Gender Diversity & Corporate Sustainability: A Study of Selected Listed Indian Companies

A Thesis

Submitted to University School of Management and Entrepreneurship, Delhi Technological University

In fulfilment of the requirement of the degree of

Doctor of Philosophy

by

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(2K18/PHDUSME/503)

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DECLARATION

I hereby declare that all the work presented in the Research Proposal "**Gender Diversity & Corporate Sustainability: A Study of Selected Listed Indian Companies"** in the partial fulfilment of the requirement for the award of the degree of Doctor of Philosophy in University School of Management and Entrepreneurship, Delhi Technological University, Delhi is an authentic record of my own work carried out under the guidance of **Dr. Deepti Aggrawal (**Assistant Professor, University School of Management and Entrepreneurship, Delhi Technological University, Delhi) and **Dr. Jagvinder Singh** (Assistant Professor, Department of Operational Research, University of Delhi).

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CERTIFICATE

Date:

This is to certify that the work embodied in the research proposal entitled "**Gender Diversity & Corporate Sustainability: A Study of Selected Listed Indian Companies"** is done by **Mr. Shubham Singhania** as a full-time scholar in University School of Management and Entrepreneurship, Delhi Technological University is the authentic work carried out by him under our supervision.

This work is based on original research, and the matter embodied in this progress report has not been submitted earlier for the award of any degree or diploma to the best of my knowledge and belief.

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Shubham Singhania

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LIST OF ABBREVIATIONS

ACPD	: Average citations per document
ACWI	: All Country World Index
B-Size	: Board Size
BRR	: Business Responsibility Report
BSE	: Bombay Stock Exchange
CEO	: Chief Executive Officer
CG	: Corporate Governance
CSR	: Corporate Social Responsibility
CMIE	: Centre for Monitoring Indian Economy
DCA	: Document citation analysis
ESI	: Environment Sensitive Industries
FTSE	: Financial Times Stock Exchange
F-Size	: Size of the Firm
FP	: Financial performance
FE	: Fixed Effects Regression Method
G-Logit	: Generalized ordered logit model
GDCS	: Gender Diversity and Corporate Sustainability
GDFP	: Gender Diversity and Financial Performance
ID	: Independent Director
IT	: Information Technology
INDFEMDIR	: Independent female director
IDE	: Integrated development environment
IIAS	: Institutional Investor Advisory Services
JCA	: Journal citation analysis
LEVER	: Leverage of the Firm
MCA	: Ministry of Corporate Affairs
MSCI	: Morgan Stanley Capital International
NIFTY	: National Stock Exchange Fifty
NVG	: National Voluntary Guidelines
OECD	: Organisation for Economic Co-operation and Development
PRISMA	: Preferred Reporting Items for Systematic Reviews and Meta-Analyses
P-Women	: Percentage of women director on board
ROA	: Return on Assets
SUSQUAL	: Sustainability Reporting Quality
TA	: Total Assets
TBL	: Triple Bottom Line
WCED	: World Commission for Economic Development

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CHAPTER 1: INTRODUCTION

1.1 Background

Countries have been propounding the role of women since ages and legislations to promote the women in the boardroom have been largely undertaken throughout the world. This further led to advocates of gender diversity contend that gender diversity in the corporate boards accords several benefits to the firms in terms of their decisions. They were also convinced based on several multidisciplinary theories backed from the subjects of sociology, psychology, organizational behaviour that a gender diverse board shall bring in a different perspective, intuitiveness and a more balanced viewpoint to the decision making. Their arguments were supported by a growing body of scholarly evidence creating nexus between gender diversity and corporate sustainability. But not everyone is of the same opinion, and some also believe that legislations of such nature promote inadequacy to the decision making in the firms and lack of qualified women candidates further make the situations worse.

India has been one of the first developing nations to pass legislations where it has become mandatory for listed companies to appoint one woman on Board, and owing to this, the share of women in the board for NIFTY 500 has increased. Of the 2,765 MSCI (Morgan Stanley Capital International) ACWI (All Country World Index) companies, 20.0% of directors were women in 2019, up from 17.9% in 2018. Also, the greater participation of women would not only dismantle the glass ceiling but would also raise the overall standard of governance.

In today's era, Firms play multifaceted and pivotal roles in the economic system and have attracted much legal & regulatory norms due to the emergence of various scams & financial frauds being surfaced in the late 1990's. These firms are not just the stimulants of the economies but are also great carriers of economic growth & development in the nation. There would be no denial of the fact that the composition of the board of directors are the heart & soul of any firm as they are the principal decision makers of all activities conducted by any firms and hence demands attention. Corporate governance of firms in developing economies is important for several reasons. First, countries like India that have weak compliance laws, imperfect markets, lack of transparency and several other issues relevant in the context of performance require a sound internal control

mechanism in the form of board of directors. Secondly board of directors are imperative for the proper functioning & performance of firms, and to make it more apt, legislations have been passed in various countries for including women on board of firms and raising the level of gender diversity. Thirdly, India came up with a similar provision under the Companies Act 2013,making it mandatory for certain classes of companies to have at-least 1 woman on board. Even after the mandatory provision, issues such as women from promoters' family, are a mere tokenism to promote women empowerment, and hence require our attention & concern.

In summary we can say that the role of boards as a mechanism for corporate governance takes on pivotal role in a framework of dynamic competition, lack of robust external mechanisms, and higher informational asymmetries due to the complexity of the working systems. Thus, the role of board of directors shall be both robust as well as dynamic to tackle complex business environments and apparently take necessary steps as and when required for the benefits of all stakeholders and society at large.

1.2 Concept of Corporate Governance, Gender Diversity & Corporate Sustainability

Corporate Governance has come into picture from the Cadbury Committee which was set up in U.K. in 1991 to develop some standards on corporate governance. As per The Committee on Financial aspects of corporate governance (1992), “Corporate Governance is the system through which firms are directed and controlled.

Diversity simply means the ways in which people are similar or different. It has been defined with two general distinctions: demographic and cognitive. Demographic diversity may be defined as the differences that are overtly visible such as age, gender, ethnicity, whereas cognitive diversity refers to things which are not visible, such as how people process things and perceive information.

Gender diversity on Board is a much talked about theme and becomes the focal point when it comes to monitoring and management of firms. The topic becomes more important in countries where the legal or the external systems are bleak and cannot do much to foster corporate governance. The role of internal board of directors is incredibly significant and, in such cases, gender diversity tends to enhance the virtue of decision making as well as the overall corporate effectiveness; thus, female participation on board is must.

Corporate Sustainability is a modern concept that has emerged based on the impact caused by the activities of the firms in greed of meeting the shareholders needs of profit maximization and broke

the traditional methods & ways of doing business. The most comprehensive & widely accepted definition was given in the Brundtland Commission Report as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). In simple parlance it can be understood as ways of means undertaken by the firmsto contribute towards the sustainable development by considering the social & environmental dimensions in their business decisions with a long-term horizon & perspective for economic progress of the firms & society. It is mainly concerned with taking care of the social & environmental impacts caused by the activities of the firms with a view to minimize the same for their long-term survival & growth.

1.3 Conceptualization of Corporate Sustainability

Based on the review of literature there is no doubt on the fact that both scholars as well as academicians are convinced that the old premise given by Milton Friedman that businesses exist only to meet the needs of profits for the shareholders is not relevant anymore in the present scenario. With growing complexities of the business environments each stakeholder such as employees, suppliers, government, customers etc play a crucial role in the success of the organization and have some direct or indirect control on the business as well. The responsibility towards society and public at large have become the new need of the hour apart from meeting the expectations of the shareholders. Gray et al., (1996) postulated that it was imperative to take the stakeholders perspective into account to take the community along and challenged the existing accounting practices that were falling short in terms of disclosures, transparency etc. In the same context Grayson et al., (2008) pitched a new perspective of sustainability that would make use of innovation based practices to harness profits for the organization and at the same does value creation for the environment as well as society.

Based on the contentions of several research studies academicians & corporates came forward and accepted the definition of World Commission for Economic Development (WCED), which has conceptualized the concept of corporate sustainability on three broad parameters namely environmental concern, social sensitivity & economic growth (Bansal, 2001, 2005; Elkington, 1998; Galbreath, 2011). Further Bansal, (2001) emphasized that the success of any one dimension if dependent upon the success of other two dimensions. Based on the above arguments we use the triple bottom line framework developed by Elkington, (1998) for the measurement of the concept of sustainability represented in Figure 1 below.

Figure 1 Triple Bottom Line Framework by John Elkington (1998)

1.4 Women on Board: Legal Framework in India vis-a-vis Global Scenario

The participation of women on board has been negligible for an exceedingly long time, and a lot of researchers as well as organizations have talked about inclusion of women on board. But it wasonly with Companies Act 2013, that a section was inserted to have women on board as a mandatory provision. Even after the legislation was passed, many firms used their family members to comply with a legal formality which finally defeated the true spirit of the legislation.

Women empowerment does not only mean that women act as senior employees in an organization,but it calls for occupying decision-making positions as well. There has been a constant growth & pressure with respect to the enhancement of the presence of women on board globally and several countries started adopting forms of voluntary as well as mandatory guidelines to enhance the representation of women on Boards. When we compare the Indian legislations with other global standards, the European markets have taken the lead in this initiative with Norway (40% gender quotas for female directors), Sweden (25% voluntary reserve of women directors) Germany (30%of women quote on German supervisory boards), France (50% of the gender parity on the boards)and Italy (1/3rd of the board members to be female in listed & state-owned enterprises. Countries like Austria & UK have adopted voluntary targets with respect to gender based representations ontheir corporate boards.

Most of these legislations & regulations indicate one aspect clearly that the presence of women on boards could affect governance of companies in various ways (Adams & Ferreira, 2009).

India has also become one of the countries to initiate the adoption of a legal framework to make the appointment of women on board mandatory for certain selected companies. Every company having paid up capital of Rs 100 Cr. or more or having turnover of Rs 300 Cr. or more shall be required to appoint at least 1 woman on board.

1.5 Why India is a Unique Setting for the Study?

According to the World Economic Outlook Report 2021 (International Monetary Fund, 2021) India shall retain its tag of being the fastest-growing emerging economy. Following the global trend of legislations mandating a quota for women on board, India came up with a similar

mandate in the year 2013. Furthermore, India's institutional and cultural environment provides a fertile ground to study gender diversity in workplaces.

Multiple factors differentiate India and make this emerging economy an interesting case for this study. First, India is one of the most culturally diverse countries in the world where the social structures are deeply rooted in the belief system (Schwartz, 2014). These social structures and cultural norms identify women into feminine roles and restrict them into family spheres. The high masculinity index of India is further evidence of the growing cultural stratification and strict division of roles among men and women (Jayachandran, 2021). The Indian social environment is dominated by the element of 'hierarchical structure' (Gupta, 2017) which negatively impacts the freedom of voicing one's opinion in front of the senior executives, especially by the female employees who are already facing the clutches of femineity and patriarchal spill over. The hierarchical structure is further apparent by the fact that India scores higher than the global average in terms of the power distance index, which stands at 77 against the world average of 59 (Tripathi and Vijayan, 2020). Owing to self-promotion and self-enhancement in the high-power distance culture of India, women face a tough time gaining visibility in strategic positions (Gupta, 2017).

Second, gender discrimination is entrenched in the Indian system, and this can be attributed to the parent's gender-based stereotypical beliefs and expectations which impact the role, attitudes, and feelings of genders in the long run (Eckes and Trautner, 2012). This also has a bearing on the emotions that are built since childhood, such as fear, sadness, and other powerless emotions in females, and anger, pride, contempt, etc. in males (Rached *et al.*, 2021). Women directors are often considered fit for doing routine tasks in the organizations and are not offered roles in prominent committees as compared to their male counterparts (Rebérioux and Roudaut, 2017). In the presence of this gender discrimination, that restricts the independence of women in India (Kumar, 2020), women directors on boards would often feel reluctant to ask for roles on prominent committees. Since female directors are brought up in a culture where they are expected to be of 'humane orientation', with feelings such as kindness, generosity, etc. (House *et al.*, 2004) they tend to show a greater inclination towards community service projects vis-à-vis the male directors (Groysberg and Bell, 2013). Hence, more often than not, they are appointed on corporate social responsibility (CSR) committees, where they are believed to do well. For instance, in the Indian context. Mrs. Sudha Murthy is the chairman of the CSR committee at Infosys Ltd. and Mrs. Nita Ambani sits on the board of Reliance Industries Ltd. by virtue of her knack towards CSR activities.

Third, the state of women's representation on Indian corporate boards is in a dismal position. India ranks 140 out of 156 countries in the Global Gender Gap Index, which indicates a high level of gender inequality (World Economic Forum, 2021). According to the report by Credit Suisse (2021), even after the constitution of mandatory provisions through the Companies Act 2013, the female representation on boards of large Indian companies has increased from 11.4% in 2015 to merely 17.3% in 2021 and is way below the global average.

The above factors lead to variations in the governance environments as well as the corporate governance practices of this emerging economy (Lattemann, 2014), thereby necessitating the study of the relatively unique case of India.

1.6 Research Gaps

The participation of women in the labour force has been predominantly low especially in a country like India where we had the male dominated society and therefore after the adventof companies act 2013 it is important to investigate whether we have a business case of women or not. (Haldar et al., 2015)

The studies conducted in this domain in the Indian context have majorly focused on the financial aspect of the gender diversity, but we do not see much investigation on the Social& Environmental contribution of gender diversity especially on CSR aspect.

Moreover, though the studies have looked at the role of the board of directors in terms of various dimensions such as financial performance, dividend aspects etc but since these board acts through the prominent committees such as remuneration committees, nomination committees etc it is important to see what impact these committees have on decision making.

There is large no of studies conducted in the developed economies, but there is lack of awareness with respect to the role of the gender diversity in top management especially in emerging economies. (Haldar et al., 2015; Issa & Fang, 2019).

Also, there is dearth of literature in this domain especially with respect to the qualitative studies as there is a predominance of quantitative modelling rather than a more systematicqualitative Investigation. (Rao & Tilt, 2016). Thus, we tried to explore these research gaps existent in the literature.

1.7 Purpose of the Study

Gender Diversity on boards has been highly debated and the role of diversity with respectto the improvement of the organizational performance has been much talked about but there is still no consensus on the same. The study would add to the existing literature and would highlight the role of women on board.

The other aspect to focus upon is the lack of studies in the developing economies especiallyin the Indian context looking after the aspects apart from financial performance. This studywould make a valuable contribution in other domains of Social & Environmental aspects.

The study is a mix of quantitative & qualitative methods which shall be systematically administered to give a wider horizon & perspectives about the role of gender diversity on Board.

Sustainability is a growing phenomenon seeing the climate change & environmental aspects and the study would highlight the role gender diversity could have on promoting better sustainability practices for the larger benefit of society.

1.8 Research Objectives

The study aims to achieve the following objectives:

- To examine the status of gender diversity on corporate boards
- To examine the status of gender diversity and corporate sustainability practices
- To study the relationship & Impact of gender diversity on Board & Financial performance.
- To study the impact of gender diversity on board committees on firms' financial performance.
- To examine the impact of gender diversity on board on Sustainability Reporting Quality.

1.9 Scope of the Study

The scope of the study is based upon creating a linkage between the concept of gender diversity and corporate sustainability. The study is limited to the scope of India which is an emerging economy driven by various unique cultural and social setting. In terms of the sample since the provisions of the companies act 2013 with respect to the gender diversity is applicable on large companies the data sources were restricted to the selected companies listed on Bombay stock exchange (BSE-500). To perform a case study on a specific sector to we have also conducted the analysis on Information Technology Sector (IT Sector).

1.10 Significance & Contribution of the Study

The proposed study shall have large scale policy implications for both academic as well as corporate firms since it would open new horizon of perspectives in terms of gender diversity &sustainability practices.

The study would throw light on the aspects of gender diversity on board and how and what are the major contributions of promoting gender diversity on corporate boards. The expected outcomes would help firms determine the future course of action with respect to future appointments.

The study would also help firm determine the impact caused by gender diversity on sustainability aspects and thus would enable them to achieve the broad ambit of legal as well as voluntary disclosures with the help of having inputs based on gender diversity onboards.

The study shall help the policy makers in determining the future course of action making legal compliances with respect to both appointment of women on boards as well as sustainability practices which has been widely questioned and the results of which havebeen inconclusive.

The study shall also help various stakeholders understand the perception of the board andbased on the same understand the various dimensions of gender diversity on board as well as sustainability practices undertaken by the firms.

CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

"If I have seen further than others, it is by standing upon the shoulders of giants."

-Isaac Newton

There is no dearth of literature in the domain of gender diversity on board. However, with the growing complexities in the market as well as in the ways of doing business, new set of dimensions have been evolving with a rapid pace. To have a better understanding of how the literature has grown and what are the dimensions which have been worked upon the literature review has been classified into six categories before we go on to discuss the various theoretical framework based on which we derive our arguments for the research objectives.

2.1 Gender Diversity on Board

Diversity means the variability of characteristics that are amalgamated and put together at a commonplace. In the context of a corporate board, diversity can be in terms of the difference in religion, ethnicity, gender, age, etc. of the board members. Das and Dey (2016) suggest that the number of women present on the board is indicative of a firm's ethical behaviour and a balanced board. Indian companies should learn how to build a competitive advantage by inviting women representation, thereby ensuring a good reputation amongst the stakeholders (Kaur and Singh, 2017) as well as better financial health. Studies prove that women's empowerment is likely to be advantageous for corporations owing to the synergies brought in by gender diversity (McGuinness, 2018). Sanan (2016a) reveals in her study that the number of companies with no independent women directors has reduced over time, which is good news as far as efficient corporate governance is concerned. According to Nielsen and Huse (2010a), the board of directors usually work in a group and hence, variations in the group can certainly lead to an increase in knowledge, abilities, and information. Based on the study, it has been postulated that homogeneity and heterogeneity work differently in different situations. For example, in the case of stable situations, homogenous boards achieve better results, whereas, during uncertainty, heterogenous boards work better (Nielsen and Huse, 2010). But whether this diversity is likely to improve corporate performance or not is debatable and far from conclusive.

Das & Dey, (2016) have mentioned in their study that the number of women present on the board is indicative of the firm's ethical behavior and a balance on the board. Indian companies should learn how to build competitive advantage by putting up women on their board, thereby ensuring good reputation amongst the stakeholders (Kaur & Singh,2017) which will lead to better financial health of the firms. Studies prove that womenempowerment is likely to be advantageous for the corporations owing to the synergies brought inby gender diversity McGuinness (2017).

Diversity, in terms of gender, on the board of directors in a firm, can influence decision making in many ways. As per Nielsen & Huse, (2010a), board of directors usually work in a group, and hence variation in a group can certainly lead to increase in knowledge, abilities, and information.Increased innovation, novice ideas, greater market penetration capability, efficiency in problem solving & corporate leadership, efficient global relationships; all these benefits can accrue to afirm on account of gender diversity in its leadership (Robinson & Dechant, 1997). The presence of women on board may help in improving the image of the firm, which would have a positive impact on customer behavior (Smith et al., 2006). Women are found to have provided unique perspectives, experiences and work styles as compared to their male counterparts, while making decisions (Daily & Dalton, 2003). Female directors have an inverse relation with accounting manipulations (Abdullah et al., 2016) as well, and they are more inclined towards asking questions, so that the decisions are not finalized without adequate discussions (Erkut et al., 2008). Stakeholder and Gender Socialization Theory advocates that heterogeneity in the top management will certainly lead to the better decision-making quality (Chams & García-Blandón, 2019). Rahman et al., (2017) also found that heterogeneity at the top-level management plays a role in reducing the level of agency conflicts within the company.

On the other hand, a homogenous board, with directors having similarity in thought, shall certainlylead to congruence in perspective and conformity in decision making (Van Knippenberg et al., 2004). It has also been observed that heterogenous boards achieve better during uncertainty, whereas homogenous boards achieve better in stable conditions (Nielsen & Huse, 2010b). Any negative effects of board gender diversity, such conflicts, may get moderated overtime when directors become aware about each other (Harjoto et al., 2015).

When it comes to sustainability, Nadeem et al., (2017) suggest that bringing together the diverserange of expertise and knowledge in the form of women's representation on board would improvedecision making in the context of sustainability. Female representation on board creates an advantage for the firms, brings in different work styles on board and leads to better adaptation to the environment (Mínguez-Vera & López-Martínez, 2010).

There are several reasons for the slow-paced growth of women can be attributed to distinct reasons which are collectively known as the “glass ceiling” (Heredia, Ramos, Sarrió, & Candela, 2002). These

obstacles, based on the societal perceptions, can take several forms including favoritism of male directors for other male directors (Hutchinson, Mack, & Plastow, 2015), the tendency of directors to feel more comfortable among directors from the same gender and demographic as per the similarity attraction theory (Chatman & O'Reilly, 2004), and the idea of prestigious occupations such as directorship belonging to males (Ridgeway, 2014).

The challenges amidst the growth of women directors on corporate boards are not just restricted to male directors but also certain perceptual biases of female directors, for example, due to the occupational identity threat females feel that growth in the number of females will lead to a fall in the esteem they have in the occupation (Cacouault- Bitaud, 2008), and, therefore, Queen Bee strategy is adopted by females to distance themselves with the other females (Derks, Ellemers, van Laar, & de Groot, 2011). There exists plethora of reasons ranging from political, social, economic etc because of which even if a woman gets appointed on the board, they are not able to reach the top management in the hierarchy. The advancement of women studies has given rise to various phenomena that portray various kinds of reasons that showcase the situations due to which even if women are being employed on board, they are not able to escalate to the upper echelons. One such phenomenon is the "double burden syndrome" that highlights the dual responsibilities of household along with the professional responsibilities of work which are considered as traditional gender-based responsibilities (Hochschild, 1990) this does not permit the women directors to take up higher responsibilities even if they wish to owe to lack of efficiency (Bratberg, Dahl, & Risa, 2002).

Another theory that documents the low representation of women on corporate boards is the concept of "glass cliff" that emphasizes the appointment on women on boards only in the situation of crisis when the firms are struggling to perform and there is a high likelihood of failure (Francoeur, Labelle, & Sinclair-Desgagné, 2008; Ryan & Haslam, 2007). Moreover, in case the situation of these firms deteriorates post appointment of women on boards, which in any case has been done noticing crisis, they shall be soon replaced by their male counterparts (Cook & Glass, 2014). Another deterrent theory is the concept of the sticky floor which is a slight contrast to the glass cliff theory and states that women are equally appointed as often as males, but they tend to receive lesser compensation (Adams & Funk, 2012). In addition to the above phenomena, women have also addressed semi- hostile work environments about stereotyping, gender discrimination, and social exclusion (Abdalla, 2015).

The act of promoting adequate gender representation on corporate boards is not merely a social phenomenon to promote gender equality, but rather the presence of diversity can accord various economic benefits to the firms.

2.2 Growth of Sustainability Reporting Framework in India

India has been making continuous efforts in terms of the global sustainability reporting guidelines and taking necessary steps in terms of legal regulations as well as various initiatives are also coming out with their voluntary code of practices. India majorly has legal framework with respect to the environmental protection other sustainability practices and codes are majorly voluntary in nature. The ministry of corporate affairs in the year July 2011 produced some voluntary guidelines with respect to the National Voluntary Guidelines on Social, Environmental and Economic Responsibilities. These guidelines included certain principles and practices which were to be included in the business and a comprehensive business responsibility report providing necessary disclosures. Later in the year 2013 companies act made several provisions with respect to the improvement on governance, corporate social responsibility norms as well as sustainability. The major provision enacted with respect to the CSR states-

Clause 135 specific to CSR

a. Constitution of CSR Committee and CSR spending made compulsory for the companies with:

   i. Net Worth of rupees five hundred crore or more, or
   ii. Turnover of rupees one thousand crore or more, or iii. Net Profits of rupees five crore or more.

b. CSR Committee to have at least three directors with at least one being an independent director.

c. Mandatory CSR spending of 2% of average net profits of last 3 years

In the year 2015 Securities & Exchange board of India (Listing Obligations and Disclosure Requirements) Regulations, 2015 made it mandatory for top five hundred listed companies based on Marketcapitalization to compulsorily report Business Responsibility Report in adequate format as provided under the regulations disclosing various initiatives taken by the firms in respect of sustainability. Further from the Financial year 2019-2020 the above regulation has been amendedto one thousand top listed entities. All these guidelines were formulated on the premise that firms would follow the “Triple Bottom Line Concept.” The concept of triple bottom line (TBL) was first postulated by John Elkington in the year 1994 as a major vision towards the achievement of sustainability goals. The concept of Triple bottom line approach rests on the premise that firms shall give as much importance to social and environmental dimensions as they give to the financial or economic dimensions and simultaneously believes that there should not be just one bottom lineapproach of profits there shall be

three in terms of profit, planet & people.

2.3 Corporate Sustainability of Companies and their Disclosures

As per Liao et al., (2018), corporate sustainability disclosures are meant to consider the contribution of companies or entities in broadly three parameters: social, economic sustainability & environmental aspect. In India, Clause 55 of the Listing Agreement with the stock exchange requires firms to have Business Responsibility Reports (BRR) based on the Framework of National voluntary Guidelines (NVG). However, there is limited literature and studies undertaken as to disclosure of CSR requirements by corporates.

While undertaking disclosures, legitimacy theory, that is congruence between the society's expectations and company's value systems plays a key role (Lindblom, C.K. & Lindblom, 1994). The quality of such disclosures would also be subjective and context dependent (Beattie et al., 2004). According to a study by Prasad et al., (2017), the extent of disclosures has increased from 2011-12 to 2014-15, but they are not significant. Moreover, the quality of disclosures has also improved, but like quantity, this is also not significant.

2.4 Gender Diversity on Board and Firm Performance

The theme of board gender diversity impacting firm performance has been the centre of focus for researchers across the globe. According to Torchia, Calabrò, and Huse (2011), women can add unique perspectives, experience, working styles, more wisdom, good atmosphere in the boardroom, they are also found to have different values and are more sensitive to women issues. There are multiple theories, such as agency theory, resource dependence theory, upper echelon theory, etc., that clearly project the needs of creating a gender-diverse board. These theories have become the basis for academicians, policymakers, as well as regulators for formulating the legal regulations which shall put a thrust on such issues (Moreno-Gómez, Lafuente, & Vaillant, 2018).

Moreover, even though the women have started occupying positions on corporate boards the pace of growth in terms of their appointment is very slow. There could be several reasons for the same. For instance, the effects of symbolism in the form of women's representation might be sufficient to bring about substantial changes in the perspectives of the board (Mahadeo et al., 2012). In another study by Sarkar and Selarka (2021), it has been seen that in family firms, the presence of independent women directors (not grey directors) leads to better monitoring and thus, positively affects the firm value. It is also contended that gender diversity in the top management is likely to bring a forward push in the financial health of the firms with weaker shareholder rights (Adams and Ferreira, 2009). Women, owing

to their nature and experience, are believed to be more inclined towards asking questions such that the decisions are not finalized without adequate discussions (Konrad et al., 2008), and due to such discussions, there is an improvement in creativity, innovation, and problem-solving. Another investigation that was conducted in the Indian context, in light of the mandated representation of women on board, also showed positive results on firm performance (Sanan, 2016b). Das and Dey (2016), while investigating the large Indian corporations for the role of corporate governance in firm performance have come across the positive impact of board diversity and board involvement on the financial performance. In another study of large Indian firms, Arora (2021) found a significant and positive relationship between gender diversity and firm performance.

The available literature also throws light on the studies which depict an adverse relation between board gender diversity and firms' financial performance. Ryan and Haslam (2005), in a study of (Financial Times Stock Exchange) FTSE 100 companies, find that firms that appointed women directors during a declining stock market experience worse performance than those with male directors. This trend has been experienced globally. McGuinness (2018), as per investigations conducted in Hong Kong, also envisages the idea of gender bias imposing a cost on stakeholders and thus affecting performance negatively. While on one hand, many authors have supported the idea of appointment of women on board, claiming that diversity would help in better decision making and problem-solving, it has also been observed that diversity brings with it more chances of conflicts and makes decision making time-consuming (Gallego-Álvarez et al., 2010). Wellalage and Locke (2013), in a study conducted in the Sri Lankan context, have found the impact of board heterogeneity to be negative due to increased chances of conflicts. In certain aspects, a more diverse group can be less integrated, and the likelihood of dissatisfaction and turnover is also high (Wagner et al., 1984). A higher turnover would further negate the performance of the firm.

In India, many firms are family-owned, and the provision of appointing women directors on board has been fulfilled by appointing female relatives on the boards. Also, it has been observed that the concept of networking is derived based on cultural values, leading to family ties and status in society (Dhir et al., 2016) and this helps in women's appointments through family affiliations. Sarkar and Selarka (2021), while investigating the presence of women in Indian family firms, have stated that the presence of grey women directors will lead to weaker firm performances on account of more control of within-family directors on the family business operations. Moreover, women who are appointed to the board through family ties and networking continue to face challenges and have not been able to reach the upper echelon in firms (Budhwar et al., 2005).

Adams & Ferreira, (2009) have stated that gender diversity in top management is likely to bring a forward push in the financial health of the firms with weaker shareholder rights. In a global study undertaken by Terjesen et al., (2016), it was found that firms having a higher proportion of female

directors on board are going to have better Tobin's Q and return on assets as compared to those which have none.

Adams and Ferreira (2009) suggested that board diversity impacts corporate governance, though they could not find any positive linkages with the financial performance. Even though there is a vast number of studies conducted to measure financial performance (Adams & Ferreira, 2009; Campbell & Mínguez-Vera, 2008; Haldar, Shah, & Nageswara Rao, 2015; Sanan, 2016b; Singh, Singhania, & Sardana, 2019) across varying time periods, there is lack of consensus on the effect of board gender diversity on the firm performance. Many researchers found a positive linkage between gender diversity and financial performance measured through various market and accounting-based dimensions (Abdelzaher & Abdelzaher, 2019; Campbell & Mínguez-Vera, 2008; Giraldez-Puig & Berenguer, 2018; Terjesen, Couto, & Francisco, 2016; Velte, 2017), while other scholars have found a negative or no significant relationship (Chebri & Bahoussa, 2020; Sanan, 2016a; Shehata, Salhin, & El-Helaly, 2017; Singh et al., 2019). In this aspect, Campbell, and Mínguez-Vera (2008) suggested that mixed results are caused due to varying legal and intuitional contexts in different countries, time periods, and based on the increased complexity owing to the larger boards which make it difficult for women due to lack of their representation (Pletzer, Nikolova, Kedzior, & Voelpel, 2015).

The research on board gender diversity has also taken various forms, such as corporate sustainability (Nadeem, Zaman, & Saleem, 2017), corporate social responsibility reporting (Pucheta- Martínez, Bel-Oms, & Olcina-Sempere, 2019), sustainable reporting quality (Al-Shaer & Zaman, 2016), etc. Birindelli, Iannuzzi, and Savioli (2019) also found that women CEOs are the linking pin to enhance the role of gender diversity on board with respect to environmental policies. Thus, we can see through a glass lens that various dimensions of board gender diversity require further exploration based on the systematic literature review.

In addition to this, various other institutions, as well as contextual factors, have also been looked upon. Institutional elements, such as corporate governance and societal perceptions (Abdullah, Ismail, & Nachum, 2016), social capital and institutional pressure (Rigolini & Huse, 2021), “soft laws” and gender-based quotas (Mateos de Cabo, Terjesen, Escot, & Gimeno, 2019) have been explored. Moreover, contextual factors, such as women’s risk-taking ability in technology firms (Mukarram, Ajmal, & Saeed, 2018), the moderating role of industry-based sensitivity (Qureshi, Kirkerud, Theresa, & Ahsan, 2020) have also been studied to some extent.

Despite growth and advancement, there are various aspects of board gender diversity where the literature is still in the state of dilemma, and the research in this area needs further exploration and investigation.

Ample studies have been undertaken to examine the impact of board diversity on firm outcomes (Baker *et al.*, 2020; Singh *et al.*, 2021a) and researchers at the global level have tried to capture the role played by women leaders in influencing firm performance (Duppati *et al.*, 2020; Martinez *et al.*, 2020; Brahma *et al.*, 2021). However, the results are mixed and far from conclusive. One set of advocates has found a positive relationship between women's representation on board and financial performance (Bennouri *et al.*, 2018; Duppati *et al.*, 2020; Brahma *et al.*, 2021), another set of advocates has found negative relationship (Adams and Ferreira, 2009; Shehata *et al.* 2017; Yang *et al.*, 2019), whereas the third set of researchers found no significant linkage between gender diversity and firm performance (Carter *et al.*, 2010; Martinez *et al.*, 2020).

As per Bennouri *et al.* (2018), women bring with them fresh viewpoints and diverse professional backgrounds on the board that differs from the 'old boys' club'. This enables them to give better advice to the managers (Anderson *et al.*, 2011). Women also act as proponents of positive behavior among the board members, which further enhances the monitoring role (Adams and Ferriera, 2009). The agency theory is one of the prime theories underlining the reduction in information asymmetry due to the presence of women directors (Reguera-Alvarado *et al.*, 2017), thereby leading to a substantial improvement in firm performance.

Contrary to this, some studies have advocated that gender diversity can negatively impact financial performance owing to conflict in opinions and delay in decision-making in dynamic market scenarios where quick decisions are required (Santacreu-Vasut *et al.*, 2017). Individuals often perceive others based on social categories, such as gender and therefore, the gender-based categorization at the board level can impair the communication process as well as cooperation (Knippenberg *et al.*, 2004).

Lastly, Green and Homroy (2015) suggest that for gender diversity to be effective, women should be appointed at workplaces where they can have decisional roles and can affect governance, without which the legal regulations and mandatory quotas would turn out to be fruitless. Moreover, the percentage of female representation on these boards has not reached the threshold where they can have a substantial say in the governance mechanisms and firm performance (Singh *et al.*, 2019; Martinez *et al.*, 2020). In the same vein, Garanina and Muravyev (2021) documented that any relation between women representation and firm performance cannot be found until the representation reaches a threshold of three directors and comparable results were corroborated when the number rose from single women director to closer to the threshold limit (Nguyen *et al.*, 2015).

According to the Institutional Investor Advisory Services (IIAS) Research Report (2021), even though the percentage of women representation has increased in India, only 31% of these seats are held by professional executive directors, and the rest are held by family and friends of the promoter group.

McGuinness (2017), as per investigations conducted in Hong Kong, also envisages the idea of gender bias imposing a cost on stakeholders and thus affecting performance negatively. A similar study conducted in Norway by Ahern & Dittmar, (2012), suggests that in companies with quota reserved for women on board, there is a decline in Tobin's Q over a period. Where on one hand, many authors have supported the idea ofappointment of women on board, claiming that diversity would help in better decision making andproblem solving, it has also been observed that diversity brings with it more chances of conflicts and makes decision making time consuming (Gallego-Álvarez et al., 2010).Wellalage & Locke, (2013), in a study conducted in Sri Lankan context, have found that board heterogeneity has a negative impact due to increased chances of conflicts.

Noland et al., (2016), in a global study of 21,980 firms, found no impact of the gender quota on board on a firm's financial performance. Many studies have also been carried out in developing countries with the same results. A study conducted by Yasser, (2012) in Pakistan showed no impactof gender diversity of board on the financials of the companies listed on the Karachi Stock Exchange. To achieve better performance, Joshi, (2017) concluded that there is a need forIndian companies to exploit the opportunity to build a strong talent pool of diverse directors.

2.5 Gender Diversity, Board Committees, and Financial Performance

Board committees acting through directors are the major drivers for decision making regarding the governance of the firms (Bugeja *et al.*, 2016) since they are vested with specific responsibilities of monitoring and advising the board (Chen and Wu, 2016). These committees accord several benefits such as knowledge specialization, decentralized decision making, efficient work allocation, enhanced accountability of board and mitigation of agency issues by allowing separation of management and control (Berezinets *et al*., 2017).

Prior research findings suggest that women directors are more inclined towards board monitoring (Gul *et al.*, 2011) and their presence enhances board effectiveness (Adams and Ferreira, 2009). The premise is based on the belief that an increase in women's representation sends a message of change in the governance mechanism (see Wang and Lee, 2012 in the context of independent directors). But the literature is translucent in defining how this change in governance takes place. In the broader context, most of the studies have focussed on finding a direct nexus between gender diversity on board and financial performance (Shehata *et al.*, 2017; Singh *et al.*, 2019; Duppati *et al.*, 2020; Brahma *et al.*, 2021). The results are typically representative of 'tokenism' rather than representing the causal impact of gender diversity on performance (Green and Homroy, 2018).

However, the engagement and participation of women directors in these committees shall integrate the element of governance and bring out the benefits of female representation on board (Green and Homroy, 2018). If women directors sit on these committees, the various advantages of diversity such as critical analysis of complex issues (Cater *et al.*, 2010) and risk averseness are likely to improve firm performance (Kahane *et al.*, 2013). Based on the diversity of the committee members, the richness of the discussions shall also improve. Moreover, the board shall not be willing to appoint those directors who are not capable of making significant contributions to the board committees (Carter *et al.*, 2010). Ararat and Yurtoglu (2021) also found that when there is active involvement of women directors on board committees, meaningful results can be seen on firm value. As per them, such results are applicable only when women are seen on prominent committees and their representation reaches a certain threshold limit. Carter *et al.* (2010) corroborated comparable results and Green and Homroy (2018) in different institutional and contextual settings.

2.6 Women on Board and Corporate Sustainability Practices

"Women make more sustainable lifestyle choices, and 10% are more inclined than men to learn about sustainability".

-Sustainability Report (Get Smarter, 2021)

Multiple studies have pointed towards the outlook of women in general, as well as women directors towards corporate sustainability and social responsibility. Males and females differ in their values especially when it comes to the corporate social performance (Post et al., 2011). As per Groysberg& Bell, (2013), female directors tend to show greater inclination towards community service projects as compared to the male directors. It has also been advocated that firms with women representation on the boards are found to violate less environmental concerns (Donaldson & Preston, 1995). According to Stakeholder Theory, women possess some communal qualities suchas helpfulness, kindness, sympathy, interpersonal sensitivity, etc. which may facilitate their say, based on stakeholders claims and expectations (Eagly et al., 2003).

Women's communal qualities also help them in taking decisions, considering their social responsibility (Tourigny et al., 2017). This is reiterated by the Social Role Theory as well, as per which women are shown to portray communal qualities (such as generosity, social orientation, concern) while men display agentic qualities (such ambitious, self-directed) (Doherty & Eagly, 1989; Eagly & Wood, 1991). Men are more prone to focus on their tasks, whereas women are social facilitators and are oriented towards others (Eagly & Karau, 1991; Major & Forcey, 1985). While men are inclined towards following and

promoting fairness and obligations, women are more likely to have long term relationships and caring for the needs of others (Gilligan, 1977, 1982). As a result, the presence of women directors on board, even if one, shall create a differencein the sustainability practices of the firm (Zaichkowsky, 2014).

The reason for this is that women directors are less power-hungry, and hence they showstrong traits like kindness & compassion. This enables them to look up to the protection of natureand other people (Adams & Funk, 2012). Women are more ethical, have better communication skills, better participation which enables them to have better concern for society and environment,and hence better CSR reporting (Kesner, 1988).

According to Zahid et al., (2020), diversity on board leads to a significant impact on the corporate sustainability disclosures (CSD), and CSD was found to be better in firms where the women werepresent in the top management. Similarly, as per Pucheta-Martínez et al., (2019), an increase in the proportion of women directors (independent & institutional directors) on boards, up to a certainthreshold limit would lead to better CSR disclosure. However, increasing the proportion beyond the threshold limit may lead to fall or decrease in the CSR disclosures. One exception to this is thestudy conducted by Sanan, (2016a), which did not find any significant impact of gender diversity on financial and social performance of firms.

These two major themes that have gained attention from large firms, scholars, and policymakers are gender diversity on corporate boards (Shehata et al., 2017; Moreno-Gómez et al., 2018; Issa and Fang, 2019; Baker et al., 2021; Singh et al., 2021) and corporate sustainability (Pucheta-Martínez et al., 2019; Naciti, 2019; Zaid et al., 2020; Nadeem et al., 2020). The concept of gender diversity has taken a center stage based on the series of mandatory as well as voluntary regulations adopted by various countries such as France, Italy, Australia, Germany, India, etc. (Nicolo et al., 2022), accompanied by the empirical evidence suggesting that their presence on boards impacts firm performance (Duppati et al., 2020; Arora, 2021). The role of gender diversity has been explored on various dimensions such as dividend payouts (Ye et al., 2019), corporate social responsibility (Yarram and Adapa, 2021; and environmental performance (Lu and Herremans, 2019), etc. The basic premise of these studies is that diverse boards shall ensure different perspectives and thereby improve the decision-making process (Lückerath-Rovers, 2013).

In the same vein, with growing environmental and social issues throughout the world, sustainability disclosures and reporting have become a focal point specifically among developing economies (Jamali and Karam, 2018). This can be attributed to the initiatives undertaken by various government as well as non-government agencies towards creating awareness regarding the unique social and environmental issues that exist in these nations (Tilt et al., 2021). The tremendous growth in the sustainability aspect at the global level has made it the core of the business operations and strategy, which shall proliferate

the benefits for the current as well as the future generations. There is pressure to enact sustainability measures, especially in the developing economies, where individuals are suffering from both, resource scarcity as well as environmental issues (Geng et al., 2010). This has also led to concerns about the publication of non-financial reports (Torelli et al., 2020). Hence, when a firm focuses on sustainability dimensions, it is pertinent that these are communicated to various stakeholders, a role which is played by sustainability reporting. Effective sustainability reporting helps the firms build healthy relationships and adds to their long-term survival as well as growth (López et al., 2007). Efforts should, therefore, be made to upgrade sustainability reporting and bring it at par with the financial reporting (Willis, 2003).

The stream of research in the field of gender diversity and sustainability performance is based on well-established theoretical frameworks such as stakeholder theory (Freeman, 1997) and resource dependence theory (Pfeffer and Salancik, 1978), which have augmented that gender diversity on board can be instrumental in influencing the sustainability and environmental practices in the wake of demands from various stakeholders (Rao and Tilt, 2016; Manita et al., 2018; Elmagrhi et al., 2018; Nicolo et al., 2022). Moreover, female directors are often found to be more sensitive toward social and ethical issues, which enhances their role in influencing the reporting practices of the firms (Giron et al., 2020). However, past research studies have focused on developed economies, with little investigation of this dimension in the case of developing nations, particularly in Asia and African regions (Tilt et al., 2020). Furthermore, both these themes are studied either in isolation or there is a lack of enough empirical evidence to warrant their suitable relationship. Thus, in our study we make use of stakeholder's theory and resource dependence theory to integrate both these elements, using the case of a developing economy, India.

Over the last few years, research in the domain of gender diversity has been majorly inclined towards measuring its impact on financial performance (Singh et al, 2019; Arora, 2021). Recently, the interest of academicians has shifted towards linking gender diversity with various aspects of sustainability (Issa and Fang, 2019; Zaid et al., 2020, Singh et al., 2021). The expected relation between these two variables is backed by various empirical studies, apart from the above-mentioned theories. Fernandez et al. (2019) and Zahid et al. (2020) suggest a positive association between gender diversity on board and sustainability practices. Similar evidence has been found by Cicchiello et al. (2021) in the context of Asian and African companies. Furthermore, Nicolo et al. (2022) found positive relation between percentage of women on board as well as ESG disclosures, both at the overall as well as at the individual level in Europe. A prominent study in the Gulf states by Issa and Fang (2019) also validates that there lies a statistically significant relation between number of female directors and corporate social responsibility (CSR) reporting, with the results varying between the sampled countries, attributable to the differences in their social and cultural barriers. This further warrants the need for conducting country-wise studies.

In another strand of research, scholars have found no association between gender diversity and sustainability disclosures. While Manita et al. (2018) provide evidence of no relation between the presence of a female director on board and ESG disclosures in the United States of America, De Masi et al. (2021) reported similar results in the context of Italy. They further suggest that critical mass of women is essential to cause a significant disclosure-based impact. Women directors, being present in marginal numbers on boards, are hardly able to convince the other decision makers for greater disclosures (Omran et al., 2021). The inadequate representation of females on board (Amran et al., 2014), along with a lack of support for their opinions (Kagzi and Guha, 2018), nullifies any positive impact on their views on the decision-making process.

Based on the above theoretical framework, in terms of stakeholder as well as resource dependency theory, it is contended that gender diversity on board is likely to promote better decision making amongst the firms by bringing diverse set of experiences, viewpoints, access to strategic linkages, etc. (Nadeem et al., 2017). Despite the favourable theoretical arguments, the literature seems translucent, and the findings with respect to the gender diversity and sustainability is mixed and inconclusive (Pareek et al., 2021). Thus, in the light of the arguments as well as the past literature, we posit that gender diversity on board is likely to impact sustainable reporting quality.

2.7 Theoretical Framework

The existing literature clearly focusses upon two elements Corporate Sustainability as well as therole of Gender Diversity on Board. The literature is based on extensive theories that lay down solid foundation for the positive implications of having gender diversity on Board.

2.7.1Agency theory

The agency theory propounded by Jensen and Meckling (1976) is one of the prime theories of corporate governance literature that focuses on the principal and agent relationships. The theory emphasizes the crucial and significant role played by the board of directors in managing and monitoring the firms by taking control over the managers (Fama and Jensen, 1983) and solving the agency conflicts as well as concerns (Reguera-Alvarado et al., 2017). The theory also postulates that the presence of women directors shall reduce the information asymmetry, which is one of the major causes of agency issues (Reguera-Alvarado et al., 2017). The theory also postulates that the presence of women directors shall reduce the information symmetry and hence improve the CSR quality and thus will also lead to the reduction in the agency issues (Reguera-Alvarado et al., 2017). Gender diverse boards are found to be one of the prominent aspects of promoting corporate governance mechanisms on board (Gallego-Álvarez et al., 2010). It has been readily accepted that strong corporate governance would lead to the

reduction in the agency issues of the firms and encourage the team of board of directors to work and operate in a much more transparent manner (Terjesen et al., 2016). We can conclude that gender diversity would be helpful in the reduction of agency costs for the firm (Reguera-Alvarado et al., 2017) and this will certainly have a bearing on the financial performance. In a recent study, Ain et al. (2021) have also highlighted that the presence of women directors in majority numbers is likely to reduce agency costs as compared to the firms having token membership of women directors.

2.7.2 Stakeholders Theory

The stakeholder theory emphasizes that the working of an organization is influenced by various stakeholders such as shareholders, employees, customers, financers, political groups, etc. (Freeman, 1997). These stakeholders often pressurize the firms to comply with ethical and regulatory norms prevalent in the society (Elmagrhi et al., 2018). The stakeholder theory acts as a linking pin between the role of board of directors and the corporate governance mechanisms with respect to the sustainability disclosures (Fernandez et al., 2019; De Villiers and Dimes, 2021). Moreover, the role of the board of directors is extremely crucial as they are the ones who are responsible for devising a robust internal control system for ensuring smooth flow of information to various stakeholders (Arayssi et al., 2019). However, the quality of decision making as well as effectiveness of operations shall depend upon the composition of the board of directors, their experiences, skill sets, etc. (De Villiers and Dimes, 2020). This warrants for a diverse team of board of directors (Fernandez et al., 2019). Female directors are often found to be different from their male counterparts, in terms of their personality, experiences, and communication style (Liao et al., 2015). Based on such differences, they can bring diverse viewpoints on the board discussion, thereby improving decision making (Valls Martinez et al., 2019), which may further affect sustainability reporting quality (Al-Shaer and Zaman, 2016).

2.7.3 Resource Dependency Theory

Firms work in a dynamic environment and need several types of resources to survive. In simple words, there is a dependency of these firms on external units (De Cabo et al., 2012). It has also been conceived that board diversity helps in building networks and linkages (Hillman et al., 2000) with various stakeholders such as customers as well as competitors (Reguera-Alvarado et al., 2017). Resource dependency theory suggests that firms shall not only focus on the management of the firms' resources but also leverage the resources from the environment (Hillman et al., 2000). Some scholars believe that women are appointed to the corporate boards to build a relationship with the female clients of the firms (Liu et al., 2014), and these connections provided by the female directors help the firms improve their financial performance (Reguera-Alvarado et al., 2017).

The resource dependence theory (Pfeffer and Salancik, 1978) supports the stakeholder theory by integrating the gender diversity aspect with the sustainability disclosure and reporting quality domain (Rao and Tilt, 2016; Manita et al., 2018; Yarram and Adapa, 2021). In terms of an organizational set up, every organization is an open system, and it interacts with various dimensions of the environment for its want for resources, but with a focus on reduction of uncertainty for survival and growth purposes (Hillman et al., 2007). To reduce uncertainty, diversity on board can turn out to be fruitful, as it shall enhance the number of interconnections and linkages that the firms can avail and shall also multiply the information exchange with other entities (Cordeiro et al., 2020). In this sense, women directors, by virtue of their background, experiences, and competencies, have better linkages with the environment and can therefore, help the firm improve internal governance as well as reduce external dependency and uncertainty (Terjesen et al., 2016; Fasan and Mio, 2017). They are also found to have better networks and linkages with other firms as compared to the male directors, which shall help firms avail diverse resources (Terjesen et al., 2016; Manita et al., 2018; Nadeem et al., 2019), further enhancing operational as well as social performance (Ali et al., 2014). A more prominent outlook, as reiterated by the resource dependency theory, is legitimacy of company in the eyes of community at large, as it provides a wider opportunity to the minority sections (female directors, in this case). This creates a better goodwill in the eyes of the stakeholders and citizens, given the opportunity, which would have otherwise led to a potential loss of human capital (Galleta et al., 2022). Furthermore, female directors are found to be more inclined towards ethical and socially responsible behavior, which makes them less likely to violate environmental norm, thereby leading to better sustainability reporting and disclosures (Al-Shaer and Zaman, 2016; Nadeem et al., 2017; Valls Martınez et al., 2019; Wasiuzzaman and Wan Mohammad, 2020).

2.7.4 Gender Socialization Theory

Gender Socialization theory believes that the leadership styles of Female directors is more ethical& Social than that of the males, and hence they are more stakeholders oriented thus would enhancethe CSR Reporting (Landry et al., 2016). Based on the socialization process prevalent in the societyWomen are more ethical, better communication skills, better participation & communication which facilitates them to have better concern for social and environment and hencebetter CSR reporting (Kesner, 1988). In the same context it is also believed that women tend to have, participative and communicative leadership styles (Eagly & Johnson, 1990). The gender socialization theory also contends that the roles assigned to different genders are also based on their personality and orientation. For example, women in top positions are given the role of handling softer issues such as HRM, Public Affairs, ethics, donations, and men are given the role of harder roles such as Finance or executive commission (Rao & Tilt, 2016). The theory also suggests that such gender-based roles determines the behavior of an individuals and how

likely arethese going to be effective as well as influential (Doherty & Eagly, 1989). Such influences shall be useful in the corporate boards as a matter of tactics to get various tasks done effectively.

Based on the above arguments and theories we contend that gender diversity on board is likely to function as a powerful determinant in determining the corporate sustainability of the firms and therefore we build our objectives based on above-mentioned theoretical framework.

CHAPTER 3: RESEARCH METHODOLOGY

This chapter shall deal with the detailed research methodology used in the study for the achievement of the various research objectives.

Based on the extant review of literature as well as theoretical framework, the study formulated below mentioned research objectives which were achieved using various techniques and methods.

The study aims to achieve the following objectives:

- To examine the status of gender diversity on corporate boards
- To examine the literature on gender diversity and corporate sustainability practices
- To study the relationship & Impact of gender diversity on Board & Financial performance.
- To study the impact of gender diversity on board committees and its impact on financial performance.
- To examine the impact of gender diversity on board on Sustainability Reporting Quality.

Based on the above-mentioned research objectives following research questions and hypothesis was formulated.

3.1 Research Questions and Hypothesis

Objective 1: To examine the status of gender diversity on corporate boards

The below mentioned research questions have been formulated to look at the growth, trend analysis, past, present, and future status of the theme of gender diversity on board.

1) *What is the current Publication volume & trends under Gender diversity on Boards?*
2) *Which are the most influential countries publishing extensively in the gender Diversity domain?*
3) *Which are the top journals publishing articles on gender diversity?*
4) *Which are the most significant research articles on gender diversity?*
5) *Which themes under gender diversity have been popular among the research scholars*

in the past as well as current and which topics have scope for future research?

Objective 2: To examine the literature on gender diversity and corporate sustainability practices

We formulated the below mentioned research questions to look at the extensive literature encompassing the theme of gender diversity and corporate sustainability (GDCS).

RQ1: What is the current publication volume, trend, and geographical distribution under GDCS?

RQ2: Which are the top journals, top authors and top articles publishing articles on GDCS?

RQ3: What are the various thematic sets formed in our field of study?

RQ4: What specific subjects and concepts have emerged through the trajectory of our field?

Objective 3: To study the relationship & Impact of gender diversity on Board & Financial performance.

H_0: *Gender diversity on boards has no impact on firm financial performance.*

Objective 3.A: To study the relationship & Impact of gender diversity on Board & Financial performance in the context of IT Sector

H_0: *Gender diversity on boards has no impact on firm financial performance (in the case of IT Sector)*

Objective 4: To study the impact of gender diversity on board committees and its impact on financial performance.

H_0: *Gender diversity on the board's committees has a positive impact on firm financial performance.*

Objective 5: To examine the impact of gender diversity on board on Sustainability Reporting Quality.

H_1: Gender diversity on board has a positive association with sustainability reporting quality.

$H_{2:}$ Independent female directors have a positive association with sustainability reporting quality.

The detailed techniques as well as the measures chosen to test the research questions and the hypothesis formulated has been provided below:

3.2 Research Design

Objective 1: To examine the status of gender diversity on corporate boards

To achieve objective one, we focused on the bibliometric analysis of the research articles on the topic of gender diversity on board based on the data (research articles) retrieved from the Scopus database (www.scopus.com). Though the Web of Science database is often considered a more popular database, the Scopus database launched by Elsevier in 2004 is found to have a broader database in social sciences, significantly covering more than 16 million references dating back to 1996 (Vieira & Gomes, 2009). Since the area of gender diversity is deeply rooted in the discipline of corporate governance, which saw an upsurge in the late 1990s, the Scopus index database by Elsevier was found to be the best match for the same. Various scholars further corroborated the above argument as well (Mongeon & Paul-Hus, 2016). Based on the preliminary search of keywords: *gender diversity* and *women on boards*, a total stream of 547 articles were found.

Accordingly, in the second phase filters were places to screen out those articles which were not connected to the subject of the study, and we have only considered full articles, and have excluded publications, such as book chapters, conference papers, editorials, etc., since they ideally do not go through a full-fledged review process.

After adequate refinement and filters in the second phase, a total of 352 articles were found relevant for the study which were published during the years 1983–2021. In the final phase, abstracts of 352 articles were scrutinized to eliminate those which did not belong to the subject domain.

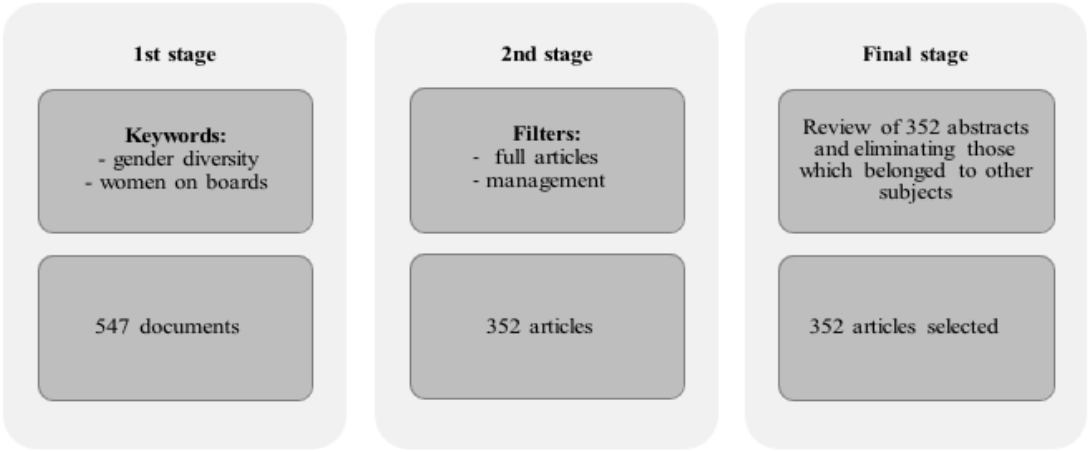

Figure 2. Selection process in the Scopus database for the finalization of the research articles.

Source: Authors' elaboration.

Firstly, based on the data extracted from the Scopus database, the author employed various descriptive statistics for the generation of various tables and graphs that could help in the identification of patterns within the database. The trends were identified in terms of the number of publications, top publishing countries, journals, top authors, most cited articles as well as the evolution of the keywords.

The author made use of citation, as well as co-citation analysis, to identify the features of the area of gender diversity on corporate boards to enhance the intellectual base (Zupic & Čater, 2015). Citation analysis refers to the frequency with which a research article or a document is cited or used by other papers located in the same database (Scopus, in this case). The author made use of the citation analysis to evaluate the top countries, journals, influential articles in the domain of gender diversity based on the number of citations.

Co-citation analysis helps us supplement the citation analysis by enhancing the intellectual base in a particular area by examining two research articles or documents which have been cited in a common document (Small, 1973).

Objective 2: To examine the literature on gender diversity and corporate sustainability practices

Date Base Selection

The study employs bibliometric analysis to uncover the intellectual development and analyse the research articles in this domain. The method has been widely used in the past studies as a quantitative review tool (Zheng and Kouwenberg, 2019; Singh et al., 2021b; Baker et al., 2020). The Scopus database by Elsevier has been used to source the relevant documents for the purpose of the analysis. The Scopus database has been a suitable database for bibliometric analysis as suggested by various past studies (Aksnes and Sivertsen, 2019; Farrukh et al., 2021). For instance, Scopus database is found to have a broader coverage in the domain of social sciences especially since the year 1996 (Vieira and Gomes,2009). It is also found to have a wider range of papers in the field of management (Aksnes and Sivertsen, 2019; Farrukh et al., 2021). Moreover, since the corporate governance literature has majorly been evolved since the year 1990 Scopus data base is a suitable choice for the analysis as stated in past literature (Mongeon and Paul, 2016). Therefore, based on above reasons Scopus database turned out to be a better source than Web of Science (Farhan and Iqbal, 2021).

We have used a systematic approach named PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines for conducting systematic research reviews (Moher at al., 2009). PRISMA specifies four steps to follow and report when identifying and extracting information for a bibliometric analysis.

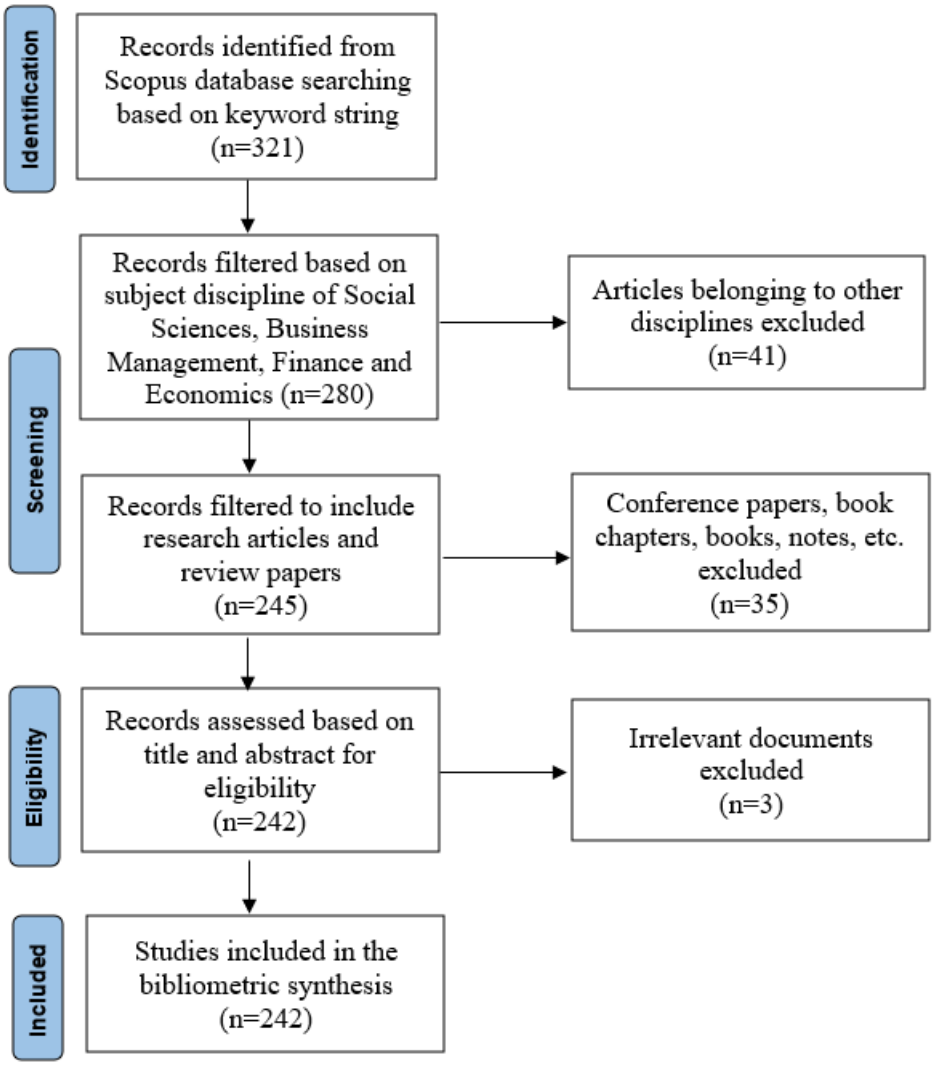

Figure 3. Provide a summarised view of the selection criteria of the research articles based on the PRISMA Model.

Source: Authors' elaboration.

Articles Selection

The first step to conduct bibliometric analysis post identification of the database was to identify and extract the various research articles from the Scopus database related to the relevant literature. The search was conducted at four different stages to identify the widest and the most suitable research articles for the quantitative analysis. In the first stage the literature was searched in the Scopus database on 22nd April 2022 using the strings of keywords: ("gender divers*" OR "female director*" OR "wom?n director*") AND ("sustainability" OR "sustainable"). In the second stage the articles were restricted to the subjects of Social Sciences, Business Management, Finance and Economics owing to the premise that the literature on

GDCS is ideally restricted to such subjects (Mumu et al., 2022). The third and the fourth stage made use of two filters with respect to English as the language and the literature was restricted to articles and review papers only. English as language was chosen for conducting an in-depth content analysis of these articles using the relevant software's (Van Eck and Waltman, 2011) and the literature was restricted to articles and review papers as they warrant more consistency in terms of quality (Zheng and Kouwenberg, 2019). Finally, filtration of some irrelevant and documents led to the final sample of 242 articles for the analysis.

Methods for Data Analysis

The next step posts the article selection was to identify the major indicators or methods for conducting the quantitative review. The bibliometric analysis is majorly conducted using the two-methods performance analysis and scientific mapping (Durieux and Gevenois, 2010). The performance analysis is based on the Volume analysis, citation analysis, co-citation analysis, co-occurrence maps etc which shall be helpful in the identification of the most influential articles, authors, journals etc. Science mapping is used as a visualisation tool to identify the linkages between various themes and structures (Gao, et al., 2021).

Software's Used

The bibliometric analysis was conducted using a mix of two software's namely VOS-Viewer and R-Studio. VOS viewer is an open-source free software based on JAVA and developed by Van 2009, mainly for literature data (Van and Waltman,2009). RStudio is R's integrated development environment (IDE), that supports direct code execution and tools for drawing, visualisation etc (Allaire, 2012). The authors made use of two software's to integrate the benefits of both as has been done in the previous studies (Gao et al., 2021).

Objective 3: To study the relationship & Impact of gender diversity on Board & Financial performance.

Sample and Data Sources

To achieve the objective, we selected a sample of all Indian firms listed on the S&P BSE 500 Index for a period of 8 years, that is, from 2013 to 2021. The year 2014 has been taken as the starting point because of the amendment in the Indian Companies Act, in the year 2013, that mandated the appointment of at least one woman on board for certain classes of companies. The S&P BSE 500 Index is a suitable measure because it represents almost 93% of the total market capitalization listed on the Bombay Stock Exchange (BSE), it comprises a diverse range

of industries (covering almost 20 industries) which shall accord richness to the industry-based outcomes (Raithatha and Haldar, 2021), and most importantly, the amended provisions of the Companies Act 2013 shall be applicable to the large companies which can be best represented by the BSE 500 Index. Out of the sample, 35 banking and financial firms were removed and 37 firms with missing data were screened out, leaving a total of 428 firms and 3424 firm-year observations.

The list of BSE 500 Index and the relevant financial variables were sourced from the Prowess database, which is maintained by the Centre for Monitoring Indian Economy (CMIE). The Prowess database is a widely accepted database for retrieving data and conducting empirical studies based on the Indian corporate sector (Haldar *et al.*, 2018; Singh *et al.*, 2021a). The corporate governance variables were manually collected from the corporate governance reports of the firms in our sample. We corrected and cross-verified many data points to avoid any inconsistencies that might be present in the data, using sources such as Bloomberg profile of directors, Ministry of Corporate Affairs website, official and personal webpages of firms and directors to reconfirm the initials of the directors. This practice was followed based on the work of Haldar *et al.* (2020).

The analysis of the results was conducted using the latest version 17 of the STATA Software.

Objective 3.A: Sectoral Study of Information technology sector to test for gender diversity on board and firms' financial performance.

Sample, Time Period and Data Sources

The sample for the panel data analysis is based on the secondary data of 26 IT sector firms listed on the Bombay Stock Exchange (BSE), for 8 years, from 1st April 2013 to 31st March 2021. The total sample comprises 208 firm years observations. All the IT sector firms which form part of S&P BSE-500 have been selected for the sample based on two reasons. First, BSE 500 comprises large, listed companies based on market capitalization and therefore, these 26 sample firms shall be representative of the Indian IT sector. Second, the mandatory provisions of the women directors shall apply to these firms and shall be well suited to gauge the reflection in terms of any significant changes in financial performance. The rationale for choosing such a period is based on the legal mandate in terms of the Companies Act, 2013 which made it mandatory for certain classes of companies to appoint one women director on board. Thus, the period posts the mandatory provision shall be reflective of the changes caused by the board gender diversity on firms' financial performance.

The financial data for the firms in our sample has been collected from the CMIE Prowess database and the data for the governance variables has been extracted manually from the corporate governance reports as well as the board reports of these listed companies. Further, to re-confirm the gender aspects of the board of directors, multiple sources such as Bloomberg profiles of individuals, the website of the Ministry of Corporate affairs as well as professional and official profiles were cross-checked. The practice was followed based on the work of Haldar et al. (2020).

Objective 4: To study the impact of gender diversity on board committees and its impact on financial performance.

Sample and Data Sources

To achieve the objective, we selected a sample of all Indian firms listed on the S&P BSE 500 Index for a period of 8 years, that is, from 2013 to 2021. The year 2014 has been taken as the starting point because of the amendment in the Indian Companies Act, in the year 2013, that mandated the appointment of at least one woman on board for certain classes of companies. The S&P BSE 500 Index is a suitable measure because it represents almost 93% of the total market capitalization listed on the Bombay Stock Exchange (BSE), it comprises a diverse range of industries (covering almost 20 industries) which shall accord richness to the industry-based outcomes (Raithatha and Haldar, 2021), and most importantly, the amended provisions of the Companies Act 2013 shall be applicable to the large companies which can be best represented by the BSE 500 Index. Out of the sample, 35 banking and financial firms were removed and 37 firms with missing data were screened out, leaving a total of 428 firms and 3424 firm-year observations.

The list of BSE 500 Index and the relevant financial variables were sourced from the Prowess database, which is maintained by the Centre for Monitoring Indian Economy (CMIE). The Prowess database is a widely accepted database for retrieving data and conducting empirical studies based on the Indian corporate sector (Haldar *et al.*, 2018; Singh *et al.*, 2021a). The corporate governance variables were manually collected from the corporate governance reports of the firms in our sample. We corrected and cross-verified many data points to avoid any inconsistencies that might be present in the data, using sources such as Bloomberg profile of directors, Ministry of Corporate Affairs website, official and personal webpages of firms and

directors to reconfirm the initials of the directors. This practice was followed based on the work of Haldar *et al.* (2020).

The analysis of the results was conducted using the latest version 17 of the STATA Software.

Objective 5: To examine the impact of gender diversity on board on Sustainability Reporting Quality.

Time period

The study employs quantitative data analysis over a period of eight years, from 2013 to 2021, to achieve the objectives. The year 2013 witnessed the amendment of the Indian Companies Act to include the provision of mandatory appointment of at least one-woman director on corporate boards. With an aim to enhance sustainability reporting standards of large, listed companies, the Ministry of Corporate Affairs (MCA), Government of India also made it mandatory for certain class of companies to issue the Business Responsibility Statement, in a phased manner, since the year 2012. To encapsulate the impact of these two mandatory regulatory amendments, the year 2013 has been taken as the starting point for the analysis.

Sample Selection

To evaluate the impact of gender diversity on sustainability reporting quality, we use the Bombay Stock Exchange (BSE) 500 index. This index is suitable since it comprises of India's top 500 companies, representing 93% of the total market capitalization, thereby encompassing those companies which are liable to comply with the mandatory provisions of the Companies Act 2013, as well as the sustainability reporting practices as laid down by the MCA. Moreover, the BSE 500 firms represent a rich diversity of 20 industries (Raithatha and Haldar, 2021), making it useful to understand and analyze the industry-based dimension of sustainability reporting. To ensure regulatory homogeneity of the sampled data, a total of 34 banks have been excluded from the sample of 500 firms, since they are regulated under the Banking Regulation Act of 1949, and are supervised by the Reserve Bank of India. Further, all the firms with the missing data have been eliminated from the sample, leaving a final sample of 432 companies for the analysis.

The data for the financial variables has been collected from CMIE Prowess, a well-established and widely acceptable database that stores authentic financial data for the Indian corporate sector (Sarkar and Selarka, 2021; Singh et al., 2021a). The corporate governance data as well

as the sustainability reporting data has been manually collected from the corporate governance (CG) reports, sustainability reports and business responsibility reports of the sampled firms. The data related to the women directors has been corrected and rectified for any inconsistencies based on the Bloomberg profile as well as MCA database of the firms, in alignment with the work of Haldar et al. (2020). The analysis of the results was conducted using the latest version 17 of the STATA Software.

3.3 Variables

To achieve the various objectives, the variables were identified based on the in-depth literature and since the topic in consideration belongs to the multidisciplinary arena the literature has been drawn from various disciplines such as corporate governance, finance, economics, psychology, business management etc.

The variables have been listed below:

3.3.1 Measures of Financial Performance

We used two different variables to measure firm performance, both of which are used extensively and reliably in the literature. First is Tobin's Q, which is a prominent market-based measure of financial performance (Shehata *et al.*, 2017; Raithatha and Haldar, 2021; Sarkar and Selarka, 2021), and second is the return on assets (ROA), an accounting-based measure that determines profitability (Duppati, *et al.*, 2020; Sarkar and Selarka, 2021; Ghalke *et al.*, 2022).

Profitable firms are found have a positive relationship with the sustainability practices as well (Ben-Amar et.al 2017), and the growth opportunities-based firms are also inclined towards better environmental disclosures to reduce the information symmetry amongst their stakeholders (Ben-Amar et.al 2017).

Tobin's Q

Tobin's Q is used as a dependent variable in our study, as a measure of the financial performance of firms in our sample. Tobin's Q is suitable since, unlike other accounting-based measures, it considers the risk factor. Since Tobin's Q is representative of the market-based element, it is often considered as an element of competitive advantage. Hence, Tobin's Q was used as a proxy for measuring the performance for various years based on the previous

literature (Campbell and Mínguez-Vera, 2008; Ahern and Dittmar 2012; Haldar et al., 2015; Bennouri et al., 2018; Singh et al., 2019; Singh et al., 2021a). Tobin's Q is calculated using the Chung and Pruitt (1994) formula, that is, the market valuation of shares plus debt divided by the total assets. Moreover, it is pertinent to note here that since in the Indian context, the debts are not actively traded in the market and are majorly comprised of the corporate debt, thus book value of debt is taken. Similarly, the assets are recorded in the books of account at the historical cost, hence the book value of the total assets is considered. The reasons for using Tobin's Q are many folds, Firstly,it considers the risk factor, unlike other accounting measures, and is not subject to distortions. Secondly, it reflects the market's expectations of future earnings and is, thus, a good proxy for a firm's competitive advantage (Wernerfelt & Montgomery, 1988). Hence, Tobin's Q was used asa proxy for measuring the performance, for various years based on the work of (Ahern & Dittmar,2012; K. Campbell & Mínguez-Vera, 2008; Haldar et al., 2015). Tobin's Q is calculated using the(Chung & Pruitt, 1994) formula, which is, market valuation of shares plus debt divided by the totalassets. In a situation where the value of Tobin's Q is greater than 1 it can be construed that the firm is making efficient utilisation of its resources. Therefore, based on the previous literature (Nguyen et al., 2014; Sarkar and Selarka, 2021) we measure Tobin's Q as:

Tobin's Q = (Market Value of Equity + Book Value of Debt)/ Book Value of Assets

Return on Asset

Return on assets is calculated as:

ROA= Net Profit before Interest, Tax, and Depreciation/ Book Value of the Assets.

The return on asset is an accounting-based performance measure and it shows how the firm is performing in terms of its operations. Return on asset is a variable which is based on the past results and hence as an accounting-based performance measure it shall throw light whether the impact of gender diversity has caused an impact on financial aspects or not. Return on assets is one of the operational-based measures of financial performance and, thus, is likely toaffect the corporate social responsibility measures of the firms (Haniffa & Cooke, 2005). The CSR disclosure of profitable firms is also larger as has been used and advocated in various other studies(Pucheta-Martínez et al., 2019; Valls Martínez et al., 2019).

3.3.2 Sustainability Reporting Quality

The current study involves the construction of a modified sustainability reporting quality variable (SUSQUAL), along the lines of Pucheta-Martínez et al. (2019) and Zahid et al. (2020). While previous studies have made use of the third-party ratings such as ESG scores or Sustainalytics ratings score to determine voluntary and mandatory disclosures (Sethi et al., 2017; Issa and Fang 2019), this paper applies content analysis to explore the level of sustainability reporting by the firms. Content analysis refers to the technique of collecting data by codifying the qualitative information available in literary form into various categories of quantitative scales for further analysis (Abbott and Monsen, 1979). Manual content analysis was used to collect the data related to the sustainable reporting of the firms based on the CSR reports, sustainability reports as well as business responsibility reports. The parameters for sustainability reporting were identified based on the work of Al-Shaer and Zaman (2016), and the same were modified as per the disclosures specified in these reports in the Indian context.

The legal, regulatory, and institutional framework of governance varies across countries, and this calls for creating a separate and independent measurement for sustainability reporting quality in India. We focused upon creating a coding-based threshold of five levels, elaborating various degrees of sustainability reporting quality. Table 1 describes that the coding values varied from 0-4 based on the disclosures reported in the sustainability or business responsibility report.

Table 1: Description of the coding-based Sustainability Reporting Quality

Description of the Disclosures (SUSQUAL)	**Assigned Coding**
Non-existence of Business Responsibility Report or Sustainability Report.	0
Existence of Business Responsibility and Sustainability Report.	1
Existence of Reports + Committee to look after Sustainability aspects.	2
Existence of Reports + Committee to look after Sustainability aspects + Internal Audit related to sustainability activities.	3

Existence of Reports + Committee to look after Sustainability aspects + Internal and External Audit related to sustainability activities.	4

The above reporting index is in the form of an ordinal scale, moving from the lowest to the highest degree of reporting.

3.3.3 Gender Diversity

Gender diversity, the main independent variable, is measured through 4 proxy variables to enhance the robustness of the findings based on the previous empirical studies (Martín-Ugedo and Minguez-Vera, 2014; Issa and Fang, 2019). The variables used are Percentage of women director on board (P-woman) (Nadeem et al., 2017; Issa and Fang,2019; Zahid et al., 2020), Number of independent female directors on the board (INDFEMDIR) and finally the two diversity indices Blau (Blau, 1977) and Shannon (Shannon, 1948).

Both the diversity indices are widely used in the fields of biology, genetics, and cultural studies (Campbell and Mínguez-Vera, 2008) and help to gauge the dis-similarities between the different categories that they measure (male and female, in this case). The major difference between the Blau and the Shannon Index lies the sensitivity of the gender composition, with Shannon index being more sensitive out of the two (Martín-Ugedo and Minguez-Vera, 2014). The maximum and minimum value of Shannon index is 0.69 and 0 respectively, whereas the maximum and minimum value of Blau Index is 0.5 and 0 respectively. Intuitively, Shannon index is always found to have a higher value than Blau Index as it is a logarithmic value and is more sensitive to small changes in value.

Percentage of Women Directors

We employ several proxy variables to measure the gender diversity aspect on the corporate boards. Firstly, P-woman reflects the percentage of women on board, calculated as the ratio of the number of women on board and the total number of directors. Literature suggests that the existence of women directors on board leads to a positive impact on organizational innovation, diversity in perspectives, and hence better decision making (Torchia et al., 2011). Board diversity also provides opportunities for strategic alliances and better relationships with other firms and corporate groups (Haldar et al., 2015). Hence, various studies have used P-woman

to measure gender diversity on board and its impact on various firm-related aspects (Campbell and Mínguez-Vera, 2008; Giraldez-Puig and Berenguer, 2018; Haldar et al., 2018).

We also made use of two more proxy variables, which are widely used in the diversity literature of various disciplines such as sociology, anthropology, psychology, etc. These are Blau Index and Shannon Index, as explained below.

Blau Index

The Blau index is a well know variable used to measure diversity.

It is calculated as: $D = 1 - \sum_{i=1}^{n} p_i^2$

In the above formula p shall be representative of the proportion of objects in the categories, and

N denotes the number of categories.

The value of the Blau index varies from 0 to 0.5 (lowest to highest diversity). The variable has been used to enhance the robustness of the study concerning women on board (Campbell and Mínguez-Vera, 2008; Issa and Fang, 2019; Singh et al., 2019).

Shannon Index

The Shannon index helps in quantifying the uncertainty of predicting the various categories of elements which are randomly chosen from any data set or sample.

It is calculated as: $H' = -\sum_{i=1}^{s} p_i \text{In } p_i$

In the above formula p shall represent the proportion of objects in the categories and

S denotes the number of categories.

The value of the Shannon Index varies from 0 to 0.69 (lowest to highest diversity). This variable has also been chosen to enhance the robustness of the study in terms of gender diversity on board (Campbell and Mínguez-Vera, 2008; Issa and Fang, 2019; Singh et al., 2019).

Number of Independent Women Directors: is measured by Number of independent women directors present on the Board (Al-Shaer and Zaman, 2016; Martinez et al., 2019). The

independent women directors bring about transparency in the decision-making process. This shall act as a merit as diversity of perspective when clubbed with higher degree of transparency is bound to improve financial performance as well as sustainability disclosures of the firm.

3.3.4 Board Size

Board size refers to the number of directors' present on the board of the firm. Board size is a crucialelement in the decision making of the firms. It has been suggested that larger boards tend to disclose more CSR related information (Esa & Ghazali, 2012) and therefore it is very likely that the board size shall impact the decisions taken with respect to the corporate social responsibility measures undertaken by the firms, and has been used extensively in literature (Issa & Fang, 2019;Karim et al., 2019; Pucheta-Martínez et al., 2019; Sanan, 2016b)

Prior literature suggests that the board size (B-SIZE) of a firm is an important driver that influences the level of corporate social responsibility (CSR) disclosure (Issa and Fang, 2019). Firms with relatively larger board size are found to make more disclosures voluntarily than the firms with smaller board size (Esa and Ghazali, 2012). Also, in the context of board size, the larger the board size larger shall be the resources with the firm and it shall lead to better decision making thus impacting firm performance (Singh et al., 2019).

3.3.5 Board Independence

Board Independence refers to the percentage of independent directors on the board of the company.Independent directors tend to promote corporate social responsibility by striking a balance between the interest of both the shareholders as well as other stakeholders. (Giannarakis, 2014). The presence of independent directors is believed to have a positive Impact on CSR reporting as well since they foster transparency in the decision making (Cheng & Courtenay, 2006).

The presence of outside and independent directors on the company's board reduces the agency cost, enhances the legitimacy and since they do not have any pecuniary relation with the firm, their presence enhances disclosures (Pareek et al., 2019). Thus, we include board independence (B-IND) as one of the control variables, measured as the number of independent directors present on the board.

3.3.6 Board Meeting

Board meetings provide adequate platform to the board of directors to discuss about various issuesand take various decisions for the company and its operations. A higher number of board

meetingsare indicative of the firms giving more care and attention to the prevalent issues including the CSRrelated aspects. Thus, we could find evidence in the literature where the number of board meetingtends to have a positive impact on CSR performance (Martínez-Ferrero et al., 2015), however thereare certain studies that found no impact of board meeting on CSR aspects (Dienes & Velte, 2016;Giannarakis, 2014; Sial et al., 2018).

Board meetings (BM) held in any organization enhances the level of information sharing and discussion between the board of directors, which is bound to make the decisions more effective and transparent (Liao et al., 2015). Through better information sharing and decision making, board meetings are expected to enhance the level of quality of voluntary disclosures (Jizi,2017). Board meeting is measured as the number of board meetings held during the year.

3.3.7 CEO Duality

CEO duality refers to the phenomenon where the chairperson as well as Chief Executive officer of the company are the same and hence this is bound to affect the independence of the board as more powerful CEOs would impact the governance of these firms as well as disclosure norms (Li et al., 2008)**.** Based on the literature it is also found that having the same person holding both the positions would negatively affect the CSR reporting negatively (Muttakin & Subramaniam, 2015)and would enhance the conflict of interest with the owners (Dienes & Velte, 2016).

Furthermore, CEO's who have access to more legitimate power are found to influence the boards' oversight. The effectiveness of the board is likely to be compromised when a single person holds dual position (CEO and Chairman) leading to the board disclosing lesser information (Sellami et al., 2019). Therefore, CEO duality (CEO-D), that measures the extent of powerful influence, has been taken as a dummy control variable, with a value of 1 if chairperson and CEO are same and 0 otherwise.

3.3.8 Firm Size

Firm size has been measured with respect to the total assets. Based on the extant literature, it has been observed that larger firms are inclined towards behaving in a socially responsible manner (McWilliams and Siegel, 2001; Barnea and Rubin, 2010) and therefore we expect that it is certainlygoing to affect the corporate social responsibility activities. This variable has been used in multiplepast studies as well (Issa & Fang, 2019; Karim et al., 2019; Pucheta-Martínez et al., 2019). large firms are engaged in catering to more diverse activities and stakeholders

needs, since they are under greater scrutiny and thus, their level of sustainability practices as well as disclosures is on the higher end (Pareek et al., 2019).

3.3.9 Firm age

Measured as the number of years for which the firm has lived from the date of its incorporation. Based on the past studies it has been identified that the firm which are older will have a better set of reputation in the market as compared to the new firms and they shall be in a better position to impact financial performance (Francoeur et al., 2019; Zahid et al., 2020).

Also, the age of the firm defines the number of years for which the firm has been inexistence and has been using societal resources. Based on the Iron Law of Responsibility, age of the firm should have a positive impact on the CSR (Jo & Harjoto, 2011) and has been used in several studies as well to measure social performance & sustainability issues (Francoeur et al., 2019; Zahid et al., 2020).

3.3.10 Leverage

Leverage of any organization is calculated as the ratio of total long-term debt to the total assets, indicating what percentage of total assets of a firm is financed by debt. In the previous literature. it has been documented that leverage shall negatively affect CSR (Campbell, 2007; Waddock& Graves, 1997) and has been empirically used in several other studies (Issa & Fang, 2019; Karim et al., 2019; Pucheta-Martínez et al., 2019; Sanan, 2016). Further, a highly leveraged firm (Lever) must act more responsibly and must make greater disclosures to sustain trust and belief of its creditors (Qureshi et al., 2020; Wasiuzzaman and Wan Mohammad, 2020).

3.3.11 Organisational Slack

Organizational slack refers to the surplus or potential resources which the firm can make use for achievement of its various goals and objectives (George, 2005). Studies suggest that how well thefirms respond to the social & environmental decisions is dependent upon the slack resources as well (Waddock & Graves, 1997).

Organizational slack, which refers to the potential of the firm to optimally utilize their resources for the needs and requirements of various stakeholders, also improves the sustainability practices of the firms as firms have higher resources for CSR (Xu et al., 2015). Organizational slack (O-Slack) is calculated as the difference between the current assets and the current

liabilities (Issa and Fang, 2019) but owing to the skewness issue, a logarithmic measure has been used.

3.3.12 Industry Classification

Firms belonging to certain polluting industries, such as tobacco and oil (Haniffa and cooke 2020) are found to be more engaged into environment and sustainable activities (Fernandez-Feijoo et al., 2014), owing to the larger pressure from the stakeholders as well as the consumers. Further firms, to compensate for the environmental damage and create a good public image are also inclined towards greater assurance of their sustainability reports (Sellami et al., 2019). Such firms, belonging to the different industries based on Pollution Index Score, have been codified as per the classification provided by Central Pollution Control Board (2016) in India. The classification parameter has been used based on the work of Verma et al., (2021). Table 2 lists the 4 categories based on the quantitative coding, where the least hazardous industries are coded as 1 and the most hazardous as 4, respectively. Further, Table 3 summarizes the description of the other variables.

Table 2: Industrial Classification based on the Pollution Index Score

Barometer based on Pollution Index Score	**Color Codes**	**Codes**
Industrial sectors having Pollution Index score of 60 and above.	Red category	Most Hazardous (4)
Industrial sectors having Pollution Index score of 41 to 59.	Orange category	Moderately Hazardous (3)
Industrial sectors having Pollution Index score of 21 to 40.	Green category	Low Hazardous (2)
Industrial sectors having Pollution Index score including and up to 20.	White category	Least Hazardous (1)

Source: Authors' own creation based on Central Pollution Control Board Report, 2016.

Table 3: Summary of all the Variables along with Data Sources

Variables	**Symbols**	**Description**	**Sources**
Independent Variables			
Percentage of women Directors	P-woman	Number of women directors divided by the total number of directors.	CG Reports
Number of women Independent Directors	INDFEMDIR	Number of independent women directors present on the Board	CG Reports
Blau Index (used for robustness)	Blau	$D = 1 - \sum_{i=1}^{n} p_i^2$ where: Pi = is the percentage of (male/female) directors; and n = is the number of distinguished categories (males/females) in the firm.	Authors Computation
Shannon Index (used for robustness)	Shannon	$H' = -\sum_{i=1}^{s} p_i \ln p_i$ where: Pi = is the percentage of (male/female) directors; and n = is the number of distinguished categories (males/females) in the firm.	Authors Computation

Control Variables			
Board Size	B-size	Total Number of directors present on the board	Prowess database
Board Independence	B-IND	Number of independent directors present on the board	Prowess database
Board Meetings	BM	Number of board meetings held during the year.	Prowess database
CEO Duality	CEO-D	Value of 1 if chairperson and CEO are same and 0 otherwise.	CG Reports
Firm Size	F-Size	Log of the total assets of the firm.	Prowess database
Firm Age	F-Age	No of years from the date of Incorporation	Prowess database
Leverage	Lever	Measured as proportion of total liabilities divided by the total assets.	Prowess database
Market based performance Indicator (Tobin's Q)	Tobin's Q	Measured as (Market Value of Equity + Book Value of Debt)/ Book Value of Assets	Prowess database

Accounting Based performance Indicator (Return on Assets)	ROA	Return on assets is measured as profit before interest tax and depreciation divided by the total assets.	Prowess database
Organizational Slack	O-Slack	Calculated as the difference between the current assets and the current liabilities.	Prowess database

3.4 Model and Techniques used for achievement of various objectives

Methodology for 1st and 2nd Objectives

Diverse set of techniques were used for the achievement of the various objectives mentioned in the study. The first two objectives were based on examining the status of gender diversity as well as its culmination with the concept of corporate sustainability.

The study focussed upon conducting an in-depth literature review along with the quantitative analysis using bibliometric analysis of the vast number of empirical as well as review articles. The major techniques used in the bibliometric analysis were citation analysis, co-citation analysis, word cloud analysis, bibliographic coupling, co-occurrence analysis, content analysis etc. To further delve deeper into the existence of various themes manual content analysis was also conducted to identify the major themes which have grown over the years and showcase the intellectual development. The content analysis also further led to the identification of the future research avenues that could be conducted by future researchers. The techniques led to various insightful outcomes in the form of tables as well as visual representation.

Methodology for 3rd and 4th Objective

The third and the fourth objective was inclined towards understanding the impact of gender diversity on board as well as on various prominent committees on firms' financial performance. We made use of descriptive as well as inferential statistics to conduct the analysis and made use of various diagnostic tests to evaluate the robustness of the findings.

To find the association between the board as well as committee gender diversity and financial performance, the study uses panel data regression method, and the following econometric model is specified:

$$Financial\_performance_{it} = \alpha + \beta_1 * gender\_diversity + \beta_2 * control\_variables_{it} + \varepsilon_{it}$$

Two sets of regression equations are estimated based on two measures of financial performance, one using Tobin's Q and the other employing ROA. The vector of control variables represents the various governance and firm-related variables as specified in the variable section.

The panel data is a culmination of both cross-sectional as well as time-varying data and various methods like pooled ordinary least squares, random effect and fixed-effect models are used to conduct the study. The panel data may suffer from various unobservable heterogeneity that needs to be addressed to avoid biased results. To choose between the random effects model or fixed-effects model, the Hausman test was conducted. We found that the explanatory variable is correlated with the unobservable heterogeneity, and hence the regression results were conducted using the fixed- effects model.

Further, based on the extant literature and studies we also went on to conduct a sector-based study using the information technology sector to see whether the gender diversity on boards impacts financial performance or not.

Methodology for Sectoral Study for 3.A Objective

Based on our objective to measure the impact of board gender diversity on financial performance, using several proxy variables of gender diversity, we formulate three econometric models using various variables employed in our study. The objective was to test whether gender diversity on board impacts financial performance in the context of Information and technology sector.

The usage of panel data methodology leads to the elimination of the unobservable heterogeneity that might be present between the sample companies. Moreover, some of the previous studies have identified the problem of endogeneity in corporate governance literature (Bhagat and Bolton, 2002; Hermalin and Weisbach, 2003). The endogeneity biases can be overcome using the estimation technique such as the random-effects model and the fixed effects model, or by using the instrumental variables in the analysis (Arora, 2021). To overcome the endogeneity issue, we have used the Hausman Test (Hausman and Taylor, 1981). The Hausman test is often used as a parameter to choose between the suitability of the fixed effect or random-effects model as has been used in various past studies (Ararat and Yurtoglu, 2020; Akram et al., 2020; González et al., 2020). As per the results of the Hausman test (Table II), we find that the fixed effects model is suitable for our regressions. Thus, using the STATA 17 version, various panel data regression models have been employed to achieve the desired objectives.

Methodology for 5th Objective

The last and the final objective was aimed at evaluating whether gender diversity on board impacts sustainable reporting quality or not, to evaluate the same first a modified sustainability reporting quality variable was created to identify the degree of reporting.

The choice of model in conducting the empirical analysis was based on the nature and characteristics of the data. The dependent variable in this study, being an index, is a categorical data. It is measured on an ordinal scale. Since the dependent variable is discrete in nature and has more than two categories, multinomial logistic regression is used for the analysis (El-Habil, 2012). The multinomial logistic regression combines the independent variables and determines the probability of happening of an event, which in this case is the improvement in the sustainability reporting quality. However, when the natural setting of the data is ordered (ordinal data), ordered logistic regression is considered suitable (Fullerton, 2009; Torres-Reyna, 2012). An implicit assumption of the ordered logistic regression is the proportional odds, also known as parallel assumption. This implies that the relationship between the various outcome groups (sustainability reporting quality levels, in this case) remains the same. The proportional odds assumption can be tested using Brant test (Brant, 1990). In case the assumption is violated, the ordered logistic model shall report misleading results and, in its place, the alternate model, that is, the generalized ordered logit model shall be used (Williams, 2006; Williams, 2016). The major advantage of using this special case of logistic regression is that it does not impose the parallel regression assumption and allows the co-efficient to vary amongst the various categories of variables. In a situation where the assumption is not violated for all the variables, it takes the form of partially constrained model. In a partially constrained generalized ordered logistic model, only certain subset of variables which violate the parallel regression assumptions are found to have a varying co-efficient. The generalized ordered model can be written as follows (Williams, 2006):

$$P(Y_i > j) = \frac{\exp\left(\alpha_j + X_i\beta_j\right)}{1 + [\exp\left(\alpha_j + X_i\beta_j\right)}, j = 1, 2, \ldots, M-1 \quad (1)$$

Where, m is the number of the categories of the ordinal dependent variable.

The partially constrained model can be written as:

$$P(Y_i > j) = \frac{\exp\left(\alpha_j + X1_i\beta 1 + X2_i\beta 2 + X3_i\beta 3_j\right)}{1 + [\exp\left(\alpha_j + X1_i\beta 1 + X2_i\beta 2 + X3_i\beta 3_j\right)}, j = 1, 2, \ldots, M-1 \quad (2)$$

Under equation 1, all the variables are relaxed from the parallel regression assumption and multiple co-efficient are generated for various categories of the variables, but in equation 2, only for certain subset of variables the assumption is relaxed, which means for the variables where the assumptions have been relaxed, multiple beta coefficients shall be generated and vice-versa. For instance, in equation 2, the betas for X1 and X2 are constrained to remain same across all categories of j, but for X3 they are allowed to differ.

To test the hypothesis, we use the following model:

Model 1: SUSQUAL = α + β_1P-women + β_2B-Size + β_3B-IND+ β_4BM + β_5CEO-D + β_6Lever + β_7Tobin's Q + β_8ROA + β_9O-Slack + β_{10}F-Size+ β_{11}INDUSTRY + €

Model 2: SUSQUAL = α + β_1INDFEMDIR + β_2B-Size + β_3B-IND+ β_4BM + β_5CEO-D + β_6Lever + β_7Tobin's Q + β_8ROA + β_9O-Slack + β_{10}F-Size+ β_{11}INDUSTRY + €

For analysis, the user written command 'Glogit2' was used in the Stata Software (Williams, 2006). Moreover, since the sign of the co-efficient value may not always provide the direction of the effect as well as interpretation, it is pertinent to conduct marginal effect analysis that provides a modest satisfaction with respect to the change in the value of dependent variable with one unit increase in the independent variables. The same has been used in various past studies (Bottia et al., 2015; Branion et al., 2019) for further analysis.

Table 4: Summary of Objective wise Methodology used

Objectives	**Sample Size & Date Source**	**Techniques/Methods/Software's**
Objective 1: To examine the status of gender diversity on corporate boards in Indian companies.	352 Research Articles **Data Source**: Scopus Data base, further supported by prominent research articles from web of science as well.	Bibliometric analysis, In-depth Systematic Literature Review, Manual and Software based Content Analysis. **Software's: Vos-Viewer, Advanced Excel**
Objective 2: To examine the literature on gender diversity and corporate sustainability practices followed by Indian Companies.	242 Research Articles **Data Source:** Scopus Data base, further supported by prominent research	Bibliometric analysis, In-depth Systematic Literature Review, Manual and Software based Content Analysis. **Software's: R-Studio (Biblioshiny Package) Vos-Viewer, Advanced Excel**

	articles from web of science as well.	
Objective 3: To study the relationship & Impact of gender diversity on Board & Financial performance.	428 Firms from BSE-500 for a period of 8 years (2013-2021) **Sectoral Study:** 26 IT Sector firms from BSE-500 **Data Source:** Prowess and Manual Collection of Data from Annual reports, Corporate Governance reports etc.	Panel Data Regression (Fixed Effect) **Software:** STATA Version 17
Objective 4: To study the impact of gender diversity on prominent board committees (Remuneration and Nomination committee) and its impact on financial performance.	428 Firms from BSE-500 for a period of 8 years (2013-2021) **Data Source:** Prowess and Manual Collection of Data from Annual reports, Corporate Governance reports etc.	Panel Data Regression (Fixed Effect) **Software:** STATA Version 17

Objective 5: To construct a Corporate Sustainability Reporting Quality Index and based on that measure the impact of gender diversity on board on Sustainability Reporting Quality.	432 Firms from BSE-500 for a period of 8 years (2013-2021) **Data Source:** Prowess and Manual Collection of Data from Annual reports, Corporate Governance reports and Business Responsibility and Sustainability Report.	Generalized Ordered Logit Model and Marginal effect Analysis **Software:** STATA Version 17

CHAPTER 4: RESULTS AND FINDINGS

This chapter elaborates the results as well as findings obtained from the statistical analysis conducted to achieve the desired objectives mentioned in the study. The chapter has been structured as per the objectives.

4.1 What is the state of literature on gender diversity on corporate boards?

The objective was achieved based on the bibliometric analysis using various techniques such as volume analysis, citation analysis, co-citation analysis, co-word analysis etc. The results of each of the analysis has been explained in detail.

4.1.1 Volume & Trend analysis of Published Studies

The primary analysis is based on the volume of publication in the gender diversity domain. The final number of research articles post filtration was 352 over a period of approximately 32 years (1989- Feb-2021) which represents that the area of gender diversity has not seen extensive publications but is growing at a rapid pace. Also, table 5 points to the fact that Norway was the first country which passed mandatory legislations of gender-based quota in the year 2003. This further led to the series of legislations being passed in other countries leading to gender diversity domain receiving wide scholarly attention.

Trends and evolution in the area was analysed based on seeing the annual growth in the volume of publications. Figure 4 points towards the year wise trends in the publications ranging from the year 1989-2021. We could notice a rising trend in the number of studies being published 9 studies (1989-2006), 33 studies (2007-2013), 310 studies (2014-2021). The studies in gender diversity gained momentum post 2013 and the studies have seen exponential growth in various dimensions. This is indicative of the fact that the scope of research in gender diversity have increased over the year and carries huge potential in the coming future as well. Through this graphical representation we could clearly notice that the no of publications has got a boost post 2010. The plausible reason for the same could be the parallel growth in the mandatory & voluntary provisions for the appointment of women on board in various countries. Table 5 clearly indicates that majority of the countries mandated the gender quotes post 2010. This led to various researchers explore the various dimensions of having a gender diverse board. Table 1a in annexure shows the performance of top 20 countries in terms of the Global Gender Gap Index and the mandatory provisions did improve the Gender Gap in various countries.

4.1.2 Publication by Countries

The number of articles considered for the study were spread across 74 countries throughout the world. This clearly points to the fact that the gender diversity area has received wide attention globally and is not limited to certain continents. Table 6 provides the list of top 20 most active countries with at least five publications in gender diversity on board. United States tops the list with 64 research publications and three thousand six hundred thirty-six citations (3636) followed by United Kingdom with 52 publications and nineteen hundred and sixty-four citations. Third Spot is captured by Australia with 34 documents and sixteen hundred and eighty-one publications. Gender diversity on board is majorly connected to the corporate governance literature and UK being the pioneer based on its Cadbury Report 1992 and USA and Australia being the countries which have seen major corporate scams during 2000 the results are not surprising at all. The area would have received greater attention with a view to leverage out gender diversity-based advantages.

Table 6 also highlights an important aspect that more than 70% of the research on gender diversity has been conducted in the developed economies especially from Europe.

The plausible reason that could explain such phenomenon is the emergence of Organisation for Economic Co-operation and Development (OECD) which has taken a strong take on the corporate governance issues. Figure 4 provides a visual representation of the relationship between the various countries, through a bibliometric citation map.

Though the number of publications in emerging and developing economies are not much we could still notice sound number of publications of the countries like India & Pakistan which could be to test the impact of gender diversity post their mandatory provisions.

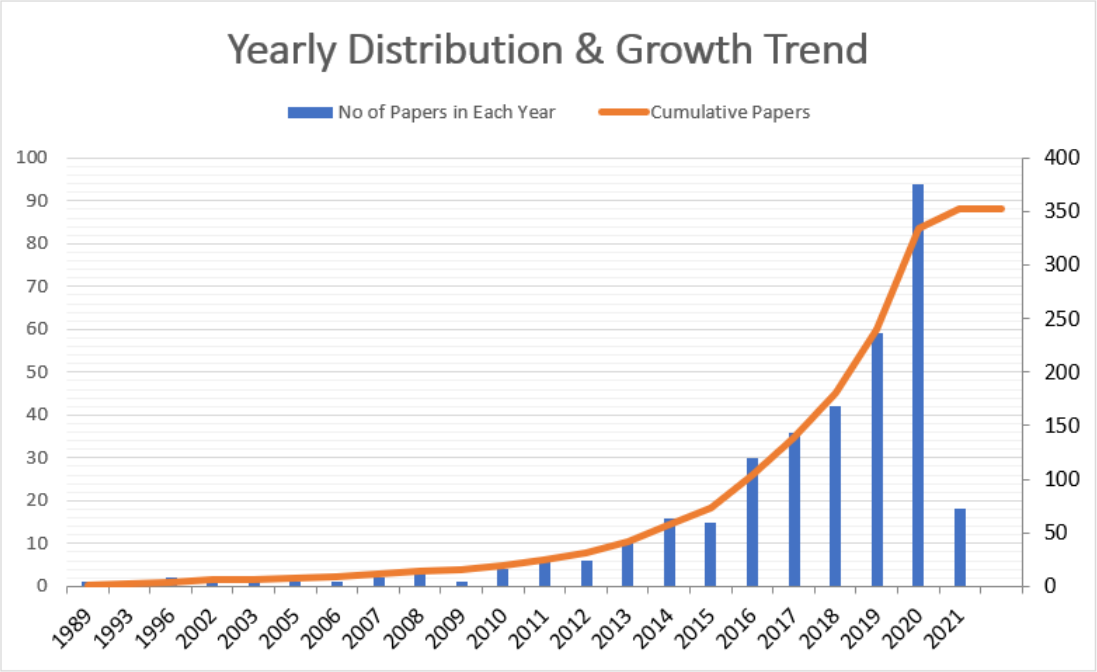

Figure 4. Articles showing gender diversity on corporate boards growth & trend based on publication each year.

Table 5: Gender Based Quota on board for Various Countries.

Countries	Quota	Year of passing	Compliance
France	40%	2011	2017
Norway	40%	2003	2008
Spain	40%	2007	2015
Finland	40%	2005	2005
Canada	50%	2006	2011
Israel	50%	2007	2010
Iceland	40%	2010	2013
Kenya	33%	2010	2010
Belgium	33%	2011	2012
Italy	33%	2011	–
Australia	30%	2018	–
India	1 woman on board	2013	2015
Pakistan	1 woman on board	2017	2020
Germany	1 woman if 4 or more executives in the board	2021	2022

Source: Authors' compilation.

Table 6: Top 20 Most active Countries publishing on Gender Diversity.

Rank	Country	Type of economy	Documents	Percentage of documents	Citations	ACPD	Nominal GDP
1	United States	Developed	64	0.16	3636	57	1
2	United Kingdom	Developed	52	0.13	1964	38	5
3	Australia	Developed	34	0.08	1681	49	13
4	Spain	Developed	31	0.08	1346	43	14
5	Malaysia	Developing	27	0.07	799	30	40
6	China	Developing	23	0.06	277	12	2
7	France	Developed	19	0.05	214	11	7
8	Germany	Developed	19	0.05	583	31	4
9	Italy	Developed	19	0.05	482	25	8
10	Canada	Developed	18	0.04	403	22	9
11	Pakistan	Developing	14	0.03	118	8	43
12	New Zealand	Developed	12	0.03	58	5	52
13	Norway	Developed	11	0.03	148	13	33
14	India	Developing	10	0.02	32	3	6
15	Netherlands	Developed	10	0.02	252	25	17
16	Tunisia	Developing	10	0.02	95	10	91
17	Lebanon	Developing	8	0.02	202	25	115
18	Turkey	Developing	8	0.02	101	13	20
19	United Arab Emirates	Developing	7	0.02	76	11	35
20	South Africa	Developing	6	0.01	9	2	42

Note: ACPD - Average citation per document

4.1.3 Publication by Journals

Next, we focus on describing the top journals publishing in gender diversity on board. The articles that were considered for the bibliometric analysis were spread across 155 journals throughout the world under several domains such as ethics, corporate governance, finance, gender, accounting, economics, strategic management, psychology etc. Table 7 points to the list of top 20 Journals based on the no of publications and *Journal of business ethics* published by *Springer nature tops* the list with 38 research papers. The position of the journal contemplates the fact of how closely the gender diversity element is linked to ethics, governance & sustainability. The ranking is followed by the *Corporate Governance Journal* with 28 publications. Next in line is *Corporate Social Responsibility and environment*

management, Business strategy and Environment & Corporate Governance: an international review to name a few. Out of the top 20 journals majority of the journals belongs to the Corporate Governance discipline that also deduces us to the premise of existence of strong relationship between gender diversity & corporate governance. The remaining list comprises of some of the top journals in Finance, Management, Strategic Management and Accounting such as *Journal of Corporate Finance* (#6), *Management Decision Journal* (#13), *Strategic Management Journal* (#18) and *Accounting & Finance* (#19). Most of these journals have top ratings based on the Association of business schools rating which also confirms that the gender diversity area has found its place in some of the top journals and the area has wide scope for further exploration.

Table 8 comprises the list of top 20 most active journals based on their citations in the Scopus database. *Journal of business ethics* published by *springer nature* yet again tops the list with three thousand two hundred and sixty-nine (3269) citations being the most impactful journal in gender diversity. Interestingly *Academy of Management Journal* which is a top-rated Management Journal has taken the second spot with seven eighty (780) citations and with one of the highest (ACPD=390). The own specialized area journal *Corporate Governance: An International Review* (#3), *Corporate Governance* (#7), *Business Strategy & Environment* (#9), *Corporate Social & Environment Management* (#10) are also included in the list. The list of other journals also comprises of the top journals in various areas such as Finance, Management, Accounting etc that portrays the multidimensional aspect of the gender diversity issue.

A quick glance making comparison between Table 7 & Table 8 reveals that though large number of research articles are published in the same area-based journals such as Corporate Governance, Ethics & Sustainability *(Journal of Business Ethics, Corporate Governance, Corporate Social Responsibility and environment management etc)* but the highest impact in terms of citations (total and ACPD) is caused by the journals in the area of Management, Accounting & Economics which have relatively lesser publications *(Academy of Management Journal, Journal of Management Studies, Journal of Accounting & Economics).*

Figure 5 represents the journal co-citation analysis (JCA) that complements the outcomes of the citation analysis represented in table 8. The various sized bubbles or the nodes depicted on the JCA map represents the number of co-citations associated with the respective journals. The journals which are located closely are co-cited frequently (Zupic & Čater, 2015) or have been

cited in similar content based articles. The links associated with these nodes or bubbles act as an indication of co-citation of articles which appear in these related journals. The frequency of co-citation of these research articles with related journals helps in the determination of the colour of the nodes. Thus, common colour nodes of these journals depict association or similarity in the contents being published (Zheng & Kouwenberg, 2019).

The JCA represents 4 major distinct set of clusters which are associated with journals represented with unique areas or subject based dimensions. The red-coloured cluster is associated with Finance & Economics, green colour represents majority of management & strategy-based journals, blue colour focusses on accounting-based journals and finally yellow colour comprises of miscellaneous journals from the area of governance, & business ethics. The focal point of the JCA map comprises of *Journal of Business ethics and Corporate Governance: An International Review* which are associated with all the disciplines (Finance &Economics, Management & Strategy & Accounting as well as Governance & Business ethics). Moreover, *Academy of Management Journal* as well as *Journal of Financial economics* are the most impactful journals in the discipline of Management, Finance & Economics.

Figure 5 substantiates the outcomes derived based on the citation analysis represented in table 8 which highlighted the presence of gender diversity-based articles in multi-discipline areas-based journals such as Finance, Economics, Management, Strategy & Accounting apart from governance & ethics.

Finally, based on the dual dimension of co-citations impact (number of co-citations) as well as boundary-based extension (links to the other journals) *Journal of business ethics* and *Corporate Governance: An International Review* are found to be the most impactful as well as influential journals publishing in gender diversity.

Table 7: The top 20 most active journals publishing articles in Gender Diversity on Board based on Volume (1989-2021)

Rank	Name of the Journal	Publisher	Coverage	No of Articles	Scopus Citations	ACPD
1	Journal of business ethics	Springer Nature	1982-Ongoing	38	3269	86.03
2	Corporate governance (bingley)	Emerald	2001-Ongoing	28	308	11.00
3	Corporate social responsibility and environmental management	Wiley-Blackwell	2003-Ongoing	13	203	15.62
4	Business strategy and the environment	Wiley-Blackwell	1992-Ongoing	12	226	18.83
5	Corporate governance: an international review	Wiley-Blackwell	1993-Ongoing	9	686	76.22
6	Journal of corporate finance	Elsevier	1994-Ongoing	8	512	64.00
7	Gender in management	Emerald	2008-Ongoing	8	111	13.88
8	International journal of business governance and ethics	Inderscience	2004-Ongoing	5	61	12.20
9	Equality, diversity, and inclusion	Emerald	2010-Ongoing	5	27	5.40
10	Corporate ownership and control	Virtus Interpress	2003-2016	5	9	1.80
11	Journal of management and governance	Springer Nature	1997-Ongoing	4	297	74.25
12	Leadership quarterly	Elsevier	1990-Ongoing	4	176	44.00
13	Management decision	Emerald	1967-Ongoing	4	47	11.75
14	International journal of accounting and information management	Emerald	2007-Ongoing	4	35	8.75
15	Australasian accounting, business, and finance journal	University of Wollongong	2014-Ongoing	4	24	6.00
16	European management journal	Elsevier	1982-Ongoing	4	23	5.75
17	International journal of finance and economics	Wiley-Blackwell	1996-Ongoing	4	4	1.00
18	Strategic management journal	Wiley-Blackwell	1980-Ongoing	3	103	34.33
19	Accounting and finance	Wiley-Blackwell	1979-Ongoing	3	86	28.67
20	Business and Society	SAGE	1983-Ongoing	3	76	25.33

Table 8: The top 20 most active journals publishing articles in Gender Diversity on Board based on Citations (1989-2021)

Rank	Name of the Journal	Publisher	Coverage	No of Articles	Scopus Citations	ACPD
1	Journal of business ethics	Springer Nature	1982-Ongoing	38	3269	86.03
2	Academy of management journal	Academy of Management	1989-Ongoing	2	780	390.00
3	Corporate governance: an international review	Wiley-Blackwell	1993-Ongoing	9	686	76.22
4	Journal of corporate finance	Elsevier	1994-Ongoing	8	512	64.00
5	Journal of management studies	Wiley-Blackwell	1964-Ongoing	1	440	440.00
6	Journal of accounting and economics	Elsevier	1979-Ongoing	1	393	393.00

7	Corporate governance (bingley)	Emerald	2001-Ongoing	28	308	11.00
8	Journal of management and governance	Springer Nature	1997-Ongoing	4	297	74.25
9	Business strategy and the environment	Wiley-Blackwell	1992-Ongoing	12	226	18.83
10	Corporate social responsibility and environmental management	Wiley-Blackwell	2003-Ongoing	13	203	15.62
11	Leadership quarterly	Elsevier	1990-Ongoing	4	176	44.00
12	Accounting horizons	American Accounting Association	1996-Ongoing	2	151	75.50
13	Journal of management and organization	Cambridge University Press	1995-Ongoing	2	126	63.00
14	Organization science	Institute for Operations	1996-Ongoing	1	112	112.00

		Research and the Management Sciences				
15	Gender in management	Emerald	2008-Ongoing	8	111	13.88
16	Strategic management journal	Wiley-Blackwell	1980-Ongoing	3	103	34.33
17	Scandinavian journal of management	Elsevier	1988-Ongoing	2	98	49.00
18	Accounting and finance	Wiley-Blackwell	1979-Ongoing	3	86	28.67
19	Business and society	SAGE	1983-Ongoing	3	76	25.33
20	Journal of business research	Elsevier	1973-Ongoing	2	72	36.00

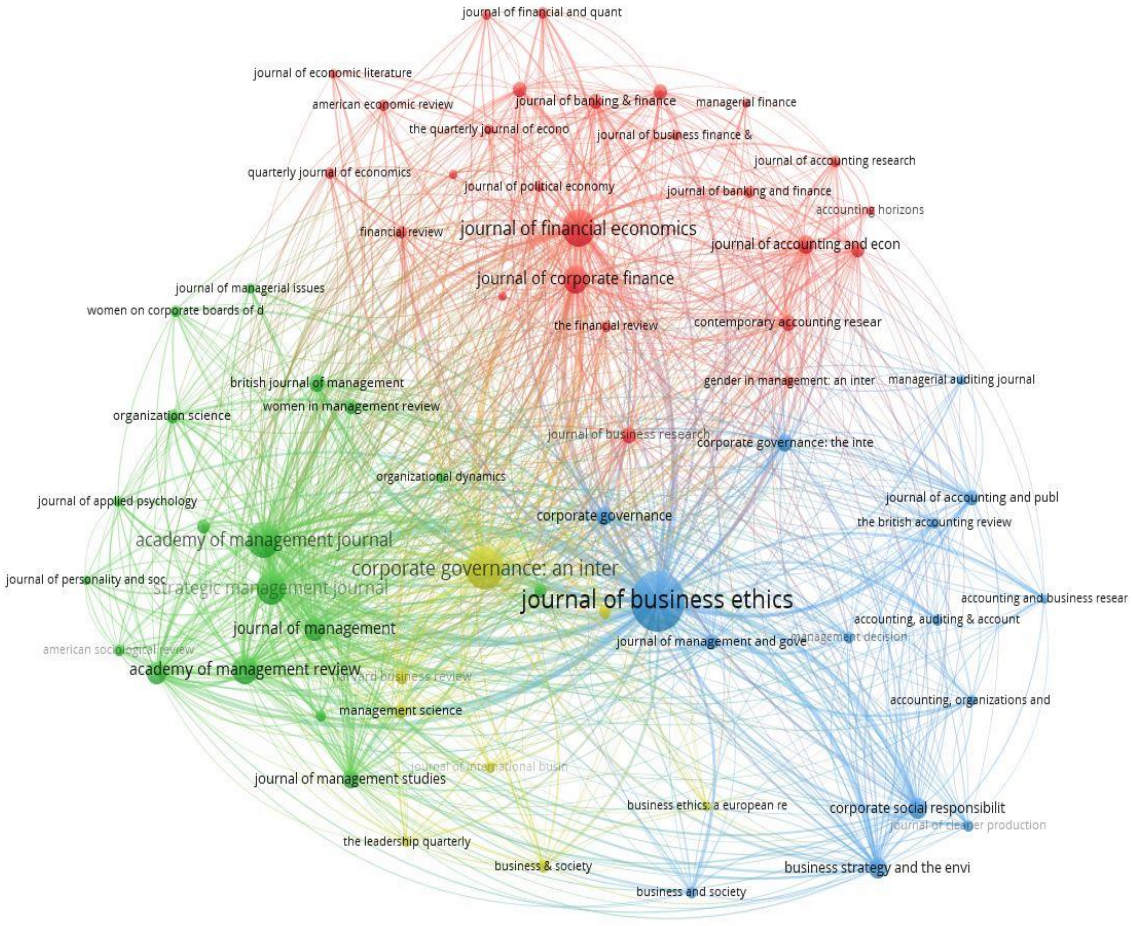

Figure 5: The network map of journal co-citations based (threshold 50 citations, display of top 70 journals).

4.1.4 Influential Articles

Bibliometric analysis also helps us identify those research articles available in our database which have made significant impact in the area, or the discipline being studied. Citation analysis helps in measuring the number of times a particular research article has been quoted or cited after being used by the other documents. It also helps to determine the impact of the article on the scientific community (Ding & Cronin, 2011). Table 9 lists down the top 20 most cited papers based on the citations available in the Scopus database. The list provided in table 9 re-confirms the impact and dominant position of the *Journal of Business ethics* as 8 out of 20 (40%) of the top 20 most influential articles are published in this journal.

Campbell & Mínguez-Vera,(2008) were among the pioneer authors to study the impact caused by gender diversity on boards on firms' financial performance. They found in their study that gender diversity on board based on parameters such as percentage of women on board, diversity indices like Blau & Shannon have a positive impact on firms financial performance whereas

the revers relationship is not true. Bear et al., (2010) extended the knowledge base of gender-based literature by evaluating the relationship between board diversity and gender aspect on corporate social responsibility and firm reputation. The study found positive linkages between gender diversity and firm reputation mediated through the CSR ratings. Miller & Del Carmen Triana, (2009) brought an interesting dimension through his study where he found that board racial and gender diversity are not causally linked to the firm performance rather, they are partially mediated by firm reputation and innovation. They also found positive linkages between gender diversity and innovation.

We came across an interesting aspect represented by table 9, that 12 0ut of 20 most cited articles (60%) were focused upon linking gender diversity and financial performance aspect in various forms. Now, to enhance the intellectual base of the literature we performed the document co-citation analysis (DCA). DCA is performed to extend the literature to a wider number of research articles where 21630 referenced articles were considered for the analysis. The top 20 most co-cited articles are represented in table 10.

The list of articles in Table 10 demonstrates that (Adams & Ferreira, 2009)"Gender Diversity, Governance and Financial Performance" is the most co-cited and impactful article in the gender diversity literature. The study found that gender diverse boards trigger the board related aspects in terms of governance, and this leads to the impact on firm's financial performance. Though the paper was not part of our Scopus database but has received highest co-citation owing to its impactful literary contribution. They also concluded that mandatory women quotas are detrimental to firm's performance. Table 9 re-affirms that (Bear et al., 2010) and (Miller & Del Carmen Triana, 2009) are the other two most influential cited articles published in the literature.

Moreover, Table 10 clearly depicts and confirms the premier position held by *Journal of Business ethics* and *Corporate Governance: An International Review* as both these journals account for 25% (5 each) out of the 20 most co-cited articles.

Table 9: Top 20 Most Influential Journals Articles Published in the Area of Gender Diversity based on Scopus Citations (1989-2021)

Rank	Title	Authors	Paper Type	Name of the Journal	Year	Citations
1	Gender Diversity in the Boardroom and Firm Financial Performance	Campbell, Kevin & Mínguez-Vera, Antonio	Empirical	Journal of business ethics	2008	654
2	The Impact of Board Diversity and Gender Composition on Corporate Social Responsibility and Firm Reputation	Bear, S., Rahman, N. & Post, C.	Empirical	Journal of business ethics	2010	588
3	Demographic Diversity in the Boardroom: Mediators of the Board Diversity–Firm Performance Relationship	Miller & Toyah	Empirical	Journal of Management studies	2009	440
4	Organizational Predictors of Women on Corporate Boards	Hillman, Amy J., Shropshire, Christine, Cannella, & Albert A.	Empirical	Academy of Management	2007	406
5	Does board gender diversity improve the informativeness of stock prices?	Gul, Ferdinand A.,Srinidhi, Bin, & Ng, Anthony C.	Empirical	Journal of accounting and Economics	2011	393
6	Women on Boards and Firm Financial Performance: A Meta-Analysis	Post, Corinne & Byron, Kris	Review	Academy of management Journal	2015	374
7	The Contribution of Women on Boards	Nielsen, Sabina & Huse, Morten	Empirical	Corporate governance:	2010	369

	of Directors: Going beyond the Surface			An international		
8	Women on Corporate Boards of Directors, and their Influence on Corporate Philanthropy	Williams, Robert J.	Empirical	Journal of Business Ethics	2003	277
9	Do women directors improve firm performance in China?	Liu, Yu, Wei, Zuobao & Xie, Feixue	Empirical	Journal of corporate finance	2014	264
10	Gender Diversity in the Boardroom and Firm Performance: What Exactly Constitutes a "Critical Mass?	Joecks, Jasmin,Pull, Kerstin, & Vetter, Karin	Empirical	Journal of business ethics	2013	231
11	Hidden Connections: The Link Between Board Gender Diversity and Corporate Social Performance	Boulouta i.	Empirical	Journal of Business Ethics	2013	211
12	Female presence on corporate boards: A multi-country study of environmental context	Terjesen s.	Empirical	Journal of Business Ethics	2008	174
13	Women on boards and firm performance	M Lückerath-Rovers	Empirical	Journal of Management and Governance	2013	172
14	Women on board: Does boardroom gender diversity affect firm risk?	Sila v.	Empirical	Journal of Corporate Finance	2016	170

15	Board Gender Diversity and Corporate Response to Sustainability Initiatives: Evidence from the Carbon Disclosure Project	Ben-amar w.	Empirical	Journal of Business Ethics	2017	137
16	Are there gender-related influences on corporate sustainability? A study of women on boards of directors	Galbreath j.	Empirical	Journal of Management and Organization	2011	119
17	The double-edged nature of board gender diversity: Diversity, firm performance, and the power of women directors as predictors of strategic change	Triana m.c.	Empirical	Organization Science	2014	110
18	Women on Boards of Directors and Corporate Social Performance: A Meta-Analysis	Byron k.	Empirical	Corporate Governance: An International Review	2016	106
19	Does board gender diversity have a financial impact? Evidence using stock portfolio performance	Chapple l.	Empirical	Journal of Business Ethics	2014	106
20	Female board appointments and firm valuation:	Campbell k.	Empirical	Journal of Management	2010	103

Table 10: Top 20 Most Influential Journals Articles Published in the Area of Gender Diversity based on Scopus Co-Citations (1989-2021)

Rank	Co-Cited Reference	Name of the Journal	Paper Type	Citations
1	Adams, r.b., Ferreira, d., Women in the boardroom and their impact on governance and performance (2009)	Journal of financial economics	Empirical	78
2	Terjesen, s., sealy, r., singh, v., Women directors on corporate boards: a review and research agenda (2009)	Corporate governance: an international review	Review	67
3	Campbell, k., minguez-vera, a., Gender diversity in the boardroom and firm financial performance (2008)	Journal of business ethics	Empirical	56
4	Torchia, m., calabro, a., huse, m., Women directors on corporate boards: from tokenism to critical mass (2011)	Journal of business ethics	Empirical	51
5	Post, c., Byron, k., Women on boards and firm financial performance: a meta-analysis (2015)	Academy of management journal	Review	44
6	Bear, s., Rahman, n., post, c., The impact of board diversity and gender composition on corporate social responsibility and firm reputation (2010)	Journal of business ethics	Empirical	41
7	Francoeur, c., labelle, r., sinclair-desgagne, b., Gender diversity in corporate governance and top management (2008)	Journal of business ethics	Empirical	37
8	Nielsen, s., huse, m., The contribution of women on boards of directors: going beyond the surface (2010)	Corporate governance: an international review	Empirical	34
9	Carter, d.a., simkins, b.j., simpson, w.g., corporate governance, board diversity, and firm value (2003)	The Financial Review	Empirical	32
10	Erhardt, n.l., werbel, j.d., shrader, c.b., Board of director diversity and firm financial performance (2003)	Corporate governance: an international review	Empirical	32
11	Jensen, m.c., meckling, w.h., Theory of the firm: managerial behavior, agency costs and ownership structure (1976)	Journal of financial economics	Empirical	31

12	Rose, c., Does female board representation influence firm performance? The danish evidence (2007)	Corporate governance: an international review	Empirical	31
13	Gul, f.a., srinidhi, b., ng, a.c., Does board gender diversity improve the informativeness of stock prices? (2011)	Journal of accounting and economics	Empirical	28
14	Carter, d.a., d'souza, f., simkins, b.j., simpson, w.g., The gender and ethnic diversity of us boards and board committees and firm financial performance (2010)	Corporate governance: an international review	Empirical	24
15	Konrad, a.m., kramer, v., erkut, s., Critical mass: the impact of three or more women on corporate boards (2008)	Organizational dynamics	Empirical	23
16	Srinidhi, b., gul, f.a., tsui, j., Female directors, and earnings quality (2011)	Contemporary accounting research	Empirical	23
17	Farrell, k.a., hersch, p.l., Additions to corporate boards: the effect of gender (2005)	Journal of corporate finance	Empirical	22
18	Boulouta, i., Hidden connections: the link between board gender diversity and corporate social performance (2013)	Journal of business ethics	Empirical	21
19	hillman, a.j., dalziel, t., Boards of directors and firm performance: integrating agency and resource dependence perspectives (2003)	Academy of Management Review	Conceptual	21
20	Hillman, a.j., shropshire, c., cannella, a.a., Organizational predictors of women on corporate boards (2007)	Academy of management journal	Empirical	21

4.1.5 Topical Focus in gender diversity knowledge base on past, present, and future

To respond to the final research, question we made use of the keywords occurrence analysis that helped them identify the most widely studied topics as well their association with other dimensions. In the words of Zupic & Čater, (2015) “When words frequently co-occur in documents, it means that the concepts behind those words are closely related. The output of the co-word analysis is a network of themes and their relations that represent the conceptual space of a field” (p. 435).The co-occurrence of these keywords act as an important tool to identify the trends as well as various dimensions of scientific research in a particular area (Madani & Weber, 2016) which have been studied by academicians and scholars.

The keyword co-occurrences were conducted based on the “All Keywords” and it led to the identification of 45 keywords with minimum 5 occurrences. The keywords that dominated the co-occurrence analysis were “Corporate Governance” (112), “Gender Diversity” (100 cases), “Board of Directors” (54), “Corporate Social Responsibility” (25 cases) and “Firm Performance” (23 cases). The results clearly re-affirms the dominant linkage of gender

diversity with corporate governance mechanisms as has been found in the “canonical” paper of (Adams & Ferreira, 2009). The other major dimensions that have been widely explored were the implications on corporate social responsibility and firm performances.

Another added feature of conducting a co-occurrence keyword analysis is to identify the “emerging research topics” which shall provide directions for future research in the sane discipline as well as associated disciplines. Through the Vos-viewer software author has also constructed a visualization keyword co-occurrence map of the literature keeping the threshold occurrence level as 5. The rationale behind keeping a low occurrence count is, the gender diversity literature is an emerging topic and does not comprise of much frequently occurring keywords. To have a comprehensive idea of the emerging topics the author has eliminated some of the keywords such as gender diversity (100 cases) as well as some other related terms such as women on boards (35 cases) etc due to their extreme & frequent occurrences.

The keyword occurrence map primarily focusses on two aspects: *firstly*, the frequency of occurrence of keyword and *secondly* transition in popularity of these keywords over a period. Figure 6 shows a depiction of the most frequently used keywords over some of the past decades.

The emerging research topics can be identified from Figure 4 based on the light green as well as yellow colours. On the parameters of frequency as well as recency the topics that have emerged significantly in the last few years are Sustainable development (7 cases), Environmental performance (7 cases), Innovation (7 cases), Agency Theory (6 cases), Board Size (5 cases) and Corporate Social Responsibility (CSR) reporting (5 cases). These are some of the emerging topics that can be built upon by scholars & academicians for future research.

The emerging studies have focused upon the role of gender diversity on sustainable development (Bravo & Reguera-Alvarado, 2019; SUMEDREA, 2016; Valls Martínez et al., 2019) and they have also found that bringing together of the diverse range of expertise and knowledge in the form of women's representation on board would improve decision making in the context of sustainability (Nadeem et al., 2017). Furthermore it has also been found that women directors tend to show greater inclination towards the community service projects as compared to the male directors (Groysberg & Bell, 2013) and they are found less guilty of violations related to environmental concerns (Donaldson & Preston, 1995), this has further led to policy thinkers invoke more stringent gender diverse laws and policies.

Another topic that has received attention in the gender diversity literature in the recent years is how do gender diversity impact environmental performance (Alazzani et al., 2017; Birindelli et al., 2019; Lu & Herremans, 2019). In this domain some recent developments have been in investigating the relationship between the moderating role of family and dual ownership structures and gender diversity on environmental performance (Cordeiro et al., 2020).

Recent studies have also investigated the role of gender diversity on corporate social responsibility reporting (Issa & Fang, 2019; Pucheta-Martínez et al., 2019). The studies have also highlighted upon the role played by various elements of board composition such as board size, board independence, CEO duality etc on CSR reporting (Pucheta-Martínez & Gallego-Álvarez, 2019). The typology of female directors such as independent and outside directors is also a growing stream that impacts CSR disclosures (Cabeza-García et al., 2018). We also notice the prevalence of the terms like "Agency theory "and innovation" in the knowledge base of gender diversity literature therefore future studies can also linked to measuring the moderating role of agency theory or innovation and gender diversity on various dimensions such as sustainability, environmental performance, and CSR reporting.

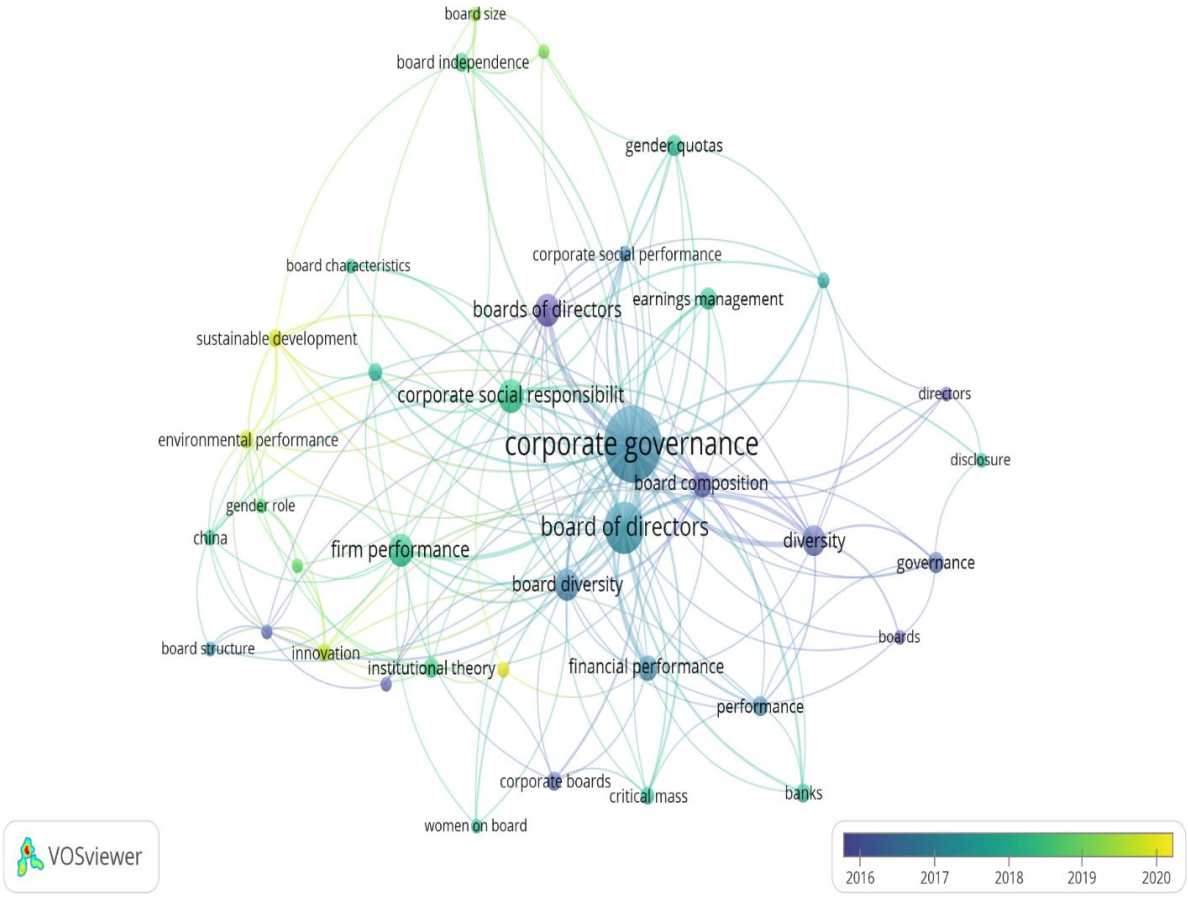

Figure 6: Temporal overlay on a keyword co-occurrence map for the BDCG knowledge base published from 1989–2021 (threshold 5 co-occurrences, display 45 keywords)

4.2 What is the status of literature on gender diversity and corporate sustainability practices?

To achieve the objective a bibliometric analysis was conducted based on various methods such as volume analysis, citation analysis, co-citation analysis, thematic clusters, content analysis etc. The details of the results have been discussed below.

4.2.1 Volume Analysis of Publications, Countries and Journals

The number of publications in the domain of GDCS has seen an upward trajectory (Figure 7) since the year 2001 to the year 2022 (April). The long span of twenty-two years has seen a steady growth in the volume of publications, especially before the period of 2007. Post the year 2007 we can see a meagre push in the growth rate of the publications which saw an exponential growth post the year 2010. The plausible reason for the growth posts the year 2010 can be attributed to the voluntary and mandatory legislations that have come up in various countries with respect to the appointment of the women directors on corporate boards (Singh et al., 2021b) and at the same time the theme of sustainability has also seen a major push in publication post 2010 (Gao et al., 2021).

Table 11 clearly highlights that most of the regulatory measures related to women directors' appointments were made post the year 2010. The annual number of publications which were around 20 in the year 2019 has increased three times in the year 2021 (60 publications), this could be a result of growing consciousness towards the sustainability as well as corporate social responsibility linking them with the diversity aspect. Such massive growth corroborates the emerging scope in the field of GDCS and the need to further delve deeper into the literature for the vibrant identification of the themes for future research.

In terms of the geographical distribution, the publication of research articles in the GDCS domain has spread across 73 countries, which highlights the emergence and growth of this literature at the global level. Table 12 shows the most productive countries in terms of the volume of publications. The top 5 most productive countries are United States, Italy, Spain, United Kingdom, and Australia. Figure 8 affirms the outcomes of Table 13 as the size of the nodes represent the volume of publications. The plausible reason for the growth of the GDCS literature in these countries are twin fold, firstly the attention paid to the gender diversity aspect and sustainability could be attributed to the economic development and literacy levels in these countries (Gao et al., 2021), secondly, the domain of gender diversity is majorly integrated with the theme of corporate governance (Singh et al., 2021b) and these countries such as U.K,

USA and Australia have been the pioneers in formulating the effective code on corporate governance (Cadbury Report 1992).Further, United States tops the list with 40 research articles and 516 citations. The citations earned by these countries are also shows that their research outcomes have been impactful. Though the top 5 list is held by developed economies, the developing economies such as Malaysia, China, India, Pakistan, UAE etc are also not far behind and are picking the pace of publication in this domain.

In terms of the sources of publications, the bibliometric analysis showed that the publications in the GDCS literature were spread across 161 journals in various disciplines such as corporate governance, ethics, management, economics, accounting etc. This points to the multi-discipline nature of the GDCS literature which has led it to find a place in such diverse fields. Table 13 highlights the top 20 most productive journals based on the volume of publications in the GDCS domain. The *Corporate social responsibility and environmental management* journal published by Wiley Blackwell tops the list with 21 publications, followed by *Sustainability* (MDPI) and *Business strategy and the environment* (Wiley Blackwell) with 20 and 17 publications respectively. The top three list clearly highlights that the literature of gender diversity has received massive attention in the sustainability and environmental context. The table also highlights that approximately 50% of the top articles belong to the *Emerald publishing*, thus future scholars may focus on the journals belonging to the same in this literature. Moreover, the table shows that the topic has seen massive intellectual development as it has been able to find place in top rated journal of other domains such as Ethics *(#6 Journal of Business Ethics),* Accounting *(#9 Journal of Financial Reporting and Accounting),* Management *(#10 Journal of management and organization)* etc.

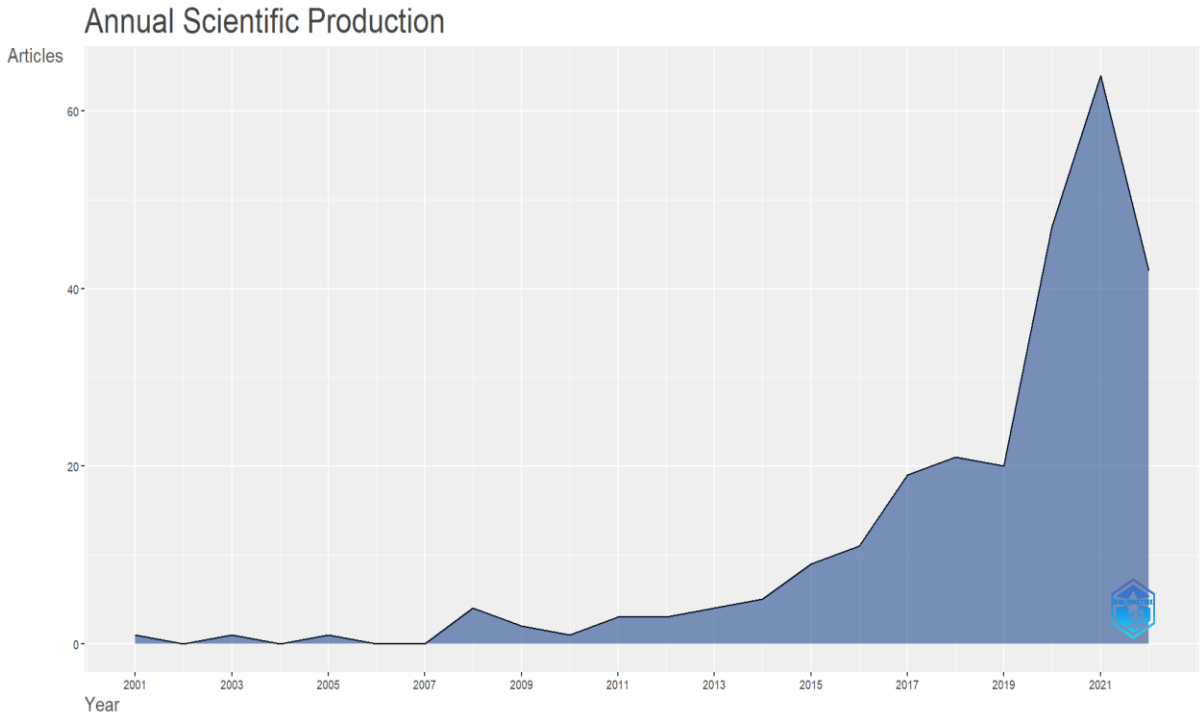

Figure 7: Annual Publication trend from 2001–2022(April) retrieved from Scopus database (gender diversity and corporate sustainability)

Source: The authors.

Table 11: Showing Gender-based quota on board for various countries

Countries	*Quota*	*Year of passing*	*Compliance*
France	40%	2011	2017
Norway	40%	2003	2008
Spain	40%	2007	2015
Finland	40%	2005	2005
Canada	50%	2006	2011
Israel	50%	2007	2010
Iceland	40%	2010	2013
Kenya	33%	2010	2010
Belgium	33%	2011	2012
Italy	33%	2011	–
Australia	30%	2018	–
India	1 woman on board	2013	2015
Pakistan	1 woman on board	2017	2020
Germany	1 woman if 4 or more executives in the board	2021	2022

Source: Authors own compilation

Table 12: The most productive countries based on Volume of Publications

Sr.no	Country	Documents	Citations	ACPD
1	United states	40	516	12.9
2	Italy	29	176	6.069
3	Spain	28	739	26.393
4	United Kingdom	26	673	25.885
5	Australia	19	815	42.895
6	China	15	229	15.267
7	France	13	242	18.615
8	Pakistan	11	276	25.091
9	New Zealand	11	265	24.091
10	Malaysia	11	155	14.091
11	Germany	11	125	11.364
12	United Arab Emirates	9	182	20.222
13	Canada	8	342	42.75
14	Turkey	8	76	9.5
15	India	8	13	1.625

16	Nigeria	6	31	5.1667
17	Portugal	6	9	1.5
18	Norway	5	74	14.8
19	Romania	5	22	4.4
20	Poland	5	17	3.4

Note: ACPD = Average Citations Per Document

Source: Authors

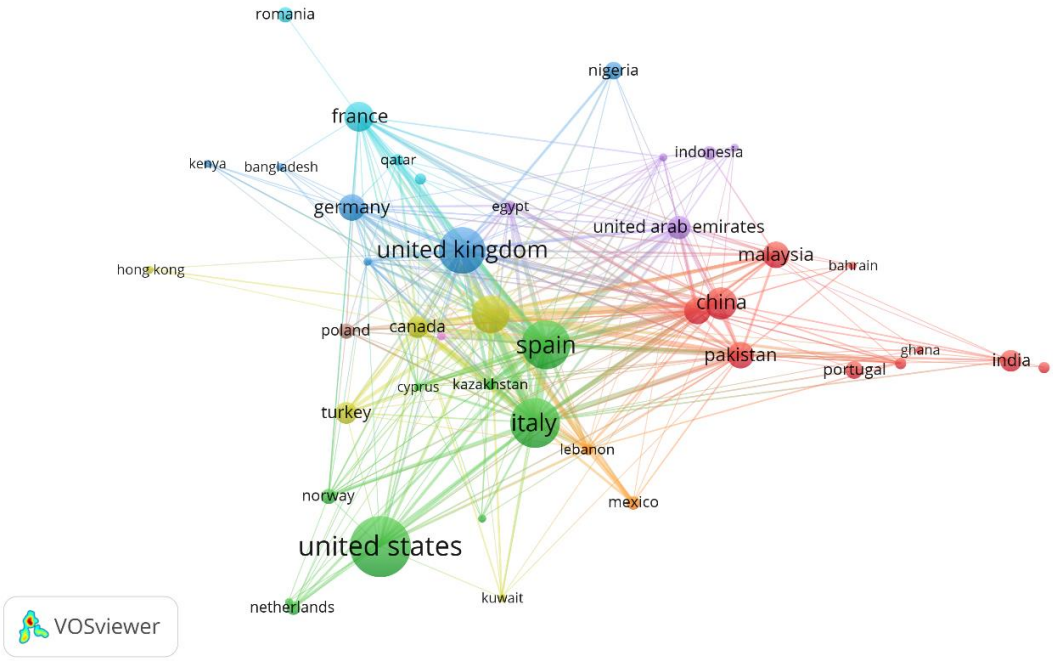

Figure 8: The most productive countries based on Citation Analysis

Source: Authors' elaboration using VOS viewer

Table 13: Showing Top 20 Journals Based on the Volume Analysis

Rank	Source	Publisher	No of Documents	Total Citations	Total link strength	ACPD
1	Corporate social responsibility and environmental management	Wiley Blackwell	21	940	80	44.76
2	Sustainability (Switzerland)	MDPI	20	172	31	8.6
3	Business strategy and the environment	Wiley Blackwell	17	635	66	37.35
4	Corporate governance (bingley)	Emerald	6	102	9	17
5	Journal of cleaner production	Elsevier	6	285	32	47.5
6	Journal of business ethics	Springer	5	403	38	80.6
7	Sustainability accounting, management and policy journal	Emerald	4	113	14	28.25
8	Gender in management	Emerald	3	45	11	15
9	Journal of financial reporting and accounting	Emerald	3	9	11	3
10	Journal of management and organization	Cambridge University Press	3	186	16	62
11	Sustainable development	Wiley Blackwell	3	62	3	20.66
12	Accounting research journal	Emerald	2	0	9	0
13	Australasian journal of environmental management	Taylor and Francis	2	1	5	0.5
14	Economic research-ekonomska istrazivanja	Taylor and Francis	2	4	2	2
15	Energy policy	Elsevier	2	38	5	19
16	Equality, diversity and inclusion	Emerald	2	2	5	1
17	International journal of gender and entrepreneurship	Emerald	2	19	0	9.5
18	Journal of accounting in emerging economies	Emerald	2	11	5	5.5
19	Journal of applied accounting research	Emerald	2	3	13	1.5

20	Journal of business economics	Springer	2	1	4	0.5

Note: ACPD=Average Citations Per Document

Source: The authors.

4.2.2 Citation Analysis for Countries, Journals, Authors, and Documents

One of the important scientific techniques of bibliometric mapping is Citation Analysis, which focusses on the aspect that citation analysis helps in building academic connections when they are cited (Sánchez-Teba et al., 2021). This can be understood as one of the most straight forward techniques as it provides analysis based on the volume of the citations and identifies the most influential elements in terms of the journal, articles etc (Stremersch et al., 2007). Citation analysis shall also assist in identification of those research articles which have prominently impacted the researchers as compared to the ones which have been less cited in a particular domain of research (Donthu et al., 2021).

Table 12 in terms of the number of citations clearly shows that, Australia tops the list with 815 total citations, followed by Spain (739 citations), U.K (673 citations) and USA (516 citations). The citations analysis reaffirms the results narrated by Volume analysis. Table 14 points out the top 20 Journals in the domain of GDCS based on the citation analysis. As mentioned earlier, citation analysis is a scientific and a straightforward method of identifying the impactful elements, citation analysis shall portray a better representation of the most influential journals in this domain as compared to the volume analysis. The table 14 highlights that *Corporate Social Responsibility and Environmental Management journal* published by Wiley Blackwell is the most cited journal with a total of 940 citations, followed by *Business Strategy and Environment* (635 citations*) and Journal of Business Ethics* (403 citations). The Journals based on citation analysis also go beyond a single discipline and the research publications have found place in other disciplines as well such as Management *(#8 Management Decisions),* Accounting *(#14 Journal of Accounting in Emerging Economies),* Technology *(#16 Technological Forecasting and Social Change).* In terms of the publishing house, approximately 50% of the top 20 journals belongs to the Emerald Publishing. If we look at the Average Citations per document (ACPD) which further gives a broader outlook in terms of the impact caused by the journals, *Journal of Business Ethics* tops the list with (ACPD=80.6), followed by *Journal of management* (ACPD=*62) and organization* and *Management decision (*ACPD=*54.5).*

Table 15 shows the top 20 authors who have made the most impact through their research in the domain of GDCS based on the citation analysis. The authors working in GDCS is spread across the globe with a total no of authors as per the Scopus database is 687. The list shows that Collins Ntim based in U.K tops the list with 282 citations with just 4 documents, followed by Mohammad Jizi from USA (227 citations) and Jeremy Galbreath from Australia with 220 citations. Mohamed H. Elmagrhi from U.K deserves special mention as despite having just 2 publications he holds the highest number of average citations per documents (ACPD=81.5). The list of authors also affirms Figure III as the top influential authors belongs to countries of USA, U.K and Australia.

Table 16 shows the list of top 20 most cited research articles over a period of two decades along with the total number of citations as well as the type of the research articles. Frias et al., (2013) is an early work which aimed at exploring some of the characteristics of board and integrating them with corporate social reporting is the most cited article with 940 citations, Ben-amar (2017) has also made significant contribution in the field, by exploring the linkage between board gender diversity and sustainability initiatives. More than 50% of the top 20 research publications have been published in the *Corporate social responsibility and environmental management, Business strategy and the environment and Journal of business ethics* as corroborated by table 14. It is also interesting to note that all 20 most cited research articles are of empirical type highlighting the degree of growing empirical research conducted in the domain of GDCS.

Table 14: Showing Top 20 Journals Based on the Citation Analysis

Rank	Source	Publisher	No of Documents	Total citations	Total link strength	ACPD
1	Corporate social responsibility and environmental management	Wiley Blackwell	21	940	80	44.76

2	Business strategy and the environment	Wiley Blackwell	17	635	66	37.35
3	Journal of business ethics	Springer	5	403	38	80.6
4	Journal of cleaner production	Elsevier	6	285	32	47.5
5	Journal of management and organization	Cambridge University Press	3	186	16	62
6	Sustainability (switzerland)	MDPI	20	172	31	8.6
7	Sustainability accounting, management and policy journal	Emerald	4	113	14	28.25
8	Management decision	Emerald	2	109	3	54.5
9	Corporate governance (bingley)	Emerald	6	102	9	17
10	Sustainable development	Wiley Blackwell	3	62	3	20.66

11	Gender in management	Emerald	3	45	11	15
12	Energy policy	Elsevier	2	38	5	19
13	International journal of gender and entrepreneurship	Emerald	2	19	0	9.5
14	Journal of accounting in emerging economies	Emerald	2	11	5	5.5
15	Journal of financial reporting and accounting	Emerald	3	9	11	3
16	Technological forecasting and social change	Elsevier	2	5	2	2.5
17	Economic research-ekonomska istrazivanja	Taylor and Francis	2	4	2	2
18	Journal of applied accounting research	Emerald	2	3	13	1.5

19	Journal of sustainable finance and investment	Taylor and Francis	2	3	4	1.5
20	Equality, diversity, and inclusion	Emerald	2	2	5	1

Note: ACPD=Average Citations Per Document

Source: The authors.

Table 15: Showing the Top 20 Most Influential Authors in the Field of GDCS based on Citation Analysis

Rank	Author	Country	Documents	Citations	Total link strength	ACPD
1	Collins Ntim	U. K	4	282	41	70.5
2	Mohammad Jizi	USA	3	227	48	75.66
3	Jeremy Galbreath	Australia	4	220	3	55
4	Ahmed A Elamer	U. K	2	166	24	83
5	Muhammad Nadeem	Pakistan	5	166	41	33.2
6	Mohamed H. Elmagrhi	U. K	2	163	30	81.5

7	Nurlan S Orazalin	Kazakhstan	3	94	32	31.33
8	Rashid Zaman	Australia	2	94	28	47
9	Patrick Velte	Germany	4	86	10	21.5
10	Isabel-María García-Sánchez	Spain	4	73	15	18.25
11	Abdullah S. Karaman	Kuwait	2	63	8	31.5
12	Merve Kılıç Karamahmutoğlu	Turkey	2	63	8	31.5
13	Ali Uyar	France	2	63	8	31.5
14	Tanveer Ahsan	France	2	55	0	27.5
15	Jennifer Martínez Ferrero	Spain	2	52	3	26
16	Chenglong Zheng	Thailand	2	52	1	26
17	Monowar Mahmood	Kazakhstan	2	46	14	23
18	Ayman I. F. Issa	Qatar	2	41	12	20.5
19	Ashfaq Ahmed	Australia	3	36	14	12
20	Anthony Bowrin	Michigan	2	33	1	16.5

Note: ACPD=Average Citations Per Document

Source: The authors.

Table 16: Showing the top 20 Most Influential Articles in the field of GDCS based on citation analysis

Rank	Title of the Paper	Journal	Paper Type	Total Citations
1	Frias-aceituno j.v. (2013) The Role of the Board in the Dissemination of Integrated Corporate Social Reporting	Corporate Social Responsibility and Environment Management	Empirical	308
2	Ben-amar w. (2017) Board Gender Diversity and Corporate Response to Sustainability Initiatives: Evidence from the Carbon Disclosure Project	Journal of Business Ethics	Empirical	251
3	Galbreath j. (2011) Are there gender-related influences on corporate sustainability? A study of women on boards of directors	Journal of Management Organization	Empirical	170
4	Setó-pamies d. (2015) The Relationship between Women Directors and Corporate Social Responsibility	Corporate Social Responsibility and Environment Management	Empirical	160
5	Jizi m. (2017) The Influence of Board Composition on Sustainable Development Disclosure	Business Strategy and the Environment	Empirical	139
6	Elmagrhi m.h. (2019) A study of environmental policies and regulations, governance structures, and environmental performance: The role of female directors	Business Strategy and the Environment	Empirical	130
7	Ntim c.g. (2013) Black Economic Empowerment Disclosures by South African Listed Corporations: The Influence of Ownership and Board Characteristics	Journal of Business Ethics	Empirical	119
8	Haque f. (2017) The effects of board characteristics and sustainable compensation policy on carbon performance of UK firms	The British Accounting Review	Empirical	113
9	Al-shaer h. (2016) Board gender diversity and sustainability reporting quality	Journal of Contemporary Accounting and Economics	Empirical	112

10	Nadeem m. (2017) Boardroom gender diversity and corporate sustainability practices: Evidence from Australian Securities Exchange listed firms	Journal of Cleaner Production	Empirical	91
11	Arayssi m. (2016) Women on boards, sustainability reporting and firm performance	Sustainability Accounting Management and Policy Journal	Empirical	88
12	Kassinis g. (2016) Gender and Environmental Sustainability: A Longitudinal Analysis	Business Strategy and the Environment	Empirical	86
13	Yasser q.r. (2017) Corporate Social Responsibility and Gender Diversity: Insights from Asia Pacific	Corporate Social Responsibility and Environment Management	Empirical	74
14	Tamimi n. (2017) Transparency among S&P 500 companies: an analysis of ESG disclosure scores	Management Decision	Empirical	70
15	Alazzani a. (2017) Impact of gender diversity on social and environmental performance: evidence from Malaysia	Corporate Governance	Empirical	65
16	Birindelli g. (2019) The impact of women leaders on environmental performance: Evidence on gender diversity in banks	Corporate Social Responsibility and Environment Management	Empirical	52
17	Zahid m. (2020) Boardroom gender diversity: Implications for corporate sustainability disclosures in Malaysia	Journal of Cleaner Production	Empirical	51
18	Orazalin.n (2020) Corporate social responsibility strategy and corporate environmental and social performance: The moderating role of board gender diversity	Corporate Social Responsibility and Environment Management	Empirical	48
19	García-sánchez i.-m. (2019) Do board characteristics affect environmental performance? A study of EU firms	Corporate Social Responsibility and Environment Management	Empirical	46
20	Gerwanski j. (2019) Determinants of materiality disclosure quality in integrated reporting: Empirical	Business Strategy and the Environment	Empirical	42

4.2.3 Keyword Analysis

Evaluating and visualization of the growing themes is a key task in any domain of research and Cobo et al. (2011) discusses the same in his scholarly work. The thematic map is graphical depiction of the growing themes and topics evaluated based on various quadrants. Thematic map is based on two components centrality on X axis (depicting the importance of the topic) and density on Y axis (showcasing development of the themes). The thematic map has four

parts. Themes that are on the lower left part of the map are declining or emerging themes. These themes can either be picked up by researchers and developed or these may get eliminated due to lack of interest. The themes on the lower right part of the thematic map are basic topics There has been substantial work on them. The left upper part represents niche schemes that are developed but in isolation. The themes on the upper right part are developed. Based on thematic map shown in Figure 9, Management, Human resource, employee engagement is some of the niche themes which have been developed in isolation but can be further researched. The themes like workforce diversity and sexual and gender diversity seems to be either emerging or declining themes. Though themes like stakeholder theory, environmental performance, sustainable development are basic themes, but we see a clear movement of development taking place in terms of the gender diversity aspect integrated with aspects like CSR, firm performance, sustainability etc. Moreover, the themes like environmental firm value, gender policies etc seems to be a fully developed in terms of substantial work.

Figure 9: Thematic Map showing development of Themes

Source: Authors' elaboration using Biblioshiny

Figure 10: Word cloud showing various Themes under GDCS Literature

Source: Authors' elaboration using Biblioshiny

Figure 10 Shows the word cloud created based on keyword Plus, gender diversity and sustainability have the highest number of frequencies for obvious reasons of the chosen themes. The other most frequently words which have been highlighted are governance approach, corporate social responsibility, education, women's status etc. Some of the other emerging themes which have been highlighted are environmental management, corporate strategy, innovation, climate change, decision making, cultural diversity to name a few. The cloud map clearly demonstrates that the domain of GDCS has a wider scope for growth in years to come.

Fig 11 shows the Thematic Evolution of the GDCS literature depicting how the themes have grown over the years and on what themes the interlinkages have been created. The period of 2001-2013 shows that major research has been conducted in the domain of gender diversity and corporate governance. In the period of 2014-2021 the interlinkages were created between the themes of gender diversity and corporate sustainability performance, corporate social responsibility etc. The period of 2014-2021 saw a faster growth in terms of GDCS literature transcending various domains.

Figure 12 shows the word tree map, showing various combinations of keywords that have been widely used in the GDCS literature. The word corporate governance, board of directors, sustainable development, corporate social responsibility etc are the most frequently used keywords. These are the themes which have been used predominantly, in terms of the emerging themes integrated reporting, sustainability reporting, gender equality, climate change etc have scope for future developments.

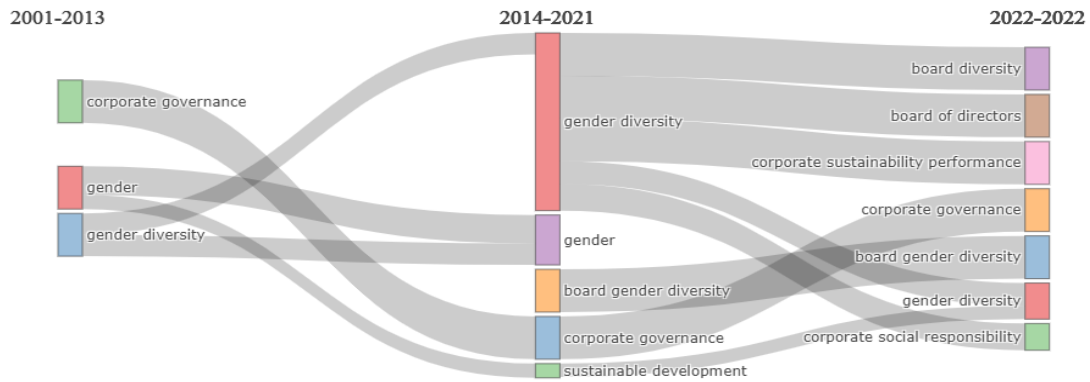

Figure 11: Thematic Evolution of GDCS literature.

Source: Authors' elaboration using Biblioshiny

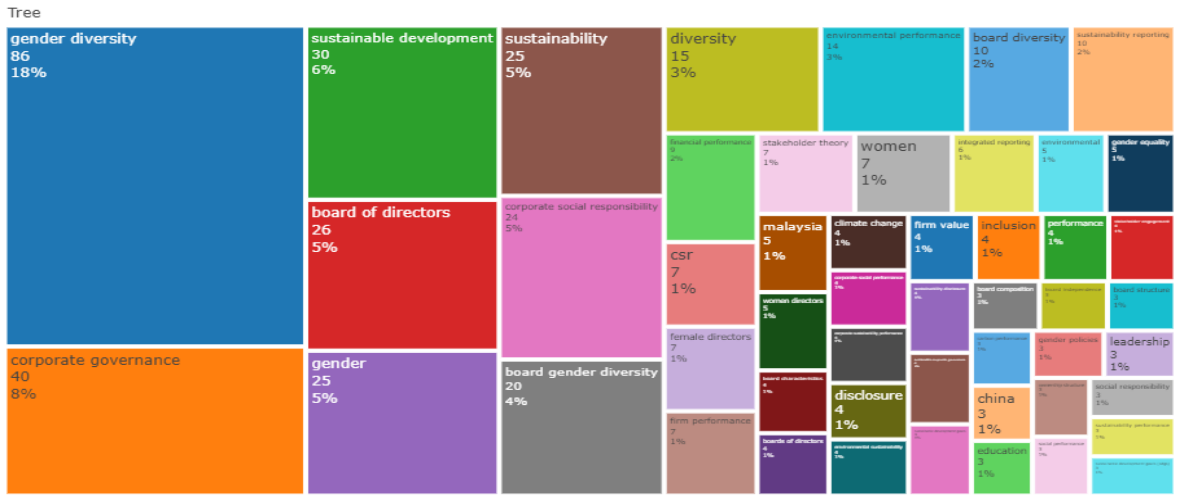

Figure 12: Word Tree Map showing growth of Themes under GDCS Literature

Source: Authors' elaboration using Biblioshiny

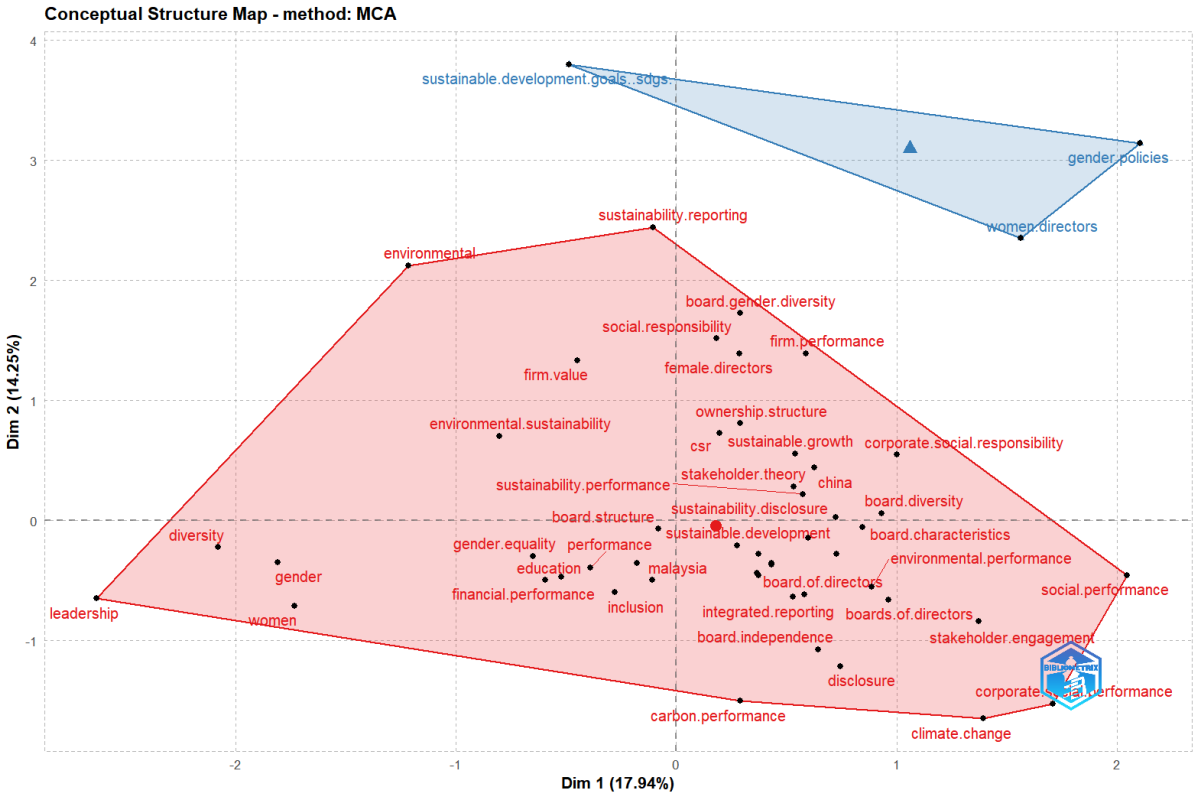

Figure 13: Factorial Analysis to depict Conceptual Structure under GDCS Literature

Source: Authors' elaboration using Biblioshiny

Figure 13 shows the factorial analysis to showcase the joint keywords which form part of conceptual structure. The factorial analysis was conducted using the "Multiple Correspondence Analysis" with the fields of record being the keyword plus, with automatic clustering and a maximum number of terms being 50. The objective of factorial analysis was to identify the variables/ factors that were smaller in numbers but can depict the growing field of research/themes. The factorial analysis depicts the conceptual structure showing two classifications of the keywords: Blue Map showing broad keywords such as Sustainable development goals, gender policies and women directors. Since the rationale behind factorial analysis is to identify keywords occurring in low numbers, Red Map provides the solution comprising of more specific keywords like sustainability reporting, social responsibility, sustainability disclosures, environmental performance, climate change etc.

Figure 14 shows dendrogram of keywords which shows the interlinkages of keywords derived from the hierarchical clustering (Sharma et al., 2021). Dendrogram is not just focussed upon deriving the association between the clusters but also the number of clusters to highlight the major drivers in the research domain Andrews (2003). Cluster 1 (Blue) show the association

between the gender policies and women directors with sustainable development goals. This highlights the role played by the women directors in fostering the SDG set by the United Nations (UN) to be achieved by 2030. Cluster 2 (Red) Shows the relationship between gender diversity and various aspects such as environmental sustainability, firm performance, social performance, social responsibility, disclosures etc.

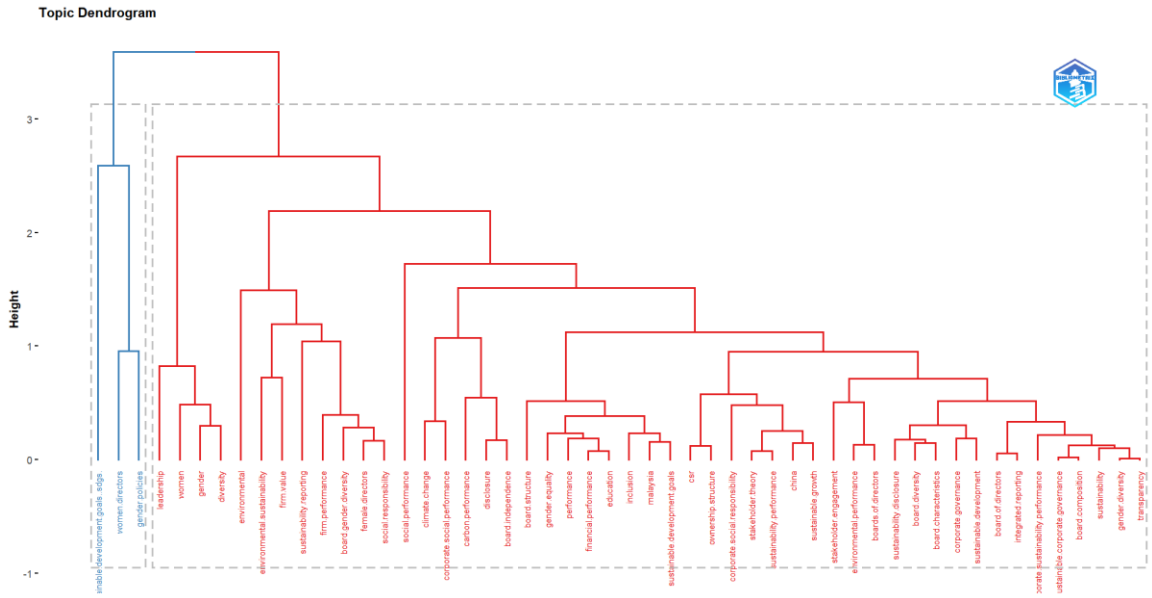

Figure 14: Dendrogram showcasing interlinkages between various themes of GDCS Literature

Source: Authors' elaboration using Biblioshiny

4.2.4 Keyword Co-occurrence Analysis

The conduct of the keyword co-occurrence analysis is based on the premise that the two concepts/keywords which occur simultaneously relate to each other based on some conceptual relation between them (Kumar et al., 2021). The keyword co-occurrence analysis is also a widely accepted tool for determining the forthcoming themes and topics which can be explored in the upcoming future (Donthu et al., 2021). Based on the VOS-viewer software a keyword occurrence analysis was performed keeping 5 as the minimum number of frequencies, it led to the discovery of 43 keywords meeting the threshold out of 1317 keywords. Though gender diversity and sustainable development are the most co-occurring keywords, our agenda was to discover the emerging themes for future research. Figure 15 shows that the keywords marked with yellow are the emerging themes for future research. Some of the prominent themes which were identified are "decision making", "corporate strategy", "integrated reporting", "gender disparity", "sustainability reporting" etc.

Figure 16 shows the progress of the research that has taken place in the domain of GDCS. In the beginning years (2012-2018) much of the research was focussed upon the themes like "women", "gender" "women directors" "diversity" etc. However, as the literature on gender diversity picked up its pace, the new themes came to light post 2018 such as "gender diversity", "sustainable development" "corporate governance" etc. In recent years (2021-2022), new developments have taken place and the literature has identified some unexplored themes such as "environmental performance" "sustainability reporting" and "Stakeholder theory". These are the themes which can be further explored in years to come.

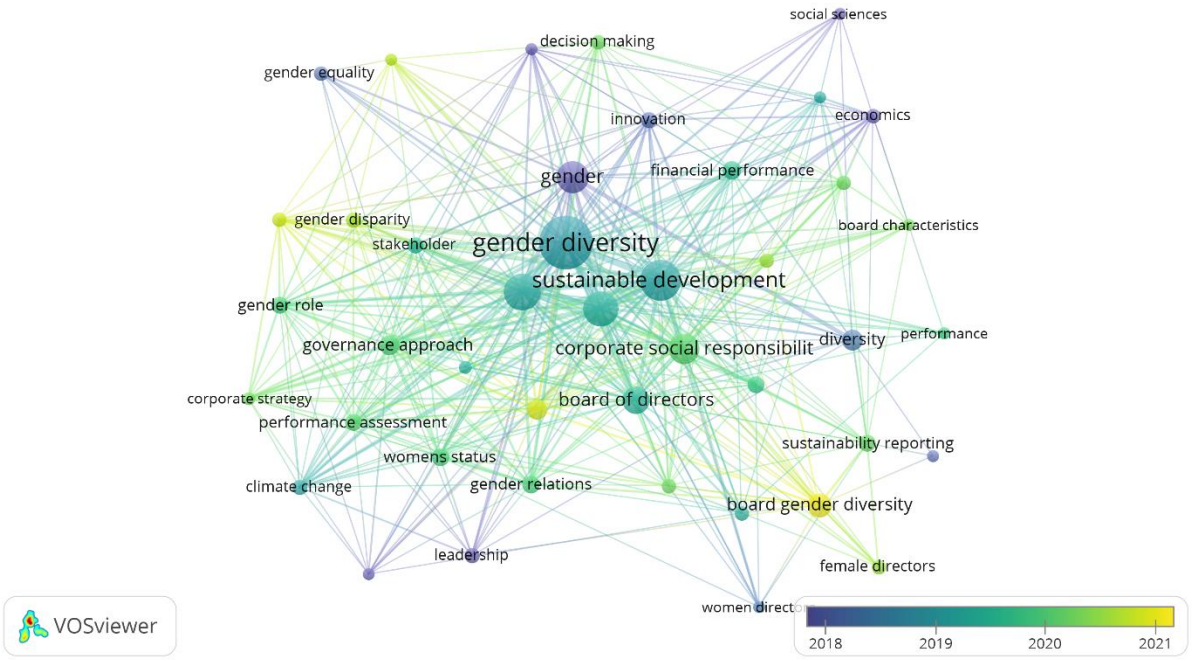

Figure 15: Temporal overlay on a keyword co-occurrence map for the GDCS knowledge base published from (threshold 5 co-occurrences, display 43 keywords out of 1317 keywords.

Source: Authors elaboration using VOS-Viewer

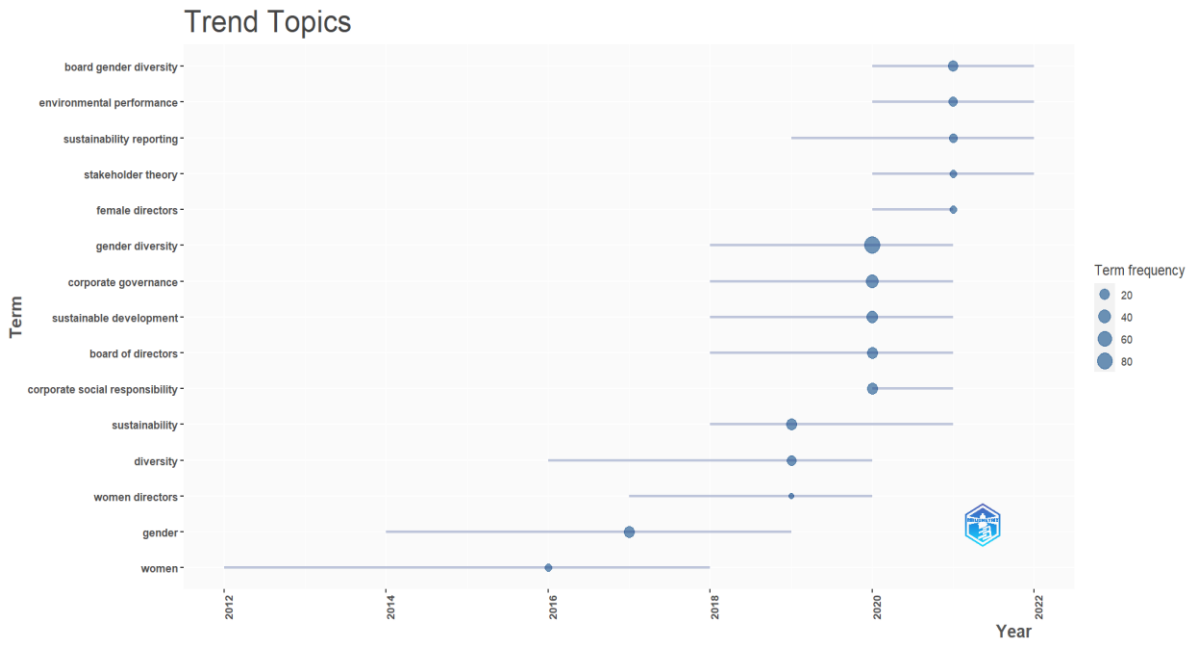

Figure 16: Trend topics over the years (Minimum term frequency 5 and Number of words per year 5).

Source: Authors' elaboration using Biblioshiny

4.2.5 Co-Citation Analysis

The Co-citation analysis tool is a scientific mapping technique to uncover the intellectual development taking place in a particular domain (Donthu et al., 2021). The major purpose of using such a tool is to identify the interlinkages (Bhaiswar et al., 2021) and thematic clusters between the references which are cited together. Academicians and researchers have also used the co-citation analysis to identify the prominent journals, impactful research articles and influential authors (Donthu et al., 2021).

In Figure 17, the nodes portray the cited reference, and the size of the nodes demonstrates the number of the documents in which the article has been co-cited. Out of 15969 cited references, 23 meets the threshold of minimum co-cited documents with at least 10 citations each. Table 17 shows the list of top 20 most influential articles based on co-citations. The most co-cited research article is by (Bear et al., 2010) linking board diversity with corporate social responsibility and firm reputation, followed by (Adams and Ferreira, 2009) which focussed upon determining the link between women on board and governance and performance. In terms of the source of publication it is noteworthy that more than 50% of the publication has taken place in the *"Journal of Business Ethics"* which is premier journal in the field of governance

and ethics. The table also represents the likelihood and growing empirical research in the field of GDCS as more than 90% of the most co-cited articles are empirical in nature.

Based on the network diagram in Figure 17 we could identify 3 different clusters followed by the content analysis of these co-cited references the themes represented by them have been identified:

Cluster 1: Gender Diversity and Corporate Sustainability

Cluster 1 represented by the red (figure 17) is the largest cluster that demonstrates the emerging theme of gender diversity and corporate sustainability. The clusters focus is on answering the mystery, whether women leaders promote sustainability practises (Glass et al., 2016). In the same vein another study forming the cluster creates interlinkage between board gender diversity and firms' response towards sustainability practises through the lens of carbon disclosure project (Ben et al., 2017). With growing progression in GDCS literature there was a need to channelise new dimensions, thus (Fernandez et al., 2014) investigated the link between gender diversity and sustainability reporting. The role of sustainability committees has become paramount in terms of decision-making thus this domain was also explored by (Liao et al., 2015) in determining any relationship between gender diversity, board independence, environmental committee, and green house disclosure. The cluster overall showcases that prominent growth has taken place in exploring the various dimensions of GDCS literature.

Cluster 2: Gender Diversity and Corporate Social Responsibility

The research in the field of gender diversity and corporate social responsibility (CSR) has also grown exponentially as depicted by the formation of the Cluster 2 represented in green (figure 17). (Bear et al., 2010) explores the link between board gender diversity and its impact on corporate social responsibility, and further mediates the relation between CSR ratings on firm reputation. Cluster 2 comprises of plethora of studies which have linked gender diversity and CSR in their own ways for instance Boulouta, (2013) finds linkage between gender diversity and social performance, (Rao and Tilt, 2016) explores gender diversity and CSR through the lens of strategy and decision making perspective, (Williams, 2003) looks after the role played by the women directors in serving the society through philanthropy activities and found that women directors have played a considerable impact on the same.

Cluster 3: Gender Diversity and Financial Performance

Cluster 3 demonstrates whether there exists a business case for women directors or not, by exploring the theme of gender diversity and financial performance represented by blue colour (figure 17). The cluster comprises of a seminal paper on agency theory by (Jensen and Meckling, 1976) which has formed the basis for conducting various research in the context of ownership structure, governance etc and is a major theoretical justification in linking gender diversity and performance. The cluster highlights two of the earliest papers linking gender diversity and financial performance (Campbell and Mínguez-Vera,2008; Adams and Ferriera, 2009) which has acted as a benchmark for future studies in this dimension conducted in various economies. Another stream of research also goes beyond the surface and highlights that gender diverse boards impacts the strategic control of the firms (Nielsen and Huse, 2010a).

Table 17: Showing the top 20 Most Influential Articles in the field of GDCS based on co-citation analysis

Rank	Title of the Paper	Source	Type of the Paper	Co-Citations
1	Bear, s., rahman, n., post, c., the impact of board diversity and gender composition on corporate social responsibility and firm reputation (2010)	Journal of business ethics	Empirical	30
2	Adams, r.b., ferreira, d., women in the boardroom and their impact on governance and performance (2009)	Journal of Financial Economics	Empirical	27
3	Campbell, k., minguez-vera, a., gender diversity in the boardroom and firm financial performance (2008)	Journal of business ethics	Empirical	23
4	Boulouta, i., hidden connections: the link between board gender diversity and corporate social performance (2013)	Journal of business ethics	Empirical	19
5	Liao, l., luo, l., tang, q., gender diversity, board independence, environmental committee and greenhouse gas disclosure (2015)	The British Accounting Review	Empirical	18
6	Williams, r.j., women on corporate boards of directors and their influence on corporate philanthropy (2003)	Journal of business ethics	Empirical	17
7	Nielsen, s., huse, m., the contribution of women on boards of directors: going beyond the surface (2010)	Corporate Governance: An International Review	Empirical	16
8	Hafsi, t., turgut, g., boardroom diversity and its effect on social performance: conceptualization and empirical evidence (2013)	Journal of business ethics	Empirical	15
9	Ben-amar, w., chang, m., mcilkenny, p., board gender diversity and corporate response to sustainability initiatives: evidence from the carbon disclosure project (2017)	Journal of business ethics	Empirical	13
10	Harjoto, m., laksmana, i., lee, r., board diversity and corporate social responsibility (2015) journal of business ethics	Journal of business ethics	Empirical	13

11	Jensen, m.c., meckling, w.h., theory of the firm: managerial behavior, agency costs and ownership structure	Journal of Financial Economics	Empirical	13
12	Fernandez-feijoo, b., romero, s., ruiz-blanco, s., women on boards: do they affect sustainability reporting? (2014)	Corporate Social Responsibility and Environment Management	Empirical	12
13	Post, c., byron, k., women on boards and firm financial performance: a meta-analysis (2015)	Academy of Management Journal	Literature Review	12
14	Rao, k., tilt, c., board composition and corporate social responsibility: the role of diversity, gender, strategy, and decision making (2016)	Journal of business ethics	Empirical	12
15	Seto-pamies, d., the relationship between women directors and corporate social responsibility (2015)	Corporate Social Responsibility and Environment Management	Empirical	12
16	Walls, j.l., berrone, p., phan, p.h., corporate governance and environmental performance: is there really a link?	Strategic Management Journal	Empirical	12
17	Erhardt, n.l., werbel, j.d., shrader, c.b., board of director diversity and firm financial performance (2003)	Corporate Governance: An International Review	Empirical	11
18	Frias-aceituno, j.v., rodriguez-ariza, l., garcia-sanchez, i.m., the role of the board in the dissemination of integrated corporate social reporting (2013)	Corporate Social Responsibility and Environment Management	Empirical	11
19	Reverte, c., determinants of corporate social responsibility disclosure ratings by spanish listed firms (2009)	Journal of business ethics	Empirical	11
20	Francoeur, c., labelle, r., sinclair-desgagne, b., gender diversity in corporate governance and top management (2008)	Journal of business ethics	Empirical	10

Source: The authors.

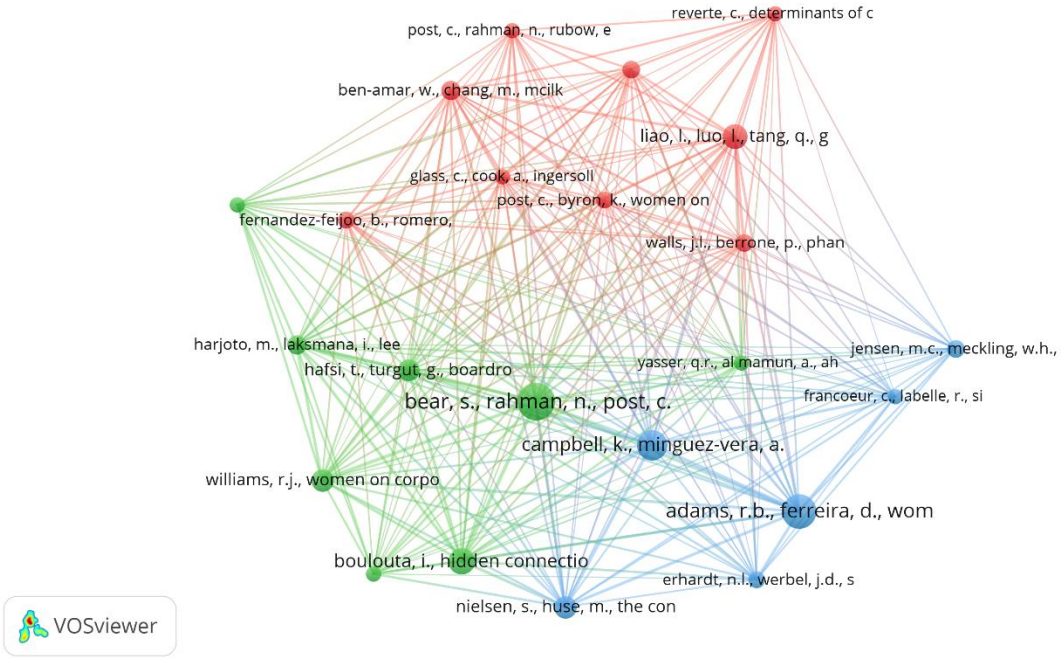

Figure 17: Documents co-citation map based on 15969 articles (threshold 10 co-citations, display top 23 articles).

Source: Authors elaboration using VOS-Viewer

4.3 Does gender diversity on board impacts firms' financial performance?

The objective was to evaluate whether the presence of gender diversity on board has any significant impact on financial performance of the large listed Indian companies. Both descriptive as well as inferential statistics was used to conduct the analysis. The detailed results which have been obtained has been discussed in detail.

4.3.1 Descriptive statistics

Table 18 briefly presents the descriptive statistics, i.e., mean, standard deviation, maximum values, minimum values, for our dependent, independent, and control variables.

Table 18: Descriptive Statistics for gender diversity and financial performance (GDFP).

Variable	Mean	Standard Deviation	Minimum	Maximum
Tobin's Q	3.90	3.27	0.213	73.78
ROA (%)	12.36	9.33	14.26	112.54
P-Women for Board	0.175	0.097	.10	.31
B-Size	11.53	3.54	3	54
ID	5.12	1.90	2	14
Duality	0.47	0.51	0	1
F-Size*(Rs. Millions)	4.89	0.977	.93	8.13
Org-Slack*(Rs. Millions)	3.75	0.872	0.041	6.69
Lever	1.32	19.42	0	87
BM	6.62	2.96	6	63

Notes: * denotes natural log.

Source: Authors' own calculations.

The Tobin's Q, the market measure of financial performance, is found to have a mean value of 3.90, suggesting sound financial health of the sampled firms, in terms of the market. The mean value of ROA is found to be 12.36 which means that on average, a firm can generate a return of 12.36% on the investments made, whereas the minimum and the maximum value are 14.26 and 112.54, respectively. The mean percentage of women on board is 0.104, indicating that the average representation of women on boards in our sample is merely 17.5%. The mean value of board size is found to be 11.53 and the minimum and maximum values are 3 and 54, respectively, representing that majority of the companies have a large-sized board. The mean number of independent directors is 5.12, clearly stating that approximately 50% of the board is comprised of independent directors. The value of CEO duality is 0.47, indicating that in at least 50% of the boards, the position of CEO and the chairman is held by the same individual, thereby leading to a possibility of a high degree of control over decisions by the chairman. The firm size and organizational slack are found to have a mean value of 4.89 and 3.75 (in millions) representing the sound health of the BSE 500 firms. The mean value of leverage is 1.32 whereas the maximum and minimum values are found to be 87 and 0 respectively. The average number of board meetings conducted in a year is 6.62, which is reasonable.

4.3.2 Diagnostic Tests

Prior to the hypothesis testing, it is pertinent to check the assumptions for panel data regression. Multicollinearity is tested using the variance inflation factor (VIF), tolerance values, and Pearson correlation matrix. Multicollinearity may turn out to be a problem in case the value of VIF is greater than 10 and tolerance levels are near 0 (Gujarati and Porter, 2017) or if the values in the Pearson correlation matrix are more than 0.5. Table 19 and Table 20 illustrate that the correlation coefficients of all the variables, in our model for gender diversity on board, are less than 0.5 and the VIFs in the model vary from 1.02 to 2.82. The tolerance values also range from .46 to .99. Thus, we may conclude that there is no issue of multicollinearity in the model. Similar results are found in the model for gender diversity on the remuneration committee as well as the nomination committee.

Table 19: Pearson Correlation Matrix for gender diversity and financial performance (GDFP)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Tobin's Q	1.000								
(2) B-Size	-0.076	1.000							
(3) ID	-0.073	0.673	1.000						
(4) P-Women	0.088	-0.310	-0.201	1.000					
(5) Duality	-0.060	0.083	0.040	-0.074	1.000				
(6) BM	-0.028	0.038	-0.041	-0.001	-0.075	1.000			
(7) F-Size	-0.229	0.386	0.239	-0.092	0.002	0.069	1.000		
(8) Org-Slack	-0.121	0.262	0.107	-0.063	-0.027	0.038	0.678	1.000	
(9) Lever	-0.093	0.021	-0.004	-0.016	0.056	0.011	0.066	-0.034	1.00

Table 20: Variance Inflation Factor for gender diversity and financial performance (GDFP)

Variable	VIF	1/VIF
B-Size	2.82	0.46
F-Size	2.02	0.511
Org-Slack	1.93	0.53
ID	1.99	0.57

P-Women	1.33	0.87
Duality	1.43	0.98
Lever	1.02	0.98
BM	1.54	0.99
Mean VIF	1.523	0.00

Furthermore, it is crucial to monitor the heteroskedasticity and serial correlation. Indeed, if these are not corrected, the estimated variances, covariances, and standard errors would be biased and inconsistent (Gujarati and Porter, 2017). Consequently, the Breusch-Pagan test is used to check for heteroskedasticity, and the Breusch-Godfrey Test is used to detect autocorrelation. Both tests lead to the rejection of the null hypothesis, pointing towards their presence in our models. Both these issues were resolved by using robust standard errors in our regression models. (Wooldridge, 2015).

4.3.3 Impact of Gender Diversity on Corporate Boards on Financial Performance (Tobin's Q)

Table 21 highlights the regression results obtained through the fixed effects model, using Tobin's Q as a measure for financial performance. The model was developed to evaluate the impact caused by percentage of women director on firm's financial performance using a market-based measure (Tobin's Q). The results of the model are found to be insignificant for the board (P-women= 2.981, p-value= 0.241). Thus, based on the market-based performance we can conclude that the results showcase that gender diversity on board has not been able to make any significant impact on firms' financial performance. The results are supported by past studies of (Singh et al.,2019).

Table 21: Summary Results of Regression Models Using Tobin's Q as Dependent Variable

Variables	**Model**
P-Women for Board	2.981

	(0.241)
B-Size	0.0864** (0.017)
ID	-0.100* (0.092)
Duality	-0.373** (0.016)
BM	-0.0263 (0.368)
F-Size	-1.686*** (0.000)
OS	0.223 (0.144)
Leverage	-0.172*** (0.002)
Constant	9.896*** (0.000)

p-values in parentheses * p<0.10, ** p<0.05, *** p<0.01

Source: Authors' own calculations

In terms of the control variables, board size is found to be positive and significant, implying that a larger board improves the financial performance of the firms and the same is well justified in terms of the resource dependence theory as well and consistent with the previous studies

(Adams and Mehran, 2012). The number of independent directors is found to be negatively correlated with the firm performance, though insignificant, based on the premise that independent directors may not have been able to bring the independence or diversity element in real terms, rather they may have added to additional costs in terms of hefty sitting fees (Arora and Sharma, 2016). The CEO duality is negatively associated with performance, which is expected since if the CEO and board chairman are the same person, there is a possibility of conflict of interest in decision making, that would hamper performance. The results are in line with the findings of Upadhyay and Zeng (2014). An important control variable that was expected to be positively associated with the financial performance but is found to be negative and insignificant is the number of board meetings. This outcome may be attributed to the fact that very frequent meetings may negate their fruitfulness and rather add to the increased cost and time of the firm. Similar results were found in the previous studies undertaken by Ting *et al.* (2018) and Chaudhary and Gakhar (2018).

The firm size is also found to be negatively associated with the firm performance, possibly because as firms grow, it becomes complicated to manage the various departments efficiently (Hamdan, 2018; Brahma *et al.*, 2021). Organizational slack is found to have a positive but insignificant impact on financial performance. The past studies have seen the impact of organizational slack as a positive dimension towards performance and this is supported by organizational theory as well (Stock *et al.*, 2018). Lastly, the co-efficient of leverage is negative and significant, indicating an inverse relationship between leverage and performance. This relation is based on two elements namely, financial distress and benefits based on the way debt has been serviced (González, 2013). In this case, the costs have certainly outweighed the benefits in the Indian context.

4.3.4 Impact of Gender Diversity on Corporate Boards on Financial Performance (Return on Assets)

Table 22 highlights the regression results using return on assets (ROA) as a measure for financial performance. The regression model was created to establish the relationship of various variables of gender diversity on board with firms' financial performance. The regression results in terms of the coefficient were found to be positive but insignificant in case of gender diversity on board (Model 1, P-women=0.0188, p-value=0.993). Thus, the accounting-based performance variable (return on asset) further supports the results obtained in case of market-based performance measure.

Table 22: Summary Results of Regression Models Using ROA as Dependent Variable

Variables	**Model**
P-women for Board	0.0188 (0.993)
B-Size	.0451* (0.060)
ID	0.267 (0.118)
Duality	-0.653* (0.052)
BM	-0.0452 (0.445)
F-Size	-5.875*** (0.000)
OS	3.049*** (0.000)
Leverage	-0.743 (0.290)
Constant	24.66*** (0.000)

p-values in parentheses * p<0.10, ** p<0.05, *** p<0.01

Source: Authors' own calculations

The results concerning ROA contrast with the results in terms of Tobin's Q. The discrepancy between the two measures of financial performance underscores the fact that both, the accounting as well as market-based measures do not work on similar lines, and thus, there is a need to evaluate both the variables for the analysis (Bennouri *et al.*, 2018). The control variables produce similar results as in the case of Tobin's Q.

4.3.5 Robustness check

We further conduct a range of tests, which are aimed at enhancing the robustness of our results. Based on the extant corporate governance literature, this study uses P-women as the main independent variable to measure gender diversity. To check for robustness of the findings of the study, two diversity indices have been used for gender diversity:

- Blau index and
- Shannon index

These two indices consider the number of categories, in terms of gender, and the evenness in terms of the distribution of board members, respectively (Stirling, 1998). When used as a proxy variable for gender diversity on board, the coefficients of these indices are found to be insignificantly related to the market-based performance measure (Tobin's Q) as well as the accounting-based performance measure (ROA).

4.3.A Does gender diversity on Board Impacts Financial performance in the case of IT Sector Firms?

The objective to test whether gender diversity on board impacts firms' financial performance was further tested in the context of Information and technology sector in India to have a better understanding of the results and the dynamics of relationship between the two variables. The results of the same has been elaborated below.

4.3.A.1 Descriptive Results

Table 23 briefly presents the descriptive statistics, i.e., mean, maximum values, minimum values, and standard deviation for our dependent, independent, and control variables. The mean values of the P-woman, Blau index, and Shannon index, which are used as proxy measures for gender diversity, are 0.104, 0.17, and 0.389, respectively. Both the diversity indices (Blau and Shannon) range from 0 to 0.13 and 0 to .113, respectively. This depicts that the gender diversity on Indian corporate boards is not well represented.

Table 23: Descriptive Statistics for gender diversity and financial performance (IT Sector)

	Mean	**Maximum**	**Minimum**	**Standard Deviation**
Tobin's Q	2.89	3.26	.108	69.77
P-Women	.104	.093	0	1
Blau	.17	.13	0	.5
Shannon	.389	.113	.0	.693
F-SIZE (Rs in Millions)	4.77	.807	.80	7.65
ROA	7.36	9.41	-142.69	115.83
Lever	.64725	6.78	0	1.2676
Age of Firm	28.63	129	4	33.450
Board Size	10.52	3.41	3	48

Source: Authors' own calculations

Table 24: Hausman Test

Test Summary	Chi-Sq statistic	Chi-Sq	p-value
Cross section random	33.858	8	0.000

Source: Authors' own calculations

Table 24 tested for the Hausman test to identify whether a fixed effect model shall be chosen for the analysis, or a random effects model shall be chosen, the (p-value=0.000) rejected the null hypothesis and thus we used fixed effect model for conducting the necessary results.

4.3.A.2 Diagnostic Test

Before the hypothesis testing, it is pertinent to test for the assumptions and hence, multicollinearity was tested using the variance inflation factor (VIF), tolerance values as well as using a correlation matrix. Multicollinearity may turn out to be a problem in case the value of VIF is greater than 10 and tolerance levels shall be near 0. The VIFs in the model vary from 1.02 to 2.18 and the tolerance values also range from .45 to .97 (Table 25). Thus, we may conclude that there is no issue of multicollinearity in the models.

Table 25: Multicollinearity Test

Variables	VIF	Tolerance Statistics(1/VIF)
P-woman	2.182	.458
ROA	2.065	.484
Lever	1.896	.527
F-size	1.868	.535
Firm-Age	1.111	.9
Board Size	1.022	.979

Source: Authors' own calculations

Table 26: Summary Results of Regression Models

Variables	Model#1	Model#2	Model#3
P-woman	-3.43		
	(-0.65)		
ROA	0.373***	0.371***	0.374***
	(3.49)	(3.50)	(3.50)
LEVER	0.297**	0.297**	0.298**
	(1.50)	(1.51)	(1.53)
F-size	-4.749***	-4.753***	-4.755***
	(-3.47)	(-3.47)	(-3.50)
Firm Age	0.1366***	0.1367***	0.1379***
	(2.23)	(2.23)	(2.24)
Board Size	-0.542**	-0.542**	-0.542**
	(-3.73)	(-3.69)	(-3.66)
Blau		-3.49	
		(-0.63)	
Shannon			-2.45

			(-0.61)
Constant	31.64***	31.69***	31.84***
	(8.15)	(8.00)	(7.78)
R^2	.0772	.0681	.1502
adj. R^2	.0662	.0641	.0671
F	17.59	16.65	48.79
Probability>F	0.0000	0.0000	0.0000

***t* statistics in parentheses * p<0.10, ** p<0.05, *** p<0.01**

Source: Authors' own calculations

4.3.A.3 Results

The results shown in table 26 indicate that all the three models are overall significant at p < 0.01, where Model 1 explains 6.62%., Model 2 explains 6.41% and Model 3 explains 6.71% variation, respectively. The results suggest that board gender diversity (P-woman, Blau, Shannon) negatively impacts financial performance, however, the regression results are not found to be significant. The results are found to be consistent with multiple studies (Farrell and Hersch, 2005; Smith et al., 2006; Adams and Ferreira, 2009; Shehata et al. 2017; Martinez et al., 2020;) which concluded that due to the prevalence of the phenomena of groupthink in corporate boards, women directors are unable to contribute to decision making and hence, firms' performance. Moreover, the results are found to be consistent even in the information and technology sector in terms of the accounting-based measure (ROA) conducted for the US economy (Simionescu et., al 2021). Studies have opinionated that the benefits of enhanced

creativity, productivity, and decision making can only happen when the share of women on the board is enhanced, which shall certainly lead to the enhancement of the firm performance (Dang et al., 2020; Martinez et al., 2020).

With respect to the control variables, all the five control variables are found to be significant, though at different p-values. Operational profitability, measured by ROA, as well as firm age is found to be positively associated with financial performance (Tobin's Q), since a firm with a higher ROA as well as longer existence in the market has a positive impression on the market as well as goodwill. The results are consistent with the studies of Campbell and Mínguez-Vera (2008) and Terjesen et al. (2016). Board size as well as firm size are found to negatively impact financial performance owing to conflict in decision making and complexities in handling and managing the firms. The results for the negative impact of board size on financial performance can be attributed to the communication and coordination problems (Jensen, 1993) between a large board as well as due to undermining of board cohesiveness (Lipton and Lorsch, 1992). The results of firm size are consistent with the studies of Becker-Blease et al. (2010) and Khatab et al. (2011). Leverage is found to be positively associated with the market-based financial performance. Similar results were found in the studies conducted by Gweyi and Karanja (2014) and Rehman (2013).

4.3.A.4 Robustness check

Based on the extant corporate governance literature (Campbell and Mínguez-Vera, 2008; Mínguez-Vera and López-Martínez, 2010; Al-Shaer and Zaman, 2016; Shehata et al., 2017; Issa and Fang, 2019; Singh et al., 2019; Singh et al., 2021a) this study uses P-woman, which represents the proportion of women directors in the firm, as the major independent variable to measure gender diversity. To check for the robustness of the findings of the study, two indices have been used:

- Blau Index, and

- Shannon Index

These two indices consider the number of categories, in terms of gender, and the evenness in terms of the distribution of board members, respectively (Stirling, 1998). In Table V, the results of the study with respect to the measurement of the impact of gender diversity on financial performance have been reported. Model 2, as well as Model 3 of the study, are representative of these proxies used and they report that gender diversity and financial performance are negatively associated. These results are in alignment with the finding of the main model (Model 1).

4.4 Does gender diversity on board impacts firms' financial performance?

The objective was to evaluate whether the presence of gender diversity on board committees has any significant impact on financial performance of the large listed Indian companies. Both descriptive as well as inferential statistics was used to conduct the analysis. The detailed results which have been obtained has been discussed in detail.

4.4.1 Descriptive statistics

Table 27 briefly presents the descriptive statistics, i.e., mean, standard deviation, maximum values, minimum values, for our dependent, independent, and control variables.

Table 27: Descriptive Statistics for gender diversity and financial performance (GDFP).

Variable	Mean	Standard Deviation	Minimum	Maximum
Tobin's Q	3.90	3.27	0.213	73.78
ROA (%)	12.36	9.33	14.26	112.54
P-Women for Board	0.175	0.097	.10	.31
B-Size	11.53	3.54	3	54
ID	5.12	1.90	2	14
Duality	0.47	0.51	0	1
F-Size*(Rs. Millions)	4.89	0.977	.93	8.13
Org-Slack*(Rs. Millions)	3.75	0.872	0.041	6.69
Lever	1.32	19.42	0	87
BM	6.62	2.96	6	63

Notes: * denotes natural log.

Source: Authors' own calculations.

The Tobin's Q, the market measure of financial performance, is found to have a mean value of 3.90, suggesting sound financial health of the sampled firms, in terms of the market. The mean value of ROA is found to be 12.36 which means that on average, a firm can generate a return of 12.36% on the investments made, whereas the minimum and the maximum value are 14.26 and 112.54, respectively. The mean percentage of women on board is 0.104, indicating that the average representation of women on boards in our sample is merely 17.5%. The mean value of board size is found to be 11.53 and the minimum and maximum values are 3 and 54, respectively, representing that majority of the companies have a large-sized board. The mean number of independent directors is 5.12, clearly stating that approximately 50% of the board is comprised of independent directors. The value of CEO duality is 0.47, indicating that in at least 50% of the boards, the position of CEO and the chairman is held by the same individual, thereby leading to a possibility of a high degree of control over decisions by the chairman. The firm size and organizational slack are found to have a mean value of 4.89 and 3.75 (in millions) representing the sound health of the BSE 500 firms. The mean value of leverage is 1.32 whereas the maximum and minimum values are found to be 87 and 0 respectively. The average number of board meetings conducted in a year is 6.62, which is reasonable.

4.4.2 Diagnostic Tests

Prior to the hypothesis testing, it is pertinent to check the assumptions for panel data regression. Multicollinearity is tested using the variance inflation factor (VIF), tolerance values, and Pearson correlation matrix. Multicollinearity may turn out to be a problem in case the value of VIF is greater than 10 and tolerance levels are near 0 (Gujarati and Porter, 2017) or if the values in the Pearson correlation matrix are more than 0.5. Table 28 and Table 29 illustrate that the correlation coefficients of all the variables, in our model for gender diversity on board, are less than 0.5 and the VIFs in the model vary from 1.02 to 2.82. The tolerance values also range from .46 to .99. Thus, we may conclude that there is no issue of multicollinearity in the model. Similar results are found in the model for gender diversity on the remuneration committee as well as the nomination committee.

Table 28: Pearson correlation matrix showing relationship between percentage of women and other variables.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Tobin's Q	1.000								
(2) B-Size	-0.076	1.000							
(3) ID	-0.073	0.673	1.000						
(4) P-Women	0.088	-0.310	-0.201	1.000					
(5) Duality	-0.060	0.083	0.040	-0.074	1.000				
(6) BM	-0.028	0.038	-0.041	-0.001	-0.075	1.000			
(7) F-size	-0.229	0.386	0.239	-0.092	0.002	0.069	1.000		
(8) Org-Slack	-0.121	0.262	0.107	-0.063	-0.027	0.038	0.678	1.000	
(9) Lever	-0.093	0.021	-0.004	-0.016	0.056	0.011	0.066	-0.034	1.00

Note: Similar results were obtained using Percentage of women on Nomination Committee as well.

Table 29: Variance Inflation Factor for gender diversity and financial performance (GDFP)

Variable	VIF	1/VIF
B-Size	2.82	0.46
F-Size	2.02	0.511
Org-Slack	1.93	0.53
ID	1.99	0.57
P-Women	1.33	0.87
Duality	1.43	0.98
Lever	1.02	0.98

BM	1.54	0.99
Mean VIF	1.523	0.00

Note: Similar results were obtained using Percentage of women on Nomination Committee as well.

Furthermore, it is crucial to monitor the heteroskedasticity and serial correlation. Indeed, if these are not corrected, the estimated variances, covariances, and standard errors would be biased and inconsistent (Gujarati and Porter, 2017). Consequently, the Breusch-Pagan test is used to check for heteroskedasticity, and the Breusch-Godfrey Test is used to detect autocorrelation. Both tests lead to the rejection of the null hypothesis, pointing towards their presence in our models. Both these issues were resolved by using robust standard errors in our regression models (Wooldridge, 2015).

4.4.3 Impact of Gender Diversity on Board Committees on Financial Performance (Tobin's Q)

Table 20 highlights the regression results obtained through the fixed effects model, using Tobin's Q as a measure for financial performance. Two models have been created simultaneously, Model 1 measures the percentage of women directors on remuneration committees and Model 2 measures the percentage of women directors on the nomination committees. The co-efficient values of p-women are found to be positive and significant at 1% level of significance for remuneration committee and nomination committee (Model 1, P-women=0.383, p-value=0.007; Model 2, P-women=0.374, p-value=0.010). The regression results of our study suggest that the presence of women directors on the prominent committees created by the board impacts financial performance through the participation of women in governance as well as the decision-making process (Green and Homroy, 2018).

The results produce an interesting finding that integrating the female directors in the governance mechanisms by enhancing their participation in the prominent committees impacts financial performance, while we saw in the previous objective that merely putting them on the corporate board for the sake of on-paper diversity does not lead to any gains. Therefore, there

lies a business case for gender diversity and encouragement of women's participation on board committees, as it is likely to improve the financial performance of the firms. The results are in line with the studies conducted in the context of emerging economies such as Turkey (Ararat and Yurtoglu, 2021) and European countries (Green and Homroy, 2018).

Table 30: Summary Results of Regression Models Using Tobin's Q as Dependent Variable

Variables	**Model 1**	**Model 2**
P-Women for Remuneration Committee	0.383*** (0.007)	
P-Women for Nomination Committee		0.374*** (0.010)
B-Size	0.0671* (0.060)	0.0667* (0.062)
ID	-0.0843 (0.162)	-0.0848 (0.160)
Duality	-0.351** (0.026)	-0.350** (0.027)
BM	-0.0266 (0.371)	-0.0272 (0.359)
F-Size	-1.721*** (0.000)	-1.720*** (0.000)
OS	0.194 (0.212)	0.197 (0.206)

Leverage	-0.164*** (0.003)	-0.165*** (0.003)
Constant	10.45*** (0.000)	10.45*** (0.000)

p-values in parentheses * p<0.10, ** p<0.05, *** p<0.01

Source: Authors' own calculations

In terms of the control variables, board size is found to be positive and significant, implying that a larger board improves the financial performance of the firms and the same is well justified in terms of the resource dependence theory as well and consistent with the previous studies (Adams and Mehran, 2012). The number of independent directors is found to be negatively correlated with the firm performance, though insignificant, based on the premise that independent directors may not have been able to bring the independence or diversity element in real terms, rather they may have added to additional costs in terms of hefty sitting fees (Arora and Sharma, 2016). The CEO duality is negatively associated with performance, which is expected since if the CEO and board chairman are the same person, there is a possibility of conflict of interest in decision making, that would hamper performance. The results are in line with the findings of Upadhyay and Zeng (2014). An important control variable that was expected to be positively associated with the financial performance but is found to be negative and insignificant is the number of board meetings. This outcome may be attributed to the fact that very frequent meetings may negate their fruitfulness and rather add to the increased cost and time of the firm. Similar results were found in the previous studies undertaken by Ting *et al.* (2018) and Chaudhary and Gakhar (2018).

The firm size is also found to be negatively associated with the firm performance, possibly because as firms grow, it becomes complicated to manage the various departments efficiently (Hamdan, 2018; Brahma *et al.*, 2020). Organizational slack is found to have a positive but insignificant impact on financial performance. The past studies have seen the impact of organizational slack as a positive dimension towards performance and this is supported by organizational theory as well (Stock *et al.*, 2018). Lastly, the co-efficient of leverage is negative and significant, indicating an inverse relationship between leverage and performance. This

relation is based on two elements namely, financial distress and benefits based on the way debt has been serviced (González, 2013). In this case, the costs have certainly outweighed the benefits in the Indian context.

4.4.4 Impact of Gender Diversity Board Committees on Financial Performance (Return on Assets)

Table 31 highlights the regression results using return on assets (ROA) as a measure for financial performance. Two simultaneous regression models were created to establish the relationship of various variables of gender diversity on prominent committees with firm financial performance. The regression results in terms of the coefficient were found to be negative and insignificant with respect to the prominent committees (Model 1, P-women = -0.217, p-value=0.482; Model 2, P-women = -0.308, p-value = 0.323).

Table 31: Summary Results of Regression Models Using ROA as Dependent Variable

Variables	**Model 1**	**Model 2**
P-Women for Remuneration Committee	-0.217 (0.482)	
P-Women for Nomination Committee		-0.308 (0.323)
B-Size	0.0470* (0.072)	0.0454* (0.076)
ID	0.258 (0.224)	0.256 (0.225)
Duality	-0.595* (0.080)	-0.599* (0.078)
BM	-0.0656	-0.0666

	(0.272)	(0.265)
F-Size	-5.912*** (0.000)	-5.904*** (0.000)
OS	3.149*** (0.000)	3.153*** (0.000)
Leverage	-0.741 (0.127)	-0.742 (0.343)
Constant	24.71*** (0.000)	24.73*** (0.000)

p-values in parentheses * p<0.10, ** p<0.05, *** p<0.01

Source: Authors' own calculations

The results concerning ROA contrast with the results in terms of Tobin's Q. The discrepancy between the two measures of financial performance underscores the fact that both, the accounting as well as market-based measures do not work on similar lines, and thus, there is a need to evaluate both the variables for the analysis (Bennouri *et al.*, 2018). The difference in the results arises because the appointment of female directors on board committees improves the perception of the investors (Green and Homroy, 2018) and other stakeholders which is readily reflected in the market-based performance measure, but it may take a longer time to get reflected in the accounting-based performance measure. The control variables produce similar results as in the case of Tobin's Q.

4.4.5 Robustness check

We further conduct a range of tests, which are aimed at enhancing the robustness of our results. Based on the extant corporate governance literature, this study uses P-women as the main independent variable to measure gender diversity. To check for robustness of the findings of the study, two diversity indices have been used for gender diversity:

- Blau index and
- Shannon index

These two indices consider the number of categories, in terms of gender, and the evenness in terms of the distribution of board members, respectively (Stirling, 1998). These variables when used as a proxy variable for gender diversity on the remuneration committee and the nomination committee, they are positive as well as significantly related to Tobin's Q but have an insignificant relation with ROA. The outcomes re-state our point that the presence of women directors on prominent committees, and not just the board, improves the perception of the investors in terms of the firm's governance and thus gets reflected in the results, though the same is not the case with the accounting-based performance measure.

4.5 Does gender diversity on board impacts sustainability reporting quality?

The final objective was to examine whether the presence of gender diversity on board impacts the degree of sustainability reporting or not. The objective also led to the creation of a sustainability reporting quality variable to measure the degree of reporting. The results of the analysis have been elaborated in detail.

4.5.1 Descriptive Statistics

Table 32: Descriptive Statistics for gender diversity and sustainability reporting (GDSR)

Panel A: Sustainability Quality					
SUSQUAL Scale	0	1	2	3	4
Number of Firms (%)	32%	11%	15%	15%	27%
Panel B: Variable	Mean	Std. Dev.	Min	Max	
SUSQUAL	1.95	1.619	0	4	
P-Woman	0.104	0.093	0.5	0.23	
N-women	1.04	0.814	0	5	
Blau	0.17	0.13	0	0.5	
Shannon	0.389	0.113	0.101	0.693	
INDFEMDIR	0.6272	0.6322	0	4	
B-Size	10.525	3.419	6	48	
B-IND	5.116	1.898	0	14	
CEO-D	0.467	0.502	0	1	
BM	6.609	2.82	4	25	
Independence	0.2587	0.438	0	1	
Committee	0.54	0.4984	0	1	
F-Size	4.773	0.807	1	7.657	
Tobin's Q	2.89	3.26	0.1084	69.77	
ROTA	17.364	9.415	2.697	115.832	
O-Slack	3.753	0.872	0.041	6.695	
Lever	1.318	19.414	0	27.21	
Panel C: Industry Classification	1	2	3	4	
Number of Firms (%)	41%	5%	18%	36%	

We report the descriptive statistics in Table 32 for the variables used in the empirical analysis. The table comprises of three categories: Panel A for sustainability reporting quality, Panel B for variables used in the models and Panel C for the industry-wise classification. Panel A shows that 32% of the firms in our sample have not published the sustainability reports or business responsibility reports, whereas remaining 68% of the firms had the reports in place. Out of

these 68% firms which had published reports, 11% of the firms have not gone beyond publishing reports in terms of sustainability aspects. The statistics also suggest that merely 15% of the firms have formulated committees to look after the sustainability activities of the firms. Moreover, 15% of the firms get their sustainability reports audited by the internal department and 27% of the firms have hired external independent agencies for the same. The firms which have hired external agencies can be construed to have better reporting practices in terms of sustainability norms.

Under Panel B, the mean sustainability reporting score (SUSQUAL) averages 1.95, which clearly shows that the reporting standards in our sample are at a modest level. In terms of our independent variable, gender diversity on board, the mean of percentage of women directors (P-woman) is 10.4%, average number of female directors on board (N-women) is found to be 1.04, the two-diversity measures (Blau and Shannon) are reported as 0.17 and 0.389 respectively and finally the number of female independent directors (INDFEMDIR) is averaged at 0.627. These proxy variables clearly indicate that the gender-based diversity on corporate boards in India is less as compared to other nations such as 14.1% in the United Kingdom (Al-Shaer and Zaman, 2016), 12% in Vietnam (Nguyen et al., 2015), and 27.44% in Spain (Martinez-Jimenez et al., 2020). The mean value of board size (B-Size) is 10.52, which is very close to what is being reported in recent studies in India as 10.57 (Arora, 2021) and 9.19 (Sarkar and Selarka, 2021). The average number of independent directors on boards (B-IND) is found to be 5.11, representing that in terms of the mean value of the board size, approximately 50% of the directors are independent directors. The mean value of CEO Duality (CEO-D) is.467, indicating that approximately 46% of the firms have the same person working as the CEO as well as Chairman. The average number of board meeting per year (BM) is found to be 6.60, and the minimum and the maximum value ranges from 4 meetings to 25 meetings. The average value of INDEPENDENCE, which refers to the percentage of firms which got their reports audited from the independent external agency, is merely 25%, whereas approximately 54% of the firms in the sample have formulated separate committees (COMMITTEE) to look after the sustainability activities. In terms of the firm specific variables, the mean of the firm size (F-Size) is found to be 4.773, market-based performance indicator (Tobin's Q) as 2.89 and accounting-based indicator (ROA) as 17.36, which indicates that the firms in the sample are financially sound. In terms of the organisational slack (O-Slack), the mean is 3.75 and leverage (Lever) turned out as 1.31, which provides strategic opportunities for the firms to flexibly adapt to the market requirements as and when needed.

Panel C comprises of the industry-wise classifications and shows that 41% of the firms in our sample belong to an industry which is least hazardous to the environment, 5% firms fall in the category of low hazardous, 18% firms are moderately hazardous and 36% of the firms are most hazardous.

4.5.2 Diagnostic tests

The correlation matrix between the variables (Table 33 and Table 34) reveals that the sustainability reporting quality aspect is positively correlated with the gender diversity variable using the percentage of women directors and number of independent women directors on board. We also find that sustainability reporting quality is positively associated with the number of independent directors, board size, size of the firm, market-based as well as accounting-based performance indicators (Tobin's Q and ROA), and organizational slack. There are some variables that are negatively associated such as CEO-Duality, board meeting as well as well as leverage. The correlation results are found to be consistent with other proxy measures of gender diversity (number of female directors, Blau index, Shannon index) as well. The results of the correlation analysis are found to be consistent with the hypothesis development between the linkage of gender diversity and sustainable reporting quality. Moreover, none of the variables are found to have a correlation exceeding 0.8, therefore the possibility of multicollinearity has been ruled out (Kim, 2019).

Table 33: Correlation Matrix showing correlation between all variables in Model 1 (P-Woman)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) SUSQUAL	1										
(2) P-Woman	0.023	1									
(3) B-IND	0.008	-0.207	1								
(4) CEO-D	-0.111	-0.086	0.038	1							
(5) BM	-0.033	0	-0.04	-0.074	1						
(6) B-Size	0.07	-0.318	0.671	0.079	0.039	1					
(7) F-Size	0.308	-0.095	0.239	-0.004	0.073	0.386	1				
(8) Tobin's Q	0.075	0.077	-0.07	-0.059	-0.03	-0.075	-0.232	1			
(9) ROA	0.047	0.008	0.021	-0.041	-0.005	-0.015	-0.121	0.394	1		
(10) O-Slack	0.254	-0.07	0.111	-0.026	0.038	0.269	0.686	-0.13	0.073	1	
(11) Lever	-0.079	-0.02	-0.005	0.056	0.01	0.021	0.068	-0.094	-0.163	-0.033	1

Table 34: Correlation Matrix showing correlation between all variables in Model 2 (INDFEMDIR)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) SUSQUAL	1										
(2) INDFEMDIR	0.137	1									
(3) B-IND	0.009	0.06	1								
(4) CEO-D	-0.111	-0.048	0.039	1							
(5) BM	-0.031	-0.106	-0.04	-0.075	1						
(6) B-Size	0.069	-0.02	0.671	0.078	0.039	1					
(7) F-Size	0.309	0.131	0.241	-0.003	0.072	0.389	1				
(8) Tobin's Q	0.075	0.031	-0.071	-0.06	-0.03	-0.075	-0.23	1			
(9) ROA	0.047	-0.012	0.02	-0.041	-0.005	-0.015	-0.118	0.393	1		
(10) O-Slack	0.256	0.081	0.111	-0.026	0.037	0.27	0.686	-0.13	0.074	1	
(11) Lever	-0.079	0.012	-0.005	0.056	0.01	0.021	0.067	-0.094	-0.163	-0.034	1

4.5.3 Empirical Results and Findings

Based on the Brant test (Brant, 1990) we find that some of the variables were violating the parallel lines assumption and therefore, generalized ordered logit model (partial proportional model) was considered as the most suitable model for the analysis The same has been recommended by Williams (2006) and Williams (2016), and has been applied in other domains with similar context (Abegaz et al., 2014; Michalaki et al., 2015).

Table 35 documents the results of the empirical analysis of Model 1, while Table 36 reports the same for Model 2. In terms of the generalized ordered logit model, a positive co-efficient means that an increase in the value of explanatory variable shall indicate that the results lie in higher categories of dependent variables, whereas for each value of negative co-efficient, we shall infer that the results lie either in the same category or in the lower category (Williams and Quiroz, 2019). Based on the above interpretation, we find that with increase in the percentage of women directors on board, the sustainability reporting quality shall be moderately affected (Table 35). In simple words, out of 4 categories of sustainability reporting quality, 3 of them are found to have a significant positive coefficient, implying likelihood of a higher degree of sustainability reporting quality (Panel A: β= 3.590, Panel B: β=1.520, Panel C: β= .640, Panel D: β= -4.080, þ=<.01). The values of the co-efficients are found to be moving from the higher degree of positive co-efficients to the lower degree, and it ultimately turns negative. This

highlights that as the percentage of women directors increase, it is highly likely that the sustainability reporting quality improves in terms of publishing necessary sustainability reports, having committees to look after sustainable practices, and getting the internal audit done to evaluate the cost-benefit of such activities. However, the presence of women directirs is has not been found powerful enough to enforce external audits. Our findings are in alignment with the previous studies which also document that having a larger percentage of women on board shall enhance the level of sustainability reporting practices and quality (Arayssi et al., 2020; Cicchiello et al., 2021; Pareek et al., 2021; Nicolo et al., 2022).

Table 35: G-Logit Results Gender diversity (P-Woman) impacting sustainability reporting quality (Model 1)

SUSQUAL	**Panel A**	**Panel B**	**Panel C**	**Panel D**
	(0 v/s 1,2,3,4)	**(0,1 v/s 2,3,4)**	**(0,1,2 v/s 3,4)**	**(0,1,2,3 v/s 4)**
P-Woman	3.590*	1.520*	0.640*	-4.080*
B-Size	-0.850	-.620	-0.580	0.850
B-IND	-1.590*	NA	NA	NA
CEO-D	-5.960*	-4.000*	-3.040*	-0.220*
BM	-4.500*	-2.700***	-2.120**	-1.810***
F-Size	11.590*	9.320*	9.440*	9.300*
Tobin's Q	3.270*	2.420**	4.250*	3.530*
ROA	-2.020**	0.030	0.570	0.760
O-Slack	-0.120	NA	NA	NA
Lever	-8.060*	-4.470*	-3.960*	-4.300*
1 (Least Hazardous)	1.360	NA	NA	NA
2 (Low	-2.220**	NA	NA	NA

Hazardous)				
3(Moderately Hazardous)	0.230*	NA	NA	NA
4 (Most Hazardous)	-1.080	0.210	1.930***	3.940*
Constant	-9.950	-8.270	-10.710	-12.400
Pseudo R2 **LR likelihood** **No of Observations**	.1122 622.97 3456			

Significance Level: *p< .01, **p< .05, ***p< .1

NA: represents variables for which parallel lines assumptions were not violated.

Table 36 shows the results based independent women director. The results suggest that the number of independent female directors on board have a significantly high impact on sustainability reporting quality (Panel A: β= .418, Panel B: β=.268, Panel C: β= .203, Panel D: β= .010, þ=<.01). This is evident by the results, as in all the panels the value of co-efficients are found to be positive and significant. In simple terms, with the increasing number of independent women directors on board, women are able to impact higher order of sustainability reporting quality and are likely to infuse external audits of sustainable activities as well. The results using independent women director are more pronounced than that of percentage of women directors. This clearly implies that the presence of independent female directors have a more significant role in impacting sustainability reporting quality. The results are consistent with the previous studies that highlight that the presence of independent women director enhances the sustainability reporting quality greater than the presence of non-independent female directors on board (Al-Shaer and Zaman, 2016).

Table 36: G-Logit Results Gender diversity (INDFEMDIR) impacting sustainability reporting quality (Model 2)

SUSQUAL	Panel A	Panel B	Panel C	Panel D
	(0 v/s 1,2,3,4)	(0,1 v/s 2,3,4)	(0,1,2 v/s 3,4)	(0,1,2,3 v/s 4)
INDFEMDIR	0.418*	0.268*	0.203**	*0.010
B-Size	-0.040	-0.042***	-0.014	0.041***
B-IND	-0.057*	NA	NA	NA
CEO-D	-0.379*	-0.610*	-0.386*	0.040
BM	-0.049*	NA	NA	NA
F-Size	1.722*	1.310*	1.286*	1.312*

Tobin's Q	0.071*	NA	NA	NA
ROA	-0.013***	0.001	0.008	0.006
O-Slack	-0.011	NA	NA	NA
Lever	-1.362*	-0.640*	-0.626*	-0.603*
1 (Least Hazardous)	0.663	NA	NA	NA
2 (Low Hazardous)	-0.456*	NA	NA	NA
3(Moderately Hazardous)	0.030*	NA	NA	NA
4 (Most Hazardous)	-0.193	0.003	0.176***	0.523*
Constant	-5.575	-4.507	-5.534	-7.247
Pseudo R2 **LR likelihood** **No. of Observations**	.1046 577.83 3456			

Significance Level: *p< .01, **p< .05, ***p< .1

NA: represents variables for which parallel lines assumptions were not violated.

In terms of control variables, board size is found to have an insignificant negative co-efficient (in both Model 1 and Model 2), which ultimately turns positive, signalling that increase in board size is going to have a moderate impact on sustainability reporting quality. The results are consistent with the previous studies (Cicchiello et al., 2021; Nicolo et al., 2022). This is

based on the premise that a larger boards shall face coordination and communication problems which shall hamper the decision-making process as well as the reporting aspects (Fasan and Mio, 2017). We also found independent directors to be less likely to impact sustainability reporting quality in both the Models, as the entire set of co-efficients (constant) were significant and negative. The results are consistent with the previous studies (Majeed et al., 2015; Mahmood et al., 2018). In the Indian context, there is a major prevalence of family firms (Bhatt and Bhattacharya, 2017), where family members dominate the affairs of the business. Thus, the role of independent directors is limited (Mahmood et al., 2018), thereby limiting sustainability disclosures. Another control variable, CEO duality, is found to have a negative significant co-efficient, implying that it is less likley to impact sustainability reporting quality. The results are supported by a recent study by Romano et al. (2020) which highlights that CEO duality outweights the benefits accrued through gender diversity and negatively impacts sustainibility disclosures. Board meeting is also found to have negative significant co-efficients implying that they are less likely to impact sustainability reporting quality. The plausible reason for the same could be attributed to the inefficiency of the board of directors in organizing board meetings, leading to higher operation costs and dismantled agenda with a little focus on sustainability issues (Dienes and Velte, 2016). The results are consistent with the previous study by Birindelli et al. (2018) who could not find any significant impact of board meeting on sustainability performance.

Furthermore, firm specific control variables such as firm size, market and accounting based performance indicators are found to have positive as well as significant co-efficients throughout the panels across both models. The results are consistent with previous literature (Sarumpaet, 2006; Pareekh et al., 2021) indicating that large-sized companies have a larger pool of stakeholders to cater to, in order to mitigate the pressure, and have to meet a wider set of expectations which enhances their sustainability reporting level (Rao and Tilt, 2016; Qureshi et al., 2020; Amorelli and Garcia-Sanchez, 2021). Moreover, profitable companies have larger access to various kinds of resources such as manpower, financial resources, etc., that provides them with greater opportunities to disclose both, financial as well as non-finacial information to various stakeholders (Haninun et al., 2018). Organisational slack is found to have a negative but insignificant impact on sustainability reporting quality and these are in alignment with respect to the study of Issa and Fang (2019). The reason for the same could be based on the premise that these asset-based slacks are very specific in nature, which can meet only business needs and not sustainability aspects (Xu et al., 2015). Leverage is found to have a negative and

significant co-efficient across all panels for both models, indicating that leverage is less likely to have an impact on sustainability reporting quality. Moreover, debtholders are in a stronger position to influence firms, and thereby firms may be more inclined towards meeting their claims rather than focussing on disclosures (Artiach et al., 2010). The results are consistent with the studies of Kuzey and Uyar (2017) and Zaid et al. (2020). Further, in terms of the industry-wise classification, the results clearly show that firms which are highly hazardous in nature are more likely to enhance the level of sustainability reporting quality. Such results are the outcome of extreme pressure from various stakeholders, especially the investors who demand more transparency in terms of information disclosures (Young and Marais, 2012; Sellami et al., 2019). These results are supported by previous studies as well (Aggarwal and Singh, 2019; Cicchiello et al., 2021).

4.5.4 Robustness Tests

We have also conducted additional analysis (Table 37 and 38) to enhance the robustness of our findings. We undertake two additional measures of sustainability reporting quality i.e., INDEPENDENCE and COMMITTEE. Since both these measures have been used as a dummy variable, a binary logit model is employed. We find that gender diversity using the two proxies i.e., percentage of women directors on board (P-Woman) and number of independent women directors on board (INDFEMDIR) are found to be significantly associated with INDEPENDENCE as well as COMMITTEE. This means that when the reports are audited and assured by an independent external agency, and there exists a committee looking after sustainability aspect, with every increase in the women directors on board, sustainability reporting quality is likely to improve. We also used various other proxy variables for gender diversity (N-woman, Blau Index, Shannon Index) to conduct the main analysis as well as additional analysis and the results were found to be consistent with our main findings, thereby providing an additional assurance of our results.

Table 37: Additional analysis: Gender diversity (P-woman and INDFEMDIR) and sustainability reporting quality through INDEPENDENCE

INDEPENDENCE	**Coef.**	**INDEPENDENCE**	**Coef.**
P-Woman	-2.616*	**INDFEMDIR**	.01*
B-Size	.028	**B-Size**	.049***

B-IND	-.096**	**ID**	-.096**
CEO-D	.07	**CEO-Duality**	.095
BM	-.038***	**BM**	-.035
F-Size	1.186*	**F-Size**	1.156*
Tobin's Q	.059*	**Tobin's Q**	.055*
ROA	.001	**ROA**	.002
O-Slack	.013	**O-Slack**	.014
Lever	-.798*	**Lever**	-.78*
Industry		**Industry**	
1	.011	**1**	-.056
2	-1.078*	**2**	-1.044**
3	-.033	**3**	-.056
4	.492*	**4**	.498*
Constant	-5.989*	**Constant**	-6.396*
PsudoR^2	.102	**PsudoR^2**	.095
Chi-Square	228.63	**Chi-Square**	213.13

Significance Level: *p< .01, **p< .05, ***p< .1

Table 38: Additional analysis: Gender diversity (P-woman and INDFEMDIR) and sustainability reporting quality through COMMITTEE

COMMITTEE	**Coef.**	**COMMITTEE**	**Coef.**
P-Woman	1.199**	**INDFEMDIR**	.356*

B-Size	-.026	**B-Size**	-.029
B-IND	-.084**	**ID**	-.095**
CEO-D	-.58*	**CEO-D**	-.581*
BM	-.053*	**BM**	-.043**
F-Size	1.294*	**F-Size**	1.229*
Tobin's Q	.057*	**Tobin's Q**	.055*
ROA	-.001	**ROA**	-.001
O-Slack	.026	**O-Slack**	.036
Lever	-.759*	**Lever**	-.743*
Industry		**Industry**	0
1	1.162	**1**	1.202
2	-.519**	**2**	-.497**
3	-.15	**3**	-.163
4	.014	**4**	-.002
Constant	-4.427*	**Constant**	-4.223*
PsedoR^2	.10	**PsudoR^2**	.106
Chi-Square	255.34	**Chi-Square**	269.28

Significance Level: *p< .01, **p< .05, ***p< .1

Table 39: Marginal effect analysis using P-woman impacting sustainability reporting quality.

Sustainability Reporting Quality	**Co-efficient**	**P-Value**

0 (No Reports)	-.4071	.000*
1 (Reports Exists)	.2217	.016**
2 (Reports + Committee)	.1140	.024**
3 (Reports + Committee + Internal Audit)	.5291	.000*
4 (Reports + Committee + Internal Audit & External Audit)	-.4578	.000*

Significance Level: *p< .01, * p< .05

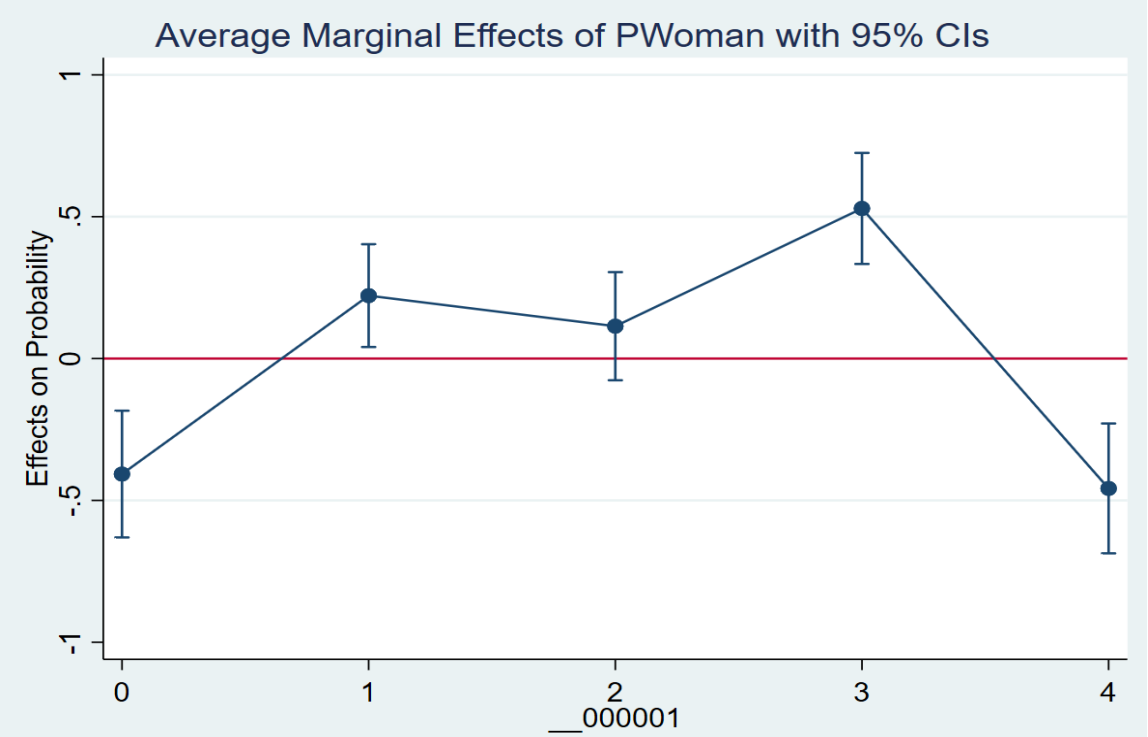

Figure 18: Plot of marginal effect analysis of P-women on sustainability reporting quality

Source: The authors.

Table 39 shows the marginal effect analysis of the changes taking place in the dependent variable owing to specific changes in the explanatory variables (Williams, 2012), especially when other factors are held constant. While using logit models, we don't get to predict the sense of magnitude. Since for better interpretation, we want the prediction in probability scale, we have used marginal effect analysis. In our model, dependent variable is sustainability

reporting quality, and the explanatory variable is percentage of women directors on board. The results show that the average marginal effect of increase in percentage of women directors on probability of sustainability reporting quality at level 0 is negative (-.4071). The negative probability indicates that with increase in percentage of women directors, the probability of no reporting (0= No reports) is going to decline. In simple words, the reporting levels are in-fact going to improve. In the similar vein, at levels of 1, 2 and 3, the probability of sustainability reporting quality is positive (1=.2217, 2=.1140, 3=.5291), which indicates the continuous improvement in sustainability reporting quality with an increase in the percentage of women directors. At the highest level (level 4), we find a negative probability (4=.4578) of sustainability reporting quality, indicating that with increase in women directors, the probability of reporting in terms of external and internal audits have declined.

The results of marginal effects analysis are on similar lines as that of the main results. Figure 18 shows the graphical representation of the marginal effect analysis, supporting the results laid down in table 39.

CHAPTER 5: DISCUSSION AND POLICY IMPLICATIONS

This chapter reflects and discusses the results and findings which have been obtained based on the statistical analysis to achieve the desired objectives undertaken in this study. The chapter is spread across five sections disseminating the explanations behind the results obtained based on the achievement of five objectives.

5.1 What has been the growth trend, intellectual development of the literature on gender diversity on boards?

The bibliometric analysis clearly reveals that the knowledge base of gender diversity on boards has grown exponentially from 1989 to 2021. The study reveals that the literature has diversified globally and is spread across 74 countries but there is a dominance of studies conducted by the developed nations like the US, the UK, Australia, Spain, France, Germany, etc. The plausible reason for the same could be the inherent linkage of the gender diversity literature with corporate governance, and since these developed nations were the pioneers of various corporate governance codes, the outcome seems justified. There also appears to be growing in the research studies conducted in the developing economies post-adoption of mandatory and voluntary codes for women directors' appointments.

The citation, as well as co-citation analysis, reveals the multidisciplinary nature of the topic covering journals across various subjects, such as Finance, Economics, Management, Strategy, Accounting, as well as Corporate Governance, and Ethics. The two most influential journals that should be of most interest to scholars working in the gender diversity area are *Journal of Business Ethics* and *Corporate Governance: An International Review*. Though considering the multidisciplinary nature, *Journal of Financial Economics* and *Academy of Management Review*, are also well sought-after journals that could be of insight. These journals portray potential publishing avenues for scholars and researchers.

Moreover, the inherent linkage of the Gender Diversity area towards Corporate Governance impacts several other dimensions through the decision-making

attribute of the board, such as Finance, Corporate Social Responsibility, Sustainability, Leadership, Accounting, etc.

Another valuable contribution made with the help of citation analysis is to identify the pioneer articles that have made a significant impact on the intellectual development of the area. The two pioneer studies by Campbell and Mínguez-Vera (2008) and Bear et al. (2010) threw light on two major dimensions of gender diverse boards that is Financial Performance and Corporate Social Responsibility, respectively. These studies were the steppingstones for other scholars to explore the dimension of gender diversity in both developed and developing economies.

The distribution of literature in the various multidisciplinary subjects along with the keyword co-occurrence analysis affirms wide scope of research in developing economies as well as several dimensions that have seen meagre growth and development. Since developing economies widely differ from developed ones owing to weak legal frameworks (Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2008; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997) along with the prevalence of concentrated ownerships (Claessens, Djankov, & Lang, 2000). The keyword evolution map highlighted various emerging topics in the literature that can provide a future scope of the study for the researchers; some of the prominent ones being Sustainable Development, CSR Reporting, Environmental Performance as well as Innovation. We would like to suggest that though some past contributions (Al-Shaer & Zaman, 2016; Nadeem et al., 2017; Valls Martínez et al., 2019; Zahid et al., 2020) have been made in evaluating the role of gender diversity on corporate sustainability practices/disclosures. There is still a dearth of research articles in this knowledge base especially in the context of emerging economies that provide sufficient room for research in this dimension.

5.2 How has the literature of gender diversity amalgamated with the element of Corporate Sustainability Practises?

Based on quantitative review of the literature in the field of gender diversity and corporate sustainability (GDCS) through bibliometric analysis, the study throws light on the prominent research question which provides an overview of the intellectual development taking place in

this domain. The volume of publication has seen a steady growth since the years 2001 but has seen an exponential growth post (2010) due to various voluntary and mandatory legislations. These legislations have given a widespread push to the research studies, and we can notice an upward sloping trends in this domain. The domain of GDCS is an integral part the corporate governance (CG) literature (Singh et al., 2021b) and thereby in terms of the geographical distribution of the publication countries like USA, U.K and Australia are amongst the top 5 list (these countries were pioneers in CG literature), moreover the nature of development and literacy levels in these developed countries further gave a push to the volume of publications. The results of citations analysis further confirm these countries as most influential countries as well.

In terms of the major sources of these publications the list of journals has spread across various disciplines such as governance, management, economics, ethics etc. The nature of the topic is such that the publications have found its place in top journals in all the disciplines mentioned above and has scope for further exploration. In terms of the prominent authors, the scholarly work in this domain has transcended throughout the globe covering both developing and developed economies, but the major chunk of influential and impactful publications was seen by the authors in developed nations majorly from USA, U.K and Australia which re-affirms the domination of these countries. In terms of the impactful publications, both citation as well as co-citation analysis highlights that majority of these publications are of empirical nature, and covers various dimensions of gender diversity and sustainability such as governance, sustainability reporting, environmental performance, financial performance etc.

The co-citation analysis along with content analysis was used in uncovering the 3 thematic clusters which were formed in this field. The clusters were identified as linking gender diversity with sustainability, corporate social responsibility, and financial performance. These clusters further points to the growing scope for future research in this domain. Further, with the help of keyword analysis along with keyword co-occurrence analysis supported by thematic map, word cloud, tree map, dendrogram etc the past, present and future themes have been identified. The major themes for future scope for research were identified as “sustainability reporting”, “environmental performance”, “decision making” etc

5.3 Does gender diversity on board impacts financial performance?

We found that that the presence of gender diversity on corporate boards does not impact firms' financial performance. The results obtained based on the research questions provides valuable insights backed by relevant theoretical framework. Since merely putting the women on board to comply with the mandatory quotas may not lead to any visible benefits, the plausible reason for the same could be that the board of directors acts through the prominent committees such as audit committee, remuneration committee etc and till the time we do not see the representation of women on these relevant committees we will not be able to take the benefit of their diverse and rich perspectives which could impact decision making and performance.

Moreover, the representation of women on these boards are fairly at a very low percentage and if we go by the theory of "Critical mass" which clearly highlights that to raise the opinion and put forth one's views strongly there is a need for at least 3 women on board which shall represent critical mass.

5.3.A Does gender diversity on board impacts financial performance through the lens of IT Sector

To test whether gender diversity on board impacts financial performance, we further tested the research question through a sectoral approach using a case of information technology. The previous literature points to an important dimension, that though the IT sector has seen an upsurge in recent years, the position of women in such sector is dismal and is often limited to routine tasks. Based on such empirical evidence, we tested whether gender diversity on board impacts financial performance in this sector but could not find significant results.

Based on the block of two studies (one using an IT sector and the other using the case of large, listed companies of Bombay Stock Exchange) we could not find any significant results. This could be based upon several reasons.

There are multiple constraints that restrict the participation of women in economic as well as social and public domains. The institutional environment of India differs widely from various developed and developing economies and therefore, there can be two reasons that could answer *"Why gender diversity (presence of women) could not impact financial performance?"*. Firstly, women in India are subject to various cultural and traditional barriers that are highly

challenging in nature (Haq, 2012). In India, men are the bread earners and major players in the decision-making process, whereas women are meant to look after household chores and children. Secondly, the low participation of women on corporate boards, as can be seen from the mean value of 17.5% of women directors, is representative of the existence of mere tokenism. Thus, the reasons for no significant relationship have been widely attributed to the lower percentage of women on board which is further supported by two prominent theories in this regard, the similarity attraction theory (Byrne,1971) as well as critical mass theory (Kanter, 1977a; 1977b). The similarity attraction theory argues that individuals are more prone to interaction and communication with people belonging to the same demographics (gender, in this case) (Markoczy et al., 2020) and this helps them build a sense of trust and mutual understanding (Riordan 2000). Moreover, critical mass theory supports the view that when women reach a certain threshold limit, only then they can make any qualitative change in interactions (Torchia et al., 2011). According to Bernardi and Threadgill (2011) critical mass, which refers to the presence of at least three women on board, is imperative to cause an impact on the performance of the firms. A critical mass of women positively impacts board strategic tasks (Torchia et al., 2011) as women directors are generally more prepared for the board meeting which results in better decision making (Huse and Solberg, 2006). In the classic case of India, where the mandatory quotas for women are related to having just one woman on board, it raises a big question of whether these women directors are capable of impacting performance or are just acting as token representatives. The reason for such inconclusive results can also be attributed to different countries, different time periods, and variations in legal and institutional factors (Campbell and Mínguez-Vera, 2008). Lastly, as per the contingency theory, the results would also vary based on situational context (Shehata et al., 2017). Thus, based on the above reasons, we can say that the study provides deeper insights into why the firms in the study were not able to take advantage of gender diversity. It can be said that in the Indian context, as of now, we do not see any business case for promoting gender diversity until and unless the critical mass is achieved on the corporate boards.

5.4 Does gender diversity on prominent committees (remuneration and nomination committees) impacts firms' financial performance?

The insignificant results obtained from the gender diversity on boards clearly highlighted that the benefits that could have been accrued based on gender diversity could not be achieved since

the board's decision making is undertaken using the various committees and hence women directors can make a valuable impact if they are made part of these committees.

Since it is well established that most of its functions to prominent committees (such remuneration, nomination, and audit committees), making women a part of these committees, and providing them a platform to take up the responsibilities as well as voicing their opinions shall have a direct impact on the performance of the committees and the firms. This direct impact accrues due to the active participation of women in strategic decisions and governance mechanisms with which the committee is tasked.

The results obtained showed that gender diversity on prominent committees significantly affects the market-based performance measure (Tobin's Q) but does not impact the accounting-based measure of performance (ROA). The plausible reason for the contradictory results could be attributed to the fact that firms with a representation of women on board committees are admired and are considered to be ethical firms, and therefore they occupy a space in the good books of the society (Landry *et al.*, 2016). This perception is reflected in the market-based indicator, but the accounting results are based on the historical transactions and thus, may take some time to reflect the positive changes that accrue in terms of the governance.

5.5 Does gender diversity on board impacts sustainability reporting quality?

The theme of sustainability reporting has seen an exponential growth in the wake of growing malpractices, frauds, and unethical activities, especially in the developing economies where the external governance mechanisms are weak, legal regulations lack proper execution and a high degree of market complexity exists. The stakeholder theory further requires the firms to attend to various expectations of the different stakeholders to avoid any frivolous complaints and penalties on the firm, which may impact its performance. In such situation albeit, the role of internal governance mechanism becomes more crucial.

The board of directors are the major backbone of any firm. The board takes all the major decisions and thus, the composition of board shall play a significant role in advancing sustainability practices. Recently, empirical studies have proven that the composition of board in terms of gender diversity has been a major determinant influencing the various decisions taken by the firms (Issa and Fang, 2019; García-Sánchez et al., 2020). Further, based on certain

traits of women such as communal qualities, compassion, kindness, ethical orientation, etc., it is often felt that their presence on boards shall increase the level of sustainable activities through greater concern for society and environment (Jain and Zaman, 2019), and shall further enhance the level of reporting for these activities to meet stakeholders' expectations. Since gender diversity on board is a prominent element of internal governance mechanisms, we believe that gender diversity on boards shall have a bearing on sustainability reporting quality. The higher the level of reporting or disclosures, the higher shall be the stakeholders' confidence, and this shall provide greater legitimacy to the firm's activities.

The result of the study suggests that with an increase in the percentage of women directors on board as well as the number of independent women directors on board, the sustainability reporting quality is likely to improve. The presence of women directors on board shall make the firms more conscious of their activities and they shall be better focused on sustainability and its proper reporting. Moreover, independent directors are often found to be more inclined towards responsible behaviour and transparency (Fuente et al., 2017). This, coupled with the element of gender, the sustainability reporting quality is expected to be more pronounced and significant.

With gender diverse boards having female directorships, firms are not only better inclined towards conducting sustainable activities, but also disclosing them in their reports as well as company website. Behaviourally, women are found to be more sensitive towards the needs of the society and community at large, as compared to their male counterparts (Tourigny et al., 2017). Since the major victims of firm's irresponsible behaviour are the society and environment, the unique traits which women possess influences their decisions and makes them more concerned towards such activities which does minimum harm to the environment and the society. Furthermore, their leadership styles are also inclined towards creating policies which enhances stakeholders' interest (Adams and Ferreira, 2009).

In the Indian context, before the institutionalization of the Companies Act 2013, women were not welcomed on the board of directors. However, post the mandatory provisions for the appointment of women directors, there has been an increment in the women directors' representation on the board, though this upward movement is slow and limited. The Indian economy has also seen a social transition, wherein the women, who were earlier considered only fit for the household chores, are provided with independence and freedom in terms of education, career opportunities as well as social, personal, and economic dimensions (Das,

2018). This transition has also played a role in enhancing their level of representation on boards, as well as their involvement in decision making.

Further, an important dimension which requires discussion is the industry aspect of the sustainability reporting quality. The results of the study point out that environment sensitive industries (ESI) are likely have a better reporting quality. The ESI firms are under tremendous pressure to make themselves look better in front of the society at large and thus, to improve their public image, they are found to be inclined towards meaningful sustainability reporting. Their failure to do so may lead to a backlash from the community as well as strict penal actions.

Thus, the study comprehensively highlights the growth and trends in the literature of gender diversity as well as corporate sustainability practises, investigates the role played by gender diversity on board and committees on firms' financial performance and finally highlight their role on improving sustainability reporting quality.

5.6 Policy Implications

This section shall deal with the various academic, research and practical policy implications that the study has for various stakeholders be it for the regulators as well as policy makers, corporate houses, and society at large.

5.6.1 Policy Implications for Regulators and law makers

Academicians and researchers can look upon this study for understanding the development of the literature, themes that have grown over a period and areas which have scope for future research. The study shall also help them identify and explore the major clusters and the seminal works to gain better insight of the area.

This study is a call for policymakers and regulatory bodies to act in a supervisory role and oversee the structure and process for the appointment of women directors, which may further give an upward push to the percentage of women directors and may lead to improved financial performance in the long run.

Policymakers' and regulators' efforts should be focussed on devising adequate provisions that could take advantage of diversity and provide an adequate critical mass of representation of women directors on board and committees. The study justifies that these mandatory quotas for

women are not just meant for women empowerment, but they hold the business case for women's participation if used wisely.

The study gives an insight into the role played by women directors on sustainability reporting quality aspect and therefore the regulatory bodies and policy makers shall plan and formulate such regulations which can further advance the presence of women on the board and in the decision-making process.

The regulators, as well as policymakers, shall ensure that having seen the insignificant results backed by various theories, it's time to modify the rules and regulations and come up with provisions that advance the appointment of women directors on such boards.

The results highlight a very significant aspect that without having a critical mass of women directors on board, these women directors shall only act as a token of representation and shall be marginalized. Thus, the policy makers shall foster to create legal regulations in a manner such that the critical mass of women could be achieved on the corporate boards.

The policymakers as well as regulators must make note of the fact that if women directors are involved and engaged in the governance mechanisms of the firms, they can make vital contributions in performance. In the light of such results, policymakers shall try to ensure that more stringent laws and regulations are devised to promote women's active participation in board committees and other avenues for strategic decision-making.

5.6.2 Policy Implications for Firms and Corporate Houses

The corporate houses based on the results shall modify their recruitment and selection process to ensure that women directors' appointments go beyond the mandatory quotas, and that they to make valuable contributions to the firm's activities based on their diverse experiences, and educational background, and leadership style.

The corporate houses also need to ensure that the presence of women on board as well as committees is not merely an act of tokenism, and steps need to be taken to foster inclusivity to enhance the active participation of women in the decision-making process.

For corporates, government, and policy makers the clusters and their outcomes can be useful in formulating further policies, laws, and regulations with respect to the improvement of diversity and sustainability parameters.

For various firms, it also opens policy implications where they could understand the relevance of having adequate gender diverse representation on the board. The literature clearly points towards the critical mass aspect of gender diversity and the benefits that might accrue from the same.

The results of the study shall play a significant role for the corporate houses, as it encourages them to modify their directors' selection process and ensure that women are able to break the "glass ceiling" to reach the upper echelon in the firms. Such policies shall ensure that the firms' dependence on external resources is mitigated as per resource dependence theory, and the firms shall be able to reap benefits of the diverse perspectives, background, socially and ethically oriented behaviour of women directors.

5.6.3 Policy Implications for Society and Community

Steps are required to provide women with better opportunities for education and ensure that they are not restricted from prioritizing career growth owing to 'double burden syndrome' (that is, an obligation to perform both job and household tasks).

The study highlights that the time has come when the 'glass ceiling', which has often acted as an obstacle for women's growth in top management positions, has to be lifted and equal opportunities have to be provided to deserving women directors so that they can make a valuable contribution to the growth of firms and the society.

In the context of developing economies, there is wider scope for the improvement of the sustainability practices as well as reporting aspects, and the government shall play an eminent role in guiding and leveraging the international standards such as Global Reporting Initiatives and United Nations Sustainable Development Goals to enhance the scope of sustainability reporting.

The study also has social implications as it contributes to the ongoing debate of the role of women's participation in the workforce, and thus the need to acquaint them with proper education, professional training, and courses for better career advancement and growth. Society

at large should support them in taking challenging career roles rather than burdening them with dual roles of household and career.

Overall, the study can provide a push towards nurturing best practises for the entire system.

CHAPTER 6: CONCLUSION

The broad aim of our research was to understand the growing linkages between the literature on gender diversity and corporate sustainability practices. The study was based on five prominent objectives which can systematically throw light on various dimensions of gender diversity and corporate sustainability.

The first objective was to systematically review the literature on gender diversity on board through bibliometric analysis and answer the prominent research questions such as yearly trends in publications, geographical distribution of studies, prominent research articles in this domain, productive and influential authors, major themes which have evolved over a period using cluster analysis. The major themes which have the possibility of future research were also identified through this research objective.

The second objective was based upon creating a dynamic link between gender diversity and sustainability practices and systematically identify the intellectual development which has occurred in the domain of gender diversity and corporate sustainability. The study used bibliometric analysis as well as manual content analysis to throw light on yearly trends in publications, geographical distribution of studies, prominent research articles in this domain, productive and influential authors, major themes which have evolved over the past years etc. Through the usage of various performance as well as science mapping techniques such as word cloud analysis, dendrogram, conceptual structure as well growth in theme as well as emerging themes were also identified. Overall, the results shows that though the research in the field of GDCS has grown over the period, but the topic has immense potential for future research as well.

The third objective explored the dimension of presence of gender diversity on board and its impact on financial performance. The study made use of market as well as accounting-based performance indicators using various proxy variables representing gender diversity on board, but the results were found to be insignificant. As part of the third objective a case study based on the Information and technology sector was also conducted to test the impact of gender diversity on board and financial performance, but the results were insignificant and consistent with the results of large, listed firms. The theories such as critical mass theory, similarity attraction theory gave vivid explanations for the insignificant results obtained.

The fourth objective took a leap forward and identified that the board of directors indulge in the decision-making process through the various committees present in the firm and thus if the gender diversity on these committees (remuneration and nomination committee) are present they are likely to impact financial performance. The results were found to be significant with the market-based performance indicator and insignificant with the accounting-based performance indicator, suggesting the prominent governance role of gender diversity on these committees. Our results suggest that benefits of gender diversity can accrue to the firms only when these women sit on prominent committees and are engaged in the strategic responsibilities and duties assigned to these committees. India, an emerging economy, has a unique set of cultural and hierarchical features driven by deep-rooted patriarchal mindset. Despite the constraints on women's participation in the workforce, we find a positive and significant relationship between women's representation on prominent committees and firm financial performance. We stress the fact that there exist multiple theories such as agency and resource dependency theory which support the accrual of the benefits and enhancement of board effectiveness due to the presence of gender diversity on boards and committees.

The last and the final objective undertook a creation of the sustainability reporting quality index and thereby measured the impact caused by gender diversity on board on the degree of sustainability reporting quality. The results indicated that gender diversity on board shall have a positive and significant impact on sustainability reporting quality. Moreover, using the independent women directors as an explanatory variable, the sustainability reporting quality is expected to show better results. The results further stated that the degree of reporting is likely to be higher for firms belonging to hazardous industries involved in environmental damage. These findings are supported by the stakeholder theory as well as resource dependence theory and is further backed by previous empirical studies.

6.1 Limitations and Scope for Future Research

Despite the great contribution of this study, the study also has its share of innate limitations like various other studies, but these limitations provide scope for the future researchers to explore this domain and take the literature on gender diversity and corporate sustainability forward.

The primary limitation of this study is that for conducting the bibliometric analysis a single database (Scopus) has been used for the collection of the research studies. Though the Scopus data base provides a wider coverage than the other data base such as web of science, but this could have led to the missing of various other studies that could have been collected from multiple data sources. This shall also limit the interpretation of the results to some extent.

Also, though our study has made use of two widely used software's (Biblioshiny and VOS-Viewer) for bibliometric analysis, future studies can explore other software's like Bib excel and Gephi for further exploration.

Secondly the study is based on just one emerging economy, that is India. Future studies could be conducted using multiple developing and emerging economies which shall be more insightful in terms of highlighting the cultural and demographic landscape.

Thirdly, we focussed on the performance of only large, listed firms which form part of the BSE 500 Index. In the future, small and medium firms can be considered for better and wholesome generalization of the results along with the non-listed firms.

Fourthly, the study did not focus upon the degree of diversity by making a categorization between firms that have one female director and more than one female director. That can be an interesting outlook as well. Moreover, an important issue that can be considered by future scholars is whether the educational qualifications of female directors impact the firm performance.

The results of the same shall help in making a distinction between the economic and social reasons for the appointment of women directors on the boards and shall also bring to light whether the regulatory changes would be detrimental or beneficial in the long run.

Fifthly, the study focussed upon the gender diversity on board aspect without focussing on the type of women directors such as independent or promoter directors, and hence the future scholars may also explore this unchartered territory for insightful contributions.

Moreover, the study has not taken into consideration the degree of gender diversity. In other words, no distinction has been made between the firms having one woman on board or larger number of women on board. The study leaves the future scholars with a question that can be

explored and tested further, that is, whether the critical mass of women shall impact the financial performance of the firms or not.

Finally, the study has made use of self-constructed index which might have been influenced by authors' subjectivity, since the authors have made use of manual content analysis for data collection. Future researchers may consider using some secondary data base which can showcase the measure of sustainability reporting.

The study has explored the dimension of gender diversity and corporate sustainability, future scholars can focus upon other dimensions such as ethnic and cultural diversity, innovation, CSR reporting etc

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