research on the ‘transformative function’ of IR.

Burke and Clark (2016) studied the insights from leading practitioners, regulators and academics. They observed that IR represents a pivotal change in the corporate reporting landscape, with practitioners and standard setters beginning to realise the complex nature of today’s business model. This new reality leads to integrated thinking and marks the acceptance of non-financial parameters as relevant to value creation. They concluded that IR is here to stay and firms should begin their journey to reap the benefits.

Vaz *et al.* (2016) examined the determinants associated with the use of IR as a corporate reporting model for sustainability information at the country level and company level. They observed that companies in the same country are more similar to one another in their reporting than are companies from different

countries. Their empirical results confirmed significant inter-country variance in reporting IR.

Humphrey *et al.* (2017) studied the emergence of International Integrated Reporting Council (IIRC) and its attempts to institutionalize IR as a practice that is critical to the relevance and value of corporate reporting. The paper identified key elements to the IIRC's strategy and observed that the IIRC has been swift in establishing itself as a globally recognised body leading development of this new reporting initiative. IR, coming after the outbreak of the global financial crisis, has exceedingly strong advantages of timing, of being in the 'right' place at the 'right' time.

Rupley *et al.* (2017) analysed the evolution of corporate reporting from stand-alone corporate social responsibility reporting to integrated reporting. Their descriptive results indicate that IRs have little focus on governance and do not provide the information most highly desired by investors (i.e., market share, executive compensation and product safety).

Maniora (2017) examined the impact of IR on the integration of environmental, social and governance (ESG) issues into the business model and the related economic and ESG performance changes. The research paper provided empirical evidence using three matched samples of companies from around the world for the sample period 2002-2011, that contradicts the general notion of IR as a superior reporting mechanism, as the benefits of IR are driven by several factors.

Mervelskemper and Streit (2017) studied the effectiveness of a firm's strategy to report on its ESG (environmental, social and governance) activities, and whether following the current IR trend is worth the effort. They observed that IR is associated with superior outcomes as compared with a standalone report for composite ESG and corporate governance performance.

Velte and Stawinoga (2017), in their research on IR, observed that as a consequence of 'integrated thinking', IR combines both traditional financial accounting with sustainability and corporate governance issues to enhance the decision usefulness of modern business reporting. Their empirical results focused on market reactions to IR and showed the factors contributing to IR implementation and IR quality.

Villiers *et al.* (2017) reviewed research papers on IR to set an agenda for future research. They have discussed broad research approaches and questions, measurement and research design issues. Their study also discussed the measurement of quality of an IR and possible control measures.

Zhou *et al.* (2017), in their research paper on the impact of IR on the capital market, found out that IR provided incrementally useful information to the capital market over and above existing reporting mechanics. They also discussed how IR facilitates transparent, ethical and sustainable business practices. They provided empirical evidence substantiating the claimed benefits of IR including capital market benefits of reduced cost of equity capital and the realised market returns.

Stubbs and Higgins (2018), in their exploratory study of the preferences of users of non-financial reporting for regulatory or voluntary approaches to IR, found more support for voluntary approaches to IR. They suggested that IR will become the reporting norm over time if left to market forces as more and more companies adopt the IR practice. However, half of the investors supported mandatory IR because, in their experience, voluntary sustainability reporting did not lead to

more substantive disclosures or increased the quality of reporting.

Camilleri (2018), in his research on the integrated reporting of financial, social and sustainability capitals, found out that organisations are increasingly disclosing financial and non-financial performance as they are encouraged to become more accountable and transparent to the providers of capital, and toward other interested parties. He inferred that using IR framework and preparing reports involved both costs and benefits.

Slack and Tsalavoutas (2018), in their empirical research on 'IR decision usefulness: mainstream equity market views', observed that IR usefulness to fund managers and equity analysts is low. They concluded that IR may become a reporting fad, if not embedded into mainstream investment thinking.

Bernardi and Stark (2018) studied ESG disclosure, IR and the accuracy of analyst forecasts. They found out that ESG disclosure levels, and in particular, environmental disclosure levels, are associated with forecast accuracy after the introduction of IR regime. Their empirical results are consistent with IR having the potential to provide useful information on the links between ESG and financial performance. They agree with many researchers that IR can provide useful information to capital markets.

Lai *et al.* (2018) in their research paper elucidates the role of preparers of IR in enhancing corporate accountability. They concluded that IR can enhance accountability by facilitating dialogue with various stakeholders, even if investors and other financial stakeholders remain the primary addressees.

Kilic and Kuzey (2018), in their analytical research on determinants of forward-looking disclosures in IR, found that majority of the entities tended to provide qualitative forward looking disclosures rather than quantitative. Their analysis showed that gender diversity and firm size were positively related to forward-looking disclosures, where as leverage was negatively related. They did not find a significant impact created by board size, board composition, profitability or industry on forward-looking disclosures.

A reference to the above-mentioned research papers reveals that most of the IR research is still in its first stage of research due to non-availability of structured data. There needs to be a debate about the possibility of harmonisation as happened in the GRI project (Dumay *et al.*, 2016). Many papers have made exploratory and conceptual studies of IR. Research studies involving analysis of data and interpretations are few. A few research studies have found out the determinants of IR at the country level, such as, regulatory environment and requirements, investor protection, economic development, cultural characteristics and development, etc., as well as the determinants at the company level, such as firm size, industry of the company, environmental and social impacts of the company, stakeholders' perception and pressure, leverage of the company, pressure of rating and legitimacy, gender diversity, board size and composition, industry concentration, financial performance and profitability, etc. In view of the above, there is justification of the present study that covers almost all important aspects of IR particularly from Indian perspective.

V. A CONCEPTUAL STUDY OF IR

IR is an integrated representation of a company's performance in terms of both financial and other value relevant information. It provides a holistic view of

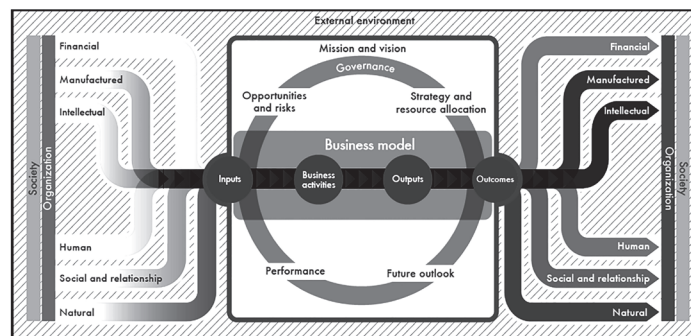
the business by connecting different functions. It recognizes the value, risks and opportunities of the organisation. It is a transition from sustainability reporting to more relevant IR. The sustainability of a company's activities and company's financial performance are linked for better decision making. It takes a wider view of six *capitals* used by the organisation for value creation.

An organization uses as the following six capitals¹ in its integrated reporting: (IIRC)

- **Financial capital:** Economic resource measured in terms of money which is used to make products or provide services.
- **Manufactured capital:** Collection of physical, material and technological objects which are available to the organisation for use in the production of goods or provision of services.
- **Intellectual capital:** Intangibles that provide competitive advantages.
- **Human capital:** The skill and experiences of people and their motivations to innovate.
- **Social and relationship capital:** Community, stakeholders and other networks to enhance individual and collective well-being.
- **Natural capital:** Water, land, minerals, forests, bio-diversity and ecosystem health.

The relationship and interaction between the above six capitals are shown in fig.1.

FIGURE 1
Interaction between the six capitals



Source: R.G. Eccles and George Serafeim, (2014), Harvard Business School.

Guiding Principles of IR

The process of producing an IR requires companies to actively measure environmental, social and other non-financial impacts and embed these factors into corporate decision making- a process referred to as integrated thinking. (www.accountingforsustainability.org). The key aspect of integrated thinking is that companies must measure and report on all of the various capitals a company uses

¹In the Case Study on Reliance Industries Ltd., a more detailed discussion on the six capitals including their importance is given in Section VII.

to create value, rather than focusing solely on financial capital. IR also includes a company's expectations about the future, including information about future prospects and uncertainties. The report should include all material matters, both positive and negative.

The guiding principles of IR are as follows (IR Framework, IIRC):

- Strategic Focus and Future Orientation
- Connectivity of Information
- Stakeholder Relationships
- Materiality and Conciseness
- Reliability and Completeness
- Consistency and Comparability .

IR Framework of IIRC has outlined eight content elements that are fundamentally linked to each other. These elements are: organizational overview, governance, business model, risk and opportunity, strategy and resource allocation, performance, outlook and basis of presentation.

VI. IR REPORTING IN INDIA

SEBI, in consultation with industry bodies and stock exchanges, asked top 500 listed companies to *voluntarily adopt* IR framework from the financial year 2017-18. After this declaration, IR in India is gaining importance. This move by the market regulator is aimed at providing stakeholders relevant information that are useful for making investment and other decisions. SEBI said that information related to integrated reporting should be provided in the annual report separately or by incorporating in management discussion and analysis or by preparing a separate report. The companies can also host the IR on their website and provide appropriate reference to the same in their annual report. To avoid duplication of information, if the firm has already provided the relevant information in any other report prepared, it should provide appropriate reference to the same in its IR.

Kirlosker Brothers Ltd. is one of the first companies in India to prepare IR since 2013-14. Yes Bank is the first bank to release the IR in line with IIRC since 2015-16. The report explains bank's dependence and impact on the various forms of capital that are fundamental to its ability to create long-term value. Tata Steel is preparing IR since 2014-15. The IR of this company for financial year 2016-17 has been recognized as Asia's best integrated report by Asia Sustainability Reporting Awards. Wipro is also preparing IR for last three years providing information on six types of capitals and their interdependence. The analysis of the annual reports revealed that the key drivers of IR are regulatory requirements like SEBI guidelines, and stakeholder perceptions and pressure to become more accountable and transparent.

The financial year 2016-17 witnessed the release of six separate integrated reports in India (KPMG, 2018). But many companies prepare IR as a part of annual report. 36 integrated reports were published in the first half of 2018 (Deloitte, 2018). At present, many large companies in India have already adopted IR. Reliance Industries, Tata Steel, Tata Motors, HDFC Bank, Wipro, HDFC, BhartiAirtel, BhartiInfratel, Indian Oil Corporation, JSW Steel, Mahindra and Mahindra, Titan Company, Cipla, Vedanta and IndusInd Bank have prepared integrated reports in

the last financial year, 2017-18. HDFC has prepared IR which gives holistic view of the long-term strategy and financial performance of the company along with benchmark standard with respect to human rights, sustainability, environment, society, governance and CSR. The Bombay Chamber of Commerce and Industry and PwC jointly conducted a survey to better understand corporate India's approach and outlook towards IR. 90% of the participants believed that IR will improve boards' understanding of how companies create value (PwC, 2018).

The analysis of Nifty 50 companies shows that only eighteen companies have prepared integrated report. Most of the services sector companies have not prepared the IR. All companies in Nifty 50 have prepared business responsibility report, corporate governance report, and report of CSR activities. Most of the companies have prepared Sustainability report. The companies have prepared IR incorporating the details regarding six capitals following the IIRC guidelines. Some companies have discussed IR in the Management Discussion and Analysis (MD&A).

VII. AN INDIAN CASE STUDY

Reliance Industries Ltd.(RIL), India's largest and most profitable private sector company, having business *verticals* such as refining and marketing, petrochemicals, oil and gas, retail, digital services and media and entertainment has been taken as a case study. The RIL prepares separate IR incorporating the details regarding *six capitals* postulated by IIRC. The need to integrate and effectively manage environmental, financial and social considerations with business decisions is at the core of RIL's value system. It has measured and presented its performance under natural capital, human capital, intellectual capital, manufactured capital, financial capital, and social and relationship capital. The company has taken a holistic view of the inter-relatedness of the six capitals to enhance value creation. To support the business model of the integrated reporting, RIL has put in place effective systems, such as, the Reliance Management System and Enterprise Risk Management Framework while leveraging digital technology.

Natural capital of RIL involves creating value through sustainable measures and contributes towards cleaner air and water, preservation of flora and fauna, and enhancement of bio diversity. Every manufacturing location of RIL works towards minimising its environmental footprint and endeavours to be in harmony with the ecosystem. The key performance indicators of natural capital inputs are rain water harvesting capacity, saplings planted and energy saved on account of conservation initiatives. RIL has planted more than 2 crore saplings since inception. The key natural outputs are total water recycled and energy intensity index ranking. The total water recycled in the financial year 2017-18 was 69,364('000m³). 6,200 Ha of green belt was developed, serving as a carbon sink. The key natural capital outcomes are cleaner air, cleaner water, cleaner soil preserving flora and fauna, and marine ecosystem. Efforts are taken for diligent use of scarce resources with minimal environmental footprint. Natural capital considerations (air, water and soil) are integrated in RIL's decision making at all stages. RIL has taken decisive steps to improve energy efficiency, thereby reducing greenhouse gas emission.

To enrich *human capital*, RIL has inculcated a deeper sense of connect and engagement for its people. It fosters a culture that is performance oriented, promotes rewards for results and provides equal importance to achieving results.

The total number of RIL employees are 1,87,729 in FY 2017-18 which constitute the human resources of the organisation. Millennials at RIL has been consistently over 40% for the last two years. There is focus on skilling and reskilling with total training hours of over 57 lakh man-hours. Employee diversity is across generation, gender and jurisdiction with people from over 15 nationalities. RIL consistently reviews the talent and potential of its employee base and strengthens its leadership pipeline to remain *ready in future*. It has medical centres, fitness centres, dedicated sports zones and an IT-enabled platform for holistic wellness of the employees. The company has instituted a set of policies, codes, and guidelines to govern its human resources and engage them fully.

As regards *intellectual capital*, RIL's vertical Jio ranked 17th in 50 most innovative companies list 2018. The company has 24 RandD Labs with more than 900 scientists and engineers. In the year 2017-18, 192 patent applications were filed and 68 number of patents granted. Total expenditure incurred on RandD was Rs. 1824 crore. The company has transitioned from a smart buyer of technology to a fast customizer of technology. RIL fosters a robust research and innovation culture to address emerging challenges and demands. At RIL, RandD is governed and operated by a well-defined set of teams, such as, strategic teams, leadership teams and functional excellence teams.

Regarding *manufactured capital* of RIL, the investments in megaprojects and complex supply chains have enabled it to improve efficiency and reduce operating cost. It has leveraged digital technologies such as platforms, artificial intelligence, machine learning, robotics process automation, big data, internet of things, block chain, 3-D printing and augmented/virtual reality to create innovative solutions for business value addition. Total asset value of RILRs. 8.16 lakh crore in 2017-18 is the key manufactured capital input. It has world's largest green field refinery and petrochemical complex. Its vertical Jio is the world's largest mobile data consumption and VoLTE network. It has integrated 'farm-to-fork' model that includes 47 collection centres and 350 million footfall in its retail stores. RIL's key manufactured capital outcomes are: it processed 1.5% of world's transportation fuel, created digital ecosystem for India with Jio which is world's largest and fastest growing mobile data network with more than 81% of total industry 4G data traffic in 2017-18. In the oil and gas industry, RIL has adopted state-of-the-art technologies and smart manufacturing processes in its value chain.

As regards RIL's *financial capital*, it has focused on improving shareholder returns by optimising the cost of borrowing, maintaining an optimal capital structure, efficiently managing its cash flows and establishing prudent risk management framework for enhancing its operational performance. It retained its credit rating of 'CRISIL AAA' from CRISIL, 'IND AAA' from India Rating and Investment grade rating for its international debt from Moody's as Baa2 and BBB+ from SandP. The key financial input is the capital expenditure incurred Rs. 79,253 croreduring FY 2017-18. The key financial capital outputs during the FY 2017-18 are revenue Rs. 4,30,731 crore, profit after taxes Rs. 36,075 crore, debt equity ratio of 0.75 and return on capital employed 28.7%. The key financial capital outcomes are market capitalisation of Rs. 5,59,223crore and 31.4% compound annual growth rate(CAGR) of market capitalisation since IPO.

For enriching its *social and relationship capital*, RIL takes initiatives for social innovation through its products and services for ensuring sustainable and

inclusive growth. By launching its digital services across both urban and rural areas, it has helped the people to enjoy higher standard of connectivity at affordable prices. The social and relationship capital inputs are its contribution to national exchequer Rs. 56,997 crore, reinvestment in the group to maintain and develop operations Rs. 39,639 crore, employee benefit Rs. 4,740 crore and contribution to society Rs. 745 crore in 2017-18. The total value created by RIL is estimated as Rs. 1,13,632 crore. The CSR expenditure is Rs. 771 crore during 2017-18. The social and relationship capital output are: total villages impacted are more than 13500 and urban locations more than 100. It has 7,573 retail stores in over 4,400 cities across the country. The outcomes of social and relationship capital are the community outreach of Reliance Foundation, which is more than 20 million people. The money of the shareholders has doubled every two and half years for the last 40 years and the market capitalisation has crossed Rs. 6 lakh crore. RIL has good relationship with the start-up ecosystem, suppliers, government authorities, academia and other institutions. Special efforts have been undertaken to take care the interests of all other stakeholders such as customers, employees, local communities and NGOs.

The RIL has prepared a separate integrated report and the details regarding six capitals (IIRC) also find a place inside the Management's Discussion and Analysis (MD&A). A detailed report of the six capitals discussing the key inputs, outputs and the resulting outcomes is the unique feature of its IR. Both quantitative and qualitative parameters have been taken into consideration in the report. RIL has provided information regarding the use and interdependence of different company resources. The discussions regarding six capitals on all the verticals of the company have made the report very voluminous and disjointed. The information on strategy and governance of six capitals is not coming out clearly from the report. But, the company has nicely presented the facts and the future value creation narrative.

VIII. BENEFITS AND CHALLENGES

There are both costs and benefits for adopting IR framework. But many research findings reveal that the benefits are more than the costs and challenges for large companies.

Benefits

The two main objectives of any business organization are financial stability and sustainability. The global financial crisis in 2007-08 brought into focus that sustainability was not embedded with business model. The tangible or financial factors are easy to account for in the financial statements. But intangible factors, like intellectual capital, competition, energy security, employee engagement, reputation and stakeholder relationships, are very complex phenomena and also very difficult to report in specific terms. The IR offers a great opportunity for companies to instil more confidence among stakeholders by integrating sustainability and financial performance which also leads to more integrated risk management process.

IR provides better clarity and better quality of information available for stakeholders. It develops a culture for departmental collaboration required to produce the report combining financial with non-financial reporting. There is enhanced accountability for six capitals. IR aims at better corporate reporting

leading to better decision making.

IR is a change from siloed reporting to integrated reporting. Its focus is on integrated thinking and management of various types of capital. It is a more efficient and effective reporting for both users and preparers. It provides a complete picture of both internal and external environment. As sustainability is embedded within the every business model, the risks of long term failures are reduced. Integrated reporting is a big shift from financial capital market system to inclusive and sustainable capital market system. IR focuses on the process/system rather than the end result or outcomes. It provides a better understanding of the performance of the organization and its value creation which helps to win the credibility of stakeholders.

IR is expected to bring greater transparency on corporate commitment to sustainability by showing the links between financial and sustainability performance in a single document. IR provides insight into firm's strategy and how it relates to the organization's ability to create value in the short, medium and long-term, and to its use of an effect on capital (www.integratedreporting.org). IR stimulates innovative reporting practices by reducing the number of reports. Finally the stakeholders get a strong company narrative and a more joined-up story regarding the organization.

Challenges

The main challenges for IR are value identification, its creation, measurement, and reporting. Another challenge is the complexity of measuring and quantifying non-financial matrices. There is need for harmonization of IR standards and regulations. Technology enabled reporting system is essential for the corporates. Audit and assurance services are required for the reported data in IR to check reliability, materiality and completeness. Initial efforts are essential to integrate a firm's strategy, governance, performance, prospects, as well as the contents within which it operates.

Proper design of the reporting process and its review are required. The organisation has to design an efficient system of collecting information, simplifying relevant information and putting it in concise, consistent and in comparable format. All areas of organizational performance should be presented in a connected reporting way (Bal, 2018). As IR is voluntary, the reporting organisations are frequently providing an incomplete and biased picture of their activities (Camillery, 2018). In addition, it can lead stakeholders to make erroneous assessment of organisations (Stubbs and Higgins, 2018).

IX. CONCLUSION

There is need for significant transformation in approach and thinking, leading to innovative reporting and IR movement in India to comply with international best practices. It is observed from the content analysis that the current system of voluntary disclosers has created an uneven playing field, with some companies clearly informing stakeholders and others under-reporting or over-reporting. Sincere efforts are required to address a number of criticisms which have been levelled at IR.

Information disclosure is one of the most important decisions to be made in business, because of its potential consequences, both positive and negative

(Frias-Aceituno *et al.*, 2014). To meet the information needs of the stakeholders, IR should be comprehensible, credible and comparable. SEBI should formulate guidelines based on best practices of various companies. As IR is believed to be a radical transformative change in the field of corporate reporting, it has significant potential for *future research*. Future research studies can be undertaken to study the relationship of IR with many variables, such as, firm value, firm size, quality of management, quality of ESG management, capital market, sustainability, stakeholder decision making, etc. Research studies can also be undertaken to study the perceptions and insights of various stakeholders on the value and decision relevance of the IR. Survey of IR practices of many countries can be undertaken for cross-country comparison and to find out the best practices. Pressure groups, regulators, academics and professionals have to play an important role in enriching integrated reporting. The SEBI, ICAI and Ministry of Corporate Affairs, Government of India, have to be proactive in corporate disclosure to help the stakeholders of business.

Finally, we acknowledge that this article suffers from several *limitations*. Indian companies do not have uniformity in the preparation and presentation of high quality and value relevant IR due to absence of standards and guidelines by the regulators. Key performance indicators, that should be disclosed, vary from company to company. As it is a relatively new approach to corporate reporting, it is adopted by a fairly small number of companies in India. Due to this, analysis and comparison was limited. This paper has also the normal limitations which apply to small sample studies. Therefore, future research studies should be able to analyse structured IR of many companies in India and find out its effects. It can be extended to investigate the IR practices of many countries for providing cross-country comparison. We conclude that the IR will prove to be a fertile ground for future research studies.

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Education and Research in Business Studies and Management in India: Opportunities and Challenges

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ABSTRACT

This paper seeks to explain the relationship between education and research, research and education, and education, research and the profession. It is a kind of exploratory research based on the experience of the author in India and abroad over a period of three-and-half decades. It gives a reasonable account of opportunities and challenges of both of education and research and also some suggestions for improvement in the environment. The paper also suggests an approach to measurement of quality of research, and future research agenda including identification of research problems and research issues in respect of some of them for benefit of the interested researchers.

Key words: Education and Economic Development, Sustainability, Macro-economic Indicators of Ranking, Opportunities and Challenges, Quality of Research, Research Agenda.

I. INTRODUCTION

This paper is predominantly based on the discussion in a workshop of commerce and management teachers on the subject conducted by the author in the Management Department of the University of North Bengal on 28th February, 2019. It focuses both on education and research from the standpoint of educators and researchers who are working in the universities and management institutes. The author had been working on similar topics since long.¹ The instant paper is however different from the earlier ones in many respects. Because of constraint of volume, it briefly discusses on some important aspects of business and management education and then shifts to research as there is always a relationship between education and research, particularly in the university system. More specifically, the issues identified for discussion are:

- Why and how should we orient business and management education

¹See for examples, *Accounting Education in India*, DSA in Commerce, University of Calcutta, 1994; *Emerging Research Issues in Accounting and Finance in India*, in Gupta and Paul (ed.) *Commerce Education in the New Millennium*, 2004; *Accounting Education in India in Changing Perspectives*, *Indian Journal of Accounting*, December, 2014; *The Role of the Institute of Cost Accountants of India in Promoting Research and Publications*, *The Management Accountant*, March 2017 (jointly with Debaprosanna Nandy).

keeping in view the economic development and more importantly sustainable economic development?

- Should not the business and management education keep in view the QS World Ranking and National Institutional Ranking Framework (NIRF) of macroeconomic indicators to enhance the competitive advantage of our educational institutes, both nationally and internationally?
- Is there any relationship between education and research, research and education, and research and education in one hand and the profession on the other?
- What are the opportunities and challenges of education and research?
- Why is research required to be done and what are its components and how to determine its quality?
- What should be the contemporary research agenda and what are the issues involved in some of them?

The paper is organised as follows. After literature review in Section II, next section deals with various aspects of education. The opportunities and challenges in education are given separately in Section IV. Similarly, Section V delves on intricate issues of research including measurement of quality. The agenda for future research is given separately in Section VI. This is followed by some concluding observations. We followed explorative type of methodology predominantly based on the author's experience in India and abroad over a period of three-and-half decades.

II. LITERATURE REVIEW

Literature on business and management education is in abundance. We try to give a snap shot of the relevant ones. It needs to be mentioned that business and management education is known as business studies or business management or commerce in India and a few other Asian countries. In almost all other countries, viz. Australia, Canada, Japan, the U.K., the U.S.A., it is accounting education. Although there are differences between the two, we do not have any option but to refer to accounting education and research in international context. First, we give some references to Indian literature and then we explore the international scenario in brief.

Dasgupta (1959) made maiden attempt in giving historical aspect of business education in India till 1950s. He documented nicely how business education developed over time since 1920s. Bhandari (1973), one of the stalwarts in business education, published part of his UGC project report in the instant article. He explained why different types of university system grew since independence and the education system that was prevalent in each. He however laid emphasis on research for improvement of business education in the country. Bhorali (1987) published an edited volume comprising about a dozen papers which were presented in a seminar organised by the Gauhati University. It was the maiden efforts to cover different aspects of commerce education. At about the same point of time, Amarchand (ed.) (1987) published *Research Methods in Commerce*. It was first of its kind to lay emphasis on research methodology to enrich research in commerce. One of the important articles in that treatise was that of Satyanarayana

on *Trends of Research in Commerce in South Indian Universities*. According to them, no doubt there were some good attempts to do research in commerce but that was not adequate both in quantity and quality. Banerjee (1994) and Sharma (1997) published their research findings in business/accounting education and professional accounting education in some South Asian countries, respectively. Then came the publication of Gupta and Paul (2004) titled *Commerce Education in the New Millennium* which comprised thirty-five contributed articles on different aspects of commerce education and research giving thrusts for the new millennium. As against this modest background, we now turn to the international scenario, that is, works relating to accounting education and research.

Sixth International Conference on Accounting Education was held in Kyoto, Japan (October 7-10, 1987). The published Proceedings of the Conference were available. Mueller's Key Note Address on 'Emergence of Accounting as World Discipline' (pp.80-86) in one of the Plenary Sessions concluded:

As scholars we have to concede that accounting is not a world discipline. But "take-off" conditions seem in place. Meetings like the Sixth International Conference on Accounting Education help to point the way. I perceive clear improvements in the direction of accounting as a world discipline. The sooner we reach this goal the more fruitful our scholarly endeavors will become (pp.85-86).

In the Kyoto conference there were papers on accounting education from many countries, viz., Australia, China, Denmark, Germany, India, Japan, Korea, Kuwait, Nepal, New Zealand, the U.K., the U.S.A. and many more. The thrust was to develop accounting education (and also accounting research) nationally and internationally by discussing, among others, cross-cultural issues and their impact on education and research. Dutta (1987) emphatically pointed out the role of education and research in industrial development in the following words:

Accounting research, like industrial research, is required to cope with the new trends of technological renovation, informationalization, and internationalization toward the twenty-first century. Without research, education becomes stale and useless like an outdated medicine (p.533).

Anyane-Ntow (1992) published an edited volume entitled *International Handbook of Accounting Education*, Pergamon Press, in association with IAAER. It contains 33 well-written articles grouped in Six Parts, viz. Part I: Accounting Education in Africa (6 articles); Part II: Accounting Education in Arab Countries (2); Part III: Accounting Education in Asia and the Pacific including India (7); Part IV Accounting Education in the Caribbean and America (6); Accounting Education in Western Europe (8), and Part VI: Accounting Education in Centrally Planned Economies including China and Poland (4). It was the sustained efforts of several years to publish the present treatise to cover the experience of large number of countries.

The central theme of the papers included in the above volume was 'how accounting education and certification in each country relates to accounting practice, the needs of the economy and challenges presented by expected future developments.' According to the Editor:

The materials in the volume could be used as bases for comparative

studies on accounting education and certification processes as well as helping policy makers in the area of accounting education (Introduction, p. xxvii).

The uniqueness of the volume is that authors were asked to give, among others, a brief description of the economy and the role of accounting within the socio-economic environment. The task was no doubt very challenging to the authors and the editors to make the volume useful both at the national and international levels.

In 1994, Burns and Needles, Jr., edited a volume entitled *Accounting Education for the 21st Century – the Global Challenges*. It contained sixty-five papers from forty countries. It was a joint venture between AAA (International Section) and IAAER. Many rapid changes in social, political, technological and economic were taking place in the world economy which led to increasing recognition of the key role that accounting and accountants in all countries play in the process of economic development. This in turn emphasises the need for quality of accounting education. In view of this, the purpose of the publication was “to provide an up to date view of the state of accounting education throughout the world and to focus on global challenges as we approach the twenty-first century. The papers were organised and edited into nine parts: Part I: Global Views of the Needs and Future of Accounting Education; Part II: Accounting Education in China and Russia; Part III: Accounting Education in Developing Countries; Part V: Accounting Education in Developed Countries; Part V: Instructional Innovations in Accounting Education; Part VI: Performance Evaluation in Accounting Education; Part VII: Ethics and Professionalism in Accounting Education; Part VIII: International Accounting Standards; Part IX: Further Issues in Accounting Education. Mueller² (1994) in discussing the global challenges for accounting education observed:

In the last 20 or so years, accounting research had no significant impact on the practice of accounting or accounting regulation. Accounting research is said to lack innovation. There is widespread sense among accounting researchers that academic accounting, particularly on the research level, currently faces a serious crisis (p.9).

Let us now look for a few individual articles on accounting education and research. Ozturk (2001) in his article, *The Role of Education in Economic Development: A Theoretical Perspective*, emphasised that ‘no country can achieve sustainable economic development without substantial investment in human capital’. Burnett (2003) in her article, *The Future of Accounting Education: A Regional Perspective*, stressed on teaching methods based on survey of accounting graduates and members of a local CPA chapter to ascertain which skills are important for new graduates and which educational innovations are effective. According to this survey, top-rated several professional skills were analytical/critical thinking, written and oral communication, and decision-making. Similarly, top three technology skills were spread-sheet soft-ware, windows, and word-

²Gerhard G. Mueller, University of Washington, was President of the AAA and also served as a member of IASB from the States. He made several contributions to international accounting. *The International Accounting*, jointly authored by Frederick D.S. Choi, New York University, and Gerhard G. Mueller, and published by Prentice-Hall, Englewood Cliffs, N.J., has received wide response in international accounting.

processing software.

In spite of many works being done on commerce and management education, some of which are briefly outlined above, there is justification for further work on the subject. Firstly, economic forces have been changing rapidly, and commerce and management education, in order to play a useful role, must also change. What should be the direction of that change? Academic research in business studies and management has very little impact on public or professional policy. In India, demand for business studies and management is going down and also not many brilliant students are attracted to these courses to the extent desirable to improve the quality of our outputs. The academic administrators do not also usually evaluate these courses creditably compared to science courses including social science. So, it is necessary to make an analysis of contemporary issues in order to find some constructive solutions.

III. EDUCATION

(a) Education and Economic Development

One of the main purposes of an education system is to contribute towards economic development, nationally and internationally. How? Education enriches people's understanding, improves quality of their lives and leads to broad social benefits to individuals and society. Education raises people's productivity and creativity and promotes entrepreneurship and technological advances. In addition, it plays a very crucial role in securing economic and social progress and improving income distribution (Ozturk, 2001). Commerce and management education, having a multi-dimensional approach, has a more important role to play both at macro- and micro levels (planning, resource allocation, measurement, risk taking, reporting, etc.).

Sustainable development is described in terms of three pillars (triple bottom-line) : the economy (economic equality), the environment (sustainable use of resources and its better management to enhance the quality of life) and the society (improving the economic conditions of people by providing minimum education, health care and housing). The welfare economists focus on human and societal development (*inclusive growth*) along with economic development. It is a holistic view that considers interest of all the stakeholders. How should we then focus on commerce and management education in order to make it compatible to *sustainable development*?

Sustainability is a long-term concept. The education system should not only be efficient but also effective – effective from long-term view point. In order to make the system “sustainable”, it must have certain attributes (high quality, robustness, vibrant, compatibility with economic policy, minimum response time for a change, etc.). These attributes must be developed from the essential components of sustainable economic policy and macro-economic indicators used for national and world ranking of higher education.

(b) Macro-economic Indicators for Ranking Higher Education

In the competitive environment today, ranking of higher education is common. One of the objectives is to attract national and international students for admission. The Human Resource Department in India publishes ranks of educational

institutions every year since 2016 (NIFR_2018_x9.CDR). Internationally, QS ranking is well-known. This organisation ranks top universities and institutions in the world³. What are the objectives of such ranking? The primary aim of QS Ranking is to help students make informed comparisons for their decision-making regarding leading universities around the world.

The objectives behind such rankings are put more elaborately by the HRD Minister, Mr. Prakash Javadekar, in his message to the Report of India Rankings 2018, in the following words:

- create an opportunity for Indian Academic Institutions for introspection on a regular basis;
- help the participating institutions to identify areas of strength and weakness with respect to peers;
- contend deficiencies and effect improvement as needed.

QS uses *six performance indicators* and their respective weights for ranking are given in table 1. Based on these indicators, the rankings are designed to assess an educational organization's performance in four areas, viz. (1) Teaching,

TABLE 1

Performance Indicators and their relative weights

Academic Reputation	40%
Student-to-faculty ratio	20%
Citation per faculty	20%
Employer Reputation	10%
International faculty ratio	5%
International student ratio	5%
Total (weights)	100%

Source: www.topuniversities.com

(2) Research, (3) Employability, and (4) Internationalization. What is their relevance? *Academic reputation* is measured using a global survey in which academics are asked to identify the institutions where they believe the best work is currently taking place in their own field (76,800 responses were received in 2018). In respect of *Student-to-faculty ratio*, it is believed that small class size is encouraged as it promotes a good level of individual supervision and interaction. *Citation per faculty* is an indication of research impact of the concerned Department/University. For measuring *employer reputation*, the survey asks employers to identify the universities they perceive to be producing best graduates (44,200 were responses in 2018). How successfully a university is attracting international students and faculty, is measured by *International faculty ratio*, *International student ratio* (5% + 5% = 10% weights). Although the weight is low, each is expected to promote cross-cultural environment in and outside the class room.

In the NIRF in India, rankings of higher education are done based on *five parameters* or criteria (www.nirfindia.org/parameter) each representing equal weights of 20 marks viz. (1) Teaching, Learning and Resources (core activities

³QS makes similar ranking for Asia using the same indicators (www.topuniversities.com).

of an institution); (2) Research and Professional Practice (excellence in teaching and learning is closely associated with scholarship); (3) Graduation Outcomes (to measure the effectiveness of core teaching and learning activities); (4) Outreach and Inclusivity (having emphasis on women and socially challenged persons), and (5) Peer Perception (perception of employers and others). Marks/weights are also allotted to sub-items under each category.⁴ The well-defined parameters of NIRF give good indication about how effectively an education system should be managed. At present, only Management is included in the seven classified subject-groups among 3,954 participating institutions. It is expected that the subject categories will be increased in near future to give opportunity to some other social science departments, namely, economics, sociology, business studies, etc. to participate.

Participating Institutes work hard to achieve excellence in each of the above mentioned parameters, either nationally or internationally. In designing our higher education system which is aimed to be sustainable, should not we keep in mind the above factors so that our education system is developed accordingly to create sustainable competitive advantage?

IV. OPPORTUNITIES AND CHALLENGES IN EDUCATION

India and China are so large that neither of them can depend on foreign universities to train enough graduates in social science departments including commerce and management. Salaries in India are rising faster than any other major country in Asia (15% in 2015, as per TOI). Commerce and management education promotes entry to other professional courses, viz. CA, Cost Accounting, Insurance, MBA, to mention a few. Since commerce and management is crucial in every field, these courses are getting good recognition throughout the world. One reason for such popularity is that they are *integrating courses* that take required vitals from many other disciplines.

The **challenges** are also many and some of them are hard nut to crack. These challenges are:

- Introducing course curriculum that will have economic and social significance
- Modernizing infrastructure
- Increasing the proportion of spending for education
- Taking steps to arrest the trend of fall in enrolment of students in some social science departments
- Increasing quantity and quality of research
- Building up industry-institution partnership for mutual benefits.

India has huge opportunities not only in terms of its own student population for higher education but also from those from neighbouring countries and some African countries. Many students from these countries are enrolling in different universities and management institutions in India. Their percentage to the total students may not be significant but to many international students their destination for higher education is India. If they go back home with successful completion of the course, their experience in India may promote growth in international students. Designing course curriculum effectively is an important

⁴For details, see Banerjee, Bhabatosh, Rankings of Higher Education Institutions in India: Efforts to Enhance their Competitive Advantage, *The Management Accountant*, ICAI, May 2018, pp.80-89.

issue. New and relevant courses should be introduced, and changing them periodically in keeping with the changes in the economic policy will be one of the critical success factors. The course objectives and the course details should be documented, circulated and effectively implemented. Periodical academic audit will help improve the practice.

Effective administration of a course depends to a large extent on the teaching methodology, among others. What methodology should be adopted - oral vs. audio-visual, case-based approach, internship, project work and viva, and at the end of the final semester, dissertation and grand viva? All these changes cannot be introduced overnight – they may be introduced over a period with the right attitude of the faculty and required infra-structure.

An improvement in infrastructure and introducing small size of class will not only increase the enrolment but also improve the performance of the students. The examination system should include grand viva and dissertation at the end of the final semester as mentioned earlier. Placement is one of the very important factors. Both quality (value) and quantity of placement should be given a serious thought to come up to the expectations of the students. To build up university-industry partnership, some of the reputable prospective employers should be inducted in course restructuring and admission process. Seminars and symposia should also be conducted periodically to increase the soft skill of the students.

In some traditional colleges and universities, there is decline in enrolment. For example, during 2004-09, under the University of Calcutta, eight commerce colleges in and around Kolkata had changed their names – from commerce colleges to general colleges. Some more followed suit. What are the contributing factors? Was there any research study to capture the perception of the students? As against this trend, IIMs are finding it difficult to recruit quality instructors in accounting and finance group. We have to find feasible solutions to these problems to prevent further downturn.

Infrastructure in new universities and institutes are far better than that in the traditional colleges and universities. They have ‘smart’ class rooms, arrangement for audio-visual presentation, and workshop and seminar halls having modern facilities. But in traditional universities and institutes, these facilities are significantly lacking. To make arrangement for such facilities, it is imperative to have further investment. It requires funding from outside as these universities and institutions do not have adequate resources. The State and Central Governments through their various agencies should help build up modern infra-structure. The local and central governments have also their limitations. The investment in education in the developing and emerging economies is far less than that in advanced countries. Consider the data in table 2.

TABLE 2
Government Expenditure on Education as % of GDP in some countries

<i>Country/Year</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>
Australia	5.24	5.17	5.32
U.K.	5.62	5.69	5.63
Hongkong	3.76	3.26	3.30
China	*	*	*
India	3.83	2.8	2.4
United States	4.98	4.99	*
World (average)	4.68	4.81	4.72

Source: <http://api.worldbank.org>

*Stands for non- available.

Figures in table 2 speak for themselves. India's expenditure on education has declined over time. However, as per Niti Aayog advice, India should spend at least 6% of GDP on education by 2022 (ddaayog-1414333-2018-12-2). It cannot be denied that investment in education will have its multiplier effect on economic development and quality of life. In the USA and in many western European countries, corporations come forward for funding of infrastructure and research projects. In India, these facilities are few and far between. We have to explore all avenues to rope in corporate organizations for funding. No doubt, this is very difficult but not impossible.

We now turn to the more important issue of research in business and management education in Section IV. Before that, let there be a brief description on the inter-relationship between teaching/education⁵ and research, research and teaching, research and profession and profession and education and research (figure 1).

FIGURE 1
Relationship between Teaching, Research and Practice
(Banerjee, 2004, p.1)



Without research can there be quality and effective teaching? Innovative teaching always makes room for research. Dutta's comments (1987) on the relationship is more specific in the following words:

Research enriches education, and education equips an accountant with professional competence. His services fructify in industrial development. In fact, all these gain momentum from one another (p.534).

Profession always looks for research that addresses business problems. For the profession, "relevant" topics are more important than "elegant" topics. Good rapport with the profession also facilitates education and placement. So, there is intimate relation between teaching, research and profession.

V. RESEARCH

(a) Need, Sources, Components and Quality

Research in any discipline, whether fundamental or applied, serves as the

⁵Teaching and education are used interchangeably in the same sense although education has wider connotation and may also include research.

'open sesame' to the advancement of the horizons of any education system (Banerjee, 1994). So, research in business studies and management cannot be an exception to this. Accordingly, we delve on some important research issues in this section. Consider the following questions.

- Why should we do research at all?
- What are the components of research?
- How can we measure the quality of research?
- What may be the potential areas of research in the coming years?

In any discipline at the higher education level, research and publications are a must for career advancement. Barring Ph.d. programmes of universities, what then are the possible sources?

- Minor/major projects funded by various agencies like UGC, ICSSR, etc.
- DRS/DSA/CAS programmes of UGC
- Publication in research and academic journals
- Publication of text and reference books.

Going back to the first question, i.e. why should we do research at all, we consider the following observations:

.... Research has its own intrinsic rewards, but it is not an end in itself. Society may reward researchers in the short run because they possess a scarce resource, namely, the ability to initiate and complete a research effort. In the long run, however, society expects more tangible results, and the value of research projects can, and should, ultimately be measured in terms of their contributions to understanding, problem solving, reduction of uncertainty, and prediction of phenomena (*Khalik and Ajinkya, 1979; pp. 1-2*).

The above observations of the two distinguished academics in the States are still valid today. Rashad Abdel-Khalik was the Editor of *American Accounting Review* and is now the Research Professor in the University of Illinois at Urbana-Champaign. Among others, he has been editing *The International Journal of Accounting*⁶ (published by Center for International Education and Research in Accounting, University of Illinois at Urbana-Champaign).

In any research work, the following **components** are involved:

- An idea (selection of the topic)
- A researcher (the background)
- A method, and
- An environment.

The selection of a research topic (idea) is very critical in any research work. It depends on the quality of the researcher (and supervisor). The quality of the researcher (and supervisor) is again influenced by their training and academic environment. The research topic may be on one of the contemporary issues that may benefit the stakeholders. Emphasis on economic policy may be a guiding factor. The work may be of fundamental or conceptual or applied or empirical

⁶It was the first international journal of accounting published by the Center when late Professor V. K. Zimmerman was the Director.

type. Both types have their merits and limitations. However, fundamental work may have far-reaching impact. Consider the following observations of Professor G. D. Roy, who became a legend in his life time for his creativity in accounting research.

..... Teachers of accounting and allied disciplines should be careful in the selection of research topics either for the purpose of their own or of their students..... It is better that the said selection of research topics is made from conceptual and theoretical topics. Otherwise, the 'academic respectability' of the discipline concerned cannot, possibly, be maintained among other disciplines of the university. — *G. D. Roy, 1991, p. 162.*

Professor Roy's above observations may not be taken as a surprise in view of his contribution to accounting research. He did a seminal research work in his book published in 1963. His idea of "Claims to Services" in accounting acclaimed him world-wide recognition.

(b) Opportunities and Challenges

In affiliated colleges, there is no compulsion for doctorate degree at the entry level – NET/SLET with M.Phil degree may be adequate although candidates with Ph.D. may confront competition better. At post-graduate level, same requirement persists although preference is given to the doctorate candidates. In the matter of promotion to or selection at higher positions, doctorate degree with publications is a must. So, given the present Indian practices, demand for Ph.D. and publications will tend to increase. There is no doubt that the position has improved in recent years significantly both in quantity and quality. The same may be true in case of other subjects within business studies and those of management. The UGC has recently introduced a radical change in research programme in Indian Universities. In some cases, industry support for research has been increasing. But compared to demand, such improvement may be considered inadequate.

Barring Ph.D. programmes, what is the overall environment of accounting research? Sunder, way back in 1991, identified "symptoms of trouble" in accounting research in the USA. They still hold good today in Indian environment. These symptoms are: (1) accounting research should lead practice and should not follow it; (2) there is little pressing demand for the expertise of accounting researchers from profession, regulators and policy makers (government); (3) teaching of accounting is becoming a service activity. Sunder then continued to observe:

..... many find accounting research difficult to read, either because it is too technical, or poorly written or both. Certainly, it is desirable to communicate research in more accessible language (p.134).

There are many **challenges** that stand in the way of improving the research environment in social science departments. Some of them are:

- Infrastructural problem
- Part-time Ph.D. programme
- Insufficient number and amount of scholarship
- Lack of competitive environment.

Historically, there is no separate infrastructure for the part-time Ph.D. programme which had been persisting for long. In many business studies and management departments, there are only a few full time Ph.D. scholars who get scholarship/stipend given by the UGC and the State Governments but majority of the research scholars pursue Ph.D. programmes on a part time basis without getting any scholarship/stipend. So, part-time and full time programmes are now going hand in hand. It is not a surprise to know that present generation of professors in almost all business studies and management departments did their Ph.Ds through part-time programmes. The author of the paper is not an exception. So, as scholars, they did not get that much opportunities to enrich their background. Supervision of Ph.D. demands considerable academic inputs, attention and time from a supervisor. If they are heavily pre-occupied with teaching load and other activities, like attending seminars, publishing papers in good journals, etc., how can their scholars get required support during their study period? So, to improve the environment, there should be more investment in infrastructure including recruitment of teachers.

(c) Quality of Research

One of the challenges is to increase the quantity and quality of research including publications. Quality is a state of mind – it needs commitment. Increasing quality requires sustained efforts – dedication and sincerity are the keys. It also demands good environment i.e. involving others and sometimes working in a team. It is ever-changing – so one has to believe in and get involved in continuous improvement.

We however argue for applying some tests for quality assessment/improvement. These are:

- Researcher's own satisfaction
- In case of a Ph.D. programme, checks and balances within the system and complying them in letter and spirit.
- Peer's scrutiny
- Publication
- Post publication review
- Citations in other research works.

Each of the above steps is self-explanatory. Sunder's article on *Measuring Research Accomplishments* throws some light on the issue. While admitting that research is not susceptible to *precise objective assessment*, he prefers researcher's own evaluation and peer review on several grounds. Regarding self-assessment, his arguments are:

Research is an intensely personal process. All important aspects of research activity are not plainly visible to others (p.135).

Regarding peer review Sunder said:

The best we can do is to keep the primary responsibility for evaluation at home, to take the time to read the work of our colleagues, and to make up our own minds about their contribution (p.137).

Researcher's own evaluation requires high level of objectivity. So, in situation

where this is expected, it can work. Possibility of peer review in Indian environment appears hard to become successful for many factors, viz. excessive load of individual teachers, lack of infrastructural support to them, existence of semi-political environment in and outside the department creating a fear psychosis, etc. So, we have to resort to other methods of external evaluation, viz. journal rating, number of citation, etc. in spite of the fact that they are not free from some limitations.

The above methods of evaluation are qualitative in character. Can we find out a quantitative method for evaluation? One such approach is given in figure 2.

FIGURE 2

Measuring Quality of a Research Work

	Assign points
I. Fundamental (<i>say, 30 points</i>)	
1. Introduction of the research problem	()
2. Review of literature	()
3. Justification and scope of work	()
4. Research methodology	()
5. Hypotheses	()
6. Limitations of the work	()
7. Scope for further research	()
II. Contents (<i>40 points</i>)	
8. Design / organization of the work	()
9. Adequacy of data and analysis	()
10. Practical applications / utility	()
11. Conclusions drawn	()
12. Adequacy of references / bibliography	()
III. Presentation (<i>30 points</i>)	
13. Clarity of objective	()
14. Clarity of language	()
15. Clear explanation of the work	()
16. Integration among various sections and chapters	()
17. Sufficient details of the methods / techniques adopted	()
Total points (say100)	()

The above aspects may be evaluated on a scale of 1 to 5 (where 5 stands for excellent, 4 for very good, 3 for good, 2 for average and 1 for poor) and relative quality of the work may be assessed accordingly. The higher the total score the better is the quality and vice-versa. This measurement approach has its merits and demerits. It is simple and can be quickly adapted and applied in any situation. But the main criticism is that it may suffer from the bias of the individual handling it.

VI. FUTURE AGENDA FOR RESEARCH

This paper will be incomplete if we do not give a list of contemporary research areas for the interested researchers (table 3).

TABLE 3
Contemporary Research Areas

Sl. No.	<i>Name of the Topic</i>
1	Enterprise Risk Management (ERM)
2	Corporate Environmental Management (CEM)
3	Big Data Analytics and Textual Analysis for Predictive Models: Role of Search Engine within XBRL Environment and Beyond
4	Internal Financial Controls : Impact on Corporate Governance
5	Accounting for Biological Assets
6	Cost Competitiveness in the Education Sector
7	Accounting Information and Security Price Determination
8	Measuring Performance of Public Enterprises in India: In Search of a Composite Index
9	Goods and Services Tax in India: Opportunities and Challenges – An Empirical Investigation
10	Financial Inclusion and Empowering Women in India
11	Value Creation, Distribution, and Integrated Financial Reporting
12	Business Valuation
13	Impact of CSR Cost on Firm Performance
14	Accounting Information and Security Price Determination
15	Changing Dimensions of Intangible Assets and their Management

The above list is illustrative. There may be many more contemporary areas for research. As for example, those who are interested on cost and management accounting topics can go through some good articles on emerging areas published in several issues of *The Management Accountant* (Bhattacharyya, 2015; Chattopadhyay, 2015; Ghosh, 2015 and Banerjee and Nandy, 2017).

What are the research issues in each of the topics given in table 3? As is the case, the issues are specific to topics and naturally may vary from one another. Because of constraint of volume, we identify some research problems and research issues for the benefits of the researchers in respect of first four topics only, leaving the remaining 11 items to the interested researchers.

(1) Enterprise Risk Management (ERM)

ERM is a relatively new management technique. In India, the Companies Act, 2013 requires, in the context of preparation and presentation of Financial Statements, development and implementation of a risk management policy for a listed company by its Board of Directors. Internationally, it is a hot topic. For example, COSCO issued in 1999 its first report on ERM which was subsequently modified in 2004 and 2014 (www.cosco.org/-erm.htm). Professional bodies, such as the KPMG, issued a professional judgment framework (www.kpmg.com). There are many issues for research, namely, various components and dimensions of risks, implementation challenges, developing an appropriate ERM model, disclosure format, internal financial controls as tools of risk management, relationship between ERM and Corporate Governance.⁷

⁷Banerjee, B. (2016). "Enterprise Risk Management", *The Management Accountant*, March, pp.66-72.

(2) Corporate Environmental Management (CEM)

There is a close relation between the issues on economic development and environmental management. In the long run, there is no conflict between environmental management, profitability and growth of a corporate enterprise. Some of the important issues for research are: the environmental challenges and the responses of the corporate sector to such challenges, international developments leading to the environmental agreements and legislations across the world, adoption of a strategic environmental management system to improve the environmental performance of the corporate sector, and accounting and reporting for environmental performance. In view of the importance of the topic, both explorative and empirical research may be undertaken⁸.

(3) Big Data Analytics and Textual Analysis for Predictive Models

The issue is to deal with the value of data mining and text mining in big data environment to develop predictive models. In particular, focus should be on text analytics in accounting and finance and updating the research community on advances in the area. The role of XBRL data in text analytics research and methods to overcome its inherent weaknesses is one of the important considerations. The technologies and techniques undergirding text analytics are still rapidly evolving. Recent strides made in this area increase both the effectiveness and accessibility of text analytics. It is important to analyse the current value of text analytics toward business and regulatory decisions. It is also necessary to examine research opportunities in integrating text analytics with quantitative business information and discuss the strengths and limitations of studies incorporating text analytics, and the steps needed to overcome those limitations. In addition, reasonable discussion on advances in technologies and techniques that increase the effectiveness of text analytics research and accessibility to a broader research community is imperative⁹.

(4) Internal Financial Controls : Impact on Corporate Governance (IFCs)

The Companies Act, 2013 requires, in the context of preparation and presentation of Financial Statements, development and implementation of a risk management policy and operation of effective Internal Financial Controls by the Board of Directors for a listed company. The explanation given after sub-section (5)(e) of Section 134 of the Act runs as follows: "For the purpose of this clause, the term 'internal financial controls' means the policies and procedures adopted by the company for ensuring the orderly and efficient conduct of its business, including adherence to company's policies, the safeguarding of the assets, the presentation and detection of frauds and errors, the accuracy and completeness of the accounting records, and the timely preparation of reliable financial information."

The Institute of Chartered Accountants of India issued a Guidance Note on IFC in November, 2014. It was revised and reissued on 16th September, 2015. Section IV of the Guidance Note deals with audit of IFC over Financial Reporting (Clauses 67 to 165). This regulation has been designed based on the Sarbanes

⁸Banerjee, B. (2009). *Corporate Environment Management – A Study with Reference to India*, PHI.

⁹http://www.researchgate.net/profile/Rajendra_Srivastava3?ev=prf_highl

Oxley Act – International Control Section. KPMG in India also issued in 2016 Internal Financial Control Perspectives.

Thus, in view of its importance, there are many important issues that concern IFC. Some of them are: What are its attributes? Are there strategic, operational and people-oriented challenges? If so, how to overcome them? Are the developments in India in this respect in line with international trends? Are there inter-relationships among Internal Financial Controls, Enterprise Risk Management and Financial Statements leading to high quality reporting and promoting value maximization objective of the firm?

VII. CONCLUDING OBSERVATIONS

Knowledge becomes obsolete faster than technology. Also, research is a continuous process. As indicated earlier, there is a relationship between education and research and to create our 'zones of comfort' we have to do both. In doing so, the interest of the profession should be taken care of to build up education-profession partnership. India is now the fastest growing emerging economy in the world. Let our education system (including research) improve more and more so that we can give leadership in this field as well.

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Analysis of Volatility and Leverage Effect in Select Stock Markets

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ABSTRACT

This study analyses the volatility and leverage effect in selected stock markets, namely, Brazil, Russia, India, China, UK, and South Korea. This study is based on time series data for the period from July 5, 2009 to May 29, 2018 using GARCH, EGARCH and TARCH models. GARCH models entail that present volatility of stock market returns can be elucidated by past volatility. Both EGARCH and TARCH test results indicate that leverage effect in six stock markets is perceived. The leverage effect is higher in the case of UK stock market; the impact of bad information and blows has a better influence on UK stock market.

Key words: Stock markets, Volatility, Leverage effect, EGARCH model, TARCH model.

I. INTRODUCTION

Volatility is a measure of demonstrating deviation in returns in a specific stock or the market portfolio as a whole. However, volatility has risks associated with a particular or entire stock market. In the efficient market hypothesis, this inalienable risk was thought to be the orderly chance (Fama et al., 1992), with the anticipated non-orderly dangers that would be completely differentiated. Stock returns volatility has got a great deal of consideration particularly among the analysts in the financial field as far back as the first work by Fama (1970). The principal factor behind the consideration on the stock return volatility is that it exposes the stock market development which is associated with the instability in the whole security exchange. This is additionally emphasized by the fact that a well functioning security exchange is essential for the stability in any economy. A profoundly unpredictable stock return is depressing for the speculators and the investors as well and thus, disintegrates their trust in a vulnerable market. Numerous financial investigations have distinguished unbalanced volatility in

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stock price, where stock return volatility has a tendency to rise after a huge fall in stock price instead of following an ascent in the same. Volatility in the market will affect how investors act towards adverse situations; higher returns urge the speculators to contribute toward increase in their capital inflows, though in unstable situations the profits are flighty, eventually influencing speculations.

Following money markets crash in 1987, a ton of empirical study has been made in an endeavour to demonstrate expectation of volatility in stock returns. As Schwert (1989) hypothesizes, the primary factors that causes volatility among stock returns still remains bewildered. In any case, other observational examinations try to focus on what causes instability among stock returns and the threadbare inter-connection between stock prices and stock returns. Dark and Scholes (1973), unequivocally expresses that the stock prices are contrarily identified with stock returns and therefore, the investors will have a certain deviation towards high premiums in order to monitor chances of unpredictability, if any.

The association between asset volatility and leverage effect has established an immense pledge of a spotlight in the finance literature. Volatilities and asset returns are negatively interrelated and this association is commonly acknowledged as the leverage effect (Black, 1976; Christie, 1982). Leverage is an essential factor of stock returns volatility; nevertheless, leverage persuades the volatility persistent and intensifies asymmetries (Lithman, 2010). The leverage effect is the entrenched association between stock market returns, and while volatility rises the stock prices fall and vice-versa (Sood and Saluja, 2016). The negative news in terms of leverage effect has a better shock on volatility than positive news and moreover volatility appears to increase when stock prices drop and reduces when stock prices rise (Triady et al., 2016). If volatility is valued by market providers, an expected augment in volatility would increase the requisite rate of return on equity that causes a present stock price turn down. Without a doubt, volatility is asymmetric for the reason that the reaction influence intensifies negative stock returns (Aboura and Chevallier, 2012).

The leverage effect is strongly associated and occasionally interchanged in the midst of a concept of the asymmetric volatility. The usual asymmetric volatility is illustrated by a lower volatility linked to an upward market and a higher volatility linked to a waning market (Kristoufek, 2014). Leverage effects depend on an asymmetric response of volatility to earlier returns and volatility increasing more quickly while returns are negative (Aydemir et al., 2006, Chorro et al., 2016). Again, Booth et al. (1997) and Albaity (2011) found that a noteworthy leverage effect and decline in stock prices appear to have a larger effect on stock prices. Engle et al. (1990), Forbes and Rigobon (2002), Baele (2005), Bittlingmayer (2005), Pesaran and Pick (2007), Nikkinen et al. (2006), Inagaki (2007) and Lee and Han (2016) investigated the volatility as well as leverage effect in stock markets. They confirmed that there was a significant leverage effect.

The time-varying character of asset returns has been considered as the beginning of the Engle's (1982) Autoregressive Conditional Heteroskedasticity Model (ARCH). Error terms of ordinary least squares regressions were presumed to show a constant variance using ARCH. After that the generalized autoregressive conditional heteroskedasticity (GARCH) model was introduced by Bollerslev (1986) and the exponential GARCH (EGARCH) model recommended by Nelson (1991). But GARCH cannot create any positive controls on variance factors.

EGARCH model examines the influence on stock volatility caused by asymmetric conditional heteroskedasticity on gripping diverse news in the stock market or in other words, EGARCH examines the shock of the asymmetric impact of good and bad information. The volatility asymmetry points out those investors are more responsive to negative information than positive news. The EGARCH also demonstrates the leverage effect in terms of a negative association between impacts to variance and impacts to returns (Turan, 2016). The uses of TAR model include regular expressions to discriminate the positive and negative impacts (Glosten et al., 1993). Keeping in view of the volatilities of the asset returns and an asymmetric response of volatility to past returns, this paper analyses the volatility and leverage effect of stock prices in selected stock markets.

II. LITERATURE REVIEW

A survey of the different studies on stock market volatility and leverage effect reveal that many financial analysts and academicians have dealt with this territory with much being in the developed nations.

A huge number of observational studies has been given to thus clarifying this reality with pioneers of the work here being Fama (1965), Black (1976), Christie (1982), Blanchard and Watson (1982), Pindyck (1984), French *et al.* (1987), Hong and Stein (2003). Various research papers have concentrated on crooked volatility as a clarification for negative skewness in total stock returns. Dark (1976) and Christie (1982) observed the leverage impact where low costs expanded market leverage which in turn prompts high volatility. This theory has also been supported by Veronesi (1999), Pindyck (1984), French *et al.* (1987), Campbell and Hentschel (1992), Bekaert and Wu (2000), Wu (2001), and Veronesi (2004) build up the volatility criticism impact where high unpredictability in stock prices is related to a high risk premium and a low price. Again, Blanchard and Watson (1982) clarify negative skewness because of the blasting of stock value bubbles.

Poon and Taylor (1992) analyzed stock returns and volatility in the British stock market utilizing daily, weekly and monthly data from January 1965 to December 1989 using ARCH models. The result revealed that the association between the unanticipated elements of the returns and volatility series was less clear. In any case, these discoveries are in entire stand out from the after effects of a last report by Glosten *et al.* (1995) which brought about a negative connection between restrictive expected monthly return and contingent fluctuation. Elyesiani and Mansur (1998) examined sensitivity of the bank stock returns that plays a considerable role in changing the level and instability of financing cost. The study utilized the structure that disposed of the prohibitive presumptions of linearity, autonomy, and consistent contingent fluctuation in demonstrating bank stock return in this manner taking into consideration, the volatility condition in reaction to the progressions in money related approach administration in 1979 and 1982. Volatility in financing costs was found to straightforwardly affect the first and the second snapshots of the bank stock returns separately. The last one likewise influences the risk premium in a roundabout way. The level of perseverance in shock is generous for all the bank portfolios and is delicate to the idea of the bank portfolio and the predominant financial arrangement administration.

Andersen *et al.* (2001) utilized the Direct Sans Model for measuring the daily return unpredictability and connection acquired from high-recurrence intra-

day exchange rates on singular stocks in the Dow Jones to test for the volatility bunching. Realized volatilities and correlations confirm strong temporal reliance as well as appear to be well explained by long-memory procedures. Positive returns have less effect on future changes and relationships than negative returns of a similar supreme greatness, in spite of the fact that the monetary significance of this asymmetry is minor.

Lee *et al.* (2001) examined the stock returns and unpredictability in the Chinese securities exchange. Results show that the difference proportion test rejects the speculation that stocks take after an irregular walk. Further, the results of ARCH models confirm long memory in Chinese stock returns. Moreover, the study result affirms the proximity of time fluctuating unpredictability and in addition consistency of volatility in stock returns. The results completely can't allow us in going against the outcomes brought about by Harvey (1995) which reveals that the developing markets have high normal stock returns, low unpredictability, low presentation to global risk elements and little coordination. However, the outcomes that stocks don't show after an arbitrary walk are paired with the results brought about by Poterba and Summers (1988). It has been found out that the outcomes of Lee *et al.* (2001), which focused on Chinese stock market, have similarities with the findings of Baillie and De Gennaro (1990) as well as with that of Poon and Taylor (1992). Both these study results demonstrate the proximity of volatility grouping, consistency and steadiness of restrictive unpredictability in the two markets.

Ericsson *et al.* (2007) utilized the Panel Vector Autoregression (PVAR) model to add observational confirmation about the significance of capital structure in deciding the volatility return. In this powerful model, leverage, return instability and an expected risk premium are orchestrated to enable the investors to ponder the association impacts between the three. In this investigation, the researchers find experimental help for the leverage impact speculation. It has been observed that leverage is an imperative part of value unpredictability. Chen *et al.* (2010) appraised the peculiar return volatility by utilizing the arrival instability decay of Campbell *et al.* (2001). Moreover, Figlewski and Wang (2000) find that information asymmetries should be thought of as a "down market impact" as opposed to something that can be followed back to capital structure. This appears to be more in accordance with a view that what causes volatility is exchanging itself.

Al-Rjoub and Azzam (2012) analyzed stock returns and volatility in Jordan's securities exchange during fiscal crisis by examining the manner in which stock prices behave and found that fiscal crisis negatively affect stock returns with banking industries being worst affected. The study confirmed the presence of continual volatility and inverse association between stock return and stock market instability in time of fiscal crises. Ahmad (2015) examined stock market instability along with changing political regime in countries like Brazil, Russia, Indonesia, India, South Korea and South Africa. The study results give enough confirmation of the presence of changing regime amongst bearish and bullish markets, over the given time frame and that the changing is related to worldwide as well as local or regional events that prompted the volatilities of those securities markets. Lanne (2002) presumed that stock returns can be successfully speculated by a few determining factors which are auto-correlated amongst themselves, particularly at longer time periods. However, many researchers suggested that the results are

quite dubious due to the presence of unit-root problem and the analysis finds no consistency with stock-return data for United States during the period 1928-1996.

Analysis by Asma and Li (2014) on securities market volatility demonstrated that stock return volatility is attributed to regular common issue as opposed to country specific factors. The investigation concentrated on 46 global markets in four continents: Asia, Europe, Latin America and Africa, and basic general issues are steadier in the European and Latin American nations than in the Asia-Pacific and African Countries. Yahchouchi (2014) in his investigation of whether return and volatility cross the MENA (Middle Eastern and North Africa) securities exchanges periphery and discovered that the business sectors are interconnected by their volatilities not by their stock returns and that conditional volatilities subsist over the business sectors, expanding amid times of emergency and lessening to pre-emergency levels. The study results also prove that the conditional relationship was on a descending direction in a portion of the MENA securities exchanges and carried on to other stock markets as well in an unexpected way. Adjasi (2009) examined macroeconomic vulnerability and restrictive stock-market volatility in Ghana. Utilizing macroeconomic factors, for example, swelling, swapping scale, financing cost, cash supply, oil, gold and cocoa costs he discovered that higher volatility costs in cocoa and loan fees expanded stock value instability while high unpredictability in gold and oil costs and in addition to cash supply diminished unpredictability in stock costs.

Leverage impact is characterized as the negative correlation between stock prices and unpredictability. Along these lines under the leverage impact, stock prices and instability are inversely related to each other, indicating that the potential financial specialists in the stocks will be interested in a premium to get protection against any potential dangers emerging from the unpredictability in the market. Pyun *et al.* (2000) in his study of Korean stock markets show that in presence of leverage effect, awful news largely affect stock returns unpredictability than uplifting news. The study results are in line with that of Goudazi and Ramamarayan (2011) who considered the impact of good and awful news on unpredictability in the Indian securities exchange utilizing deviated ARCH model.

Choi and Richardsson (2008) built five portfolios complying with each leverage impact of their dataset and ran different volatility models to examine whether the arrangement of higher leverage endure a more noteworthy tirelessness in instability or are more helpless to counter unpredictability impacts. They thought about the different coefficients for this value return portfolios with the coefficients for resource return portfolios. Both portfolio arrangements are arranged by leverage, however, one is a progression of value returns and the other is of advantaged returns. In addition to other things that value returns and resource returns must be viewed as presenting a blunder that diminishes the legitimacy of their decision, the outcomes demonstrated that these portfolios hold their properties paying little attention to equivalent or market weighting. They run a one-factor EGARCH estimation utilizing the Black-Scholes recipe to examine the benefits of the leverage speculation versus the unpredictability input impact. The authors find that leverage plays an essential role to a great extent in clarifying the seriousness of deviated unsteadiness impacts. The unpredictability of the evaluated measure of firm esteem (i.e. resource esteem) is then found to decide both leverage and

value instability. At last, the impact of leverage on instability is bifurcated into transient and perpetual segments.

III. PROBLEM STATEMENT

An organized and healthy securities exchange that behaves in a good fashion is the heart for a vigorous functioning of an economy of a country as a whole, by advancing development and economic venture besides imparting speculators with faith and assurance, in contrast to a profoundly unpredictable market that creates a feeling of insecurity and nervousness amongst the investors thus keeping them at bay from investing in stocks because of diminished market certainty. Similarly, leverage effect will be present where the market is highly volatile and the speculators and investors will insist for higher market premiums in order to get reimbursed on some risk of market volatility.

An observation of the early works in the field of stock market volatility and leverage effect, it is revealed that most of the studies confirm the presence of leverage effect in a highly volatile market apart from a positive and affirmative relationship between stock returns and stock market volatility.

Black (1976), Christie (1982), Duffee (1995) and many others reported that the existence of leverage impact where the market is quite instable and an inverse association between stock returns and stock market volatility. In light of their works the correlation between market volatility and stock returns has been the central theme of a range of research works and investigations in the world of finance literature. We believe that our present study will contribute to the existing literature in three ways: firstly our study deals with latest dataset i.e. data up to May 29, 2018, so that we can understand and examine the latest scenario regarding leverage effect and stock market volatility; secondly we have chosen stock markets from both developing and developed nations so that we can have a comparative look between various categories of stock markets and finally we have employed series of GARCH models like GARCH (1,1), EGARCH and TARCH to capture volatility and leverage effect from various dimensions.

The fundamental purpose of this study is to analyze and scan the relationship between leverage effect and stock returns in selected stock exchanges across the globe and in particular:

- to find out the volatility clustering in the stock exchanges of Brazil, Russia, India, China, the UK, and South Korea; and
- to determine the leverage effect on stock returns on the selected exchanges mentioned above.

IV. DATA AND METHODOLOGY

4.1 Data source

This study is based on daily data of the closing indices of BOVEPSA (stock index of Brazil), MICEX (stock index of Russia), BSE Sensex (stock index of India), Shanghai Composite (stock index of China), FTSE 100 (stock index of UK) and KOSPI (stock index of South Korea), which is obtained from Bloomberg database. The study period spans from July 5, 2009 to May 29, 2018. The opening data July 4, 2009 has been considered because the global recession ended in June 2009 and it was declared by the IMF on July 4, 2009 and the last data May 29, 2018

has been considered because of latest availability of data.

4.2 The GARCH models

In the case of volatility, Engle’s (1982) approach was to put the conditional values of a series of errors, ε_t ’s, as a function of lagged errors, time (t) factors and fixed variables as $\sigma_t^2 = \sigma^2 (\xi_{t-1}, \xi_{t-2}, \dots, \xi_t, x_t) \dots (1)$ and $\xi_t = \sigma_t z_t \dots (2)$, where $Z_t \sim i.i.d$ with $E(z_t) = 0, E(z_t^2) = 1$ and ξ_t is not serially correlated and has zero mean. Nevertheless, the conditional variance of ε_t formed on the entire existing information at time t-1 as $\sigma_t^2 = \omega + \sum_{i=1}^p \alpha_i \xi_{t-i}^2 \dots (3)$, where ω and α_i ’s are positive constants sequentially in support of σ_t^2 is positive. This model $\sigma_t^2 = \omega + \sum_{i=1}^p \alpha_i \xi_{t-i}^2$ is prepared to portray volatility as the clustering of large influences to the dependent variable. Bollerslev (1986) extended the ARCH model into the GARCH model in the midst of signifying a higher order ARCH and authorizing the past conditional variances. The GARCH (p,q) can be symbolized as $\sigma_t^2 = \omega + \sum_{i=1}^p \alpha_i \xi_{t-i}^2 + \sum_{j=1}^q \beta_j \sigma_{t-j}^2 \dots (4)$, where σ_t^2 is a function of lagged values of ξ_t^2 and $\omega, \{\alpha_i\} i=1 \dots p$ and $\{\beta_j\} j=1 \dots q$ are positive constants.

Both Bera and Higgins (1991) and Bollerslev, Chou and Kroner (1992) described GARCH as $\xi_t^2 = \omega + \sum_{i=1}^p (\alpha_i + \beta_i) \xi_{t-i}^2 - \sum_{j=1}^q [\xi_{t-j}^2 - \sigma_{t-j}^2] + [\xi_t^2 - \sigma_t^2] \dots (5)$

$$\sigma_t^2 = \omega + \sum_{i=1}^p \alpha_i \xi_{t-i}^2 + \sum_{j=1}^q \beta_j \sigma_{t-j}^2 = (\omega / (1 - \beta)) + \sigma \sum_{i=0}^{\infty} \beta_i \xi_{t-i}^2 \dots (6)$$

Nelson (1991), the first researcher of leverage effects model, introduced exponential GARCH model in the case of excess conditional kurtosis using a generalized exponential distribution. He confirmed that the downward movements are more powerful for forecasting volatility than the rising movements. This can be symbolized as $\log \sigma_t^2 = \omega + \sum_{i=1}^p \beta_i \log \sigma_{t-i}^2 + \sum_{j=1}^q \gamma_j (|\xi_{t-j}| / \sigma_{t-j}) + \sum_{j=1}^q \gamma_j (\xi_{t-j} / \sigma_{t-j}) \dots (7)$

This model (7) tolerates positive and negative values of ε_t to have unlike shocks on volatility. The EGARCH model is asymmetric for the reason that the level $|\xi_{t-1}| / \sigma_{t-1}$ is integrated with coefficient γ_i . As this coefficient is usually negative, positive impacts make less volatility than negative impacts and all other things being equal. Glosten *et al.* (1993) established the threshold GARCH after adding up the negative shock of leverage in the conditional variance and the design for the conditional variance is specified as $\xi_t^2 = \omega + \sum_{i=1}^p \alpha_i \xi_{t-i}^2 + \sum_{i=1}^p \alpha_i d_{t-i} + \sum_{j=1}^q \beta_j \sigma_{t-j}^2 \dots (8)$

Where $d_t = 1$ if $\xi_t < 0$, and 0 or else. In TARCH or GJR (Glosten, Jaganathan, and Runkle) model, positive information when $\xi_t > 0$ and negative information when $\xi_t < 0$, this has discrepancy impacts on the conditional variance. Positive information has a shock of α , whereas negative information has an impact of $(\alpha + \gamma)$. If $\gamma > 0$, we state that the leverage impact subsists and if $\gamma \neq 0$, the information impact is asymmetric. Therefore it can be seen that markets are more volatile when there is negative information. For getting the econometric results, Eviews software 9 has been used.

V. EMPIRICAL RESULTS

5.1 Descriptive statistics

Table 1 shows the descriptive statistics of the daily stock market returns of the selected six stock markets. It has been detected that FTSE and Shanghai composite index are the most volatile as revealed by the standard deviation of 0.211665 and 0.178324 respectively whereas Sensex is the least volatile with standard deviation of 0.109635. This indicates that UK stock market demonstrates high variations

from the mean of stock market returns. Again, FTSE shows the survival of 'fat tails' as measured by excess kurtosis and moreover excessive changes are likely to occur more frequently in FTSE. To observe the survival of 'fat tails', student-t distributed innovations have been considered. The Jarque-Bera (1987) statistics show that none of the series are normally distributed. Normality rejection somewhat indicates the intertemporal reliance in the moments of the series.

TABLE 1
Descriptive Statistics

	BOVEPSA	FTSE 100	KOSPI	MICEX	SENSEX	SHANGHAI
Mean	0.001664	0.000998	0.003304	0.005179	0.002974	0.000222
Maximum	0.592848	0.889155	0.661256	0.851421	0.935048	0.686501
Minimum	-0.828288	-1.721458	-0.852776	-1.569469	-0.598970	-1.087003
Std. Dev.	0.130484	0.211665	0.126861	0.186952	0.109635	0.178324
Variance	0.017026	0.012469	0.016094	0.034951	0.012020	0.031799
Skewness	-0.138855	0.255785	-0.471638	-0.495254	-0.441028	-0.911795
Kurtosis	5.114404	35.964398	7.238388	8.243008	7.56035	8.250503
Jarque-Bera	422.9478	191848.4	1732.970	2656.036	185037.7	2790.691
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	2232	2250	2206	2239	2210	2168

It has been observed that UK stock market reveals the most intense values for the daily stock market return in comparison to other five stock markets, which indicates that volatility is much higher in UK stock market than the other five stock markets under study. UK stock market demonstrates the lowest mean returns as well as the difference between the maximum and minimum returns is higher, which entails that UK stock market experiences huge variations than other stock markets under study. This is not unexpected in view of the comparative openness and smallness of the stock market and weakness to global stock market impacts.

5.2 Test results of GARCH model

Table 2 gives the GARCH (1, 1) model results for the return series of the selected six stock markets. All the parameters' estimates of the GARCH (1, 1) model are statistically significant at 1% level.

TABLE 2
GARCH (1, 1) Test Results

	BOVEPSA	FTSE 100	KOSPI	MICEX	SENSEX	SHANGHAI
ω (constant)	0.0007* (0.00)	0.0003* (0.00)	0.0002* (0.00)	0.0005* (0.00)	0.0001* (0.00)	9.29E-05* (0.00)
α (arch effect)	0.0698* (0.00)	0.1283* (0.00)	0.0656* (0.00)	0.0589* (0.00)	0.0742* (0.00)	0.0501* (0.00)
β (garch effect)	0.8870* (0.00)	0.8428* (0.00)	0.9160* (0.00)	0.9218* (0.00)	0.9133* (0.00)	0.9459* (0.00)
$\alpha + \beta$	0.9568	0.9711	0.9816	0.9807	0.9875	0.9960

*Denotes significant at the 1%. P-values are included in brackets.

The coefficients are all positive and very much smaller than the sample

variances in table 2 because of the changing conditional variances over time as well as their ultimate involvement to unconditional variances. Our results furthermore point out that the determination in volatility, as calculated by the sum of α and β in the GARCH (1,1) model, ranging from 0.9568 to 0.9960 with an average of 0.9789, is closer to one, signifying a stronger existence of ARCH and GARCH influences, as supported in, Tian and Guo (2006). This entails that present volatility of stock market returns can be elucidated by past volatility that has a tendency to continue over time.

5.3 Test results of EGARCH model

To examine the asymmetric effect of information on volatility and the leverage effect, EGARCH (1,1) model has been used in the study. A statistically significant and negative gamma (γ) in EGARCH (1,1) model indicates the existence of leverage effect to divulge positive impacts have less influence on the conditional variance and it is anticipated that the leverage effect (gamma) must be negative and significant.

TABLE 3
EGARCH (1, 1) Test Results

	BOVEPSA	FTSE 100	KOSPI	MICEX	SENSEX	SHANGHAI
ω (constant)	0.0385* (0.00)	0.026* (0.00)	0.056* (0.00)	0.0656* (0.00)	0.054* (0.00)	0.0156* (0.00)
α (arch effect)	0.1130* (0.00)	0.1764* (0.00)	0.1122* (0.00)	0.1217* (0.00)	0.1064* (0.00)	0.1229* (0.00)
β (garch effect)	0.9635* (0.00)	0.9596* (0.00)	0.9773* (0.00)	0.9801* (0.00)	0.9847* (0.00)	0.9939* (0.00)
$\alpha + \beta$	1.0765	1.1360	1.0895	1.1018	1.0911	1.1168
γ (leverage effect)	-0.081* (0.00)	-0.060* (0.00)	-0.100* (0.00)	-0.073* (0.00)	-0.089* (0.00)	-0.076* (0.00)

*Denotes significant at the 1%. P-values are included in brackets.

Table 3 points out that the sum of α and β in the EGARCH (1,1) model are ranging from 1.0765 to 1.1360 with an average of 1.10625. Results being more than one (1.00), signifies a stronger existence of ARCH and GARCH influences on volatility. Furthermore, it indicates that conditional variance is volatile and the coefficients of ARCH and GARCH are statistically significant at 1% level. As regards the gamma parameter (γ) that is the pointer for asymmetric volatility, it is negative and significant at 1% level in case of all stock markets. This indicates that leverage effect in selected six stock markets persists. Also this entails that a positive returns impact to the selected six stock markets creates lower volatility than a negative returns impact, as supported in Bala and Premaratne (2003).

5.4 Test results of TARCH model

To confirm the availability of asymmetric performance and the continued existence of leverage effect, this study also applies TARCH (1,1) model in an attempt to identify the asymmetric or leverage effect.

TABLE 4
TARCH (1,1) Test Results

	BOVEPSA	FTSE 100	KOSPI	MICEX	SENSEX	SHANGHAI
ω (constant)	0.0071** (0.00)	0.0042** (0.00)	0.0033** (0.00)	0.0082** (0.00)	0.0013** (0.00)	0.0051** (0.00)
α (arch effect)	0.0711* (0.02)	0.1208* (0.03)	0.0700** (0.01)	0.0238* (0.02)	0.0331* (0.02)	0.0514** (0.00)
β (garch effect)	0.8925** (0.00)	0.8645** (0.00)	0.9284** (0.00)	0.9149** (0.00)	0.9242** (0.00)	0.9472** (0.00)
$\alpha + \beta$	0.9636	0.9853	0.9984	0.9387	0.9573	0.9986
γ (leverage effect)	0.1020** (0.00)	0.2361** (0.00)	0.1182** (0.00)	0.0791** (0.00)	0.1273** (0.00)	0.0713 (0.00)

**Denotes significant at the 1% and **denotes significant at 5% level. P-values are included in brackets.

Table 4 reveals the TARCH test results. Table 4 points out that the volatility, as revealed by the sum of α and β in the TARCH (1,1) model, ranging from 0.9387 to 0.9986 with an average of 0.96865, is close to one (1.00), signifying a stronger existence of ARCH and GARCH influences on volatility and the coefficient of ARCH is statistically significant at 1% level. It has also been observed that the gamma parameter (γ) is positive and greater than zero, which is significant at 1% level. This indicates that leverage effects in selected six stock markets do persist. The extent of the differential shock on conditional variance can be established from the values of α (arch effect) and γ (leverage effect). Good information to the Brazil stock market has a shock of 0.0711, whereas the shock of bad information on the conditional variance is 0.1731; good information to the UK stock market has a shock of 0.0208, whereas the shock of bad information on the conditional variance is 0.2641 and in this way, good information to the Indian stock market has a shock of 0.0331, whereas the shock of bad information on the conditional variance is 0.1604 and so on.

It has been observed that FTSE (UK stock market) reveals higher α (Arch effect) values than other five stock markets, which indicates that the consequences of impacts in previous periods have a tendency to remain more or less for a longer time than it does in other five stock markets under study. This also means that the FTSE (UK stock market) has less market efficiency than the other five stock markets because the consequences of shocks have received a greater effect for a long period of time. The β (Garch effect) values indicate long term effects on market volatility. Again, γ (leverage effect) value in FTSE (UK stock market) is greater than the other five stock markets, which indicates that the leverage effect is higher in the FTSE (UK stock market) against that experienced in BOVEPSA, KOSPI, MICEX, BSE-Sensex and Shanghai Composite. The impact of bad information and blows has a better influence on UK stock market. Finally, it has been observed that the UK stock market is extremely susceptible to peripheral volatility movements in most important five stock markets under study (Bala and Premaratne, 2003).

VI. CONCLUSION

The primary findings of our study reveal that FTSE is the most volatile and shows high variations from the mean of stock market returns. Again, FTSE has the highest level of excess kurtosis followed by Shanghai, MICEX, BSE-Sensex, Kospi and Bovepsa which indicates the existence of 'fat tails' and therefore, extreme changes are likely to take place more regularly for these indices. GARCH model entails that present volatility of stock market returns can be elucidated by past volatility that has a tendency to continue over time. EGARCH test results indicate that leverage effect in all stock markets persists as well as a positive returns impact to the selected six stock markets creates lower volatility than a negative returns shock. TARARCH test results point out that leverage effects in selected six stock markets are present. Again, this test results reveal higher ARCH and GARCH effect in the case of the UK stock market, which indicates that the consequences of impacts in previous periods have a tendency to remain more or less for a longer time as well as long term effects on market volatility and demonstrates a less market efficiency than the other five stock markets. Since the leverage effect is higher in the case of the UK stock market, the impact of bad information and blows has a greater effect on the UK stock market. Finally, it can be inferred that the UK stock market is extremely susceptible to external volatility movements in comparison to other stock markets under study.

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INDIAN ACCOUNTING ASSOCIATION RESEARCH FOUNDATION

Regn. No. S/63876 of 1989-90 under West Bengal Act XXVI of 1961

Working Office : Department of Commerce, University of Calcutta, Kolkata - 700 073

G.D.Roy Memorial Lecture & Annual Seminar on Saturday the 20th July, 2019

Jointly with

EIILM-Kolkata

Venue: Seminar Hall, EIILM-Kolkata, 6 Waterloo Street, Kolkata 700069

- 09.30 am – 10.15 am : *Registration and Tea & Snacks*
- 10.15 am – 11.15 am. : **Inauguration**
- In Chair : Prof. Bhabatosh Banerjee, President, IAA Research Foundation
- Welcome Address : Prof. R.P.Banerjee, Director, EIILM-Kolkata
- Felicitation to : Prof. Dhrubaranjan Dandapat (VP at Large, IAAER)
Prof. R.P.Banerjee (VP, IAARF)
- Chairman's Address : Prof. Bhabatosh Banerjee, President, IAA Research Foundation
- Vote of Thanks : Prof. Dhruva Ranjan Dandapat, Secretary, IAA Research Foundation
- 11.30 am – 01.00 p.m. : **G.D.Roy Memorial Lecture on Corporate Social Responsibility Reporting**
- In Chair : Prof. Bhabatosh Banerjee, President, IAA Research Foundation
- Speaker : Prof. Nikhil Bhusan Dey, Former Dean of Commerce, Assam University, Silchar
- Vote of Thanks : Prof. Tanupa Chakraboty, EC Member, IAA Research Foundation
- 1.00 pm – 2.00 pm. : LUNCH
- 2.00 pm. – 3.00 pm : **Annual Seminar on Business Risk: A Study on Indian Manufacturing Companies (1994-95 – 2017-18)**
- In Chair : Prof. R.P.Banerjee, Director, EIILM & Vice-President, IAA Research Foundation
- Speaker : Dr. Debasish Sur, Professor, Dept. of Commerce, The University of Burdwan
- Vote of Thanks : Prof. Ashish Kumar Sana, Treasurer, IAA Research Foundation
- 3.15 pm. – 3.30 pm : *Tea*
- 03.30 pm – 4.30 pm. : **Annual General Meeting of IAA Research Foundation**
- Delegate Fee : **Rs.100 per head** (to be paid by cash or cheque in favour of IAA Research Foundation by **15th July, 2019** to the Treasurer Prof. Ashish Kumar Sana, Treasurer, IAA Research Foundation & Professor, Dept of Commerce, University of Calcutta, Email : cu.ashis@gmail.com, Mobile: 9477276331

(No spot registration)

D.R.Dandapat

Dr. D.R.Dandapat
Secretary, IAA Research Foundation
Professor, Dept of Commerce
University of Calcutta

Measuring Performance and Implementation of Accrual Accounting in Local Government Bodies

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ABSTRACT

The aim of this study is to assess the performance of accounting of local government bodies in India. It uses modified balanced scorecard by adding another performance perspective, i.e. social perspective to the existing balanced scorecard. The finding of this study shows overall performance level of 36.23%, mainly due to poor financial performance rather than non-financial performance measures. Results indicate that there is a scope for Indian local government bodies to improve both financial and non-financial performance through improvement in individual performance matrices which in turn will improve overall performance.

Key words: Accrual accounting, Local government bodies, Performance measurement, Financial performance, Balanced scorecard.

I. INTRODUCTION

Government accounting is expected to provide relevant, reliable and timely information to the government and the other users of government financial statements which assist them in their decision making process apart from being a statutory requirement.

Traditional Government Accounting aims only on ensuring compliance with budget and proper utilization of public money. The data provided by the government is only about cash receipt and cash expenditure due to ease of use. Government has been following the Cash Accounting Systems in which a transaction is recognized only when money changes hands while accrual accounting recognizes the transaction at the time it is made.

Governments of various countries have begun to move from traditional cash based system to accrual system of accounting in presenting their accounts to keep

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pace with the non-public sector. However, in absence of global principles and standards, there is no uniformity in government accounting system.

Nowadays, public financial management has evolved significantly and issues like operational efficiency, results, effectiveness of delivery systems, cost of services delivery, good governance etc. are also of paramount importance.

Many countries have migrated to accrual accounting system fully or partly. The countries that have implemented have gained from this exercise with improved governance, better control over assets and increased disclosure level in the financial statement.

To strengthen the accountancy profession worldwide, the International Federation of Accountants (IFAC) was founded on October 7, 1977 in Munich (Germany). The International Public Sector Accounting Standards Board (IPSASB) is one of the four independent standard-setting boards that are supported by IFAC. Main function of IPSASB is to develop high-quality International Public Sector Accounting Standards (IPSASs), provide guidance and resources for the use by public sector entities around the world for general purpose financial reporting.

Developed countries, such as, the UK, the US, Canada, Australia and New Zealand have adopted accrual system of public sector accounting. However, very few governments of developing countries have adopted the full accrual accounting to present their government accounts. According to International Monetary Fund (IMF), New Zealand, Australia, the US, the UK, Canada, Colombia and France have adopted the full accrual basis of accounting in 2009.

In India, Twelfth Finance Commission recommended the introduction of accrual based accounting for government. Government has accepted the recommendation in principle and asked Government Accounting Standards Advisory Board (GASAB) in the office of the Comptroller and Auditor General of India to draw a roadmap for transition from cash to accrual accounting system and to prepare an operational framework for its implementation. So far, 21 State Governments have agreed in principle to introduce accrual accounting.

The ICAI has issued seven accounting standards for local bodies, such as, Municipal Corporation, Municipality and Panchayat. The authorities, which approve the financial statements, are expected to comply with these standards.

Over the last two decades, a number of local governments have moved from pure cash accounting to accrual accounting. However, many local bodies still follow the cash accounting system. The government is aware of the fact that many countries are shifting to accrual accounting system for better transparency, to make corporations more accountable and to make accounting statements more useful for government and other users. The States at the forefront are Tamil Nadu, Gujarat, and Maharashtra while several other States are also quite active in this regard.

Following a decade of major reforms, this research aims to examine how performance measurement and accountability as the core of public sector reforms in India have been implemented and examines factors affecting the development and use of performance indicator in Indian local government agencies. The current research makes an attempt to provide an in-depth and comprehensive study in the area of performance measurement and accountability. This study examines whether implementation of accrual system was helpful for local government bodies to increase its performance level or kind of challenges faced by local government

bodies in the process of implementing accrual system. The study explores the experience and perception of the government officials regarding the development and the use of performance indicators and accountability practices in the context of a local government.

The aim of this study is to measure the performance of local government authorities in India, which is based on three functions:

- a. Accountability
- b. Allocation, and
- c. Learning.

In India, local government authorities are among the public sector organization that plays an important role in the delivery of the government services as they are assigned the responsibility to deliver key public services, such as, education, local health services and other local public services. In the past decades, local authorities have come under increasing pressure of modernization to improve overall performance and service delivery, cost reduction, competition and to increase accountability to their stakeholders (Guthrie English, 1997). In 2009, the Indian government introduced a performance management system in the Union Government for cabinet secretariat PMS to public sector including local government planning, implementation, monitoring, evolution and reporting in public services in India.

This research explores the opportunities presented by accrual accounting system and analyzes the deficiencies in the present accounting system, if any, from the standpoint of meeting the expectations of various users.

II. REVIEW OF LITERATURE

The purpose of this review is to identify the key concepts of accrual accounting. The summary of previous studies would also be useful to understand the growth, difficulties arising in implementation of accrual accounting in local government of different countries, etc.

Atan and Yahya (2015) in their paper conducted survey of 119 public sector accounting personnel in various ministries in Malaysia. The general findings of this study revealed that the respondents have positive behaviour concerning readiness for change to accrual accounting. However, the results show that they slightly disagree to take responsibility if the accounting change fails in their area.

Schrooten (2014) gave a multiple-perspective view on the future of the Dutch central accounting system in his research. The prevailing accounting system in Netherlands was cash accounting system. He made a comparison between the accrual accounting system and the cash accounting system using the insights of different perspectives. The main purpose of the study was to create a vision, explaining which accounting system should be adopted. They have interviewed seven stakeholders based on their high financial expertise regarding accounting systems.

Marissa (2013) in her study aims at revisiting the debates surrounding accrual accounting in the public sector and presenting how discrepancy of opinions—either supporting or not supporting—occurs based on the contributors of the literature. Findings showed that most sources from practitioners opt for accrual accounting while most of literature from academicians were not in support of

accrual accounting. The finding suggested that there was a missing link between academic accounting research and professional practices in the public sector.

Harun (2012) in his article studied about the institutionalization process of an accrual accounting system in the Indonesian public sector. The data drawn from the various sources concluded that, at the organizational level, the internalization processes of the accounting system primarily motivated by the presence of legal enforcement.

Ellwood and Newberry (2007) in their research examined the role of public sector accounting in implementing neo-liberal reforms. For this, they compared the development and use of accrual accounting in public sector financial management reforms in the UK and New Zealand using proposition that the adoption and development of accrual accounting in the public sector is a technical development intended to improve transparency and accountability.

Baker and Rennie (2006) examined several factors that had the potential to influence the federal government's decision to adopt full accrual accounting, including two royal commissions, the Office of the Auditor General of Canada, the Canadian Institute of Chartered Accountants, credit markets, and the practices of other national governments.

Saleh and Pendlebury (2006) in their study examined the move to accrual accounting in the United Kingdom and compared with developments in Malaysia. In the UK, primarily the principles of accrual accounting were introduced for managerial accounting and control purposes. Malaysia has also focused primarily on management accounting initiatives for the development of governmental accounting.

Barton's (2005) paper examined the role of accounting as financial management information and reporting system (FMIRS) in government, and the nature and role of government to establish its financial information needs in case of Australia. Then, he examined the nature of different accounting systems i.e. cash accounting and budgeting system (CABS) which was scrapped in Australia to introduce the accrual accounting, namely, Australian Accounting Standards (AAS) system and the Government Finance Statistics (GFS) system and the types of information provided by each.

Caperchione (2003) in his research illustrated the aims and the contents of the 1995 Local Government Accounting Act, which introduced an accrual-based financial reporting for Italian municipalities and provinces. This paper focused on a sample of 23 local governments that produced the reports for the first time in 1998, and highlighted a series of problems that emerged with regard to both communicational efficacy and fair presentation.

Research Gap

The summary of review of existing literature indicates that no study has yet been made relating to the implementation of accrual accounting in local government bodies in the Indian context. Hence, there is a need to examine the effect of accrual accounting in local bodies and identify the difficulties and benefits of adopting the same by the local government bodies in India as well.

III. OBJECTIVES AND HYPOTHESES

Objectives

The objectives of this research are to identify the steps for successful implementation of double entry accounting system in local government bodies (LGBs) of India. Based on the identified research gap, the present study has undertaken following objectives:

- (i) To examine the ability of the LGBs to utilize the resources received from both internal and external sources using balanced scorecard.
- (ii) To evaluate overall financial performance of LGBs in India.
- (iii) To assess the overall non-financial performance of LGBs together with their financial performance level.
- (iv) To know the perceptions of government employees about implementing accrual accounting in LGBs in India.

Hypotheses

H₀₁: There is no significant difference between the users and non-users' perceptions about the feasibility of implementing accrual accounting in local government bodies.

H₀₂: There is no significant difference between the user and non-user groups regarding the perceived difficulties in implementing accrual system in LGBs.

H₀₃: There is no significant difference between the user and non-user groups regarding the usefulness of financial information provided by accrual accounting in LGBs for decision-making.

IV. METHODOLOGY

This research uses both primary and secondary data for analyzing the performance in LGBs in India. Therefore, research methodology of this paper has been divided into two parts. First part is based on secondary data related to performance measurement of LGBs and second part is related to the primary data about perceptions of user and non-user group of respondents.

Based on Secondary Data

In the first part of study, researchers attempt to examine performance by applying balanced scorecard performance measurement techniques to measure performance of LGBs in India. The performance measurement in this study has been disaggregated into financial and non-financial matrices. Kaplan and Norton (1992) established Balanced Scorecard (BSC) model as the performance measurement tool to enable the measurement of both financial and non-financial performance of both public and private sector organizations. In previous studies also, BSC model was used as the performance measurement model for public institutions (Martin, 2000). Garrison and Noreen (2004) stressed on BSC by saying that under the BSC approach, top management transforms its strategy into performance measures that employees can recognize and can do something about organization's goal. In the above studies, BSC model was proved to be the best model for measuring performance in public institutions. The use of BSC enables the measurement of both financial and non-financial performance and allows the

easy comparison of overall performance after incorporating overall performance indicators into single indicator value.

This research is the first to use a BSC approach to measure performance especially for local government operating in India.

The BSC proposed by Kaplan and Norton (1992) included four perspectives -

Financial: It views organizational financial performance, and the use of financial resources.

Customer: It views organizational performance from the point of view the customer or other key stakeholders.

Internal Business Process: This perspective views organizational performance about the quality and efficiency related to product, services, or other key business processes.

Organizational Capacity (Learning and growth): This is related to human capital, infrastructure, technology, culture and other capacities of the organization.

This study added another performance perspective, which is the *social performance*. The addition of this perspective was necessary for capturing the social aspect of LGBs. The selection of the perspectives should be based on the necessity and priorities of each organization that create a competitive advantage for the organization. Accordingly, in this study, the balanced scorecard with five performance matrices have been used to measure such dimensions.

Measures of Financial Matrices

Financial ratios are the most frequently used predictors that measure the financial performance using variable for firms from various factors or from firms around the globe (Shah 2014). The financial Ratios not only capture the financial condition but can help to recognize signals of fiscal stress.

Financial performance of LGBs have been measured based on indicators proposed by Nollenberger (2003). These are as follows:

$$OPF_{it}1 \quad \frac{IR_{it}}{RE_{it}} \quad \dots (1)$$

$$OPF_{it}2 \quad TR_{it} - \frac{RE_{it}}{IR_{it}} \quad \dots (2)$$

$$FMB_{it}1 \quad \frac{IGF_{it}}{TRG_{it}} \quad \dots (3)$$

$$BUP_{it}1 \quad BTR_{it} - \frac{ATR_{it}}{BTR_{it}} \quad \dots (4)$$

$$BUP_{it}2 \quad BTE_{it} - \frac{ATE_{it}}{BTE_{it}} \quad \dots (5)$$

These financial ratios have been computed based on the financial statements and fund statements of the LGBs being studied.

Where,

OPF_{it} 1 and OPF_{it} 2 represent LGB operating performances ratio for LGB₍₁₎ at time t,

IR_{it} is the total internal revenue collected by LGB from different internal sources.

RE_{it} is total recurrent expenditure of LGB at time t and

TR_{it} is total operating revenue excluding grant and contribution for the development by the LGA i at time t .

FMB_{it} represent fund mobilization performance ratio of LGB_i at time t .

IGF_{it} is the total inter governmental fund received by LGB_i in time t_1 and

TRG_{it} is the total revenue including grand's and contributions.

BUP_{it} 1 and BUP_{it} 2 represent budget performance ratio for LGA in time t for model 1 and 2.

ATR_{it} is the actual total revenue collected for each LGB i in time t ,

BTR_{it} is the budgeted total revenue collection for LGB i in time t ,

ATE_{it} is the actual total expenditure for LGB i in time t and

BTE_{it} is budgeted total expenditure of LGB i in time t .

In equation (1), OPF_{it} measures the operational sustainability of $LGBs$. It determines whether there is sufficient revenue to pay for the recurrent operational expenses. This is one of the important measures of LGB financial performance. Since inability to cover operating expenditure using revenue generated from own source indicates high dependence of $LGBs$ on intergovernmental transfers and local borrowings. $LGBs$ that cannot generate enough revenue to cover operating expenses are not sustainable and are in danger of failure to operate in situation when the central government funds are unavailable or when the funds get delayed. Different standards have been established to recognize the various revenue raising capacities across the sector.

Between 40% - 60%	-	Basic Standard
Between 60% - 90%	-	Intermediate Standard
Above 90%	-	Advanced Standard

In equation (2), OPE_{it} measures the ability of local government to cover its operational cost and have revenue available for capital funding or other purpose. If a local government consistently achieves a positive operating surplus ratio and has sound long term financial plans showing that it can continue to do so in future. The basic standard lies in between 1-15% while advance standard is $>15\%$ (0.15).

In equation (3), FMB_{it} 1 measures the extent to which $LGBs$ depend on the external resources. A high ratio may indicate that a local government is highly dependent on external resources, and having increasing risk as external sources may alter funding streams.

In equation (4) and (5), BUP_{it} measures ability of $LGBs$ to manage the budget, which they set in accounting periods. Two ratios are used to assure budget performance wherein first ratio addresses the ability of $LGBs$ to meet the revenue budget in terms of total revenue collecting from internal and governmental sources while the second ratio measures the ability of $LGBs$ to minimize cost and attain the expenditure budget.

Overall LGB Financial Performance

In measuring financial performance, researchers used different ratios as shown above in equation (1) to (5). The average overall financial performance results were obtained using the arithmetic mean for which the formula is as follows:

$$FP_i = W_{TEF}TEF_j + W_{OPF}OPF_j + W_{FMB}FMB_j + W_{BUP}BUP_j/4 \dots(6)$$

Where,

FP_i = Financial performance index,

W_{TEF} , W_{OPF} , W_{FMB} , and W_{BUP} = Weight of performance matrices as obtained from

Balanced Scorecard,

OPF_j = Operating cost performance,

FMB_j = Fund mobilization performance,

BUP_j = Budgeted performance.

In calculating the financial performance index, it is assumed that the weight of each dimension is equal although authors believe that the weight of each dimension should be different. Ritonga (2012) provides detailed discussion about how to develop LGBs financial performance index.

Measurement of non-financial performance

Non-financial performance has been measured using the BSC model by aggregating the performance matrices in the model. The data used for measuring non-financial performance has been obtained through questionnaires, which were administered to staff manager and users of local government accounts. The measurement of metric used a 5-point Likert scale in which one (1) represents high performance or high importance of the indicator evaluated. The rated questionnaires for each LGB have been grouped and analyzed in order to obtain the average performance indicator value for the LGB from each of the performance matrices. In order to measure performance indicator, performance matrices for each LGB as an average of the respondent results the following arithmetic mean formula :

$$Y_i = \frac{\sum_{j=1}^n W_{ij}}{n} \quad \dots (7)$$

Where Y_i is the average weighted value of an indicator i , W_{ij} is the rating value of j^{th} respondent in the indicator i and n is the total number of respondents on each of the performance indicator category respectively.

Overall LGB Non-Financial Performance

The performance of the four dimensions making up the non-financial performance of LGBs have been measured using the composite non-financial performance indices using equation 7.

To obtain overall LGB non-financial performance results, following composite non-financial performance index has been used:

$$NFP_i = \sum_{j=1}^n W_{sp} SP_j + W_{cp} CP_j + W_{lgp} + W_{ibp} IBP_j \quad \dots (8)$$

Where NFP_i is non financial performance index, SP_j social performance for LGA_j, CP_j is customer perspective performance, LGP_j is learning and growth performance, IBP_j is internal business process performance, W_{sp} , W_{cp} , W_{lgp} and W_{ibp} are the weights of each performance matrices in each performance dimension and n is the number of performance dimensions.

Measurement of Overall LGB performance

Overall performance of LGBs has been measured as the weighted average of financial and non-financial performance obtained from balanced scorecard model. The overall performance of LGBs has been obtained by using the following composite performance index.

$$TPI_i = W_{fp} FP_j + W_{nfp} NFP_j \quad \dots (9)$$

Where TPI_i is overall performance index for i^{th} LGB and W_{fp} and W_{nfp} are the

weights associated with financial and non-financial performance respectively.

The data used in this research have been collected from LGBs selected from various regions in India using purposive sampling method. The period covered by the study is from 2014 to 2017.

Based on Primary Data

In second part of the study, to know the government employees perceptions, primary data have been collected from 50 respondents working in different departments such as health sector, education etc. and for this purpose convenient sampling has been used. Data have been collected with the aid of structured questionnaire that has been designed to collect data on non-financial performance of LGBs in India. For this purpose, respondents have been categorized into two groups: first one is the user group who are acquainted with accrual accounting, and second one is the non-user group who are using cash based accounting. Sample profile of the respondents is shown in table 1.

TABLE 1
Sample Profile

Basis of accounting	Respondents		
	From Health and Education departments	From other Departments	Total
Cash based accounting	8 (40%)	8 (26.66%)	16 (32%)
Accrual based accounting	12 (60%)	22(73.33%)	34 (68%)
Total	20 (100%)	30 (100%)	50 (100)

Research Tool: Descriptive statistics and t test have been used for data analysis.

V. ANALYSIS AND DISCUSSION

Data analysis has been done in the following two sections:

- (i) Based on Secondary Data
- (ii) Based on Primary Data

Based on Secondary Data

In first section, researchers measured the performance of LGBs using Balanced Scorecard model proposed by Kaplan and Norton (1992).

Financial performance of Local Government Bodies (LGBs)

Financial performances of LGBs have been measured on the basis of indicators proposed by Nollenberger (2003) which have already been discussed in previous section.

In this study financial performances are summarized in table 2. It is observed that the mean value of own source revenue coverage over the entire period of three years is 0.1085. This indicates that LGBs are operationally poor performing, as they are not capable of funding their recurrent operations without depending on central government and donor by 13.5%. The results also indicate that LGBs in India are highly dependent on central government, donors, and other development partners in financing their operations.

TABLE 2
Financial Performance of LGB during 2014-17

Performance Dimensions	Descriptive Statistics	2014-2015	2015-2016	2016-2017	Average
Operational performance (1)	Mean	0.112	0.1029	0.1102	0.1085
	S. D.	0.168	0.0820	0.1214	-
Operational cost performance based on revenue (2)	Mean	-11.73	-8.8123	-8.887	-9.8097
	S. D.	0.072	0.1823	0.1402	-
Fund Mobilization (FMB1)	Mean	0.8283	0.8173	0.8329	0.82616
	S. D.	0.2814	0.1932	0.1219	-
Budget Performance (BUP1)	Mean	0.1210	0.2241	0.1619	0.169
	S. D.	0.1535	0.0742	0.1817	-
Budget Performance (BUP2)	Mean	0.2626	0.2525	0.2919	0.269
	S. D.	0.1778	0.0786	0.583	-

Moreover, researchers also measure the ability of the LGBs to cover its operational cost and have revenues available for capital funding for other purposes. The results shown in table 2 indicate that the mean value of operating surplus performance over the entire period of 3 years is -9.8097.

This indicates that the LGBs are financially unsustainable. The results also indicate that about 9.80% increase in total own sources revenue would have been required to achieve a break-even operating results. The results also show that local government consistently achieves a negative operating surplus ratio for the 3 years of study period. Although this negative trend shows a sign of improvement as it decreases year after year.

Furthermore, this study also measures the dependence of LGBs on the government for resources. This has been measured by fund mobilization performance, FMB (1). The results show that mean value of inter government ratio is 0.82616. This indicates that the LGBs in India are financially dependent on external sources by 82.16% and cannot meet their financing needs using internally generated funds. This level of dependency affects the service delivery of overall performance of LGBs. Most grants from the Central Government are conditional and therefore earmarked for specific services. Only a slight degree of flexibility is permissible but that also with restrictions.

We have also measured the ability of local government to utilize the resources received from both internal and external sources in implementing the LGBs day-to-day activities as per approved budget. This has been measured by performance 1 BUP (1). The results show the mean value of BUP as 0.169. This indicates that 16.9% of the total revenue received by the LGBs have not been utilized and planned activities have not been fully implemented. Either this is perhaps due to procedural lapses in releasing such grant timely or there is ambiguity in scheme details. In this respect, efficient operation of the day-to-day activities in LGBs is affected and this hinders the realization of earmarked services and benefits to the public. This may also lead to budget revision to accommodate possible price fluctuations due to inflation.

Similarly, the ability of LGBs in implementing development and recurring activities within the limit of approved budget was measured by budget performance model (BUP2). The result in table 2 shows the mean value of BUP2 as 0.269. This indicates that about 26.9% of the developmental activities have not been implemented. This might be due to non-release of grant due to which LGBs have not been able to implement activities as planned.

TABLE 3
Overall Result of Financial Performance

Performance dimensions	Average Results	Average Weight	Average Weight Score from BSC (X of 5)	Weighted Average F.P. Score	Average Weight Performance Level
Operational Performance	0.1050	25%	1.98	0.2079	0.04819
Fund Mobilization Performance	0.8261	25%	1.98	1.635	0.3294
Budget Performance	0.2145	25%	1.98	0.42471	0.090
Average Financial Performance	0.3818	25%	1.98	0.755964	0.1451

Different performances have been measured through operating performance indicators under the balanced scorecard, which included financial performance, budget performance and fund mobilization performance. In table 3, the result shows that the average financial performance of LGBs is poor at the average rate of 14.51%. The poor average performance is contributed by poor operating performance results and poor fund mobilization performance among the reviewed LGBs.

TABLE 4
Weight on Balance Scorecard Matrices

Balance Scorecard perspectives	Total Score	Weights (%)
Social Performance	15.82	24.29
Customer Perspective	18.48	28.38
Learning Growth	16.36	25.12
Internal Business Process	14.45	22.19
TOTAL	65.11	100

The analysis of weight among the non-financial perspectives in table 4 shows that customer perspective is having the maximum importance (28.38%) followed by learning and growth with 25.12% weight, social performance with 24.29% importance and internal business process with 22.19% importance. This implies that LGBs focus much on making sure that customers are satisfied by the services offered since the service provisions is the key objective of all LGBs.

TABLE 5
Average Overall Non-Financial Performance

Non-Financial Performance	Score
Mean Score	3.85
Performance Score	60.01
S. D.	0.60

Additionally, the study also has also assessed the overall non-financial performance of LGBs together with their performance level on average, which is found to be moderate. The result in table 5 shows the average weighted score of 3.85 with an average of 60.01% performance compared to the best-expected performance of 100%. The low S.D. is indicated the stability of financial performance.

TABLE 6
Overall BSC Weight

Performance Indicator	Total Score	Weights (%)
Financial Performance	1.98	40%
Non Financial Performance	3.02	60%
TOTAL	5	100%

The results of overall performance weight between financial and non-financial performance are summarized in Table 6. From the result, it is observed that financial performance in LGBs takes about 40% weight while non-financial performance takes 60% of the total weights. This implies that LGBs use more of non-financial performance matrices.

TABLE 7
Overall Performance Results

Performance Results	Score
Average Score	1.82
Performance Level	36.23%

Moreover, overall LGB performance score has been measured as the weighted average of both financial and non-financial performance dimensions. The result of table 6 shows the average weight scores of 2% with an average of 36.23% performance level. This implies that about 63.77% of the performance level among the reviewed LGBs is poor. According to researchers, some factors responsible for this poor performance in LGBs may be due to high dependence on central government transfer. Poor performance might be due to absence of long-term strategic development plans for designing and supervising the collection of revenue from various sources, shortage of staff, or it might be due to poor performance level by adopting cash based system of accounting. It does not provide direction about efficient revenue collection strategies, which contribute to low revenue potential from council.

Based on Primary Data

In the second part of this paper, researchers investigated the different aspects of implementation of accrual-based accounting in LGBs. Table-8 summarizes the results of users and non-users perceptions about the feasibility of implementing accrual based accounting.

TABLE 8
Results of Respondents Perceptions Regarding the Feasibility of Implementing Accrual Accounting

Accrual Base of Accounting	Users (n = 20)	Non Users (n = 30)
Yes	08 (40%)	08 (26.67 %)
No	12 (60%)	22 (73.33 %)
TOTAL	20 (100 %)	30 (100%)
Chi Square Value	8.620	
Contingency Coefficient	0.125	
Asymp. Sig. (two sided)	0.002	
d.f.	1	

Chi-square test has been used to compare the frequency of the respondents' perceptions about the feasibility of implementation of accrual-based accounting in the users and non-users sample group. The result in Table-8 shows that there is significant difference (p value = 0.002) between the two groups which suggests that the non-users' group perceives the feasibility of implementing accrual based accounting less than users' group. Hence, the null hypothesis (H_{01}) of no significant difference between the users' and non-user's perceptions about the feasibility of implementing accrual based accounting in local government bodies may be rejected.

The respondents have been asked to indicate the extent of agreement to which they would anticipate problems in the various aspects of implementation of accrual based accounting. The aim here is to examine the perceptions of users and non-users about the difficulties arising in applying accrual based accounting in the Indian government accounting system. t-test is used to measure two unrelated means and to compare the respondents' rating and difference between the means of the users and non-users group. Results of the difficulties anticipated in implementing accrual based accounting are summarized in Table 9.

TABLE 9
**Result of Respondents' Perceptions Regarding Problems of
 Implementing Accrual Accounting**

Sr. No.	Difficulties	Users (20)	Non-User (30)	t-stat	P value
1.	Difficulty to measure and determine revenue and expenses accurately	Mean 2.98 S.D.0.96	Mean 3.08 S.D.1.02	1.60	0.192
2.	Difficulty to valuate fixed assets held by government units with the absence of market price	Mean 3.96 S.D.0.90	Mean 4.0 S.D.1.02	0.0220	0.638
3.	The absence of a clear valuation policy for fixed assets.	Mean 2.73 S.D.1.43	Mean 3.0 S.D.1.37	0.180	0.666
4.	Difficulty to identify all fixed assets owned by government unit	Mean 4.03 S.D.1.4	Mean 4.15 S.D.1.00	.843	.459
5.	Lack of additional resources manpower and funding needed for assets evaluation	Mean 3.86 S.D.1.45	Mean 3.4 S.D.1.86	.832	.747

Among the various problems in implementing accrual accounting, respondents in both groups ranked "difficulty in identifying all fixed assets owned by government unit" as number 1. The mean score for the user group and non-user group were 4.03 (S.D. 1.4) and 4.15 (S.D. 1.00) respectively. Second problem identified is "valuation of fixed assets held by government unit with the absence of market price" that is being faced as impediment in the implementation of accrual based accounting with mean score for user group 3.96 (S.D. 0.90) and for non-user group 4.03 (S.D.1.4). The respondents in both group also ranked the item "Lack of additional resources manpower and funding needed for assets evaluation" as the third problem faced in the implementation of accrual based accounting with mean 3.86 (S.D. 1.45) for user groups and 3.4 (S.D.1.86) for non-user groups.

On the other hand, the respondents do not have difficulties regarding the "Difficulty to measure and determine revenue and expenses accurately" with mean score 2.98(S.D. 0.96) for user group and non-user group is 3.8 (S.D.0.96). No strong opinion has been found for the absence of a clear valuation policy for fixed assets with mean 2.73(S.D.1.43) for users and 3.00(S.D. 1.37) for non-users group. Hence the results indicate that we may not reject the null hypothesis (H_{02}) that there is no significant difference between the user and non-user group regarding the perceived difficulties in implementing accrual based system.

In order to examine the hypothesis H_{03} , respondents have been asked to provide information on usefulness of accrual based accounting for decision-making.

TABLE 10
**Respondent Perceptions Regarding Usefulness of Financial Information
 Provided by Accrual Accounting for Decision-Making**

Sr. No.	Usefulness of the financial information	Users (20)	Non-User(30)	t- statistics	P value
1.	Financial Statement produced from accrual accounting system disclose enough data for monitoring financial position	Mean 3.96 S.D.1.25	Mean 3.15 S.D.1.16	28.94	0.000
2.	Accrual accounting system effectively disclose the economic and financial results for measuring programme performance	Mean 3.90 S.D.1.30	Mean 3.25 S.D.1.20	16.821	0.000
3.	Accrual accounting system is capable of serving the basic financial information need achieve cost recovery	Mean 4 S.D.1.03	Mean 2.58 S.D.1.26	90.106	0.000
4.	The adoption of accrual accounting effectively disclose the economics and financial result the measurement of cash flow position	Mean 3.30 S.D.0.99	Mean 3.40 S.D.1.20	0.056	0.802
5.	The adoption of accrual accounting would speed up the compare output among department	Mean 3.98 S.D.1.05	Mean 2.96 S.D.1.40	30.147	0.000

The respondents of the user group perceive that adoption of accrual accounting is capable of serving the basic financial information needed to achieve cost recovery and also accrual based accounting is expected to speed up the ability to compare output among different departments. The mean scores are 3.98(S.D. 1.05) and 4.0(S.D. 1.03) respectively. They also have positive opinion that accrual accounting system provides adequate financial data for monitoring financial position and measuring programme performance. Further they are not sure that accrual based accounting discloses financial information to measure cash flow position.

On the other hand, respondents from the non-users group have modest views regarding all the above statements. t-test for two unrelated means has been used to compare the respondents rating and the difference between the means of users and non-users group regarding the usefulness of financial information provided by accrual based accounting for decision-making purpose. table-10 provides the evidence which support that usefulness of the financial information in relation to the items shown under serial numbers 1,2,3,5 are highly significant (t statistics =28.94, 16.82, 91.06, 30.147) respectively as $p < 0.05$, indicating that users group tended to rate the usefulness of accrual based accounting more highly than the non-user group.

The results suggest that users group who already has some experience in using accrual based accounting are more convinced about the usefulness of accrual

based financial information for decision-making purpose. Hence, null hypothesis (H_{03}) of no significant difference between the user and non-user groups regarding the usefulness of financial information provided by accrual based accounting in LGBs for decision-making may be rejected.

VI. CONCLUSION

This paper evaluates the performance of LGBs in India on the basis of analysis of secondary data and primary data relating to sample LGBs of various regions within India. Financial ratios have been used in analyzing the financial condition and balanced scorecard approach has been used to study the performance of LGBs. Results of the analysis show that overall performance of LGBs is poor with a performance level of 36.23%, primarily due to poor financial performance rather than non-financial performance.

The study results indicate that LGBs in India have a chance to improve both financial and non-financial performance through improvement in individual performance matrices that will in turn improve overall performance.

Results of the study also indicate that users and non-users have different perceptions about the feasibility of implementing accrual based accounting in LGBs. The results also suggest that there is no significant difference between the user and non-user groups regarding the perceived difficulties in implementing accrual based system and user groups who already have some experience in using accrual based accounting are more convinced about the usefulness of accrual based financial information for decision-making purpose in comparison to non-user groups.

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INDIAN ACCOUNTING ASSOCIATION RESEARCH FOUNDATION

Regn. No. S/63876 of 1989-90 under West Bengal Act XXVI of 1961
Working Office : Department of Commerce, University of Calcutta, Kolkata - 700 073

June 11, 2019

NOTICE

The 30th Annual General Meeting of the IAA Research Foundation will be held on July 20, 2019 (Saturday) at 3.30 p.m. in Room No. 7, EILM Campus, 6, Waterloo Street, Kolkata-700069, to consider the following:

Agenda

Giving **Outstanding Researcher Award** and **Active Member Awards**

1. Confirmation of the minutes of the last Annual General Meeting held on 07.07.2018.
2. Consideration of the Secretary's Report for the year ended 31.03.2019.
3. Consideration of the Audited Accounts for the year ended 31.03.2019.
4. Consideration of the Budget for the year 2019-20.
5. Appointment of Auditors for the year 2019-20 and fixation of Auditor's Remuneration.
6. Such other business that may be brought forward by any member giving 14 days previous notice.
7. Miscellaneous.

All the members of the Research Foundation are requested to attend the meeting.

D.R. Dandapat

(D. R. Dandapat)

Secretary

IAA Research Foundation

N.B. Printed copies of the Secretary's Report and Audited Accounts will be available from the Secretary in the Department of Commerce, University of Calcutta, Kolkata 700 073. Members may collect the same on any of the working days from 01. 07.2019 to 06.07.2019 between 12.00 noon and 4.00 p.m.

Virtual Water Trade on Primary and their Derived Crop Products: A Component-wise Analysis in the Context of Indian International Trade with Developed Countries during 2008-09 to 2017-18

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ABSTRACT

The present study tries to explore an evaluation framework for international trade by incorporating virtual water trade as a parameter. It seeks to estimate and analyse the component-wise virtual water trade of crop products (Primary and Derived) which were traded by India with the developed countries during the course of international trade during the period 2008-09 to 2017-18 and to quantify the volume of net Virtual Water Trade for that period. A comparative analysis of virtual water trade and balance of trade over the same period is also undertaken to verify the presence of any association between these two important parameters.

Key words: Virtual Water Trade, Water Foot Print and Sustainable Development.

I. INTRODUCTION

Virtual Water Trade and Water Foot Print are the two important concepts arising out of globalization of water. Water is the minimum requirement for producing any commodity or rendering any service. The water foot print of a product is the total volume of water used to produce the product and summed over the various steps of the production process. Actually water foot print is an indicator of water use that looks at both direct and indirect water use of a consumer or producer (Water Foot Network Glossary, 2018). The water foot print of a product is segregated into the following three categories:

- **Green Water Foot Print** – It refers to the rain water consumed by the product or service.
- **Blue Water Foot Print** – The volume of surface and groundwater consumed (or evaporated) as a result of the production of a good or rendering a service.

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- **Grey Water Foot Print** – It is the volume of freshwater that is required to assimilate the load of pollutants based on existing ambient water quality standard. Simply speaking, it is the summation of pollutant water produced during the production process plus the volume of water needed to nullify the effect of such pollutant. Grey water foot print is relatively new in water use studies, but justified when considering the relevance of pollution as a driver of water scarcity (Mekonnen and Hoekstra, 2011).

The concept of Water Foot Print was first introduced by Hoekstra in 2002 and it was refined and accounting methods were established by Chapagain and Hoekstra. On the other hand, Virtual Water Trade refers to the hidden flow water that is being transferred during the course of international trade. The virtual water was defined at the beginning of the year 1990 by J. A. Allan as “Water Embedded in Commodities” (Allen et al, 1998). For example, to produce one metric ton paddy requires 1673 cubic meter of water, one metric ton wheat requires 1827 cubic meter of water and about 3200 liter water is required to produce thirty two megabyte of computer chip of two grams (Mekonnen and Hoekstra, 2011). Here the water is called virtual because it is not physically contained any more in the product (Kumar and Jain, 2007). The direct and physical flow or trade of water in a huge volume is much costly and almost impossible in international trade scenario. As such, the concept of virtual water flow is getting prominence with the passage of time and now it has reached such a stage that virtual water trade attracted lot of economic and political debate all over world. Many countries are taking a strategy to stop exporting their high water consuming product to the other countries. For example, Israel discourages the export of Oranges (relatively heavy water guzzler) to the different part of the world. Most of the developed countries are practising to import heavy water consuming products from developing countries and under-developed countries in exchange of export of low water consuming products to those countries. Precisely because of this reason, water as a recourse has become most debatable issue in the arena of geo-politics and every country now puts much more sincere thought over the use of water and its virtual flow.

Conventionally, the international trade situation of a country is measured by parameters expressed in monetary terms, such as, Balance of Trade. Such measures capture the net monetary flow due to international trade under a specific head during a period of time. But virtual flow of water along with its component-wise analysis in the course of international trade is neither measured nor taken into account while making several policy decisions relating to international trade. On this backdrop, the present paper is going to explore a theoretical framework for evaluation of international trade situation and highlight the component-wise virtual water flow in relation to India’s international trade with developed countries¹ during the period 2008-09 to 2017-18. It also highlights the year-wise and product-wise virtual water flow during the period under consideration.

¹Here Developed Countries means countries which are considered as developed by the APEDA (Agricultural & Processed Food Products Export Development Authority) of India. The names of these countries are: USA, UK, Netherland, Germany, Canada, Singapore, Australia, Belgium, New Zealand, Korea Republic, Poland, Sweden, Switzerland, Portugal, Greece, Italy, Hong Kong, Israel, Japan, Spain, Luxembourg, France, Ireland, Estonia, Austria, Slovenia, Czech Republic, Slovak Republic, Iceland and Finland.

II. IMPORTANCE OF VIRTUAL WATER FLOW

Virtual water flow has gained so much attention because of the following developments:

- We all know that water is the basic element of maintaining life. It is also one of the important components of production of any product and service. Actually water is the most valuable resource for nurturing human civilization and its sustainability. But from the beginning of 21st century, scarcity of water for the purpose of drinking, household activities and agrarian activities is felt almost all over the world. According to a recent BBC News (BBC news, 11/2/2018), most of the famous populated cities (Cape Town, Sao- Paulo, Bangalore, London, Mosco, Tokyo and Jakarta, etc.) all over the world are on the verge of facing serious drinking water crisis.
- In the era of globalized economy, fresh drinking water is treated as a new economic commodity. Even in India, consuming packaged water is no longer a status symbol now, rather a basic necessity of life. According to a recent report, nearly 5735 licensed water brands are operating in India along with many unregistered water brands. The growth rate of packaged water industry, on an average, is 20%. Most water plant of those industries is situated in rural areas. They continuously dig ground water for their production purposes thus leading to substantial decline in ground water level. Moreover, around 33% water is wasted while producing packaged drinking water (Dutta, 2018).
- Internationally, water has been an important issue and controlling over water is the main epicenter of every geo political crisis throughout the world. According to a report of BBC in 2nd September 2010, the so-called Six-Day War² in 1967 arguably had its origin in water dispute –a move to divert the River Jordan, Israel’s main source of drinking water. It is also said that main reason of Arab – Israel conflict hovers around land and more specifically, the water which flow through that land. In India also, the relations with its neighboring countries are dependent on sharing of river water which is flowing across the countries. As such, bilateral or multilateral relations of a country in the days to come will be affected not only by river sharing understanding but also by the virtual flow of water.
- The main reason for tug of war over water in the recent past is the galloping increase of human population all over the world, especially in a country like ours. It creates a huge demand for fresh water for drinking as well as agricultural purpose. That is why *Ismail Serageldin*, the former Vice President of the World Bank, said that the water will be the main reason of inter- country conflict in the 21st century (Sen, 2012). In 2009, the then UN Secretary General *Ban Ki Moon* noted that water scarcity will be transformed into a violence chapter in near future. Then the world will witness a war named ‘water war’. But until now, countries do not

²Six – Day war was fought between 5 and 10 June 1967 by Israel and neighbouring states of Egypt, Jordan and Syria.

go for war over water; they solve their water shortages through trade and international agreements. They use virtual water trade as a tool to solve their water crises. Basically, the corporate giants are creating new economy, called water economy by utilizing water as a market product. They are adopting or exploring several strategies to use the water of other countries by shifting their heavy water consuming products or manufacturing process from developed to under-developed or developing countries.

In this context, huge amount of virtual water outflow during the course of international trade is not desirable for any developing countries, especially like ours, where scarcity of water for drinking and irrigation purpose is taking a serious turn in the recent past. Every year, mostly the farmers of western part and central part of India suffer due to lack of supply of irrigation water. Actually if we want to make our economy sustainable, then we have to protect our water resources. For that we need to look at judicious and efficient use of water in one hand and maintaining a favourable position in terms of virtual water flow on the other. Otherwise, sustainability of life and environment will be at stake in the days to come.

III. LITERATURE REVIEW AND RESEARCH GAP

A good number of research works both at international and domestic levels has been conducted on the topic of virtual water trade and water foot print. A review of the relevant literature is given below chronologically.

Hoestra and Hung (2002) estimated the amount of water needed to produce crops in different countries of the world, quantify the volume of virtual water trade flows between nations during the period 1995-1999 and to put the virtual water trade balance of nations within the context of national water needs and water availability. In studying global virtual water trade flows, it was recommended to start working on other products than crops as well, for instance, livestock products such as meat. The study indicated how governments can deliberately interfere in the current national virtual water trade balance in order to achieve higher global water use efficiency.

Singh *et al.* (2004) estimated that dairy based rural livelihoods systems are now threatening the limited water resources of arid and semi-arid areas, and their future in turn is threatened by the depletion of these resources. The paper analysed virtual water exports and imports by some of the leading dairy cooperatives of Gujarat.

Yang *et al.* (2007) studied awareness of the limited effect of water scarcity on the global virtual water trade and the negative implications of the global water saving for the water use efficiency and food security in importing countries and the environment in exporting countries. They analyzed the complexity in evaluating the efficiency gains in the international virtual water trade. The findings of the study, nevertheless, call for a greater emphasis on rain fed agriculture to improve the global food security and environmental sustainability.

Ansink (2010) using the Heckscher–Ohlin trade model, refuted two prominent but incorrect claims on virtual water trade. These claims are uneven water distribution and reducing the potential for water conflict. Both claims are based on

an incorrect understanding of comparative advantage in the production of water-intensive goods. The results showed that both claims only hold under certain conditions, but do not necessarily follow from the Heckscher–Ohlin trade model.

Mekonnen and Hoekstra (2011) quantified the green, blue and grey water footprint of global crop production in a spatially explicit way for the period 1996 – 2005. The study is based on primary crops and their derived crops. The study found that green water plays a prominent role in the global crops production. Reimer (2012) developed new theoretical results that place the virtual water concept on a firm economic foundation which correct several misconceptions within the existing literature on virtual water economics.

Hoekstra *et al.* (2017) opined that ‘Sustainable Development Goal (SDG) number 6³ of the United Nations lacks any target on using green water more efficiently. While addressing efficiency and sustainability of water use, it also lacks a target on equitable sharing of water. The researcher claimed that the latter issue is also receiving limited attention in research. It asserted that understanding of water problems and proposed solutions will likely to remain unresolved because focus is primarily on water-use efficiency in farming and industries at the local level and issues around equitable water use are largely being ignored.

Chukalla *et al.* (2017) developed and applied a method to find the most cost-effective pathway to reduce the water footprint in irrigated crop products. Different cases were considered, including three crops (maize, tomato and potato); four types of environment (humid⁴ in UK, sub-humid⁵ in Italy, semi-arid⁶ in Spain and arid⁷ in Israel); three hydrologic years (wet, normal and dry years) and three soil types (loam, salty clay loam and sandy loam). It found that, when aiming at water footprint reduction, one can best improve the irrigation strategy first, next the mulching practice and finally the irrigation technique.

Betsie *et al.* (2017) investigated the ability of water footprints and water resource management of Steenkoppies Aquifer⁸, South Africa. By using the information the researcher derived a water balance and developed a water footprint framework. The results of the study indicate that current irrigation on the Steenkoppies Aquifer is unsustainable. The report advocates that the water footprint methodology can be applied to other water-stressed aquifers around the world and highlights the sustainability of catchment scale⁹ water use in order to help set and meet sustainability targets.

Verge *et al.* (2017) indicated that grey water is an indicator of pollution in water footprint assessments. In this study, the grey water footprint for corn and soybean was calculated on daily to yearly time steps. It is found that the grey water footprint varied significantly when calculated for different time steps and those results, therefore, are highly dependent on the time step of calculation. The effect of this issue extends beyond crop production as it is exported and amplified through feed rations to affect the grey water footprint from animal production.

³Sustainable Development Goal number 6 is one of the important 17 Sustainable Development Goals outlined by the United Nations in 2015. It calls for clean water and sanitation for all people.

⁴Humid means relatively high level of water vapour in the atmosphere.

⁵Sub humid means having humidity in typical of grassland and prairie.

⁶Semi-arid means a climate has little rain but is not completely dry.

⁷Arid means a climate having little or no rain; or too dry or barren to support vegetation.

⁸An aquifer is an underground layer of water-bearing permeable rock, rock fractures or unconsolidated materials (gravel, sand, or silt)

⁹Catchment scale means river drainage system.

It suggested that in order to reconcile these problems, grey water calculation pathways should be reconsidered and standardized.

Abovementioned review clearly shows that few researches have been conducted on virtual water trade arising out of primary and their derived crop products¹⁰ in the context of India's international trade. There is virtually no study on the trade balance and net virtual water trade of India arising out of international trade in primary and their derived crop products. Component wise analysis of virtual water flow in relation to international trade has not yet been undertaken by any systematic study. In view of the increasing emphasis on efficient use of water, it is a very crucial to compare trade balance and virtual water trade along with its component-wise analysis. It would help a country to marshal its trade policy in relation to virtual water trade. The present study aims to fulfill this research gap.

IV. OBJECTIVES

The prime objective of the study is to explore a theoretical framework for evaluation of international trade situation and to examine the component wise virtual water trade position of India with the developed countries on the basis of export and import of primary crops and their derived crops. The specific objectives are as under:

- To explore a theoretical framework to evaluate international trade by considering water (which is neither priced nor considered in the whole process) as a vital resource.
- To estimate the amount of water needed (Green water, Blue water and Grey Water) to produce primary crops and its derived crops which were traded by India with the developed countries during the period 2008-09 to 2017-18.
- To quantify the component-wise net virtual water trade flows during the period 2008-09 to 2017-18.
- To compare year-wise and component-wise net virtual water flow with the amount of balance of trade during the period 2008-09 to 2017-18.

V. METHODOLOGY

The study is both explorative and analytical in nature. It explores the conceptual issues relating to virtual water trade and tries to develop an evaluation framework which would assess the international trade position by combining virtual water trade along with traditional monetary measure of international trade (i.e. balance of trade). Alongside, it aims at analyzing the product-wise, year-wise and component-wise virtual water trade flow from India. The study is based on secondary data only, which were collected from the websites of Agricultural & Processed Food Products Export Development Authority (APEDA) of India and the Glossary of Water Foot print Network. It is basically focusing on estimation of component-wise net virtual water flow of primary crops and their derived crops which were traded by India with the developed countries during the period of

¹⁰According to Global Water Foot Print Network, each and every product and its derived product are classified into various categories, like: primary product, bio product, animal product and industrial product. These products are also codified in FAOSTAT code by the Food and Agricultural Organization of the United Nations.

2008-09 to 2017-18. The data are analyzed by using descriptive statistics like mean, variance and correlation coefficient. For estimation of global average water foot print of each primary crop and its derived crop, some dummies or proxies have been taken into consideration due to unavailability of exact data of global average water foot print. The details of such dummies used in the study are given in table 1.

TABLE 1
**Dummy used to calculate virtual water trade of
India during 2008-09 to 2017-18**

Products on which water foot print data are not available	Dummy Product taken into consideration
Basmati Rice	Non Basmati Rice
Guargum	Ordinary Gum
Other processed fruits and vegetables, dried and preserved vegetables , fresh vegetables and fruits and vegetables seeds	Vegetables
Other cereals	Cereals

VI. EVALUATION FRAMEWORK FOR INTERNATIONAL TRADE

Classically, balance of trade, which captures the net monetary flow arising out of international trade under a specific head during a period of time, is a measure of international trade situation of a country. But in the context of impending water crisis, we need to incorporate another dimension i.e. flow of water (virtual) during the course of international trade. The incorporation of virtual water flow is justified on the ground that water is used for producing products/services, but its price is not included in the production cost as water, as of now, is not priced. So, international trade situation should be evaluated by considering both monetary measure (balance of trade) and non-monetary measure (virtual water trade) to reflect the growing importance of water as a resource. When we combine these two parameters, we can devise a 2 X 2 matrix like evaluation framework as shown in chart 1 below.

CHART 1
Evaluation framework of international trade situation

Favourable in Water Savings	Most Favourable Situation
Negative Balance of Trade Positive Virtual Water Trade	Positive Balance of Trade Positive Virtual Water Trade
<u>Most Unfavourable Situation</u>	<u>Favourable in Monetary Term</u>
Negative Balance of Trade Negative Virtual Water Trade	Positive Balance of Trade Negative Virtual Water Trade

From chart 1, we can think of four mutually exclusive and exhaustive classes when we incorporate two parameters (balance of trade and net virtual water trade) in evaluating the international trade situation. These are as follows:

- **Most unfavourable situation:** When a country experiences negative

balance of trade and negative virtual water trade, the situation becomes most unfavourable. In consequence, this combination is not desirable for any country. Basically, most of the African countries fall in this quadrant.

- **Favourable in monetary terms:** In this case, the balance of trade is favourable but virtual water trade balance is unfavourable. This combination can be suitable for those countries which have enough fresh water resources and the economies that are dependent on primary sectors. Basically developing countries, like the south-east Asian countries are trying to achieve this kind of combination. The notable fact is that countries falling under this quadrant are actually ignoring the loss of water in lieu of favourable trade balance in order to correct the overall balance of payment position.
- **Favourable in water saving terms:** If a country is having negative trade balance and positive virtual water trade, then we can say that it saves water during international trade. This combination is the rarest so far as international trade situation is concerned.
- **Most Favourable case:** This is the most desirable situation that a country should aspire of achieving. If a country can continue to stay on this phase over a long period of time, it can generate holistic gain out of international trade. Here both the parameters are favourable. This combination is supporting the 'triple bottom line approach (TBL)' . In recent times many developed countries are trying to achieve this kind of trade situation.

It should be noted that the above four situations are not static for a country. As international trade follows autonomous behavior of the economic agents, the position of a country is likely to vary from one quadrant to another over the period of time. But if a country is prone to concentrate on a particular quadrant year after year and if the position is not desirable for that country, then it must intervene in international trade policy so as to make a shift in its position to a desirable quadrant.

VIII. DATA ANALYSIS

The study is mainly based on two parameters – amount of trade balance of India and net virtual water flow. We primarily focused on calculation of year-wise trade situation and component wise virtual water flow of India in course of international trade with developed countries. The calculated values are then element-wise summarized and presented in table 2. The element-wise share of virtual water trade is presented in table 3. As pointed out earlier in our theoretical framework, the results during the period under consideration have been summarized into four possible cases that India experienced when we combine two parameters – balance of trade and virtual water trade as shown in chart 2 below. The year-wise detail calculations for a year in each quadrant are shown in annexures 1, 4 and 5.

CHART 2

**Evaluation of international trade positions of
India during 2008 – 09 to 2017-18**

<u>Favourable in Water Savings</u> Negative Balance of Trade Positive Virtual Water Trade (During the year 2017-18, 2016 – 17, 2015 – 16, 2009-10 and 2008 – 09)	<u>Most Favourable Case</u> Positive Balance of Trade Positive Virtual Water Trade (During the year 2014 – 15, 2012-13 and 2010-11)
<u>Most Unfavourable Case</u> Negative Balance of Trade Negative Virtual Water Trade	<u>Favourable in Monetary Term</u> Positive Balance of Trade Negative Virtual Water Trade (2013 – 14 and 2011 – 12)

From table 3 and chart 2, we can observe that in the year 2008-09, 2009-10, 2015-16, 2016-17 and 2017-18, India's trade balance was in unfavorable condition but the status of net virtual water flow of these five years was in favourable condition. That means during these five years, India's international trade involving crop products generate result which is beneficial in terms of water savings.

Subsequently, when we concentrate on the year 2011 – 12 and 2013 – 14 the situations are just the reverse (i.e. trade balance is favourable but virtual net water flow is unfavorable). It signifies favourable situation in terms of monetary value. But in the year 2014 – 15, 2012-13 and 2010-11, both the parameters are favourable which indicates the most favourable combination for India. So, we found that India did not experience the most adverse situation both in monetary term and virtual water count during the last ten years so far as international trade in crop products are concerned. The correlation coefficient of the two parameters over the period, however, is calculated as 0.061, which signifies absence of any definite trend pattern in the magnitude of trade balance and net virtual water flow during the period under consideration.

For India, the cumulative virtual water flows during the period under review are favourable with 41.98%, 7.14% and 50.88% accounting for green, blue and gray water flows respectively. Consequently, the mean value of virtual water flow during the last 10 years are favourable with 41.98%, 7.14% and 50.88% accounting for green, blue and gray water flows. However, the mean value of trade balance (Rs. 219967.554 crore) is unfavourable during the period. It signifies that during the period of last ten years, India's involvement in international trade produce, on an average, net benefit in terms of virtual water flow so far as primary crops and derived crops are concerned but monetarily it has adverse effect. In short, the India's international trade in crop products during the last ten years saves water on an average. The range and standard deviation over the years depict wide variation both in trade balance and net virtual water flow. As the trade in primary and derived crops has arisen from autonomous behaviour of the economic agents, the resultant virtual water flow (which in this case is favourable, on an average) is autonomous in nature. As such, the favourable position of each element of virtual water flows is not due to any policy intervention. Through policy intervention, suitable strategy can be developed so as to make the international trade on crop products favourable on both monetary and water flow count.

TABLE 2
Component-wise virtual water flow of primary crops and derived crops registered under APEDA of India

Year	Virtual water Outflow (Quebec meter)				Virtual water Inflow (Quebec meter)				Annexure
	Green water	Blue water	Grey water	Total	Green water	Blue water	Grey water	Total	
2017-18	7410440808	517938678	454763883.1	8383143369	11185943842	673998538.6	2481344704	14341287085	1
2016-17	6435830929	479036062	408127102.7	7322994093	16800347760	6765559865	31302547759	54868455384	2
2015-16	5198433704	464009257	3810570056	9473013017	13272801585	755925876.7	2937528197	16966255659	3
2014-15	8333312108	551117874	48832474.1	8933262456	9469334114	439220365.6	2114663862	12023218342	4
2013-14	8158003137	769101974	599616641	9526721752	6915508323	317808206.3	1538350931	8771667460	5
2012-13	3232679905	760190185	508333635.3	4501203725	7134237782	32888564.8	1589013827	8756140174	6
2011-12	10431572674	489871748	494986031.1	11416430453	6781417552	312671895.1	1506306098	8600395545	7
2010-11	4801896200	260251232	247754998.5	5309902431	5935526101	307106514	1309090024	7551722639	8
2009-10	673344033.5	104028468	108982938.2	886355439.3	6904149006	358032288.7	1544612211	8806793506	9
2008-09	623833704.7	76039937	115011388.7	814885030.5	4319878950	193739774.3	974173790	5487792514	10
Total	55299347203	4471585415	6796979149	66567911766	88719145015	10156951889	47297631403	146173728308.0	
No. of year (n)	10	10	10	10	10	10	10	10	
Mean	5529934720	447158541	679697914.9	6656791177	8871914502	1015695189	4729763140	14617372831	
Max.	10431572674	769101974	3810570056	11416430453	16800347760	6765559865	31302547759	54868455384	
Mini.	623833704.7	76039937	48832474.1	814885030.5	4319878950	32888564.8	974173790	5487792514	
Range	9807738969	693062036	3761737582	10601545422	12480468810	6732671300	30328373969	49380662870	
S. D	3278249653	238276194	1116828642	3671431378	3835104397	2031281196	9354795882	14545860712	

Source: Authors' calculation.

TABLE 3
Component-wise virtual water trade of primary crops and derived crops registered under APEDA of India (Continuation of Table 2)

Year	Net Virtual Water Trade (Quebee meter) Virtual Water Inflow – Virtual Water Outflow				Trade Balance (Rs. in Cror.)	Annexure
	Green Water	Blue Water	Grey Water	Total		
2017-18	3775503034 (63.37)	156059861 (2.62)	2026580821 (34.01)	5958143716	-1341421.1	1
2016-17	10364516831 (21.80)	6283523803 (13.22)	30894420656 (64.98)	47545461291	-7220.76	2
2015-16	8074367881 (107.76)	291916619.7 (3.90)	-873041858.9 (-11.65)	7493242642	-3235.36	3
2014-15	1136022006 (36.76)	-111897508.6 (-3.62)	2065831388 (66.86)	3089955885	8717.82	4
2013-14	-1242494814 (164.56)	-451293767.2 (59.77)	938734290 (-124.33)	-755054291.2	7775.98	5
2012-13	3901557877 (91.69)	-727301620.3 (-17.09)	1080680192 (25.40)	4254936448	2491.57	6
2011-12	-3650155122 (129.62)	-177199852.7 (6.29)	1011320067 (-35.91)	-2816034908	925.36	7
2010-11	1133629901 (50.57)	46855281.7 (2.09)	1061335026 (47.34)	2241820208	1871.68	8
2009-10	6230804973 (78.67)	254003821.1 (3.21)	1435629273 (18.13)	7920438066	-51145.44	9

Year	Net Virtual Water Trade (Quebec meter) Virtual Water Inflow – Virtual Water Outflow				Trade Balance (Rs. in Cror.)	Annexure
	Green Water	Blue Water	Grey Water	Total		
2008-09	3696045245 (79.10)	117699837.2 (2.52)	859162401.3 (18.39)	4672907484	-358165.29	10
Cumulative Total	3341979812 (41.98)	5685366475 (7.14)	40500652255 (50.88)	79605816541	-2199675.54	
No. of year (n)	10	10	10	10	10	
Mean	3341979781.2 (41.98)	568536647.5 (7.14)	4050065225.5 (50.88)	7960581654.1	-219967.55	
Max.	10364516831 (21.80)	6286523803 (13.22)	30894420656 (64.98)	47545461291	8717.82	
Mini.	-3650155122 (129.62)	-727301620.3 (25.83)	-873041858.9 (31.00)	2816034908	-1341421.1	
Range	14014671953 (27.83)	7013825423 (13.93)	31767462515 (63.08)	50361496199	1350138.92	
S.D	4220764594 (29.49)	2034555193 (14.21)	9466721356 (66.13)	14314942003	435327.60	

Source: Authors' calculations.

Note: The figures in *italic* denote unfavourable balance and figures in the bracket denote percentage of total virtual water flow.

VIII. FINDINGS AND CONCLUSION

The above noted discussion and analysis pointed out the followings:

- During each of the five years (2017-18, 2016 – 17, 2015 – 16, 2009-10 and 2008-09) India's international trade involving crop products generates result which is beneficial in terms of water savings.
- During the year 2011 – 12 and 2013 – 14 trade balance is favourable but virtual net water flow is unfavorable which signifies favourable situation in terms of monetary value only.
- During each of the year 2010-11, 2012-13 and 2014 – 15, both the parameters are in favourable condition which indicates the most favourable combination for a country.
- India, however, did not experience the most adverse situation in monetary and virtual water count during the last ten years so far as international trade in crop products is concerned.
- The mean value of virtual water flow during the last 10 years is favourable with 41.98%, 7.14% and 50.88% accounting for green, blue and gray water flows. However, the mean value of trade balance (Rs. 219967.554 crore) is unfavourable during the period.
- It signifies that during the period of last ten years, India's involvement in international trade produce, on an average, net benefit in terms of virtual water flow so far as primary crops and derived crops are concerned but monetarily it has adverse effect.
- The correlation coefficient of Balance of Trade and Virtual Water Trade over the period is calculated as 0.061, which signifies absence of any definite trend in the magnitude of trade balance and net virtual water flow during the period under consideration.
- In short, India's international trade in crop products during the last ten years saves water on an average.
- Considering the uncertainty associated with the future international trade environment, there is least scope of further improvement in blue and green virtual water flow situation because these two are inherent part of the production process of any product or service.
- In case of grey virtual water flow, however, we can improve the position by restricting the use of hazardous chemical and pesticides and reducing the co-lateral damage of water in course of production process because grey water is not an inherent part of any production process.

India at present stands on an impending water crisis situation. Most inter-state conflicts in India are based on sharing of river water which is flowing across various states. India's bilateral relations with the neighboring countries also depend upon the river water sharing agreements. Moreover, because of the increasing trend of population in Indian subcontinent, huge demand is created for fresh water. In view of all these factors, we should not only be concerned about profit and favourable trade balance so far as international trade is concerned. Equal weightage should be given on water use efficiency and virtual water trade during the course of international trade and virtual water trade should be recognized as

a decision input while framing national policies relating to international trade especially with developed countries.

IX. LIMITATIONS OF THE STUDY

The present study is an initial attempt of its kind. So, it suffers from certain limitations as mentioned below:

- The study is based on those primary crops and their derived product which are registered under the APEDA of India. There will be some other primary crops which are traded by India in course of international trade. Accordingly, the base of the study can be increased to some extent if such information and data are available in future.
- The animal products, industrial products, bio products are not taken into consideration for this study.
- Due to data unavailability, some dummies and proxies in relation to water footprints are used, so the results are to some extent approximation.
- The time horizon of the study could not be enlarged partly because of time and resource constraints and partly because of non-availability of authentic data.

In spite of the above, the study highlights the importance of considering the component-wise net virtual water trade of India during the period under consideration and compares it with the classical monetary measurement, such as, balance of trade. Such kind of inputs should be taken into consideration while framing policy decisions relating to export and import of crop products. It is possible to frame a policy with regard to export and import of crop products so that international trade on these items may generate favourable impact both in terms of monetary value and virtual water flow.

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