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ARTHAVAAN

Prof. Saloni Gupta
Editor-in -chief, Arthavaan

Dear Readers,

India is on the cusp of great glory and is all set to occupy its rightful place in the sun. The policy makers in the last few years have invariably ticked the right boxes to try and ensure the above. Nevertheless, a lot more needs to be done. There is tremendous potential in India which is untapped, be it the educated youth or the humungous richness of natural resources. Coexisting with these is the challenge of developing the economy at a pace that is in proportion to the aspirations of the growing population. The development should also focus on improving the human development index while ensuring sustainability. It is very satisfying to see that the policy makers of late have focused on localization and the need for ensuring that the critical resources needed for investment are not mis-utilized or wasted.

One of the focus areas to this end is to recognize the need for *Aatmanirbharta* or self-reliance, in all those fields that we Indians have a known core competence or potential to develop them as sustainable businesses. The Indian ethos talks of *Vasudhaiv Kutumbakam* or the World is a family; and like the family which is a single unit and thinks like one unit, we need to take care of environment with development. No development is complete if the interests of even one of the stakeholders is compromised. Businesses need to leverage the Make in India and Production Linked Incentive scheme put in place by the central government. For this, Indian businesses have to focus on import substitution and alternatives to the imports by looking inwards as in the case of defense and computer chips as well as alternative fuels. They need continuous to innovation in products and solutions. With significant structural reforms implemented over the last decade, and India as an economy with a stable macroeconomic and policy environment, it is an opportune time to overcome the barriers impeding growth while conserving the environment for future generations. Hence the focus on 'sustainable business models for an *Aatmanirbhar bharat*'.

There is pressure on the environment from increasing economic activities of a growing population, urbanisation and climate change. Corporates have recognises these challenges and are trying to address them. There is a need for partnerships among corporates, non-governmental organisations (NGOs) and the government to create social impact through Corporate Social Responsibility (CSR) activities. The CSR has lot of potential to bridge the gap between nongovernmental organizations (NGOs) and businesses in order to create meaningful socially sustainable projects all across.

All vibrant democracies have grown on the basis of its educated population and it is time India follows suit. Together we can work wonders towards 'sustainable business models for an *Aatmanirbhar bharat*', provided we create an ecosystem that makes it possible and that ecosystem requires the coming together of the government, NGOs, PPPs, the academia and the industry.

Prof. Saloni Gupta
Editor-in -chief, Arthavaan
Principal, Bharati College

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Emotions and Ethical Decision Making: Literature Review and Research Agenda

Dr Seema Gupta[1] and Shreya Gupta[2]

Abstract

Traditionally, ethical decision making is perceived as a rational and cognitive process by academicians and researchers. The contemporary authors have linked emotions to ethical decision making (EDM) and integrated the concept with organisational decision-making in a business setup. This literature review attempts to contribute to the ongoing discussion on consumer ethics by conducting an exhaustive and in-depth analysis of 32 papers that were published in 14 journals between the years 2001 and 2021. The objective of this conceptual paper is to investigate the empirical evidence for the role of emotion in EDM in business organisations. Theoretical frameworks provide for the synthesis of the influence of emotions on the cognitive process, although reflections of the processing of emotions in the EDM process is not so clearly evident by practitioners in organisations.

Keywords: Emotions, Ethical decision making, business ethics, organisational research

Introduction

Over the past two decades emotional dimension in ethical decision making (EDM) have received considerable scholarly interest as an important area of research in organisational theory.The emerging areas of literature is investigating the role of emotions as an integral element on decision making interactions and consequences (Mittal and Ross, 1998; Raghunathan and Pham ,1999; Connoly and Zeelenberg, 2002; Pham, Lee and Stephen , 2012) in different aspects of management settings. This includes the psychological traits of decision makers and how various types of emotions affect their ethical judgement. As put forth by Koporcic et al. (2017) : "…emotions are a natural part of the business world and they do not need to be avoided or restricted, but understood and managed accordingly."(p.436).

Several important conceptual theories support emotional aspect of ethical decision making research in business. Recent researches have evolve decision-making as conscious, rational systematic process (e.g., Kohlberg 1994) and established that ethical judgements are emotion-based and automatic (Haidt, 2001; Sonenshein, 2007; George and Dane 2011). However, extant theories have ignored emotions as a possible dimension of ethical decision-making and need arises for the incorporation besides review related to the influence of emotional aspect in business ethics research. In recent years, management scholars have integrated emotions as non-rational antecedents and predictors of moral judgement and ethical decision-making in organisations (Haidt 2001, Dedeke 2015,

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Schwartz 2016). Recently, Business ethics researchers have theorized and proposed an integrated framework of cognitive-emotive mode of EDM (Vitell et al 2013).

Overall, emotions and organisational decision-making processes and consequences interplay with each other in the managerial context. However, recent systematic review of literature of examining factors influencing EDM has revealed the emergence of emotions as one of the under investigated factor. Craft (2013) summarised the research findings from eighty four articles on ethical decision-making from 2004 to 2011. The researcher identified only seven empirical studies examining emotions/mood as dependent variable with judgement (3), and intent (4) as constructs influencing ethical decision in organisations. In another recent study, Casali and Perano (2020) adopted a qualitative approach to highlight the process made over the past four decades in investigating factors influencing DM. Among the 42 potentially influencing factors provided in the paper on EDM, the researchers identified emotions/mood as understudied variable (less than 32 papers) but found to be influential and slightly significant (upto 50%-75%). The recommended future empirical research to be done to understand the possible relationships among various unobserved factors to improve decision making capabilities of managers.

Specifically, EDM has remained an area of research in the last forty years and factors that potentially influence EDM has been systematically investigated and published. To the best of our knowledge, none of the studies has taken a systematic literature assessment of the effects of emotions on the EDM of managers in spite of the increasing interest in the topic. This paper draws upon existing literature to consolidate the empirical findings of interrelations of an emotive process for managerial ethical decision-making and understand practical implications. There has not been a literature review that has synthesised the conceptual and empirical research of the influence of emotions and EDM. This paper aims to investigate the scholarly investigation of the influence of emotions in the managerial context within business organisations and contribute to further theoretical development.

The primary purpose of the paper is to review the empirical research examining the influence of emotions on EDM using a Literature Approach. In addition, research studies investigating emotions as moderating variables and their effects on EDM of managers are also included as a secondary purpose of the study.

Research Questions:

RQ 1: What are the various emotions studied in the context of managerial decision-making?

RQ 2: How do emotions influence managerial ethical decision-making?

RQ 3: How do different emotions influence EDM as a potential moderator factor?

As a result, this study provides a comprehensive perspective by including research that is relevant to both the streams of emotions and the ethics of business. The following are some of the ways in which this review adds to the existing corpus of knowledge on organisational ethics. It provides a summary of the theoretical foundation that may be found in the literature, then it describes the procedures for gathering the data and consequent variables that were investigated in business ethics research related to emotions. The remaining parts of the paper are organised as follows. In the next section, the research methodology is discussed followed by findings related to empirical studies done in the last two decades. the last section. In the end, we make conclusions and summarise our findings.

2. Research Methodology

The search for papers started with keyword themes (emotions or feel* or affect*) in the article title, abstract and / or keywords by focussing our research in the areas of management, psychology, decision sciences, economics and finance. Initially, the search string resulted in thousands of articles including word ‘affect’ and ‘feel’ , since they were used as working verbs. Since the focus was on the review of emotion in EDM of managers, the term ‘ethical decision making’ (with or without a hypen) and ‘organisation’ was searched within the content of the articles. Finally, the search string used “Emotion” AND “Ethical decision making” of the organisations in the business context.

Inclusion: English Language, Only peer-reviewed and academic journals, Only Empirical results studies published

Exclusion: Articles published in conferences, proceedings, or book chapters or unpublished research studies; consumer emotions, research articles related to Medicine, Neuroscience, Clinical Psychology, and Nursing; theoretical and conceptual papers

In the present study, only those articles were included on emotions and EDM explicitly focussing on managerial/ organisational decision making context published since 2001 till 2021.

3. Findings and Analysis

In the past twenty years , the field of research of the repercussion of emotions on decision making in organisations has grown rapidly. A number of publications have organised and analysed theoretical and empirical work of emotions on judgement and EDM (Kupers & Weibler, 2008; Angie, 2011, George & Dane, 2016). Traditional research on business decision making has helped to identify broader areas of emotions such as integral, incidental, specific and discrete and its influence on ethical judgement and decisions (Lerner et al., 2015).

3.1 Emotions and Ethical Decision Making

Table 1 shows the number and type of emotions studied over the last two decades and the key findings in these empirical studies. In recent decades, emotion as the affective state has been increasingly investigated in decision-making, and it is a powerful generator of judgment and decision-making processes (Lerner et al., 2015). Emotions are known to impact judgments (Crane et al., 2017), lessen cognitive focus (Garfinkel et al., 2016), and impair cognitive processing (Kusev et al., 2017). These studies show that emotional distress can result in the reinterpretation of problematic situations leading to illogical behaviour and incidental influence over other decisions. Keltner and Lerner (2010) model of emotion-based decision making model reflects the emerging acknowledgement of the significance of emotion in decision-making. The combination of cognitive and motivational pathways, according to this paradigm, determines whether emotions improve or degrade judgment and decision-making. Higgs et al (2020) have examined the influence of cognitive emotions like guilt and embarrassment on EDM. The discrete emotions have positive or negative effects in reasoning strategies for decision ethicality and sense-making processes. The various participants were induced to scenarios related to shame, guilt and embarrassment emotion thereby their perception of moral intensity was measured. Results showed the negative impact of these emotions on cognitive reappraisal of situations and emotional interventions. Another study by Motrod et al (2018) purported the connection of anger and guilt on unethical judgements using dual process theory. The findings indicate that guilt reduces unethical behaviour and anger aggravates it by impulsive processing mechanisms of cognitive reasoning.

TABLE 1 : Analysis of Studies by Type of Emotion

Sr. No.	Citation	Year of Study	No. of Emotion studied	Type of Emotion	Key Findings
1	Kugler, Noussair, & Hatch.	2021	1	Disgust	Disgust has no effect on ethical decision making.
2	Jayawardena-Willis, Pio, & McGhee.	2021	5	Divine States	Love, Compassion, Joy influences ethical decisions made by managers.
3	Zolotoy, O'Sullivan, Seo, & Veeraraghavan.	2021		Positive Affect	Companies invest more in corporate social responsibility when their corporate headquarters have positive high morale.
4	Higgs, McIntosh, Connelly, & Mumford.	2020	3	Guilt, Shame, Embarrassment	Various emotions are associated negatively with cognitive reasoning and reappraisal.
5	Jeong, Sun, & Fu.	2020	14	Moral Emotion, Hedonic emotion	Moral emotions are more associated with EDM. Business school education affects the relationship between emotions and EDM.
6	Chen, Treviño, & Humphrey.	2020	2	Anger, Sympathy	Sympathetic and angry emotional expressions of ethical people increased ethical decision ethicality but anger was disliked.
7	McIntosh, Higgs, Turner, Partlow, Steele, MacDougall, ... & Mumford.	2019	In general	Positive and negative , Active and passive emotions	The negative impact of stressors often adversely affect rational thinking and barrier to effective whistleblowing.
8	Diochon & Nizet.	2019	in general	Self and for others	Emotional awareness, ethical decision-making, and unraveling, emotional (dis)engagement suggest existence of Emotions and ethical reflection.

Sr. No.	Citation	Year of Study	No. of Emotion studied	Type of Emotion	Key Findings
9	Motro, Ordóñez, Pittarello, & Welsh.	2018	2	Discrete emotions, Anger Guilt	Unethical actions are intensified by anger, but they are lessened by guilt. Both impulsive and deliberate thought processes mediated these results.
10	Bonner, Greenbaum & Quade .	2017	3	Shame, Guilt , Embarrassment	Findings point to a strong positive correlation between unethical actions and feelings of shame. Managers have the power to shape their subordinates' responses to their unethical activities.
11	Baker, D. F.	2017	1	Empathy	Empathetic concerns for self and others is important in ethical situations .
12	Noval, L. J.	2016	2	Happiness , Disappoinment	indicated that the anticipated emotional effects of desired outcomes did not affect task performance. Based on a biased emotional influence, people try to enrich themselves unethically and selfishly.
13	Johnson, & Connelly.	2016	2	Guilt , Shame	shows high guilt mitigates the unfavourable association between moral disengagement and EDM, while low guilt does not. Moral disengagement and EDM are unaffected by shame.
14	Guzak, J. R.	2015	10+10=20	Positve Affect, Negative Affect	Making moral choices while feeling negative alters the decision-making process in ways that aren't seen when people are feeling happy or neutral.
15	Winterich, Morales & Mittal.	2015	3	Disgust, happiness, sadness	Disgust and sadness have distinct moderating effects, but disgust and happiness have minimal efficacy.

Sr. No.	Citation	Year of Study	No. of Emotion studied	Type of Emotion	Key Findings
16	Fida, Paciello, Tramontano, Fontaine, Barbaranelli,& Farnese.	2015	17	Negative	greater moral disengagement and enactment of CWB occurred when workers experienced more negative emotions in response to stressors.
17	Piff, Dietze, Feinberg, Stancato & Keltner.	2015	1 and 4 others	Awe	The presence of awe prompted a rise in morality. The impact of the awe induction on moral judgement was moderated by the individual's sense of modesty.
18	Celuch, Saxby & Oeding.	2015	2	Regret,	The expected regret from an unethical decision affected subjects' judgement and influence ethical decision-making.
19	Zhu, Y.	2015		Qing (Positive emotions), Love and compassion	This study showed the importance of love and compassion based on Confucian ideals. Qing fosters morals and virtue.
20	Dietz & Kleinlogel.	2014	1	Empathy	Empathy had a modestly unfavourable impact on their intention to reduce salaries. (unethical be both empathy and guilt influence the ethical attitudes that were measured in this study behaviour).
21	McCool & Bremser.	2014	3 types of subscale of disgust	Disgust	Findings give support to the argument that moral outrage over impurity is not the only context in which disgust is experienced.
22	Celuch, & Saxby.	2013	3	Negative	Negative anticipatory emotions and intentions linked with unethical behaviour are found to be considerably impacted by an experiment aimed to induce a counterfactual thought.

Sr. No.	Citation	Year of Study	No. of Emotion studied	Type of Emotion	Key Findings
23	Ghorbani, Liao, Çayköylü, & Chand.	2013	2	Shame, Guilt	shame and Guilt mediates the reparative behaviour in doingbethically good.
24	Agnihotri, Rapp, Kothandaraman, & Singh.	2012	2	Empathy, Guilt	both empathy and guilt influence the ethical attitudes that were measured in this study.
25	Shapiro,Jazaieri, & Goldin.	2012	20	State and Trait Anxiety, Positive and Negative Affects	Mindfulness is associated with moral reasoning, EDM and emotional well being.
26	Krishnakumar, & Rymph.	2012	2	Anger, Sadness	Results demonstrated that lower ethical decision-making happened with increased negative emotions. Persons with a high EI are better able to deal with their feelings, which may lead to their making more moral choices.
27	Sekerka, Godwin, & Charnigo	2012	5P,5N	Positive, Negative	Managers who practised BEI reported feeling less dejected and less need for constant reassurance and praise.
28	Zhong, C. B.	2011	12	12 Emotional States	Respondents who lie expressed higher levels of discomfort feelings such as contempt, anxiety, and unhappiness, which are prevalent after moral transgressions.
29	Thiel, Connelly, & Griffith.	2011	20 item -10 positive 10 negative	State affect positive Negative	Certainty drives the unfavourable association between anger and EDM. Certainty appraisals increased EDM and its processes more than goal obstacle evaluations.
30	Curtis, M. B.	2006	2	Affect exam and Affect comparing	Negative mood was connected with fewer intentions to report unethical behaviour to a superior in the organisation. Emotional judgments explain ethical discrepancies.

Sr. No.	Citation	Year of Study	No. of Emotion studied	Type of Emotion	Key Findings
31	Connelly, Helton-Fauth, & Mumford,	2004	P-16,N-18	Positive and negative	Emotions have a stronger relationship to interpersonally directed ethical choices. Both positive and negative trait emotions relate to ethical choices. Active emotions showed stronger relationships with EDM.
32	Bartlett, D.	2003	In general	Affect	Emotions were found to have crucial role in EDM and during the ethical reasoning process, as when a feeling of guilt leads the decision maker away from or towards certain courses of action.

Source : Author's compilation Work

3.2 Role of Emotions in Organisational DM

Emotions have become a popular area of study in organizational behaviour ethics, which broadens the rationalist view to include impulsive processing of thoughts. Over the years, scholars have examined the direct influence of specific emotions on ethical judgments related to business settings. The research of Winterich et al. (2015) on the role of happiness, disgust, and sadness states of mind shows the impact of an experienced emotional state on the severity of individuals' ethical judgments. Another breakthrough was a study conducted by Fida et al. (2015) on understanding aggression and other negative emotions using counterproductive work behaviour (cwb). The responses elicited from 1147 respondents supported the moral disengagement of employees due to negative emotions being experienced during stressful situations in the work environment. The employees behaviour such as abuse, the ft, defiance in response to negative situations at work place was empirically examined by Kiewitz et al (2016). 297 employees responded to stressful scenarios and their emotional responses were measured to understand coping strategy and beliefs of the employees. Another study examined how guilt as an emotion influences restorative behaviour , beliefs for negative events such as tax evasion (Dunn et al., 2018). The findings have implications for tax policy to encourage tax disclosures as guilt is recognised as an emotion to corrective behaviour to ethical action. Moreover, there is a dearth of research connecting shame and embarrassment to moral judgment. The cognitively-based approach to ethical decision-making, which holds that emotion can be counterproductive to rational processes of decision-making, is at odds with the findings of these studies, which show that a lack of emotion during an ethical situation can hinder ethical decision-making.

4. Implications and Future Research

In a sense that is more applicable to real life, the findings that have been presented here have implications for managers, who undoubtedly will have interactions with subordinates or co-workers who are going through emotional states. It indicates that managers should be cognizant of the feelings experienced by others associated with them and consider how they may act due to differences in processing that are produced by those emotions as they engage with various stakeholders. This does not imply that businesses should try to elicit specific processes or responses from their employees by provoking particular emotions in their coworkers. Instead, managers should focus on evaluating the feelings that are already being experienced by others and effectively working through those feelings if they appear to be problematic (Higgs et al., 2020). According to the findings presented here, managers should employ reappraisal techniques and competencies in emotion regulation. This is due to the fact that cognitive reappraisal tends to have a detrimental effect on decision-making when it is presented in framework of a complicated ethical circumstance.

Researchers should further investigate the fundamental basis of emotion, EDM and moral magnitude, and not restricted to the causal assertions about these characteristics. Theoretically, the findings of the current research provide an understanding into the distinctive characteristics of numerous self-conscious emotions along with their varied consequences on ethical judgments. More research needs to be undertaken to collect data on the impacts of guilt, regret, and embarrassment concerning morality, affect modulation, and ethics. Furthermore, limited study has been conducted on the specific feelings of shame, embarrassment demonstrating a link to ethical decision-making. Studies further suggest that being indifferent during an ethical situation results in hindered EDM. This contradicts being aware, cognitively-based approach of EDM, which contends that emotion may be counterproductive to rational processes of decision-making. Future research could try to build on these findings by evaluating other emotions that possibly be associated to EDM (disgust, greed, empathy), as well as exploring the EDM of persons people who are possibly less prone to developing affective reactions.

Additional studies on techniques for emotion control and the expression of distinct emotions in response to a variety of challenging circumstances should help managers evaluate which techniques to employ and under what conditions. To build on these results, future studies could examine the ethical judgments of people who are less likely to experience affect on a regular basis, as well as investigate other emotions that may be associated to decision-making ethics, such as contempt and empathy. Due to the limits of the research that has been done so far, it is important that more research be done to find out what causes feelings, moral reasoning, and levels of moral conviction.

5. Conclusion

In conclusion, the findings of the current study offer evidence of the influence that particular emotions have on the process of making ethical decisions. The Greek philosopher Plato believed that while emotions are a fundamental part of our minds, they are not particularly helpful. He suggested that we visualize our thoughts as a chariot drawn by two horses, one of which is noble and submissive (moral feelings) and the other is wild and unruly (primal emotions), with the charioteer representing human reason and the two horses representing various emotional states. Aristotle believed that one's emotions reveal one's personality and that virtuous person will feel and experience their emotions at the appropriate times. Scottish philosopher David Hume claimed that logic is subservient to emotion and that feelings should always come first. Since our emotions (the chariot) are being pushed along without any control over a charioteer (the mind), our reasoning is driven by them. Consequently, the power is in the hands of the horses, or our emotions. The current study's findings have important significance for understanding how different emotions and their control have an influence on the ethical decision-making process in organisations. In accordance with the various findings of this study, cognitive reappraisal results in a detrimental impact on ethically challenging decision-making situations. (Johnson and Connelly 2016) To be more specific, the findings show that reassessing one's feelings may not always be beneficial when it comes to making decisions during complex situations and explore research areas for further investigation into this topic.

Research on EDM has primarily focused on Rest's (1986) framework, which is a rational and conscious model of ethical decision-making. Nevertheless, the literature on EDM has contributed relatively less studies in human cognition that suggests a dual-processing framework based on both rational and affective components. After reviewing the research on dual processing, it appears that affect could be a significant component in decision-making within the situational or the contextual frame of the situation. This is because making ethical decisions is a serious and complex undertaking. Sigmund Freud and other psychoanalysts urged us to understand our drives as being motivated by unconscious desires and inclinations. Recent neuroscience research has demonstrated the impact of unconscious bias on our beliefs, reasoning, and judgements. This raises the question of whether the notion that reason and passion are opposing forces is correct. Another school of thought contends that our emotions are a component of our reasoning. They represent our opinions on how the world is and how we would like it to be. Are we the helpless captives of our emotions? Is it something we decide on? Our response will help us assess how we feel about moral judgements, ethical decisions and how responsible we are at our workplace. Early models of emotions have viewed affect and emotions as a component of the analytical cognition process based on arousal and valence (Russell's affect model, 1980; Pfister and Bohm, 2008). However, much of the recent research has focused on underlying discrete emotions (anger, fear, sadness) and how cognitive tasks (decision-making) are influenced by various kinds of emotions (such as integral, incidental, specific and others) to choose a particular course of action (Hastie 2001; Lerner et al. 2015). For this reason, we need to understand the current body of literature and the underlying links between emotions and EDM for further knowledge development.

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Impact Investing in Social Sector Organizations: A Bibliometric Analysis

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Abstract

Impact investment is a relatively new area which has gained significance in the era because of focus on Triple Bottom Line reporting. The Governments today are not merely asking for reporting in areas of environment, social and governance but also looking into the impact that such investments are generating. This paper is an attempt to review the literature in the domain of Impact Investing.

The paper has used Biblioshiny to find answers to research questions viz the prolific authors, the significant countries, the most cited works in this domain. 1590 documents have been retrieved from Web of Science to have a bibliometric analysis of the data. There is an annual growth rate of 35.86% in the publications as observed in the area of Impact investing since 2006. USA is the leading country in terms of publications from authors in this domain. The emerging lines of research and motor themes were also found from the bibliometric analysis.

Keywords: Impact investment, Social sector, Bibliometric review, science mapping

Introduction

The concept of social enterprise has attracted the attention of policy-makers and practitioners around the world (Wilson and Post 2013) and many research scholars have reflected their insights through an increasing number of publications in the area, many considering social enterprises as a as a distinct category of organizations (Cukier et al. 2011; Lepoutre et al. 2013; Lumpkin et al. 2013). To couple with this, concern for sustainable development has permeated development goals of most nations and keeping in mind the Sustainable Development Goals 2030 agenda, there have been various initiatives and reforms by the Governments worldwide. The classical goal of profit maximization, after repeated criticism, has fallen short in the theory of firm in the current economic scenario. Investors derive nonpecuniary utility from investing in dual objective of profits with social impact, thus sacrificing returns (Barber et.al. 2021). In today's era of depleting natural resources, climate change challenges, socio-economic inequalities, food insecurities and other holistic development challenges faced by nations, the corporations are shifting to incorporate SDGs in their objectives. A very prominent vehicle for growth in the social development is the *social sector organizations*. These may be primarily seen as organisations that primarily aim to achieve some social objective. As per SEBI memorandum on Social Stock Exchange a social enterprise includes "An enterprise working in 15 broad eligible activities based on Schedule VII of the Companies Act,2013, Sustainable Development Goals

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and priority areas identified by Niti Aayog." It further states that a social sector organization may or may not be for profit generation and "shall target underserved or less privileged population segments or regions recording lower performance in the development priorities of national/state governments." To fulfill this agenda, corporations need to invest judiciously while requiring funds for their projects and this is where the research about Impact Investing draws its relevance. Impact investing implies investments made into organizations, any funds and projects with the purpose of having some social impact (Nicholls, 2010). The term Impact investment was used for the first time in the ground-breaking book on its transformative power referring to it as a positive disrupting force in the business scenario (Bugg-Levine & Emerson, 2011). Impact investment is an emerging approach to financing social enterprises that aims to achieve blended value by delivering both impact and financial returns (Castellas, 2018). Impact investing is a relatively new concept in the annals of research, and this paper tries to find out insights into the same by studying Impact investing through the lens of a Bibliometric analysis.

Objectives

With a growing importance to social sector given through the adoption of SDG goals throughout the world and recent setting up of social stock exchange in India in 2022 by the Government of India, Impact Investing will be the future cornerstone for success of the nascent social stock exchange and growing investment in the social sector. More and more investors will be interested to know the impact their investment is making towards achievement of SDG goals. Being a developing area in research, impact investing requires a review paper to uncover the work published in the realm so far, at the same time give insights to researchers about scope of future work in the area. To accomplish these objectives, the following research questions were framed for bibliometric review:

Research question 1: What is the bibliometric profile of the database, the growth trends, emerging themes in this domain and the geographical distribution of this domain of knowledge?

Research question 2: Who are the most influential authors, journals, articles of this area of research?

Research question 3: Which geographic regions countries dominate publication in this area?

Research Question 4: What is the co-citation network between authors?

Research Question 5: What is the thematic development of research in the area of Impact investment?

Research methodology

A bibliometric analysis was carried out for the research domain focusing impact investing in social sector organizations.

Data Extraction: The data from Web of Science database was used for Bibliometric analysis. Plain text file was downloaded from the Web of Science database for analysis. The extracted file has details viz. author's name, affiliation, article title, keywords, abstracts, and citation data. This file was used with Bibliometrix (R Studio).

Data Search: 2444 results came from Web of Science and they were limited to categories in Web of Science. TITLE-ABS-KEY ("Impact investment in Social Sector organizations") AND (LIMIT-TO (SUBJAREA, «BUS FIN») OR LIMIT-TO (SUBJAREA, «MGMT») OR LIMIT-TO (SUBJAREA, «BUSI») OR LIMIT-TO (SUBJAREA , «ECON»)

Post this refine, 1590 results were used for analysis. These subject areas were selected to focus the data collection to the most relevant journal articles. The analysis using Biblioshiny was conducted on 18th Sep 2021. The Biblioshiny software was used to explore the motor theme or an emerging area with future scope. Further, the collaboration network between countries was also studied. So, it helps to gain knowledge on the broad work done in the area, prolific authors doing work in the area and the growth of work. The underlying review applied bibliometric analysis, to explore the knowledge base of role of impact investment in achieving sustainable development goals.

Data Collection

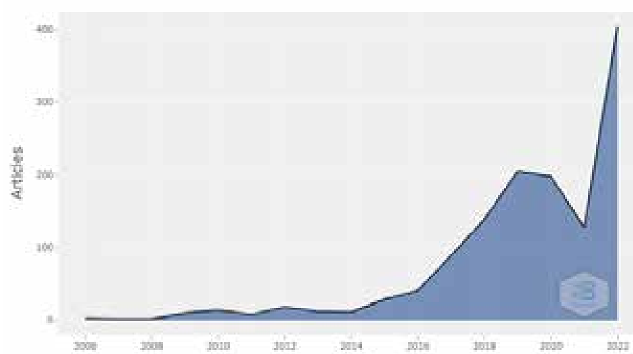
Based on the above search criterion, the bibliometric profile of the domain was drawn and summarized in Table 1, throwing light on time span of development of research , sources tapped, document types, number of authors and collaborative efforts in the domain.

Table 1: Bibliographic synopsis

TIMESPAN	*2006:2022*
Sources (Journals, Books, etc)	233
Documents	1590
Average years from publication	2.63
Average citations per documents	28.56
Average citations per year per doc	6.15
References	62761
DOCUMENT TYPES	
Article	1164
article; book chapter	2
article; early access	243
article; proceedings paper	8
book review	1
editorial material	20
editorial material; early access	2
Review	118
review; early access	32
DOCUMENT CONTENTS	
Keywords Plus (ID)	2295
Author's Keywords (DE)	2873
AUTHORS	
Authors	2593
Author Appearances	4657
Authors of single-authored documents	108
Authors of multi-authored documents	2485
AUTHORS COLLABORATION	
Single-authored documents	162
Documents per Author	0.613
Authors per Document	1.63
Co-Authors per Documents	2.93
Collaboration Index	1.74

Table 1 reveals the nascent nature of research in the field of impact investment as the time span takes all publications up to 2022 published in the stated domain yet the initial year of publication on impact investing literature was on social entrepreneurship (Mair & Marti, 2006). The total span of development of literature in arena is roughly last 16 years only. The maximum academic contribution in the domain comes from research articles category followed by review document types. Though 2593 authors have worked on the area directly or indirectly, there were 162 single-authored documents in the entire set written by 108 authors. The average citations are steadily growing with 6.25 as average per year per document. To decipher the growth of literature in a birds eye view , a graphical presentation of annual publications follows in figure 1.

Figure 1: Annual Scientific Production

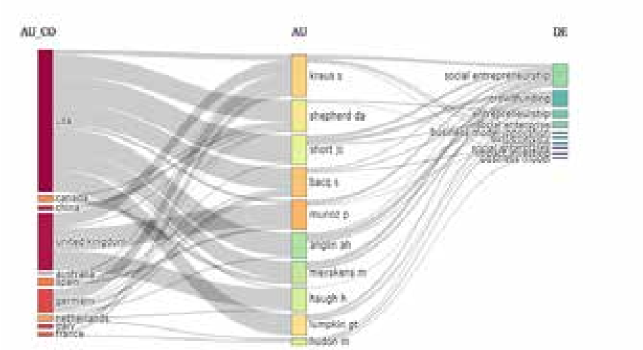


Source: Author's own work and compilation using software

The above Figure 1 clearly shows that following an initial lean period of almost a decade, the research work is increasing in the field since 2015, the year, that saw the world adopt the sustainable development goals 2030 agenda (Colglazier, (2015) and growing furthermore in years following 2017.There is an annual growth rate of 35.86% in the publication in this domain. This upward graph as presented in the figure is showing encouraging concern of researchers and academicians towards this research area. The last one year has shown a spike in research publications in the area which may be contributed to the aftermath of COVID-19 pandemic, setting of ESG taskforce by the SEC in 2021 and increasing practitioner interest in the field of impact investment (Adams & Abhayawansa, 2022, Agrawal & Hockerts, 2021).

Three field plots have been prepared based on Sankey diagrams which show a particular flow depending on the variable chosen (Riehmann, 2005). The thickness of each edge also has a meaning showing that thickness is in proportion to the flow quantity that passes through that edge. The plot as in Figure 2 takes countries, keywords and authors into account as three parameters. For a clearer version, Three Field Plot was developed taking 10 items in each parameter viz countries, keywords and authors for the above Plot.

Figure 2: Three Field Plot using Authors, Keyword and Countries as Parameters



Source: Author's own work and compilation using software

The above Field plot is showing a confluence of counties publishing maximum research work related to the prominent authors in middle and most used keywords in the right. The Plot shows that U.S.A is working in a huge manner in topics like social entrepreneurship, Impact investing, business model innovation etc. followed by the U.K. and Germany. However, again, specific research on impact investing is quite limited and is dominated by allied areas. Kraus, Shephard, Short, Bacq, Lumpkin and Munoz are prominent authors from these top 10 countries researching on this area. None of the developing countries including India gained space in the above figure, showing that publications related to Impact investing is yet to gain momentum on global scale especially in developing economies of Asia, Africa and Latin America. It is also visible that impact investment itself has not retained the place of a dominant keyword in research, the research work has been more on social entrepreneurship than directly on impact investment.

The authors further collated the data on the journals that are contributing the most in the publication of research work in the area. The results are shown in Table 2 below.

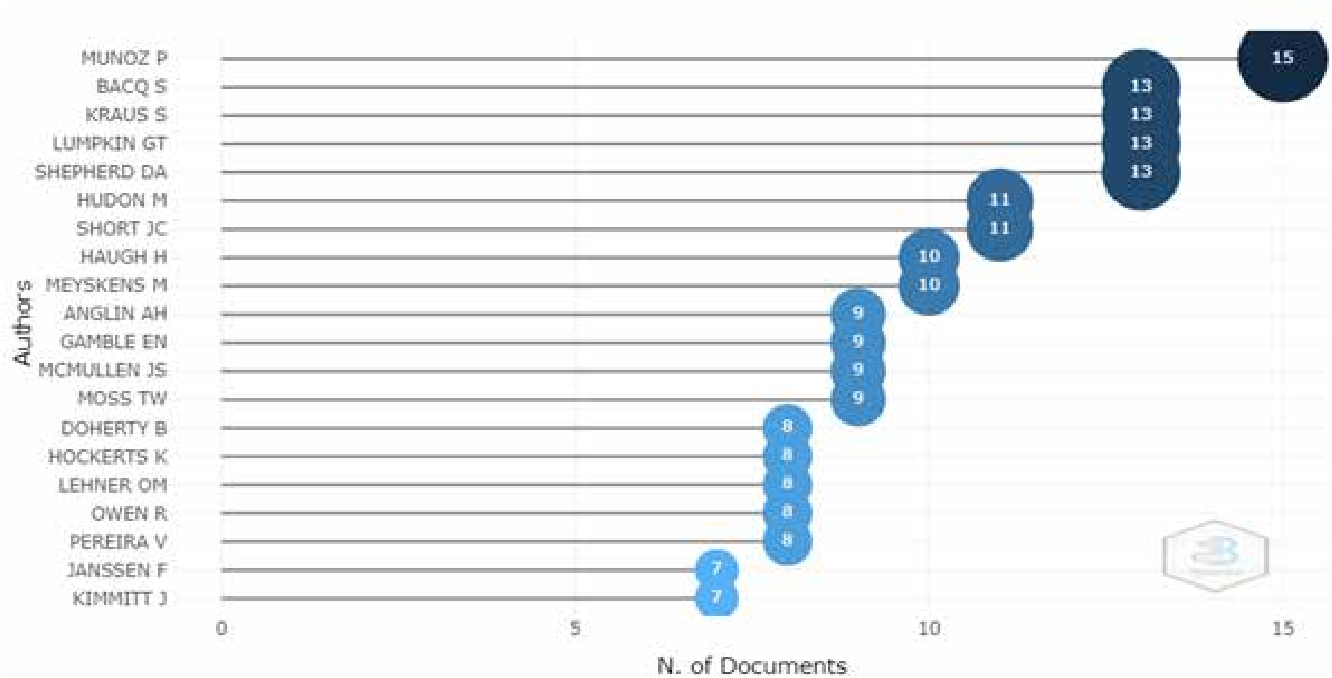
Table 2: Most Relevant Sources

Name of Journal	*Number of Publications*
Journal of Business Research	95
Journal of Business Ethics	88
Technological Forecasting and Social Change	74
Journal of Business Venturing	69
Entrepreneurship Theory and Practice	47
International Journal of Entrepreneurial Behavior & Research	42
Business Strategy and The Environment	36
Entrepreneurship and Regional Development	34
Accounting and Finance	32
Small Business Economics	30
Entrepreneurship Research Journal	27
Management Decision	26
Journal of Small Business Management	25
Annals of Public and Cooperative Economics	24
Industrial Marketing Management	21
International Journal of Management Reviews	21
Business & Society	20
IEEE Transactions on Engineering Management	19
International Entrepreneurship and Management Journal	19
International Small Business Journal-Researching Entrepreneurship	19

Source: Author's own work and compilation using software

The above table shows that Journal of Business Reaearch (Elseiver) is publishing maximum work in this area with 95 number of documents being published by the journal so far. Journal of Business Ethics is ranked second having published 88 documents so far in this domain. Many Journals like Technological Forecasting and Social Change, Journal of Business Venturing, Accounting and Finance are also publishing various articles in the area of impact investing. After identifying the journals the most influential authors in th arena were identified with the number of publications as summarised in Figure3 below.

Figure 3. Most relevant Authors



Source: Author's own work and compilation using software

From the above chart it is evident that Munoz P has the highest number of publications being 15 followed closely by BacqS, Kraus S and Shephed Da having 13 publications so far each. However, not many authors have surfaced as being very influential in the area again indicating that it's a growing area with still a lot of scope for work. The most cited documents on a global scale are collated in the following Table3. However, again the most cited work is not direct work on impact investment but on social entrepreneurship (Mair & Marti, 2006).

Table 3. Most Globally Cited Documents

Paper	DOI	Total Citations
MAIR J, 2006, J WORLD BUS	10.1016/j.jwb.2005.09.002	1619
MAIR J, 2006, J WORLD BUS-a	10.1016/j.jwb.2005.09.002	1619
ZAHRA SA, 2009, J BUS VENTURING	10.1016/j.jbusvent.2008.04.007	1137
BATTILANA J, 2014, ACAD MANAG ANN	10.1080/19416520.2014.893615	793
DACIN PA, 2010, ACAD MANAGE PERSPECT	10.5465/AMP.2010.52842950	751
DOHERTY B, 2014, INT J MANAG REV	10.1111/ijmr.12028	690
DOHERTY B, 2014, INT J MANAG REV-a	10.1111/ijmr.12028	690

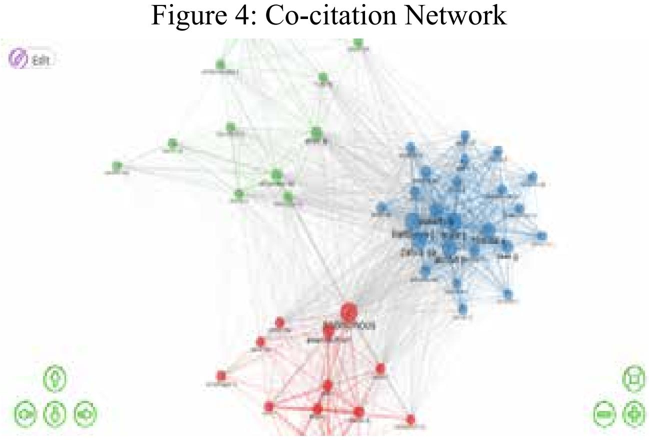
SHORT JC, 2009, STRATEG ENTREP J	10.1002/sej.69	645
SHORT JC, 2009, STRATEG ENTREP J-a	10.1002/sej.69	645
COHEN B, 2007, J BUS VENTURING	10.1016/j.jbusvent.2004.12.001	634
SANTOS FM, 2012, J BUS ETHICS	10.1007/s10551-012-1413-4	589
SANTOS FM, 2012, J BUS ETHICS-a	10.1007/s10551-012-1413-4	589
HOCKERTS K, 2010, J BUS VENTURING	10.1016/j.jbusvent.2009.07.005	555
ADAMS R, 2016, INT J MANAG REV	10.1111/ijmr.12068	478
MILLER TL, 2012, ACAD MANAGE REV	10.5465/amr.2010.0456	475
NICHOLLS A, 2010, ENTREP THEORY PRACT	10.1111/j.1540-6520.2010.00397.x	467
NICHOLLS A, 2010, ENTREP THEORY PRACT-a	10.1111/j.1540-6520.2010.00397.x	467
EBRAHIM A, 2014, RES ORGAN BEHAV	10.1016/j.riob.2014.09.001	463
FULMER CA, 2012, J MANAGE	10.1177/0149206312439327	434
BACQ S, 2011, ENTREP REGION DEV	10.1080/08985626.2011.577242	391

Source: Author's own work and compilation using software

Further, the co-citation analysis is used to determine the relationship between articles by finding out which articles are cited by other research together. The co-citation relies on the approach to find a network in which different articles are prominently cited in the similar research domain. The diagram below in figure 4 shows three broad distinct clusters. The first cluster has likes of authors Porter, Foss, Teece Di. The second cluster has authors Battilana, Zahra, Mair, Nichollas Doherty Bacq S which are prominent authors working in the area of social entrepreneurship and often cited together. The third cluster shows Shephard, Baron, Mollick, Davidson, etc who are being cited together because of the similarity of work. All these are often cited together by other authors working on social entrepreneurship and impact investing area.

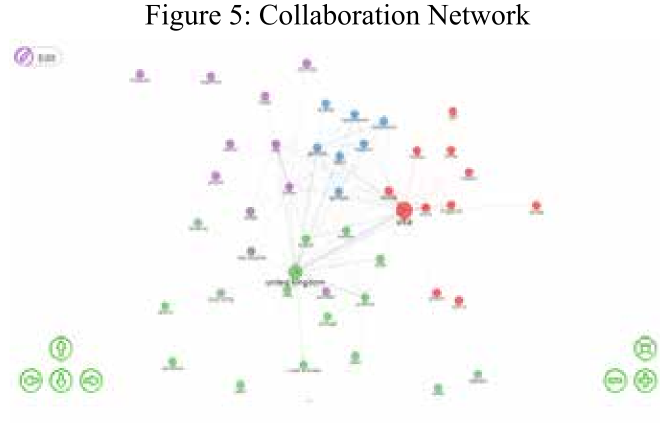
In order to throw light on the nature of author collaboration in this field of research, Figure 5 shows collaboration network by countries. Four collaborations can be seen in the network diagram. Prominent countries collaboration as seen from the Figure 5 are; firstly in Red cluster that shows collaborations of majorly developed countries viz USA, China, Canada, Singapore, Korea, Greece being together in one cluster. The second cluster has collaboration between European countries like Germany, Spain, Netherland, Switzerland, Denmark, Austria etc. Another cluster in Green has work from Asia, Oceania and one country from Africa viz India, Australia, Japan, Vietnam. UAE, Ghana, Indonesia etc. The last cluster has global collaborations viz France, Italy, Brazil, New Zealand, Argentina, Malaysia in Purple cluster.

Figure 4: Co-citation Network



Source: Author's own work and compilation using software

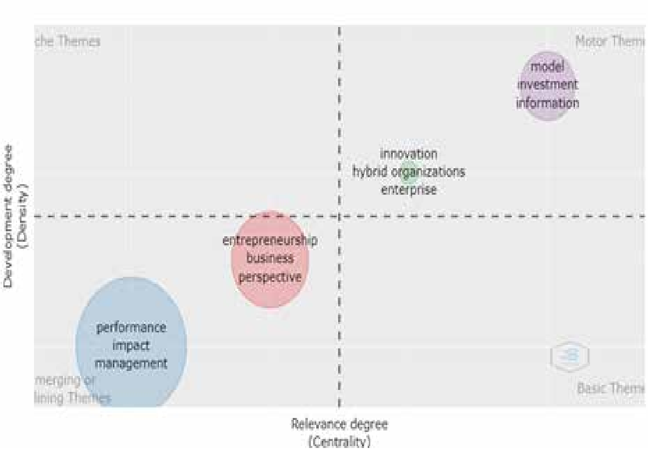
Figure 5: Collaboration Network



Source: Author's own work and compilation using software

The authors further generated the thematic map in Figure 6 to depict the thematic development of the area of research. A thematic map represents the centrality on the X axis and density on the Y axis of the keywords cluster (Griivel et.al.1995). Centrality symbolizes the degree of interaction while density is about the "internal strength" of a cluster as shown in figure.

Figure 6: Thematic Map



Source: Author's own work and compilation using software

The above Figure 6 clearly shows that this is an emerging line of research. We can find that the themes like performance impact management are found in Emerging Lines Quadrant, even in the Motor themes quadrant, we can find themes like innovation, hybrid organizations which are looking into the area of impact investing. The lower left quadrant displays the emerging themes which means the topic "impact investing" is weakly developed with both low Centrality as well as density. The work done so far is mainly in concept building and in any field of study, for further development, it is imperative to move beyond conceptual conversation and move towards applied science (Agrawal & Hockerts 2021, Kuhn, 2012),

The word cloud depicted in Figure 7 shows the words being used in this domain of research and how this field has grown. The most significant words used are the ones with the largest fonts being use viz. innovation, impact, management , perspective are the most used ones in the domain of Impact investing.

Figure 7: Word Cloud

Source: Author's own work and compilation using software

Conclusion

The domain of impact investment is still in the development stage of published research work and has foundational ties with social entrepreneurship. In initial development stage, prominent work has been done in social entrepreneurship (Mair & Marti 2006, Peredo & McLean 2006, Short et.al. 2009). Since then, it has seen significant changes and authors thereafter initiated work on hybrid organizations (Pache and Santos 2012, Doherty et.al. 2014) in more recent years and undertook research on social finance (Nicholls 2015, Biancone & Radwan 2018, Kuchler & Stroebel 2021) and social innovation (Phills et.al. 2008, Moore et.al.2012, Dionisio & Vargas 2020) as with time common consensus on social benefit over profitability gained momentum (Grinols & Mustard 2001, Sentana 2017). Sooner global development of the United Nations laying down Sustainable Development goals laid the foundation of acquiescence on areas of social development across nations. Journal of Business Research, Journal of Business Ethics, Journal of Business Venturing and Entrepreneurship theory and Practice are the main Sources in this domain of research. USA is leading in the publication of impact investing and social entrepreneurship research. Battilana, Zahra, Mair, Nichollas, Doherty, Bacq S are prominent authors working on social entrepreneurship and are often cited together. The work particular to impact investment is steadily increasing and authors are studying both demand and supply sides of the same in recent years. An annual growth rate of 35.86% is seen in this research domain, particularly more in the realm of impact investment in recent years which came out to be predominantly an emerging field of research. There is ample scope for research on the theme in developing and under-developed countries as most prominent work is concentrated in developed world. Similarly author collaborations are also showing a pattern of collaborations in and among US, Europe and Oceania and further scope for greater global collaborations is suggested.

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Microfinance for Microenterprise Fosters Socio-economic Development: A Study with Special Reference to Delhi

By Dr. Yasha Bothra[1] and Prof Ritu Sapra[2]

ABSTRACT

Microfinance is regarded as a tool for reducing poverty since the time it became popular in Bangladesh in 1970s. Millions of low-income borrowers who were previously beyond the reach of formal financial institutions now have access to loans due to the microfinance sector. The provision of financial services, in particular lending for microenterprises (income generating activities), will lead to the upliftment of the underprivileged .The microfinance sector is largely focused on providing loans to the underprivileged without the need for any type of collateral security. The majority of microfinance companies in India employ the self-help group (SHG) or joint liability group (JLG) models of group lending to issue loans since peer pressure acts as social collateral in these models. Offering microloans to microenterprises has been acknowledged as a crucial strategy for socioeconomic development in terms of improving the lives for microfinance beneficiaries and their households. The review of literature helps to identify gaps in research that may be succinctly stated. First, the examined literature reveals that there are several research on microfinance and its effects on socioeconomic development from various parts of the globe based on diverse theories, but there aren't many studies examining these effects in connection to metropolitan areas. Studies on the impact of microfinance in the Delhi region are particularly scarce. Second, while the majority of researchers have examined the effects of microfinance generally, few have sought to determine whether there are differences based on the beneficiary's group type such as whether they are SHG microfinance beneficiaries or JLG beneficiaries. The present study attempted to fill the above-mentioned gaps by examining the impact of microfinance on socio-economic development (microfinance beneficiary and their household) with special reference to Delhi.

The study is a cross sectional study based on primary survey. A total of 391 responses were analysed and subjected to empirical testing. Validity and reliability were ensured. Hypotheses testing was conducted using multiple linear regression. In pursuance of the research objectives and using the results of multiple linear regression, the study has been able to see the impact of microfinance by specifically analysing the impact of accessibility to microfinance loan, microfinance loan experience and microfinance group type on socio-economic development. Accessibility to microloans has been proven to significantly improve overall socio-economic development. Additionally, microfinance beneficiaries who have taken out more than one loan have greater overall socioeconomic development than beneficiaries who have taken out only one loan. As a result, the study found that joining a microfinance group and borrowing

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money for a microenterprise has a beneficial effect on socioeconomic development. Through the empirical testing of a conceptual framework for the influence of microfinance on socioeconomic development and its dimension, the study has theoretically contributed to the literature on microfinance. Based on primary data obtained from microfinance borrowers in Delhi the study increases understanding of microfinance and demonstrates that there is a significant and beneficial impact of microfinance on socio-economic effects at the household and individual level.

INTRODUCTION

Microfinance is viewed as a credit approach that frees microentrepreneurs from financial restrictions and utilises a reliable alternative to collateral (Hubka & Zaidi, 2005). Since microfinance first gained popularity in Bangladesh in the 1970s as a result of Dr. Muhammad Yunus's work, it has been intended to be a long-term tool for decreasing poverty. Many people at the bottom of the pyramid struggle to find suitable jobs that pay enough to cover their requirements and are unable to establish their own businesses because they lack the resources to do so.It was once difficult for those with low incomes and those living in developing nations like India to obtain loans from the conventional financial system. Lack of access to formal financial services has contributed to these people's capacity to start an enterprise (or other income-generating endeavour) that will assist them and their families satisfy their requirements.(Helms, 2006). The poor were excluded from these services for a number of reasons, including information asymmetry about them, a lack of knowledge about their credit histories, and a lack of collateral to use as security for loans (Pathak and Varshney 2017). Robinson has given a comprehensive definition of Microfinance. According to that "Microfinance refers to small-scale financial services— primarily credit and savings— provided to people who farm or fish or herd; who operate small enterprises or microenterprises where goods are produced, recycled, repaired, or sold; who provide services; who work for wages or commissions; who gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools; and to other individuals and at the local levels of developing countries, both rural and urban. Access to microfinance services is very helpful for low-income people. This enables them to reduce risk, increase their productivity, to get more return on investments, increased incomes and improved the quality of life of the household. (Robinson M. S., 2001)

In Indian context microfinance programs are usually operated through groups like SHG (Self help group) and JLG(joint liability group)as in this methodology peer pressure serves as social collateral. Numerous research have been done on the socioeconomic effects of microfinance. As stated by Hulme (1997) "behind all microfinance programs is the assumption that intervention will change human behaviours and practices in ways that lead to the achievement (or raise the probability of achievement) of desired outcomes". The microfinance services have an impact on the recipients of microloans in terms of numerous economic, social, and psychological parameters like income, investments, expenses, growth of jobs and employability, awareness and reduction of migration (Khandker, 1998)(Panda & Atibudhi, 2010) (Panda D., 2016)(Pitt, Khandker, Choudhury, & Millimet, 2003).

A thorough analysis of the pertinent literature identifies gaps in research that may be succinctly stated. First, the examined literature reveals that there are several research on microfinance and its effects on socioeconomic development from various parts of the globe based on diverse theories, but there aren't many studies examining these effects in connection to metropolitan areas. Studies on the effects of microfinance in the Delhi region are particularly scarce. Second, while the majority of researchers have examined the effects of microfinance generally, few have sought to determine whether there are differences based on the beneficiary's group type, such as whether they are SHG microfinance beneficiaries or JLG beneficiaries.

The study makes an effort to bridge the aforementioned gaps. The study has attempted to analyse if Microfinance (accessibility to microfinance loans, microfinance loan experience and microfinance group type) impact the socio-economic development in Delhi in terms of improvement in living standard and personal empowerment of microfinance beneficiary.

LITERATURE REVIEW

Theoretical Underpinnings

The benefit of getting credit for enterprise has been explained with the help of Theory of Change (Loiseau & Walsh, 2015). This theory emphasises the need for microfinance institutions to develop products that make it easier for entrepreneurs with limited access to credit to use them. As a result, with the help of money obtained from a microfinance loan, an investment can be made in an existing business or to start a new one. In other words, small businesses will see an increase in sales and earnings as a result of this microfinance loan investment. Now that household income will grow as a result of this, household expenditure on a variety of items, including food, healthcare, education, and housing, will also increase. Additionally, because women are the primary audience for these services, these clients will become empowered as a consequence. It will raise one's status in society, give them more authority to make decisions, and boost their involvement in local affairs.

Microfinance and its Socio-Economic Impact

The benefit of getting credit for enterprise has been explained with the help of Theory of Change (Loiseau & Walsh, 2015). This theory emphasises the need for microfinance institutions to develop products that make it easier for entrepreneurs with limited access to credit to use them. As a result, with the help of money obtained from a microfinance loan, an investment can be made in an existing business or to start a new one. In other words, small businesses will see an increase in sales and earnings as a result of this microfinance loan investment. Now that household income will grow as a result of this, household expenditure on a variety of items, including food, healthcare, education, and housing, will also increase. Additionally, because women are the primary audience for these services, these clients will become empowered as a consequence. It will raise one's status in society, give them more authority to make decisions, and boost their involvement in local affairs.

Microfinance and its Socio-Economic Impact

Different organisations and governments from varied nations have different definitions of microfinance. However, microfinance is typically defined as the delivery of a wide array of services (both financial and non-financial) to the underprivileged and low-income clients, but primarily as financial capital for their extremely small firms, or microenterprises. (Banerjee and Jackson 2017) (Copestake 2007) (Sharma and Zeller 1997). "Microfinance" is defined as "the provision of thrift, credit and other financial services and products of very small amounts to the poor in rural, semi-urban and urban areas for enabling them to raise their income level and improve living standard" as per the definition given by the task force on microfinance established by RBI.

To help the impoverished in their respective target regions, these microfinance loans are given through either individual or group lending procedures.(Kovseos and Randhawa 2004).According to the report of Malegam Committee (2011)," Microfinance is an economic development tool whose objective is to assist the poor to work with their way out of poverty. It covers a range of services which include, in addition to the provision of credit, many other services such as savings, insurance, money transfers, counseling etc…."

In an economy, raising people's standards of life is the main goal of development efforts. (Baghel 2015). Microfinance is viewed as a development strategy in Asian, African, and South American nations to reduce poverty. Microfinance aids in the marked improvement of the impoverished. It enables them to begin money-generating activities. Microfinance, according to Otero (1999, p-8) is "the provision of financial services to low-income poor and very poor self-employed people"

The microfinance services have an impact on the beneficiaries of micro finance and their household in terms of numerous economic, social, and psychological parameters (like income, investments, expenses, growth of jobs and employability, awareness and reduction of migration)(Khandker, 1998) (Panda & Atibudhi, 2010) (Panda D., 2016) (Pitt, Khandker, Choudhury, & Millimet, 2003).The aim of microfinance programs is to alleviate the social and economic inequalities. There are evidences that microfinance intervention improves the living conditions of the people. In a study in Bangladesh(Ahmed et al. 2011)salso found that the families in which woman have taken loan also showed improvement in spending on sanitation and healthcare of family members. (Sarkar & Dharin, 2011) in their book on Microfinance have written that microfinance is a useful tool that helps in capacity building of the poor.

Thus, it was determined that microcredit is crucial for enhancing the socioeconomic standing and means of subsistence of disadvantaged households. Poor households will be helped through microfinance to escape the cycle of poverty. Having a variety of income sources enables households to reduce risk and prepare for shocks. (Sebstad & Monique, 2000).

In an empirical study, in the Kupwara area of Jammu and Kashmir. Socioeconomic development was taken into account as both financial and non-financial results. The influence on income, spending, saving, asset accumulation, housing, health, children's education, and women's empowerment have been the main points of attention. It was determined that microfinance had a substantial impact in the economic wellbeing of the disadvantaged. Additionally, it aids in their economic and social empowerment. According to certain Indian research on SHG, microfinance loans through SHG have a favourable effect on empowering women, enhancing children's education, and releasing male family members from social vices like intoxication. Ahmad and Choudhary (2021),(Dahiya, Pandey, & Karol, 2001).(Prathap, Mahesh, & Karthik, 2018)According to a research that included SHG/MFI participants participating in microfinance activities, microfinance significantly affected family living standards in both economic and social parameters. According to a study on the two group lending models, SHG and JLG, each has advantages based on the situation and external environment. (Sarma and Menta 2014)

Studies have put forward that microfinance brings improvements in the lives of all the members of household which has been benefitted by increased income from microfinance (Satpathy, 2017) (Verma, Aggarwal, &, 2014) (Mutai & Achieno, 2014). (Herath, Guneratne, & Sanderatne, 2015), (Copestake, Dawson, Fanning, McKay, & Revolledo, 2005)

Conceptual Framework & Hypothesis Development

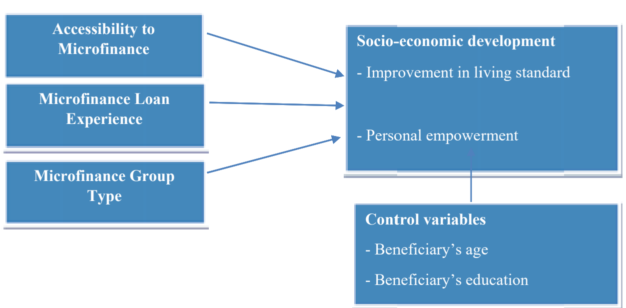
Until now, microfinance has mostly provided microcredit intended for very small businesses of poor and very low income families. Since they lack the means to sustain their microenterprises, impoverished and low-income households need microfinance.

According to a number of earlier research, microfinance has improved the socioeconomic situation of beneficiary households. Along with the microfinance recipient, all household members are impacted when a microloan is given for business.

Various researchers have defined socio-economic development differently and there appears to be no consensus on a single meaning of the word. According to Todaro (1988), Socio-economic development entails increase in income, business growth, consumer habits, education, health and infrastructure among other things. Smith and Rees view socio-economic development as improvement in living standards (Smith, 1998). In context of microfinance studies, it is generally viewed as improvement in wealth, health education and other factors.

So it is understood in terms of all aspects on which its influence was assessed or all aspects that seem to be in some way impacted by receiving microfinance and therefore result in better living conditions. The socioeconomic impacts of microfinance often involve a notable improvement in people's lives, better education for children, improved health, and empowered women because microfinance clients are typically women. The study has defined microfinance as the access to a microloan for a microenterprise by a microfinance beneficiary who is a member of a microfinance group (SHG/JLG) based on the literature review.

Thus, three independent variables (accessibility of microfinance, microfinance experience, type of microfinance group) are taken .The socio-economic development in the study has been taken in two dimensions. The first dimension is taken as improvement in living standard and the second dimension is personal empowerment of microfinance beneficiary. The framework also considers beneficiary's age and education as control variables. Following figureis the diagrammatic presentation of conceptual framework for the impact of microfinance on socioeconomic development (in context of microfinance beneficiary's households and microfinance beneficiary).



On this basis following null hypothesis were developed to be tested:

Primary Hypothesid

H[1]: There is significant impact of accessibility to microfinance loan on socioeconomic development.

H[2]: There is significant impact of microfinance loan experience on socio-economic development.

H[3]: There is significant impact of microfinance group type on socio-economic development.

Secondary Hypothesis

H[4]: There is significant impact of accessibility to microfinance loan on improvement in living standard of microfinance beneficiary's household.

H[5]: There is significant impact of microfinance loan experience on improvement in living standard of microfinance beneficiary's household.

H[6]: There is significant impact of microfinance group type on improvement in living standard of microfinance beneficiary's household.

H[7]: There is significant impact of accessibility to microfinance loan on personal empowerment of microfinance beneficiary.

H[8]: There is significant impact of microfinance loan experience on personal empowerment of microfinance beneficiary.

H[9]: There is significant impact of microfinance group type on personal empowerment of microfinance beneficiary.

METHODOLOGY

Sample and Data Collection

In this study a questionnaire was designed to address the mentioned hypothesis and empirically test the model. The study is a cross sectional study based on primary survey. For the present study, the universe consists of all the microfinance beneficiary who have taken the first microfinance loan for microenterprise between the year 2015-2018 by being a member of a group (SHG/JLG) in the NCT of Delhi.The areas were covered on the basis of the operation of the select MFIs/SHG in the area. The questionnaire was in Hindi language and it was check for validity. The data was collected from 410 respondents out of which only 391 were complete and used in the final study.

Sampling Technique

The study has followed multistage sampling technique. Microfinance beneficiaries who have taken first loan for microenterprise between the years 2015-2018 were approached through the select NBFC-MFIs and SHPIs. Information about MFIs in Delhi were taken from MFIN report and information about SHPI were taken from bank in Delhi having highest number of saving linked SHG to it. From the select MFIs and SHPIs information about microfinance beneficiaries were obtained.

Measures

The constructs used for this study were derived from past research studies, and minor adjustments were made to achieve this study's research objectives. The questions that were on five-point Likert type scale required respondents to express how much they agree or disagree with a particular statement. Here quantitative values are assigned to qualitative data for the purpose of analysis. The construct 'Accessibility to microfinance' has been measures using Five-point scale. It has six items under it which are taken after referring to various studies such as (Bernard, Kevin, and Khin 2016) (Mahmood and Mohd Rosli 2013)(Fayyaz, Abdul Hakim, and Khan 2016) (Suja 2012). Microfinance loan experience of beneficiary has been taken as the number of loans accessed by the beneficiary. The third dimension under microfinance is taken as the type of group. Since in India we have mainly two types of microfinance groups i.e., SHG or JLG.The dimension 'living standard' of household of microfinance beneficiary is composed of twelve items. These were identified by referring to (Dhaneshwar Singh and Ramananda Singh 2012) (Fayyaz et al. 2016) (Baghel 2015) (Hossain et al. 2016). And the dimension of personal empowerment of women is composed of nine items. These were identified by referring to (Herath et al. 2015), (Af rane 2002) (Hossain et al. 2016) (Murali 2012).

All the constructs confirmed the highreliability of the measurement scales adopted for this study. The questionnaire contained question on some variable that were intended to be used as control variables.

Factorial Structure for Socio-economic Development Variable

The Principal Component Analysis with Varimax Rotation method was used to evaluate the factorial structure for the socio-economic development construct. Testing for sphericity and adequate sampling were done. The KMO value is above 0.6 and Barlett's test has p value of 0.000 which indicates that it is highly significant. Thus, this shows that PCA is applicable.

KMO and Barlett's Test-Socio-economic Development

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.934
Bartlett's Test of Sphericity	Approx. Chi-Square	6973.401
	df	210
	Sig.	.000

Source: SPSS Output

The factor solution to be the best one must have at least three or more items that must load on a component (Pallant 2001). On this basis we got two components. These components were consistent with the proposed dimension of variable representing improvement in living standard and personal empowerment of microfinance beneficiary. The total variance that is explained by these two components is 62.067%.

Total Variance Explained-Socio-economic Development

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.162	53.150	53.150	11.162	53.150	53.150	8.074	38.449	38.449
2	1.872	8.916	62.067	1.872	8.916	62.067	4.960	23.618	62.067
Extraction Method: Principal Component Analysis.									

Source: SPSS Output

Dimensions of Socio-economic Development		
	Number of items	**Cronbach's alpha**
Living standard of beneficiary household	12	.949
Personal empowerment of beneficiary	9	.891

The study tested its hypotheses using multiple linear regression.

ANALYSIS & RESULTS

To analyse the cause-and-effect relationship between microfinance and socio-economic development regression analysis has been used. By bootstrapping the data, the assumptions of normality and heteroscedasticity in particular have been met. For the assumption of multicollinearity, the checking was done for Variance Inflation Factor (VIF) and Tolerance statistics (Hosseini et al. 2017) including birth weight, sex, age, waist circumference, family history of obesity, as well as some lifestyle factors as frequency of breakfast days and physical activity, on the body mass index among a nationally representative sample of Iranian children and adolescents by using bootstrapping regression. Materials and Methods: This study was conducted as the third survey of a school-based surveillance system (CASPIAN-III study. When the VIF score is less than 10 and the tolerance score is greater than 0.2, the assumption of no multicollinearity is satisfied.(Field, 2013). All the VIF values were below 10.

The three models (equations) were framed to test all the hypotheses related to the impact of microfinance on socio-economic development.

Age of Respondents

From the results shown in table 1.1 for age of respondents (microfinance beneficiary) it is clear that most of the respondents were under 40 years of age. Since to be a member of SHG or JLG one has to be of at least 18 years old therefore it can be observed from the table that there are 287(73.4%) respondents between the age of 18 to 40 years. Since the highest age of respondent in the data is 60 years therefore there are 26.6% of respondents who are in the age group of 41-60 years. This shows that comparatively young people are more likely to take up loan for microenterprises.

Table 1.1: Age of Microfinance Beneficiary

Age group (years)	Frequency	Percent
18-40	287	73.4
above 40 years	104	26.6
Total	391	100

Microfinance Beneficiary's Education

In terms of respondents' education levels, table 1.2 shows that 40.2% of respondents had more education than the primary level, compared to 59.8% of microfinance beneficiaries.

Table 1.2: Microfinance Beneficiary's Education level

	Frequency	Percent
Below Primary	234	59.8
Above Primary	157	40.2
Total	391	100.0

Model 1: Regression Analysis - Impact of Microfinance on Improvement in Living Standard

The model analyses the impact of independent variables accessibility to microfinance loan, microfinance loan experience and microfinance Group type on improvement in living standard of microfinance beneficiary household, controlled for microfinance beneficiary's age and education.

The following equation has been framed

SE_LS = α + β1 (MF_Acc) + β2 (MF_loanexp) + β3 (MF_grjlg) + β4 (resage_40& below) + β5 (resedu_aboveprimary) +εi

Where,

SE_LS represents the dependent variable, Improvement in Living standard

MF_ Acc represents the independent variable, accessibility to microfinance loan

Mf_loanexp represents the independent variable, microfinance loan experience

MF_grjlg represents the independent variable, microfinance group type

resedu_aboveprimary and resage_40& below represents beneficiary's education and beneficiary's age respectively.

Table 2.1 : Model Summary (Dependent Variable SE_LS)

Model Summary					
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Durbin-Watson**
5	.490[a]	.240	.230	.65414	1.892

Source: SPSS Output

Table 2.2 : ANOVA (Dependent Variable SE_LS)

ANOVA						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
5	Regression	52.083	5	10.417	24.344	.000[b]
	Residual	164.739	385	.428		
	Total	216.822	390			

Source: SPSS Output

Table 2.3 : Regression Result (Dependent Variable SE_LS)

	Unstandardized Coefficients		**Standardized Coefficients**	**t**	**Bootstrap Sig. (2-tailed)**
	B	**Std. Error**	**Beta**		
(Constant)	.823	.325		2.534	.013
Mf_acc	.670	.070	.440	9.539	**.001**
MF_loanexp	.257	.068	.172	3.772	**.001**
Mf_grjlg	.032	.071	.021	.456	.650
resage_40& below	.017	.077	.010	.222	.821
resedu_aboveprimary	.057	.070	.038	.821	.419

Source: SPSS Output ($p<0.05$)

The result in the above tables explains the impact of microfinance on improvement in living standard of beneficiary's household .According to the result of multiple regression the R^2 = .240, Adjusted R^2 = .230, F (5,385) = 24.344 , p = <.01. The model represents 24% of the explained variance in the improvement living standard of household. The result in the above tables explains the impact of microfinance on improvement in living standard of beneficiary's household

.According to the result of multiple regression the R2 = .240, Adjusted R2 = .230, F (5,385) = 24.344 , p = <.01. The model represents 24% of the explained variance in the improvement living standard of household. The F ratio is found to be statistically significant at 1 percent level of significance. Table 2.3 above depicts that the variables accessibility to microfinance loan and microfinance loan experience significantly impact the improvement in living standard of the household of microfinance beneficiary. Both are significant at 1% level of significance. On the basis of the beta values, it can be said that positive relationship exists between the accessibility of microfinance and improvement in living standard. Also, positive relationship exists between the microfinance loan experience and improvement in living standard. In the literature also there has been various studies that signifies a positive relationship between microfinance and the living standard(Idowu and Salami (2011); Mahmood et al. (2016); Mohammad (2007); Chaudhury (2016); Baghel(2015). However according to the results there is no significant impact of microfinance group type on living standard of household. This implies that it does not matter whether a beneficiary is from JLG or SHG in context of improvement in living standard of household.

Model 2: Regression Analysis: Impact of Microfinance on Personal Empowerment of Women

The model analyses the impact of independent variables accessibility to microfinance loan, microfinance loan experience and microfinance Group type on personal empowerment of microfinance beneficiary, controlled for microfinance beneficiary's age and education.

The following equation has been framed on the basis of the above hypothesis

SE_PE = $\alpha + \beta 1$ (MF_Acc) + $\beta 2$ (MF_loanexp) + $\beta 3$ (MF_grjlg) + $\beta 4$ (resage_40& below) + $\beta 5$ (resedu_aboveprimary) +εi

Where,

SE_PE represents the dependent variable, Personal empowerment

MF_ Acc represents the independent variable, accessibility to microfinance loan

Mf_loanexp represents the independent variable, microfinance loan experience

MF_grjlg represents the independent variable, microfinance group type

resedu_aboveprimary and resage_40& below represents beneficiary's education and beneficiary's age respectively.

Table 3.1 : Model Summary (Dependent Variable SE_PE)

Model Summary					
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Durbin-Watson**
2	.452[a]	.204	.194	.54731	1.932

Source: SPSS Output

Table 3.2 : ANOVA Table (Dependent VariableSE_PS)

ANOVA						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
2	Regression	29.616	5	5.923	19.774	.000
	Residual	115.326	385	.300		
	Total	144.943	390			

Source: SPSS Output

Table 3.3 : Result of Regression Analysis (Dependent VariableSE_PS)

	Unstandardized Coefficients		Standardized Coefficients	t	Bootstrap Sig. (2-tailed)
	B	Std. Error	Beta		
(Constant)	1.568	.272		5.766	.001
Mf_acc	.509	.059	.409	8.650	**.001**
MF_loanexp	.179	.057	.146	3.141	**.002**
Mf_grjlg	.001	.059	.001	.025	.981
resage_40& below	.127	.065	.092	1.969	**.047**
resedu_aboveprimary	-.012	.058	-.009	-.201	.852

Source: SPSS Output (p<0.05)

The table above shows the multiple linear regression result for the impact of microfinance on personal empowerment of microfinance beneficiary(women). According to the result of multiple regression the R^2 = .204, Adjusted R^2 = .194, F (5,385) = 19.774 , p=<.01. The model represents 20.4% of the explained variance in the personal empowerment of beneficiary. The F ratio is found to be statistically significant at 1 percent level of significance. Table above depicts that there is significant relation between accessibility to microfinance, microfinance loan experience, beneficiary age and personal empowerment of microfinance beneficiary. Both are significant at 1% level of significance.

In the literature also there has been various studies that signifies a positive relationship between microfinance and personal empowerment of women. (Krishnan; S, Sivramkrishna and U (2017); Rajasekaran and Sindhu (2013);Afrane (2002)(Hossain, Islam, and Majumder (2016). As per the regression result microfinance group type does not have a significant impact on personal empowerment of beneficiary.

Additionally, it has been discovered that people over forty years of age are less likely than people under forty to feel personally empowered. This shows that younger women are becoming more powerful than generally older women. This might be the case because older people already have control over their lives or because they are unable to use microloans productively enough to feel personally empowered.

Model 3: Regression Analysis: Impact of Microfinance on Socio-economic Development

The model analyses the impact of independent variables – Accessibility to microfinance loan, Microfinance loan experience and Microfinance Group type on overall socio-economic development, controlled for microfinance beneficiary's age and education.

The following equation has been framed on the basis of the above hypothesis

SED_Overall = α + β1 (MF_Acc) + β2 (MF_loanexp) + β3 (MF_grjlg) + β4 (resage_40& below) + β5 (resedu_aboveprimary) +εi

Where,

SED_Overall represents the dependent variable, Socio-economic Development

MF_ Acc represents the independent variable, accessibility to microfinance loan

Mf_loanexp represents the independent variable, microfinance loan experience

MF_grjlg represents the independent variable, microfinance group type

resedu_aboveprimary and resage_40& below represents beneficiary's education and beneficiary's age respectively.

Table 4.1 : Model Summary (Dependent Variable SED_Overall)

Model Summary					
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Durbin-Watson**
3	.511[a]	.261	.252	.53969	1.949

Source: SPSS Output

Table 4.2 : ANOVA Table (Dependent Variable SED_Overall)

ANOVA						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	39.695	5	7.939	27.257	.000[b]
	Residual	112.138	385	.291		
	Total	151.833	390			

Source: SPSS Output

Table 4.3 : Result of Regression Analysis (Dependent Variable SED_Overall)

	Unstandardized Coefficients		**Standardized Coefficients**	**t**	**Bootstrap Sig. (2-tailed)**
	B	**Std. Error**	**Beta**		
(Constant)	1.268	.264		4.799	.001
Mf_acc	.589	.058	.463	10.167	**.001**
MF_loanexp	.218	.056	.174	3.878	**.001**
Mf_grjlg	.017	.058	.013	.289	.803
resage_40& below	-.072	.064	-.051	-1.133	.245
resedu_aboveprimary	.023	.058	.018	.396	.701

Source: SPSS Output ($p<0.05$)

The table above shows the multiple regression result for the impact of microfinance on personal empowerment of microfinance beneficiary(women). According to the result of multiple regression the $R^2 = .261$, Adjusted $R^2 = .252$, F (5,385) = 27.257, p = <.01. The model represents 26.1% of the explained variance in the personal empowerment of beneficiary. The F ratio is found to be statistically significant at 1 percent level of significance. Table 4.3 above depicts that there is significant impact of accessibility to microfinance and microfinance loan experience on overall socio-economic development. From the coefficient table of the results of the regression it is found that the independent variable accessibility to microfinance loan and microfinance loan experience are significant at one percent level of significance.

Their respective coefficient values of 0.463 and 0.174 demonstrate that microfinance loan experience and accessibility to microfinance have a beneficial impact on socioeconomic development in the context of microloan beneficiaries and their households. Accessibility to microfinance has the biggest impact on overall socioeconomic changes. As per the regression result microfinance group type does not have a significant impact on socio-economic development.

Table 6.5 : Summary of Hypotheses Testing on the basis of Multiple Linear Regression

H_o^1: There is significant impact of accessibility to microfinance loan on socio-economic development.	Fail to reject
H_o^2: There is significant impact of microfinance loan experience on socio-economic development.	Fail to reject
H_o^3: There is significant impact of microfinance group type on socio-economic development.	Reject
H_o^4: There is significant impact of accessibility to microfinance loan on improvement in living standard of microfinance beneficiary's household.	Fail to Reject
H_o^5: There is significant impact of microfinance loan experience on improvement in living standard of microfinance beneficiary's household.	Fail to Reject
H_o^6: There is significant impact of microfinance group type on improvement in living standard of microfinance beneficiary household.	Reject
H_o^7: There is significant impact of accessibility to microfinance loan on personal empowerment of microfinance beneficiary.	Fail to Reject
H_o^8: There is significant impact of microfinance loan experience on personal empowerment of microfinance beneficiary.	Fail to Reject
H_o^9: There is significant impact of microfinance group type on personal empowerment of microfinance beneficiary.	Reject

CONCLUSION

The multiple linear regression was used to see the impact of accessibility to microfinance loan, microfinance loan experience, group type on socio-economic development and its dimensions. Following are the major findings of the study in this regard:

- There is significant impact of accessibility to microfinance loan on socio-economic development.
- There is significant impact microfinance loan experience on socio-economic development.
- There is significant impact of accessibility to microfinance loan on living standard of microfinance beneficiary household.
- There is significant impact microfinance loan experience on living standard of microfinance beneficiary household.
- There is significant impact of accessibility to microfinance on personal empowerment of microfinance beneficiary.
- There is no significant impact microfinance loan experience on personal empowerment of microfinance beneficiary.

However, the improvement in living standards, beneficiaries personal empowerment, and consequent socioeconomic development were not significantly impacted by the type of microfinance group. The study concluded that a microfinance beneficiary›s membership in a JLG or a SHG has no bearing on their socioeconomic development (in context of microfinance beneficiaries and their household)

This suggests that having access to microfinance has a very beneficial overall effect on socioeconomic development. Additionally, microfinance recipients who have taken out multiple loans have greater socioeconomic overall development than recipients who have only taken out one loan. As a result, the study found that borrowing money through membership in a microfinance group had a favourable effect on socioeconomic development.

Group type did not, however, significantly affect overall socio-economic development (for microfinance beneficiary and their household). According to research, persons who are poor or have limited income and do not have collateral security may be able to get small loans for microenterprises, which could improve their standard of living and empower women (microfinance beneficiary)

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Self-Sufficiency through Development of Banking Market of Public Sector Banks in India

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Abstract

Banking is the backbone of economic development in India. The growth of banking is the most reliable source of self-sufficiency. The private banks and foreign banks enhances the dependency on promoters and foreign country respectively but public sector banks are the most dependable as far as self-sufficiency is concerned. Unlike the other two types, PSBs have dual objective of profitability and maintaining liquidity. Also, PSBs are the main source of priority sector lending in India. PSBs accept savings from household sector and channelise these deposits into loans and advances and provide it to industries (short-term, medium-term, and long-term loans), household sector (e.g. Housing loans) and also, invest in other industries and companies. It is clear that PSBs leads to economic development by promoting self-sufficiency through mobilising deposits into loans and advances.

In banking economics, the market structure is measured in terms of deposits plus advances. The structure of banking market refers to the study of nature of banking. Hence, market structure is defined in terms of nature of the market which could be competitive or monopolistic. A monopolistic market restricts the market size whereas a competitive market leads to the expansion of the market. Using the Structure-Conduct-Performance Approach, we attempt to analyse various aspects related to structure of PSBs. In the industrial economics, market structure can be studied through three elements namely, product differentiation, market concentration, and advertisement expenditure.

In the present paper, our objective is to analyse the market development of PSBs which are main source of self-sufficiency. We want to examine the nature of market structure to see whether it is a growing market; to see whether there is competition in the market in terms of rivalry. Here, market share is measured in terms of size which has been taken as the sum of deposit and advances because these are two core banking activities which defines banking business. Product differentiation is measured as the non-interest income in proportion to total income but advertising expense is taken in absolute terms (as a structure variable) because if it is taken in proportion to total operational expenditure, then it becomes a conduct variable because in that case it would show changes in one variable correspond to the change in the conduct of banks.

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We have used Herfindahl's measure of concentration to measure competition in the public sector banking industry. In order to capture inter-bank competition and rivalry, all public sector banks are divided into two groups; Nationalized group and the SBI group. Murthy's Index of Rank Dominance is used to express a degree of dominance of an ordinal measure such as rank. The Relative Index of Rank Dominance is used to establish the close rivalry that existed amongst PSBs. Semi-growth log equations are used for analysing the trends in market share, diversification, and advertising expenses. We have used growth rates to examine the growth in size is not homogenous across strategic groups in PSBs. In one of research paper (Sonia, 2017), the evolution of strategic groups was examined and found that there are strategic groups amongst public sector banks in India. So, here in this paper, PSBs are examined in terms of strategic groups.

It is encouraging to see that the overall impact of liberalization has resulted in growth of size of banks; healthy rivalry and competition. The growth rate of market size has been statistically significant in both SBI group, Nationalized Banks group. The Murthy's Index of Rank Dominance has given exciting results. SBI has been on first place in each year. While the relative index of rank dominance of other top four banks is very close to that of state bank of India. The Relative Index of Rank Dominance shows close rivalry amongst four other banks (Punjab National Bank, Bank of Baroda, Bank of India and Canara Bank). Also, there is no major change in the relative index of remaining 20 banks. The overall result shows that there is competition within the public sector banks in terms of strategic groups.

Key Words: *Banking, Household, Household savings, Market structure, Advertising, Product-differentiation*

JEL Keywords: *G21, H31, G51, L10, M37*

1.0 Introduction

The five pillars of self-reliant India are economy (focus on quantum jumps, not incremental changes), infrastructure (representative of modern India), system (technology driven), demography (vibrant demography of the largest democracy) and demand (full utilisation of power of demand and supply). In Atmanirbhar Bharat Abhiyan, Rs.20 lakh crore which is nearly 10% of GDP (including recent economic measures and RBI announcements) has been kept as package where the focus is on land, labour, liquidity and laws. The main objective of this Abhiyan is to cater to labourers, middle class, cottage industry, MSMEs and industries among other.

Liquidity which is one of the focus point of Atamnirbhar Bharat Abhiyan is primarily maintained by banks under the stewardship of RBI. In India, there are public sector banks, private sector banks and foreign banks. In case of private and foreign banks, we have to depend on promoters capital and foreign capital respectively which does not go with the concept of self-reliance. So, we have taken public sector banks which can be depended upon as the primary source of self- reliance. The dual objective of profitability and maintaining liquidity besides priority sector lending leads to economic development and self-sufficiency eventually. Therefore, banking is the backbone of economic development in India. The growth of banking is the most reliable source of self-sufficiency. The private banks and foreign banks enhances the dependency on promoters and foreign country respectively but public sector banks are the most dependable as far as self-sufficiency is concerned. Unlike the other two types, PSBs have dual objective of profitability and maintaining liquidity. Also, PSBs are the main source of priority sector lending in India. PSBs accept savings from household sector and channelise these deposits into loans and advances and provide it to industries (short-term, medium-term, and long-term loans), household sector (e.g. Housing loans) and also, invest in other industries and companies. It is clear that PSBs leads to economic development by promoting self-sufficiency through mobilising deposits into loans and advances.

In banking economics, the market structure is measured in terms of deposits plus advances. The structure of banking market refers to the study of nature of banking. Hence, market structure is defined in terms of nature of the market which could be competitive or monopolistic. A monopolistic market restricts the market size whereas a competitive market leads to the expansion of the market. Using the Structure-Conduct-Performance Approach, we attempt to analyse various aspects related to structure of PSBs.

In the present research paper, our objective is to analyse the market development of PSBs which are main source of self-sufficiency.

1.1 Research Questions

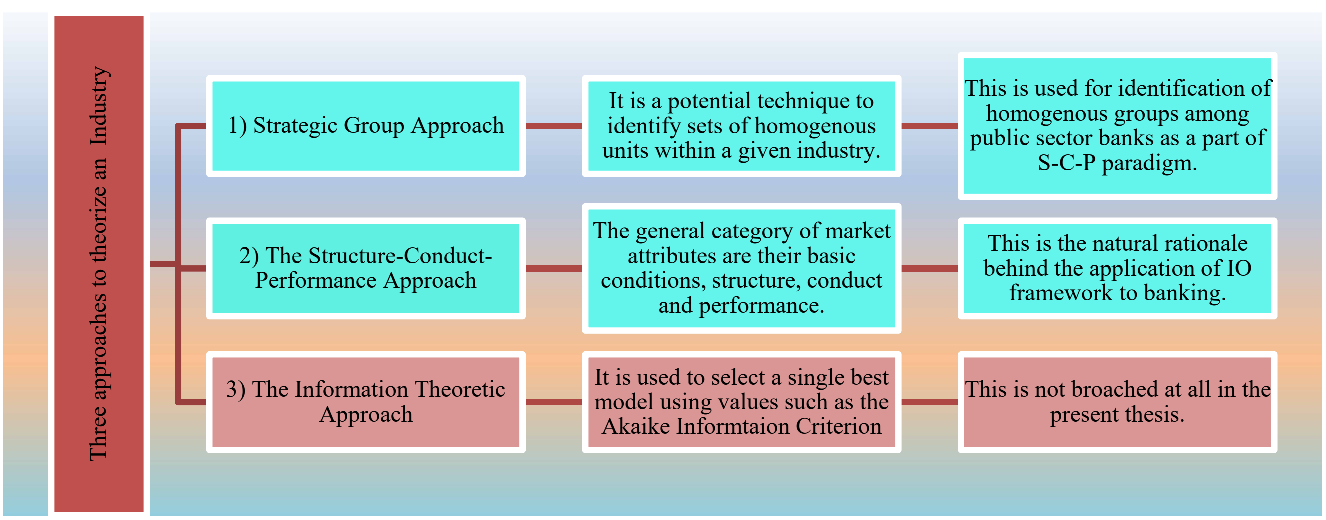
In the industrial economics, market structure can be studied through four elements namely market concentration, product differentiation, market share and advertisement expenditure. For this analysis, we have taken market size as the sum of deposit and advances which represent core banking business. The absolute advertisement expenditure is a proxy for selling cost. It is taken in absolute terms as a structure variable because when it is taken in proportion then it becomes a conduct variable. The non-interest income has been taken as a proxy for product differentiation which is very much part of structure. Concentration ratio has been chosen to look into the nature of public sector banking market. The analysis has been done for the two strategic groups, SBI group and NB group which are present in the public sector banks in India (Sonia, 2017).

Our research questions are as follows:

1. To examine the nature of market.
2. To see whether it is growing market or a saturated market.
3. To see whether there is competition in the market in terms of rivalry.
4. To measure the rate of growth of structure variables amongst strategic groups within PSBs.
5. Is there significant difference between strategic groups in terms of market concentration?
6. To examine the market dominance pattern amongst strategic groups.

1.2 Theoretical Framework

The S-C-P framework has been used to study the nature of banking market.



The S-C-P paradigm assumes that there are certain attributes which are given and are referred as basic conditions. Furthermore, there is a chain of causation that logically determines all the other attributes in a sequence as follows: In the chain, basic conditions are the primary determinants of the market or industry structure. In the next step, the structure of the industry influences the conduct or behavior of the participants in the industry. Conduct, in turn influences performance finally. The schema of traditional S-C-P paradigm was like the flow chart below:

Source: Authors' own compilation

1.3 Literature Review

While concentration is a crucial aspect of market structure, it is important to keep in mind the limitations of concentration as a measure of competition. These limitations are analyzed by (Deb A. T., 2005) and (Murthy & Deb, 2009). A fall in concentration ratio is equated with a rise in competition. However, an analysis of concentration ratio needs to be supplemented by an analysis of identities of the leading firms for an understanding of competition. If a fall in concentration is accompanied by a change in identities of leading firms, it indicates a greater degree of competition as compared to a situation characterized by a fall in concentration with no change in identities of leading firms. In the first case, there is reallocation of the market share among leading firms and the rest of the firms. In the second case, there is reallocation of market share among the leading firms as well. Clearly, an analysis of concentration ratio needs to be supplemented by an analysis of changes in the identities of leading firms, if any.

The evolution of market structure of public sector banking industry during the period 1992-2006 was examined by a research scholar (Bajaj, 2008). In the study, the focus was mainly on two aspects of market structure, first, concentration, and second, product differentiation. The study figures out pattern of dominance in the market using three variables namely assets, deposits, and advances. She found out that the share of public sector banks was slowly decreasing over the period because of entry of new private banks and foreign banks. The linear trend of concentration ratio was statistically declining, and the linear trend of product differentiation was statistically rising. Top five banks in terms of size are ranked in the study which reveals a fair amount of stability in the market structure. The identities of the five top banks remained unchanged throughout the period of analysis. The ranks of a few of them have undergone some change, but overall, no substantial churning among the top banks could be noticed in the industry over the said period. This shows that the pattern of market dominance has not changed in the industry over time. While SBI stayed dominant in absolute terms, but it may fall over time. Therefore, one also needs to examine the relative dominance of SBI with respect to its nearest rival. It is quite possible that the relative dominance of SBI has fallen in the new scenario. There is still another dimension in the story. Whatever there is the expansion of market of public sector banking industry and by individual PSBs, one does not know how the expansion of market of public sector banking industry is being shared among different PSBs.

A comparative study of public and private banking industry in India to assess the impact of banking reforms and competition on these two segments (Gupta L. , 2013) was conducted in 2013. The period of the study was 1995-96 to 2009-10. She found out that competition has emerged in Indian banking industry because of liberalization. Further, she found out that the competition has emerged in form of new banks vs. incumbents rather than in the form of public vs. private banks. Lastly, she concluded that conduct puts an impact on both structure and performance. But the study does not talk about competition within public sector banks in India.

A bank level data study was conducted to estimate the extent to which revenues earned reflects changes in input prices (Claessens & Laeven, 2004). The study used production function approach to study competition of specific banks in 50 countries banking systems. But, (Murthy & Deb, 2013) discards the use of production function approach for measurement of competition. It provides a methodology to arrive at the market form in banking industry through an analysis of all the aspects of basic conditions, structure, conduct and performance. Therefore, in the present study, production function approach will not be used.

A conceptual and theoretical framework to measure and model competition in private banking industry in India (Murthy & Deb, 2014) was given in 2014. The study used Bodenhorn's measure of competition in terms of degree of mobility. It provides the theoretical background of an alternative mechanism based on S-C-P framework, which apart from including traditional elements of S-C-P framework included entry, economies of scale, product differentiation and price cost margin, also incorporates basic conditions and strategic groups to analyze the process of market dynamics in the industry. The paper argued that competition affects basic conditions, structure, conduct and performance. The result demonstrates that variables related to basic conditions, structure, conduct and performance influence competition. The study concludes that private banking industry in India is characterized by monopolistic competition.

In all of these studies, public sector banks have been treated as homogenous lots. Mostly, the focus has been on the study of behavioural aspect of PSBs. But, in the present paper, we have examined public sector banks in terms of two strategic groups, SBI group and NB group and overall.

1.4 Objectives and Hypotheses

1.4.1 Objectives

The primary objectives are as follows:

1. To measure the rate of growth of structure variables in the PSBs.
2. To measure the product differentiation in the PSBs.
3. To measure the growth rate of concentration ratio in the PSBs.
4. To examine the impact of advertisement expenditure on the PSBs.
5. To examine the market dominance pattern in the PSBs.

The Secondary objectives are as follows:

1. To study the growth pattern of SBI group.
2. To study the growth pattern of NB group.
3. To examine whether there is a significant increase in product differentiation due to higher advertisement expenditure in case of SBI group.
4. To examine whether there is a significant increase in product differentiation due to higher advertisement expenditure in case of NB group.
5. To measure the concentration ratio of SBI group.
6. To measure the concentration ratio of NB group.
7. To examine whether the advertisement expenditure is going to rise in a quest to capture more market share by SBI group.
8. To examine whether the advertisement expenditure is going to rise in a quest to capture more market share by NB group.
9. To examine the dominance pattern in SBI group.
10. To examine the dominance pattern in NB group

1.4.2 Hypotheses

Following are the primary hypotheses of the study.

H1: There is no growth in the output of PSBs.

H2: There is no change in the product differentiation of PSBs.

H3: There is no growth in the concentration ratio of PSBs.

H4: There is no change in the advertisement expenditure of PSBs.

H5: There is no change in the dominance pattern of PSBs.

Secondary hypotheses are as follows:

H1: There is no growth in the output of SBI group.

H2: There is no growth in the output of NB group.

H3: There is no change in the ratio of non-interest income to total income in case of SBI group.

H4: There is no change in the ratio of non-interest income to total income in case of NB group.

H5: There is no change in the concentration ratio of SBI group.

H6: There is no change in the concentration ratio of NB group.

H7: There is no change in the ratio of advertisement expenditure of SBI group.

H8: There is no change in the ratio of advertisement expenditure of NB group.

H9: There is no change in the dominance pattern of SBI group.

H10: There is no change in the dominance pattern of NB group.

Alternate hypotheses are opposite to the null hypotheses.

1.5 Methodology

Methodology has been divided into three subsections. The first subsection 1.5.1 shows the time period and source of data used. Second subsection 1.5.2 shows variables used in the present chapter. After that tools used for the analysis are explained in subsection 1.5.3. We have used semi-log growth equation, paired t-test and t-test for equal variance. All these subsections are explained below.

1.5.1 Data Set and Data Source

For the present study, annual data from 1992 to 2017 has been taken from RBI website. The Reserve Bank of India publishes the data annually. For the present study, 25 public sector banks, i.e., Nationalized Banks (9) and State Bank group (6) have been chosen. Those who have left and joined in between 1992 to 2017 have been left because in semi-log equation and paired t-test, the number of observations should be same for both time periods.

1.5.2 Variables

Market structure can be studied through four elements. First element is concentration ratio which helps us to comment on the nature of the market. It compares the size of individual bank in comparison to the public sector banking industry as a whole. In the present chapter, we have used HHI index to calculate the concentration ratio. It was propounded by Hirschman Herfindahl. For this we have used the sum of deposit and advances as market size. The second variable is non-interest income. It is a proxy for product differentiation. Also it shows the monopolistic power in the market. The absolute amount of non-interest income has been taken as a structure variable. The third variable is market size which represents the sum of deposit and advances. Actually the core banking business is accepting deposits and extending loans. That is why we have taken the sum of deposit and advances as market size. This variable represents a barrier to entry that are present in the market. In other way round, it says that when there is an increase in the market share it works as a barrier to entry in the market for the potential new entrants. The fourth variable is advertisement expenditure. It is known as deferred revenue expenditure. That means advertisement expenditure once done gives benefit over many years not in the same year when the expenditure is actually incurred. The basic purpose of advertisement expenditure is to inform the customers about the product features services so that it remains in the memory of the investors. This should not be linked with increasing sales because the advertisement expenditure is incurred to make the product stay in the limelight. But after a certain time period, the effectiveness of advertisement expenditure decreases. Here, comes the inverted u shape of advertisement expenditure which says that after a certain time period or a saturation point the effectiveness of advertisement decreases. These variables are explained below.

1. **Market Size- Barriers to Entry**

It is sum of deposit and advances. Market size is the variable that represents core banking business which is deposits and advances. So, it is measured as sum total of deposits and advances. It is expected to affect concentration in the public sector banking industry in a positive way.

2. **Advertisement Expenditure- A Proxy to Selling Cost**

As an absolute term, advertisement expenditure is considered as part of structure whereas when it is in proportion to Total expenditure it is considered as part of conduct. Because advertisement expenditure is a deferred revenue nature expenditure, and it brings enduring benefits. It is done with an objective to increase sales. So, it is taken as a proxy for selling cost.

3. **Non-Interest Income - Product Differentiation**

Other income in absolute terms, it shows the amount of product differentiation in an industry. Therefore, it is a structure variable; a proxy of product differentiation.

4. **Concentration Ratio- Nature of the Market**

It compares the size of an individual banks in relation to PS banking industry as a whole. In the present chapter, we have used HHI (Hirschman Herfindahl Index) to calculate concentration ratio in terms of deposit plus advances.

Table 1.1: List of Market Structure Variables

Name of the variable	Structure variable	Expected sign
Market size	Market share (Barriers to entry)	Positive
Non-interest income	Product differentiation (Monopolistic power)	Positive
Advertisement expenditure	Advertisement (Proxy to Selling cost)	Positive
Concentration ratio	Nature of the market	Negative

Source: Authors' own Compilation

1.5.3 Statistical Tools used for the Analysis

We have used Herfindahl's measure of concentration to measure competition in the public sector banking industry. In order to capture inter-bank competition and rivalry, all public sector banks are divided into two strategic groups: SBI group and NB group. Murthy's Index of Rank Dominance (IRD) is used to express a degree of dominance of an ordinal measure such as rank. The Relative Index of Rank Dominance (RIRD) is used to establish the close rivalry that existed amongst PSBs. Semi-growth log equations are used for analysing the trends in concentration ration, market size, diversification, and advertisement expenditure.

1.5.3.1 Growth Model: Semi-log

The growth rate is used for analysing trends in market structure variables of both strategic groups (SBI group and NB group). Further, it is examined through growth rates that the growth in structure variables is not homogeneous across strategic groups in PSBs. The growth rate has been calculated by using the semi-log regression function.

A semi-log function is the best for determining growth rates.

$$\text{Log } Yt = a + b*t \qquad 1$$

$$\text{Log } Y(t\text{-}1) = a + b*(t\text{-}1) \qquad 2$$

Equation 1 minus equation 2

$$\text{Log } t - \text{Log } (t\text{-}1) = b \qquad 3$$

Or

$$\text{Log } (Yt/Y(t\text{-}1)) = b \qquad 4$$

Hence, b is measure of the relative change of Y over time and it is the exponential growth rate.

1.5.3.2 Herfindahl-Hirschman index (HHI) (Hirschman, 1964)

The Hirschman-Herfindahl Index (HHI) is a generalized measure of concentration which precise the information on the number and size distribution of firms into a single value. It is the sum of squares of relative sizes or market shares of the firms in the market, where the relative sizes are proportions of the total size of the market. Mathematically, it can be given as:

HHI =

HHI = Hirschman-Herfindahl index

S i = Percentage market share of the i th firm

n = Total number of firms in the market

1.5.3.3 Murthy's Index of Rank Dominance (IRD) and Relative Index of Rank Dominance (RIRD)

The index of rank dominance (IRD) is an innovative measure which gives us a coefficient that expresses the degree of dominance of an ordinal measure such as rank. IRD has been further refined as a relative-Relative Index of Rank Dominance (RIRD), which measures dominance in a relative sense. This gives the proportionate weight of the rank dominance index. It will also be established through RIRD whether close rivalry exist amongst public sector banks or not.

Amongst the public sector banks, the dominant position of a bank (i.e., highest rank) for the longest period has been estimated with the help of index of rank dominance (IRD) and relative index of rank dominance (RIRD).

$$I_{rd} = \sum_{1992}^{2017} \frac{(\text{Rank Score on the basis of market size})i}{\text{Maximum rank score}}$$

where;

= is the index of Rank Dominance. Rank Score = 25, 24, 23.... (In decreasing order of rank)

1.6 Findings

The objective of this paper is to look into the market structure and dominance pattern in the two strategic groups (SBI group and NB group) amongst PSBs as a result of reforms. So, findings are divided in four sub-sections, as mentioned below.

1.6.1 Growth Rate of Structure Variables

First of all, using semi-log growth equation has been used to caculate growth rates of structure variables. The following table shows growth rate for all these groups.

Table 1.2: Growth Rate of Market size, Advertisement Expenditure, Product differentiation and Concentration Ratio

Banks Variables	All Banks	SBI group	NB group
Market size	6.9%, Significant	6.4%, Significant	7%, significant
Advertising Expenditure	2.5%, significant	2.9%, significant	2.3%, significant
Product differentiation	0.34%, not significant	0.55%, significant	0.33%,not significant
Concentration Ratio	-0.595% Significant	-0.086% Significant	-0.178% Significant

Source: Authors' own Calculation

Table 1.2 shows growth rates for all the variables and all for both the strategic groups, namely, SBI group and NB group. First of all, in case of size, growth rate is positive and statitically significant in case of all banks, SBI group and NB group. It means that size of each group is increasing significantly. In case of advertisement expenditure, there is positive and significant growth rate in all the three cases. It shows that banks are putting more emphasis on advertisement of their products and services. It is increasing over the time period which is a good sign of the growth of banking industry. Product differentiation, income from fee-based activities, is positive and significant only in case of SBI group which means that SBI and group is quite successful in achieving higher standard of fee-based income. In case of all PSBs and NB group, it is statistically not significant which means that fee-based income of these groups does not have a trend, i.e., we cannot comment on the trend of these groups. This is quite interesting. After so many years of liberalisation, still all PSBs, SBI group and NB group prefer to play safe, ie, they are investing more funds in government securities which is a safe investment. It shows that these bank groups are risk-averse. The trend of concentration ratio is statistically significant in case of all PSBs, SBI group, and NB and it shows a decline in the concetration ratio and consequently, there is increase in the competition within each group. The decline in the concentration trend is highest in case of NB group. It means there is fairly high competition within NB group than SBI group and all PSBs.

1.6.2 Concentration Ratio

In order to study the nature of competition in public sector banking industry, we have used Hirschman Herfindahl Index (HHI) concentration ratio. It was expected with the entry of new private banks that it will reduce the level of concentration. And, consequently, a fall in the concentration ratio will decrease the monopoly power in the market. For analyzing the concentration, sum total of deposits and advances that constitutes its total market is being taken.

Table 1.3: Trend of Concentration Ratio: All PSBs

All PSB	Coefficients	Standard Error	t Stat	P-value
Intercept	9.64006947	3.3802743	2.85186012	0.00879904
Time	**-0.0059775**	0.00168633	-3.544702	0.00164926

Source: Authors' own Calculation

Table 1.4: Trend of Concentration Ratio: SBI group

SBI group	Coefficients	Standard Error	t Stat	P-value
Intercept	1.18053766	4.00818189	0.29453196	0.77088401
Time	**-0.0008622**	0.00199958	-0.4311955	0.67017463

Source: Authors' own Calculation

Table 1.5: Concentration ratio of all PSBs, SBI group, and NB group

All PSBs	
Years	**C.Ratio**
1992	0.10855939
1993	0.10541179
1994	0.10130867
1995	0.09686379
1996	0.10003767
1997	0.09887031
1998	0.09957228
1999	0.10300704
2000	0.10308522
2001	0.10730041
2002	0.10286664
2003	0.101053
2004	0.0960617

All PSBs	
Years	**C.Ratio**
2005	0.09519245
2006	0.08986454
2007	0.08568051
2008	0.08548955
2009	0.09300879
2010	0.08797433
2011	0.08747012
2012	0.08583928
2013	0.08688326
2014	0.08882098
2015	0.09194781
2016	0.09730401
2017	0.10755478

SBI group	
Years	C.Ratio
1992	0.65474588
1993	0.63258189
1994	0.59937888
1995	0.57878025
1996	0.5825493
1997	0.57124031
1998	0.58253049
1999	0.59700631
2000	0.5943373
2001	0.60195551
2002	0.58500544
2003	0.56914594
2004	0.54350957
2005	0.53119439
2006	0.50701337
2007	0.49447356
2008	0.50129757
2009	0.55352982
2010	0.54654178
2011	0.58233448
2012	0.57207536
2013	0.57568483
2014	0.60048111
2015	0.63071521
2016	0.62013384
2017	0.66670469

NB group	
Years	C.Ratio
1992	0.074186475
1993	0.072038344
1994	0.073024629
1995	0.071288259
1996	0.071700574
1997	0.07219358
1998	0.072218218
1999	0.070103097
2000	0.068789364
2001	0.068928734
2002	0.069441881
2003	0.069546676
2004	0.068830598
2005	0.068315625
2006	0.068839981
2007	0.068124484
2008	0.066729208
2009	0.067462885
2010	0.067549517
2011	0.068825238
2012	0.069481896
2013	0.068451918
2014	0.070217674
2015	0.071351536
2016	0.070017108
2017	0.071642466

Authors' own Calculation

Table 1.6: Trend of Concentration Ratio: NB group

NB group	Coefficients	Standard Error	t Stat	P-value
Intercept	0.9265742	1.2361103	0.74958861	0.46078757
Time	**-0.0017893**	0.00061666	-2.9015144	0.00783225

Source: Authors' own Calculation

Table 1.7: Annual Compound Growth rate (Concentration Ratio)

Banks group	Instantaneous Growth Rate	Annual Compund Growth Rate	
All PSBs	-0.0059775	-0.595	Lowest decline
SBI group	-0.0008622	-0.086	Moderate decline
NB group	-0.0017893	-0.178%	Highest decline

Source: Authors' own Calculation

The trend results of all PSBs, SBI group, and NB group are statitically significant. There is declining trend in the concentration ratio. This means concentration ratio is significantly declining in all PSBs, SBI group, and NB group. There is competition within each group. But it is interesting to see a highest significant declining trend in NB group.

It means they are competing rigorously within their group. There is moderate competition in SBI group. While in all PSBs, the concentration ratio trend is declining with lowest rate. But still, The concentration ratio of all PSBs, SBI group and NB group is given below.

Further, in order to examine the intensity of competition, the concentration ratio has been put in a range which is given by Woolridge and Pearson in 1993. The concentration ratio is PSB group is below 40% in all the year from 1992 to 2017 which shows that competition is fairly high in the PSB group because it falls in low category. Whereas in case of SBI group, the concentraion somewhere falls between 40-70% category and it falls in medium category which shows there is moderate comeptition in SBI group over the time period. Lastly, in case of NB group, the concentarion ratio falls below 40% category over the time period. It fall in low category which depicts fairly high degree of competition amongst NB group banks. Since, the SBI group is in medium range, it is monopolistic in nature whereas the NB group is in low concentration range, it is competitive in nature. It is shown in the table below:

Table 1.8: Market Concentration - Hirschman Herfindahl Index (HH Index)

Concentration Ratio **Criteria for Market concentration via Hirschman Herfindahl Index (HH Index)**				
		NB group	**SBI group**	**PSB group**
0 – 40%	**Low**		**C.Ratio (<70% but >40%)**	**C.Ratio (<8%)**
40 - 70%	**Medium**	**C.Ratio (< 11%)**		
70 - 100%	**High**			
Source: Woolridge and Pearson (1993).				

Source: Authors' own Calculation

1.6.3 Index of Rank Dominance and Relative Index of Rank Dominance

Index of rank dominance and relative index of rank dominance helps us to comment on the structure and rivalry amongst public sector banking industry. Market size has been taken to assign ranks for all banks.

The table 1.9 shows that state bank of India has been on first place in each year. It means that state bank of India highest rank in all the years. And remaining banks are given ranks according to their market size. A bank with highest market size is given 25th rank and the second highest market size having bank is given 24th rank and so on. In other words, the rank of State bank of India has occupied first place in each year but despite that its relative index of rank dominance is 0.0769. While the relative index of rank dominance of other top four banks is very close to that of state bank of India. The top four other banks are Punjab National Bank. Canara Bank, Bank of Baroda, Union Bank of India. These have remained in top slot in almost all the years. And if we look at the remaining 20 banks, their relative index of rank dominance has no major fluctuations. It means all the banks are performing consistently and competing with each other.

Table 1.9: Rank Dominance and Relative Index of Rank Dominance: All PSBs

Banks	rank dominance	relative index of rank dominance
State Bank of India	1	0.076
Punjab National Bank	0.898	0.069
Canara Bank	0.891	0.068
Bank of Baroda	0.888	0.068
Union Bank of India	0.77	0.059
Bank of India	0.768	0.059
Oriental Bank of Commerce	0.703	0.054
Corporation Bank	0.64	0.049
Syndicate Bank	0.545	0.041
State bank of Hyderabad	0.541	0.041
Allahabad Bank	0.521	0.040
State bank of Patiala	0.503	0.038
Andhra Bank	0.495	0.038
Indian overseas Bank	0.485	0.037
Central bank of India	0.448	0.034
Indian bank	0.446	0.034
State Bank of Bikaner & Jaipur	0.376	0.028
State bank of Travancore	0.345	0.026
Dena Bank	0.315	0.024
Uco Bank	0.305	0.023
Vijaya Bank	0.275	0.021
Bank of Maharashtra	0.255	0.019
State Bank of Mysore	0.213	0.016
Punjab and Sind Bank	0.185	0.014
United Bank of India	0.176	0.013

Source: Authors' Own Calculation

Table 1.10: Rank Dominance and Relative index of Rank Dominance: SBI group

Bank	Rank Dominance	Relative Index of Rank Dominance
State Bank of India	1	0.285714286
State Bank of Hyderabad	0.80128205	0.228937729
State Bank of Patiala	0.6474359	0.184981685
State Bank of Travancore	0.51282051	0.146520147
State Bank of Jaipur	0.37179487	0.106227106
State Bank of Mysore	0.16666667	0.047619048

Source: Authors' Own Calculation

Table 1.11: Descriptive Statistics (IRD and RIRD): SBI group

Rank Dominance		Relative Index of Rank Dominance	
Mean	**0.58333333**	Mean	**0.16666667**
Standard Error	0.1222775	Standard Error	0.03493643
Median	0.58012821	Median	0.16575092
Mode	#N/A	Mode	#N/A
Standard Deviation	**0.29951747**	Standard Deviation	**0.08557642**
Confidence Level(95.0%)	0.31432431	Confidence Level(95.0%)	0.08980695

Source: Authors' own Calculation

This SBI strategic group result is quite interesting. The RD of these banks is not similar to that of RIRD. The individual ranks of banks are high but when these are competing with all other banks in the group, it shows somewhat a different picture. It shows that SBI group banks are competing within the group.

The descriptive statistics table shows so many interesting facts. First of all, the mean of rank dominance is 0.583 but in case of relative index of rank dominance it is just 0.1666. Secondly, the standard deviation is 0.299 in case of rank dominance, but it is 0.085 in case of relative index of rank dominance. It shows that all the banks in SBI group are competitive and consistent with little standard deviation in their relative index of rank dominance. Similarly, sample variance is also quite less in case of relative index of rank dominance. The rank dominance index and RIRD of NB group is shown below:

Table 1.12: Rank Dominance and Relative index of Rank Dominance: NB group

Banks	Rank Dominance	Relative Index of Rank Dominance
Punjab National Bank	0.937246964	0.093724696
Bank of Baroda	0.929149798	0.09291498
Bank of India	0.914979757	0.091497976
Canara Bank	0.886639676	0.088663968
Central Bank of India	0.74291498	0.074291498
Union Bank of India	0.722672065	0.072267206
Indian Overseas Bank	0.62145749	0.062145749
Syndicate Bank	0.611336032	0.061133603
Uco Bank	0.568825911	0.056882591
Indian Bank	0.481781377	0.048178138
Oriental Bank of Commerce	0.477732794	0.047773279
Allahabad Bank	0.453441296	0.04534413
Andhra Bank	0.315789474	0.031578947
Corporation Bank of India	0.307692308	0.030769231
United Bank of India	0.253036437	0.025303644
Bank of Maharashtra	0.236842105	0.023684211
Vijaya Bank	0.234817814	0.023481781
Dena Bank	0.182186235	0.018218623
Punja and Sindh Bank	0.12145749	0.012145749

Source: Authors' own Calculation

Table 1.13: Descriptive Statistics (IRD and RIRD): NB group

Rank Dominance		***RIRD***	
Mean	**0.52631579**	Mean	**0.05263158**
Standard Error	0.0626684	Standard Error	0.00626684
Median	0.48178138	Median	0.04817814
Mode	#N/A	Mode	#N/A

Standard Deviation	**0.2731652**	Standard Deviation	**0.02731652**
Confidence Level(95.0%)	0.13166141	Confidence Level(95.0%)	0.01316614

Source: Authors' own Calculation

The results of both IRD and RIRD shows there is intense competition within the NB group. The descriptive statistics table shows so many interesting facts. First of all, the mean of rank dominance is .526 (0.583 in SBI group) but in case of relative index of rank dominance it is just 0.0526 (0.1666 in SBI group). It means SBI group enjoys more market share because of a smaller number of banks in the group. That is why their RIRD is fairly high than NB group which shows that there is more competition within NB group. Secondly, the standard deviation is 0.273 (0.299 in SBI group) in case of rank dominance, but it is 0.027 (0.085 in SBI group) in case of relative index of rank dominance. But since the variation in both RD and RIRD is less in NB group which is a better indication of consistency that banks in NB group are maintaining while being competitive. This shows that NB groups banks have been successful in retaining their ranks over the time period while facing the stuff competition with the entry of private sector banks. Overall, the result shows that all the banks in SBI group and NB group are competitive and consistent with maintaining their ranks.

1.7 Implications for theory and practice

This paper burst the most popular myth about public sector banks that these are inefficient and loss-making lot functioning with the support of government and RBI. It is clearly evident from the empirical results that banking market has been developing a lot since liberalization. There is stiff competition amongst all the banks both within the strategic groups and between strategic groups. The advertisement expenditure is statistically significant in case of all banks and both strategic groups which shows the growth and use of advertising a mean to increasing sales. Similarly, market size is also statistically increasing. SBI group has been able to diversify successfully into fee-based activities as compared to NB group. The changes in ranks of top five banks shows the intense rivalry in the public sector banking industry. It is the high time now that these banks should not be treated as alike, inefficient and loss-making units.

1.8 Conclusion

To investigate into market structure of public sector banks and strategic groups within public sector banks, we have applied semi-log growth equation (to examine growth rates), paired t-test (differences over the time period), Murthy's index of rank dominance and relative index of rank dominance (to study the dominance pattern), and concentration ratio (to measure and examine competition) to draw meaningful results.

The growth rate has been statistically significant and positive in case of market size and advertisement expenditure but in case of product differentiation, it is positive and significant only in case of the SBI group not in NB group and overall PSBs. It means only SBI group has been successful enough to use advertisement as a mean to offer different products to the general public. Secondly, the trend in concentration ratio has shown a significant decline over the time period in all PSBs, SBI group, and NB group. This decline clearly points out the rising competition within all PSBs, SBI group, and NB group. This declined was highest in NB group. This means that there is fairly high competition in NB group as compared to SBI group.

Another significant observation is that the dominance pattern shows that the strategic groups amongst public sector banks are rivals because they are consistently competing with each other. The Murthy's Index of Rank Dominance has given exciting results. SBI has been on first place in each year. While the relative index of rank dominance of other top four banks is very close to that of state bank of India. The RIRD shows close rivalry amongst four other banks (PNB, Bank of Baroda, Bank of India and Canara Bank).

It is encouraging to see that the overall impact of liberalization has been growing market share, healthy rivalry and competition amongst SBI and NB groups. These determinants are all market variables and not representative of government control. This means that public sector banks have adjusted to the new reality and shifted from being loss-making state-controlled units to profit-making market-oriented units and the most reliable source of self-sufficiency.

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A Comparative Study of Green Banking Initiatives Implemented by the Indian Banks

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ABSTRACT

Due to increasing industrialization, global warming and other environmental degradation have become critical issues. It is not an individual economic problem, but a global challenge, and rapid economic growth can only be achieved if every industry contributes to a sustainable environment. Banks can play an important role in contributing towards a sustainable environment and green world through green banking initiatives. Green banking means performing normal banking functions using environment-friendly technologies. In recent decades, there has been a worldwide emphasis on eco-friendly banking. India is likewise doing its best to promote environmentally responsible banking. The present paper is an attempt to assess the current condition of green banking in India and the manner in which Indian banks are prioritising sustainable development investment. In order to accomplish this objective, a comparison of two public and two private sector banks has been performed. In addition, this research also investigates the potential for green banking in India in the future. The study finds that Indian banks have expanded beyond just offering online services to include carbon neutralisation, support for environmentally conscious projects, waste management, and other relevant fields. It is suggested that there is still room for the promotion of additional green banking initiatives in India so that a variety of small banks can also make substantial contributions to green banking. The findings of the study may assist bank regulators and other regulatory bodies in determining the growth potential of green banking in India.

Keywords*: Banks, Green Banking, Carbon Neutralization, Sustainable Environment.*

INTRODUCTION

The expansion of economies has led to an increase in the prevalence of environmental issues like climate change, greenhouse gases, carbon emissions, global warming, and extremes of rainfall and drought. As a direct consequence of this, the standard of the environment deteriorates. The rate at which we are irresponsibly depleting the earth's resources raises the question of what kind of legacy we will be leaving for future generations. Therefore, the idea of sustainable growth while also protecting the environment has emerged as one of the most pressing concerns in the context of the global community. At the international level, different groups have tried to adopt strategies for sustainable development. Multilateral organisations,

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multilateral financial and development institutions, and a few international groups have supported the evaluation of investment projects based on environmental criteria and strategies. In recent years, the International Organization for Standardization (ISO) has put out a set of guidelines, known as ISO 14000, that tell businesses all over the World how to protect the environment and prevent pollution from happening.

All of these efforts resulted in the creation of the idea of green finance, which ultimately resulted in the creation of green banking. The concept of green banking first appeared in 2003, with a focus on safeguarding the planet's natural habitats and resources in US. In March 2009, The Green Bank Act, presented by Congressman of US Chris Van Hollen, sought to establish a green bank with US government ownership. The primary objective was to do away with the use of paper in financial transactions to reduce humanity's environmental impact by reducing dependency on tree-based raw materials. Currently, financial institutions and banks are associated not only with environmental conservation but also with sustainable development. They can help protect the environment not only by using products and services that are eco-friendly but also by funding projects that are good for the environment.

What is Green Banking?

Green has become a global icon of environmental consciousness. According to (IBA) the Indian Banks Association, a "Green Bank is like any other bank in that it examines all social and environmental/ecological concerns with the goal of protecting the environment and conserving natural resources." It is often referred to as a sustainable bank or an ethical bank. The primary goal is to carry out banking operations while also taking care of the environment, ecology, and natural resources of the planet, particularly biodiversity. Technical developments, operational enhancements, and a change in customer behaviour are all part of "green banking" in the banking sector. Encouragement of eco-friendly practices and a decrease in the carbon emissions of financial activities are part of it. It is a proactive, forward-looking way of thinking that considers sustainability in the future.

India is new to both the idea and the practice of green banking. To avoid causing irreparable damage to the natural world, we must give priority to environmentally responsible banking practices. In addition to security and profitability, banks should also consider the environmental impact of their financing decisions.

Role of RBI in green banking

The Reserve Bank of India developed the IDRBT (Indian Institute for Development & Research in Banking Technology), which defines green banking as techniques and tenets that make banks sustainable in terms of their effects on the economy, the environment, and society (IDRBT, 2013).

The institute provides a comprehensive framework of green banking methods, including "paperless banking," "internet banking," "mobile banking," and "mass transit system." It also recommends adopting green banking practices such as recycling paper, toners, and cartridges; using renewable energy generated by "solar power plants"; utilising "energy star-rated motion sensors"; installing "sewage treatment plants" and "rainwater harvesting systems"; and using "energy star-rated motion sensors."

In one of its recent discussion papers on green financing RBI, has suggested that financial institutions including banks should increase green lending and set voluntary green finance targets in order to mitigate the risks posed by climate change. The banking regulator also recommended that financial institutions incorporate climate risk as part of their due diligence process and provide a "climate-risk rating" for customers who have significant exposure to the risk.

REVIEW OF LITERATURE

This section examines some of the empirical research on green banking that has been published in both India and other countries.

In a recent article Chen et al., (2022) examine the incentives of sustainable financing for financial institutions in Gulf Cooperation Council member states. Using a large group of banks from 2011 to 2021, the study finds that banks' default risk will decrease if they consider environmental factors when making loans. Green finance has a greater impact on small banks, demonstrating that responsible lending provides some new revenue streams while lowering risk. The benefits listed in the study are encouraging for a green recovery, and banks may play a crucial role in accomplishing sustainable development targets. The regulatory community, central banks, and the banking sector can all benefit greatly from green finance since it has the potential to produce financially sound and efficient economies.

The authors Khairunnessa et al., (2021) look into the beginnings of "Green Banking" in Bangladesh, focusing on the roles that financial regulators play in promoting environmental responsibility within the sector. It also looks into how financial institutions like banks and other institutions are helping to facilitate the shift to a green economy. Secondary data was analysed from a wide range of resources, including annual reports and websites of commercial banks and other financial entities in Bangladesh and beyond. The analysis, which makes use of descriptive statistics, shows that the Bangladesh central bank played a crucial role in greening the country's financial system by adopting a wide range of green policies and regulatory efforts.

Ibe-Enwo et al., (2019) investigate customers' perceptions and effects of green banking practises on bank loyalty using primary data. They survey 551 account holders of the retail banking industry in North Cyprus for this purpose. Using the structural equation modelling technique it is found that Banks' green reputations are directly tied to their efforts to promote environmental sustainability. The study further concludes that there is no substantial correlation between bank trust and bank loyalty.

A study conducted by Park & Kim, (2020) presents an overview of green banking as a growing industry that creates strategic benefits for private sector banks' and opens up new business opportunities, while also increasing the responsibility of central banks and regulators to safeguard the financial system. In order to determine what is standing in the way of green banking and what needs to be done to overcome these obstacles, this article applies the theory of change conceptual framework at the institutional, sectoral, and combined levels.

In his research Aruna Shantha, (2019) analyses the factors that influence customers' propensity to utilise green banking services at People's Bank of Sri Lanka. The study is based on first-hand information collected from 371 customers of People's bank at the Kandy branch through a structured questionnaire. The intention to buy is treated as the dependent variable, and the independent variables include things like customers' knowledge of and confidence in green products, as well as the benefits and perceived value of those products including their security and privacy. The study discovers that green product awareness, benefits, perceived value, and green product privacy & security have significant positive effects on customers' choices to use green banking products, while green product and image trust have significant negative effects.

According to Sahoo et al., (2016), green banking is distinct from conventional banking because it focuses on making banking better for the environment. In their paper, they try to figure out how customers of different ages are using green banking products. Using ANOVA and multiple comparisons tests the results show that people of different ages use green banking products in different ways. For example, young people have a greater propensity to utilise green banking products than middle-aged and older people. So, people in the middle age and older age groups need to be made more aware of this issue.

Nath et al., (2014) are of the view that Banking has nothing to do with the environment in a physical way, but the actions of their customers have a big effect on the outside world. Therefore, they list the significant strategies for adopting Green Banking and draw attention to the green rating standards prescribed by the Reserve Bank of India (RBI), the environmental and social norms established by the World Bank, and the steps taken by various Indian public and private sector banks to implement these practices.

In his study Bahl, (2012) emphasises the methods for promoting Green Banking in order to achieve sustainable growth. He used a rating system to evaluate the most essential Green Banking techniques. In his view, fostering knowledge and awareness is the only way to realise the objective of advancing sustainable development. Publications and newsletters should be promoted within internal subsystems; while event meetings, media, and websites should be prioritised externally to maximise exposure. Green banking cannot function without a comprehensive green policy framework.

A review of the literature on green banking reveals that several studies have been undertaken around the World especially in developed western nations. However, there has been a paucity of thorough investigations in India. The majority of studies have concentrated on the green banking practices of a few Indian banks, green banking products offered by banks, the advantages and disadvantages of green banking, and other related topics.

OBJECTIVES

There are several dynamic factors involved in the implementation of green banking. It is essential to be aware of the different methods in which banks are implementing green banking practices and to be familiar with the numerous initiatives that are being undertaken by these banks. Taking into consideration the present study has the following objectives.

1. To understand Indian banks' perspective on green banking and to identify various green banking products offered by Indian banks.
2. To analyse key sectors in which some Indian banks focus on promoting green banking.
3. To analyse and compare Green Banking Projects at major Indian private and public sector banks.

RESEARCH METHODOLOGY

The current analysis is based on secondary data that was gathered from academic works in the field, annual reports, and websites of the banks reports from the RBI, and occasionally published news in different media. These secondary sources were used to compile the data for the study. There are 12 Banks that are public while 21 banks are private, which are functioning in India. Two public sector banks (State Bank India and Punjab National Bank) and two private sector banks (HDFC and ICICI bank) are included in the study. These are the two topmost public and private banks based on their total assets (source: moneycontrol.com).

The present study is conducted using the most recent data from the Annual Reports and other relevant reports like Corporate Social Responsibility Reports and Sustainability Reports uploaded on the official websites of the banks regarding the environmental initiatives undertaken by the banks in accordance with SEBI's guidelines. In addition, relevant journals, newspapers, published research papers, and articles and documents written by bank officials are all included in the data for the study.

GREEN BANKING INITIATIVES BY INDIAN BANKS

There are many green banking initiatives that Indian banks have implemented in recent years. This section identifies a few of the common eco-friendly banking services utilised by the sample banks in the research. These services are discussed below.

Public Sector Banks

State Bank of India (SBI)

With 18 of its bank locations being recognised as Green Buildings by the IGBC (Indian Green Building Council), SBI, India's largest public sector bank, has a significant impact on fostering a green environment. For a sustainable future, several green banking efforts are required. These SBI programs are quite well-liked in the Indian banking industry.

- SBI efforts to reduce its environmental footprint through its various steps like:

(i) The Bank employed diesel generators in the past, but solar energy-backed power supply systems have mostly taken their place. The benefit of employing a solar-powered power source is that it extends the life of electronics, reducing E-waste in the process. By using solar or wind energy at several bank locations, the bank has gradually increased the percentage of renewable energy sources.

(ii) Establishing 22 sewage treatment units and 15 food waste composting facilities to reduce waste produced by the bank. During the fiscal year 2021-22, about 64.62 MT of total garbage was recycled, and additional progress will be made in coming years.

Figure 1: Key Green Banking Measures taken by SBI

Source: Author's own creation

(iii) In 2021–2022, SBI used software for intelligent power management, which helped the Bank save about 25 Gigawatt Hrs of energy, 9,858 Megatonne of greenhouse gas emissions, and 9,36,512 m3 of water.

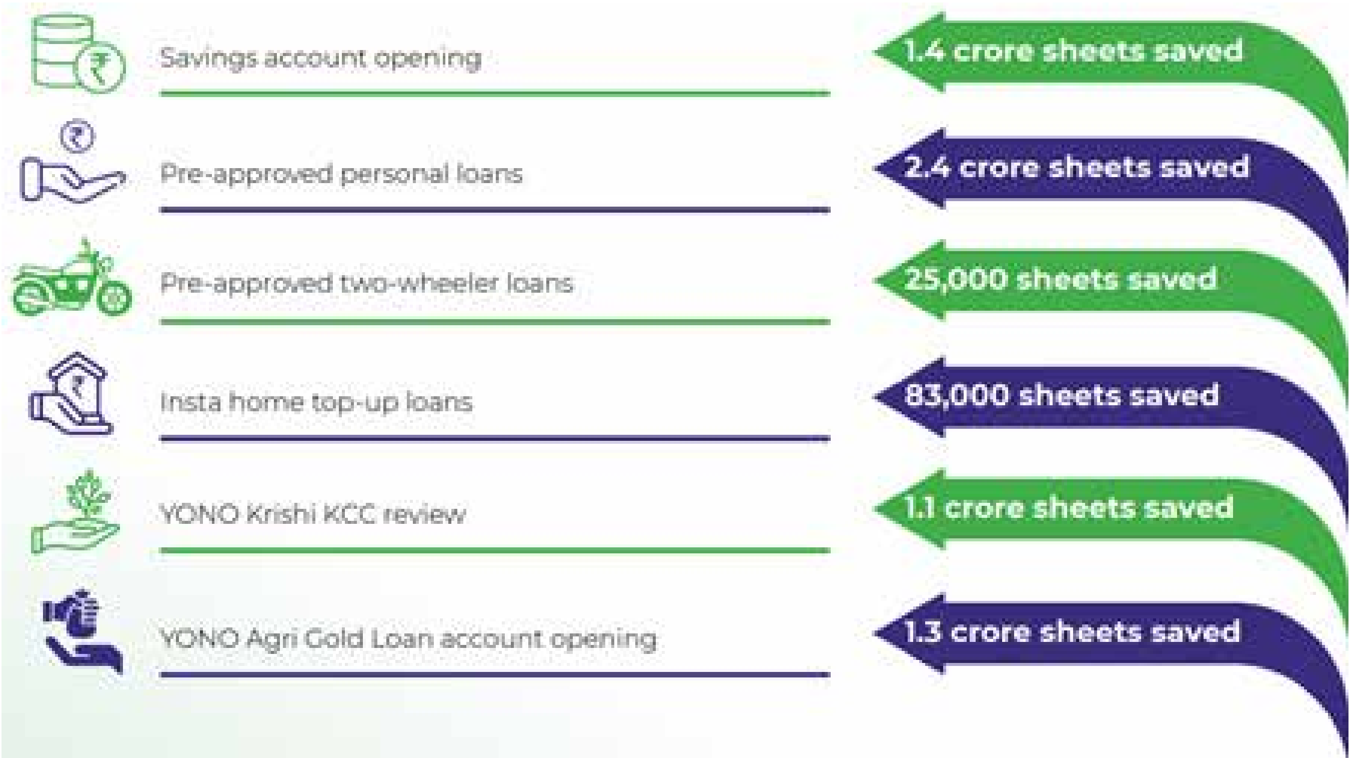
(iv) SBI has installed more than 3000 solar-powered ATMs across the nation as of March 31, 2022.

(v) SBI organized numerous tree-planting drives, and more than 6,45,000 trees were planted in 2022.

- SBI has set a 2030 goal to achieve carbon neutrality.
- The bank has launched YONO ("You Only Need One") products and services like YONO Loans, YONO Cash, YONO Shopping, and YONO KCC, to encourage electronic banking in India and decrease paper use. These products and services also include Pension Seva Portal, WhatsApp Banking, Internet Banking, and WhatsApp Banking.

The graph below demonstrates how SBI has reduced paper use across every process.

Figure 2: Paper Saved In Various Processes With the use of Mobile Banking, WhatsApp Banking, and Internet Banking.



Source: SBI sustainability report 2020-21

- Since FY 2018–19, SBI has issued green bonds totalling US$800 million, of which US$650 million was listed on Luxembourg and the INX Stock Exchange in November 2021.
- Additionally, In FY 2020–21, the Bank raised a green loan for €50 million that will be put to use for a range of renewable energy sources, including rooftop solar power, wind power, ground-mounted solar power, small hydro plants (up to 25 MW), and conversion of waste to energy. As of the end of March 2022, SBI had also approved projects for renewable energy worth 19,766 crores for solar power, 5,077 crores for wind energy, 7,601 crores for small hydro, 28 crores for waste-to-energy, and 2 crores for biomass plants in India. **(Sustainability Report 2021-22)**
- To advance the renewable energy agenda, SBI worked with a number of business associations and organizations, including the Bureau of Energy Efficiency (BEE), the Federation of Indian Chambers of Commerce & Industry (FICCI), the Confederation of Indian Industries (CII), Science & Technology for Society (STS), and BRICS.
- To advance green banking, SBI has also cooperated with international institutions, including the World Bank, KfW German Development Bank, and European Investment Bank.

(i) It partnered with the World Bank to enhance clean energy generation in India, worth US$ 625 million. Under this partnership, more than 400 rooftop solar projects have received approval.

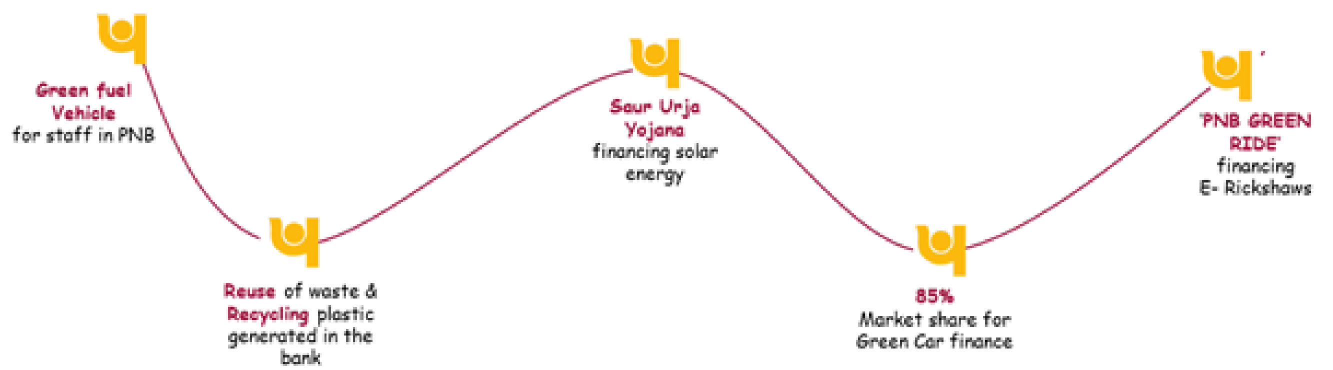
(ii) It has a long-standing partnership with the KfW German Development Bank to facilitate funding for RBI priority sector projects, credit works to incentivize home loan borrowers and builders to choose energy-efficient options, and it has financed Indo-German Solar Energy projects with a combined capacity of 555 MW.

(iii) To reduce reliance on fossil fuels, it worked with the European Investment Bank to finance 4 Greenfield solar installations with a combined capacity of 493 MW.

Punjab National Bank

PNB is another public sector bank that actively participates in green banking activities. PNB has recycled all physical records. The Bank runs Sewerage Treatment Plants in the majority of its buildings and has taken the initiative to recycle wastewater. To boost green energy, a number of programs have been introduced, including funding for electric vehicles, solar panels, solar pumps, etc.

Figure 3: key green banking measures taken by PNB bank.



Source: Author's own creation

- PNB has launched a new program called PNB Green Car that offers a longer repayment time and a favourable rate of interest to finance the acquisition of a new electronic automobile for personal use. PNB Bank has partnerships with eight automakers, including Honda, Maruti, Mahindra & Mahindra, Force Motors, Tata Motors, Hyundai, Toyota, and M G Hector, which together account for 85% of the auto market. **(Annual Report, 2021-22)**
- Solar power installations are financed by the PNB Housing Loan Scheme. The program's goals include encouraging green energy and providing funding for the installation of rooftop solar systems on residential properties.
- PNB has introduced the "PNB GREEN RIDE" programme to finance e-rickshaws.
- To support the green environment, a number of initiatives have been launched, including financing for electric vehicles, financing for the installation of biogas units, financing for solar power projects, financing for greenhouses, conserve soil, provide funding for solar water pumping system installation, etc.
- To save resources, PNB Bank has also adopted several green measures, including digitization and the reuse of e-waste (electricity, water, paper, etc.). Through e-services like UPI payments (PNB BHIM), the adoption of online banking. Green Pins, mobile banking, etc. all promote digital banking.
- PNB is making an effort by installing rainwater collection systems in existing structures and supporting environmentally friendly new developments. Additionally, it raises awareness through our numerous social media platforms with the help of initiatives like the Indian government's "Catch the Rain" Mission. PNB also conducts a number of other green projects, including a tree-planting program and the distribution of e-rickshaws.

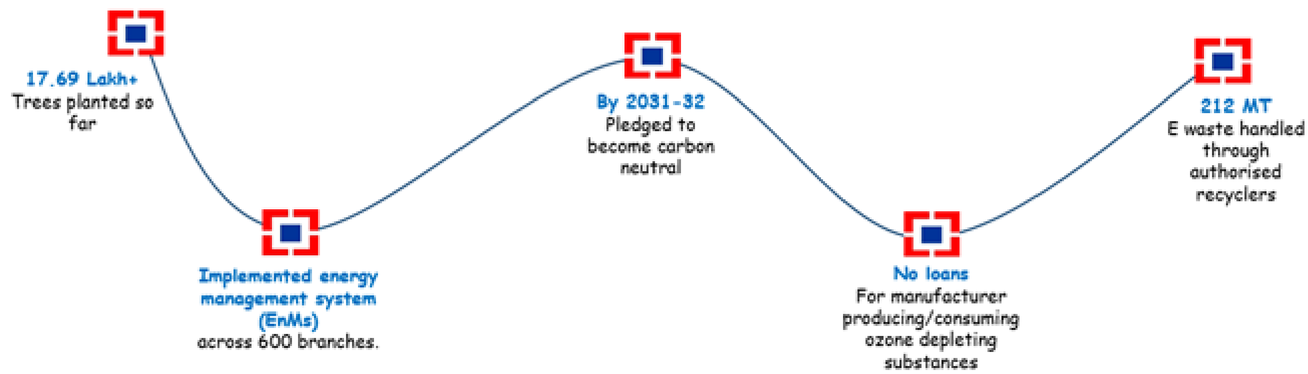
- PNB also tries to recycle waste generated by the bank. They have an organic waste converter for biodegradable waste that turns it into plant fertilizer.

Private Sector Banks

HDFC Bank

By recycling E-waste produced by the bank through authorized recyclers, HDFC Bank has recycled 212 MT of E-waste this year. Employees at HDFC Bank have taken the initiative to plant more than 17.69 Lakh+ trees so far. Among the several other initiatives undertaken by HDFC Banks are the installation of 41,810+ solar lights to improve the use of solar energy, 11,670+ biomass stoves to produce renewable sources of heat, and 10,500+ water conservation structures to conserve water for future generations. **(Annal Report, 2021-22)**

Figure 4: key green banking measures taken by HDFC bank.



Source: Author's own creation

- Through their "green event" effort, HDFC Bank saved around 2.1 million square feet of paper and is a proponent of open disclosure of greenhouse gas emissions. There are actions taken to lower carbon emissions. With 14 HDFC branches using green energy, 905 MT of carbon emissions is prevented annually on 1,028 MWh of electricity purchased. **(Annual Report, 2021-22)**
- HDFC bank has set a 2032 goal to achieve carbon neutrality.
- The bank also acknowledges the need to play a significant role in ensuring environmental sustainability through initiatives including waste management, renewable energy (solar), and urban ecological restoration as part of its CSR activities.
- HDFC bank introduced Green Bonds, which aim to make finance available for ecologically friendly initiatives that lessen the effects of climate change.
- The primary objective of HDFC Bank is to provide funding for environmentally sound projects that reduce the dangers associated with climate change. To reduce our carbon impact, it finances renewable energy and energy-efficient initiatives. Even HDFC clients are urged to practice "green banking."
- Under several ECLGS programs, MSMEs received loans totaling about Rs. 17,100.89 Crore from HDFC Bank, which prioritises lending to small and medium-sized businesses. Among the financial actions the HDFC Bank has made are:

  (i) According to the HDFC credit policy, no funding may be provided for the construction of new manufacturing facilities that generate or use compounds that deplete the ozone layer, as well as for businesses that manufacture aerosols using CFCs.

  (ii) To guarantee that loans are issued to legitimate eco-friendly projects, HDFC loan approval goes through multiple approval processes by a Credit Approver, Senior Credit Approver, senior manager, and the Board member with the requisite approval power.

(iii) For substantial infrastructure and industrial projects with a budget greater than $100 million and a duration longer than five years, the Social, Environmental, Health, and Safety (SEMS) framework is utilised to analyse long-term financing options.

(iv) HDFC Bank employs a framework known as SEMS, which stands for Social, Environmental, Health, and Safety issues, as part of the overall appraisal process of loans. This entails a thorough assessment of the operations of the borrower as well as any potential detrimental environmental and social effects.

(v) SEMS evaluation is carried out in capital-intensive industries, including thermal power, hydroelectric power, roads and highways, power transmission, cement, and manufacturing. Through the SEMS framework, 861 loan proposals were reviewed in FY22.

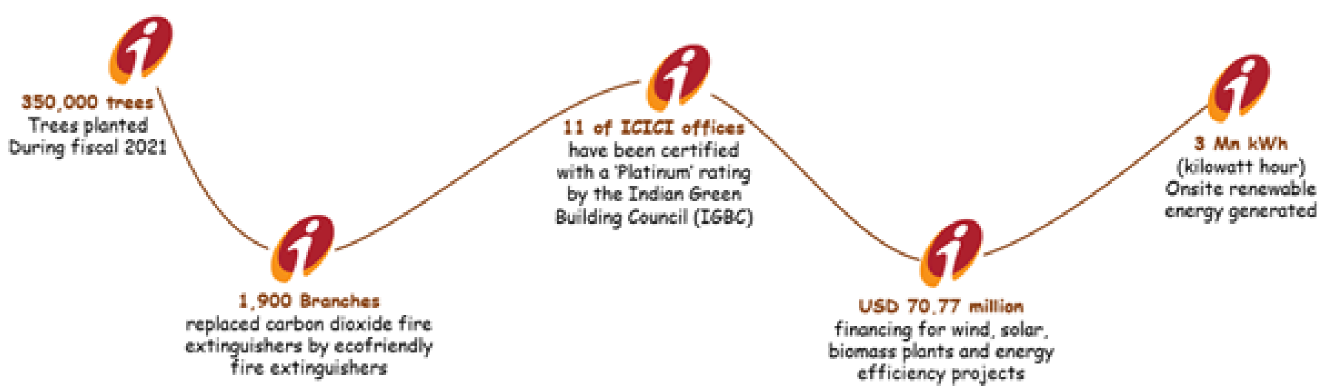
(vi) These loans adhere to the rules established by the RBI.

- In addition to green home loans, HDFC Bank also finances renewable energy projects. It granted loans totaling Rs 14,839 Crore for the production of 5,860 MW of solar and wind energy. **(Annual Report, 2021-22)**
- The largest waste-to-energy facility in Asia is being financed at Indore thanks to a partnership between HDFC bank and Indore Clean Energy Pvt. ltd. This facility aims to completely transform 50% of the city's municipal trash into biogas and manure.

ICICI Bank

ICICI Bank takes action to save the environment from the severe effects of global warming and development. The bank makes significant investments in renewable energy. It generates 11.9 MWp of renewable energy through a variety of sources. It has expanded its ability to produce solar energy by 66% over prior years, demonstrating a significant commitment to the environment. It has taken action to reduce energy consumption. At 1100 branches, approximately 6.52 million kWh of energy was saved this year. **(ESG, 2022)**

Figure 5: key green banking measures taken by ICICI bank.



Source: Author's own creation

- ICICI Bank has implemented digital initiatives to decrease the use of paper in its branches. 9 million pieces of paper use are prevented, saving 1100 trees and 4.5 million litres of water in the process. The bank also utilises paper created from wheat straw or a by-product of agriculture. The use of digital banking has received a lot of attention from the bank. 90% of saving account transactions now take place online, which is a step in the direction of a developed, green economy.

- In 2021, ICICI Bank launched a new initiative by switching out the fire extinguishers in 1900 of its branches for environmentally friendly ones. Environment-friendly fire extinguishers cause less harm than conventional ones. Compared to older models, these eco-friendly extinguishers use 30% less carbon dioxide. Thus, it aids in reducing Green House Gas (GHG) emissions from fire extinguishers by about 70%.
- Around 775,000 trees were planted by ICICI bank in the past 3 years. In 2021, the Foundation planted 350,000 trees. **(Environmental, Social and Governance Report 2022)**
- ICICI bank received 9 awards received in energy management which are National Awards for Excellence in Energy Management 2020, Performance Challenge for Green Built Environment 2020, and UP Energy Awards 2020. 11 ICICI offices totalling 2.28 million square feet have received "Platinum" certification from the Indian Green Building Council (IGBC). **(Annual Report, 2021-22)**
- The bank works to protect the environment by supporting sustainable practises and addressing local environmental issues. It is of the opinion that a greener world can be built by solving local problems. The "Parijat Udyan" (flower garden), a sizable afforestation project, was started by the ICICI bank Rural Livelihood Programme in Fatehpura village in Jaipur district of Rajasthan. The project's goal is to turn 125 acres of waste land into a forest and orchards. Farmers are being encouraged by the ICICI Bank to grow crops that use less water instead of those that use a lot of water.
- In order to manage waste (wet waste, dry waste, and e-waste) generated, ICICI Bank uses a number of programmes. It composts organic waste to recycle it and uses it as a fertiliser in the gardens at different bank locations. The bank controls e-waste by reusing electronic items, donating reconditioned IT assets, using certified recyclers to ensure safe disposal & recycling, and utilising remanufactured toners that have been recycled at least two to three times to reduce our consumption of printer toners.
- ICICI bank has financed projects for creating capacity in renewable energy sectors like hydropower, wind, and solar and other sustainable sectors like waste processing. As of March 31, 2021, the Bank's renewable energy sectors outstanding portfolio was over Rs 31.5 billion. For these specific purposes, it had cumulatively extended loans totalling about USD 70.77 million as of March 31, 2021. **(Environmental, Social and Governance Report 2020-21).**

Comparative analysis

The comparison of green banking initiatives by the four banks discussed in the previous sections is explained in Table 1.

Table 1
Comparison of Green Banking Initiatives by Public and Private Sector Banks

BASIS	**PUBLIC SECTOR BANKS**		**PRIVATE SECTOR BANKS**	
	State Bank of India	Punjab National Bank	HDFC Bank	ICICI Bank
Planting trees drive	More than 6,45,000 trees were planted in 2022.	Planting Saplings drive has been conducted every year	planted more than 17.69 Lakh+ trees	775,000 trees were planted in 2022
Waste Treatment plant	22 sewage treatment units and 15 food waste composting facilities	Sewerage Treatment Plants and recycle wastewater	Recycling E-waste through authorized recyclers	certified recyclers to ensure safe disposal & recycling of waste
Solar-powered ATM installed	Installed 3000 solar-powered ATMs			
Carbon Neutralisation goal	2030		2032	
Applications launched to reduce paper use and conserve energy	SBI YONO app	PNB ONE app	HDFC mobile banking app	iMOBILE pay app
Green bonds issued	Issued green bonds of US$800 million		Issued Green Bonds, to finance ecologically friendly projects	
Green loans raised	Raised a green loan for €50 million for renewable energy sources and waste conversion	Raised a green loan for green cars, Solar power projects, Rain water harvesting projects, etc.	Raised a green loan for renewable energy projects, green homes etc.	Raised a green loan for hydropower, wind, and solar, and other sustainable sectors like waste processing.
Collaboration with other organizations to promote a green environment	World Bank, KfW German Development Bank, European Investment Bank, BEE, FICCI, and BRICS.		Indore Clean Energy Pvt. ltd	
The main initiative taken by the bank for environment	Finance wind and solar power plants in India	PNB GREEN RIDE" programme to finance e-rickshaws	Installed 41,810+ solar lights to improve the use of solar energy, 11,670+ biomass stoves, and 10,500+ water conservation project	1900 branches have installed environmentally friendly fire extinguishers
Awards and recognition	18 bank locations recognized as Green Buildings by the IGBC			Received 9 National Awards for Excellence in Energy Management 2020

Source: Author Compilation

CONCLUSIONS

The banks in India have recently started adopting a new method for running their operations to fulfil their responsibility towards the sustainable environment through green banking initiatives.

After analysing four public and private sector banks in India it can be concluded that the banks in both sectors are implementing mobile and online banking in order to eliminate the need for paper documents, facilitate transactions more quickly, and save time. All four banks have made a variety of efforts, including providing green loans, utilising energy-saving technologies, installing solar ATMs, and launching an awareness campaign. Banks like HDFC and SBI also issued Green bonds, which attempt to make funding available for environmentally friendly initiatives that decrease the consequences of climate change. Some banks have declared goals to become carbon neutral. For example, SBI has set a 2030 aim, whereas HDFC bank has set a 2032 goal. It is further discovered that SBI has shown superior performance and more initiatives in green banking than the other banks. Indian banks have begun to take the initiative toward the achievement of sustainability and have the potential to play an essential role in the growth of our country. If the Indian banks really want to continue supporting the expansion of the economy, they must put up a substantially greater effort in the area of green banking. A green economy can be achieved by different banks taking incremental efforts in the right direction.

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Phool: Journey from Waste to Wealth

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Abstract

With increasing awareness about sustainable living, there are many entrepreneurs who think of innovative sustainable business models but are hesitant to take the initial steps as they are sceptical about the challenges that they may have to face in the journey and where to look for the solutions. Thus, there is a need to document the journey of successful green businesses right from the point when the idea clicked to its transformation in to successful business, their triumphs and low points and what kept them going. This will not only serve to give recognition to these entrepreneurs for their work but will also guide upcoming entrepreneurs. The present work is in this direction. The present case study seeks to document the journey of Phool.co. The objective of the present case study is to examine unconventional business model adopted the company, identify the challenges faced by the company and explore strategies adopted by company to overcome these challenges, and its key success factors.

All the data and information for the study has been collected from the company's website, published interviews of its founders and key managerial personnel. The study revealed that company was able to succeed due to its unique packaging and marketing model. Its ability to innovate new green products such as florafoam, and fleather gave it recognition across the globe. The research findings about the way the founders of Phool toiled day and night and crossed initial hurdles regarding procurement of raw material, technological innovation, and securing finances for the project will certainly serve as a guide to other green entrepreneurs go wholeheartedly in their quest for sustainable living. In future, the work can be extended to comparative study of some more such start-ups to get better understanding of challenges faced by such entrepreneurs and how to resolve these.

Key Words: *Green Businesses, Sustainability, Zero waste solutions, Innovations in Business, Green Manufacturing Processes, Sustainable Business Models, Environment Protection, Eco-friendly Businesses*

1. Introduction

Green entrepreneurs in India are changing the basic network of production, marketing and consumption through eco-friendly concepts utilizing innovative product designs, raw materials, process design and marketing policies. They are the people who recognize the links between innovation and sustainability and thereby develop a comparative advantage for their firms/companies by selling differentiated products and services based on their environmental benefits. They are playing a crucial role towards sustainable economies not just by devising innovative production/marketing

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techniques but also by creating awareness among people at large about sustainable, zero waste living in the long run. Green raw materials in them can either be converted from waste in the environment or are nature-friendly or manufactured and/or packaged in an environmentally friendly way. Over the past decade, India is seeing a lot of Sustainable Startups such as Ather Energy, Phool, ZunRoof, BluSmart, Banyan Nation and many more. Some of these are highly successful and some are not. With increasing awareness about sustainable living, there are many entrepreneurs who think of innovative sustainable business models but are hesitant to take the initial steps as they are skeptical about the challenges that they may have to face in the journey and where to look for the solutions. Thus, there is a need to document the journey of successful green businesses right from the point when the idea clicked to its transformation in to successful business, their triumphs and low points and what kept them going. This will not only serve to give recognition to these entrepreneurs for their work but will also guide upcoming entrepreneurs. The present work is in this direction. The present case study seeks to document the journey of Phool.co.

2. Objectives: The objective of the present case study is to

- Examine unconventional business model adopted by Ankit Agarwal, founder of Phool.co
- Understand the need and importance of green innovations in business for sustainable future to protect the environment, repair damage done to the environment in the past, and conserve the Earth's natural resources
- Identify the challenges faced by the company and explore strategies adopted by company to overcome these challenges (lessons for future businesses)
- Identify key success factors of Phool.co.
- Examine challenges faced by the company due to increasing competition and the strategies adopted it to retain its dominance and future growth plans

3. Research Methodology: As it is an exploratory study, all the data and information has been collected from the company's website, published interviews of its founders and key managerial personnel. However, the study faced a tough challenge in collecting information about its business strategies as it is a privately owned company and not much information is available on public platform.

4. Case Overview:

Background*:* India being the second most populous country in the world attracts a lot of waste daily. Tonnes of waste is produced without having ample sources for the waste accumulation. With this being the major problem it would be great enough to look for a venture that would not only absorb this waste but also produce something that is environment friendly and productive too. Such a case is the company, Kanpur flower cycling private limited now called Phool.co, that has been started with the vision of helping vulnerable people and preserving the river Ganges from pollution.

Spark of the Idea

On the holy day of Makar Sankranti, Ankit Agarwal, the founder of the company Phool observed the floral waste being accumulate around the shore, stinging and wasted. While the blame is put on industrial and agricultural sector for polluting the rivers and water bodies, most of the household and religious waste goes unnoticed. The sight of so much of flower waste polluting holy Ganges stuck his mind. To save the aquatic life and create something new out of these waste flowers, he held discussions with his close mate, Prateek Kumar. Two young minds researched upon the issue and with around 1 year and a half years' research work, the incense sticks company "Phool" came to light. Along with the cause of sustainability and environment protection, the duo wanted to empower vulnerable people.

With the mission to repurpose the waste of places of worship, preserve holy river Ganges and empower women of marginalized communities by providing them a means to earn their livelihood, the company is continuously working under the guidance of Ankit Agrawal, the founder of the company.

5. Business Structure: Phool.co

Phool.co is a private limited company following the B2B as well as B2C business model. The business model of Phool is a circular economy model. The company's business is to collect flower waste and convert these into diverse products such as organic vermicompost, incense sticks, soap, vegan leather goods, and other biodegradable packaging materials.

Founders

Ankit Agarwal: The founder and CEO of Phool.co, has been a bachelor of science in computer engineering from PICT in Pune before going to the masters in innovation management at Symbiosis International University Pune. He started his career as a project in turn at Symantec. Currently holding an automation engineer degree. Ankit has published around 17 research papers and is a patent holder to he is a member of Asia society as Asia 21 young Leader 2016.

Prateek: Co-Founder of Phool.co is an Electrical Engineer from Bharati Vidyapeeth and did has masters from Amity University in the field of marketing. He started his career as a n engineering trainee at Woodgroup Engineering India Private Ltd, later joined as territory sales in charge at Apollo Tyres Ltd, and also founded Berry Tarts LLP in Nov 2014 till April 2017 and joined hands with Ankit Agarwal for the project. Currently, he works as its Head of Operations.

List of Board of Directors: Phool.co having most of its advisory board members from the top companies with excellent experience can boast of solid techno-financial background.

Its founder technopreneurs include:

- Ankit Agrawal (Founder &CEO KFPL)
- Manoj Kumar (Co Founder and CEO, Social Alpha)
- Nathalie Kylander (Managing Director: DRK Foundation)
- List of advisory board members:
- Gary Mao-Co-Founder – TOTO Express
- Deepa lyer-Media Investments – Omidyar Network
- Prashanth Venkatesh Director, Brand Unilever and Sustainability.
- Antoni Gandia-Chief Technology Officer - Mogu S.r.l.
- Vaibhav Lodha Co-Founder – ftcash
- Amitabha Bandyopadhyay-Head of Innovation and Incubation, IIT Kanpur
- Ameya Velankar-Head – Product Marketing, Uber

All these members have contributed immensely to kind of innovations that the company is having in its product line, smooth financing and top class marketing strategies resulting in excellent returns. The vision of Ankur had led to the birth of a company that is working towards environment protection, sustainability and uplifting marginalized sections of the society by giving them respectable livelihood.

The company manufactures and sells a variety of products ranging from incense candles and cones, soaps, essential oils, gift packs etc. The company is continuously upgrading the technology to come up with new products like organic fertilizer, fleather, florafoam to make this world greener and sustainable.

The marketing strategy of the company is a milestone in the marketing of these products. The company follows the social media marketing strategy by promoting its products through online platforms like Instagram, facebook etc. It has added a religious angle to its products by adding a tagline "from the home of the Gods". It is trying to create breed of informed consumers who are willing to pay extra price for the cause of environment.

It can be called accurate master of the behavior and psychology of consumers. Through clear brand positioning, the reasonable target customers, the high end products and innovative marketing techniques like online marketing, special editions during festivals, it is able to increase its market base and improved profits.

6. Innovative Business Model- Financial Strategy, Production Strategies, Marketing Strategy, Sustainability and Social Strategy

The company is formed with the objective of conserving and protecting environment, sustainability, and uplifting marginalized sections of society. It works on circular economy model wherein floral waste generated from religious places of worship is collected and recycled into totally natural and charcoal free products which are handcrafted by women from dalit community giving them respectable livelihood and providing consumers with a natural products and fertilizers.

Financial Strategy

The Challenge

- Raising funds for a venture with idea only

The Strategy

- Start with small model of business idea, go for entrepreneurship model competition
- Move on to Seed funding, and Series A funding

The Idea of converting floral waste into useful products was good but they needed funds to explore ways to turn their idea into reality. Like any startup, main problem here was funds. Ankit and Prateek initially started with personal savings, help from family and friends. With Rs. 72000 and 2 kg of floral waste, they started shaping the model and framework. With this investment, they were able to develop the product. Now, they needed more funding to convert this into a business venture.

Solid technical background, good homework and passion for the idea helped them in funds generation. They started presenting their entrepreneurial skills through their ideas and innovations in various business model competitions that were being conducted by IIM Ahmedabad and IIM Mumbai. Their efforts proved productive and they were able to raise grant of around Rs 20 lakh as grant in January 2016 through IIT KANPUR and DRK foundations.

The daily working capital requirements and operational activities were funded by the company's daily operations. But it came to a stagnation during the covid crisis. Company however overcome those and paced its operations for receiving funds from IAN fund and Social Alpha. It was able to procure capital of $2M.

In 2020, the company came to limelight when it found a loyal angel investor, Alia Bhatt who invested an undisclosed amount in the company. It gave a fame base to the company. It gathered more visibility and funding. The company in its four stages namely grant seed round and series A round has raise the capital of $8M.

Series A funding refers to an investment in a privately held start-up in Company after it has shown progress in building its business model and demonstrates the potential to grow and generate revenue. A startup will generally draw this level of financing only after it has demonstrated a viable business model with strong growth potential. It enables a startup that has potential but lacks cash to support increase in its operations, inventory, equipment and other long term goals. The major difference b/w the seed funding and Series A board is amount of money involved and ownership status. Seed capital is in small amounts whereas Series A funding is generally in millions of dollars. The Series A funding Is often funded thorough VC and PE

The company yielded $8M in Series A round from domestic consumer focused venture fund. The company currently has 28 major and minor investors raising a cap of around $9.4M.

Table 1: Funding secured by the Phool.co

Capital Investment Phase	Source of Funding	Amount Raised
Seed Fund I (2017)	Own Funds	Rs. 72,000
Seed Fund II (2019)	business model competitions that were being conducted by IIM Ahmedabad and IIM Mumbai	Rs. 20 Lakhs

Seed Round through Venture Capital and PE (2020)	Indian Angel Network, The Draper Richards Kaplan Foundation, IIT Kanpur and Social Alpha	$1.4 M
Seed Round (2021)	Alia Bhatt	Undisclosed
Series A funding through Venture Capital and PE (April, 2022)	Sixth Sense Venture and others	$8M (Rs. 605M)

Production Strategy

The Challenge

- Procurement of waste flowers
- Procurement of technology to convert flower waste into natural useful products
- Provide natural, charcoal free products
- Breaking stereotypes about use of waste for something that we use for rituals and personal hygiene

The Strategy

- Convinced the temple authorities "Tera tujhko arpan"
- Exploring available technology and modifying it to suit the needs rather than creating new one
- Searching for all possible options patiently
- Continuous upgradation and innovation

Raw Material: A majority of the raw material requirements of the product is flowers. The procurement of such flowers from temples was not an easy task. Though a waste to be dumped in the rivers or in dumping grounds, Ankit found it very tough to procure that due to the people's sentiments and rituals attached to what has been offered to God. To make it actually feasible for the business idea, Ankit found the way. He managed to convince the temple authorities by saying that whatever belongs to god is his and why not we should return it back to god. He used the phrase "Tera tujhko arpan" from the famous Hindu prayer being enchanted daily in temples. Initially, the company started taking its raw material from the famous Kashi Vishwanath temple where they are able to collect five tonnes of flowers daily. Presently the company collect and recycle 8.4 tons of floral-waste from temples in Uttar Pradesh, India on a daily basis.

During Covid 19, the company had difficulty in getting access to the raw material. Public gatherings were banned and lockdown was announced. Thus, company took U turn and reached the floral farmers who were also facing the problem of not getting potential buyers. Thus company managed its raw material.

Technology

Now, Ankit had the idea, funding, raw material but no technology. To give shape to his idea, Ankit needed technology which could convert flower waste into useful products. In his quest for suitable technology, he met Professor Amitabha Bandyopadhyay, recollected, Professor-in-charge of the Technology Business Incubator of IIT Kanpur. He liked the idea and introduced him to BIRAC funded BioNest, SIIC (Startup Incubation and Innovation Centre) at IIT Kanpur that had all the relevant infrastructure and Ankit was allowed to start using the facilities from the very next day. This is how the incubation of PHOOL started at SIIC, subsequently SIIC helped the company recruit top quality talents from the campus, assigned dedicated infrastructure for the company."

Biotechnology Industry Research Assistance Council (BIRAC) is a not-for-profit Section 8, Schedule B, Public Sector Enterprise, set up by Department of Biotechnology (DBT), Government of India as an Interface Agency to strengthen and empower the emerging Biotech enterprise to undertake strategic research and innovation, addressing nationally relevant product development needs.

Since then the company is innovating the technology and has come up with designed packaging that is too seed based. The company has also developed substitute to thermacol which is the 5th most pollutant substance. With the trend of vegan products, company is also producing fleather with good future prospects.

The R&D department of Phool is their greatest asset. Technical entrepreneurs find fulfillment in developing new goods and finding solutions to issues. They are engrossed in creating a product and not the commercialization of the products. Therefore, one needs to have a balance in green innovations and their marketability for successful ventures.

Products offered

Recycle based industrial company phool as the name suggest is a floral based industry that offers variety of products along its product lying ranging from incense sticks to vermi compost. The company has initiated organic colours made from natural flowers that are chemical free. These don't harm the environment and protects the skin also from the damage that is caused by using chemical colours. The company has also introduced Diwali boxes of seed based crackers and sweets that promote celebrating the festival using crackers to plant trees. The company keeps on innovating new products. Presently, its product offerings include:

Basic Products: The Company initially started with basic products like completely natural and charcoal free incense sticks, incense cones, essential oils, wellness packs, gift boxes, refill packs, décor and Votive

Vermicompost: The vermicompost that Is being created at the company's site is made from mitti. It is rich in minerals and enzymes that energizes the soil. The entire production of mitti is being done using biological methods without having carbon imprints and is free from all types of chemicals and carcinogens.

Seed Based Packaging: A few of the packaging products of the company are made using Tulsi or holy basil seeds which are impregnated in seed paper and ink made from vegan products. The whole process is very convenient. After using the incense, all that the user is required to do is to open and unfold the packaging, bury it in a pot with soil, water it frequently and watch the seed growing into Tulsi plant. So the company is solving the problem of flower and packaging waste. Customers who buy these compostable packages can post pictures of their plants and receive product discounts by scanning a QR code on the pack, which directs them to a microsite.

Florafoam: The company has also developed substitute to thermacol which is the 5th most pollutant substance. The company aims to replace use of thermocol in packaging with florafoam. A 100% biodegradable alternative to the toxic thermocol that is destroying our environment is florafoam. Made from temple-flowers, Florafoam is a high-performing, moldable and durable material. Florafoam is 100% biodegradable and can be buried in your garden post usage. It can be customized to any shape, size, and strength, depending upon the requirement. Moreover, it has superior functionality than traditional Thermocol. It is fire resistant, and biodegradable. Florafoam is certainly an eco-friendly and cheaper alternative to Thermocol.

Fleather/Fashion Industry: With the trend of vegan products, company is also in process of producing fleather with good future prospects. Fleather was a chance discovery which took place while the team was working on their other flower waste-based products. The process to make it is quite similar to curd. They noticed a "dense, fibrous, mat", that was growing on a pile of unused flower fibers and the texture resembled that of leather in appearance, elasticity and tensile strength, and voila! That started the process of research into fleather. It will also help in reducing the poaching of wild animals

Marketing Strategy

The Challenge

Making their space in highly unorganized and price conscious market where one can buy these products at a price as low as Rs. 10 to Rs. 60 was a big challenge

Strategy

- Three Step Unique Brand building: the Name and Logo
- Visual Identity

- A Digital First Incense Brand
- Religious appeal
- Introducing wellness practices, creating multiple usage moments that embrace spirituality
- Targeting young environment conscious people

The name of the company is derived from the Hindi word 'Phool', which means flower. The logo itself appears to be the word Phool with the tagline "Made from the Temple Flowers". The founders of the company wanted to position their brand as unique reflecting the vision of the company-Natural, Environment Friendly, and Social Cause. They are able to achieve this through following three steps:

(a) Natural, charcoal free – Their products made from flowers. Their products are mainly charcoal free. Other charcoal-based incense sticks release sulphur dioxide in the environment.

(b) Unique Packaging – Phool products are packaged in compostable packaging materials. The company uses seed paper that can easily be grown into plants after use.

(c) Moral Booster – Phool products are handcrafted by women from marginalized sections of society. It provides them respectable livelihood which acts as a morale booster for its customers.

Phool has created unique colorful identity through its colorful packaging and website. The packaging includes three components:

- The female image representing the women the company employs to gather flowers from temples
- The river, that the company seeks to protect
- A landscape depicting the temples from which flowers are gathered

The company follows the social media marketing strategy. The company promotes its products through online platforms like Instagram. With more than 46,000 followers, the company's instgram account regularly publishes images of rich cultural heritage, spelling out benefits of herbs and essential oils, Indian festivals and art forms.

During the festivals, it comes up with unique products and branding idea by relating to traditions and culture to promote the products like on Holi, the company created the tagline of # phoolwaliholi. On the occasion of Diwali festival, the company came up with attractive boxes and packaging that can be presented as gifts that are environmental friendly too.

The company has very well used the strategy to retain in the hearts of the Hindus that is a majority of the target population. People in India are emotionally related to their God and most of them perform religious practices and rituals. Therefore, to mark its presence the company offers a variety of products that contain the Tulsi or the holy basil seeds which is worshipped in the Indian culture.

The company has targeted young working professionals of 25-40 years of age who live away from their homes. They have seen religious practices and rituals being performed in their homes, but are not inclined to such practices as they live away from families. However, they may like to light up aromatic candles for relaxation or for aesthetic appeal when friends are coming or for the calming and soothing effect. Phool products are naturally scented, organic, and free from harmful chemicals. So, they are willing to pay extra price for the products.

The company has upgraded its marketing policies over the years. It has followed a variety of strategic to attract the customers. Sustainability is the core focus area of marketing. Following the sustainability marketing, the company has developed seed based packaging that is bio-degradable, can easily be transformed into plants and so environment friendly.

The company is able to carve out a place for itself by aligning itself with religious sentiments, social cause and build a strong environmentally conscious customer base. It is growing leaps and bound with its marketing strategy. Recently, the company has started engaging customers with personalized communication.

With an approximate earning of dollar 15 million the company generates the majority of its revenue through its online platform.

Sustainability and Social Initiative

The products at Phool are handcrafted by women from vulnerable backgrounds who go to collect flowers from the temples. It gives them a respectable source to earn livelihood themselves at the same time managing the waste issue. Phool has employed women from the local villages who used to be manual scavengers. Before joining Phool, these women used to earn their bread and butter by removing human waste from dry latrines and sewers, loading it into cane baskets, and bringing it outside the village to be disposed of. Today, these women are proud of joining Phool, where they have secure bank accounts and access to safe and healthy drinking water and toilets and earn over Rs 7,000 per month.

Competition: Some of the competitors of Phool are Holywaste (Hydrabad), YUVAN (Una), Essent by Urpan (an SRCC initiave under the aegis of Connecting Dreams Foundation), Auruhi Enterprises (Gurugram). However the company with its strong brand image, customer connect, and new green innovations and products is the winner of all.

7. Phool.co - Future Plans

- Expanding Business: Currently the company operates in four cities in Uttar Pradesh. Phool is in the discussion phase with the Government of India to scale up its growth across India. The company plans to expand its business to other countries like Bangladesh and Nepal where they find a good potential.
- Phool Training and Consultancy: Phool is also looking at collaborations /Partnership programs wherein they will collaborate with people of similar vision and help them set up their businesses by sharing their technology and marketing tips through 5 day training workshop at a cost of Rs. 3,50,000 with certain conditions attached. They will not transfer the technology and know-how to other people/organization and will not approach any customers /client in Switzerland and Germany. As a first step for these people to understand the efficacy of product and market dynamics, they are to sell at least 100 Phool boxes. They are not to sell it to their friends/relatives or distribute it for free.

8. Achievements and Milestones

Phool and its founder Ankit Agarwal has received several I**nternational Recognitions** as follows

- United Nations Young Leaders Award for Sustainable Development Goals
- The Unilever Young Entrepreneur Award 2017
- United Nations Momentum of Change Award at COP 2018
- The ‘Goalkeepers’ award by Bill and Melinda Gates Foundation
- GSG Millennial Honour 2018.
- Asia Sustainability Award 2020, Hong Kong
- Alquity Transforming Lives Awards, London
- Breaking the Wall of Science, Berlin
- Wharton India Economic Forum
- BIRAC Innovator Award 2021 for FLEATHER by The Hon’ble Vice President of India Shri Venkaiah Naidu Ji

The company has also been shortlisted recently for THE EARTHSHOT PRIZE for its fleather. Ankit was also mentioned in the esteemed ‘Forbes 30 under 30’ list in 2018.

In its initiative to protect river Ganges, recycle flower waste and provide livelihood to marginalized sections of society, staring with 2 persons and a dream, the company has reached following **milestones**:

- The company has been able to flower cycle 11,060 metric tons of Temple garbage waste till date.
- 110 metric tonnes of chemical pesticides that enter the river through temple waste have been offset;
- 73 households who used to work as manual scavengers now make at least six times as much money after being employed by Phool.
- Phool has impacted 365 families by raising living standards and ensuring steady earnings.
- 1,260 women have been supported through Phool to date;
- After joining Phool, mothers of 19 children who previously worked as manual scavengers have begun enrolling them in school.

10. Summary

The study has revealed that key challenges faced by the company were convincing temple authorities for collection of flower waste, development of technology for converting flower waste to useful products and tapping a price conscious consumer market where their products like incense sticks ranging from rupees 10 to rupees 60. High pricing of Phool products was also a big issue. However, the company was able to overcome these challenges because of its innovative business model, unique product identification strategy, branding the products with the lifestyle of Gen Z and continuous innovations in the products. Its main success factors are:

- ***Business Structure****:* It is a private limited company following the B2B as well as B2C business model.
- ***Finance Strategy:*** Phool came to limelight when the Bollywood actress Alia Bhatt joined as one of the investors has till date raised 8 million dollars in IT series round from 6th sense Ventures. Earlier the company had raised 2.5 million dollars from IAN fund, Tata social Alpha, IIT Kanpur, Draper Richards Kaplan Foundation and Alia Bhatt.
- ***Production Strategy:*** The Company is basically into recycling the floral waste to produce incense sticks and that too hand made. The company offers a variety of products ranging from incense sticks to vermicompost, organic colours made from natural flowers that are chemical free. It generates the majority of its revenue through its online platform selling the pool of its products. In the B2B model, the company generates revenue by providing packaging material and its gift hampers. With its technological innovations, the company has come up with two green products namely florafoam and fleather.
- ***Marketing Strategy:*** Phool follows the social media marketing strategy. The company promotes products through online platforms like Instagram, Facebook and their company website. Company very well uses social media marketing through Instagram handle where it post its products and their benefits as per the occasions. The company generates revenue by selling its product through its online website. The company has a wide variety of products ranging from essential oils, incense sticks, to vermicompost. During the festivals, the company starts special drives to increase consumer base through specially designed products such as Holi colours, diwali candles, seed crackers and much more. Recently the company has come up with two new green product namely fleather and florafoam, a packing material similar to thermocol.
- ***CSR activities:*** By employing a majority of female workers from vulnerable communities, the company is also working towards removing social inequities. In a way, the founders are committed to uplift economically weak groups. Their commitment is evident from the fact that when they had to shut their operations for full 4 months in Kanpur due to massive heat wave, they continued paying the women workers and they expect the same commitment from their partners.

Salient Learnings:

Diversified offerings: One should aim for multiple benefits through the products and do not rely on just one offering.

Patience is precious: one should understand that success is a gradual process. One needs to be patient with the business, and constantly evolve.

11. Implications and Future Directions for Research: The research findings are a morale booster for all the upcoming green entrepreneurs who want to make this world a better place to live. The way the founders of Phool toiled day and night and crossed initial hurdles regarding procurement of raw material, technological innovation, and securing finances for the project will certainly serve as a guide to other green entrepreneurs go wholeheartedly in their quest for sustainable living. In future, the work can be extended to comparative study of some more such startups to get better understanding of challenges faced by such entrepreneurs and how to resolve these. One limitation of the study was that it lacks financial information like sales, capital, profits as it is a private company and financial data is not in the public platform. In future, the work can be extended by collecting financial data through interviews of key company officials to analyze its financial performance.

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Electric Vehicle : Need of the Hour

Dr Vandana Bansal[1]

ABSTRACT

Pollution is becoming a worldwide phenomenon which India is also facing. This problem is resulting in a plethora of problems like breathing and lung diseases, global warming, changes in weather cycles and extremes of temperature among others. Vehicular pollution is one of the major contributing factors for the same. To take care of this rising vehicular pollution, the Ministry of Road Transport and Highways and NITI Aayog has announced that we should increase the share of sold electric vehicles from 1% to 30% by the end of 2030. Electric vehicles (EV) will not only result in a reduction in vehicular pollution but will also reduce the running cost to the vehicle owner. Despite these two major advantages of EVs, India is not seeing an increase in the manufacture and sale of these vehicles. There are a number of problems faced by consumers like very high vehicle cost, no charging infrastructure, etc. For manufacturers it is a capital-intensive project, there is a lack of trained personnel, etc. The study aims to find out government's policies in support of EVs. The focus of the study is how government policies like FAME I & II, PLI, technology innovation platform under the capital goods scheme, concessions in customs duty on imports and softer loans can be used to resolve the issues currently being faced. India needs to become aatmanirbhar in the manufacturing of EVs. Measures like setting up of organisations for research and development with all EV start-ups as members who can divide the cost of research and development amongst themselves are suggested. The paper also throws light on Government initiatives to increase the demand of EVs by giving subsidies, tax concessions and building the infrastructure of charging stations.

INTRODUCTION

Pollution is becoming a worldwide phenomenon which India is also facing We who are living in Delhi experience this problem tremendously. Generally the AQI is more than 250 and at times especially during Diwali the AQI is more than 400. This problem of pollution is resulting into plethora of problems like breathing diseases, lung diseases, global warming, change in weather cycles, extremes of temperature etc. Very soon earth will not be a suitable place to live in and soon maybe we have to carry oxygen cylinders with us. Vehicular pollution is one of the major contributing factor for the same.

To take care of this rising vehicular pollution Ministry of Road Transport and Highways and NITI Aayog announced that we should increase the share of electric vehicles from 1% to 30% by the end of 2030. This is also in consonance with the Paris Treaty adopted by 196 countries including India to limit carbon emissions and there by reduce global warming.

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Electric vehicles will not only result into reduction in vehicular pollution but will also reduce the running cost to the vehicle owner. The petrol prices in Delhi in last three months on an average is almost ₹100 per litre and a person has to shell out Rs 12,000 to Rs14,000 per months if he/she is commuting a distance of an average 30 km per day for work. The EV car will cost only Rs 2900 per month to travel a similar distance. Despite so much of cost saving these EV cars at present make up only 1.5% of total automotive sales. Other advantages of EVs are no cabin noise, less maintenance cost and ease of driving.

OBJECTIVE OF THE STUDY

Despite so many advantages of EV the world including India is not witnessing a spurt in the manufacturing and sales of these vehicles. The objective of this study is to look into the problems and challenges being faced by manufacturers in the making of these EVs. Also, a study has been conducted regarding the reasons for low acceptability by consumers. The study aims to find out government's policies in support of EVs. The focus of the study is how government policies can be used to resolve the issues currently being faced. The study has suggested how budding entrepreneurs can make use of government policies to promote EVs. India needs to become aatmanirbhar in the manufacturing of EVs. Furthermore, the study has suggested what more can be done by the government to support its vision of having 30% EVs on the road by 2030.

This research paper is based primarily on the secondary data collection method. The study's data came from the websites of the "Ministry of Micro, Small, and Medium Enterprises," "Ministry of Heavy Industry," journals, research articles, and other published sources.

LITERATURE REVIEW

"Electric vehicles in India: a literature review" by **Singh *et al*. (2021)** concluded that the higher cost of these vehicles is the major reason for the slower development of EVs in India. This high cost is due to imports, but the article is of the opinion that this cost will be lowered soon by FAME , a government policy on EVs and due to the reserve of lithium found in Bengaluru.

Predicting electric vehicle (EV) buyers in India: a machine learning approach; **Dixit & Singh (2022)** has found the challenges faced by Indian consumers with electrical vehicles. They have also developed a predictive machine learning model that can classify whether an Indian consumer will "buy" or "won't buy" an electric vehicle. Their conclusion was that local conditions and regional variations have a major effect on EV purchases. According to them, charging infrastructure and government subsidies do not affect the purchases of electric vehicles.

A study by **Abhyankar *et al*.(2017)** titled 'All Electric Passenger Vehicle Sales in India by 2030: Value proposition to Electric Utilities, Government, and Vehicle Owners' compared cost of battery electric vehicles compared to ICE vehicles, the reduction in Co2 emissions , the increase in electricity load, impact on the power sector investments ,impact on the crude imports, smart charging capabilities in EVs etc. The study concluded that there can be a reduction of 35% to 37% in C02 emissions in case of cars and 50% in case of 2 Wheelers; crude oil imports will be reduced by 8% by 2030 and 28% by 2050. Also if smart charging is done cost of electricity generation will also go down significantly.

A study was done by **Mishra & Malhotra (2019)** titled "Is India Ready for e-Mobility? An Exploratory Study to Understand e-Vehicles Purchase Intention' to study the purchase intention of Indian buyers. The sample size was 228. The study concluded that Indian buyer is dissuaded by cost of the vehicle and infrastructure problem. According to them only sensitisation of consumer towards environmental benefits can increase the use of E vehicles.

PROBLEMS FACED BY MANUFACTURERS

- The manufacturers have to shift from manufacturing internal combustion engine (ICE) to batteries and electric motors which is very tough. Though all major automakers like BMW, Ford, General Motors and Volkswagen have announced there plans to manufacture EVs due to need of the hour; yet most of them are planning for in- house production due to high intellectual property costs. The process of production is very complex and to develop it is an arduous task. The project is capital-intensive too.

- Manufacturing of electric motors may require more robots. Robots will be required to assemble smaller parts and subassemblies, making connections, pressing the rotor shaft, welding and gluing, plus bolting the body together. Since manufacturing electric motors requires continuous testing & inspection this task may also require robots due to very tight tolerances. Use of robots is not only expensive but may also lead to unemployment in a country like India.
- The startups cannot think of entering the industry because it requires lot of Research and Development, is capital intensive and have to make frequent changes in technology to suit to the needs of consumers. The only silver lining being not having any earlier set up and can easily develop the new systems and technology.
- The manufacturers may develop an indigenous technology by Research and Development. But that too is an arduous task as it requires components like motor test benches mixed signal oscilloscopes, cell battery cyclers. The cost of these components may range from 3 to 5 crores each.
- Another problem being faced by the manufacturers is the vehicle weight because vehicle weight effects the driving range of the vehicle considerably. The electric drive trains and batteries are much heavier than the ICE power trains. This increased weight of vehicle can be counteracted by reducing the weight of vehicle body. This can be done by using lightweight material into the vehicle body but doing this may affect the safety of the vehicle.

PROBLEMS FACED BY CONSUMERS

- **Cost of vehicle**

  The cost of an EV vehicle is much higher as compared to ICE vehicle. Following chart shows the comparative price.

S No.	Name of the vehicle EV	Similar ICE Vehicle	Price EV Rs in Lakhs	Price ICE Rs in lakhs
1	Mahindra eKUV	Mahindra KUV100	8.25	6.18
3	Tata Nexon EV	Tata Nexon	14.54	7.6
6	Mercedes Benz EQS	Mercedes Benz EQB	175	60
7	Motor cycle EV	Motor cycle ICE	1.25	0.51
8	Bus EV	Bus ICE	75	28.36

The cost of an EV is two to three times the cost of ICE vehicle. Secondly after elapse of certain years the battery requires a change which costs around 3-4 lakhs for a car.

- **Range of EV**

  The main problem is of range of an EV on a full charge. For example Car's range is 200 to 300 kms that too in ideal conditions. If the vehicle is loaded the range will be lesser. Also if there is bumper to bumper traffic there are chances that EV owner might be stranded in between.

- **Depleting Battery Range**

  The batteries are Lithium Ion Batteries which become weak with usage. The charging time increases and range decreases and eventually has to be replaced after 8-10 years. This adds to the cost to the owner.

- **EV Battery Insurance**

  50% of the cost of EV is battery and none of the insurance companies cover 100% of the battery. They cover just 50%

- **Lack of charging stations**

  There is a lack of charging stations in India at present. There is no dependable infrastructure. As per the report of The Central Electricity Authority (CEA) India has 927 charging stations nationwide as of June 2020 as compared to the 57,000 petrol pumps in the country. Hence the owner can recharge EV only if charging station is available. Even if charging station is available, the charging will take on an average 3 to 4 hours. On the other hand in case of ICE vehicles it just takes 5 minutes to refuel it.

- **Lack of charging facilities at home**

  EV owners not only face the problem of lack of charging stations they also face the problem of charging at home if they do not have reserved parking.

- **Lack of Standardisation of EV charging ports**

  Every EV manufacturer is having its own type of charging port which is creating trouble both for the consumer and owners of charging stations. it is difficult to set up an ecosystem with proper charging stations for 2 and 3 Wheelers. As far as cars are concerned there is standardization of charging port(CCS-2).

- **Lack of mechanics and skilled labour for EVs**

  The EV technology is in a nascent stage and still there is dearth of manpower to handle any breakdown of any EV. This also effects the decision of buying EVs because if the consumer buy an ICE vehicle he is sure to find a mechanic in case of breakdown which is not the same in case EVs.

- **Not suitable for all parts of the country**

  An EV vehicle has ideal performance in the temperature range of 15 to 40 degrees. Therefore, it is unsuitable for regions like Jammu and Kashmir, Himachal Pradesh, Meghalaya, etc which are very cold and Rajasthan, Kerala, etc where the temperatures are very high.

GENERAL CONCERNS

- **Increase in the demand of electricity**

  If most of the vehicles on road will be EVs definitely there will be an increase in the demand of electricity. This increase in demand for electricity, if it is fulfilled by generation of electricity by burning fossil fuels as is the case now then the very idea of going green is not met. At present most of the charging stations are using diesel generators to generate electricity which is polluting the environment more than an ICE vehicle.

- **Extraction of Lithium and Disposal of Batteries**

  The EV car batteries are made up of Nickel, Cobalt and graphite which are extracted through mining. The mining of these minerals itself is a highly polluting process. Another problem when these batteries reach there end of life; there disposal is a challenge. If during disposal these batteries leak they give toxic gases which is very harmful for the environment.

MAJOR POLICY INITIATIVES BY THE GOVERNMENT

The Ministry of Heavy Industries (MHI) is continuously making efforts that India becomes atma nirbhar in auto sector. To support electric vehicles government has taken steps both to increase the demand of the electric vehicles and also to provide support and various schemes for development of automobile manufacturing units and it's components.

1. FOR INCREASING THE DEMAND

A) FAME India Scheme: Faster Adoption & Manufacturing of Hybrid & Electric Vehicles: This scheme was launched in 2015 to promote EVs in the country. After success of FAME I scheme FAME II scheme was launched and the same was extended till 2024. This scheme has a budget outlay of Rs 10,000 crores and will support 1 million e-two-wheelers, 0.5 million e-three -wheelers, 55,000 e-passenger vehicles and 7,000 e-buses. 10 % of the outlay of this scheme will be used for charging infrastructure. It is envisaged that there should be at least one charging station in 3 kilometre X 3 kilometre grid in the cities and 25 kilometres on highways. The focus areas under this scheme are technology development, pilot projects and infrastructure for charging.

The Ministry of road transport has already invited expression of interest from city municipal corporations discoms oil companies, etc and have selected 2636 charging stations (1633 charging stations will be fast charging stations) in 62 cities after ensuring the availability of land. These entities have to put the charging stations in a time bound manner.

For a clean mobility, Ministry of Heavy Industries and public enterprises has sanctioned 5595 electrical buses in 64 cities./state government entities for intra city and intercity transportation under FAME II scheme Expression of interest were invited from million plus cities and 86 proposals accepted. These buses will result into avoidance of 2.6 million tonnes of CO2 emission.

B) NITI Aayog has released a draft battery swapping policy which will be valid until March 31, 2025. This policy will promote battery swapping which will result in standardistion of batteries.

C) To promote EVs the Delhi government has announced that delivery service providers will be eligible for financial support from the Delhi finance corporation if they convert 50% of their fleet operating in Delhi to electric fleet by 31st March 2023 and 100% by 31st March 2025. This incentive will encourage food delivery, e-commerce logistics providers, couriers to switch to using electric two wheelers. To ensure the switch happens in a time bound manner, all delivery service providers shall be expected to convert 50% of their fleet operating in Delhi to electric by 31st march, 2023 and 100% by 31st March, 2025.The delivery service providers, who commit to achieve these targets shall be eligible for financial support from the Delhi Finance Corporation (DFC).

D) GNCTD (The Government of National Capital Territory of Delhi) has given number of incentives to the purchaser of new electric autos instead of ICE autos . For the purchase of E autos he will be given incentive of ₹30,000 per vehicle on purchase. He will be reimbursed up to Rs7500 for deregistering old ICE auto rickshaw and registering electric auto. The permit to run old ICE auto can be replaced by permit of running of E auto without any charges. Similarly other state Governments have given many incentives.

E) To develop charging points at home and residential buildings Delhi Government has also announced grant of 100% for the purchase of charging equipment up to Rs. 6000/- per charging point for the first 30,000 charging points.

F) Work is initiated to set up charging stations for electric vehicles at more than 30% of petrol pumps all over the country.

G) The Ministry of Road Transport & Highways (MoRTH) has announced that EVs will use green license plates and need not obtain permits in case of commercial vehicle.

H) Most of the states have waived road tax on EVs as advised by MoRTH. GNCTD has also announced that Road Tax and registration fees shall be waived for all Battery Electric Vehicles.

I) Ministry of Housing & Urban Affairs (MoHUA) has amended Model Building Bylaws 2016 to provide for 20% of parking space for charging stations in private and commercial buildings.

J) The loans for EVs will be at lower rate of interest.

K) An individual will get a deduction under section 80EEB of income tax Act,1961 for interest on loan taken for purchase of a 2W or 4W EV upto Rs 1.5 lakh in every financial year.

L) A purchase Incentive of Rs. 30,000/- per vehicle shall be provided by GNCTD to the registered owner of the e-auto. Secondly, an Interest subvention of 5% on loans and/or hire purchase scheme for the purchase of an e-auto will be given. The Registered owner of e-autos will also be eligible for a Scrapping Incentive for scrapping and de-registering old ICE auto rickshaws registered in Delhi of up to Rs. 7,500. Delhi Government has also announced full reimbursement of State Goods and Services Tax (SGST) on the purchase of sophisticated EV batteries.

M) Like Delhi other states have also reduced road tax and have given other incentives.

2. FOR MANUFACTURING

A. A national program on advanced chemistry cell (ACC) was approved by the cabinet in May, 2021 with a total outlay of ₹18,100 crore. This program intends development of manufacturing facilities for ACC in India. At present India is importing ACC. This indigenous production of ACC will reduce the import bills by rupees 1,50,000 crores. Government has already invited proposals from domestic and international manufacturers for setting up ACC manufacturing facilities.

B. PLI Scheme: Production Linked Incentive for Advanced Chemistry Cell Battery Storage (PLI-ACC) scheme: 50% of the cost of EVs consists of batteries. Government has started this scheme to give incentive of 4-6% on incremental revenue to the manufacturers of batteries keeping 2019- 20 as the base year. The scheme has a total outlay of Rs. 18,100 Crores spread over 5 years. The focus of this scheme is to invite Foreign companies to set up factories in India and local companies are encouraged to set up or expand existing factories. Also a subsidy will be given to manufacturers that achieve 60% value added within five years of project commencement.

This scheme intends creating economies of scale and building up supply chain in automotive products. It is expected that this scheme will attract investment of around 1.5 lakh crores and will also create more than 7,00,000 jobs. The scheme is for both existing automobile manufacturers as well as new investors. The scheme has 2 components namely 'champion OEM incentive scheme' and 'component champion incentive scheme'. Both the schemes are 'sales value linked' schemes on various automobile components. The incentives are for a period of 5 years up to FY 2026-27.

C. The Government has allowed 100% FDI in the automobile sector.

D. A Round Table on December 4, 2021 was organised in Goa by Ministry of Heavy Industries to work out strategies to promote adoption of Electric Vehicles in India and attract investment in manufacturing of EVs, batteries and high technology automotive components in India.

E. The automobile industry can make use of technology innovation platform under the capital goods scheme developed by Ministry of Heavy Industries. These are web based platforms which help in identification of technology related problems faced by the Indian industry and find out solutions for the same. These platforms help startups and are a step towards *Aatmanirbhar Bharat* . Six such platforms have been developed by BHEL, HMT, IIT Madras etc.

F. A machine tool park has been developed in Karnataka in over 530 acres of land. The automobile components manufacturers can start their units in this park. It has 158 ready to build industrial plots of various dimensions with concrete roads, footpath, drainage, electricity, water and even bus shelters.

G. Various workshops, webinars seminars are organised by capital goods industry association, Society of automobile manufacturers and other associations for development of automobile industry.

H. Ministry of MSME (micro, small and medium enterprises) has approved a scheme of Micro finance program in association with SIDBI for loan given by it. The MFI/ NGOs which takes the loan has to deposit 10% of loan amount called portfolio risk fund to SIDBI. Under this scheme 75% of security deposit will be provided by Government of India. This scheme is applicable in the underserved states/ underserved districts of other states and is for new industrial estates.

I. Another scheme of MSME is 'Entrepreneurial and managerial development' through incubators. Under this scheme an entrepreneur can apply to a host institution like IIT and develop an indigenous technology or process which can be commercialised in a year. MSME provides financial assistance to such ventures upto ₹62.5 lakh.

J. To meet the credit requirements of MSME units ;it has started with the 'Bank credit facilitation' scheme in collaboration with NSIC (National small industries corporation). Under this scheme the MSME unit can get itself rated by any credit agency which can help it to secure loans easily and at a lower rate of interest.

K. Any registered MSME unit can seek the benefit of 'Raw material assistance' scheme. Under this scheme MSME helps the unit in purchase of raw material both indigenous and imported by providing financial assistance up to 90 days, bulk purchases, cash discount, documentation and issue of letter of credit in case of imports, etc.

L. Another very useful scheme for MSME units is 'Custom duty concession' This scheme is specifically for a manufacturer in automotive sector. Under this scheme the entrepreneur will get concession in customs duty for importing any machinery and equipment for initial setting up of a project. The application has to be sent to 'Department of heavy industry'

M. There are a number of schemes developed by North Eastern Development Finance Corporation Limited (NEDFL) to support development in 8 north eastern states. The schemes are for corporate finance, equipment Finance, Rupee Term Loan , working Capital Term Loan, etc for these states.

N. Self-Employment and Talent Utilisation (SETU) is another scheme for technology driven start-ups. Under this scheme government has given an amount of ₹1000 crores to Niti Aayog to help start-up businesses in technology area.

O. The GST on the electric vehicles is now 5% in place of earlier 12% in case of charging stations.

P. The GST on EV batteries has been reduced from 18% to 5 % in June,2022.

Q. To promote EVs Government has reduced customs duty on nickel ore (key component of lithium-ion battery) from 5% to 0%.

PRESENT STATUS OF EVS IN INDIA

1. A few companies like Battery Smart is providing battery swapping facility for 2 and 3-wheelers, Lohum cleantech is providing facility of recycling of batteries and battery packs using state of the art machines, Nexus Battery is developing nexus solar energy battery, Log 9 Materials is doing research to develop aluminium fuel cells and their lithium battery at present for 2 and 3 wheelers charges in 35 minutes. Several companies are working on innovation in the field of electric vehicles powered by hydrogen fuel cells and solid-state batteries aside from lithium-ion batteries.

2. GreenCell Mobility has started its first intercity e-Bus(NueGo) service with Maharashtra regional state transport corporation (MRSTC)from Pune. Its first electric bus service was launched on 1st June 2022 on the Pune- Ahmadnagar route. The company announced its plans for roll-out of 750 premium AC e-buses across key inter-city routes in southern, northern and western India.
3. Olectra Greentech, the market leader in electric bus manufacturing has developed a truck which is first of its kind with a range of 220 kilometre on a single charge and has a heavy duty boggy suspension tipper.
4. There are many EV startups like Ola, Ather, Pure EV, Hero electric.
5. Revolt RV400 is an electric bike which is gaining good market share.
6. Hyderabad-based start-up BharatMobi have converted a Maruti 800 and Maruti Esteem into electric vehicles. The upgraded vehicle did not affect the overall performance of the vehicles adversely. The cost of conversion is around 5 lacs and other entrepreneurs have follow suit.
7. Another milestone in the development of EVs is the development of e-Amrit web portal by Niti Aayog in November 2021. This portal provides extensive information on EVs. This will help in sensitising the consumers, manufacturers, and service providers.
8. Canadian company Capsolar and German startup Sono Motors are developing a solar powered EV in India.
9. Mumbai-based Atum Charge have installed a self-sustaining solar powered charging station.
10. The setting up of KABIL (Khanij Bidesh India Ltd.), to explore mining agreements with countries rich in these resources, is a beginning. The recent arrangement with Argentina is an encouraging step.
11. ISRO and IIT , Chennai are doing research and have developed a technology to produce electricity from sea water which is a welcome move .

Looking at the various problems faced by the consumers, manufacturers and various Government policies the following measures can help India achieve e Mobility and take care of environmental problems being faced.

SUGGESTIONS

1. It is not possible for a single start-up to buy all the equipment for research ; the material being very expensive , but an organisation can be set up with all EV start-ups as members who can divide the cost of research and development amongst themselves.
2. The manufacturers may make use of government policies like FAME I & II, PLI, technology innovation platform under the capital goods scheme, concessions in customs duty on imports and softer loans.
3. The construction of roof top solar panels and solar-powered EV models is other plausible solution.
4. The Government may do standardisation of batteries and import lithium from smaller countries.
5. Indian Government may also develop Special E-Mobility zones like in European countries and China.
6. Batteries which have reached their end of life should be either reused or recycled.
7. Another method which can be adopted is by putting a surcharge on polluting vehicles and giving a rebate to the efficient ones.
8. Technological changes can be made by research and development and promoting start-ups through more schemes of *atmanirbhar bharat*.
9. India can develop indigenous technologies to replace lithium batteries with aluminium sodium or zinc based batteries. This will not only reduce the cost of EVs but will also reduce the chances of

leakage of batteries thereby increasing the pollution

10. The Government has to also update its e-waste management policy.
11. The government can also think of building rooftop solar power roads which can also provide shelter to the roads thereby reducing the maintenance cost as suggested by scientist of Bharatiya scientists at Gujarat Energy Research and Management Institute (GERMI). These roads can be on PPP basis.
12. Another very important suggestion is to create awareness amongst the consumers regarding the cost of EV vehicles in the long run. This can be done by advertising in the radio , TV channels , newspapers and other social media.
13. 2 and 3 Wheelers can have detachable batteries
14. Another option is we can develop the technology of hydrogen fuel battery.

CONCLUSION

Though the path of EVs is fraught with innumerable challenges, there are solutions as well. These teething problems can be resolved by making use of government policies and creating awareness amongst consumers. Our budding entrepreneurs can start making parts for EVs which is an area unexplored till now and help India move towards an atmanirbhar Bharat.

Though the disposal of batteries will be a challenge; yet to conclude EVs are need of the hour and must be promoted.

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E-Commerce : A Route to Atma-Nirbhar Bharat Vision

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Abstract:

The dreadful impact of covid-19 pandemic cannot be overlooked worldwide. The world saw the dramatic consequences of the unpredictable event on lives and livelihood. It lead to deteorating socio-economic activities with complete shutdown and lockdown situation across the world menacing the businesses ,businessmen and the consumers altogether. However In such a frightening scenario e-commerce proved to be a boon to an Indian economy. China ,being the first economy that was hit by corona virus ,dragged itself to the leading position in terms of economic recovery. This recuperation was pitched due to self-reliance concept in their economy. Realizing the importance of self-reliance , India took various initiatives to promote self reliance in the economy-such as Vocal for local, Make in India and Atma Nirbhar Bharat. With the copious labour force , innovations , digitalization and technological upgradations e-commerce has helped not only the consumers but also Indian markets to get back in the saddle and is aiding Indian economy to become more self-reliant and make Atma-Nirbhar Bharat. In this context, the present paper attempts to study the emerging trends of e-commerce and various employment and livelihood opportunities it seeks to create. It examines the post-covid impact of e-commerce in revival of economy and its potential to accomplish the objective of Make in India. This research is focused on analysing how e-commerce can create and achieve the motive of Atma-Nirbhar Bharat.

Keywords: Covid-19, e-commerce, Atma - Nirbhar Bharat, self-reliance, innovations technologies, Make in India.

Objectives:

1) To study the emerging trends of e-commerce in recent years.
2) To identify the role of e-commerce in achieving goal of Aatmaa- Nirbhar Bharat.
3) To identify the strength of E-commerce in revival of Economy after Covid-19
4) To examine the potential of E-commerce in achieving the objective of ' Make In India.'
5) To study how e-commerce may emerge as a tool to develop the economy sustainably

Introduction:

The world has seen extensive disruptions in the wake of Covid-19.Major economies of the world were doomed.

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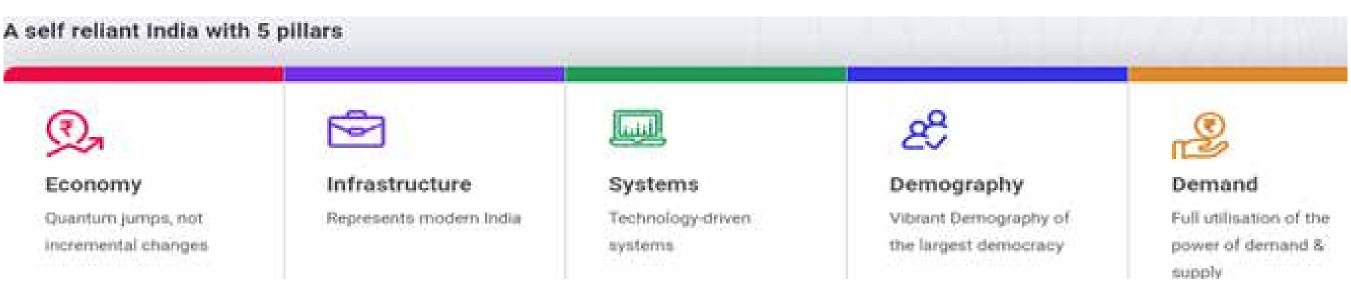
There were no social contacts and economy went on ventilator. During this period India's economy too faced commotion and reached to a shrieking rest. According to the data issued by the ministry of Statistics and programme Implementation, the economy of India contracted by 23.9% in the first quarter of 2020 leading to the worst. The Other two countries which were acutely affected by corona virus i.e., Italy and USA encountered a decline in GDP by 17.7% and 9.1% respectively. Although China was the first nation to be strike by corana virus, It managed to convalesce at the earliest in comparison to all the economies of the world. In comparison to the year 2019, China's output grew by almost 5% (approx.) in quarter 3 of 2020.This positive outcome was due to the self reliance policy adopted by China. This achievement of China made India introduce the notion of self –reliance in its economy .Being a large importer of raw material and finished goods ,India too found itself in challenging situation in the midst of pandemic where imports globally became paralyzed. However India saw an opportunity in this face of adversity and manifested to work towards becoming self-reliant. E-commerce is one such tool that acted as saviour in such difficult times. Over the last 5 years , the India e-commerce industry has observed a upswing with significant assart for future growth. According to a report ,e-commerce market is approximated to extend upto 300 to 350 million buyers by 2025.

Facts about Atma-Nirbhar Bharat campaign:

Atma-Nirbhar Bharat is a self reliant campaign in India ,contemplated by hon'able Prime Minister Shri Narendra Modi on 12th May 2020.The scheme was initiated with the vision of new self-reliant India. The scheme was announce with the special economic and comprehensive package of INR 20lakh crores – equivalent to 10% of India's GDP to fight COVID -19 pandemic in India. The main objective behind launching of the programme is to make India and all its citizens self-reliant in all aspects. He further highlighted 5 pillars of Atma-Nirbhar Bharat, which are:

1. Economy
2. Infrastructure
3. System
4. Vibrant Demography
5. Demand

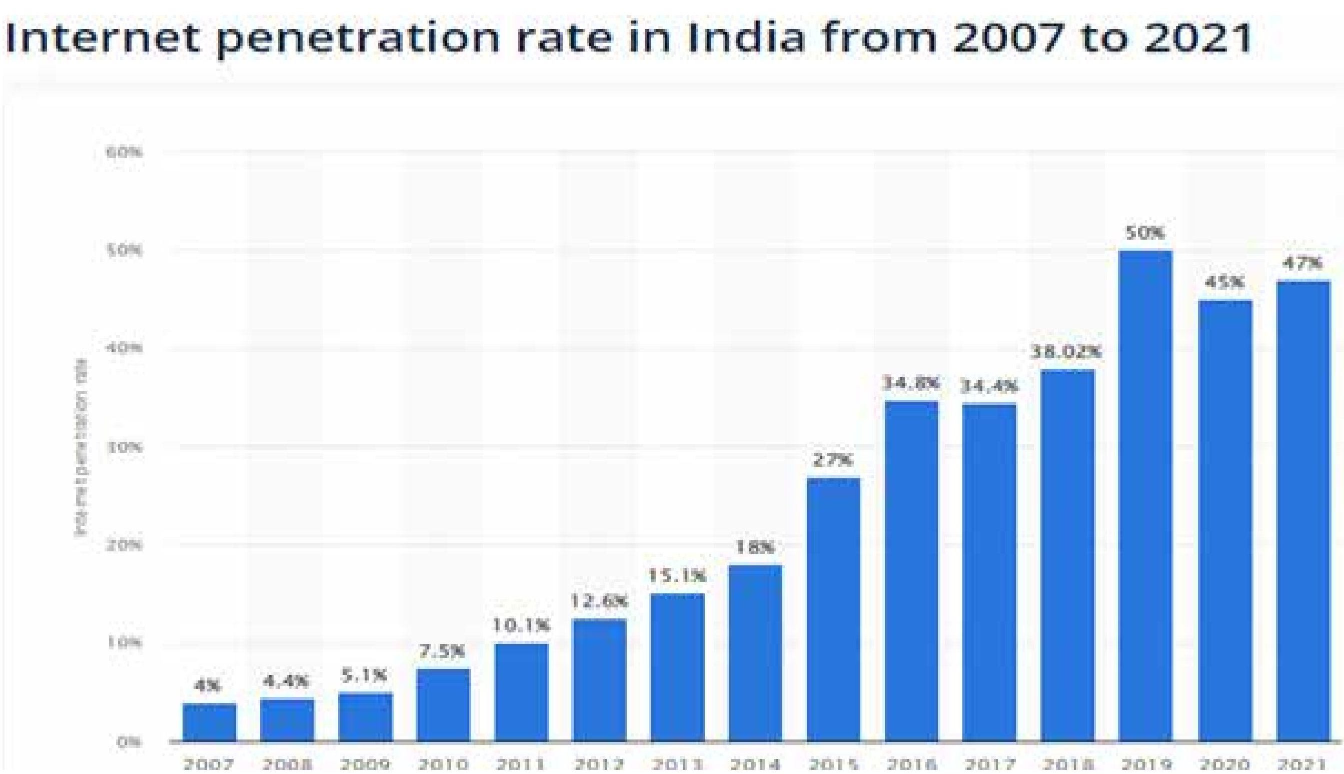


The Atma-Nirbhar Bharat incentive package consisit of the following 5 tranches:

1. Business including MSMEs
2. Poor,including migrants and farmers
3. Agriculture
4. New horizons of growth
5. Government Reforms and enablers

Internet and smartphones penetration – A Boost to E-Commerce

According to a report of IBEF.org ,e-commerce market is growing at fastest pace in India. The E-commerce ecosystem is emphatically supported not only by favourable FDI policies , attractive opportunities, and amplified investments but also by a persistent addition in internet facilities and smartphone users. According to the report of India Brand Equity Foundations the count of internet connections increased significantly to 830 million in 2021 pushed by the 'Digital India Programme', out of which 55% of the connections were in urban area, out of which 97% of the connections were wireless. Also the use of smartphones is majorly been impacted, which is expected to reach 100 crore by 2026. This is the reason why India's digital sector is blooming up and is expected to reach Rs 82.49 (lakh crore) by 2030. According to the report, Internet penetration rate went up to nearly 47% in 2021 which was just 4% in 2007.This shows to what extend percentage of population using Internet has increased post-covid situation.



Due to this increased internet dependability of Indian citizens, pandemic scenario and digital transformation consumer consumption pattern has undergone a drastic change. Consumer predilections are moving from shops, supermarket and shopping malls to online platforms to buy their all needs ranging from basic primary needs to branded and luxury goods. Vulnerabilites during pandemic hasten this shift in a more notable manner as due to the situation of complete shut down consumers could easily get their needs fulfilled sitting back at home that too with widened choices.

E-commerce market by 2030

"E-commerce will play a key role in the Indian governments's vision of 'Atmanirbhar Bharat' (self-reliant India)as more homegrown brand scale up and go global, leveraging digital infrastructure", said by Amit Agarwal, global senior vice president and country head of Amazon

India. He further said that "e-commerce is at nascent stages in India given that it is hardly 3% of country's total retail consumption". There is drastic change in terms of trading and commerce practices in India. Rapid increase in internet users and smartphone penetration, increase in income and digitalization has paved way for development in e-commerce market in India. Various segments like business to business (B2B), Direct to customer (D2C), Consumer to Consumer (C2C) and consumer to business (C2B) have been uncovered. There has been immense growth in major sectors like D2C and B2B recently. Growth in D2C market in India is expected to reach Rs.495000 (in crores). The e-commerce market countrywide is expected to reach Rs.2887500 (in crores) by 2030 and will observe the growth of 21.5% in 2022 thus reaching Rs.617100 (in crores).

Atma-Nirbhar Bharat vision through E-commerce:

India has a well built local MSME ecosystem. It possess large workforce ,frequent innovations and there exist regular upgradation and acceptance of technology not only by the customers but also by the big and small enterprises. The government look upon to position India as a favourable landing place for investment by strengthening the domestic business and production and boosting up the exports. E-commerce act as a potential ally to support this vision of the government. The Indian SMB (Small and Midsize business) is distinctive in its entrepreneurial force. It is observed how over the time STD booths developed as mobile recharge centres; transformation of stationary shops to digital printing centres and it can be very well noticed how kirana stores are revive themselves into digital business by selling to customers against digital payment, providing doorstep deliveries ,coming up as delivery and pickup points and many more.

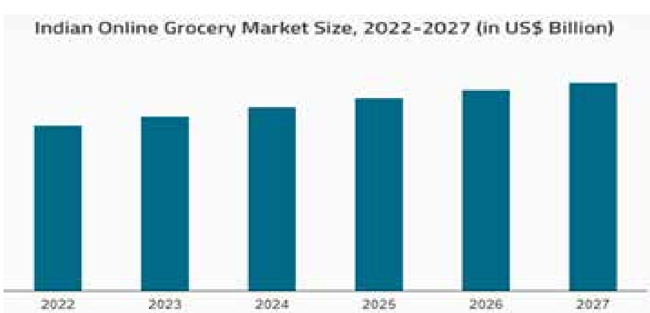
Investmesnt in E-commerce is generating extensive employment opportunities as well as various livelihood opportunities. It allows Business to Customer exports through E-commerce and thereby merging MSMEs on national and worldwide level. As per one of the reports India's revenue accounts for Rs.7013350 (in crores) from E-commerce sector today .It provides employment to 50 million people and joins India's ecosystem of 30 million SMB (Small and Medium Business) to its customers.

FDI in e-commerce

FDI in e-commerce has provided for smooth and extended infrastructure for supply and delivery. It has opened new doors for encouraged production activities and provided for innovations so that consumers all over the world that are serviceable get access to similar product and services. FDI in e-commerce provides new opportunities for manufacturers and more choices to consumers. It generates more employment opportunities and promotes the comcept of "Make in India". This not only increases the national product of the country but also accelerate exports and makes our country self – reliant ,where it becomes capable of satisfying majority needs of its people.

E-commerce in grocery market:

Rapid urbanization, greater consumer awareness, increased digital literacy, more internet accessibility and consumer response during covid-19 are the major factors responsible for pushing the Indian online grocery market to new heights. Sellers are able to break off their stock without very large infrastructure and are able to make contactless deliveries. Consumer on the other hand can get fresh groceries at their door step. Various innovative business models like slotted delivery,on demand delivery models have been adopted. As per the report of IMARC, value of online grocery market of India is expected to reach INR 233418.400 (in crores) from INR 42100 (in crores). The data above shows all the possible prospects that e-commerce holds to bring in near future.



Major Investments:

Various recent investments have been undertaken by the e-commerce market of India which are discussed below :-

- One district One product bazaar was initiated by Amazon India , in February 2022, in support of MSMEs.
- The "sell back program" was started by Flipkart in second month of 2022 to allow buying and selling of smartphones.
- In January 2022, Walmart invites Various Indian sellers were invited by Walmart to unite its US market with the objective of allowing export of US$ 10 billion i.e. Rs. 82480 (in crores) from India every year by 2027.
- Expansion of grocery services has been introduced by Flipkart in 2022 (January).It will also be providing its services to 1,800 cities of India.
- Memorandum of understanding has been signed by Amazon India with Manipur Handloom & Handicrafts Development Corporation Limited (MHHDCL), which is a Government of Manipur Enterprise to provide assistance to the development of artisans and weavers all over the state.

These investment initiatives clearly reflects the willingness of the economy to adapt to e- commerce in different ways and response of the consumers suggests the future growth that can be forecasted via e-commerce. It clearly reflects that e-commerce has a great potential to act as a support system for the development of an economy.

Conclusion:

Based on the above information , it shows that the E-commerce is a potential source to achieve the objective of self-reliant India. Consumers prefer more of digital ways of buying than offline purchasing. E-commerce has become an important source to create employment and livelihood in various sectors and is expected to create new ways and opportunities for manufacturers as well as the consumers. E-commerce has made the citizens more independent and has provided them with widened choices of goods and services. E-commerce has boosted up the exports and has made significant contribution in reducing the imports through "Make in India" programme. E-commerce market and trade holds significant future possibilities to lead the economy towards growth and development and make India a complete "Atma-Nirbhar Bharat".

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Sustainable Accounting Control System for Aatmanirbhar Bharat

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Abstract

Recent business failures and corporate scandals, the world over, and particularly in India, point towards greed and financial irregularities by top leaders of these corporate entities. In the post-covid crisis scenario, when many businesses suffered because of lockdown, all that is needed is revisiting of governance model and make it more purposeful and achievable for a new beginning which is free from corruption envisioned by Prime Minister Modi for Aatmanirbhar Bhatat. Since manipulation of accounting practices and reporting are at the core of most of these frauds and they are committed by not only non-owner mangers but also by owners, the corporate governance framework needs to be examined for the Sustainable accounting practices specially accounting control system. The study recognizes four most important entities- top managers, statutory auditors, members of audit committee and independent directors, who are most important entities in management and control by exercising internal control as well as external control. The methodology has been administered by developing a structured questionnaire to gather responses on perceptions and attitudes of the four entities. The principal component analysis and factor analysis gives the measurements of various significant factors of this framework. Four indices are constructed at two levels, the most important being Index of Accounting Control System (IACS). Major findings of the study suggest that Index of Adequately Safeguarded Assets (IasA) and Index of Simplified Transactions (IsT) are important factors of accounting control system for effective corporate governance. The main contribution of the study is, whereas extant literatures focus on internal control only, this study brings in the role of external control too in minimizing the fraud risk factors. Hence, the earlier studies done in the corporate governance framework do not explain the framework adequately; whereas the present study explains satisfactorily the framework of sustainable accounting control system for aatmamirbhar bharat.

Key words: Internal Control, External Control, Independent Directors, Members of Audit Committee, Statutory Auditors, Fraud Risk Factors.

1.0 Introduction

Corporate scandals and failures have become a routine phenomenon in corporate affairs of India. Recent one to join the long list of such failures is Vijaya Mallya's Kingfisher Airlines. Vijaya Mallya, known as 'King of Good Times', is despised for his flamboyant lifestyle. He has a total debt of $1.3 Billion from various banks. He is a recklessly selfish criminal, who misused money that does not belong to him (Nag, 2017).

The latest scandal discovered in 2018, has Nirav Modi at the centre of it who became the first Indian jeweller to be featured on the cover of Sotheby's and Christie's auction catalogues in 2010 has been involved in India's biggest banking fraud to the tune of Rs. 11,300

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crore at Punjab National Bank. He with his uncle Mehul Choksi connived with certain bank officers for fraudulently issuing Letter of Undertakings which has prompted Serious Fraud Investigation Office (SFIO) to investigate the group companies for possible fund diversion (Business Today, 2018).

Not very long ago in 2009, failure of Satyam has been an example of how greed of individuals like Ramalinga Raju, resulted in India's biggest corporate fraud known till that date, to the tune of Rs. 7000 crores. This happened due to the falsification and window dressing of its (Satyam's) accounts. It was also a case of complete failure of Sustainable corporate governance (Bhasin, 2015).

As we discuss these scams, the concept of accounting malpractices comes into the forefront. This concept has become all the more relevant in the light of various scams world over including Enron and WorldCom in US and Satyam in India.

Through the extant studies, it appears that business practices have emerged from implications of corporate governance norms under Clause 49 of listing agreements and later the Listing Obligations and Disclosure Requirements (LODR) enactment. The available literature makes it appear that the legal framework makes corporate scandals happen and are still taking place because of ineffective accounting practices. The problems of corporate failures are attributed to the conflicts between ownership and control which essentially may not be the case. It is assumed that non-owner managers do not look after the interest of owner non-managers. Whereas in recent times, the accounting scandals and the complete undermining of the accounting system has been done by the owners (Satyam is a case in point). At times there is an ethical breach on the part of the owners. With this background in view, this study attempts to look into the role played by top industry players- Top Managers, Independent Directors, Members of Audit Committee and Statutory Auditors in developing the Sustainable or Ethical Accounting Control System.

This study focuses the perceptions of top management and other three entities of accounting control system in particular as they are responsible for Sustainable corporate practices. To become sustainable, it essentially has to be ethical. The sustainable corporate practices include many dimensions, for example corporate governance, structural processes, legal aspects, accounting disclosure norms etc. We restrict our study to most important dimension of accounting practices, i.e., its accounting control system. The study is restricted to the four most important entities responsible for direction and control in the accounting control system, namely, Top Managers, Statutory Auditors, Members of Audit Committee and Independent Directors, who build the corporate governance framework.

Aatmanirbhar Bharat means we are trying to make India more self-reliant by recovering from corporate corruptions and failures. This will lead to ethical as well as sustainable model for healthy accounting practices. Developing sustainable model of accounting practices is essential for an Aatmanirbhar Bharat envisioned by our Prime Minister Narendra Modi. How the internal and external control of accounting control system (ACS) is tapped through the four entities for containing accounting frauds, what are the significant factors such as Fraud Risk Factors responsible for Protecting Organization Assets and measuring the impact of these factors will be the central theme of this study. However, this study is restricted to the Indian scenario as per the theme of self-reliant India.

Accounting control system is defined as methods, procedures that form the complete internal control system of an organization. This system is concerned with:

1. Ensuring compliance with accounting policies and procedures
2. Protecting the organization's assets.
3. Preparing reliable and timely financial reports (Business Dictionary, 2018).

The above definition takes into the narrow definition of accounting control system whereas this study takes into account the broader outlook of control which is two pronged, **internal** as well **external**.

The present study recognizes that sustainable accounting control system can be developed by taking into account both internal and external control. An important factor contributing to the integrity of the financial reporting process is the tone set by those in management and control of accounting information and internal and external framework of the accounting control system. It is dependent upon perception of the top management, independent directors, members of audit committee and statutory auditors (others not included for the purpose of this study). These perceptions are based on the organizational climate and culture created by these entities which in turn depends considerably on the code of ethics being created in the institution and not thereby dependent on their personal ethics.

1.1 Research Objectives

The specific research objectives examined in this study are drawn from the investigations discussed above.

The objectives are:

1. To identify the significant factors of minimizing fraud risk factors for Sustainable accounting control system.
2. To measure the significant factors of minimizing fraud risk factors for Sustainable accounting control system.

1.2 Literature Review

Global Scenario	
Cadbury Committee Report, UK (1992)	The first reference about the ethical or sustainable framework of accounting practices that we can find in literature is about Cadbury Committee report, UK, 1992. This report was published following the scams in late 80s and early 90s. Its objectives included: "(i) uplift the low level of confidence both in financial reporting and in the ability of auditors to provide the safeguards which the users of company's reports sought and expected; (ii) review the structure, rights and roles of board of directors, shareholders and auditors by making them more effective and accountable; (iii) address various aspects of accountancy profession and make appropriate recommendations, wherever necessary; (iv) raise the standard of corporate governance; etc.". (Cadbury, 1992) (p. 10)
Galloway (1994)	Galloway (1994) developed a control model which can be discussed in perspective of financial reporting. He defined control in a new way. He says that a control as a comprehensive term has foundation on three legs – process of control should be right; it should be done in a way to survive or it needs to be viable; and doing the right thing ethically. If auditors do so at local level, they play a vital role in avoiding bureaucratic problems of control. The complex problem is solved at the very level it belongs, i.e., at the local level (Galloway, 1994).
D'Aquila (2001)	The organizational climate created by top management and those in control is most important. "This tone should be communicated through management's own actions as well as through management's expectations of the employees" (D'Aquila, 2001) (p.236).
Sarbanes-Oxley Act (2002)	The enactment of Sarbanes-Oxley Act (2002) highlights the importance of internal control environment and the ethical aspect attached to it. It was only after this, that external auditors were expected to specifically design their audit procedures to detect all frauds (Wagner & Dittmar, 2006).
Castka & Balzarova (2008)	At the same time, farsighted organizational leaders recognize that lasting success must be built on credible business practices and the prevention of such activities as fraudulent accounting which contributes to sustainable development. At the same time, it encouraged the development of national standards that are more specific and more demanding (Castka & Balzarova, 2008).

Sinnet (2009)	Sinnett (2009), in his article "Does internal control improve operations and prevent fraud?" says that Sarbanes-Oxley Act, 2002, requires that a complying organization should identify a framework of internal control for its use. However, it was also felt that compliance had resulted in unintended consequences, such as excessive costs, diversion of management attention from running the business and a changed relationship with their external auditors.
ISO 26000 (2010)	Next important reference is about ISO 26000 which was brought in 2010. Organizations around the world, and their stakeholders, are becoming increasingly aware of the need for and benefits of socially responsible behavior. The objective of social responsibility is to contribute to sustainable development. Pressure to do so comes from customers, consumers, governments, associations and the public at large.
Indian Scenario	
Gupta (2009)	In the Indian Scenario, for over two decades since April 1998, releasing a Task Force report entitled "Desirable Corporate Governance: A Code", which outlined a series of voluntary recommendations, Confederation of Indian Industries (CII) has remained in the fore front of establishing corporate governance norms. Most of its codes were incorporated in SEBI's committee headed by Kumar Mangalam Birla and later in Clause 49 and Listing Obligations and Disclosure Requirements (LODR), 2015 of SEBI. The quality review board, set up by the government in July 2007 reviews the quality of services rendered by the members of the Institute of Chartered Accountants of India (ICAI) (Gupta, 2009). Securities and Exchange Board of India (SEBI) too works hand-in-hand to ensure effective governance. CII, Narayan Murthy Committee and Naresh Chandra Committee which all led to formation of famous Clause 49 Guidelines of Corporate Governance.
Mandal (2012)	According to Mandal (2012), there must be three elements in the ethical process for principle-based accounting: 'What to act', 'How to act' and 'By whom to act' of operating system. It is also important that value system and ethical standards of management people as corporate participants should be of high level. "The key elements of good corporate governance of corporate participants are honesty, integrity, mutual respect and transparency." (Mandal, 2012) (p.345) It is believed that Indian ethos of value-based ethics and spiritual approach is beneficial to all.
Ravi (2016)	KFA had many corporate Governance issues relating to number of board of directors, transparency in financial reporting, unpaid salaries of employees, non-compliance of Provident fund norms, non-compliance of deposits of TDS of income-tax authorities and many other corporate governance issues. The role of the banks in granting the loans to KFA seems questionable in many cases. Mallya according to reports provided 'personal' guarantee to SBI and Punjab National Bank by mortgaging Kingfisher Villa in Goa, his family home and Kingfisher House in Mumbai. But the value of the properties is so meagre that one wonders how commercial banks have extended such huge loans on such properties." (Ravi, 2016)
Murthy (2007)	The emphasis has been how managers can improve ethical leadership by learning about their own values. How they perceive their environment and effects of their perception on employees have been well documented. Most of these studies were talking about business ethics as personal ethics, until a path breaking study by Murthy (2007), "Business Ethics and Corporate Responsibility- A New Perspective". The paper stresses the need to understand business ethics as organizational ethics. It is this understanding of business ethics that has been used in this study. (Murthy K. V., 2007)

1.3 Present study

An important purpose of sustainable accounting practices is to provide structure that works for the benefit of everyone concerned by ensuring that the enterprise adheres to accepted ethical standards and best practices, as well as to formal laws and regulations. It also places emphasis on economic efficiency and catering to welfare of shareholders. These functions are prescribed by Company Law, regulations and codes of practices.

It has been found that even the best practices could not prevent the frauds as has happened in WorldCom, Enron, & Tyco at global front and Satyam-Maytas at domestic front in India make the Corporates Unsustainable in the long run. The root cause of corporate troubles lies in the problem of corporate governance, concerning ethics, morality and legality of governance.

Goals must be honest, inclusive of all stakeholders and the society where it operates. There could be a scenario where business may target faulty goals despite the best intentions of top executives and hence the business finds itself in trouble. Here is the role for Sustainable accounting practices to put a check on these faulty goals. Sustainable governance has been found to take care of compliance with legal system. The framework should be about ethicality of systems and resources being employed by the company; the quality and value system of the people who run the company; and the sensitivity of the board for its stakeholders and the society it serves.

The paper ponders over sustainable accounting control system by restricting the study to fraud risk factors which can prevent accounting failures and thereby scams.

We are looking at the possibility of preventing frauds and financial irregularity by developing a framework which focuses at protecting assets as pointed in the definition of accounting control system by minimizing fraud risk factors. This is done by gauging the perceptions of four important entities of accounting control system both internal as well as external control.

1.4 Basic Construct: The Questionnaire

The questionnaire is designed to draw out responses from the four concerned entities- Top Managers, Independent directors, Audit Committee Members and Statutory Auditors. On the basis of their perception, experience and understanding, the attempt is to verify, test and validate the construct of corporate governance framework as applied to accounting control system. The questionnaire is attached as an Appendix to this paper[5].

Data and Sample

The whole study is based on Primary Survey. For data collection and sampling, proportional sampling technique has been used to collect the data. The sample size is 100 entities representing top managers (CFOs/ Managing Directors/ General Managers/ Company Secretaries), statutory auditors, members of audit committee and the independent directors. About 25 samples from each of the four categories have been approached for taking responses on the questionnaire. Eventually 28 Top Managers, 24 Statutory Auditors, 24 Independent Directors and 24 Members of Audit Committee responded and total 100 responses received.

There is no source amongst whom the respondents belonging to these categories of entities can be drawn for study. They were chosen at random. Therefore, the sampling process attempted to minimize the purposiveness by not having a predetermined set of companies, though snowballing technique was also used in limited way. There was no particular bias either towards private sector or public sector companies. There was neither any bias in terms of larger and smaller companies. Furthermore, the responses have no bias in terms of choice of regions for respondents. Many of the respondents have responded through email as they were not present in NCR.

1.5 Methodology

The methodology used for the analysis is Principal Component Analysis which tries to collate and draw meaningful results from the huge data collected from all the four entities, namely, Independent Directors, Top Managers, Audit Committee Members and External

[5]The questionnaire used for this research paper is part of full questionnaire of 5thesis submitted by the authors.

Auditors. Two very important analyses are done here:

1. Construction of Composite Indices
2. Impact of Composite Indices

In the context of present study, the Composite Index is a grouping of variables or other factors that combine in a standardized way to provide a useful statistical measure of overall responses for the Sustainable ACS.

Construction of Composite Indices helps in analyzing the data by combining the raw variables by a suitable technique. The technique used is Principal Component Analysis which further allows the Factor Analysis by allowing grouping of logically related variables.

The construction and analysis of Composite Indices becomes more meaningful when its impact (Index of factors developed through construction of Composite Indices) on Sustainable ACS is interpreted. The technique that can lead to meaningful interpretations is Regression Analysis.

1.5.1 Construction of Composite Indices

The Construction of Composite Index involves step by step explanation of Principal Component Analysis, Factor Analysis and then constructing the Composite Indices (Murthy & Jha, 2006).

Principal Component Analysis (PCA)

Principal Component Analysis allows dealing with reduced number of variables or it can be said that it allows data reduction. For doing so, there is need to find a common thread. This thread is called a latent factor. The need of Principal Component Analysis arises because it helps in (i) data reduction and (ii) making the dependent variables uncorrelated with other. Unlike OLS wherein the procedure is to minimize the sum of the squares of deviations, in the case of PCA the procedure is to maximize the variance. The second feature of PCA is that it segregates inter-correlated variables in to the separate orthogonal factors or principal components. (iii) Thirdly, PCA can be used for developing a composite index which collapses a set of variables into a single variable that represents a complex phenomenon like Corporate Governance framework.

1.5.2 Impact of Composite Indices

A multidimensional phenomenon like Sustainable Accounting Control System can be measured by constructing a composite index as explained above. Further, the Indices of factors affecting them will also be developed. It will be interesting to draw meaningful interpretations out of it. One of the techniques to measure their impact is Regression Analysis.

Regression Analysis

Regression estimates are used to describe data and to explain the relationship between one dependent variable and one or more independent variables. The Overall Composite Index is Dependent Variable whereas Indices of Factors are Independent Variables.

Interpretation through Regression Analysis

The following terms are used in this analysis:

Regression Coefficients: Regression coefficients represent the mean change in the response variable for one unit of change in the predictor variable while holding other predictors in the model constant.

Standard Error: The standard error of the estimate is a measure of the variability of predictions in a regression. A low value of Standard Error means that there is a consistent pattern.

T-stat: The t statistic is the coefficient divided by its standard error. The standard error is an estimate of the standard deviation of the coefficient, the amount it varies across cases. It can be thought of as a measure of the precision with which the regression coefficient is measured. There is a T 2 rule, a rule-of-thumb of $|t| >= 2.00$ to determine whether or not a variable is statistically significant.

P-value: The p-value for each term tests the null hypothesis that the coefficient is equal to zero (no effect).

A low p-value (< 0.05) indicates that the null hypothesis can be rejected. In other words, a predictor that has a low p-value is likely to be a meaningful addition to this model because changes in the predictor's value are related to changes in the response variable. Conversely, a larger (insignificant) p-value suggests that changes in the predictor are not associated with changes in the response.

R-square: R-squared is a statistical measure of how close the data are to the fitted regression line. It is also known as the coefficient of determination, or the coefficient of multiple determinations for multiple regressions. It varies from 0%-100%. 0% indicates that the model explains none of the variability of the response data around its mean. 100% indicates that the model explains fully the variability around its mean. It is also called Goodness-of-fit statistics.

Adjusted R-squared: Adjusted R-squared is a measure that tells goodness of fit adjusted for degrees of freedom. It gives the net picture. The adjusted R-squared is a modified version of R-squared that has been adjusted for the number of predictors in the model. The adjusted R-squared increases only if the new term improves the model more than would be expected by chance. It decreases when a predictor improves the model by less than expected by chance (Minitab, 2013).

1.6 Analysis and Interpretation of Components of Accounting Control System:

There is need to find which components of Accounting Control System are important constituents for sustainability. This is further analysed through factor analysis. With the help of highest representation in each factor, a composite index is developed.

1.6.1 Principal Component Analysis

1. The first step involves testing for sampling adequacy and sphericity. For this the KMO and Bartlett's Test is estimated.

Table No. 1: **KMO and Bartlett's Test- Fraud Risk Mangement**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.876
Bartlett's Test of Sphericity	Approx. Chi-Square	757.836
	Df	78
	Sig.	.000

In the case of nominal determinants, the KMO measure is 0.876 which is on higher side. Bartlett's Test is highly significant. On the whole, the test indicates that PCA is applicable.

2. Selection of principal variables: PCA was applied on independent variables. The principal components to be retained are determined. In this step, the Kaiser criterion is used to retain six principal components where eigen values were greater than one. Three variables are selected in the descending order beginning with the largest component.

Table No. 2: Total Variance Explained- Fraud Risk Factors

Components	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.251	48.081	48.081	3.273	25.174	25.174
2	1.804	13.876	61.957	3.207	24.669	49.843
3	1.090	8.388	70.345	2.665	20.503	70.345

Table No. 2 shows the total variance explained by the extracted principal component. It is evidenced that 70% of the information is captured by the retained component.

3. Rotation of components: With the help of Varimax rotation with Kaiser Normalization the components were rotated. This was done with a view to obtain the clear interpretation of the components. This resulted in a set of component scores with respect to the three retained components. Table No. 3 reports the rotated component scores matrix.

Table No. 3: Rotated Component Matrix[a] – Fraud Risk Factors

Rotated Component Matrix[a]			
	Component		
	1	2	3
E.3.1. (xiii)	.869		
E.3.1. (xii)	.829		
E.3.1. (xiv)	.798		
E.3.1. (xv)	.705		
E.3.1.(iv)		.794	
E.3.1.(iii)		.743	
E.3.1.(ii)		.738	
E.3.1.(x)		.708	
E.3.1.(i)		.705	
E.3.1.(vi)			.791
E.3.1.(v)			.695
E.3.1. (vii)			.685
E.3.1.(xi)			.541

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

1.6.2 Factor Analysis

At this stage, the components scores are isolated and factors of Accounting Control System are identified:

Table No. 4: Constituents of Fraud Risk Factors

Component	Variables	Identifier	Factor
1	E.3.1. (xiii)	Industry standard wage structure	Company specific positive attributes
	E.3.1. (xii)	Happy employees	
	E.3.1. (xiv)	Less pressure on target	
	E.3.1. (xv)	Solvent company	
2	E.3.1.(iv)	Proper documentation	Adequately safeguarded assets
	E.3.1.(iii)	Adequately safeguarded assets	
	E.3.1.(ii)	Clear Job Description	
	E.3.1.(x)	Strong internal audit	
	E.3.1.(i)	Minimum pilferage	
3	E.3.1.(vi)	Simplified transactions	Simplified transactions
	E.3.1.(v)	Few related party transactions	
	E.3.1. (vii)	Simplified valuation	
	E.3.1.(xi)	Small span of control	

This results in identifying three latent factors of Fraud Risk Factors, namely, Company specific positive attributes, adequately safeguarded assets and Simplified transactions.

Company specific attributes following industry standard wage structure, happy employees, solvent companies and putting less pressure to achieve targets.

By adequately safeguarded assets, we intend proper documentation of assets, clear job description of assets, minimum pilferage and their strong internal audit.

By simplified transaction is meant the few related party transactions, easy valuation of assets and where the span of control for supervision is small.

1.6.3 Composite Index

Following the method suggested by Murthy and Jha (2006), composite Index for System of Ethics is constructed with the help of Factor Analysis/ Principal Components and Rotated Component Matrix as follows (Murthy & Jha, 2006):

Table No. 5: Composite Index Constituents- Fraud Risk Factors

Component	Retained Variable No.	Highest Loading Factor	Retained Variable Identifier
1	E.3.1.(xiii)	.869	Industry Standard Wage Structure
2	E.3.1.(iv)	.794	Proper Documentation
3	E.3.1.(vi)	.791	Simplified Transactions

On the basis of retained components, the highest component scores are selected. By using highest loading factor as weights and variable identifiers given in Table No. 5, the index of dependent variables is constructed as follows:

$$Index = \sum_{j}^{n} wjxj$$

Two sets of composite Indices are developed:

1. Composite Index of Accounting Control System (IACS):

   IACS= Industry Standard Wage Structure* 0.869 + Proper Documentation*0. 794+ Simplified Transactions*0.791

   I A C S = = N 2 * 0 . 8 6 9 + E 2 * 0 . 7 9 4 * +G2*0.791=9.128486

2. Thereafter, composite index is constructed for each factor of Accounting Control System in the context of Fraud Risk Factors. These Indices are: Index of Company Specific Positive Attributes (IcspA), Index of Adequately Safeguarded Assets (IasA) and Index of Simplified Transactions (IsT).

   Index of Company Specific Positive Attributes (IcspA)

   = N 2 * 0 . 8 6 9 + M 2 * 0 . 8 2 9 + O 2 * 0 . 7 9 8 +P2*0.705=11.301

   Index of Adequately Safeguarded Assets (IasA)= E2*0.794+D2*0.743+C2*0.738+K2*0.708 +B2*0.705=15.404

   Index of Simplified Transactions (IsT)=G2*0.791+ F2*0.695+H2*0.685+L2*0.541=8.29

   Similarly, Composite Indices are obtained for all 100 respondents.

1.6.4 Analysis through Construction of Composite Indices and Findings

PCA is applied on independent variables of Accounting Control System using Kaiser Criteria and three principal components are retained which explain 70% of variation by rotated sum of square loadings.

These 15 variables extracted 3 principal components. With the help variable identifiers three latent factors are isolated and identified. The data reduction technique is based on the following selection criterion:

(i) Eigenvalue should be greater than 1.

(ii) There should be at least three coefficients in each retained factor.

(iii) Coefficient value should be at least 0.5.

(iv) There should not be any sub-item having value less than 0.

In the first iteration of running PCA, 4 Principal Components are found with a component having only two coefficients. After dropping these one by one and running PCA, 3 Principal Components are obtained. After running the PCA again, 13 variables and 3 principal components are extracted and retained which satisfy the above-mentioned criterion.

Further, two sets of composite indices are obtained:

1. Composite Index of Accounting Control System (IACS) is found by using the method of Jha& Murthy (2006). The three variables so selected are included in the formula for composite Index. These variables are: Company specific positive attributes, adequately safeguarded assets and Simplified transactions.
2. Thereafter, composite index is also developed for each Principal Component or factor of Accounting Control System: Index of Company Specific Positive Attributes (IcspA), Index of Adequately Safeguarded Assets (IasA) and Index of Simplified Transactions (IsT).

1.6.5 Analysis through Regression Analysis and Findings

Regression of Independent variables: Index of Company Specific Positive Attributes (IcspA), Index of Adequately Safeguarded Assets (IasA) and Index of Simplified Transactions (IsT) on Dependent variable-Index of Accounting Control System (IACS) is explored to find significant factors out of the three factors.

Table No. 8: Regression Analysis- Accounting Control System

Dependent Variable - Index of Accounting Control System (IACS)

Regression Statistics	
Multiple R	0.907713342
R Square	0.823943512
Adjusted R Square	0.818441747
Standard Error	1.738917716
Observations	100

	Coefficients	**Standard Error**	**t Stat**	**P-value**
Intercept	-9.466077449	1.39330495	-6.79397	**9.14E-10**
IcspA	0.051289416	0.086178383	0.595154	0.553141
IasA	0.73366162	0.110092618	6.66404	**1.68E-09**
IsT	1.145206162	0.120644105	9.492434	**1.83E-15**

Regression Equations

1. Functional Relationship:

$$IACS = f\ (IcspA, IasA, IsT)$$

2. Estimating Equation:

$$IACS = \propto\ + \beta_1(IcspA)\ +\ \beta_2(IasA)\ +\ \beta_3(IsT)\ +\ \varepsilon_i$$

3. Estimated Equation:

$$IACS =\ -9.47 +\ 0.05(IcspA)\ \ +\ 0.73(IasA)\ \ +\ 1.14(IsT)$$

Intercept: Its coefficient being -9.47, higher Standard Error, higher t-stat and very significant P-value make it a significant factor. At the same time this coefficient has negative impact. There are some unaccounted factors that are not measured by this regression model.

Index of Simplified Transactions: This factor has highest coefficient (1.12), lower Standard Error, higher t-Stat and very significant P-value. This is the most significant factor among the three factors.

Index of Adequately Safeguarded Assets: The magnitude of adequately safeguarded assets to Accounting control system is 0.73 which is high. It has relatively lower Standard Error, high t-Stat and very significant P-value. This factor is very important in making its impact in corporate governance in accounting control system.

Index of Company Specific Positive Attributes: Its coefficient is 0.05 which is low, lower Standard Error, somewhat low t-Stat and insignificant P-value. This factor is not as important in comparison to other two factors.

The overall assessment is Index of Adequately Safeguarded Assets (IasA) and Index of Simplified Transactions (IsT) are important factors of minimizing fraud risk factors for effective accounting control system and Index of Company Specific Positive Attributes (IcspA) is relatively less important factor based on the direction, significance and magnitude. Intercept or some unknown factors are also important and negatively related. The significance of simplified transactions is largest. It indicates to have effective corporate governance in accounting control, it's better to have few related party transactions, simplified valuation of assets and to keep the span of control for supervision small. It is also good to have proper documentation of assets, clear job description and strong internal control system.

R^2 measures how good the regression line fits the actual data. A high percentage indicates that a model has good fit. R^2 here is 0.82 which means 82% of the variability in composite Index of Accounting Control System (IACS) is explained by independent variables: Index of Adequately Safeguarded Assets (IasA), Index of Simplified Transactions (IsT) and Index of Company Specific Positive Attributes (IcspA). Adjusted R^2 is 0.81 which is even better.

1.7 Conclusion and Practical Implications

The accounting control system which is observed through compliance of internal control or rules and regulations is not adequate for sustainable development. To fill the gap external control is also required which can be provided by other entities of accounting control system such as Independent Director, Member of Audit Committee and External Auditor.

Principal component analysis helped in identifying three latent factors for minimizing fraud risk factors: adequately safeguarded assets factor, simplified transactions factor and company specific positive attributes factor.

This led to creation of two sets of composite Indices as suggested by Murthy and Jha. In all four Composite indices were formulated: IACS, IasA, IsT and IcspA.

The Regression analysis helped in identifying significant factors: Simplified transactions factor and company specific positive attributes factor.

The overall conclusion is Index of Adequately Safeguarded Assets (IasA) and Index of Simplified Transactions (IsT) are important factors of accounting control system for sustainable corporate governance and Index of Company Specific Positive Attributes (IcspA) is relatively less important factor. The significance of simplified transactions is largest. It indicates to have effective sustainable accounting control, it's better to have few related party transactions, simplified valuation of assets and to keep the span of control for supervision small. It is also good to have industry standard wage structure, proper documentation of assets, clear job description and strong internal control system.

Self-reliance built upon strong corporate structures will increase levels of economic activity. Strong corporate structures will promote ethical and sustainable accounting control system which can be achieved by protecting assets through minimizing fraud risk factors. Ethical accounting practices will result in social and economic links with local communities and thereby lead to Aatmanirbhar Bharat. In the post-covid crisis scenario, when many businesses suffered because of lockdown, all that is needed is revisiting of governance model and make it more purposeful and achievable for a new, firm and sustainable beginning. It should be ensured that managers employ the principles of value-based management that protects the interest of all stakeholders. In the backdrop of interdependence of notions for economic and social growth, there may be many ways to do so, but the chosen way should be ethically sustainable in the interest of all stakeholders.

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APPENDIX 1: QUESTIONNAIRE

		Questionnaire					
S. No.	**Q. No.**						
		Instructions for questions based on 5-point scale:					
		1. The verbal and interval scale would help you in identifying the number from 5 to 1 (where 5 is the highest in order and 1 is the lowest).					
		2. The most appropriate and in-depth response can be expressed by referring to all three scales. For instance, if your response is "Fully Aware", you should tick on '5' in case you feel that "Fully" means within the range of 81%-100%.					
		Ordinal Scale	5	4	3	2	1
		Verbal scale	Fully Aware	Some-what Aware	Can-not Say	Somewhat Ignorant	Completely Ignorant
		Interval Scale	100%-81%	80%-61%	60%-41%	40%-21%	20%-1%
Section II							
	E	**Accounting Control System**					
		In the context of ethical framework of Accounting Control System, mark the options as per the given scale:					
	E.1	**Attitude**					
	E.2	**Knowledge**					
	E.3	**Protecting Assets (Fraud Risk Factors)**					
	E.3.1	Fraud Risk Factors can be minimized by managers.	5	4	3	2	1
	E.3.1.(i)	Fraud Risk Factors can be minimized by managers when there is minimum pilferage of valuable assets.	5	4	3	2	1
	E.3.1.(ii)	Fraud Risk Factors can be minimized by managers when there is clearly defined job description.	5	4	3	2	1
	E.3.1.(iii)	Fraud Risk Factors can be minimized by managers when there are adequate physical safeguards to assets.	5	4	3	2	1
	E.3.1.(iv)	Fraud Risk Factors can be minimized by managers when there is proper documentation of assets.	5	4	3	2	1
	E.3.1.(v)	Fraud Risk Factors can be minimized by managers when there are few related party transactions.	5	4	3	2	1
	E.3.1.(vi)	Fraud Risk Factors can be minimized by managers when the nature of a company's business involves simplification of transactions.	5	4	3	2	1
	E.3.1. (vii)	Fraud Risk Factors can be minimized by managers when the valuation of assets is easy.	5	4	3	2	1
	E.3.1. (viii)	Fraud Risk Factors can be minimized by managers when there is decentral-ization of decision making power.	5	4	3	2	1

	E.3.1.(ix)	Fraud Risk Factors can be minimized by managers when there are more automated operations.	5	4	3	2	1
	E.3.1.(x)	Fraud Risk Factors can be minimized by managers when there is strong internal audit function.	5	4	3	2	1
	E.3.1.(xi)	Fraud Risk Factors can be minimized by managers when the span of control is small.	2	4	3	2	1
	E.3.1. (xii)	Fraud Risk Factors can be minimized by managers when the employees are happy with the company.	5	4	3	2	1
	E.3.1. (xiii)	Fraud Risk Factors can be minimized by managers when the wage structure is commensurate with the industry standard.	5	4	3	2	1
	E.3.1. (xiv)	Fraud Risk Factors can be minimized by managers when there is less pressure on meeting targets.	5	4	3	2	1
	E.3.1. (xv)	Fraud Risk Factors can be minimized by managers when the company is solvent/ bouyant.	5	4	3	2	1
	E.4	**Ensuring Compliance of Policies and Procedures**					
	E.5	**Preparing Reliable and Timely Report**					

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