THE IMPACT OF NON-FINANCIAL INDICATORS ON CORPORATE FINANCIAL PERFORMANCE WITH REFERENCE TO THE MANUFACTURING SECTOR IN INDIA

Thesis

Submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

by

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DECLARATION

(By the PhD Research Scholar)

I hereby declare that the Research Thesis entitled **"The Impact of Non-Financial Indicators on Corporate Financial Performance with Reference to the Manufacturing Sector in India,"** which is being submitted to the **National Institute of Technology Karnataka, Surathkal**, in partial fulfillment of the requirements for the award of the Degree of **Doctor of Philosophy in Management** is a *bonafide report of the research work carried out by me*. The material contained in this Research Thesis has not been submitted to any University or Institution for the award of any degree.

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Date: 25-07-2023

CERTIFICATE

This is to certify that the Research Thesis entitled "**The Impact of Non-Financial Indicators on Corporate Financial Performance with Reference to the Manufacturing Sector in India,**" Submitted by Sreepriya J (Register No-187073SM003) as the record of research work carried out by her, is accepted as the Research Thesis submission in the partial fulfillment of the requirements for the award of the degree of Doctor of Philosophy.

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ABSTRACT

A new disclosure approach that emphasizes creating value for the firm's long-term goals is sustainability or non-financial reporting. Over the last decades, policymakers and stakeholders have started giving corporate sustainability reporting more attention. In addition, the question of whether corporate sustainability disclosure (CSD) enhances corporate financial performance (CFP) and whether it can be utilized as a risk-mitigation strategy is a subject that is receiving a growing amount of attention. A better understanding of non-financial disclosure and its impact on CFP and the firm's financial health is essential for the investor's stakeholders and management to build a better strategy and policies. The study investigates a sample of 223 manufacturing firms covering different industries with in the manufacturing sectors throughout ten years from 2010 to 2019. To account for the endogeneity in each of the four objectives, the authors used the generalized method of moments (GMM). The study has four primary objectives. This includes examining the impact of CSD on CFP and financial distress of the firm and whether CSD can be used to mitigate the firm's default risk; further, the study also explored the moderating role of GRI compliance and Firm life cycle in this association. The results illustrated a positive and significant association between CSD (ESG) and CFP in all the models, indicating that CSD doings will enhance the firm value and profitability of Indian manufacturing firms. Furthermore, the study discovered that the relationship between CSD and firm value is positively moderated by GRI compliance, demonstrating that ESG-disclosing firms being GRI compliant have an improved firm value than those not. Further examining the role of the company life cycle indicates that adopting CSD along with various stages aids in the business's comprehensive, concrete, and intangible development even in the declining introduction and shake-out stage. Further, the results of the current study imply that ESG disclosure is associated with a lower risk of default, indicating CSD can be used as a risk mitigation strategy. Hence, understanding the CSD and CFP linkage can aid the industry and managers in framing and establishing acceptable disclosure methodologies.

Keywords- CSD, CFP, financial distress, GRI compliance, firm life cycle

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ABBREVIATION

UN	United Nations
GRI	Global Reporting Initiative
SASB	Sustainability Accounting Standards Board
WBCSD	World Business Council for Sustainable Development
PRI	Principles for Responsible Investment
ESG reporting	Environmental social and Governance reporting
CSR reporting	Corporate social responsibility reporting
NVG	National voluntary guidelines
BRR	Business Responsibility Report
SEBI	Securities Exchange Board of India
BRSR	Business Responsibility and Sustainability Report
CSD	Corporate sustainability reporting
CFP	Corporate Financial Performance
FD	Financial Distress
EDS	Environmental Disclosure Score
SDS	Social Disclosure Score
GDS	Governance Disclosure Score
GMM	Generalized Method of Moments
CCA	Co-Citation Analysis of References
BCA	Bibliometric Coupling Analysis of Documents
TLS	Total Link Strength
WCED	World Commission for Economic Development

ROA	Return on asset
ROCE	Return on Capital Employed
EVA	Enterprise value-added
MTB	Market-To-Book Ratio
CSP	Corporate Sustainability Performance
INTRO	Introduction Stage
GROW	Growth Stage
MATU	Maturity Stage
SHAKE	Shakeout Stage
DECL	Decline Stage
RET	Retained Earnings
TA	Total Assets
FDR	Financial Distress Rate
FLC	Firm Life Cycle
ESSI	Environmental and Socially Sensitive Firms
RD	Research and development expenditure/intensity
TURN	Turnover
SIZE	Firm Size
LQDTY	Liquidity ratio
ESI	Environmentally Sensitive Industries
TOBIN'S	Tobin's Q
NIC	National Industrial Classification

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

In recent decades, sustainability or non-financial disclosure has emerged as a standard disclosure component. Although even in understanding and assessing a firm's long-term value, non-financial information is favored over financial information. Considering the sustainability disclosure literature, whether non-financial disclosure improves the firm's financial performance has been the subject of ongoing discussion. This research aims to determine whether non-financial disclosure significantly enhances the firm's corporate financial performance and whether non-financial disclosure can be adopted as a risk-reduction tactic. The first chapter introduces the context of non-financial disclosure in India and discusses the study's research problems, scope, and significance. Finally, it describes how the thesis is structured chapter by chapter. Section 1.2 describes the background of the study, while section 1.3 highlights the research problem. Sections 1.4 and 1.5 discuss the research objectives and research questions. Section 1.6 details the significance of the study. Section 1.7 describes the scope of the study, and the chapter ends with section 1.8 defining the outline of the thesis.

1.2 BACKGROUND OF THE STUDY

The organization's role is significant in the progress and growth of the nation. A successful organization plays a crucial role in the development of an economy. Thus, many consider organizations critical in determining a nation's economic, social, and political progress. According to Gruning (2002), performance is defined as the “ability of a company to achieve goals, i.e., meet expectations, and is therefore influenced by results in a broader sense, but also by the corresponding goal setting. " The firm's performance can be analyzed and measured through various dimensions. However, the present study is confined to financial performance.

Successful financial management is widely acknowledged as essential to organizational success. Businesses cannot start, grow, or be expanded without financial resources. How skillfully the funds are managed determines whether a commercial firm will succeed. Even though the firm has a wealth of physical and human resources, it will not last if the revenue it has access to is not used efficiently. Similarly, a firm's financial performance plays a crucial role in better understanding of financial health of the firm. Examining corporate financial performance helps in knowing the firm's financial position and place within the industry, as well as detailed knowledge about the firm's cost and profit centers (Hariem Abdullah and Turgut Tursoy, 2023). Managers, investors, and creditors can make investment and strategic planning decisions using the accounting information that financial analysis provides. The firm's financial performance is vital for investors, stakeholders, and the economy. As far as investors are concerned, the return on investment is precious; a financially sound organization will fetch steady and high returns.

According to prior corporate finance literature, in the past, organizations valued financial factors, particularly profit, to gauge their success. Moreover, profit cannot be the only motivator in contemporary business. Businesses are becoming more aware of modern trends on a global scale. Since financial success only considers one facet of organizational performance, it does not reflect the original value of the firm. Consequently, stakeholders consider the qualitative parameters that reflect a firm's social and environmental commitment and reputation while making investment decisions (Securities Exchange Board of India, 2017). Earlier financial reports were sufficient to meet the demands of various stakeholders. However, financial statements alone are not enough to satisfy the needs of diverse stakeholders nowadays. To provide stakeholders with pertinent corporate disclosure, voluntary disclosure of non-financial information always be provided in addition to financial information (Arvidsson, 2011). Moreover, there is a tendency to consider non-financial information over financial information as a better source for understanding and evaluating the firm's long-term value (Cohen et al., 2012).

Hence, the concept of non-financial information is gaining increasing attention globally. Moreover, organizations recognize the value of revealing non-financial information—besides, organizations incorporating and adopting non-financial disclosure into their business models are growing (Asamoah, G., 2019). Considering the corporate side, to deflect demand from interest groups and the media or to advertise themselves to customers, corporations are becoming more aware of the need to be ethical, or at least appear to be. Hence, non-financial disclosure criteria have become essential to investment decision-making, especially for stakeholders, policymakers, regulators, and even prominent institutional investors. Accordingly, the broad perspective on organizational value has changed much beyond financial and accounting statements.

Globalization and information-sharing access have encouraged the disclosure of non-financial information in response to the stakeholder's demand (Laudal, 2011). The way firms conduct their operations has also changed due to the socially and environmentally conscious economic climate. International organizations that have established the principles, recommendations, and best practices for corporations to handle their different functions and asset in a more sustainable multi-stakeholder manner includes support from institutions like United Nations (UN), Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), World Business Council for Sustainable Development (WBCSD) and Principles for Responsible Investment (PRI). As a result, non-financial disclosure has emerged as a new business language demanding organizations to maintain financial viability (for shareholders) and to create consciousness about their social and environmental impacts on more prominent stakeholders, including the local customers, community, employees, consumers, and suppliers. Non-financial disclosure has changed how businesses conduct their operations in a socially and environmentally conscious market environment (Nizam et al., 2019).

Non-financial reporting is often termed sustainability reporting, Environmental, social, and Governance (ESG) reporting, Corporate social responsibility (CSR) reporting, or even triple-bottom-line reporting. According to Global Reporting Initiative (2006),

measuring, revealing, and being held responsible to internal and external stakeholders for organizational performance toward sustainable development is known as sustainability reporting. It is a voluntary disclosure method that depicts how environmental and social concerns are considered in corporate operations and communication with stakeholders (Van Marrewijk, 2003). Hence, sustainability reporting is a novel development in corporate reporting that combines the firm's financial, environmental, governance, and social performance into a single report (Bhatia and Tuli, 2017).

The number of firms adopting sustainability disclosure practices has recently risen dramatically (Kumar et al., 2021). Many countries have experienced a significant shift in the acceptance and adoption of sustainability reporting (KPMG, 2020) because of various factors, including increased awareness, new laws and regulations, legitimacy, and understanding of how sustainability disclosures influence corporate value and financial effectiveness.

The KPMG report of worldwide data observes that out of the sample collected, North America and Latin America—have improved corporate disclosure by seven percentage points during 2017 to an outstanding 90% of corporations reporting. While in considering the Asia Pacific region, sustainability disclosure reached 84 percent, including Japan (100 percent), Malaysia (99 percent), India (98 percent), Taiwan (93 percent), and Australia (92 percent). At the same time, In Europe, the rate of sustainability disclosure remains unchanged (77 percent) from 2017 to 2020. While growth in Western Europe has halted, reporting rates in Eastern Europe have increased dramatically since 2017 (+ 9 percentage points). The European Directive on Non-Financial Reporting has probably impacted the development of sustainability reporting in Eastern Europe. Some Eastern European nations adopted the directive into domestic legislation more slowly than their Western European equivalents.

Since the KPMG survey's inception in 1993, more than half of N100 companies have invested in independent third-party assurance of their sustainability information. This conclusion suggests that major and mid-cap organizations worldwide are now using the assurance of sustainability information as a regular procedure. Sustainability reporting

improved significantly by seven percentage points across the Middle East and Africa, with Nigeria (85 percent) and South Africa (96 percent) continuing to lead the way. However, much like in 2017, these high reporting rates were regionally compensated by lower reporting rates in nations like Angola (30 percent), Saudi Arabia (36 percent), and the United Arab Emirates (51 percent). At the same time considering Indian firms, there is a significant increase in the adoption of sustainability disclosure.

Examining the literature on sustainability disclosure reveals a lack of academic exploration of the issue, particularly in the Indian context. The corporate sustainability disclosure literature displays that most studies on the subject have focused on Western economies (Abdul Rahman and Alsayegh, 2021; KPMG, 2013; Kumar et al., 2021; Kuzey and Uyar, 2016; Laskar, 2018). Similarly, the sustainability disclosure practice is still evolving, and most studies are qualitative in the Indian context (Jyoti and Khanna, 2021; Kumar et al., 2021; Laskar, 2019). In developing nations like India, transparency in corporate sustainability disclosure will likely stimulate more socially responsible investment opportunities (Jyothi and Khanna, 2021). Besides, the SEBI circular 2021 outlining the standardization of ESG parameters for the top 1,000 firms to help better and comparable stakeholder decision-making indicates the importance of sustainability disclosure at the policy level.

Reviewing the regulatory environment in India, it is observed that Indian regulators have also focused on making sustainability reporting more transparent and accountable to society and the environment. The influence of structural change and how firms implement disclosure contribute to reforms in Indian business (Goel, 2019). India has implemented several reforms in the past to improve sustainability disclosure. One among those reforms was the National Voluntary Guidelines on Social, environmental, and economic business responsibilities (NVGs) published by the Ministry of Corporate Affairs in 2011. Mandatory corporate social responsibility (CSR) spending necessitates listed companies to file a Business Responsibility Report (BRR) to improve the quality of revelations (SEBI, 2013). Besides, the Indian context also witnessed enhanced integration with GRI reporting in 2017 (Goel, 2019).

Recently, SEBI announced a new set of sustainability-related disclosure requirements. SEBI issued a circular containing the format of the Business Responsibility and Sustainability Report (BRSR) for the top 1,000 firms in terms of market capitalization. It is yet another defining moment in India's sustainability disclosure reporting requirements. This initiative focuses on standardizing the CSD parameter disclosure so that relevant and comparable information on CSD will help the investor make a better investment decision (SEBI circular, 2021). Early studies found fewer firms issued structured sustainability reports because stakeholders lacked legally binding requirements and awareness (Mitra, 2012). However, according to KPMG's latest report, there has been a substantial increase in the adoption of sustainability reports in India (KPMG, 2020). Several questions are driving this study. Firstly, whether non-financial disclosure improves a firm's collaborative financial performance is becoming more widely discussed.

Additionally, most studies in this field have been conducted in developed contexts (Aboud and Diab, 2018; Yadava and Sinha, 2016). Besides, some notable studies have concluded that sustainability reporting is still in its infancy in the Indian context (Kumar et al., 2021; Jyoti and Khanna, 2021). As a result, the lack of conclusive evidence regarding the impact of CSD on financial performance and financial distress, and the role of GRI and firm life cycle in this connection, captivated interest to conduct this research. In addition, the numerous studies that tested this association in the Indian context are mainly focused on the service and financial sectors. Hence, the scope of the study is confined to the manufacturing sector in India

Despite being one of the most critical drivers of economic advancement and growth, the manufacturing industry is the key contributor to environmental degradation and other environmental issues, such as biodiversity loss, climatic change, and even resource exploitation Alam et al., (2016). Hence, structural reforms and implementing reporting requirements of the manufacturing sector make a case for intriguing research examining the implication of this nexus in the Indian manufacturing sector. Similarly, growing discussions regarding adopting sustainability reporting and manufacturers'

implementation and reporting on sustainability actions remain unexplored (A. Buallay, 2020b).

Manufacturers adopt sustainable manufacturing to address the environmental challenges posed by operations (Piyathanavong, 2019). For instance, green manufacturing, green lean, and cleaner production are a few such practices. Regardless of these efforts, there are still unaddressed issues, such as how manufacturers must manage and report sustainability activities (Buallay, 2020b). In this regard, there are several reasons why developing, implementing, and reporting sustainability in manufacturing is challenging. Product quality and safety, training and development, and technology adaptation are critical considerations that require a considerable investment (Laskar, 2019). Sustainability in the manufacturing sector is a long-term process. As a result, it is appealing to investigate the status of sustainability disclosure and firm performance relationship in the Indian manufacturing sector. Moreover, the enhanced influence of manufacturing on human lives, the environment, overconsumption (Haski-Leventhal, 2022), and the mounting discussion about adopting sustainability reporting in the manufacturing sector are the key motivating factors for the sectoral choice.

From the academic research perspective, this study offers a thorough grasp of non-financial disclosure and its impact on financial performance in India, particularly in the Indian industrial sectors. It will also extend the existing literature on the subject and benefits managers and industries in formulating better disclosure policies by evaluating the role of GRI and the business life cycle in this association. It further contributes to the body of knowledge by empirically analyzing the role of sustainability in risk mitigation. Examining the role of corporate sustainability disclosure in lowering the firm's distress level will deepen the literature in the Indian context, particularly in the manufacturing sector. Further, it facilitates a more profound knowledge of the numerous aspects of sustainability reporting among researchers and implementers, particularly in developing nations like India. It also enables the prospect of additional study in this field. Therefore, knowing how CSD and firm performance are related can help managers and the industry frame and implement appropriate disclosure strategies.

1.3 RESEARCH PROBLEM

From the literature surveyed, there is much academic interest in sustainability reporting worldwide. According to the literature, sustainability reporting is relatively new in India (Laskar, 2019). Additionally, several notable studies, including those by Aggarwal and Singh (2018), Kumar et al. (2021), and Kumar and Prakash (2019), revealed that corporate sustainability reporting in India is still in its infancy or early stages of development. In the Indian context, most of the studies in this area focused on the nature, content, and determinants affecting sustainability reporting practices (Kumar et al., 2021). Hence, the academic exploration of the association between corporate sustainability reporting and corporate financial performance is relatively few in the Indian context.

Moreover, the studies conducted in this area on the relationship between CSD and corporate financial success show conflicting outcomes (Fatemi et al., 2017; Soytas et al., 2019; Zahid et al., 2020). Researchers cannot reach a consensus on this relationship (Goyal et al., 2013; Zahid et al., 2020). Several academics considering these different findings assert that the conclusions of this association were confusing, inconclusive, or contradictory (Al Hawaj and Buallay, 2021; Brooks and Oikonomou, 2018). The disparity in country and industry contexts is one of the likely causes for the contradictory outcomes (Behl et al., 2022). According to Baughn et al. (2007), social, political, and economic contexts and institutional capabilities affect a firm's social and environmental responsibilities. As a result, territories and nations have different environmental and social obligations. India's political and regulatory environment differs from that of the industrialized world. Hence, the lack of academic exploration and inconclusive evidence in corporate sustainability disclosure and firms' financial performance encourages additional study in this area.

Considering sustainability disclosure in the manufacturing sector is a long-term process that requires technology adaption, training, new product development, etc., which cannot be attained instantaneously (Laskar, 2019). The formation of sustainability committees, sustainability regulations, and disclosure are all topics of growing discussion in the manufacturing sector. Despite these initiatives, there are still

challenges regarding how manufacturers should plan, execute and report on their sustainability initiatives. According to Buallay (2020), it is also challenging to implement and design sustainability in the manufacturing sector for several reasons; Firstly, there are several divisions within the manufacturing. Hence it will be complex when it comes to sustainability disclosure. As a result, there is nothing like a 'one size fits all ' approach to sustainable manufacturing, which makes it a contentious issue (Searcy and Buslovich, 2014). Secondly, the logistics procedure is overly complicated (Fletcher, K and Grose, L., 2012). The aforementioned makes it challenging to evaluate and report on sustainability owing to the thousands of suppliers, distributors, and retailers that constitute it. Finally, as manufacturing industries are rapidly evolving, it is necessary to regularly modify business models, including sustainability strategies (Allwood et al., 2006). Based on the literature surveyed, it is observed that many manufacturers report on their ESG (Sustainability reporting) performance while describing their sustainability progress. Although the disclosure of sustainability is expanding, limited studies currently examine how the industrial sector's financial performance is affected by sustainability disclosure (Buallay, 2020b). Hence there is a need to study from the manufacturing sector perspective.

The researchers have adopted several theories from the theoretical perspective on sustainability and firm performance association. These include stakeholders', resource-based, legitimacy, and institutional theories. However, analyzing the objective of this study, the role of signaling theory has a significant impact on most of the objectives laid down in this study. Considering the various theories, institutional theory explains why firms engage in sustainability reporting and corporate social responsibility initiatives. The institutional theory argues that firms resort to sustainability reporting and other corporate social responsibility initiatives to adhere to societal and institutional norms, values, and beliefs. Similarly, the legitimacy theory states that firms must act in a socially desirable manner since there is a social contract between society and firms. Hence, firms engage in sustainability reporting to abide by the implied social contract to gain legitimacy for their survival. However, neither the stakeholders' nor the legitimacy theory provides a convincing explanation for understanding why GRI

compliance is a moderator in the sustainability reporting-firm value relationship or whether sustainability reduces the distress level.

Likewise, resource dependence theory states that firms depend on stakeholders for crucial resources and compete to allocate available scarce resources. Firms use sustainability reporting as a strategic tool for reducing their resource dependence. Stakeholders' theory indicates that they can exercise resource constraints in this connection. The stakeholder theory postulates that firms' engagement with the larger society through social, environmental, and governance disclosure results in potential long-term advantages, earnings, and value creation (Behl et al., 2022). However, sustainability reporting can mitigate the probable constraints that might emanate from among the stakeholders in raising resources to enhance firm value. By implication, stakeholder theory explains the role of sustainability reporting as a predictor of firm value. Thus, resource dependence and stakeholder theories explain whether sustainability reporting can positively influence firm value. Though these theories help us sense the sustainability reporting-firm value relationship, the rationale for positing GRI compliance as a moderator of this relationship remains a black box. Signaling theory is adopted in very few studies examining the linkage. Hence, the current study adopted the signaling theory as the base theory and all the other theories to analyze the role of GRI as a moderator and sustainability disclosure's role in reducing distress levels. The study findings would help create implementation plans for sustainability disclosure in the Indian manufacturing sector.

1.4 RESEARCH QUESTION

The following are the key questions addressed in this research

1. Is there a link between corporate sustainability disclosure (CSD or ESG) and Corporate financial performance (CFP)**?**

    1.1 What is the link between environmental disclosure and Corporate financial performance**?**

1.2 What is the link between social disclosure and Corporate financial performance**?**

1.3. What is the link between governance disclosure and Corporate financial performance**?**

2. Is there a link between sustainability disclosure and firm value in the Indian context?

2.1 Does a firm's GRI compliance act as a moderating factor in this relationship**?**

3. Is there a link between ESG and the financial success of corporations?

3.1 Is there a role for the firm's life cycle in this relationship**?**

4. Is there a link between sustainability disclosure and financial distress**?**

4.1 What is the link between environmental disclosure and financial distress?

4.2 What is the link between social disclosure and financial distress**?**

4.3 What is the link between governance disclosure and financial distress**?**

1.5 RESEARCH OBJECTIVE

The study's findings, particularly those on the manufacturing sector's pursuit of conclusive proof of the link between sustainability reporting and firm performance, can help sectors strategize the implementation of sustainability reporting. As a result, the following study objectives are established:

1. To study the impact of corporate sustainability disclosure CFP

1.1 To study the impact of Environmental disclosure impact on CFP

1.2 To study the impact of social disclosure impact on CFP

1.3 To study the impact of Governance disclosure impact on CFP

2. To examine the moderating Role of GRI compliance on the relationship between sustainability disclosure and firm value.

3. To examine the moderating role of firm life-cycle on the relationship between CSD and CFP and CSD and financial distress (FD).
4. To assess the impact of ESG on financial distress.

4.1 To study the impact of environmental disclosure score (EDS) on FD.

4.2 To study the impact of social disclosure score (SDS) on FD.

4.3 To study the impact of governance disclosure score (GDS) on FD.

1.6 SIGNIFICANCE OF THE STUDY

Reviewing the research literature in the field has shown that most studies examined one or more aspects of financial performance. The literature analysis also revealed several researchers' traditional internal financial drivers had been considered earlier. The impact of non-financial indicators on corporate financial performance and risk, particularly in the manufacturing sector, is measured and examined in the study**.** The 2030 Agenda for Sustainable Development was created in 2015 to address environmental degradation and resource depletion issues. Hence, crucial public information about ESG indicators is needed to promote greater socially responsible investing in developing nations like India. Learning how difficult it is for socially conscious investors to expand sustainable organizations in rapidly growing countries like India would be fascinating. According to several studies, publications, and reports, little research has been done on the Indian economy. Examining how businesses, investors, the public, and stockholders have begun to consider ESG factors when determining a company's profitability and strategy for long-term wealth creation is one of the crucial parts of the Indian context (Jyoti and Khanna, 2021; Tripathi and Bhandari, 2014).

Investigative research on sustainability disclosure explains that it is distressing to see that the studies done up to this point have produced inconsistent, positive, negative, and inconclusive results, making it much harder to conclude. Not much research can convincingly demonstrate how sustainability affects the financial performance and distress of the firms in the Indian setting. There is not enough empirical study examining this relationship in many other developing economies. Hence there is not any conclusive proof. By reviewing the sustainability components, specifically the ESG

combined score and sub-indicators of ESG scores, this study contributes to the existing body of knowledge in the Indian context. The study's baseline attempts to determine whether the non-financial disclosure factors impact corporate financial performance and whether it helps in risk mitigation strategies. This study intends to analyze the relationship between sustainability reporting and firm financial stability to explore the unidentified dimensions in this area.

1.7 SCOPE OF THE STUDY

The study concentrates primarily on how non-financial indicators influence the financial performance of Indian manufacturing firms. Additionally, the study is restricted to the years 2010 to 2019. To examine this association, the studies emphasize solely Indian manufacturing firms listed on the CNX 500. The CNX 500 reflects the top 500 businesses in the qualifying universe, ordered by total market capitalization. Furthermore, it accounts for 96.1 percent of the NSE-listed equities' free-float market capitalization. The primary independent variable in the study is non-financial indicators. Generally, any information the firm reports that is unrelated to its finance is referred to as a non-financial indicator.

Numerous indicators fall under the category of non-financial indicators. As a result, not all non-financial factors fall under the study's purview. Only environmental, social, governance, and sustainability disclosures are considered for the current study due to the emerging relevance of non-financial reporting. Further, the literature gap found through systematic review may also have several limitations. One thing that confines the study is that the relevant literature from Scopus' first and second quartiles was considered to identify the gaps. Since the top journals have the highest citation impact and level of participation, the top two quartile journals are considered. It depicts purely the accuracy and dependability of the work done for those articles. Therefore, every research gap found with these factors in mind will directly affect the caliber of the work and considerably advance the subject of study (Hebbar and Kiran K.B., 2022).

1.8 ORGANISATION OF THE THESIS

The thesis is divided into seven chapters. The outline of the thesis is described in detail here.

Chapter One- This chapter outlines an overview of the entire chapter, then describes an introduction to the current study by exploring the background and context for the current study. Further, it explains the research gaps and the significance of the study. It then states the research questions and objectives investigated in the study. Finally, it states the significance and scope of the study, followed by the organization of the thesis.

Chapter Two -A comprehensive examination of the literature is provided in chapter 2. This chapter includes the currently known literature on sustainability disclosure. The chapter contains a detailed literature analysis of the various theoretical models used for the investigation. In addition, it performs bibliometric analysis and systematic literature review to identify gaps in this subject. The chapter provides a detailed explanation of the pertinent literature related to each research variable. Moreover, the research gap is also addressed in this chapter. This chapter presents the hypothesis formulation, and each objective and gap are mapped with the hypotheses. This chapter also explains the conceptual framework and ends with the conceptual framework.

Chapter Three – This chapter explains a scenario for sustainability disclosure concerning India. The chapter outlines why the manufacturing sector was chosen as a sectoral choice and why India, further the chapter elaborates the methodology adopted.

Chapter Four - This chapter explains the study's primary goal: to determine whether corporate sustainability disclosure influences financial performance (CFP). To make sense of this series of analyses were performed, followed by results and a conclusion.

Chapter Five - A comprehensive examination of the second objective is carried out in this chapter. This chapter aims to answer whether GRI compliance acts as a moderator in CSD and firm value relationships. To find the answer to this set of analyses was performed in this chapter, followed by results, and the chapter ends with the conclusion.

Chapter Six - This chapter illustrates the third objective of the study. This chapter aims to find out the role of the firm life cycle in the association between CSD and CFP. A Series of analyses and robustness checks were performed to validate the results, and finally, the chapter ends with the conclusion.

Chapter Seven - This chapter outlines the last objective of the study, i.e., whether CSD impacts the firm's financial distress. In order o study this association, a series of analyses and robustness checks were performed to validate the preliminary results of the model. Finally, the chapter ends with a concluding remark.

Chapter Eight - The investigation's key findings are explained in chapter 8. A complete discussion of the ramifications for business and academics is performed. In this chapter, the recommendations are described in great depth. Also, the limitation and recommendations, and further scope of research are included in this chapter. The chapter ends with a conclusion.

CHAPTER 2

2. LITERATURE REVIEW

2.1 OVERVIEW

This chapter focuses on the relationship between corporate sustainability reporting, financial performance, and financial distress by employing a systematic review approach and a conventional interpretive approach. The research theories and themes in corporate sustainability reporting that scholars widely used up to this date in this association are summarized in this review. However, the main focus of this chapter is to identify the research gaps and demands that result from comprehending the available literature sources. Section 2.2 discusses the bibliometric analysis carried out to explore the theoretical and methodological underpinning and the current themes in this field, followed by section 2.3 on the results of the bibliometric analysis. Section 2.4 explains the research on sustainability disclosure and its definition and evolution, followed by examining the theoretical models for sustainability disclosure and CFP studies utilized in the earlier research investigations. Section 2.5 provides an overview of the various theoretical frameworks for CSD and CFP financial distress studies used in earlier research investigations. In section 2.6. the relationship between CSD and CFP is investigated. In contrast, the moderating role of GRI compliance and firm life cycle in this linkage is explained in subsequent sections 2.7 and 2.8. The literature exploring the relationship between CSD and distress is explained in section 2.9, followed by an exploration of the research gap in section 2.10. A detailed section on hypotheses development is presented in section 2.11. The chapter ends with a conceptual model and conclusion.

2.2 SYSTEMATIC AND BIBLIOMETRIC REVIEW ON CSD

The bibliometric analysis provides an intellectual framework for capturing objects over time, which is difficult to achieve using a qualitative method (Casillas and Acedo, 2007). Concurrently, bibliometric mapping visualizes academic output and employs citation and publication details 1as parameters. According to Garfield (1979), bibliometric analysis entails the statistical analysis of scholarly publications.

Employee-centric CSR (Low and Siegel, 2019), sustainable manufacturing (Bhatt et al., 2020), board diversity (Kent Baker et al., 2020), and social entrepreneurship (Ferreira et al., 2017) are just a few examples of the bibliometric analysis carried out in this domain.

The current study used a mix of systematic literature research and bibliometric analysis to comprehend the concept of sustainability, environment, social, governance, and corporate financial performance relationship and its advancement in business management and finance disciplines. The study believes an integrated approach is beneficial for comprehensively understanding the examined concept. In the case of the bibliometric analysis, the study began with the selection of an appropriate database. While reviewing, the Scopus database proved to be the most exemplary because it is a significant wide-reaching citation database**.**

Initially, a literature search was conducted to better understand the corporate sustainability disclosure domain (CSD or ESG). Elsevier's Scopus is one of the well-known databases for collecting journals that have undergone peer review. Due to its size and breadth of citations, the Scopus database emerged as the most excellent one. Elsevier also introduced Scopus to provide a comprehensive overview of the research output from many study topics as the academic research community demanded more. It is the most comprehensive abstract and citation database for peer-reviewed publications(Low and Siegel, 2019). As a result, it contained abstracts and sources from various scholarly journals, books, and conference presentations.

Due to its ease of use, Scopus is regarded as a perfect substitute for another database like the Web of Science (Boyle and Sherman, 2006). Moreover, robust quality assurance processes and extensive author and institution profiles of Scopus constructed from advanced summarizing algorithms and manual curation ensure high recall precision and reliability have resulted in the adoption of the database (Baas et al., 2020). As a result, to better comprehend this area of research, the Scopus database was used to extract the article list and their details on the research field of CSD.

After finalizing the database, the next step was to recognize the query. To investigate the existing pattern and numerous advancements in this association, the authors employed the keywords TITLE ABS-KEY ("Sustainability Disclosure*" OR "Sustainability Reporting*" AND financial AND performance) to gather papers. The primary rationale for adopting this keyword is that the study examines the relationship between two variables (corporate sustainability disclosure and corporate financial performance). The database furnished 305 articles related to this area using the above keywords.

For further refinement, the exclusion criteria listed in Table 2.1 were used. The period chosen was 1970 to 2022. There were no results before 2002, even though the researcher searched for data from the 1970s to 2022. Due to this, the collection includes the work published between 2002 to 2022. The second phase refined the data using the following criteria; document type was limited to articles, reviews, and conference papers**.** The papers were from the area of business management and accounting, social sciences, economics, econometrics, and finance.

Moreover, publications in English-language were taken into account for subsequent analysis. In this phase, the references cited by documents in the sample with minor errors, misspellings, document duplication, and inappropriate formatting were found and fixed. A total of 210 articles were gathered during this phase. Hence, the data refined in this phase is used as input for bibliometric analysis.

The dataset was manually cleaned in the third phase. The samples were thoroughly investigated. Those that were expressly connected were added, and those that were not directly tied to this relationship were eliminated. The seminal works published before 2002 were also added for a thorough literature assessment. One hundred papers were explicitly chosen for this phase's systematic literature review analysis concerning corporate sustainability disclosure and financial performance. During this phase, the papers from the area listed in the first and second quartiles were chosen and analyzed to determine the research gap. According to Scopus metric analysis, documents from the top-ranked journals were also considered. A list of 70 articles was produced as a

result of this review and gap analysis. The third phase dataset identified the gaps in the variable and methodology used to study this link further.

Table 2.1 Criteria for screening and selecting the final article

Research Criteria (selection criteria of the article)	
Research database	Scopus (Elsevier)
Document Type	Articles, reviews, and conference papers
Language	Only those papers published in the English language
Year	1970–2020(Scopus database)
Search field	Title, abstract, Keywords
Search terms	Keywords TITLE-ABS-KEY
Inclusion criteria	Papers related to Business Management and Accounting, Social science, Economics, Econometrics, and Finance were included.
Exclusion criteria	Papers that did not assess the CSR and firm performance linkage were excluded.
Software used	VOSviewer
Data analysis	Based on the visualization generated by the software, the literature review.

(Source; Framework adopted by Machado et al., 2020)

The selection of the software needed to conduct the bibliometric analysis came next. Several software applications (such as Bibexcel, Citespace, VOSviewer, etc.) can be used to do bibliometric analysis. As a result of its high reputation for analyzing large datasets and producing better visual results, the VOSviewer is employed in the current work (Bhatt et al., 2020; Fahimnia et al., 2015). VOS-Viewer software is the standard tool used for both of these analyses. It was created by (van Eck et al., 2010; van Eck and Waltman, 2011) and is an open-access bibliometric analysis tool. As a result, the information gathered from the Scopus database was processed through VOSviewer. The research questions were addressed using both the visualization and the information produced. Figure 2.1 depicts the review's organizational framework.

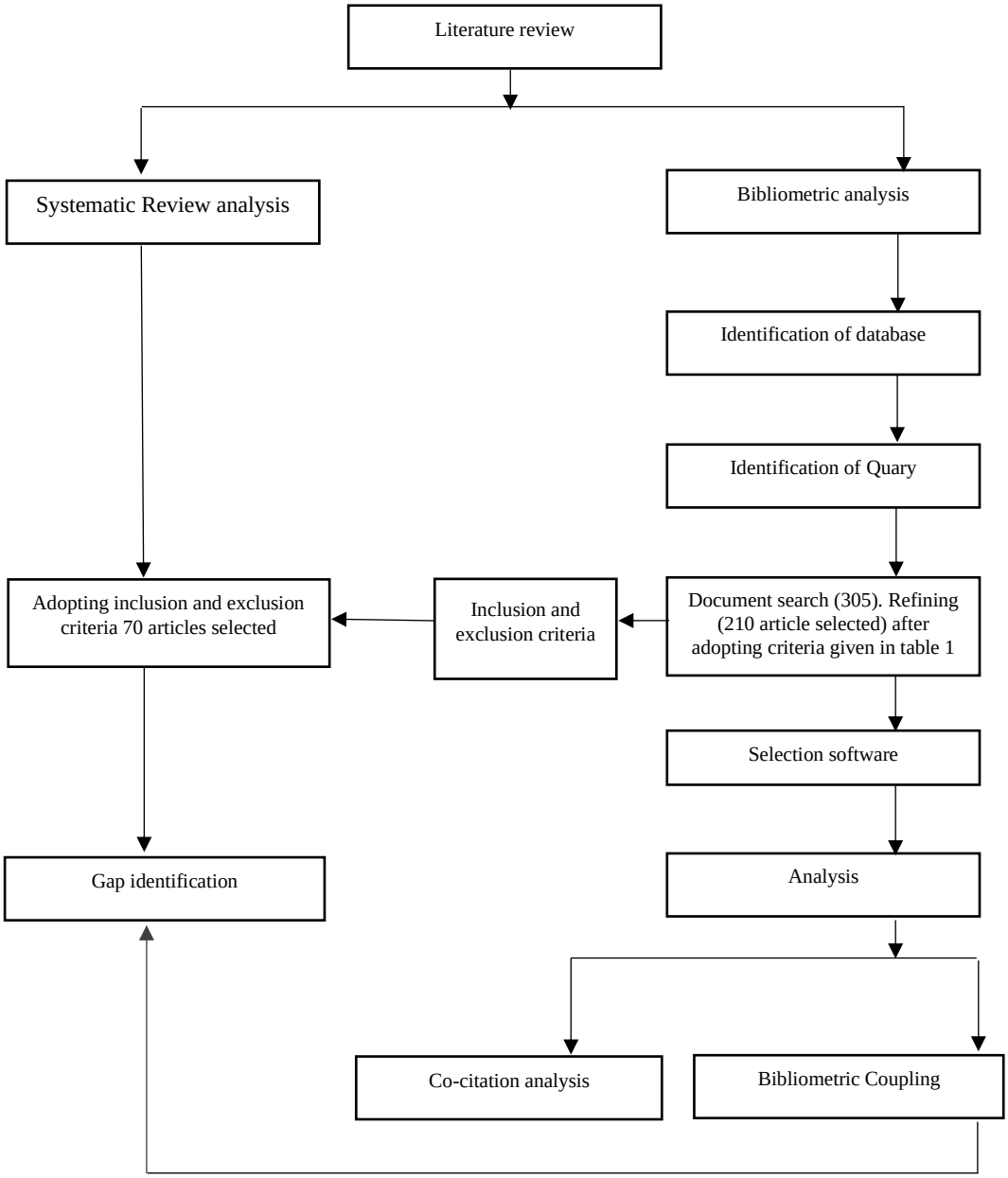

Figure 2.1 Research structure of the study

An understanding of the given subject of research growth prospects, trends, and theoretical and methodological underpinning is facilitated by bibliometric analysis. A proper analysis of the prior studies in this field helps in identifying the emerging research themes and theories. Additionally, it establishes the linkages between various pieces of literature and identifies recently developing themes for additional investigation (Liñán and Fayolle, 2015; X. Zhang et al., 2019)**.** Co-Citation Analysis of References (CCA-R) and Bibliometric Coupling Analysis of Documents (BCA-D)

are two essential methods for this purpose. A CCA-R approach recognizes a particular field's theoretical and methodological underpinnings.

In contrast, BCA-D identifies current trends or themes in the field of study. This analysis makes a substantial contribution by first identifying the most significant current studies. It also offers a helpful visual reference. Thirdly, it lists understudied topics and categorizes several subcategories or themes. It provides a comprehensive summary of sustainability disclosure research to academics and practitioners and guidance for further study.

2.2.1 CO-CITATION ANALYSIS

Co-citation analysis is beneficial in identifying the theoretical and methodological underpinnings on which the subject is founded. Hence, co-citation analysis represents significant work in this area (Zupic and Čater, 2015). Figure 2.2 helps to assess methodological and theoretical underpinnings in sustainability and corporate financial performance studies. The articles that received the most co-citations, with the highest number of occurrences and mapping, were obtained and served as the field's foundational work (Stock and Weber, 2006). However, it does not extract contents and related subjects of recently popular articles (Zupic and Čater, 2015). Citation analysis helps to comprehend the key literature's theoretical underpinning, eventually assisting future researchers in advancing theories and practical applications.

The references cited in the co-citation analysis may change over time. Their co-citation will therefore fluctuate and are not stable. Further, the reference of co-citation analysis is a map that depicts how frequently two texts are cited collectively in other articles (Small, 1973). All 13,291 references from 210 articles were considered for co-citation analysis using VOS viewer software. The citation with fractional counting is a widely used and preferred method of normalizing the data (Perianes-Rodriguez et al., 2016). The references cited at least eight times were considered as the threshold, 22 cited references were considered for mapping, and the same results were analyzed. For co-citation analysis, the nodes in Figure 2.2 reflect the field's most cited references.

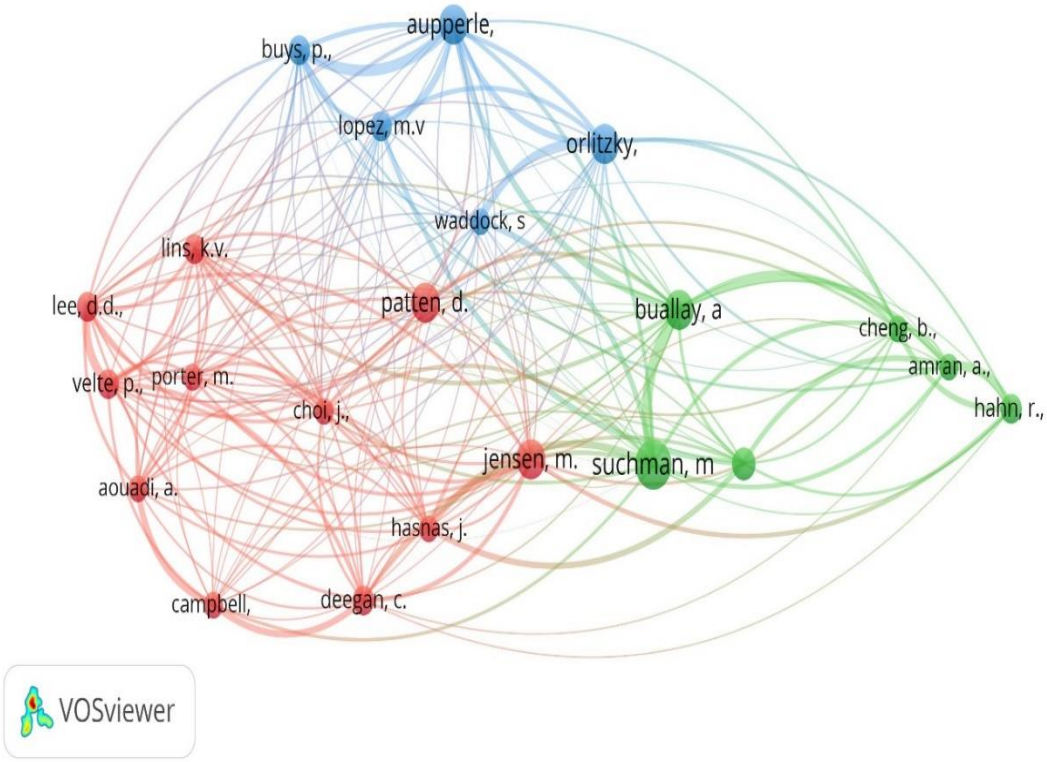

Figure 2.2 Co-citation analysis

Tables 2.2 and Figure 2.2, which were principally used in mapping articles, offer information about each article's cluster, citations, and Total Link Strength (TLS). The co-citation analysis identifies the critical publication as the theoretical or methodological underpinning for corporate sustainability disclosure and financial performance. These literary works strengthen the fundamental and critical understanding of the corresponding work fields. Based on the references of the papers in the corporate sustainability disclosure domain, the co-citation analysis of the current study identified three major clusters. The section that follows interprets and elaborates on these clusters.

Table 2.2 Co-citation analysis

Sl. No	Cited references	Clusters	Citations	TLS
1	Suchman. C (1995)	Cluster-2	15	11
2	Aupperle, K.E., Carroll, a.b. and Hatfield, J.D. (1985)	Cluster-3	12	11
3	Buallay, A. (2019)	Cluster-2	12	12
4	Jensen, M.C, and Meckling, W.H. (1976)	Cluster-1	12	9
5	Orlitzky, M., Schmidt, F.L. and Rynes, S.L (2003)	Cluster-3	12	10
6	Patten, D.M. (1991)	Cluster-1	12	8
7	Guthrie, J. and Parker, I.D (1989)	Cluster-2	10	7
8	Buys, P., Oberholzer, m. and Rikopoulos, P. (2011)	Cluster-3	9	9
9	Deegan, C and Blomquist, C (2006)	Cluster-1	9	9
10	Hahn, R., Kuhnen, M. (2013)	Cluster-2	9	5
11	Lee, D.D and Faff, R.W (2009)		9	9
12	Lins, K.V., Servaes, H. and Tamayo, A. (2017)	Cluster-1	9	8
13	Lopez, M.V., Garcia, A. and Rodriguez, l. (2007)	Cluster-3	9	8
14	Velte, P (2017)	Cluster-1	9	9
15	Amran, A and Haniffa, R. (2011)	Cluster-2	8	7
16	Aouadi, A and Marsat, S (2018)	Cluster-1	8	8
17	Campbell, J.L. (2007)	Cluster-1	8	7
18	Cheng, B., Ioannou, I and Serafeim, G. (2014)	Cluster-2	8	6
19	Choi, J and Wang, H (2009)	Cluster-1	8	8
20	Hasnas, J (1998)	Cluster-2	8	8
21	Porter, M.E. and Kramer, M.R., (2006)	Cluster-1	8	7
22	Waddock, S.A. and Graves, S.B. (1997)	Cluster-3	8	8

(Source- Literature review)

2.2.1. A. Cluster 1 – Red Color (11 Articles)

Red in Cluster 1 represents the pioneering work done in the CSD field as it is developed on multiple levels. It considers every factor when evaluating the CSD dimensions from a theoretical standpoint. The cluster also considers critical theories and aspects taken into account by researchers from the beginning to the most recent stage of the CSD study**.** These clusters also cover the fundamental theories, including the theory of the firm, legitimacy theory, and normative theory of business ethics. Meanwhile, the evolution of sustainability and financial performance from the 1990s to 2017, as well

as the examination of sustainability disclosure from a stakeholder perspective, were also addressed in this cluster. Cluster 1 (red) illustrated the evolution as well as the theoretical foundation of this area. If the relationship between sustainability disclosure and firm performance was evaluated, the ongoing discussion and evolution of this relationship from cluster 1 could be observed. Beginning with the influential work by Patten (1991), the author argued that firms adopt social disclosure mainly due to public pressure than profitability dimensions. The author advanced the case that either public demand or a firm's performance influences the voluntary social disclosures included in annual reports of the companies. Social disclosures are intended to address the social environment exposure that businesses face. As such, they ought to be more significantly linked with indicators related to public pressure than profitability measurements. This implies that in the early phases of the development of sustainability disclosure, businesses were more concerned with stakeholder perception and public pressure than they were with improving business performance.

The association between environmental social and governance disclosure on firm performance was further expanded by (Porter and Kramer, 2007). The authors suggested social responsibility of the firm can lead to significant social advancement as the business devote their vast resources, knowledge, and insights to socially beneficial endeavors. Further, being socially conscious allows a firm to capitalize on the competitive advantage, which enables the firm's long-term survival. This work shows that social responsibility can be used to gain a competitive advantage. The authors Lins et al. (2017) and Velte (2017) bolstered this viewpoint. The former explored this relationship and discovered that when the whole market experiences a negative shock, the firm that invested in social capital pays off despite a negative trend: implication, socially responsible investment payoff even in adverse events. The latter study discovered that effective stakeholder management would only result in improved social performance and greater financial visibility. Moreover, non-financial reporting is no longer viewed as a marketing tool (i.e., "greenwashing") but as an impartial and trustworthy information source required for the stakeholders.

At the same time, Jensen and Meckling's (1976) conception of the firm, the institutional, stakeholder, and normative framework outlined by Aouadi and Marsat (2018) continues to serve as the theoretical foundation for this linkage in this cluster.

2.2.1. B Cluster 2 –Green Color

Cluster 2, symbolized by green, considers the foundational literature on sustainability reporting during its early stages of development, which served as a baseline reference for further research. The key study in this field was conducted by Suchman (1995), who examined the legitimacy theory, one of the theoretical pillars in the domain. Followed by the studies of Amran and Haniffa (2011), Cheng et al. (2014), and A. Buallay (2019a). Amran and Haniffa (2011) lay down the methodological foundation in this field. The author has employed a mixed methodology approach to explore the determinants of sustainability reporting. This study begins with an interview with the local preparer before the information is triangulated to identify the most critical possible determinants, in contrast to prior studies, which mainly used ex-post content analysis of annual reports or other published data to investigate this connection. The results of the interviews were evaluated using institutional theory to identify potential determinants. The results of this study demonstrate that a considerable quantity of sustainability reporting only in a government firm is enormous.

Similarly, the study by Cheng et al. (2014) provided a unique direction by examining the relationship between improved access to finances and superior performance on corporate social responsibility (CSR) strategies. They discovered that improved access to financing could be ascribed to two factors: (1) decreased agency costs as a result of improved stakeholder involvement and (2) decreased informational asymmetry as a result of increased transparency. According to the findings, firms that perform well enough in social responsibility are subject to fewer capital constraints, which boosts overall firm performance. Comparing and evaluating the studies in this cluster study by (A. Buallay, 2019a) received maximum citations for exploring the linkage between sustainability and the financial performance of banking firms. The conclusions drawn from the empirical studies show that ESG has a considerable positive impact on

performance. If the individual elements of sustainability were examined separately, the link between ESG disclosures and firm performance would vary.

2.2.1. C Cluster 3 – Blue Color

The pioneering effort in sustainability disclosure solely focused on the social component of sustainability disclosure is represented by Cluster 3, symbolized by the blue color. These groups consist of the contributions of (Aupperle et al., 1985; Orlitzky et al., 2003; López et al., 2007; Buys et al., 2011). The cluster highlighted the pioneering study of Waddock and Graves (1997), using the support of the slack resource theory, who proposed a paradigm approach to examining the relationship between social responsibility and corporate performance. The role of managers in this association was also investigated, and it was found that while good managers are aware that engaging in social responsibility can have certain advantages, even then, they may not be dedicated to improving corporate social performance. On the other side, in order to minimize negative publicity, executives adopt socially responsible corporate actions (Waddock and Graves, 1997). At the same time, Orlitzky et al. (2003) performed a meta-analysis to explore the relationship between corporate social responsibility and financial performance. As per the study, social responsibility on the part of corporations, and to a lesser extent environmental responsibility, is likely to pay off. The study also shows that social responsibility is more likely to correspond with accounting-based measures than market-based measures. This study has made the association between social responsibility and CFP more evident. On the other hand, López et al. (2007) argued that although a firm's engagement in socially responsible activities may result in financial disadvantage, policies that contain sustainability requirements can sustain and generate long-term value for the firm. Further, reduced ecological impacts, higher employee satisfaction, and continued positive local public engagement could not continuously translate to boosting the financial indicator quantitatively. Hence, this study further expanded the argument by contributing mixed results in this association. Even though Buys et al. (2011) research suggests that firms that publish sustainability reports might perform better financially. Hence, all the studies carried out in this cluster majorly focused on the social component of sustainability reporting.

2.2.2 BIBLIOMETRIC COUPLING

The bibliometric coupling technique draws out research themes, subjects, current research issues, or trends currently popular or significant in a field. Here, document mapping is done, and the quantity of shared links between the documents is evaluated. The number of closely shared references between two publications indicates how closely related they are to one another on a given issue or purpose (Cheng et al., 2014). As a result, this mapping will help comprehend how a research field has changed from conventional foundational studies to the most recent developments. As per Walsh and Renaud (2017), this method can also determine the gaps and context in which the issues are discussed. The BCA-D analysis considered all 210 articles to look into recent trends. A criterion of ten citations is maintained as the minimum number for a document. This analysis produced eight clusters using a fractional counting approach for normalization. Figure 2.3 exhibits the findings of the the bibliometric coupling. The details of bibliometric coupling of each cluster are shown in table 2.3 in annexure I.

Like the references more frequently mentioned or co-cited in co-citation and bibliometric coupling analyses, nodes serve as the analytical unit in these maps. It stands for the document with the more significant number of interrelated references in the bibliometric coupling of documents. Here, the software uses the normalized indices to assign each unit to a cluster based on references in the bibliometric coupling of the document and co-citation analysis. A different color represents each group, and nodes connect units that belong to the same group. The relevance of the nodes (most cited documents) among the various nodes labels in the map is used to determine which nodes should be given priority. The link thickness between the nodes indicates the percentage of co-citation indices in the co-citation analysis map and the degree of bibliometric coupling. In comparison, the nodes' size indicates the association's strength.

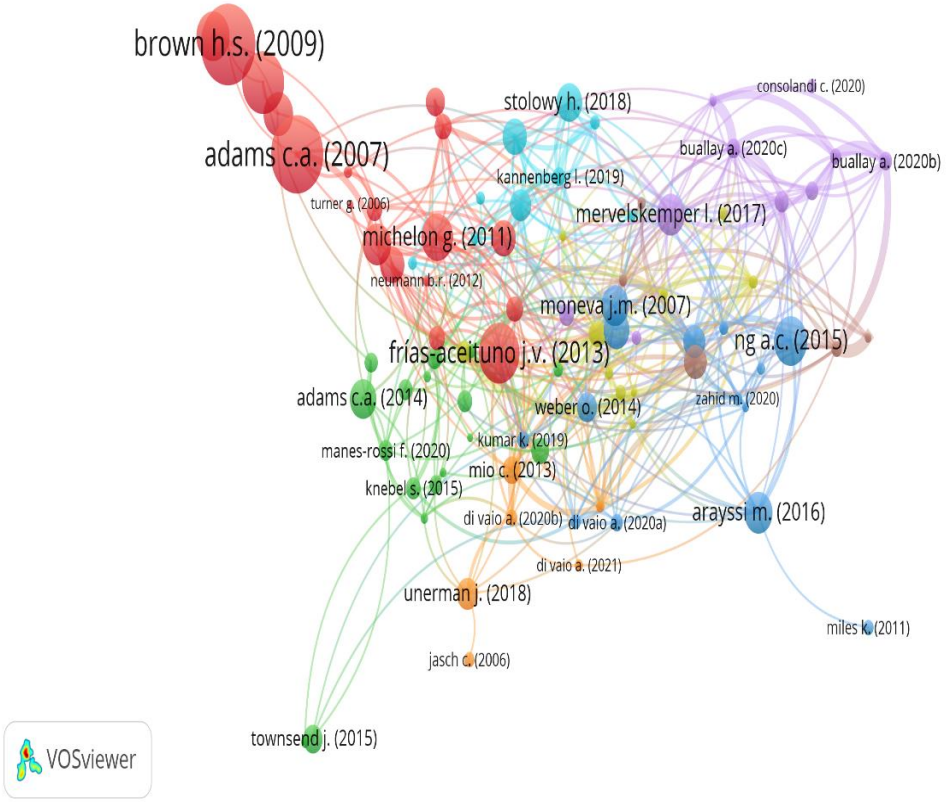

Figure 2.3 Bibliometric coupling of documents

2.2.2 A. Cluster 1 Red Cluster (18 Items)

The red color represents Cluster 1, which considers the foundational studies of sustainability disclosure during its early development, serving as a standard reference for further research. The development of sustainability reporting is the central subject of the documents in the cluster. This cluster discusses the difficulties, legalities, and stakeholders' perceptions of sustainability reporting. Additionally, this cluster includes a thorough discussion of the Global Reporting Initiative's involvement in sustainability reporting. It is interesting to note that several studies found distinct differences between countries and industries when analyzing the developments concerning the contents of these sustainability reports, focusing on economic factors and business drivers, stakeholder dialogue and feedback, and performance benchmarking (Kolk, 2004). Even the methodological conclusions in the extant literature yield inconclusive and contradictory results. These conflicting conclusions might be due to factors like a firm's social and environmental responsibility are typically influenced by social, political, and

economic contexts and institutional capabilities. As a result, the literature shows that corporate, social, and ecological responsibilities differ significantly by country and territory (Baughn et al., 2007).

An evaluation of the literature exhibits this cluster focused on the regulatory framework and developments in reporting sustainability reporting. Adams and Whelan (2009) suggest that studies should be more sophisticated concerning the political realities influencing the potential for change in corporate sustainability disclosure patterns. In the published research concerning the role of legality in sustainability reports, a study conducted by Vormedal and Ruud (2009) found that only ten percent of the firms sampled firms of Norway comply with a legal obligation for environmental reporting, and more than fifty percent focus only on the governance and working condition indicators of sustainability reports. On the contrary, Frías-Aceituno et al. (2013) discovered that firms in nations with civil law systems and intense levels of law and order are more likely to produce and publish a wide variety of integrated reports.

A critical evaluation of the cluster reveals that these studies constitute the foundational research in sustainability reporting, focusing solely on the development and organizational processes of creating sustainability reports. These studies also discussed how stakeholders like the government, laws, and the socioeconomic environment interact intricately to develop sustainability. Most of the studies in the red cluster were conducted between 2010 and 2015 and were solely concerned with the sustainability performance facet. Hence these studies referred to carry research in sustainability reporting. As a corollary, this cluster provides an overview of the seminal works that sheds light on the developments, trends, drivers, legislative implications, and potential future of sustainability disclosure.

2.2.2. B Cluster 2 Green Cluster (18 Items)

Green, which represents cluster 2, highlights pertinent literature that focuses on measuring sustainability across diverse industries (For instance, the seminal works of (A. Adams et al., 2014; Greiling and Grüb, 2014). Additionally, it is intriguing that the seminal works of sectoral evaluations strongly emphasize gauging the sustainability

measurement of the public enterprise. The main conclusion of the sectoral review implies that voluntary sustainability reporting by enterprises that largely adhere to Global Reporting Initiative (GRI) standards is expanding. At the same time, the public sector has relatively little sustainability reporting. The least adopted performance metrics are those for sustainability, environment, and social responsibility, and those which are adopted chiefly focus on economic factors and employee diversity. The outcome also specifies benchmarking, and a balanced scorecard performance measurement may significantly enhance a government department's efficacy (A. Adams et al., 2014). This conclusion was reaffirmed by Greiling and Grüb (2014), who investigated the measurement of sustainability reporting in local Australian and German businesses. The study found that, despite mounting pressure on public companies to show how they add value for stakeholders, the adoption of sustainability reporting is still far behind. The summary indicates that the green cluster focuses on significant literature that brings into focus the measurement and evaluation of sustainability disclosure across different industries.

2.2.2. C. Cluster 3 Blue Cluster (14 Items)

The studies that examined the relationship between sustainability disclosure and the various performance indicators are shown in this cluster. An analysis of the different clusters by year reveals that early studies were primarily concerned with advancements and measurement of sustainability reporting. A trend began to assess the relationship between sustainability reporting and key performance metrics in 2014. The ground-breaking work of (Arayssi et al., 2016; Miles, 2011; Moneva et al., 2007; Ng and Rezaee, 2015, 2020; Taliento et al., 2019) is included in this cluster.

The various performance indicators that were tested include the relationship of sustainability reporting with stock market performance (Ng and Rezaee, 2020), cost of equity capital (Ng and Rezaee, 2015), economic performance (Taliento et al., 2019), the role of gender diversity in sustainability performance (Arayssi et al., 2016; Miles, 2011) are the few examples of seminal works carried out in this cluster. Therefore, starting in 2015, research on sustainability reporting changed focus to examining how it relates to different performance metrics. The overview of the blue cluster reveals that

the blue cluster is focused on essential studies examining various performance indicators related to sustainability reporting.

2.2.2. D. Cluster 4 Yellow Color (11 Items)

The relationship between corporate financial performance and sustainability reporting is one of the newer, emerging themes in this field that is illustrated by the yellow cluster. Whether sustainability reporting improves business performance is still a topic of ongoing discussion. Despite its importance, there is no common consensus on whether a company's financial performance is related to its sustainability performance. Corporate sustainability is crucial for long-term corporate success and for ensuring that markets deliver value across society (Ching et al., 2017). Even now, the literature demonstrates this imprecision. The majority of the studies in this cluster concentrate on the relationship between corporate sustainability disclosure and financial performance.

The seminal studies carried out in this field include the work of (Ching et al., 2017; Goel and Misra, 2017; Hongming et al., 2020; Karaman et al., 2018; Oncioiu et al., 2020; Wasara and Ganda, 2019). Therefore, this cluster provides global evidence regarding how sustainability reporting improves corporate financial performance.

An evaluation of the results conducted worldwide indicates mixed results. Ching et al. (2017) conclude that there is no association between the two in Brazilian listed firms. This finding holds for each sustainability component as well. Furthermore, despite an improvement in quality disclosure over the years under study, reporting ratings of the sample have remained poor. In contrast, a study by Oncioiu et al. (2020) revealed that corporate sustainability reporting significantly impacts the business's financial success. The impact of sustainability reporting on shareholders and employee productivity is enormous. Combining financial and non-financial factors might be beneficial for more accurately determining a firm's viability. This conclusion was further supported by the findings of (Hongming et al., 2020), which showed that both three individual indicators and the composite element of the sustainability reporting index had favorable impacts on firm performance. The results of the study emphasized the role of non-financial reporting as a powerful corporate strategy.

A thorough examination of the studies in this cluster shows no consensus on the relationship between firm financial success and sustainability reporting, not even on a global scale. The idea of sustainability reporting is growing in emerging nations. Considering the Indian context, it is still in its evolving stage (Goel and Misra, 2017). As a result, academicians and researchers still have an ongoing discussion on the link between corporate sustainability reporting and its impact on financial performance. To close the knowledge gap in this area, further study in this topic is therefore necessary.

2.2.2. E. Cluster 5 Violet Color (10 Items)

The violet cluster comprises studies on sustainability reporting in various industries and cross-industry comparison studies on the relationship between sustainability and corporate performance. This includes the most recent and popular theme linking sustainability and financial success across industries. The seminal work carried out in this cluster includes the contributions of (A. Buallay, 2020b, 2020b; A. Buallay et al., 2020; A. Buallay, Fadel, et al., 2021; A. M. Buallay, 2020; Mervelskemper and Streit, 2017)

Most of the studies carried out in this field focused on the analysis of sustainability and firm performance in the banking sector. Analyzing the data from the baking industry in the European context by (A. Buallay, 2019a) reveals conflicting results in the financial sector concerning the relationship between CSD and CFP. Inferences from the empirical findings showed that CSD had a favorable impact on performance. However, the link between CSD disclosures varies when examined separately; the environmental disclosure discovered positively impacts the ROA (Return on Assets) and Tobin Q. However, the CFP is adversely affected by corporate social responsibility disclosure. (Return on Equity). However, the corporate governance disclosure negatively impacts the ROA and ROE, whereas Tobin's Q is positively impacted. The conclusion is similar in the case of the analysis of this linkage in MENA banks as well (A. Buallay et al., 2020).

Similarly, the assessment of the relationship between CSD and CFP in selected agricultural industries demonstrates no relationship between CSD and financial

operational and market-based performance (A. Buallay, 2020a). At the same time comparison of this association between developed and developing countries' banking sector empirical analysis reveals that CSD has an insignificant effect on market performance; it does positively improve the bank's performance in developed and developing nations, supporting the value creation aspect of sustainability reporting.

Summarizing this cluster analysis indicates that most of the studies contributed to this cluster analyze the relationship between CSD and CFP in various sectors to capture the sectoral differences.

2.2.2. F Cluster 6 Brown Color (11 Items)

The primary focus of this cluster lies in assessing the factors or drivers of sustainability disclosure as well as sectoral differences or variations in reporting sustainability. The significant studies in this cluster include the seminal works of (Al Hawaj and Buallay, 2021; El Khoury et al., 2021; A. M. Buallay, 2020; Hussain et al., 2018). This cluster includes the latest studies that explored the association between CSD and CFP at various sectoral levels and is an extended work of cluster 5.

2.2.2.G. Cluster 7 Light Blue Color (11 Items)

This cluster focuses on the challenges of theoretical insights in this domain. The light blue cluster primarily focuses on or outlines the theoretical foundations for the organizations' environmental, social, and governance (ESG) disclosures and the goal of integrated thinking and disclosure. The foundational works in this cluster showed that investors and other financial stakeholders are still the primary organization's essential stakeholders and are still the principal recipients of corporate reports. As practitioners incorporate ESG data into their integrated reporting, the integrated disclosures are also assisting them in strengthening their organizational stewardship and credibility with institutions and other societal stakeholders (Camilleri, 2018). Legitimacy, stakeholders, and stewardship theory are hence the fundamental theories that underpin sustainable disclosure. At the same time, the limits and the challenges of preparing an integrated report were discussed by (McNally et al., 2017). Adding to the existing literature, Stolowy and Paugam (2018) discovered that US-listed firms had

fewer reported sustainability reports, while European firms operating in the sector of high environmental sensitivity had higher sustainability performance and better financial results. On the contrary, Kannenberg and Schreck (2019) demonstrated an equivocal result regarding sustainability reporting in this cluster.

2.2.2. H Cluster 8 Orange Color (6 Items)

The cluster presents significant work that focuses on how sustainability reporting can contribute towards the attainment of sustainable development goals. Further, this cluster also indicated the required changes in the accounting aspects for non-financial reporting. Hence this cluster included the works of (Di Vaio et al., 2021; Jasch and Lavicka, 2006; Lawal et al., 2017; Mio and Venturelli, 2013; Unerman et al., 2018).

2.3 DISCUSSION ON BIBLIOMETRICS ANALYSIS

Seminal works, several themes, and sub-themes in the field of sustainability disclosure were identified due to the bibliometric study of the article collected. Furthermore, mapping the outcomes of the bibliometric coupling and co-citation analysis assisted in linking essential works according to significance. It gave a comprehensive overview of significant works with a particular focus theme.

Hence based on the analyses, the evolution of sustainability disclosure literature and the new themes and developments started in this area were observed. Additionally, research has demonstrated the significance of business sustainability and financial performance studies. The literature revealed outcomes varying from industry to industry and country to country. Moreover, relationships were also neglected in the Asian environment. Due to its developing stage and numerous legislative reforms, India has also emerged as one of the emerging themes where sustainability and business performance studies were concentrated. Examining this domain by country reveals that most sustainability studies were conducted in industrialized nations. The new social and sustainability disclosure trend needs further study, especially in emerging nations like India. This intrigues the researcher's attention to further research in this area.

The formation of the Global Reporting Initiative, establishing sustainable accounting standards, mandatory CSR regulations, sustainability, and integrated reporting norms may also have marked the beginning of a massive opportunity in this domain. Nonetheless, compulsory CSR provisions in several countries, including Sweden, Norway, the Netherlands, Denmark, France, and India (Karnani, Aneel, 2013) and United Nations Sustainable Development Goals, also resulted in a substantial study in this area with expanding studies from 2012.

Integrating this conventional interpretive strategy might be a great choice because the bibliometric analysis might not include all of the documents in the field that might be pertinent to the research. The drawback is that these examined documents came exclusively from Scopus databases; adding additional databases could increase the procedure's dependability. Still, since Scopus is an extensive database and is widely used, using it will help discover any gaps in the literature. The co-citation analysis and bibliometric coupling analysis can provide specific limitations in this field. At the same time, combining these two methods could help overcome each method's shortcomings.

However, both approaches have made a substantial contribution to the field of systematic research in sustainability disclosure. It helped in locating the critical works in the field, which is essential for conducting the study in the area. Furthermore, the study themes in the present focus area were determined by the bibliometric coupling of document analysis. In contrast, the theoretical underpinning in this field was discovered through co-citation analysis. Therefore, combining the two gives a road map, input, and essential recommendations for the current field of research. The main findings from the co-citation and bibliometric coupling analysis on CSD are outlined below:

- The CCA-R analysis found three clusters outlining significant works on the evolution of sustainability disclosure as a field of study. The fundamental theories that were identified by the clusters included the normative theory of business ethics, the theory of the firm, and the theory of legitimacy. Cluster 2 revealed the field's methodological foundation, meanwhile. Cluster 3 cited pioneering research that only addressed the social dimension of sustainability disclosure.

- The major topics of the past studies that have focused on the field of sustainability disclosure were determined based on the bibliometric coupling analysis. The critical finding is that empirical analysis of the relationship between corporate financial performance and sustainability disclosure predominates recent papers as per Cluster 4.
- Clusters 1 and 2 of the bibliometric coupling analysis discussed sustainability disclosure's evolution, developments, and measurement. It also revealed how the theme has changed from the initial focus. Later, the emphasis switched to evaluating the relationship between sustainability reporting and different performance measures, with the relationship with corporate financial performance emerging as a critical subject in this area. Studies on the relationship between firm financial performance and sustainability disclosure were conducted concurrently, employing theories such as the stakeholder's theory, the normative theory of business ethics, and the legitimacy theory. Later, integrated theories and models were employed to comprehend the relationship between corporate financial performance and sustainability reporting.
- The most recent field found by bibliometric coupling includes sustainability reporting and ESG disclosure. Relevance of corporate financial performance, firm value, even the role of GRI, non-financial reporting, and voluntary reporting Indian context appeared as new areas that require deeper investigations.

In summary, the impact of non-financial elements has emerged as a critical component at the organizational level and from the stakeholders' perspectives. The evaluation of the number of articles in this domain also showed a steady increase in research articles on sustainability and corporate financial performance relationship since 2016. This suggests how sustainability and corporate financial performance studies continually evolved and added to the existing body of knowledge.

2.4 LITERATURE ON SUSTAINABILITY DISCLOSURE

In its widely acclaimed study, Our Common Future, published in 1987, the World Commission for Economic Development (WCED) popularized the phrase "sustainable development" (Diamond CP, 1996). According to the WCED (1987), sustainable development " satisfies the needs of the present without jeopardizing the ability of future generations to meet their own need."

The WCED claimed that simultaneously adopting environmental, economic, and equitable goals was necessary for sustainable development. This assertion was initially considered suspicious as it contradicted the widely held belief that social justice and environmental integrity are incompatible with economic growth. After ten years, Rondinelli and Berry (2000) discovered that many significant multinational corporations believed these three sustainable development tenets were internally consistent. This belief has led to corporate support for sustainable development (Bansal, 2005). As a result, firms are encouraged to adopt sustainability disclosure to contribute to the global agenda of sustainable development by disclosing their sustainability efforts.

Hence, corporate sustainability has historically evolved in response to economic development, environmental policy and governance, and the pursuit of social justice and equity. Nevertheless, later on, industry, governments, and non-governmental groups have shown a global interest in working together to create strategies for delegating responsibility and upholding the laws that protect the environment and its natural resources. Further, due to instability in the financial and capital markets, governments worldwide have come together to support the sustainable initiative, which has led to the end of "the age of irresponsibility[1]." (Christofi et al., 2012).

The concept of sustainable development, which became apparent between 1980 and 1988, is the time frame that logically demonstrated the necessity of sustainability

[1] The former British prime minister Gordon Brown coined the phrase "era of irresponsibility" in a speech to the UN on September 26, 2008, declaring: "The age of irresponsibility must be terminated. We must now establish a transparent, not opaque, new world order.

disclosure. The reports "World Conservation Strategy," "World Commission on Environment and Development," and "Our Common Future," published in 1980, 1983, and 1987, respectively, provided the theoretical foundation and widespread adoption of the idea of sustainable development as well as the requirement for sustainability reporting (Gokten et al., 2020). Hence, environmental accounting is the first methodological instrument introduced in sustainability reporting (Elkington, 1994). The chemical industry published the first environmental report in the 1980s. Several companies in this field were small and medium firms that are very advanced in the environmental management system. Tobacco industries adopted the same much earlier than the other corporate world to attract investors (Goyal et al., 2013). This resulted in the massive adoption of sustainability reporting by environmentally sensitive firms, which started the adoption of environmental disclosure worldwide.

In the 1990s, the concept of sustainability reporting was discussed in terms of environmental accounting, emphasizing the environmental effects of corporate operations. The concept of sustainability disclosure emerged in the middle of the 1990s as a way for businesses to coordinate and harmonize their productive efforts with those of the environment and the communities in which they operate. Sustainability, also regarded as TBL (triple bottom line method), which was first proposed in 1998, defined corporations as social, economic, and environmental entities. Moreover, the GRI steering committee stressed the necessity of creating a reporting framework that considered economic, social, and environmental impacts in 1998. This makes 1998 the year that environmental accounting changed into sustainability accounting. As a result, the development of sustainability reporting occurred between 1989 and 1998 (Gokten et al., 2020).

In general, as defined by the accounting firm Deloitte means,

> "Sustainability is an ability to create and maintain the conditions of a delicate balance between human and business needs, to improve lifestyle and feeling of well-being and preserve natural resources and ecosystems' (Deloitte, 2015, p. 1)."

At the same time, in practice

> "Sustainability disclosure or reporting is a process of gathering and disclosing data on non-financial aspects of a firm's performance including environmental, social, employee and ethical matters, and defining measurements, indicators and sustainability goal based on firms' strategy" (Deloitte, 2015, p. 1)

According to the Global Reporting Initiative (GRI- the organization that sets sustainability standards), sustainability reporting demonstrates a firm's commitment to a sustainable global economy and assists organizations in measuring, understanding, and communicating their economic, societal, and environmental performance. Hence, sustainability reporting or non-financial disclosure has three dimensions, namely environmental, social, and economic aspects. However, governance disclosure is also considered an element in sustainability reporting. Fast forward to the present day, sustainability disclosure adoption has increased.

Similarly, investors, government regulators, policymakers, and the public have come to understand the importance of corporate sustainability over time and are getting more concerned about the possible implications. The authorities have created rules and standards to reduce the costs resulting from corporate negligence in the social and environmental realms (Christofi et al., 2012). Hence, regulators have set many reporting standards globally and at various national levels to report sustainability initiatives.

Sustainability disclosure has become a new tool that provides a wide range of information to stakeholder investors, regulators, and even the public (Kuzey and Uyar, 2016; Orazalin and Mahmood, 2020). In other words, sustainability disclosure is one of the main strategies managers use to notify all parties involved about the sustainability strategy for the firm. A business's ability to meet its moral, ethical, and social commitments to the environment and the society it operates is further empowered by the disclosure of sustainability measures (Orazalin and Mahmood, 2020). Due to its significance, non-financial reporting and sustainability disclosure is becoming essential. Further, nowadays, investors assess business strategies and risks, and now even employees prefer to work for organizations that are held accountable for their

sustainable initiatives (Belal and Owen, 2015). Moreover, consumers are concerned about the quality of goods and services due to growing environmental consciousness. These expectations have caused sustainability disclosure to become more widespread (Orazalin and Mahmood, 2020).

Many studies have been carried out to understand the evolution, importance, and benefits of sustainability reporting. A wide range of other stakeholders, including investors, are increasingly calling for disclosing non-financial information beyond what is usually included in financial statements. According to the UN Principles for Responsible Investment, many investors feel that incorporating environmental, social, and governance (ESG) factors into financial decision-making has both public and private benefits. Some are more focused on generating competitive financial performance by pursuing sustainability disclosure. Investor interest in increasing transparency on the impact of global climate change trends on business assets and supply networks has also increased due to the mild demand from some regulatory agencies to examine the risks of climate change and extreme weather on corporate balance sheets (Bose, 2020).

Hence these factors, as well as the growing stakeholders' awareness, is also one of the primary reasons for firms' wide adoption of sustainability reporting. According to Morhardt et al. (2002), there are eight reasons why a business should adopt sustainability disclosure practices (1) stricter regulations and proactive cost-cutting for the future, (2) Adherence to industry environmental or ecological codes, (3) Cost cutting (d) Promotion of stakeholder relations; (e) Perceived environmental or ecological visibility of the firm (d) Belief that disclosing of environmental social and governance aspect will give a competitive edge to the firm. (g) Acknowledging that responsibility comes with disclosure.

Even though sustainability reporting has various advantages, in emerging nations, evidence of the influence of CSD on CFP is equivocal. As a corollary, there has been a surge of interest and research in this field. Given the impact of CSD on corporate financial performance, it is recommended that every firm disclose environmental, social, and governance actions to stakeholders and demonstrate accountability,

truthfulness, and transparency concerning socially responsible activities (Said et al., 2009). This will enhance corporate reputation, generating value for the business (Dellaportas et al., 2012; Forcadell and Aracil, 2017). A stream of research documented that CSD positively influences firm value (Aboud and Diab, 2018; Fatemi et al., 2018). Nevertheless, Peiris and Evans (2010) concluded that CSD impacts corporate financial performance and is considered a critical factor for investment-by-investment decision-makers.

On the other hand, some studies also documented negative relationships (Brammer et al., 2006; Uwuigbe, 2018). This argument is grounded on the notion that embracing environmental disclosure measures comes at a cost and that this cost would harm the firm's profitability. Furthermore, according to neoclassical philosophy, as Friedman, M (1970) observed, the firm's primary social responsibility is to maximize its shareholders' profit. The fundamental premise is that sustainability initiatives' benefits do not outweigh their expenses (Aboud and Diab, 2018). The primary goal of any business sustainability report is to increase openness to improve performance evaluation. This can only be accomplished by providing facts in a highly unbiased and accurate manner (Laskar and Gopal Maji, 2018). The foundation for this study ascends from the understanding that most studies on the subject focused on the Western world (Kumar et al., 2021; Kuzey and Uyar, 2016; Laskar, 2018).

Examining the literature on sustainability disclosure and corporate financial performance in the Indian context uncovers a paucity of academic exploration into the subject. Similarly, the idea of sustainability disclosure is still developing, and in the context of India, the majority of studies were qualitative (Jyoti and Khanna, 2021; Kumar et al., 2021; Laskar, 2018). Moreover, significant studies in this field focused on measuring sustainability performance. Even the studies examining the linkage between corporate sustainability disclosure and CFP majorly tested in financial and service sectors in India. Hence, studying the connection between CSD and CFP and the transparency about ESG predictors is intended to encourage more socially responsible investment opportunities in emerging countries like India (Jyoti and Khanna, 2021). The relevance of sustainability disclosure at the policy level is further demonstrated by

the SEBI circular 2021, which outlines the standardization of ESG indicators for the top 1000 enterprises to aid in improved and comparable decision-making by the stakeholders.

Several questions were the driving forces behind this investigation. Firstly, corporate sustainability reporting is a relatively new phenomenon in India. Some notable studies have concluded that sustainability reporting is still in its infancy in the Indian context. However, CFP and sustainability disclosure are still primarily new fields, particularly in the industrial industries of emerging nations like India. A more in-depth investigation will help to clarify and illuminate this link.

Furthermore, earlier studies emphasized the necessity of further investigation into this link from many perspectives to understand more and make better decisions. The motivation behind carrying out this work is to fill these gaps in the body of knowledge concerning the relationship between CSD and CFP. Manufacturers' development, implementation, and reporting of sustainability activities have also been questioned (A. Buallay, 2020b). As a result, the lack of conclusive evidence regarding the impact of CSD on financial performance and financial distress, as well as the role of GRI and firm life cycle in this connection, aroused interest and encouraged the researcher to conduct this research.

2.5 THEORETICAL BACKGROUND

The nexus between CSD and CFP is constructed based on various theoretical foundations. Theoretical perspectives on sustainability reporting and CFP were discussed, emphasizing the literature assessment of the setting and theories of the studies in the focal area. This section discusses the various theories adopted in the literature on CSD's relationship with CFP and Financial distress.

Theories in CSD and CFP Linkage

CSD and CFP linkage

I. Resource-based perspective

1. Slack Resource Theory

According to the slack resource theory, organizational slack assists a company in coping with both internal and external demand(Bansal, 2005; Bourgeois, 1981). Slack resources are generated by outstanding and improved performance and can be used for social and environmental initiatives (Ahlström, J., and Ficeková, M., n.d.); Waddock and Graves, 1997). Moreover, the theory explains how more significant and more prominent firms—measured in size—can quickly adapt to new and external developments with these extra resources. Additionally, firms with more resources may quickly implement new procedures and rules (Bansal, 2005). Slack resources aid in adapting to the new environment, and businesses with higher financial performance also have more substantial resources and cash for funding social and sustainable activities. Investing more in socially conscious, environmental, social, and governance initiatives can boost business success (Wissink, R. B. A. (2012), n.d.)Slack resource theory, therefore, attributes an excellent association to this relationship.

2. Resource Based Theory

The resource-based theory asserts that firms may create and preserve a competitive edge by effectively managing their scarce, priceless, and non-replaceable resources ((Bowman and Ambrosini, 2003; Laskar, 2018; Lourenço et al., 2012). While considering how a business operates, many stakeholders control the firm's access to these resources. These resources will be with a wide range of stakeholders; therefore, the firm needs to continually satisfy a wide range of stakeholders through sustainability reports to access these resources ((Roberts, 1992)). According to resource-based theory, intangible resources are essential and needed for sustainability ((Villalonga, 2004). The resource-based theory also asserts a positive relationship between CSD and CFP.

II. Stakeholder perspective

1. Stakeholders' theory

The stakeholders' theory focuses on how an organization's success and survival are determined by meeting expectations and maintaining relationships with various stakeholders (Edward Freeman and Phillips, 2002). Often, organizations are held accountable to diverse shareholders (Freeman, 1984). The organization should treat all stakeholders fairly. Furthermore, corporations adopt voluntary quantitative and qualitative sustainability disclosure to progress stakeholders' preconceptions(Aggarwal and Singh, 2018). Stakeholders' theory positively affects sustainability disclosure and firm value. If a firm wishes to satisfy a variety of stakeholders, it must report on the sustainability targets it has set. Stakeholders expect the corporate to report financial data and environmental, social, and governance (ESG) activities (Carrots and Sticks, 2013; KPMG, 2013). As a result, stakeholders make up the society in which firms operate, and their legitimacy is contingent on meeting stakeholders' expectations (Fernandez-Feijoo et al., 2014). Hence legitimacy and meeting the expectation of a wide range of shareholders are enabled through sustainability reporting, thereby enhancing its value. Hence, the stakeholder theory asserts a positive relationship between CSD and CFP.

2. Institutional theory

The institutional theory states that "businesses should aspire to practice and implement the best practices as specified by important stakeholders"(Doh and Guay, 2006). Therefore, failing to uphold institutional standards and perform admirably from society's critics' perspective can harm a company's credibility and reputation. As a result, this perspective suggests that businesses adapt strategically to changes in the social context (Bansal, 2005; Suchman, 1995).

3. Legitimacy theory

As per the theory, legitimacy is a social contract between an organization and a social system (Lindblom, C.K., 1993). Since 1980, the legitimacy theory has been proposed as a credible explanation for the rise in environmental reporting (O'Donovan, 2002). Furthermore, maintaining legitimacy is a challenge, and this could only be overcome

by anticipating the public's needs and wants over time (Suchman, 1995). The theory asserts that organizations must adhere to social norms and expectations. A company's continued existence mainly depends on how well it operates within societal boundaries and standards (Uwuigbe, 2018). When the organization's social performance is matched with society's expectations, if an organization fails to perform well or does not uphold moral values, society will severely condemn this; these regulations may even result in the organization's failure (Schiopoiu Burlea and Popa, 2013).

According to the literature, corporate sustainability disclosure lowers the risk of regulatory action and shareholder boycotts while strengthening the firm's operating license (Aggarwal, 2013). As a result, the legitimacy theory proposes that when firms disclose information about sustainable development, their reputation improves and additionally attracts members of society. This theory explains sustainability reporting as influencing firm performance (Uwuigbe, 2018) and conferring to legitimacy theory, business sustainability reporting and financial performance positively link. One element that inspires firms to engage in sustainability projects is their perceived legitimacy.

III. CSD and Financial Distress Linkage

1. RBT theory

Considering RBT theory, Barney (1991) stated firms may control internal dynamic aspects that impact their performance. Companies with more excellent dynamic skills may successfully utilize ESG benefits in their financial risk management by combining ESG strength with other corporate strategies (Teece et al., 1997). Enhancing ESG performance will lead to improved sales and customer satisfaction, eventually resulting in improved profitability; this ensures stable cash flows, reducing the chance of default (Atif and Ali, 2021).

IV. Role of Firm life cycle as a moderator

1. Firm Life cycle theory

According to the corporate life cycle theory, businesses progress reliably from one phase to another (Porter, 2008). Firms in the early phases of their life cycle are often

young, with more investment prospects, but they are not lucrative enough to return a profit. The early-stage firms opt to fund their investment projects. On the other side, established businesses, significantly matured firms, are typically larger. Even though matured firms have additional resources, they have fewer investment options (Trihermanto and Nainggolan, 2020).

Further, each stage is distinct (Miller and Friesen, 1984; Porter, M. E., 2008). Contingent upon where a firm is in the life cycle, its structure, strength, plans, competencies, and cash-flow flow unpredictability will vary. Previous studies have observed and proved the firm's life cycle's significance in shaping choices and policies (Atif and Ali, 2021; Grullon et al., 2002; Hasan and Habib, 2017a).

Several theories help us decipher the direct effect of sustainability reporting on firm value, corporate financial performance, or financial distress. For instance, institutional theory explains why firms engage in sustainability reporting and corporate social responsibility initiatives. The institutional theory argues that firms resort to sustainability reporting and other corporate social responsibility initiatives to adhere to societal and institutional norms, values, and beliefs. Similarly, the legitimacy theory states that firms must act in a socially desirable manner since there is a social contract between society and firms. Hence, firms engage in sustainability reporting to abide by the implied social contract to gain legitimacy for their survival. However, neither the stakeholders' nor the legitimacy theory provides a convincing explanation for understanding why GRI compliance is a moderator in the sustainability reporting-firm value relationship.

Similarly, the resource dependence theory asserts that firms fight for scarce resources and depend on stakeholders for essential resources. Firms use sustainability reporting as a tactical tool to reduce resource reliance. According to the stakeholders' theory, they can use resource constraints in this context. According to the stakeholder hypothesis, businesses' interactions with society through disclosure of their social, environmental, and governance practices can lead to long-term benefits, revenues, and value creation (Behl et al., 2022). However, sustainability reporting can help reduce potential obstacles that stakeholders may present when raising money to increase business value.

Stakeholder theory implicitly explains how sustainability reporting is a predictor of business value. Therefore, resource reliance and stakeholder satisfaction theories explain whether or not sustainability reporting can increase business value. Though these theories help us sense the sustainability reporting-firm value relationship, the rationale for positing GRI compliance as a moderator remains a black box**.** Further, rather than adopting RBT theory for CSD and financial distress relationship, the study assumes that the signaling theory can be a better foundation for CSD and financial distress relationship. These factors led us to adopt the signaling theory as the base theory.

2.5.1 SIGNALING THEORY

According to the signaling theory, firms attempt to communicate information to less informed people to reduce the information gap (Spence, 1973). The signaling theory indicates mainly three elements sender- signal- and receiver. External parties generally have difficulty getting information about a firm's sustainability efforts (Yang et al., 2021). Disclosing sustainable practices signals a firm's commitment to environmental and social practices. It reflects the company's attitude, values, and practices, resulting in transparency and a better reputation (Yang et al., 2021). The sender (firm) conveys the signal to the market to reduce information asymmetry; by reducing the information gap, the firm benefits by reducing financial costs and increasing its reputation(Baiman and Verrecchia, 1996). The receiver (stakeholders) assumes that the firm is committed to sustainability actions (Corazza et al., 2017).

Moreover, positive publicity about a firm enhances its value and makes it more appealing to society. This image can attract more qualified personnel, customers, and investors, leading to improved financial performance (Uwuigbe, 2018). Firms use sustainability reports to send signals to interested parties, allowing them to make sound decisions (H. Levy and Lazarovich-Porat, 1995). It is beneficial for organizations to gain a competitive edge by giving accurate information to stakeholders by enhancing their value. Further, signaling strength and environment are the two most important variables derived from signaling theory (Connelly et al., 2011; Yang et al., 2021). An ambiguous signal is weak, whereas a strong signal with clear information can result in

a positive stakeholder reaction (Suazo et al., 2011). Hence, dealing with financial disclosure signaling theory would be a better fit than other theories adopted. The study adopted signaling theory to analyze and uncover the black box of the moderating role of GRI compliance in the relationship between CSD and firm value and in assessing the CSD and CFP linkage. In the case of GRI as a moderator, GRI is considered an essential tool in handling sustainability initiatives; hence being GRI compliant conveys a solid signal to the market (D. L. Levy et al., 2010; Yang et al., 2021). The signaling theory elucidates why companies report or disclose positive information about their activities to distinguish themselves from competitors to improve their brand value and reputation. As a result, being GRI-compliant transmits a strong signal and could be crucial in separating the equilibrium between GRI-compliant firms and non-GRI firms.

The researcher adopted the same theory to uncover this linkage while considering the case of CSD and risk (Financial distress). According to Bouslah et al. (2013), two fundamental theories explore the relationship between socially responsible investment and risk. One is risk mitigation, and the other one is overinvestment. The former is predicated on a premise for risk management that draws upon both the stakeholder theory and the utility that moral capital generates (Godfrey et al., 2009; Luo and Bhattacharya, 2009). This theory explains how organizations become more shock-resistant by lowering the likelihood of adverse occurrences. While the overinvestment method is based on the selected behavior of the managers drawn from agency theory, it claims that managers attempt to enhance the socially responsible score to portray the firm as socially committed, increasing the visibility, reputation, and image of the firm (Barnea and Rubin, 2010). The two points of view give conflicting predictions (Chiaramonte et al., 2021).

Nevertheless, neither the stakeholders' nor agency theory provides a compelling justification for how corporate sustainability might be employed to lessen the firm's distress. Although these theories give us a better understanding of the association between sustainability reporting and firm performance, the justification for proposing the information elements is still a question. Hence, the researcher believes the Signaling theory can better assess the relationship between CSD and financial distress linkage.

According to signaling theory, to lessen information asymmetry, firms attempt to disseminate information to less informed people (Spence, 1978). Inferring from the examples of (Connelly et al., 2011; Kirmani and Rao, 2000a), there are two different types of industries: those that disclose and adapt ESG at a higher level (high achievers) and those that disclose merely for the sake of disclosure. Although the firms involved in this were aware of their genuine quality, outsiders (such as investors and customers) were not, which resulted in asymmetric information. As a result, the firm can decide whether to reveal its genuine quality to outsiders. When high-quality firms signal, they obtain a pay-off X; if they do not, they obtain a pay-off Y. Low achievers, on the other hand, get a pay-off A when they signal and pay-off D when they do not seem to. When X >Y and D > A, signaling is a viable strategy for highly disclosing and adapting firms. Hence, this situation causes equilibrium to separate. Outsiders can precisely identify between high- and low-quality performers in these circumstances. Due to these settings, high-quality businesses were encouraged to communicate, while low-quality firms were not. According to the signaling theory, the study assumes that firms that perform well in sustainability disclosure and have higher disclosure ratings gain a competitive advantage by providing accurate information to stakeholders. Businesses use sustainability reports to signal interested parties, enabling them to make informed decisions(Levy and Lazarovich-Porat, 1995). As per the theory, the firms signal the market through sustainability disclosure to close the information gap. Doing so reduces signaling costs and enhances the firm's reputation (Baiman and Verrecchia, 1996). This will eventually enhance the firm's performance by stable cash flow and reducing the chance of default risk.

A conceptual model is developed based on these theoretical frameworks and a literature review. The model addresses some of these shortcomings discovered in earlier studies on the linkage between CSD and CFP. It also tries to address some of the gaps in variable interactions by adopting signaling theory and integrating it with other base theories in this field to overcome theoretical limitations.

2.6 REVIEW OF CSD AND CFP RELATIONSHIP

Analysis of the relationship between CSD and CFP revealed that earlier research in this field concentrated more on the social and environmental aspects of sustainability reporting; subsequently, a shift towards the sustainability concept began as a discussion in examining this relationship. Examining seminal works on this linkage displays the following results. The relationship between CSD and the Firm value of 403 American firms listed between 2006 and 2011 was investigated in a study by (Fatemi et al., 2018). In a nutshell, the results indicated that increased CSD -related disclosure enhances firm value. The findings imply that transparency significantly moderates by reducing vulnerabilities and adverse effects. Moreover, this study also elucidates how businesses utilize CSD to differentiate their equilibrium. In conjunction with financial performance or value, the study offers evidence supporting the claim that voluntary reporting can have several advantages.

The study further expands the literature by illustrating the argument that firms with good CSD performance would report extensively on CSD activities. In contrast, those with a negative CSD performance would choose to report minimally. This paradigm states that firms communicate their CSD performance to stand out from lower performers and prevent adverse effects (Akerlof, 1978). This argument is further supported by Cahan et al. (2015), implying that firms with significant and strong CSD performance can attain more value or lower cost of capital if they receive positive media attention. This finding is credence to the claim that solid CSD performance generates positive publicity.

Conversely, Yu et al. (2018) opined that firms with larger sizes, more liquidity, higher R&D intensity, fewer insider holding, and solid historical financial performance would be more open about CSD issues. Further, the study added that CSD is value relevant; However, the study discovered that CSD and Tobin's Q linkage is non-linear. In light o the study findings, CSD transparency can be viewed as additional information that improves stakeholder satisfaction. The enhanced CSD disclosure will gradually reduce information asymmetry and agency costs.

On the contrary, an evaluation of this linkage in the Brazilian context study by Ching et al. (2017) brings out an exciting finding: there is no association between the quality of sustainability disclosure and the CFP of the firms evaluated. Hence, this result depicts a neutral association between the two. The study argues that the business investment in costly reporting initiatives of sustainability and the unwillingness of the stakeholders to accept the sustainability disclosure could be the possible reason for this neutral effect. Moreover, it adds that the earnings from socially responsible behavior will balance the expense in the market equilibrium.

At the same time, Wasara and Ganda (2019) confirm the benefits of being sustainable adopters. As per the study, implementing social disclosure is advised since it will stimulate firms to take social responsibility seriously while generating financial rewards. In comparison, Wong et al. (2021) explored CSD's impact on Malaysian companies' market value. According to the data, CSD certification increases a firm's value while reducing its cost of capital. These findings highlight the benefits to stakeholders from firms adopting the CSD agenda, consistent with earlier studies in developed economies proving value increase through social responsibility disclosure. The finding also recommends that the equity market is more open to adopting CSD than the debt market. By implication, it indicates that the principal focus in corporate credit decisions might not be CSD transparency.

An analysis of the performance of ESG-indexed firms with others in the Egypt context depicts that the firms listed in the ESG index have a higher firm value. Also, there is a significant positive association between ESG-indexed firms with Tobin's, indicating the significance of sustainability disclosure adoption (Aboud and Diab, 2018). Examining this linkage of Romanian firms, Oncioiu et al. (2020) indicated that integrating financial and non-financial indicators can transform sustainability by creating tangible value for interested parties. Even, Hongming et al. (2020) also support the favorable effect of CSD on firm performance in Pakistan firms. The finding supports the positive effect of the three indicators and the composite form of the sustainability reporting index. This conclusion makes it abundantly evident how economically important it is to integrate corporate sustainability reporting methods into corporate strategy.

In contrast, Jyoti and Khanna (2021), taking into account the Indian context, investigated the effect of CSD on CFP in service sector firms included in the BSE index. A significant negative relationship between CSD and CFP is inferred through panel data regression analysis. The outcomes are consistent for each of the individual sustainability components as well. According to Behl et al. (2022), the impact of CSD – the CFP link differs between economies, industries, and institutional frameworks due to the different legal, societal, and stakeholder expectations. By adopting four waves of cross-lagged panel structural equation modeling, the results show no bidirectional linkage between the firm value on overall and individual elements of sustainability disclosure.

Even then, the last two lags of the coefficient showed a positive association. Indicating relationship between CSD and CFP is negative in the short run and positive in the long run. The plausible explanation given in the literature for this effect is the greater political and institutional instability, regulations, standards on carbon emission and environmental hazards, pollution, and various other social issues relating to wages and other aspects. Developing economies like India take longer to develop intangible resources like corporate culture and reputation (Behl et al., 2022; Odell and Ali, 2016; Odera et al., 2016). Similarly, Maji and Lohia (2023) found a positive impact of sustainability disclosure on firm performance.

Hence a review of the literature covering different continents, including both developed and emerging markets, on the influence of CSD on the firm value, it can be concluded that most studies on the subject have focused on Western economies (Abdul Rahman and Alsayegh, 2021; Kumar et al., 2021; Kuzey and Uyar, 2016; Laskar, 2018). Further, it reveals the lack of academic exploration of the issue, particularly in emerging nations like India. Comparing the results further indicates that this linkage remains an unsolved puzzle.

On the other side, it is observed that sectoral differences or differences in the industry were the main focus of some of the notable studies in this linkage. Brogi and Lagasio (2019) evaluated U.S. firms active from 2000-2016. The results indicate that the association differs between banking and manufacturing firms. Moreover, the banks'

results for that period are highly significant and positively associated with performance. Indeed, solid environmental policies can also fetch profitability in the long run. In contrast, analyzing the industrial firms in the sample reveal that the impact on profitability gradually decreases over time; by implication, CSD should be included in the long-term plan of the business to retain a long-lasting beneficial impact on performance. In summary, these findings also confirm the significance of non-financial reporting tools, which have lately been recognized by several international legislation intended to increase transparency and non-financial disclosure, demonstrating the topic's current relevance in the disclosure.

Consequently, author A. Buallay (2019b) compares manufacturing and banking firms and indicates that CSD positively impacts accounting marketing and operational indicators in the manufacturing sector. At the same time, the result indicates a negative impact on the banking industry. Subsequent studies in this linkage by Al Hawaj and Buallay (2021) conducted a worldwide sectoral analysis of seven industries in this association. The results of manufacturing and retail industries showed a significant and positive effect on CFP.

Indicative of the fact that the manufacturing and retail industries' return on equity generated showed that CSD information outweighs its costs. The intuitive assumption that meeting shareholders' requirements improves a firm’s earnings performance is supported by demonstrating a favorable relationship between CSD and CFP. However, the relationship is the inverse in the banking and financial services industry. The perception can explain the findings among financial institution investors that spending on sustainability reporting is superfluous and disadvantages the firm in the marketplace (Barnett, 2007; D. D. Lee and Faff, 2009). Intangible assets at financial institutions, such as shareholder satisfaction, which is measured by their investment in the firm’s equity, may be adversely affected by sustainability disclosure (D. D. Lee and Faff, 2009). The results remain the same in the IT and financial sectors. At the same time, the tourism sector showed a positive and significant relationship with accounting and market-based measures. While insignificant in the case of Return on equity. The existing literature on CSD and CFP literature primarily focuses on the financial and

service industry. Therefore, a more comprehensive examination of the manufacturing sector will advance the literature. An evaluation of the variables used for the study indicates that several authors used various measurements as a proxy for CSD. Researchers used various measurements to conceptualize and operationalize the concepts of social and corporate sustainability and CFP (Klassen and McLaughlin, 1996). The amount spent on socially responsible activities was employed as a proxy for sustainability reporting in notable studies (R. Sharma and Aggarwal, 2021). Although, some employed a self-made index to evaluate the sustainability reporting (Goel, 2019). On the other hand, most researchers (Atif et al., 2022; Atif and Ali, 2021; Fatemi et al., 2018; J. et al., 2023) have employed the overall rating generated by Bloomberg. In contrast, other studies employed the CRISIL-developed ESG score (Maji and Lohia, 2023). Hence, based on the literature, the current study adopts the Bloomberg rating score as a proxy for CSD. The variable measurement and description are listed in (Table 2.4)

Table 2.4 Measurement and Variable Description of CSD

Variable	Variable Abbreviation	Measurement	Literature support
CSD	Corporate Sustainability Disclosure	Bloomberg rating score for ESG.	(Fatemi et al., 2017; Atif and Ali, 2021, Atif et al., 2022; Wong et al., 2021; Chiramonte et al., 2021; J et al., 2023)
EDS	Environmental Disclosure Score	Bloomberg rating score for EDS	Fatemi et al., 2017; Atif and Ali, 2021, Atif et al., 2022; Wong et al., 2021; Chiramonte et al., 2021; J et al., 2023)
SDS	Social Disclosure Score	Bloomberg rating score SDS	Fatemi et al., 2017; Atif and Ali, 2021, Atif et al., 2022; Wong et al., 2021; Chiramonte et al., 2021; J et al., 2023)
GDS	Governance Disclosure Score	Bloomberg rating score GDS	Fatemi et al., 2017; Atif and Ali, 2021, Atif et al., 2022; Wong et al., 2021; Chiramonte et al., 2021; J et al., 2023)

(Source- Literature review)

While considering the CFP variable, the following ratios are adopted to measure the profitability and value of the firm. The amount of profit a firm makes typically accounts for the majority of how well it performs. The interests of the shareholders provide the

foundation for the metrics used to assess the organization's success. Hence, this study divides corporate financial performance into accounting and market-based measures. At the same time, accounting-based measures depict the profitability of the firm. At the same time, market-based measure indicates the value of the firm. The market-based measure helps to analyze the linkage between CSD and stock market returns(Murray et al., 2006). Several authors used Tobin's q as a variable for market value estimation. Tobin's q represents market aspirations for future earnings (Hou, 2019; Isidro and Sobral, 2019) and also identified Tobis q as capable of valuing intangible assets generated from social activities. Further, Murray et al. (2006) proposed that accounting-based measures better predict social and sustainable disclosure. Moreover, market-based measures are forward-looking measure that depicts future earning aspiration.

In contrast, accounting-based depict backward-looking measures (Javaid and Al-Malkawi, 2018). Hence a combination of both forward and backward-looking measures can better depict the CFP of the firm. Hence based on the literature, the current study adopts the following proxies for estimating CFP are given below in Table 2.5.

Table 2.5 Measurement and Variable Description of CFP

Variable	Variable Abbreviation	Measurement	Literature support
ROA	Return on asset	Net profit divided by total assets of the company	(Ching et al., 2017),(Cherian et al., 2019), Jha and Rangarajan, 2020), Jyothi and Khanna, 2021,
ROCE	Return on capital employed	EBIT divided by Net assets	Jyothi and Khanna, 2021; Jha and Rangarajan, 2020),(Bhatia and Tuli, 2017)
TOBIN	Tobin's Q	Market capitalization plus long-term debt plus short-term debt divided by the total asset.	(Hou, 2019) (Jha and Rangarajan, 2020),(Aboud and Diab, 2018)
EVA	Enterprise value-added	Enterprise value divided by total asset	Jyothi and Khanna, 2021

(Source- Literature review)

According to the literature on examining CSD and CFP linkage, there are two sides to espousing sustainability initiatives. One of the arguments is that implementing environmental disclosure measures comes at a cost, which would harm a business's profitability (Klassen and McLaughlin, 1996). Additionally, it has been viewed as a

burden that enhances the operational cost (McWilliams and Siegel, 2000). On the contrary, a set of experts, on the other hand, argue that sustainability initiatives will provide the potential for long-term survival and growth, contributing to firm value. It should not be considered a cost even though the cost is immediate; the benefit is ephemeral and will appear gradually (Christofi et al., 2012).

Likewise, A. Buallay (2019b) exhibited two different dimensions of sustainability. The first is the cost-generating component, and the second is the value-creating component. The former argument highlights that implementing environmental disclosure policies drains the company's profitability. The second aspect highlights how sustainability disclosure may gain a competitive advantage by improving the firm's overall value. This advantage will be intangible but help the company work more effectively (A. Buallay, 2019b; Orlitzky et al., 2003). Hence the outcomes in this association are assorted or even conflicting. Therefore, the nexus between sustainability reporting and CFP remains unanswered or even inconclusive, specifically in Indian industries. Nonetheless, this connection is untapped in Asian or emerging economies (Behl et al., 2022; Jyoti and Khanna, 2021). Businesses are increasingly concerned about the link between ESG, firm value, and CFP.

The studies exemplified mixed results when it comes to examining this nexus. Several studies have discovered a positive association (Aboud and Diab, 2018; Behl et al., 2022; Fatemi et al., 2018; Wong et al., 2021). Another group of studies uncovers the negative association between corporate sustainability reporting (ESG) and firm value (Behl et al., 2022; Brammer et al., 2006; Uwuigbe, 2018). Similarly (Aggarwal, 2013; Moneva et al., 2007) discovered no link between sustainability and firm value. Moreover, (Behl et al., 2022) also opined that the ESG and firm value association are still indecisive due to the methodologies and legal precedents yielding disparate results.

Examining sustainability and firm performance studies, Gnanaweera and Kunori (2018) found that corporate sustainability performance (CSP) had a substantial and favorable influence on the market-to-book (MTB) ratio in all Asian nations examined. Simultaneously, Uwuigbe (2018) observed that market price per share negatively influences sustainability reporting. Many studies have been conducted on sustainability

disclosure practices and their impact on CFP (Aggarwal and Singh, 2018; Goyal et al., 2013; Laskar and Maji, 2016). Despite several exhaustive efforts, the link between CS and firm performance remains unexplored (Goel, 2019). An evaluation of detailed analysis of the relationship between CSD and CFP exhibits further examination of this association is necessary to obtain more reliable and conclusive results.

2.7 THE ROLE OF GRI COMPLIANCE IN CSD AND CFP LINKAGE

The Global Reporting Initiative (GRI) is an essential platform for informing the public about all the critical sustainability metrics (Global Reporting Initiative, 2013). It has evolved into the global sustainability reporting standard (Roca and Searcy, 2012). Governments, businesses, and other organizations may better analyze and share their impacts on issues like corruption, climate change, and human rights with the help of the Global Reporting Initiative (commonly abbreviated as GRI). GRI is a non-profit organization that operates independently and develops sustainability guidelines.

GRI was founded in Boston in 1997 in response to the public uproar over the environmental damage caused by the Exxon Valdez oil spill. GRI was established to create the first accountability system to ensure firms follow the rules of ethical and environmental behavior. The GRI Guidelines (G1) original release in 2000 offered the first global benchmark for sustainability reporting. The following year, GRI separated into a separate nonprofit organization.

In 2002 the publication of the first iteration of the guidelines (G2) and the relocation of GRI to Amsterdam, the Netherlands, happened. As businesses' interest in GRI reporting and their need for it increased dramatically, the rules were modified and expanded, culminating in G3 (2006) and G4 (2013). In light of the GRI standard, the first global standards for sustainability reporting were created in 2016 as a departure from GRI's prior function as a source of guidelines. Among the most recent GRI modifications and additions are a new set of themes called Standards on Tax (2019) and Waste (2020). Figure 1 below shows a timeline of the many standards that GRI has established from its inception until the year 2022. Due to its adoption, comprehensiveness, reputation, and global visibility, the GRI framework is regarded as the most extensively and often

acknowledged framework for sustainability information disclosure when compared to other frameworks and standards (Dissanayake et al., 2019; Kuzey and Uyar, 2016; Orazalin and Mahmood, 2020).

Figure 2.4 Figure depicting the history of GRI

Even though GRI does not impose obligatory disclosure obligations, adopting the GRI standards will help improve corporate disclosure practices. The GRI standards provide an integrated assessment of environmental, social, and economic issues (Yadava and

Sinha, 2016). Implementing the GRI framework also increases stakeholder participation (Orazalin and Mahmood, 2020; Yadava and Sinha, 2016).

The GRI standards and framework for sustainability reporting heavily emphasize stakeholder participation and communication. Similar to how demands for transparency, responsibility, and disclosure have altered firms' ideas on relationship-building with their stakeholders.

The Global Reporting Initiative (GRI) created a thorough sustainability reporting methodology that is widely used worldwide. Businesses can voluntarily accept the GRI standards to report on social, environmental, and economic sustainability (Global Reporting Initiative, 2006). According to previous research, stakeholder management can benefit from open, sincere, relevant, and well-targeted sustainability communications (Ghanem and Elgammal, 2017). Transparent and well-organized sustainability disclosure may increase stakeholder trust and loyalty and enhance the brand, reputation, and revenue (Furlow, 2014). Due to this, there will eventually be a long-term competitive advantage (Nola Buhr, 2007). However, Alon et al. (2010) argued that failing to report sustainability will result in businesses missing out on lucrative opportunities.

The direct impact of GRI compliance on firm value and GRI compliance as a moderator in CSD and firm value relationships has received little attention in the literature. GRI is considered a universal standard for adopting sustainability. Moreover, Global Reporting Initiative (GRI) guidelines are one of the sustainability reporting organizational standards that have gained the most global adoption (H. S. Brown et al., 2009; Christofi et al., 2012). Hence, GRI is an international standard for documenting and enabling data comparison between firms (Diouf and Boiral, 2017; Widiarto Sutantoputra, 2009). Considering the research on the impact of GRI reporting on financial performance, most articles adopt qualitative terminology while describing the benefits of GRI adoption, such as improved disclosure comparability, trustworthiness, and transparency. There is not much convincing research to support the claim that firms embracing GRI are more likely to become successful. The link between GRI

implementation and financial performance continues to be up for dispute (Belkhir et al., 2017).

According to Bernard et al. (2015), industry-specific research comparing GRI and non-GRI firms showed a significant drop in emission intensity. However, J. Lee and Maxfield (2015) found that GRI reporting has a more profound influence than traditional CSR reporting on both financial and environmental performance. On the other hand, Yang et al. (2021) looked into the advantages of GRI reporting for Chinese public sector firms. The authors' findings show a positive association between GRI adoption and CFP. By implication, the increased firm profitability resulted from adopting the GRI-based framework. Businesses with ties to the regional political scene stand to benefit more from sustainability reporting adhering to GRI.

Findings from the adoption of GRI-based sustainability reporting have been inconsistent. According to several academicians, GRI sustainability reporting improves stock market performance and financial outcomes (Willis, C. A., 2003; Yang et al., 2021). Although some academics contend that GRI is solely used as a tool for reporting procedures rather than as a management tool, implementing GRI rules is difficult, time-consuming, and expensive because it is challenging to gather data for so many different indicators (Lozano, 2006a; Lozano and Huisingh, 2011). Over the past few years, there has been a significant rise in companies using GRI sustainability guidelines. The majority of studies, however, use qualitative terms to discuss the possible benefits of adopting the GRI. Nonetheless, the assertion that firms adopting GRI are likely to be profitable is not backed up by much compelling evidence (Yang et al., 2021).

An examination of the GRI compliance status indicated in the study by Yadava and Sinha (2016) in 2011 and 2012, only 68 of India's 721,719 registered firms prepared sustainability reports, with 104 submitted to GRI. Only twenty reports were comprehensive. Besides, only 11 reports used the GRI 2011 guidelines (Global Reporting Initiative, 2011). Even though most significant firms use the GRI standards to document non-financial data, modifications depend on the country, industry, or stock index (Marín Andreu and Ortiz-Martínez, 2018). As a result, even while firms declare sustainability-related operations, not all are GRI-compliant. As a result, whether CSD

under GRI compliance is beneficial in increasing firm value remains to be investigated. In this regard, the study expects GRI compliance to strengthen the relationship between CSD and firm value.

The literature on the advantages of GRI adoption on firm value is unexplored in the Indian context. Moreover, the firms adhering to the GRI standards also comparatively less. Hence the question of whether the firms adopting GRI can generate more value than the non-GRI firms arise. Hence, the lack of evidence on the direct relationship between GRI and firm value relationship and the moderating role of GRI on CSD and CFP linkage motivated us to explore the moderating role of GRI as a second objective. A dummy variable has been used to measure the moderating role of GRI. The measurement and variable description are depicted in Table 2.6

Table 2.6 Measurement and Variable Description of GRI

Variable	Variable Abbreviation	Measurement	Literature support
GRI	GRI compliance of the firm	1 for GRI compliance, 0 otherwise	Kumar et al., 2021

(Source- Literature review)

2.8 THE ROLE OF FIRM LIFE CYCLE IN CSD AND CFP LINKAGE

The firm life cycle refers to the advancement of business in stages over time. The introduction, growth, maturity, shakeout, and declining stages comprise the most common division of the firm life cycle. The introduction stage is the initial phase of the firm life cycle. The literature demonstrates that while early-stage businesses are often young and have more significant investment potential, they are not profitable enough to generate a profit. Early-stage firms generally finance their investment projects to generate more income and focus on covering up the initial investments. The second stage of the firm life cycle is the growth stage. Hence during this phase, manufacturers can lower their costs through economies of scale as output rises to meet demand, and well-established channels to market will also become much more effective. Once the

firm passes this stage, the next stage is known as maturity. Similar to how economies of scale in the growth stage assisted in cost reduction, manufacturing improvements may result in more effective ways to produce large quantities of a specific product, aiding in even more significant cost reduction. The primary attribute of the maturity stage is that sales volume is still increasing but more slowly. The growth in sales volume will increase more slowly as the mature gets closer to its finish.

Further, fiercer competition exists for customers and market share. As a result, the company now attempts to implement better strategies to contend with the market rivalry. Shake-out and decline are the final two stages of a firm's life cycle. Firms have difficulties like decreased market share, declining sales, lowering pricing, downgrading resources, and managerial skills as they go towards the shake-out and declining stages.

The term firm life cycle was initially used in organizational science literature. Literature exhibits that early-stage firms opt to fund their investment projects. On the other side, established businesses, significantly matured firms, are typically larger. Even though matured firms have additional resources, they have fewer investment options (Trihermanto and Nainggolan, 2020). According to the corporate life cycle theory, businesses progress reliably from one phase to another (Porter, 2008).

Further, each stage is distinct (Miller and Friesen, 1984; Porter, M. E., 2008). Contingent upon where a firm is in the life cycle, its structure, strength, plans, competencies, and cash-flow flow unpredictability will vary. Previous studies have observed and proved the firm's life cycle's significance in shaping choices and policies (Atif and Ali, 2021; Grullon et al., 2002; Hasan and Habib, 2017a). Hence, organizational performance varies depending on the various phases of the firm life cycle (Richardson and Gordon, 1980; Rappaport, 1981). The firm life cycle stages are critical for understanding corporate performance (Anthony and Ramesh, 1992). A firm's earnings requirements fluctuate as it grows from origin to maturity, depending on its capacity to create cash, its growth opportunities, and the risk involved in pursuing those opportunities. The nature of a corporation's precise financial decisions during its life cycle and the changing financing preferences will reflect this. Therefore, as they move through the various stages of their life cycles, firms at the beginning of their life

cycles arguably tend to have higher levels of asymmetric information (La Rocca et al., 2011). By implication, indicating each stage of a firm is entirely different from the other. Considering the literature, the underlying link between social responsibility and financial performance is dynamic, depending on changes in financial fundamentals (such as cash flows, liquidity, and other risks) and prospects available at different times (Al-Hadi et al., 2019). A group of scholars, Atif and Ali (2021), Deangelo et al. (2006), and Faff et al. (2016) observed that organizations use various financial strategies at various stages of a firm's life cycle, and each stage of its lifecycle has varying levels of governance mechanism. As a result, the impact of disclosure processes on CFP is expected to differ depending on the stage of a firm's life cycle. This evidence suggests that sustainability and financial performance relationships may differ depending on the life cycle stage.

The role of firm lifecycle in CSD and CFP linkage is examined in this research, one of the least discussed subjects regarding sustainability disclosure. Though there are studies on the firm life cycle in corporate finance (Rakotomavo, 2012; Trihermanto and Nainggolan, 2020), there is still a paucity of literature on the role of the firm life cycle in CSD and CFP nexus. The literature shows that organizations adopt different financial approaches at various stages of their life cycles and have varying governance mechanisms. Hence, the impact of disclosure policies on CFP is expected to differ depending on the firm's life cycle (Atif et al., 2022). Based on this evidence, the study presumes that the firm life cycle might mitigate the CSD and CFP links. Adopting CSD in different life cycle stages could impact corporate financial performance differently.

Moreover, Managers' strategies also can differ based on where they are in the life cycle. Henceforth, the current study assumes that the firm life cycle plays a critical role in CSD and corporate financial performance. In the past, sustainability research has concentrated chiefly on development, measurement, and the potential connection between sustainability disclosure and corporate financial performance. The moderating role of the firm life cycle focuses on one of the less-discussed topics related to sustainability disclosure.

Authors employed various proxies to ascertain the business life cycle (Can, 2020). For instance (size, retained earnings, asset growth, and firm age are a few examples). The current study employs proxies developed by Deangelo et al. (2006) and Dickinson (2011) both of these measures have been widely cited in the literature to measure firm life cycle (Atif et al., 2022; Faff et al., 2016). The study classifies firms into life cycle stages using cash flow patterns, primarily based on (Dickinson, 2011), which aligns with the theory. Here each element of cash flow (such as operating, investing, and financing activities) represents the firm's risk, profitability, and growth variance. The cash flow proxy employed is a better indicator of a corporation's life cycle. The firm life cycle proxies adopted are listed in Table 2.7.

Table 2.7 Measurement and Variable Description of Firm Life Cycle

Variable	Variable Abbreviation	Measurement	Literature support
Firm life cycle			
INTRO	Introduction stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.	Dickinson (2011); Atif et al., 2021
GROW	Growth stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.	Dickinson (2011) Atif et al., 2021
MATU	Maturity stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.	Dickinson (2011) Atif et al., 2021
SHAKE	Shake-out stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.	Dickinson (2011) Atif et al., 2021
DECL	Decline stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.	Dickinson (2011) Atif et al., 2021
RET/ TA	Firm life cycle proxy	Retained earnings to total asset	DeAngelo et al., 2006; (Al-Hadi et al., 2019); Atif et al., 2021

(Source- Literature review)

Therefore, to classify the various stages of the firm, the present study adopted the (Dickinson, 2011) model of the firm life cycle, as used in previous studies. As a result, cash flow patterns are employed to capture the firm's life cycle stage, and a firm's life

cycle mapping is created by combining operating, investment, and financing cash flows. Dickinson (2011) developed eight different cash flow pattern combinations by capturing the sign of the three forms of cash flows. Based on the pattern created by Dickinson (2011), the present study manually created dummy variables based on the signs and categorized in into introduction, growth, maturity, shakeout, and decline. The study also adopts DeAngelo et al. (2006) life cycle proxy of retained earnings to total asset ratio, which assesses the firm's dependency on external or internal insolvency. This measure is also considered the best proxy for the firm life cycle. Because of the gradual accumulation of earnings and investment activities over time, greater retained earnings indicate the firm is matured, while lower indicates young and growing (DeAngelo et al., 2006). The variable measurement and definition are discussed below.

2.9 CSD AND FINANCIAL DISTRESS LINKAGE

If a firm's financial performance is erratic or starts to fall, or if the return generated is insufficient to pay the principal and interest, the firm is in distress. As a result, distress and improved business performance are two sides of the same coin. Four primary terminologies can be used to describe 'corporate financial distress,' including 'failure,' 'insolvency,' 'bankruptcy,' and 'default' (Altman and Hotchkiss, 2006). Financial soundness and stability are critical indicators of a firm's future success.

Default risk is an essential factor to consider when valuing a firm. The risk of default increases if a firm's cash flow is erratic or it cannot access the market. This risk verifies a firm's earnings stability (Godfrey et al., 2009; Rego et al., 2009) noted that it is conceivable to embrace socially responsible activities as a risk management technique based on the sparse evidence from the literature. By doing this, the firm's reputation is enhanced and shielded from unfavorable political, societal, and regulatory effects. In addition, firms with poor or lower social responsibility policies are substantially more susceptible to idiosyncratic risk (Lee and Faff, 2009). Financially troubled businesses have greater capital costs and fewer outside investment opportunities, which results in low credit ratings. Firms with credit limits highlight the need for capital preservation and credit rating preserve in their contracts(Al-Hadi et al., 2019). As a result, a firm in financial distress may face other serious consequences, including loss of corporate or

executive reputation, increased political or media pressure, the possibility of fines or penalties, and even criticism from customers or creditors (Al-Hadi et al., 2019).

According to Godfrey et al. (2009), investment in socially responsible events acts as amoral capital and helps the firm as a protection against unfavorable events. The study also asserts this initiative can result in positive stakeholder assessments, increasing value and reputation. This results in consistent and stable cash flow, reducing the default risk. Boubaker et al. (2020) evaluated the body of research in this area and investigated the relationship between corporate social responsibility (CSR) and the likelihood of going through financial distress (FD). Using a sample of 1,201 US-listed firms from 1991 to 2012. The results demonstrate that firms with higher CSR levels have lower FDR, which suggests that better CSR performance increases a firm's creditworthiness and enhances its capacity to obtain capital, both of which are reflected in a lower financial default rate. Additionally, this link is more common in businesses with robust governance frameworks and intense rivalry in the product market. Overall, the study's results indicate that employing sustainability practices lowers the chance of financial distress and default, improves financial stability, and makes economies more resilient to crises while also boosting business conditions.

Orazalin et al. (2019) investigated the effect of sustainability reporting on financial stability. They found that increasing a firm's sustainability performance measures can help lower risk and improve its financial stability. Further demonstrating that financially distressed firms had lower-quality ESG disclosures than non-distressed firms, Harymawan et al. (2021) extended this concept further. The results support the idea that financially troubled firms are motivated to enhance ESG disclosure since doing so will improve their financial and market performance. Therefore, this study broadens the scope of past investigations by emphasizing organizations' desire to provide higher-quality ESG disclosure, particularly troubled firms in Indonesia.

Furthermore, Al-Hadi et al. (2019) evaluated the impact of CSR on financial distress using data from a sample of 651 publicly listed Australian firms from 2007 to 2013. According to the econometric findings, successful CSR initiatives significantly lower the firm's financial distress. Similar studies in the US context also demonstrated that

ESD lowers the default risk, lending credence to the literature. Atif and Ali (2021), using a sample of US non-financial institutions from 2006 to 2017, explored the linkage between sustainability reporting and Default risk. Authors discovered that ESG disclosure is positively related to Merton's distance to default and is negatively related to the credit default swap spread, indicating that companies with higher ESG disclosure have lower default risk. Further, the authors added that ESG disclosure negatively impacts default risk through higher profitability, less performance variability, and lower transaction costs. In industrialized economies, studies show CSD effectively reduces firms' financial difficulty (Brown-Liburd et al., 2018). Such analysis is lacking in the context of India (Oware and Appiah, 2021). The dearth of studies assessing the impact of sustainability disclosure on risk mitigation and the relevance of adopting risk mitigation strategies in the manufacturing sector motivated us to undertake this objective. The variable used to measure financial distress and their definition are discussed below in Table 2.8.

Table 2.8 Measurement and Variable Description of Financial Distress

Variable	Variable Abbreviation	Measurement	Database
Financial distress			
Z score	Alt men Z score	Altman Z score collected from Bloomberg	Bloomberg database
FD One year	One-year default probability	Bloomberg probability for the firm's year default	Bloomberg database
FD Two year	Two-year default probability	Bloomberg probability for the firm's two-year default	Bloomberg database
FD Three year	Three-year default probability	Bloomberg probability for the firm's three-year default	Bloomberg database
FD five years	Five-year default probability.	Bloomberg probability for the firm's five-year default	Bloomberg database

(Source- Literature review)

The various studies that examined CSD with CFP and distress association are summarized in Tables 2.9 and 2.10.

Table 2.9 Various Literature and Findings on Sustainability Disclosure and CFP

Year /Authors	Data	Period	Sector	Sample/Size (Observation)	Method	Findings
(Jyoti and Khanna, 2021)	Thomson Reuters database	2014 - 2018	Service sector	28	Panel data fixed effect within the regression	Negative association
(Al Hawaj and Buallay, 2021)	Bloomberg database	2008-2017	Different sector	23738	Multiple regression	Depending on the industry, results vary.
(A. Buallay, El Khoury, et al., 2021)	Bloomberg database	2008-2017	Smart cities	3536	Multiple regression	Positive – with financial performance Negative – Market-based performance
(A. Buallay, 2019b)	Bloomberg database	2008-2017	Manufacturing and Banking sector (Comparative study)	11 705	Pooled data regression under GLM	Positive- Manufacturing Negative- Banking
(Zahid et al., 2020)	Annual reports	2013-2017	Banking Sector	49	Content analysis, OLS, and 2SLS	Social disclosure- Positive impact Environmental disclosure- Negative impact
(Jha and Rangarajan, 2020)	Bloomberg database	2008-2018	S&P BSE 500	5500	Panel regression Causality test	At aggregate level- Insignificant. At the individual level- Negative
(Hongming et al., 2020)	Sustainability report and annual reports	2013-2017	Non-financial public limited companies	50 non-financial firm	OLS, Panel regression (Fixed effect and Random effect)	Positive impact.

(A. Buallay, 2019a)	Bloomberg database	2008-2017	Banking Sector	372	IV-GMM dynamic fixed effects estimation	ESG disclosure-Positive impact Social – Negative impact
(A. Buallay et al., 2020)	Bloomberg database	2007-2016	Financial institution- Bank	3420	Panel regression	Positive impact- market performance. Negative- financial and operational results.
(Orazalin et al., 2019)	Sustainability reports and Annual reports	2012-2016	Oil and Gas	181	Panel regression	Improving sustainability mitigates risk and financial stability.
(Wasara and Ganda, 2019)	Sustainability reports	2010-2014	Mining Industries	50	Panel regression Fixed and Random effect	Environmental disclosure-Negative impact Social disclosure- Positive
(A. Buallay, Fadel, et al., 2021)	Bloomberg database	2006-2017	Banks	2350	Panel regression	Positive
(Soytas et al., 2019)	CSRHUB database	2010 - 2013	Mining, Construction, Transportation, Service, etc.	1668	OLS and IV regression	Positive
(Laskar, 2018)	Sustainability Reports	2010-2015	Non-financial firms in India and South Africa	28 – India 26- South Korea	Random GLS	South Korean- Positive Indian context - Negative
(Brogi and Lagasio, 2019)	MSCI, ESG, KLD STATS	2000-2016	Banks, Insurance, and Industrial firms	17 358	Multiple regression Analysis	Positive association

(Source- Literature review)

Table 2.10 Various Literature and Findings on Sustainability Disclosure and Corporate Financial Distress

Year /Authors	Data	Period	Sector	Sample/Size (Observation)	Method	Findings
(Harymawan et al., 2021)	Annual reports and sustainability reports	2010-2018	Non-financial firms	459 firm-year observation	OLS Probit regression	Financially distressed firms have lower disclosure quality
(Oware and Appiah, 2021)	From BSE website	2010-2019	80 large firms in India	800 firm-year observation	Hierarchical regression, Probit, and Panel probit regression	Firms with assurance are less likely to stay in the financial distress zone.
(Farooq et al., 2022)	Annual reports	2008-2019	Non–financial firms	139	Panel logit regression GMM)	Investment in CSR reduces the level of distress
(Atif and Ali, 2021)	Bloomberg	2006-2017	Non-financial firms	5206 firm-year observation	OLS, 2SLS, Multivariate regression	Negatively related to the credit default swap spread and positively correlated distance to default.
(Boubaker et al., 2020)	World scope DataStream	1991- 2012	US-listed firms	1201	Regression 2SLS, GMM	Higher levels of CSR lower financial distress
(Shahab et al., 2018)	Rankins rating from the HEXUN	2009 -2014	Different industries in China	3343 firm-year observation	Regression	Solid environmental performance strategically reduces the severity of business financial distress.
(Al-Hadi et al., 2019)	Annual reports	2007-2013	Public listed firms	93 firms	OLS and 2 SLS	Positive CSR activities reduce the chance of default.

(Source- Literature review)

2.10 RESEARCH GAP

After analyzing the literature, it is observed that India's practice of sustainability disclosure is still developing (Bel et al., 2022; Jyothi and Khanna, 2021; Laskar, 2019; Goel, 2019). Moreover, this association is predominantly examined in the service and financial industries. There is a paucity of studies in the manufacturing sector. The manufacturing sector is the primary cause of environmental degradation and other environmental challenges, including biodiversity loss, climatic change, and even resource exploitation, despite being one of the most critical drivers of economic advancement and prosperity (Alam et al., 2016). So, the implementation of reporting requirements in the manufacturing sector and structural reforms provide an exciting line of inquiry into the implications of this connection in the Indian manufacturing sector. Similarly, implementing sustainability reporting by the manufacturing sector is still under investigation despite increased discussions about implementing sustainability reporting (A. Buallay, 2019b).

In the Indian context, the literature on the benefits of GRI adoption on business value was minimal. Additionally, the businesses that follow the GRI guidelines are significantly fewer. Thus, the question of whether firms that embrace GRI can provide enhanced value rather than those that do not arise. Therefore, the study gains relevance. Further, the lack of data about the direct association between GRI and firm value and the moderating role of GRI in the CSD and CFP relationship has motivated the current study to fill the knowledge gap.

One of the less-discussed topics concerning sustainability disclosure is the role of the firm lifecycle in the CSD and CFP connection. Despite research on the firm life cycle in corporate finance (Rakotomavo, 2012; Trihermanto and Nainggolan, 2018), the literature on the firm life cycle's function in the CSD and CFP nexus is still underexplored. According to the research, organizations use distinct financial strategies and have unique governance structures at different points in their life cycles. Therefore, depending on the firm's life cycle, the effect of disclosure regulations on CFP is anticipated to vary (Atif et al., 2022). Based on this evidence, it is presumed that the

firm life cycle might mitigate the CSD and CFP links. Using CSD during various life cycle stages may have varied effects on the firm's financial position.

Furthermore, strategies taken by managers may also differ depending on where they are in the life cycle. Hence, based on the evidence, it is assumed that the firm life cycle significantly influences CSD and corporate financial performance. To fill in this gap study examined the role of the firm life cycle in the CSD and CFP nexus.

Another aspect of stabled performance is financial distress. Research examining how CSD may affect the firm's financial distress or default risk has received little attention. Even a small number of research in this area focused on advanced economies (Atif and Ali, 2021; Cerqueti et al., 2021; Chiaramonte et al., 2021). The importance of the business lifecycle and the link between CSD and financial crisis are two less-discussed issues concerning sustainability disclosure. Therefore, the paucity of research on the relationship between CSD and financial distress and defining the function of the business life cycle in this association is undertaken in this study to fill the knowledge gap.

2. 11 HYPOTHESES DEVELOPMENT

2.11.1 SUSTAINABILITY DISCLOSURES AND CFP

Borrowing from signaling theory, it is argued that sustainability reporting portrays the signaling fit of firms that invest in sustainability-related initiatives (Y. Zhang and Wiersema, 2009). The signaling fit refers to the correlation between the signal and its unobservable quality (Sigurdsson et al., 2020). If firms engage in sustainability activities, such companies' signaling fit would be strong because investors trust the signaling honesty of those firms that engage in sustainability-related activities. Signaling honesty refers to the trust in the signaler's possession of the unobservable quality (Connelly et al., 2011). If firms command signaling fit and signaling honesty, they will lose signaling reliability (Connelly et al., 2011). The strength of signaling reliability concerning firms' intent regarding sustainability-related activities will strengthen the positive association between sustainability reporting and its value, eventually leading to a stable income.

Scholars articulate two sides to the idea, which espouses the need for sustainability initiatives. The first argument states that implementing environmental disclosure entails cost, which harms a business's profitability (Klassen and McLaughlin, 1996). Additionally, scholars view it as a burden that enhances the operational cost (McWilliams and Siegel, 2000). On the contrary, some experts argue that sustainability initiatives contribute to long-term survival and growth potential, thus facilitating increased firm value. Hence, scholars say adopting CSD should not consider a cost (Christofi et al., 2012). The benefit manifests gradually despite the immediate cost (Evans and Jack, 2003). Despite reducing current profitability, literature shows that CSD disclosure promotes profitability, goodwill, and reputation over the long term (Ng and Rezaee, 2015).

Additionally, firms with excellent governance and social and environmental responsibilities are anticipated to perform better financially, create shareholder value, and inspire confidence in the public and investors (Ng and Rezaee, 2015). Examining sustainability factors, including the environment, the economy, and governance, reveals that environmental issues like lowering emissions or energy costs require a substantial initial outlay of capital. However, they eventually reduce the ecological obligation (Salehi and Arianpoor, 2020). The results of most of the studies support the value-creating aspect of sustainability disclosure. Even though sustainability practices are complex in the manufacturing industry, green production does not involve colossal outlay compared to the outcome of adopting sustainability (Albertini, 2013). Further, sustainability reporting positively impacts the manufacturing industry's profitability and value (A. Buallay, 2019b). Hence, the study expects a significant association between sustainability disclosure and CFP in the manufacturing sector. Even Thus, the study hypothesizes:

$H_{1:}$ Corporate sustainability reporting (CSD) has a significant association with the corporate financial performance of the Indian manufacturing sector.

2.11.1.a. Environmental Disclosures and CFP

Following the resource-based paradigm, there is strong evidence that environmentally sustainable performance influences competitive advantage and firm financial performance (Behl et al., 2022; Christmann, 2000; S. Sharma and Vredenburg, 1998; Waddock and Graves, 1997). According to the conventional view, environmental regulations put additional costs on industries, which could reduce their profitability. However, Porter contends that implementing environmental programs will encourage businesses to innovate in management and technology. This will increase effectiveness, cutting costs and ultimately increasing the firm's earnings (Xie et al., 2019).

While investigating the relationship between environmental disclosure and CFP, most research indicates a favorable link (Brogi and Lagasio, 2019). At the same time, certain studies discovered a short-term negative impact of the environmental score on firm value suggesting a long-term beneficial link (Behl et al., 2022). Further, integrated practices not only create opportunities for better tangible and intangible resources, such as know-how and technology, but they also assist businesses, particularly manufacturing firms, in lowering future regulatory costs and enhancing overall operational effectiveness (Ambec, S., and Lanoie, P., 2008; Hart and Milstein, 2003). Hence based on this evidence, the study expects a significant association between sustainability disclosure and CFP of the manufacturing sector. Thus, the study hypothesizes:

$H_{1a:}$ Environmental disclosure (EDS) has a significant association with the corporate financial performance of the Indian manufacturing sector.

2.11.1.b Social Disclosures and CFP

According to signaling theory, insiders are more inclined to engage in sustainability activities and reporting if they anticipate that their firm will perform well financially due to an excellent macroeconomic environment (Connelly et al., 2011; Kirmani and Rao, 2000; Spence, 1973). According to the signaling hypothesis, signalers adjust their signals as they are being sent based on the opinions of their peers. In this situation, investors have enough faith in firms' sustainability reporting.

Moreover, following the 'social impact hypotheses of the stakeholder theory,' exceeding employee and customer expectations will improve a firm's reputation and image. Ultimately, this will help the firm's financial performance (Alturki, 2014). Likewise, socially conscious activities assist in lowering the cost of capital, which leads to enhanced financial performance (Dhaliwal et al., 2011). Moreover, improved socially responsible efforts of the firms enable them to assume less financial risk, improving economic stability and government relations (McGuire et al., 1988). Further, the manufacturing sector has a significant link between socially responsible performance and disclosure tone in earnings management (Lu et al., 2019). Hence, based on the literature, corporate social disclosure is expected to have a significant relationship between social disclosure and CFP in the manufacturing sector.

$H_{1b:}$ Corporate Social Disclosure (SDS) has a significant association with the corporate financial performance of the Indian manufacturing sector.

2.11.1.c Governance Disclosure and CFP

The association between corporate governance and corporate financial performance has been the subject of ongoing research. The agency cost hypothesis has been employed as the primary theory for this relationship (Fama and Jensen, 1983; Jensen and Meckling, 1976). A shred of solid evidence from a range of studies showed a strong association between different corporate governance measures and corporate financial performance (Kumari and Pattanayak, 2017; Sarkar, J and Sarkar, S, n.d.). This is supported by (Claessens and Fan, 2002), indicating that improved corporate governance mechanism enhances return on equity by improving firm performance.

A set of scholars argued that various governance indicators impact firm performance (Yameen et al., 2019). In their study, firm performance varies according to the board size. Businesses will have more access to a variety of resources when there are more directors on the board than if there were fewer. With more board members and directors, more skilled and experienced individuals will be available, resulting in cautious decision-making and improved performance. Examining the role of women on board with firm financial performance, firms with female directors have better financial

performance and create value in business (Isidro and Sobral, 2019). Based on all this evidence, the present study examines a significant association between corporate governance and corporate financial performance. Hence, the study hypothesizes.

$H_{1c:}$ Corporate Social Disclosure (SDS) has a significant impact on the corporate financial performance of the Indian manufacturing sector.

2.11.2 SUSTAINABILITY DISCLOSURES AND FIRM VALUE

There are two different dimensions of sustainability (A. Buallay, 2019b). The first is the cost-generating component, and the second is the value-creating component. The former highlights that implementing environmental disclosure policies drains the company's profitability. The latter highlights how sustainability disclosure may contribute to competitive advantage by improving the firm's overall value. Though this advantage remains intangible, it helps the firm work effectively (A. Buallay, 2019b; Orlitzky et al., 2003). Drawing from the studies conducted in the Indian context, improved sustainability disclosure positively signals a firm's reputation, which enhances the firm's creditworthiness and lowers the cost of capital (Bhattacharya and Sharma, 2019). Besides, the firm value will increase due to improved stakeholders' transparency and accountability by disclosing sustainability. Interestingly, there was a negative impact of sustainability disclosure on firm value in the short run in the Indian oil industry. Still, this effect turned out to be positive in the long run (Behl et al., 2022).

The results of most of the studies supported the value-creating aspect of sustainability disclosure. Hence, the current study expects a significant association between sustainability disclosure and firm value. Thus, the study hypothesizes:

$H_{2:}$ Corporate sustainability reporting (CSD) has a significant association with firm value in the Indian manufacturing sector.

2.11.2. a. Environmental disclosure and firm value

From the standpoint of the signaling theory, the study argues that high-quality firms derive their motivation for sustainability reporting because of a specific pay-off.

However, this requires differential signaling costs for high-quality firms. However, low-quality firms may not display a willingness to incur differential costs. Besides, they may also find it challenging to afford additional expenditure to convey positive signals. Such unwillingness or inability to spend on differential signal costs will probably lead to low signal observability (Ramaswami et al., 2010). Thus, the low-quality firms fail to attract receiver attention, which implies the "extent to which receivers vigilantly scan the signaling environment" (Connelly et al., 2011).

Environmental and social concerns influence businesses to play a more transparent and credible role. Many scholars argue that environmental reporting hurts the firm's profitability due to the increased cost of undertaking such an initiative. In contrast, some cite evidence of high profitability by adopting environmental disclosure practices (Klassen and McLaughlin, 1996). For instance, Clarkson et al. (2011) argue that environmental reporting improves polluting industries' financial performance and value.

Additionally, environmental accounting typically provides helpful evidence on sustainable performance that helps gain legitimacy among stakeholders (Cantele et al., 2018). In this regard, (Konar and Cohen, 2001) observe a significant increase in the intangible asset value of firms through improved environmental disclosure. Hence, the study expects a significant association between environmental disclosure and firm value. Thus, hypothesizes:

$H_{2a:}$ Environment disclosure has a significant association with firm value in Indian manufacturing firms.

2.11.2.b. Social disclosure and firm value

The social dimension of ESG reporting is concerned with how a firm's actions affect the social system in which it operates. Publicly traded firms fund socially responsible activities that do not increase the present value of firms' future cash flow (Mackey et al., 2007). Further, a firm's investment in socially responsible activities can prove detrimental (López et al., 2007). Even then, guidelines that integrate sustainable goals can help the company survive and generate long-term value. In this connection, a study

by Prasad in 2022 showed that enhanced socially responsible performance decreases the cost of debt. Firms reveal more socially accountable behavior to protect their image and increase visibility (Prasad et al., 2022). Subsequently, this helps firms to maintain their reputation and value (Kansal et al., 2014). Hence, the current study hypothesizes:

$H_{2b:}$ Social disclosure has a significant association with firm value in Indian manufacturing firms.

2.11.2. c. Governance disclosure and firm value

The signaling theory states that signal observability is a crucial criterion for determining the signal's effectiveness (DesJardine et al., 2020). Signal observability implies a noticeability of the signal. As a result, sustainability reporting inspires higher investor confidence in firms and a consequent increase in firm value. The linkage between governance and value indicates a positive association. For instance, the governance index strongly correlates with stock market returns (Gompers et al., 2003). Besides, independent directors enhance the quality of sustainability reporting, which implies that the Board's independence improves transparency and disclosure quality (Naciti, 2019). Accordingly, higher governance standards reduce the cost of equity, enhancing the firm's value (Asbaugh et al., 2004). Consequently, improved governance strengthens transparency and ranking, resulting in higher stock market returns (Durnev and Kim, 2005). Most studies found a significant relationship between governance and firm value (Aboud and Diab, 2018; Siagian et al., 2013). Hence, the present study hypothesizes

H_{2c}: Governance disclosure has a significant impact on the firm value of Indian manufacturing firms.

2.11.3 GRI COMPLIANCE AND FIRM VALUE

The separating equilibrium hypothesis of signaling theory suggests the emergence of investors' cognitive possibility to differentiate GRI-compliant firms from those firms that are not GRI-compliant. Suppose GRI-compliant firms receive a pay-off *'x'* because they convey a positive signal about themselves by being GRI-compliant. Also, assume that they do not receive a pay-off *'y'* when they do not send such signals because they

are not GRI-compliant. In this scenario, the GRI-compliant firms receive motivation to be GRI-compliant. However, if it is assumed that the non-GRI-compliant firms accept a given pay-off, whether they adopt GRI reporting. In this scenario, the non-GRI-compliant firms are not incentivized to adopt GRI reporting. Besides, if the GRI-compliant firms receive a pay-off higher than the non-GRI-compliant firms, they receive an additional incentive to follow the GRI reporting mechanism.

CSD indicators are reported using a variety of measures and standards. According to the Global Reporting Initiative, sustainability reporting demonstrates a firm's obligation to a sustainable global economy and assists organizations in measuring, understanding, and communicating their economic, societal, and environmental performance. The Global Reporting Initiative is the most widely used global standard for documenting CSD. In terms of adoption, completeness, prominence, and discoverability worldwide, the GRI approach has been considered the most globally acknowledged mechanism for CSD practices, among various other tools and frameworks (Dissanayake et al., 2019; Kuzey and Uyar, 2016). Additionally, the GRI guidelines do not impose any mandatory disclosure obligation. Firms that use CSD do not need to be GRI compliant. According to sample data, most of the sampled firms disclose CSD. However, only forty-six percent of manufacturing firms comply with GRI. Various stakeholders consider GRI compliance essential, enabling the firm to engage in better and standardized ESG reporting practices (Roca and Searcy, 2012).

The literature is still inconclusive regarding the GRI's benefits. Concerns about GRI compliance, financial performance, and firm value are continuously discussed and debated. However, this relation has limited empirical evidence (Belkhir et al., 2017). GRI-based CSD is assumed to improve information quality. GRI-compliant firms convey a stronger signal to their stakeholders than those firms that are not GRI-compliant. Hence, GRI-compliant actions also legitimize the firm's activities and thus send a solid signal to the stakeholders (Yang et al., 2021). Besides, GRI-compliant firms show a more consistent average score than non-compliant firms (Governance and Accountability Institute, 2017). In addition, GRI compliance contributes to separation equilibrium, allowing stakeholders to differentiate between GRI-compliant and non–

GRI compliant firms. Hence, the present study expects a significant association between GRI compliance and firm value. Thus, the current study hypothesizes:

H_2d: GRI compliance has a significant relationship with firm value in the Indian manufacturing sector.

$H_{2e:}$ GRI compliance moderates the relationship between CSD and firm value such that the firm value increases when a firm's CSD is GRI compliant.

2.11.4 THE ROLE OF THE FIRM LIFE CYCLE IN CSD AND CFP LINKAGE

There are a minimal number of research studies that observed how the firm life cycle affects non-financial reporting. The life cycle hypothesis states that when a corporation moves through different stages of the firm life cycle, systematic changes occur in its investing, operating, and financing activities, factor endowments, strategies, proficiencies, and risk preferences. A firm's structure, strength, strategies, capabilities, and cash-flow predictability vary depending on the stage of its life cycle (Atif and Ali, 2021). Therefore, the study assumes firm life cycle influences the link between CSD and CFP. Thus, the study hypothesizes that,

H3: Firm life cycle has a significant and moderating relationship with CSD and CFP.

Considering the introduction stage, or early stages of a firm life cycle, businesses lack existing clients during this phase. Further, a lack of understanding of anticipated sales and costs results in negative operating cash flows (Dickinson, 2011). Hence the direct effect of the introduction stage on profitability is considered negative in the previous literature. Further, industries lack stable resources, and the ability to compete with their counterpart in the early life cycle phase is limited (Spence, 1978). Due to concerns regarding future cash flow, firms in the early phases of life may have a high cost of capital and may have trouble raising additional financing (Hasan et al., 2015).

Regarding the interaction effect of CSD with the introduction stage, corporate sustainability disclosure is considered a tool that increases profitability and firm value (A. Buallay, 2019b; Fatemi et al., 2018). Hence, firms with better governance and social

and environmental responsibilities are projected to perform better financially, produce shareholder value, and gain public and investor confidence (Ng and Rezaee, 2015). Additionally, embracing sustainability and being ethical benefits the company (Turcsanyi and Sisaye, 2013). Adopting sustainability disclosure will make it possible to implement more robust standards and proactive cost-cutting. Moreover, perceiving the firm's environmental or ecological visibility will give it a competitive advantage (Morhardt et al., 2002). Therefore, being socially responsible can benefit the company by allowing it to access capital sources and obtain better terms from suppliers. For instance, according to (Moussavi, F., and Evens. D., 1986), a firm with a high reputation for socially responsible initiatives may experience few labor issues and have a satisfied client.

Further engaging in socially conscious business practices can help the firm gain reputation among key stakeholders, including bankers, government officials, and investors. The economic advantage might result from improved interactions with these stakeholders. Similarly, analyzing the impact of CSD on firm value, firms are less likely to consider sustainability adoption during the early stages since reputation costs and financial reporting effects are less important than gaining needed capital for survival, growth, innovation, and long-term financing in the earlier stages (Can, 2020). Hence based on the literature, the study assumes the interaction effect between CSD and the introduction stage is favorable.

H_{3a} = *Introduction stage has a significant impact on CSD and firm profitability.*

H_{3b} = *Introduction stage has a significant impact on the relationship between CSD and firm value.*

Similarly, when the firm reaches the growth stage, firms are considered less risky and more profitable; even though the firm lacks material, technological, and financing resources, these firms will have more enormous investment opportunities than mature firms (Dickinson, 2011). While seeing the direct effect of the growth stage on corporate financial performance due to the lack of material technology, financing resources, and high capital expenditure, the literature shows a negative association between the growth

stage and profitability. On the other hand, considering the moderation effect, integrating sustainability and social responsibility into a firm's strategic planning implicitly promotes long-term financial performance (Turcsanyi and Sisaye, 2013). Moreover, being ethical (adopting ESG) strengthens the firm. Also, customers prefer socially responsible firms' products over rivals, owing to their social mission, enabling them to acquire market share and expand revenue (Cornell and Damodaran, 2020). Further, in the growth stage, CSD can be adapted to draw outside funding. Hence based on the literature, the present study assumes that the interaction effect between CSD and the growth stage is favorable to corporate financial performance.

H_{3c}= *Growth stage has a significant and moderating impact on the relationship between CSD and firm profitability.*

$H_{3\ d}$ = *Growth stage has a significant and moderating impact on the relationship between CSD and firm value.*

After the growth phase, the next phase is considered the maturity phase. At the same time, the maturity stage positively impacts profitability. The positive relationship between the maturity stage and profitability is influenced by sufficient well-resourced business and competitive advantage. Firms may achieve a competitive edge during maturity by streamlining resource allocation, capability development, and maintenance (Gray and Ariss, 1985; Helfat and Peteraf, 2003). In this phase, having more resources, especially knowledge experience, may allow firm management to focus on protecting their reputation and investment (Hasan and Habib, 2017b; Jovanovic, 1982). Hence firms at this phase are likely to impact profitability positively. The mature organization has fewer investment opportunities than growth firms regarding investment opportunities. In addition, the shortage of investment opportunities outweighs the issues of overinvestment (Dickinson, 2011). The comparison of the younger or declining firms with matured firms is more concerned with the reputational effects of their actions and how they intermingle with critical stakeholders comprising regulatory authorities. Henceforth, firms in the maturity phase will likely adopt or engage in sustainability disclosure (Hasan and Habib, 2017b). While considering the moderation effect due to the enormous resources, technical and managerial know-how, and favorable aspects of

CSD, the current research study assumes that CSD and maturity positively influence profitability. Moreover, sustainability adoption in the growth and mature stage could impact cash flows favorably. Therefore, the current study expects that adopting sustainability reporting in maturity will significantly impact the profitability and value of the firm.

$H_{3\,e}$ = Maturity stage has a significant and moderating impact on the relationship between CSD and firm profitability.

$H_{3\,f}$ = Maturity stage has a significant and moderating influence on the relationship between CSD and firm value.

The last two phases of the firm life cycle are shake-out and decline. As the firm progress towards shake-out and declining stages, firms face challenges such as reduced market share, dropping sales, lowering prices, downgrading resources, and managerial expertise. Moreover, even in the shake-out stage, firms lack adequate resources and investment opportunities; therefore, the immediate impact of the shake-out stage on profitability is likely to be negative. This will result in a shaky financial performance, leading to unstable cash flows (Dickinson, 2011; Hasan and Habib, 2017b; Wernerfelt, 1984). Hence the literature exhibits a negative association between shake-out and declining stages with profitability. On the other hand, considering sustainability, according to stakeholders' theory, a firm's socially accountable actions are the best way to gratify varied stakeholders by combining ethical aspects to wealth creation (Benlemlih, 2014). Additionally, firms realized that taking on more environmental and social accountability and responsibility would help them perform better.

Nonetheless, the introduction declining and shake-out stage will not influence firm value since capital for existence, stabilizing the sales, capturing the market share, and improving profitability by reducing cost were much more important in these stages. Hence, it is assumed that adopting CSD in the declining phases of the firm life cycle helps the firm to perform better in terms of profitability. Hence based on the literature, the current study expects the moderation effect of CSD with shake-out, and the

declining stage could be significant in case of profitability. The current study hypotheses that

$H_{3\,g}$ = Shake-out and declining stage have a significant and moderating impact on the relationship between CSD and firm profitability.

$H_{3\,h}$ = Shake-out and declining stage have a significant and moderating impact on the relationship between CSD and firm value.

2.11.4. CSD AND FINANCIAL DISTRESS

The signaling theory is employed in this study to explore whether corporate sustainability disclosure helps mitigate a firm's default risk. The study assumes that by including improved rating and sustainability in corporate sustainability, the disclosure will aid the company in establishing a distinction between high performers and underperformers.

Based on the literature, the study expects that considering the shareholders and debt holders, shareholders are seen as residual claimants when comparing them to debt holders, who are non-residual claimants and have a definite claim against the firm. This suggests that the debt holder will exercise caution in assessing the short-term and long-term risks a firm would experience (Anderson and Mansi, 2009). Default risk is one of the elements that trouble debt holders the most as it is closely related to their welfare (Sun and Cui, 2014). Debt holders are not the only stakeholders who evaluate the danger of a corporation defaulting. According to earlier studies, valuing a corporation and determining its liquidity typically require evaluating its debt risk (Brealey et al., 2008). Additionally, research shows a link between excessive distress and low stock return (Campbell et al., 2008; Sun and Cui, 2014). Consequently, along with debt holders, shareholders should have one of their key concerns, i.e., the risk of default.

Literature suggests that CSD is viewed as a strategic investment in the firm's reputation when assessing financial distress and CSD or ESGD (environmental social and governance disclosure) association. Adopting CSD is considered a strategic investment in long-term value creation (McWilliams et al., 2006). Moreover, it is intrinsically

linked to customer satisfaction and brand value, enhancing profitability and sales (T. J. Brown and Dacin, 1997; Luo and Bhattacharya, 2009). This will result in a steady cash flow, reducing the chances of default. However, cash flow directly influences a firm's propensity to default because it makes operations more accessible and keeps the business from going bankrupt (D'Aveni and Ilinitch, 1992). Consequently, it is anticipated that the CSD's cash flow-related functionality will reduce the likelihood of firm default.

Further, socially responsible investment stabilizes financial performance by enhancing the firm image and reputation and responds well in connection with the government and financial markets (Cornell and Shapiro, 1987; McGuire et al., 1988). CSD disclosure keeps the cash flow stable and reduces default risk. Businesses may fail when cash flow is erratic because sporadic income flows result in cash shortages for essential needs (Chava and Purnanandam, 2010). Corporate sustainability disclosure increases brand equity and builds customer loyalty and trust, resulting in stable income and profitability and less volatility in the cash flow, especially during adverse events (Godfrey, 2005; Godfrey et al., 2009). At the same time, the risk argument approach supports the claim that a firm that adopts and publishes socially responsible doings would look out for the interest of its shareholders, potentially reducing the risk of experiencing financial distress (Al-Hadi et al., 2019). Furthermore, performance variation is less likely to happen when there is a steady cash flow. Therefore, ESG disclosure serves as a type of "assurance" for firms, preventing default by ensuring steady cash flows (Atif and Ali, 2021). Therefore, the study anticipates that adopting sustainability will help reduce the firm's distress. Thus, the present study hypothesizes

H_4: Corporate sustainability reporting (CSD) has a significant association with financial distress in the Indian manufacturing sector.

2.11.4.a. Environmental Disclosure and Financial Distress

According to the signaling hypothesis, it is contended that high-performing companies were concerned about environmental sustainability and were motivated to report the same because of a positive advantage that sets high-environmentally committed firms

apart from their rivals. However, this type of disclosure entails an extra expense that high-performing firms can afford but that low-performing firms might not be willing to bear. Low signal observability will likely result from this refusal or incapacity to pay differential signal costs (Ramaswami et al., 2010). The extent to which receivers vigilantly monitor the signaling environment implies that low-quality firms do not draw receiver attention. As a result, high-quality firms will garner high brand equity and foster consumer loyalty and trust, leading to stable revenue and profitability, eventually resulting in steady cash flow and a low risk of default. Investors and creditors are paying more attention to a firm's environmental performance since poor environmental performance typically has financial repercussions. The literature discusses how environmental performance is crucial in lowering firm risk and enhancing financial stability (Jia and Li, 2022). Further, the authors also argued that environmental performance would aid in easing financial distress. For instance, high environmental performance is always linked to lower firm risk (Cai et al., 2016). Moreover, a lower cost of capital and less capital-related strain will alleviate financial distress (Cheng et al., 2014; Sharfman and Fernando, 2008). Solid environmental performance can also fetch better stakeholder relationships, lessening financial distress. Moreover, the inverse relationship between environmental performance and the likelihood of financial hardship is more apparent for firms with higher risk (Jia and Li, 2022). Further, (Shahab et al., 2018) also demonstrate that improvement of environmental policies is likely to strategically lessen the severity of business financial distress through improved environmental performance. Hence, based on the theory and literature, the current study assumes a significant relationship between environmental disclosure and financial distress.

$H_{4\,a:}$ Environmental disclosure score (EDS) has a significant association with financial distress in the Indian manufacturing sector.

2.11.4.b. Social Disclosure and Financial Distress

Firms' treatment regarding the community and social aspects has attracted media notice. This reduces information asymmetry and improves stakeholders' perception regarding the firm's social engagement with media coverage (Farooq et al., 2022). As a result, this

would help high-performing companies convey sustainability as a solid signal to the market. When a firm makes its socially responsible endeavors or disclosures known to the market, it gives the information a competitive edge when used to make decisions (Spence, 1978). Therefore, a clear message is considered a strong signal that produces a favorable response from stakeholders (Suazo et al., 2011). Research demonstrated that socially responsible business practices encourage stakeholders to understand a company's social and community responsibility (Verrecchia, 1983). High achievers can set themselves apart from the competition by sending a strong signal with a clear message while bearing the extra expense of disclosure. According to studies on the relationship between social responsibility and financial distress, investing in socially responsible activities will lower the chance of default or financial distress(Al-Hadi et al., 2019; Farooq et al., 2022), which would also raise one's credit score (Attig et al., 2013). Hence based on the theory and literature, the present study hypothesizes

$H_{4\,b:}$ Social disclosure score (EDS) has a significant association with financial distress in the Indian manufacturing sector.

2.11.4.c. Governance Disclosure and Financial Distress

Consistent with signaling theory, the present research argues that the firms doing well in governance (high governance rating firms) communicate their high quality to their potential investors. Hence, they claim that the firm's governance practice and the board's excellent management can enhance its value. A central thread of the signaling theory is that the signal must be observable and known in advance so stakeholders can decide on any event (Certo et al., 2001). This will lead to effectively utilizing the signal by the informed party. Hence, as per the theory, it will be difficult for low-performing corporate governance firms to signal since such signals are costly. Moreover, the weaker signal creates confusion which results in adverse stakeholder reactions. Higher governance rating firms send positive information that it is being appropriately managed, eventually resulting in consistent cash flow investment, likely reducing the chances of default. Whether corporate governance traits will aid in lowering financial distress is a subject of intense study and discussion. Many studies have been carried out in this association to answer this question. Further, it is also observed that firms with

poor governance mechanisms are more susceptible to economic downturns and more likely to experience financial hardship (T.-S. Lee and Yeh, 2004). Implying a solid governance mechanism can lower the risk of default. At the same time, a study by Wang and Deng, 2006 discovered that state ownership, substantial shareholder ownership, and the proportion of independent directors are connected adversely with the probability of distress (Wang and Deng, 2006).

Similarly, it is also noted that board composition and ownership structure are diffusely connected with the likelihood of financial distress, indicating this has the potential to lower and increase the likelihood of default of sampled firms (Gerged et al., 2022). Further, the author added that the chance of financial distress is adversely affected by institutional ownership, board gender diversity, audit committee independence, and board independence. In its place, ownership concentration has a positive relationship with financial difficulty. Based on the previous study, it is evident that a solid governance mechanism will reduce the default. Hence based on the literature and theory, the present study hypothesizes that.

$H_{4\ c:}$ Governance disclosure score (EDS) has a significant association with financial distress in the Indian manufacturing sector.

2.11.4.d. Moderating Role of the Firm Life Cycle in CSD and Financial Distress Link

The life cycle hypothesis states that when a firm moves through different life cycles, systematic changes occur in its resource requirement financing, investing, and operating activities. This was also reflected in the risk preferences that the firm makes (Helfat and Peteraf, 2003). Moreover, a firm life cycle plays an essential role since its structure, strategy, capacity, and ability to estimate cash flow and efficiency vary based on its life cycle (Atif and Ali, 2021). Based on this evidence and the study by Al-Hadi et al. in 2019, a firm life cycle played an essential role in the relationship between corporate sustainability disclosure and financial distress (Al-Hadi et al., 2019). Based on the theory, during the earlier phases of the life cycle, firms could be unable to compete successfully with their rivals due to the constraints of liquid resources (Spence,

1978). In the early stages of their existence, firms may have a high cost of capital and struggle to raise additional capital (Hasan et al., 2015).

Further, owing to the potential challenges, firms may face a high cost of capital in the early phases of development (Al-Hadi et al., 2019; Jenkins et al., 2004). In contrast, better management and experience, technical know-how, and capabilities management and maintenance may give businesses a better competitive edge throughout the mature stage (Gray and Ariss, 1985; Helfat and Peteraf, 2003). Consequently, during the stage of maturity, competitive advantage in terms of technical, managerial, and resource know-how makes them less vulnerable to financial distress (Al-Hadi et al., 2019). While resource scarcity, lack of market access, and capital constraints can increase the likelihood of early default for the younger ones. Hence based on the theory and literature, the current study hypothesizes that.

$H_{4\,d:}$ Firm life cycle stage has a significant and moderating impact on the relationship between sustainability disclosure and financial distress.

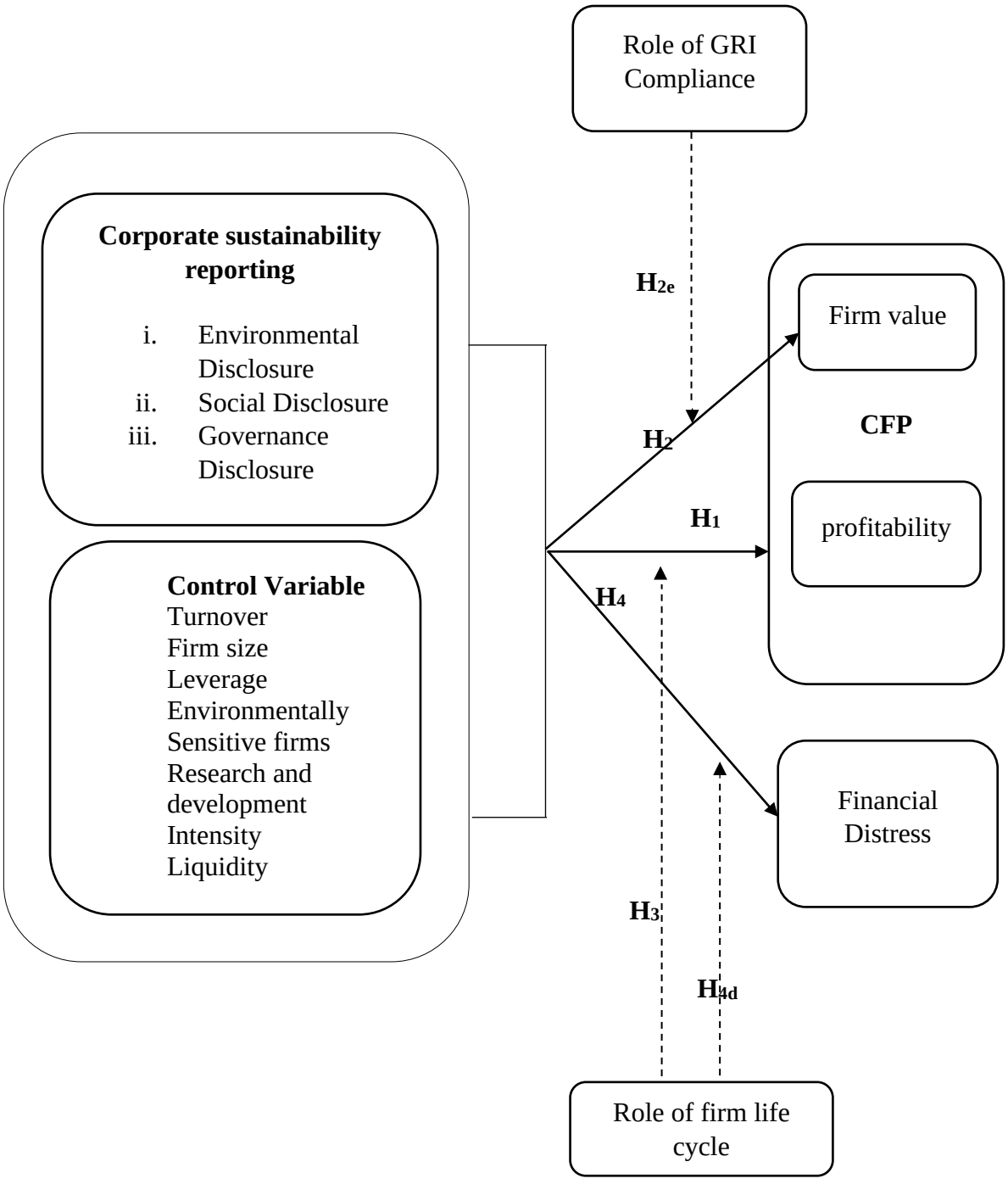

Figure 2.5 Proposed Framework

(Source: Developed for the research based on a literature review)

Figure 2.5 narrates the proposed framework of the current research. The hypotheses stated from H_1 to H_5 are depicted in the above model. The pictorial representation denoted whether CSD impacts CFP, which is seen in H_1. Further, it narrates whether there is any moderating role of GRI compliance of CSD and firm value, which is depicted in H_2. The proposed framework also depicts the moderating role of the firm life cycle on CSD and CFP linkage, which can be seen in H_3 and H_{4d}. Finally, H_4 depicts whether CSD has an impact on financial distress. The outcome variable used in the present study is CFP, firm value, and financial distress. CSD and its elements are used as the major independent variable.

2.12 CONCLUSION AND SUMMARY

The current chapter provides a comprehensive literature review concerning the association between CSD and corporate financial performance and financial distress. Moreover, an attempt was undertaken to conduct a systematic and bibliometric review of the existing literature, encompassing all relevant clusters. Each relationship was thoroughly examined through an elaborate review. The literature review facilitated the researcher in identifying and analyzing significant studies conducted in the field while also shedding light on major research gaps. Ultimately, the chapter concludes by presenting a detailed description of the hypotheses and offering an overview of the thesis through a conceptual framework.

CHAPTER 3

SUSTAINABILITY DISCLOSURE – AN INDIAN CONTEXT

3.1 OVERVIEW

A scenario for sustainability disclosure in the context of India is presented in the chapter, along with background information. The current situation is covered in part 3.2, followed by an explanation of why the manufacturing sector was chosen for the study in section 3.3. Further, the study details the methodology adopted in section 3.4, and the chapter is concluded with closing remarks in section 3.5.

3.2 SUSTAINABILITY DISCLOSURE IN THE INDIAN CONTEXT

The Indian government recently enacted several laws as part of non-financial reporting. It also has implemented several reforms in the past to improve sustainability disclosure. One among those reforms was the national voluntary guidelines on social, environmental, and economic business responsibilities (NVGs) published by the Ministry of Corporate Affairs in 2011. By adopting the Companies Act (2013) and CSR (policy) rules (the Act) on April 1, 2014, India has become one of the top nations to make Corporate Social Responsibility (CSR) mandatory. Before then, the CSR provision was optional for businesses, but they must disclose their CSR spending to shareholders. Moreover, business or firms can use their revenue to support poverty, hunger, education, gender equality, and community development. It can be inferred as a direct invitation to corporations to collaborate in addressing India's intricate development problems. The progress of the Indian firm's CSR journey is something that various stakeholders are constantly interested in learning about (KPMG, 2017). The CSR clause was optional in the draft Bill 2009. Further, the Companies Act 2013, it is also required that there must be at least one member on the corporate board. This regulation was one of the defining moments in Indian business legislation regarding non-financial reporting.

Mandatory CSR spending necessitates listed companies to file a Business Responsibility Report (BRR) to improve the quality of revelations (SEBI, 2013).

Besides, the Indian context also witnessed enhanced integration with GRI reporting in 2017 (Goel, 2019). Further, it focused on making sustainability reporting more transparent and accountable to society and the environment. The influence of structural change and how firms implement disclosure contribute to reforms in Indian business (Goel, 2019).

Recently, SEBI announced a new set of sustainability-related disclosure requirements. SEBI issued a circular containing the format of the business responsibility and sustainability report (BRSR) for the top 1,000 firms in terms of market capitalization. It is yet another defining moment in India's sustainability disclosure reporting requirements. This initiative focuses on standardizing the CSD parameter disclosure so that relevant and comparable information on CSD will help the investor make a better investment decision (SEBI, 2021). Early studies found fewer firms issued structured sustainability reports (Mitra, P.K., 2012) because stakeholders lacked legally binding requirements and awareness. However, according to KPMG's latest report, there has been a substantial increase in the adoption of sustainability reports in India (*Kpmg 2020*).

Developing economies like India have a significant part in sustainability since it contributes significantly to global GDP through business activity. Therefore, India also needs to contribute significantly to sustainability (Jha and Rangarajan, 2020; Von Hauff M and Veling A, 2018). Considering the literature in the Indian context, earlier studies focused more on the 'S' factor of ESG. Hence, most of the studies initially focused on social responsibility; the combined and integrated studies on CSD, including the 'E,' 'S,' and 'G' factors, have started recently.

An evaluation of the notable studies conducted on sustainability disclosure states that the research focusing on the relationship between CSD and CFP linkage is unexplored in India. Further, it is untapped in the Asian context (Jyoti and Khanna, 2021). In Asia, the relationship between environmental, social, governance, and firm value is becoming increasingly important as investors realize the benefits of sustainable business practices for long-term value generation (Behl et al., 2022). Significantly, India has trouble incorporating ESG factors into its strategy due to its poor facility in resource allocation,

physical and social infrastructure, as well as lack of political instability. Owing to these factors, research in this area in India is of utmost importance (Behl et al., 2022).

Similarly, the evidence of sustainability disclosure practice is still evolving in the Indian context (Jyoti and Khanna, 2021; Kumar et al., 2021; Laskar, 2018) as well as the studies conducted in this area primarily focusing on qualitative aspects (Jyothi and Khanna, 2021) also necessitate research in this area. In addition, transparency in CSD is anticipated to encourage more opportunities for socially responsible investment in emerging countries like India (Jyothi and Khanna, 2021).

A study conducted by CRISIL on fiscal data 2021 on risk assessment exhibits progress in the majority of firms' CSD scores of 586 Indian firms across 53 sectors compared to the prior year. The result also indicates better and improved disclosure and performance of various metrics. This is mainly on KPIs (Key performance indicators) like board independence, renewable energy, and gender diversity. An overall assessment demonstrated that 14 businesses were classified as 'leadership,' 108 firms fell in the 'strong category,' and 73 were classified as 'below average and weak.' Public sector undertakings (PSUs) performed substantially better on social elements, scoring an average of 55 vs. 49 for private firms. PSUs, however, lagged behind private businesses in governance procedures, particularly in the makeup and operation of the board (CRISIL, 2021). Hence, these evaluations illustrated the necessity of integrating and carrying out more research in this area to understand the importance of CSD to help in improving various performance metrics. For this purpose, more empirical research on this association is necessary.

India has recently implemented several regulatory changes to encourage corporate sustainability and ethical business practices to achieve sustainable development. As a result, this highlights the significance of CSD at the policy level. In addition, the researcher's interest was sparked by the lack of studies and the equivocal and inconclusive findings in CSD and CFP in the manufacturing sector. Similarly, another ongoing debate is whether CSD may be utilized as a risk reduction strategy. Financial distress is considered a negative and lousy occurrence in the firm's life. A corporate failure is an event that incurs reorganization and liquidation costs (Alderson and Betker,

1995; Giammarino, 1989) to the organization. The 2016 bankruptcy code (*Ministry of Law and Justice, 2016*, n.d.) also demonstrates the rules drafted to address insolvency difficulties in the Indian setting. The concept of bankruptcy law and its implications have continued to draw attention because of its significance to practitioners, regulators, and academics. There is, however, no information on how firms could prevent the worsening of their financial problems. The discussion on whether CSD can be utilized as a risk reduction strategy received massive attention from the literature. At the same time, considering the literature in the case of the Indian context, the study by (Oware and Appiah, 2021) on whether CSR assurance reduces distress likelihood is among the few studies conducted in the Indian context. Even these studies directly did not assess the distress likelihood and CSD in the manufacturing sector. Hence the paucity of CSD and distress-like hood studies in this field, as well as to check whether CSD can be used as a risk mitigation strategy, motivated the researcher to carry out this objective in the Indian context.

3.3 WHY MANUFACTURING SECTOR

Manufacturing has been and continues to be a crucial component of national growth and prosperity. The manufacturing industry makes up a large portion of India's GDP and has produced several opportunities for all parties involved. Despite being one of the most critical drivers of economic advancement and growth, it also consumes energy and natural resources, such as water. It generates effluent that is hazardous to the environment. In addition, manufacturing significantly impacts human lives and the environment (Haski-Leventhal, 2022). However, a sustained, long-term economic expansion is impossible without the equipment industry (Herrmann et al., 2014). As a result, there is growing discussion about implementing sustainability reporting in the manufacturing sector to address this.

Manufacturers adopt sustainable manufacturing to overcome the environmental issues provided by operations (Piyathanavong et al., 2019). Such techniques include cleaner production, green lean, and green manufacturing. Adopting sustainable manufacturing in the manufacturing sector is more challenging than in other sectors, particularly in developing countries like India, since it is a lengthy process that takes time to achieve.

Additionally, adopting sustainable manufacturing involves a substantial initial investment.

It is challenging to design, put into practice, and report sustainability in manufacturing for several issues in this respect. Considerations including product quality and safety, training and development, and technology adaptability are crucial and cost a lot of money (Laskar, 2018). Even if the firm's expenses initially exceed its earnings, these costs substantially reduce expenses over time and could increase a profit margin (Laskar, 2018). However, to thrive and rebuild a robust manufacturing industry, they must continually adapt to new manufacturing challenges, technologies, and paradigms to remain competitive (Herrmann, 2014). So one such technique is adopting sustainable production practices in the manufacturing industry.

India is rated third globally in terms of CO2 emissions and is one of the leading emitters of greenhouse gases. The country as a whole produces the third-highest amount of greenhouse gases. India is not now subject to a statutory target for emission reduction, but due to the pressure from the wealthy nations, it has agreed to reduce in the upcoming years (Cherian et al., 2019). According to the global compilation of PM 2.5 particulate pollution data, India was the fifth most polluted nation in 2019, with Ghaziabad in the national capital region being listed as the most contaminated city in the world.

Further, industrial pollution contributes to 51 percent of the pollution (Indian Express, 2019). By implication, more than half is being contributed by the industries. As a result, all parties are responsible for limiting emissions by taking the necessary actions. One such action that could address the problem is adopting sustainable manufacturing. The ability of the industry to create and employ sustainable goods and resources with long lifecycles is essential for sustainable manufacturing. This will result in the least amount of resource utilization and ensure that all the parties engaged are secure. The transition to sustainable manufacturing is already underway, and Indian businesses are becoming more aware of how they may optimize resources and material use, minimize emissions, and increase machine efficiency to cut waste (Pednekar, 2023). Therefore, the manufacturing sector's structural reforms and implementation of reporting requirements offer a compelling argument for the study that looks at the implications

of this connection in the Indian manufacturing sector. Similarly, the manufacturing sector's implementation and reporting of sustainability measures are still under investigation despite increased conversations about implementing sustainability reporting (A. Buallay, 2019b). This has motivated the study to select the Indian manufacturing sector as the essential choice for the study.

As discussed earlier, the focus of the study is limited to manufacturing companies that are listed on the Nifty 500 indices. The following is a list of different industry categories that are part of the manufacturing sector.

Table 3.1 Sector-wise distribution of Manufacturing Firms.

Sl. No.	Sector	No. of companies
1	Automotive	21
2	Cement	17
3	Chemical	13
4	Construction	25
5	Fertilizers and pesticides	8
6	Metals, minerals, and mining	18
7	Oil and power	24
8	Other industrial manufacturing	50
9	Pharmaceutical	33
10	Textile and paper	14

**Data collected on June 2020*

(Source – PROWESS database)

3.4 DETAIL DESCRIPTION OF THE METHODOLOGY ADOPTED

To achieve the aforementioned objectives, the present study utilized secondary data. Specifically, panel data spanning a period of 10 years, from 2010 to 2019, was adopted. The utilization of panel data confers numerous advantages. It provides more informative and efficient data with high variability and increased degrees of freedom and effectively addresses individual heterogeneity (Baltagi, 2005).

To address the presence of severe outliers without omitting data, the study employed winsorization on all firm-level variables at the 5th and 95th percentile levels. Winsorization, as recommended by Shao (2019), is a frequently employed technique in studies investigating corporate governance and firm performance relationship since the profitability indicators may largely vary from firm to firm. The utilization of winsorized estimators is generally associated with greater reliability compared to un-winsorized results (Yang et al., 2011). Consequently, the present study can confidently rule out the possibility that our findings are influenced by outliers.

The majority of the studies carried out in examining the CSD and CFP linkage adopted models like multiple regression, OLS, and Panel regression methods like fixed effect and random effect. As per the literature, the relationship between CFP and CSD is endogenous. Hence, due to endogeneity bias, measurement, and modeling errors, basic regression models like OLS might result in erroneous estimates (Soytas et al.,2019). Moreover, the key difficulties in addressing the causal relationship between CSD and CFP include heterogeneity in financial return, measurement error, omitted variable bias, unobserved factors, and reverse causality (Zahid et al., 2017; Soytas et al., 2019). Various factors can cause endogeneity; for example, Simultaneity is one such factor for endogeneity (where two variables simultaneously influence each other). Dynamic endogeneity (where the present value of a variable can be strongly influenced by its lagged values) and unobserved heterogeneity (where the relationship between two or more variables is influenced by an unobservable factor) can be said as the other cause of endogeneity (Wintoki et al., 2012). Considering the present study, all these factors can have an impact on the causal relationship between CSD and CFP or financial distress.

As per Maddala and Lahiri (2009), the OLS model is biased upward and cannot reliably estimate the coefficient of a lagged dependent variable due to heterogeneity. Further, it exhibits biasedness due to omitted variables. Even though the fixed effect model can partially resolve the endogeneity biases, the presence of dynamic endogeneity and the increased number of cross-sections with less time series (T) can also lead to inefficiency in the estimate (Chatterjee and Nag, 2023). Hence, considering all these factors, the study is certain of neither Pooled OLS nor Fixed effect can produce an accurate estimate in addressing the causal linkage between CSD and CFP.

There are multiple methods to address the presence of endogeneity; one such model is 2SLS and 3SLS. In the case of survey data, 2SLS and 3SLS are commonly used techniques, and in the case of panel data, GMM is a widely used technique to correct endogeneity (Zaefarian et al., 2017; Ullah et al., 2018). While comparing 2SLS with GMM due to the limited number of IVs, 2SLS has limitations to control for unobserved heterogeneity. Moreover, it fails to address the unobserved time-specific or individual effects, which may lead to biased estimates.

There is no clear way to statistically assess that an endogenous variable is associated with the error term since the error term in endogeneity bias is unobservable. Additionally, exogenous factors are generally never truly exogenous. The endogeneity causes inconsistent estimations, which can turn, causes improper interpretation, confusing conclusions, and inaccurate theoretical justification (Ullah et al., 2018). To obtain reliable estimates, it is crucial to detect and deal with endogeneity. The current study uses Durbin- Wu- Hausman tests adopted by Ullah et al. (2018) to identify endogeneity in the current data set.

According to econometric theory, explanatory variables are expected to not correlate with the error term. The basic OLS method was adopted to test the endogeneity. Firstly, each independent variable is considered a dependent variable and regressed with other independent variables. The regression on each explanatory variable is estimated to detect the residuals from it to determine whether the independent variable is endogenous or exogenous. The residual of the independent variable is included in the main model as an independent variable. The independent variable is endogenous if the

test statistics of the Durbin-Wu- Hausman test are significant for the independent variable residual. This process was repeated for all the other independent variables as well. The Durbin-Wu- Hausman test revealed that almost all the variables used in the model are endogenous.

Hence to address the issue of endogeneity and to analyze the dynamic nature of the CSD and CFP relationship, the present study employed the generalized method of moments based on the estimating technique provided by Arellano and Bond (1991); Blundell and Bond (1998). In GMM, the dependent variable's lag value is employed to correct endogeneity in the dynamic relationship (Roodman, 2009; Ullah et al., 2018). By modifying data internally, GMM eliminates endogeneity (Roodman, 2009). The lag value of the dependent variable and the lag value of the explanatory variable is used as internal instruments in the endogeneity correction. The introduction of lag values of the variable transforms the model from static to dynamic (Ullah et al., 2018). Nevertheless, the heteroscedasticity and autocorrelation issue probably present in the dataset is also addressed by the GMM approach (Alam et al., 2019).

GMM uses two different types of estimators, namely, difference GMM and system GMM. Whereas the former uses difference equation estimation. While the latter takes into account one equation at the level and the other equation at the difference. While comparing First -difference transformation and system GMM, difference GMM has some limitations, i.e., the first-difference transformation subtracts a variable's past value from its present value, hence if the most recent value is missing, it will lead to the loss of too many observations (Roodman, 2009). Whereas the two-step system GMM not only prevents the loss of data, further the system GMM produces more accurate results when the period (T) is short, and the number of cross sections is large. In such a situation, the persistence of the dependent variable is strongly correlated with the autoregressive term (Blundell and Bond, 1998). As a result, the two-step system GMM approach delivers accurate and reliable estimations while also handling data loss. Hence, the present study adopts a two-step system GMM to address the many sources of endogeneity in this relationship. The dynamic panel model specification is explained below.

$$Y_{it} = \beta Y_{it-1} + \delta x_{it} + \mu_i + \varepsilon_{it} \quad \text{.....} \quad (3.1)$$

$$\Delta Y_{it} = \beta (\Delta Y_{it-1}) + \delta(\Delta x_{it}) + (\Delta \varepsilon_{it}) \quad \text{.....} \quad (3.2)$$

Here, equation 3.1 is at level, and equation 3.2 is at difference form. Y_{it} refers to the dependent variable used in the study. Y_{it-1} refers to the lag of the dependent variable used as the independent variable to correct the endogeneity. X_{it} refers to the set of control variables used in the study. μ_i unnoticed firm-specific fixed effect and ε_{it} denotes the error term.

3.5 CONCLUSION AND SUMMARY

In this chapter, a comprehensive elucidation of the method, sampling, and sectoral choice is presented. Consequently, a meticulous rationale behind the selection of India and the manufacturing sector as the focal point of the study has been provided. Furthermore, a thorough exposition is offered regarding the decision to employ the system Generalized Method of Moments (GMM) instead of alternative methodologies in the current research.

CHAPTER 4

IMPACT OF CSD ON CORPORATE FINANCIAL PERFORMANCE

4.1 OVERVIEW

The study's primary objective, as stated in this chapter's thesis, is to ascertain whether corporate sustainability disclosure impacts the corporate financial performance (CFP) of the Indian manufacturing sector. A series of analyses were carried out to comprehend the relationship. The introduction is explained in Section 4.2, and thereafter Sections 4.3 and 4.4 contain the data and methods. The empirical results are illustrated in Section 4.5, and their validity is then confirmed by a robustness check. The discussion part is broadened in Section 4.6. Finally, the chapter ends with a conclusion in Sec 4.7.

4.2 INTRODUCTION

In the sustainability disclosure literature, there is a broad debate and discussion on whether corporate sustainability disclosure enhances corporate financial performance. Corporate sustainability disclosure (CSD) has become a buzzword in recent decades. When examining the present-day corporate environment, hardly any business can function in a vacuum without intermingling with its environment. Organizations have societal and environmental consequences due to their continuous interaction with their environment (Uwuigbe, 2018). Hence, concerns about severe ecological and social effects on business activities have fueled calls for corporations worldwide to adopt sustainability practices and report on them (Adams and Frost, 2008). Moreover, the changing expectations and increased stakeholder awareness in this new information age have also led firms to adopt sustainability disclosure practices (Karaman et al., 2018). Recently, the number of firms adopting sustainability disclosure practices has risen dramatically (Kumar et al., 2021). Due to various factors, including increased awareness, new laws and regulations, legitimacy, and the understanding of how sustainability disclosures influence corporate value and financial effectiveness, many countries have experienced a significant shift in the acceptance and adoption of sustainability reporting (KPMG, 2020).

Corporate sustainability disclosure (CSD), social responsibility investment (SRI) programs, and environmental reporting are considered essential for contemporary organizations to compete on a global scale. The significance of studies on sustainability and corporate social responsibility (CSR) has increased in light of widespread environmental management. CSD is particularly crucial when viewed from the perspective of stakeholders (Kim and Oh, 2019). Consequently, stakeholders now examine qualitative or non-financial parameters in addition to the firm's financial value (SEBI, 2021) before making investment decisions.

A review of the academic literature on sustainability disclosure reveals a dearth of research into the topic, particularly in the Indian setting. Similarly, the idea of sustainability disclosure is still developing, and in the context of India, the majority of studies are qualitative (Laskar, 2018; Kumar et al., 2021; Jyothi and Khanna, 2021). Additionally, earlier research on the connection between CSD and CFP yielded contradictory findings (Fatemi et al., 2018; Soytas et al., 2019; Zahid et al., 2020). Against this backdrop, even though mixed associations persist, it is relevant to note that previous studies in the Indian context seldom examined the impact of aggregate and individual CSD scores on the Indian manufacturing sector. A consensus on the association is not attained despite the researchers' best efforts (Goyal et al., 2013; Zahid et al., 2020). One of the plausible explanations for the mixed results is the difference in country and industry context (Behl et al., 2022). Social, political, and economic contexts and institutional competencies influence a firm's social and environmental responsibility. As a result, environmental and social responsibilities vary significantly by territory and country (Baughn et al., 2007). This has motivated the researcher to frame the first research question

Does sustainability disclosure enhance the corporate financial performance of the Indian manufacturing sector?

To answer this question, an attempt is made to frame one major and three sub-objectives.

To study the impact of corporate sustainability disclosure on Corporate Financial Performance

- *To study the impact of environmental disclosure impact on CFP*
- *To study the impact of social disclosure impact on CFP*
- *To study the impact of governance disclosure impact on CFP*

The present study makes a significant contribution to the extant literature on sustainability disclosure by providing empirical evidence regarding the impact of CSD disclosure on the corporate financial performance of Indian manufacturing firms. This contribution is achieved through a comprehensive integration of signaling theory with the foundational theories that have been widely adopted in this field. The findings of the study demonstrate a positive relationship between CSD disclosure and both the firm's value and profitability. In other words, the study establishes that the practice of CSD disclosure enhances the financial performance of firms operating in the Indian manufacturing firms. Moreover, the study reveals a crucial insight that should guide organizations' perspectives on adopting CSD disclosure. Contrary to perceiving it as a cost burden, the study highlights that CSD disclosure should be regarded as a strategic opportunity for long-term sustainability. By embracing CSD disclosure practices, organizations can position themselves to thrive in the ever-evolving business landscape, demonstrating their commitment to responsible business practices and ensuring their long-term viability. This shift in perception encourages organizations to view CSD disclosure not only as a means of meeting regulatory requirements but also as a proactive strategy that can yield competitive advantages and foster sustainable growth.

4.3 DATA

The data in this study spans ten years, from 2010 to 2019. The sample consists of 223 manufacturing firms from ten different industries. All financial performance data were collected using the CMIE PROWESS database. The ESG scores are gathered from the Bloomberg database.

4.3.1 DATA SOURCE

The data used for the current study has been taken from Bloomberg and the prowess database. ESG disclosure metric of Bloomberg's captures the level of CSD and identifies individual sustainability elements scores. The Bloomberg ESG scores are based on the firms' filings, such as CSR reports, sustainability reports, annual reports, and documents on the company's website, and represent a wide range of publicly available information to investors. Based on the information provided, Bloomberg designates disclosure scores ranging from 0.1 to 100 (lowest to highest) and tailors its documentation to the industry (Fatemi et al., 2017). Hence Bloomberg ESG rating has been used for measuring CSD. At the same time, all the other financial data on corporate financial performance has been taken from the Prowess database.

4.3.2 CONTROL VARIABLE

Several firm-specific characteristics were controlled while investigating the link between sustainability disclosure and firm value. Leverage, firm size, liquidity, and research and development intensity were used to control the growth opportunity effect (Prasad et al., 2022). In addition, an environmentally sensitive firm dummy variable was created to control for the effect of environmentally sensitive firms. High-risk firms are likely to release sustainability reports. Environmentally conscious businesses reveal additional information. Hence they are more likely to cause environmental damage (Legendre and Coderre, 2013; Liu and Anbumozhi, 2009). Moreover, sustainability reporting varies greatly depending on the industry, indicating that environmentally damaging discloses the most ecological, social, and governance practices (Dong and Burritt, 2010). To control the effect of environmental and socially sensitive (ESSI) firms, the industrial classification adopted by the studies (Shabana et al., 2017; Simoni et al., 2020) was followed. The ESSI is a dummy variable taking the value of one if the firms belong to ESSI and zero otherwise. Table 4.1 lists the variables used for this objective.

Table 4.1 Definition of independent variables, dependent variables, and control variable

Variable Name	Variable Abbreviation	Variable Description
Independent variables		
CSD	Corporate sustainability disclosure	Bloomberg rating score for ESG (sustainability reporting)
EDS	Environmental disclosure score	Bloomberg rating score for Environmental disclosure
SDS	Social disclosure score	Bloomberg rating score for social disclosure
GDS	Governance disclosure score	Bloomberg rating score for governance
Dependent variables		
TOBIN	Tobin's Q	Market capitalization plus long-term debt plus short-term debt divided by the total asset.
EVA	Enterprise value-added	Enterprise value divided by total asset
ROA	Return on asset	Net profit divided by total asset
ROCE	Return on capital employed	EBIT (I-T) divided by Net asset
Control variables		
RD	Research and development expenditure	Total research expenditure divided by sales.
TURN	Turnover	Net sales divided by total assets
LEV	Debt to equity ratio (times)	Total debt divided by total equity
SIZE	Size	Natural logarithm of total asset
LQDTY	Liquidity ratio (times)	Quick asset divided by current liability
ESI	Environmentally sensitive industries	One, if environmentally sensitive firm, 0 otherwise

(Source- Literature review)

4.4 METHODOLOGY

The nexus between sustainability reporting and CFP is still developing, especially in developing economies. Most of the studies ignored the endogeneity issue while addressing this relationship. Basic regression models like OLS may yield inaccurate estimates due to endogeneity bias, measurement, and modeling errors (Soytas et al., 2019). According to the literature, the critical challenges in addressing the causal association between corporate sustainability disclosure and firm value or firm performance are heterogeneity in financial return, measurement error, omitted variable bias, unobserved factors, and reverse causality (Soytas et al., 2019; Zahid et al., 2020). Potential endogeneity problems in this nexus will cause inconclusive or misleading results. Moreover, endogeneity bias can result in misleading inferences and unreliable estimates (Ullah et al., 2018). To handle the endogeneity issue caused by omitted bias and reserve causality (Zahid et al., 2020), the study employed a generalized method of moments (GMM).

According to (Roodman, 2009), GMM eliminates endogeneity problems by internally converting data. The present study adopted a two-step GMM (Arellano and Bover, 1995). The study adopted the following model for estimating the nexus between corporate sustainability disclosure and CFP.

$$CFP_{it} = f(CSD_{it}, CFP_{it-1}, X_{it}) + e_{it} \quad (4.1)$$

$$i = 1 \ldots\ldots\ldots N$$

$$t = 1 \ldots\ldots\ldots\ldots Ti$$

CFP depicts the corporate financial performance, where '*i*' is the cross-section(firms) in period *'t.*' The function of corporate sustainability disclosure is used to represent corporate financial performance. At the same time, CFP_{it-1} depicts the lagged value of the corporate financial performance used in the estimation process. X_{it} is the set of control variables associated with CFP; 'e' denotes the error term. To test the relationship between sustainability disclosure and CFP, the first step was to identify a set of proxies for corporate financial performance. The firm's financial performance is usually

measured by two sets of accounting-based and market-based measures. The CFP of the firm is proxied by accounting measures and market measures. Hence, ROA and ROCE were adopted as proxy measures for a firm's profitability (accounting measures) in examining CFP. Where ROA is adopted for primary analysis and ROCE for robustness check. Based on the literature, in addition, Tobin's q and EVA are identified as the widely used measures for firm value. Hence, the study adopted Tobin's q for performing the primary analysis, while EVA for performing the robustness check. Market-based measures help analyze the linkage between stock market returns and socially responsible disclosure (Murray et al., 2006). Several authors have used Tobin's Q as a variable for market value estimation. Accounting measurements are backward-looking and portray historical costs, whereas market measures are forward-looking and depict future earnings expectations (Javaid and Al-Malkawi, 2018). Both metrics can handle potential measurement predisposition (Javaid and Al-Malkawi, 2018; Scholtens, 2008). The dynamic panel model specification is explained below.

$$Y_{it} = \beta Y_{it-1} + \delta x_{it} + \mu_i + \varepsilon_{it.} \quad \text{.....} \quad (4.2)$$

$$\Delta Y_{it} = \beta (\Delta Y_{it-1}) + \delta(\Delta x_{it}) + (\Delta \varepsilon_{it}) \quad \text{……..} \quad (4.3)$$

In the case of panel data, GMM is a widely used method to correct endogeneity (Ullah et al., 2018; Zaefarian et al., 2017). Unless the number of periods *t* is large, models using within-group or random effect estimation produce biased coefficients. In the case of OLS estimators, the OLS might produce inconsistent results due to the connection between the fixed effect and the lagged dependent variable (Garín Muñoz, 2007). Efficient methods for overcoming this issue are to "first difference the model and use the dependent variable's lag value as an instrument" (Garín Muñoz, 2007, p.18). The current study adopted a two-step system, GMM, to solve this problem. In GMM, the dependent variable's lag value is employed to correct endogeneity in the dynamic relationship (Roodman, 2009; Ullah et al., 2017). By modifying data internally, GMM eliminates endogeneity (Roodman, 2009). The dependent variable's lag and the lag value of the explanatory variable are used as internal instruments in the endogeneity correction. Furthermore, the introduction of lag values of the variable transforms the model from static to dynamic (Ullah et al., 2017). Thus, the two-step system GMM

addresses the many sources of endogeneity in this relationship. The empirical specification used in this study is explained here.

$$CFP_{it}\,(ROA \text{ or } Tobin's\ q) = \alpha + \lambda\, CSD_{it} + \beta\, CFP_{i,t-1} + \delta\, X_{it} + \mu_i + \varepsilon_{it} \quad \ldots \qquad (4.4)$$

$$CFP_{it}\,(ROA \text{ or } Tobin's\ q) = \alpha + \lambda\, \Delta\, CSD_{it} + \beta\, \Delta\, CFP_{i,t-1} + \delta\, \Delta X_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots \qquad (4.5)$$

Model (4.4) i represents the cross-sections, and *t* stands for the period. To measure CFP ROA and Tobin's q is adopted. *CSD* is the primary explanatory variable used in the model. At the same time, Tobin's $q_{i,t-1}$, is the lagged value of the dependable variable. X_{it} is the control variable (*TURN, LEV, R&D* $_{exp,}$ *liquidity, Firm size, environmentally sensitive dummy*). μ_i is the unnoticed firm-specific fixed effect, and ε_{it} denotes the error term. For a system, GMM, one Equation will be at a level, and the other is a difference. The second part of the model is explained in Equation (4.5). The advantage of the system GMM framework is that it avoids needless data loss and offers accurate and effective estimates for a balanced panel (Arellano and Bover, 1995). The explanatory variable employed in this study is the Corporate Sustainability Disclosure score, and the dependent variable lagged values. Control variables used in this study include TURN, LEV, R&D expense, Size, Liquidity, and environmentally sensitive dummy variable. Five empirical estimations are used in this study to measure the relationship between sustainability disclosure and firm value; each model is explained here.

$$CFP_{it} = \alpha_1 + \beta_1\, CSD_{it} + \beta_2 TURN_{it} + \beta_3 LQDTY_{it} + \beta_4 LEV_{it} + \beta_5\, RD_{it} + \beta_6\, ESI_{it} + \beta_7\, Size_{it} + \beta_8\, Year\ effect + \varepsilon_{it} \ldots\ldots \quad (4.6)\ (Base\ model)$$

- $CFP_{it} = \alpha_{1a} + \beta_{1a}\, EDS_{it} + \beta_{2a} TURN_{it} + \beta_{3a}\, LQDTY_{it} + \beta_{4a}\, LEV_{it} + \beta_{5a}\, RD_{it} + \beta_{6a}\, ESI_{it} + \beta_{7a}\, Size + \beta_{8a}\, Year\ effect + \varepsilon_{it} \ldots\ldots \quad (a)$
- $CFP_{it} = \alpha_{1b} + \beta_{1b}\, SDS_{it} + \beta_{2b} TURN_{it} + \beta_{3b}\, LQDTY_{it} + \beta_{4b}\, LEV_{it} + \beta_{5b}\, RD_{it} + \beta_{6b}\, ESI_{it} + \beta_{7b}\, Size + \beta_{8b}\, Year\ effect + \varepsilon_{it} \ldots\ldots \quad (b)$
- $CFP_{it} = \alpha_{1c} + \beta_{1c}\, GDS_{it} + \beta_{2c} TURN\ it + \beta_{3c}\, LQDTY_{it} + \beta_{4c} LEV_{it} + \beta_{5c}\, RD_{it} + \beta_{6c}\, ESI_{it} + \beta_{7c}\, Size + \beta_{8c}\, Year\ effect + \varepsilon_{it} \ldots\ldots \quad (c)$

Here, the base model explains the impact of aggregate CSD scores on corporate financial performance. At the same time, the model (a), (b), and (c) measure the impact of individual elements of sustainability, i.e. (environmental, social, and governance)

impact on corporate financial performance. To control for the time-varying effect, year dummies are also included in the estimation.

4.4.1 DESCRIPTIVE STATISTICS

The descriptive statistics, including mean and standard deviation, are shown in Table 4.2. To control for outliers, winsorization on all continuous variables at the 5% and 95% levels was performed. Regarding kurtosis, Tobin's q, EVA, research, and development intensity, and liquidity are above 3, which means these variables are leptokurtic. Skewness determines the positive or negative outcome of the variable. In the present study, all the variables except the environmentally sensitive dummy variable are positive. The mean value of sustainability reporting is 24.14, with a standard deviation of 12.76. The mean values of the individual elements, such as environmental, social, and governance, are 18.24, 29.92, and 48.18, respectively, with a standard deviation of 14,04, 15.38, and 6.86. The key dependent variables, Tobins q, and ROA, have a mean of 4.48 and 7.72 with a standard deviation of 8.30 and 5.64.

4.4.2 CORRELATION FOR THE TOTAL SAMPLE

Table 4.3 depicts the outcome of the correlation between the variables. A positive correlation was found between turnover, liquidity, and research and development expenditure with ROA (profitability). At the same time, all the other independent and control variables' relationship with ROA is negative. No high correlation was observed between the variables except for individual elements of sustainability with CSD score. It is expected to be highly correlated since all the individual elements of sustainability are extracted from the total CSD score. The study also employed VIF to check the potential multicollinearity problem in regression. The variance inflation factor in the regression model ranged from 1.04 to 1.85, indicating multicollinearity is not a serious concern in the present results (Ryan, 2008).

Table 4.2 Descriptive Statistics

Variables	Mean	St. Dev	Mini	Max	Skewness	Kurtosis
ROA	7.72	5.64	-.32	20.79	0.67	2.73
ROCE	11.5	8.34	-.39	30.63	0.63	2.65
TOBIN	4.489	8.303	0.055	33.05	2.49	8.31
EVA	1.70	1.90	0	7.19	1.57	4.82
CSD	24.14	12.76	9.090	52.69	0.94	2.94
EDS	18.24	14.04	3.876	49.61	1.10	3.07
SDS	29.92	15.38	7.017	59.64	0.21	2.16
GDS	48.18	6.865	39.28	64.28	1.00	3.31
ESI	0.806	0.395	0.000	1.00	-1.55	3.40
TURN	0.880	0.604	0.001	4.540	0.63	2.71
RD	0.008	0.016	0.000	0.063	2.46	8.01
LEV	0.530	0.562	0.000	1.910	1.03	3.00
SIZE	4.677	0.638	2.782	6.536	1.03	3.00
LQDTY	1.030	0.699	0.221	2.850	1.15	3.60

(Source- Data analysis)

Table 4.3 Correlation for the Total Sample

Variable	ROA	*CSD*	EDS	SDS	GDS	ESI	TURN	RD	LEV	SIZE	LQDTY	V I F
ROA	**1.000**											
CSD	-0.058*	**1.000**										1.65
EDS	-0.077*	0.964*	**1.000**									
SDS	-0.005	0.873*	0.749*	**1.000**								
GDS	-0.090*	0.809*	0.742*	0.628*	**1.000**							
ESI	-0.014	0.141*	0.129*	0.123*	0.141*	**1.000**						1.13
TURN	0.304*	-0.047*	-0.012	-0.057*	-0.118*	-0.204*	**1.000**					1.16
RD	0.137*	0.061	0.064*	0.0323	0.035	0.044*	-0.117*	**1.000**				1.04
LEV	-0.518*	0.011	0.0391	-0.072*	0.065*	0.184*	-0.052	-0.142*	**1.000**			1.42
SIZE	-0.196*	0.600*	0.569*	0.525*	0.517*	0.238*	-0.252*	0.073*	0.167*	**1.000**		1.85
LQDTY	0.416*	-0.035*	-0.076*	0.056*	-0.076*	-0.011	-0.097*	0.095*	-0.495*	-0.138*	**1.000**	1.35

**Correlation is significant at the 0.05 level*

(Source- Data analysis)

4.5 EMPIRICAL RESULTS

The impact of corporate sustainability disclosure on corporate financial performance is explained below. *Model (1)* explains the impact of CSD on firms' profitability and *Model (2)* explains the impact of CSD on firm value. As evident from Table 4.4, CSD is highly significant at a 1 percent level in *Model (1)* and *Model (2),* Implying that corporate sustainability disclosure enhances the profitability and value of the firm.

Table 4.4 CSD and CFP Relationship using GMM.

Variables	**ROA** **Model 1**	**Tobin's Q** **Model 2**
CSD	0.027***	0.007***
	(0.002)	(0.001)
TURN	1.307***	-0.243***
	(0.083)	(0.0483)
R.D.	-5.748***	1.746**
	(1.635)	(0.798)
LQDTY	-0.252***	0.216***
	(0.047)	(0.0289)
SIZE	-0.941***	-1.685***
	(0.111)	(0.0495)
LEV	-1.361***	-0.630***
	(0.078)	(0.0293)
ESI	0.328**	-0.552***
	(0.160)	(0.0880)
L. ROA	0.683***	
	(0.005)	
L.Tobins		0.787***
		(0.00245)
Constant	5.661***	8.994***
	(0.487)	(0.267)
Year effect	Yes	Yes
AR 1	0.000	0.010
AR 2	0.679	0.799
Hansen test	0.244	0.226
No of firms	223	223

(Source- Data analysis)

Note-** The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

Considering the lagged values of the dependent variable, ROA and Tobin's coefficient significantly impact CFP at a 1 percent level (*p < 0.01).* Regarding the control variables used in the study, liquidity, research, and development intensity are significant and negatively impact profitability. While environment-sensitive dummy variable and turnover is highly significant and positively impacts profitability. In contrast, turnover and environmentally sensitive dummy variables are highly significant at a 1 percent level (*p < 0.01).* However, they negatively impacted the firm value. While liquidity and research and development intensity had a positive impact on the firm value. In comparison, the size and leverage coefficient were negative in both *models (1) and (2).* Given the impact of R&D spending, it was evident that effective management is absent; high R&D spending does not always equate to higher returns (Lewin and Chew, 2005). R&D costs rose significantly and had an impact on business profitability projections.

Further, the benefit derived from spending on research and development would be useful for the firm in the long run. Leverage is viewed as a double-edged sword because it has the potential to increase or decrease a firm's profitability (Hou, 2019; Ross et al., 2002). At the same time, the negative impact of firm size on both ROA and Tobin's is much more logical since these are bigger-sized firms, and as the firm size increases, the transaction and agency cost also increases (Javaid and Al-Malkawi, 2018).

The post-estimation test assumes the presence of first-order autocorrelation but not second-order autocorrelation. The GMM employs two post-estimation tests to evaluate the autocorrelation and overriding constraints. The present study adopted Hansen J statistics to evaluate the instrument's overall validity. According to the post-estimation Hansen test, all the instruments employed in this study are reliable and valid across all models, and the moment requirement is adequately specified. The value of AR (2)>0.05 indicates that the error term is serially uncorrelated. The estimation also suggests that fewer instruments were employed in this study than the number of cross-sections. As a result, the model's specifications and tools are accurate and consistent with GMM's requirements. The year effect was added to account for the macroeconomic factors in the current analysis.

Even if the CSD results showed a favorable impact on financial performance, dividing the sustainability indicators could provide a different perspective on the link between CSD indicators and financial performance. Hence tables 4.5 and 4.6 depicts the influence of individual elements of CSD on corporate financial performance. The results indicate that the individual elements of sustainability disclosure (environmental disclosure, social disclosure, and governance disclosure) are also positive and significant at a 1 percent level of significance.

Table 4.5 CSD element's relationship with CFP using GMM

Variables	**ROA Model 1**	**ROA Model 2**	**ROA Model 3**
EDS	0.0120***		
	(0.002)		
SDS		0.0148***	
		(0.002)	
GDS			0.0353***
			(0.007)
TURN	1.417***	1.481***	1.457***
	(0.077)	(0.060)	(0.096)
R.D.	-4.565***	5.026***	-6.194***
	(0.828)	(1.075)	(1.519)
LQDTY	0.0654	0.0456	-0.0918
	(0.044)	(0.051)	(0.059)
SIZE	-0.907***	-0.835***	-0.874***
	(0.066)	(0.070)	(0.113)
LEV	-1.640***	-1.378***	-1.327***
	(0.039)	(0.052)	(0.074)
ESI	0.910***	0.676***	0.530***
	(0.087)	(0.074)	(0.158)
L. ROA	0.703***	0.702***	0.662***
	(0.004)	(0.004)	(0.005)
Constant	5.127***	4.438***	3.959***
	(0.333)	(0.448)	(0.406)
Year effect	Yes	Yes	Yes
AR 1	0.000	0.000	0.000
AR 2	0.512	0.435	0.689
Hansen test	0.354	0.590	0.277
No of firms	223	223	223

(Source- Data analysis)

Note**- The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

The results of how the individual elements of sustainability disclosure impact profitability are depicted in 4.5. The EDS score has a significant positive impact on CFP. For example, a 1 percent change in environmental disclosure score results in a one percent change in firm profitability, as shown in Table 4.5. Similarly, the coefficient of social disclosure score is also highly significant at a 1 percent level (β =0.014, $p < 0.01$). Further, the governance disclosure score is also positive and highly significant. The lagged value of dependent variables (L.ROA) also significantly impacted CFP at a 1 percent level ($p < 0.01$).

Table 4.6 CSD element's relationship with CFP using GMM

Variables	Tobin's Model 1	Tobin's Model 2	Tobin's Model 3
EDS	0.00673***		
	(0.001)		
SDS		0.00740***	
		(0.000)	
GDS			0.0202***
			(0.002)
TURN	-0.362***	-0.217***	-0.418***
	(0.042)	(0.046)	(0.052)
R.D.	-9.307***	-12.77***	-0.253
	(1.177)	(1.250)	(0.878)
LQDTY	0.0351**	0.264***	0.143***
	(0.017)	(0.021)	(0.025)
SIZE	-1.979***	-1.969***	-1.841***
	(0.049)	(0.044)	(0.0487)
LEV	-0.803***	-0.847***	-0.783***
	(0.042)	(0.035)	(0.035)
ESI	-1.236***	-1.384***	-0.658***
	(0.072)	(0.115)	(0.087)
L. Tobin's	0.697***	0.686***	0.779***
	(0.002)	(0.002)	(0.002)
Constant	13.02***	11.67***	10.53***
	(0.220)	(0.189)	(0.304)
Year effect	Yes	Yes	Yes
AR 1	0.024	0.024	0.010
AR 2	0.455	0.451	0.802
Hansen test	0.312	0.296	0.275
No of firms	223	223	223

(Source- Data analysis)

Note**- The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

The results of how each CSD component affects firm value are shown in Figure 4.6. Likely, the relationship of EDS with market performance is also highly significant at a 1 percent level **(β =**0.006**; p ≤** 0.01), implying that better and improved environmental disclosure enhances market-based performance, which eventually results in improved firm value. Considering the social disclosure and governance disclosure, SDS and GDS positively and significantly impact firm value in market-based measures. Further, the dependent variable's lagged value (L. Tobin's) also significantly impacts CFP at a 1 percent level (*$p < 0.01$*). Both the results presented in Tables 4.5 and 4.6 indicate that EDS, SDS, and GDS are highly significant at 1 percent. The present study added the year effect to control for the time-varying factor. Given the post-estimation test, the model's specifications are accurate and consistent with GMM's requirements. Hypotheses H_1, H_{1a}, and H_{1b} H_{1C} are accepted based on the result.

4.5.1 ROBUSTNESS CHECK

To test the reliability of the findings, alternative measures of CFP have been adopted. Return on capital employed (ROCE) and economic value added (EVA) is used as the alternative measures of CFP. The results of the robustness check are depicted in Tables 4.7 and 4.8.

All five models utilizing EVA and ROCE display a consistently favorable link between sustainability reporting at the aggregate and individual levels, which is statistically significant at ($p<0.01$). The results of GMM adopting Tobin's Q and ROA as a proxy for CFP are consistent with the robustness check conclusion, indicating how sustainability reporting increases the firm's worth and profitability. Additionally, the findings support the idea that providing sustainability information has dramatically enhanced the firm's worth and profitability. *Models (1) to (4*) exhibited the same and consistent results with the primary analysis when evaluating the influence of CSD on CFP. *Model 1 to 4* in Tables 4.7 and 4.8 indicates that sustainability disclosure has a beneficial influence on corporate financial performance in accounting and market proxies (ROCE, EVA).

Table 4.7 CSD and CFP(ROCE) Relationship using GMM

Variables	ROCE Model 1	ROCE Model 2	ROCE Model 3	ROCE Model 4
CSD	0.0626***			
	(0.00442)			
EDS		0.0261***		
		(0.00363)		
SDS			0.0166***	
			(0.00325)	
GDS				0.112***
				(0.00911)
TURN	1.942***	1.784***	1.817***	2.538***
	(0.124)	(0.111)	(0.0952)	(0.136)
R.D.	-21.50***	-29.54***	-18.06***	-20.17***
	(1.869)	(2.899)	(2.633)	(2.235)
LQDTY	-0.279**	-0.0743	-0.124**	-0.0890
	(0.115)	(0.0781)	(0.0584)	(0.105)
SIZE	-1.828***	-1.464***	-1.110***	-1.518***
	(0.174)	(0.174)	(0.124)	(0.204)
LEV	-2.460***	-3.156***	-2.758***	-2.410***
	(0.0975)	(0.0732)	(0.105)	(0.0981)
ESI	2.034***	3.044***	1.708***	1.907***
	(0.276)	(0.250)	(0.177)	(0.258)
L. ROCE	0.681***	0.704***	0.720***	0.669***
	(0.00640)	(0.00606)	(0.00492)	(0.00684)
Constant	9.105***	7.972***	6.780***	3.535***
	(0.755)	(0.777)	(0.562)	(0.663)
Year effect	Yes	Yes	Yes	Yes
AR 1	0.000	0.000	0.000	0.000
AR 2	0.568	0.945	0.964	0.558
Hansen test	0.340	0.448	0.470	0.354
No of firms	223	223	223	223

(Source- Data analysis)

Note-** The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

Table 4.8 CSD and CFP (EVA) relationship using GMM

Variables	EVA Model 1	EVA Model 2	EVA Model 3	EVA Model 4
CSD	0.0043***			
	(0.00)			
EDS		0.0128***		
		(0.000)		
SDS			0.00814***	
			(0.000)	
GDS				0.0110***
				(0.003)
TURN	0.370***	0.771***	0.663***	0.448***
	(0.027)	(0.017)	(0.025)	(0.057)
RD	15.66***	13.63***	14.25***	10.87***
	(0.624)	(0.489)	(0.569)	(1.059)
LQDTY	-0.156***	0.0876***	0.0429***	-0.200***
	(0.017)	(0.014)	(0.016)	(0.034)
SIZE	-0.527***	-0.324***	-0.205***	-0.934***
	(0.044)	(0.041)	(0.037)	(0.060)
LEV	0.0192	0.166***	0.126***	0.164***
	(0.025)	(0.020)	(0.020)	(0.045)
ESI	-0.986***	-1.108***	-1.177***	-0.694***
	(0.061)	(0.037)	(0.034)	(0.103)
L. EVA	0.843***	0.813***	0.833***	0.824***
	(0.002)	(0.001)	(0.001)	(0.003)
Constant	3.194***	1.687***	-1.177***	4.517***
	(0.195)	(0.168)	(0.034)	(0.283)
Year effect	Yes	Yes	Yes	Yes
AR 1	0.001	0.002	0.001	0.001
AR 2	0.691	0.968	0.847	0.702
Hansen test	0.221	0.414	0.396	0.139
No of firms	223	223	223	223

(Source- Data analysis)

Note-** The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

The models adopted yielded highly significant results at the 1% ($p<0.01$) level. Furthermore, the robustness of the core model is reaffirmed by the alternative measures employed in the robustness check. The result indicated that sustainability disclosure enhances the value and profitability of the firm.

Considering the control variables, all models, including the robustness check model, found that leverage and size negatively influence corporate financial performance. According to (Hou, 2019), a potential explanation for this negative impact is that larger firms are less productive than smaller ones. As a result, as the firm grows, its costs (agency, transactional, and other charges) escalate (Javaid and Al-Malkawi, 2018). Leverage is perceived as a two-edged sword that can increase or lower a firm's worth (Hou, 2019). Subsequently, the environmentally sensitive firm dummy variable and research and development showed mixed results in the analysis. Mixed evidence, including the positive and negative effects of R&D, suggests that greater R&D spending does not guarantee increased yields unless appropriately managed (Lewin and Chew, 2005). The robustness check reaffirmed the validity of the findings by depicting consistent results with the primary analysis.

4.6 DISCUSSION

The present chapter examined the impact of CSD on CFP from 2010 to 2019 in the Indian manufacturing sector firms listed in the Nifty 500. The study adopted a set of analysis and robustness checks to discover that disclosing CSD will enhance the corporate financial performance of the firm. According to the results, communicating or reporting on sustainability initiatives boosts the firm's financial performance. Furthermore, the findings support the theoretical argument by claiming that adopting CSD in the manufacturing sector will enhance the firm's financial performance in all the models adopted with a p-value of ($p < 0.01$). The study's results align with the studies of (A. Buallay, 2019b; Friede et al., 2015; Kuzey and Uyar, 2016). Studies corroborate this assertion that ESG transparency is a tool for creating a competitive edge and enhancing performance.

Studies demonstrating a favorable relationship between sustainability disclosure and market performance support the notion that disclosing sustainability aids in meeting stakeholder needs and enhances firm performance by fostering relationships with stakeholders, eventually enhancing the firm's reputation and legitimacy and reducing transaction costs (Barnett, 2007; Perrini et al., 2009). Moreover, it is possible to view sustainability initiatives as an investment that enhances a firm's value (Awwad, 2018; Perrini et al., 2009). Further, the result implies that the market perceives that firms are disclosing the sustainability aspect better due to their improved information system and well-organized structure (Kumar et al., 2021; Menassa and Dagher, 2019). Hence disclosing sustainability aspects to the public assists stakeholders in determining firms' attitudes toward sustainable development. Moreover, if this communication or adoption does not match the actual firm behavior, the firm's long-term image and stakeholders' readiness to deliver resources will also be affected (Donaldson and Preston, 1995; Schreck and Raithel, 2018). Clear and structured sustainability disclosure may develop trust among the stakeholder and loyalty in addition to helping to strengthen the brand and reputation and raise revenue (Furlow, 2014). This will eventually lead to a long-term competitive advantage (Nola Buhr, 2007).

In contrast, Alon et al. (2010) opined that failure to disclose sustainability would result in missing business opportunities. Similarly, Porter (1991) contends that businesses that prioritize adhering to existing regulations over rivals are innovators in benchmarks, boosting their wealth and, ultimately, the wealth of their stakeholders. The market worth of the firms could rise due to innovation and future-focused thinking, which could help them retain or attract more stakeholders. This suggests that adopting sustainability and engaging in environmentally and socially responsible business practices can give manufacturers an upper hand. The findings confirm the contention that green production expenses are relatively low compared to the benefits they produce (Albertini, 2013; Friede et al., 2015). Investors consider such measurements because they create value for stakeholders. The outcome is contrary to the studies from (Laskar, 2018; López et al., 2007). The expense associated with the sustainability process is the logical explanation provided in the literature for the negative relationship. The costs of resource reallocation, training, and technological development are all part of the

sustainability model (Lopez et al., 2007). Even though this hurts profitability, it can improve profitability and value over time by lowering overall costs (Laskar, 2018); therefore, even though sustainability creates a short-term disadvantage, literature exhibits a long-term positive influence on firm value (Behl et al., 2022) and profitability. Based on the empirical evidence, it is assumed that adopting disclosure of sustainability enhances the manufacturing sector's performance. Based on the study, we encourage firms to adopt sustainability practices and disclose these for better transparency.

4.7 CONCLUSION AND SUMMARY

The current chapter aims to fill the necessary gap to determine the impact of sustainability disclosure on the financial performance of Indian manufacturing firms. The results show that sustainability disclosure favors the profitability and value of Indian manufacturing firms. Further, the environmental, social, and governance performance of manufacturing firms have a significant and positive impact on the profitability and value of the firm.

The assertion that meeting and satisfying stakeholder needs will strengthen the relationship with the stakeholder will be supported by the positive association between CSD and CFP in the Indian manufacturing sector. This will eventually boost the firm reputation, visibility, and legitimacy and lower transaction costs (Al Hawaj and Buallay, 2021; Barnett, 2007; Perrini et al., 2009). Therefore, sustainability disclosure can be viewed for the Indian manufacturing industry as an investment that improves corporate financial performance.

CHAPTER 5

THE ROLE OF GRI COMPLIANCE ON THE RELATIONSHIP BETWEEN CSD AND FIRM VALUE

5.1 OVERVIEW

This chapter seeks to determine whether GRI compliance moderates the links between CSD and firm value. This chapter conducted the analyses necessary to determine the answer, then summarized the findings. Hence, section 5.2 provides an introduction to the chapter. Section 5.3 elaborates on the data used in the analysis, followed by the methodology and empirical results in sections 5.4 and 5.5, respectively. Section 5.6 details the discussion of the findings. Finally, section 5.7 concludes the chapter.

5.2 INTRODUCTION

Sustainability disclosure has become a new tool that provides a wide range of information to stakeholder investors, regulators, and even the public (Kuzey and Uyar, 2017; Orazalin and Mahmood, 2018). In other words, sustainability disclosure is one of the managers' main strategies to notify all parties involved about the firm's sustainability strategy. The ability of the business to meet its moral, ethical, and social commitments to the environment and the society it operates is further empowered by the disclosure of sustainability measures (Orazalin and Mahmood, 2019). Due to its significance, non-financial reporting and sustainability disclosure is becoming essential. The scope of sustainability disclosure has broadened. Similarly, how investors, government regulators, policymakers, and the public have come to understand the importance of corporate sustainability over time and are getting more concerned owing to its possible implications. The authorities are creating rules and standards to reduce the costs resulting from corporate negligence in the social and environmental realms (Christofi et al., 2012). Hence, regulators have set many reporting standards globally and at various national levels to report sustainability initiatives. Stakeholders' theory also asserts that companies' participation in society through social, environmental, and governance transparency will lead to long-term benefits, profitability, and value creation (Behl et al., 2022).

On the contrary, owing to the various potential advantages of environmental, social, and governance disclosure, there is also an inclination for firms to use sustainability disclosure to play down their weakness. Even some firms adopt 'selective disclosure' or greenwashing, where these firms disclose only a portion of private information to stretch a falsely favorable outlook (Marquis et al., 2016; Yang et al., 2021). Hence, these industries may adopt ESG disclosure to hide wrongdoings and highlight the positive aspects of their operations. Here arises the firm's necessity to comply with the global standard. For this reason, compliance with GRI becomes more prominent. By adopting GRI guidelines, organizations can comprehend what information to capture and how to present it. GRI establishes a universal standard for documenting sustainability reporting and makes it possible to compare data between various organizations (Sutantoputra,2009; Diouf and Boiral, 2017; Yang et al., 2021). Hence, disclosing ESG adhering to GRI guidelines can partially help address the 'selective disclosure' (Yang et al., 2021).

GRI is also the *de facto* international benchmark for sustainability reporting (Roca and Searcy, 2012). Further, Global Reporting Initiative (GRI) serves as a vital channel for disseminating all major sustainability indicators to the public (Global Reporting Initiative, 2013). GRI guidelines are now an important tool used by businesses to organize sustainability information (Yang et al., 2021). The number of firms publishing sustainability reports using the GRI framework has risen dramatically (A. Buallay et al., 2020; Carrots and Sticks, 2013; KPMG, 2013). Apart from GRI, there are several standards for disseminating ESG disclosure. Hence, disclosing ESG varies from firm to firm (Ioannou and Serafeim, 2011). Apart from GRI, the Initiative for Integrated Reporting (IIR) also established a standard with an international framework in 2013 (Cheng et al., 2014; Fatemi et al., 2017). In addition to these standards, firms adopt non-traditional methods such as websites and social media to communicate their disclosure (Fatemi et al., 2017). Henceforth, it is not essential that all the firms disclosing ESG information are GRI compliant. In addition, compared to other countries, the number of firms that follow GRI guidelines is relatively low in the Indian context. One of the reasons could be ambiguity and lack of empirical evidence on the economic advantages of being GRI compliant in ESG disclosure.

The literature has a dearth of information addressing how GRI compliance impacts a firm's financial performance. A group of academics asserts that adhering to GRI guidelines improves stock market and environmental performance (del Mar Alonso-Almeida et al., 2014; Willis, C. A., 2003). However, other scholars are skeptical of this association (Yang et al., 2021). However, few experts assert that it is time- and cost-consuming (Lozano, 2006b). Therefore, the research is inconclusive regarding the relationship between GRI compliance and financial performance. The primary driving force behind pursuing this objective has been the dearth of studies regarding the relationship between GRI compliance and corporate financial performance. Second, lack of empirical evidence regarding the financial benefits of GRI compliance in ESG disclosure. Thirdly, to test the moderating role played by GRI compliance in CSD and to evaluate whether the value produced by GRI-compliant firms is in comparison to non-GRI firms. In light of this, this chapter responds to the following research question.

1. *Whether GRI compliance improves the firm performance?*
2. *Does GRI compliance play a moderating role in the CSD and firm value relationship of Indian manufacturing firms?*
3. *Whether the value generated by GRI firms is more compared to non-GRI firms?*

The study contributes to the existing body of knowledge on sustainability disclosure by delivering empirical evidence on the influence of CSD and GRI compliance on the firm value of Indian manufacturing firms by using signaling theory. The study found that sustainability disclosure and GRI compliance boost the firm's value. Further, the study discovered that GRI compliance strengthens CSD and firm value association, acting as moderators. Implying firms disclosing CSD by adhering to GRI compliance have a significantly improved firm value than firms that are not.

5.3 DATA

The data in this study spans ten years, from 2010 to 2019. The sample consists of 223 manufacturing firms from ten different industries. Except for GRI compliance and ESG rating score, all data were collected using the CMIE PROWESS database. The details of firms compliant with GRI sustainability reporting standards are collected from the GRI database. The ESG scores are gathered from the Bloomberg database.

5.3.1 DATA SOURCE

The study adopted Bloomberg's ESG disclosure metric to capture the level of CSD and identify individual sustainability elements scores. The Bloomberg ESG scores are based on the firms' filings, such as CSR reports, sustainability reports, annual reports, and documents on the company's website, and represent a wide range of publicly available information to investors. Based on the information provided, Bloomberg designates disclosure scores ranging from 0.1 to 100 (lowest to highest) and tailors its documentation to the industry (Fatemi et al., 2017). The firm's GRI compliance is a dummy variable with a value of one if the firm follows GRI guidelines and zero otherwise. Data on GRI compliance is gathered from the GRI SDD database, and each firm's sustainability reports are also used to collect the data. The firms that are GRI referenced, comprehensively adopting GRI, or fully adopting GRI are considered GRI compliant. Additionally, the Prowess database was used to obtain the firms' financial information.

5.3.2 CONTROL VARIABLE

Several firm-specific characteristics were controlled while investigating the link between sustainability disclosure and firm value. Leverage, firm size, liquidity, and research and development intensity were used to control the growth opportunity effect (Prasad et al., 2021). In addition, an environmentally sensitive firm dummy variable was created to control the effect of environmentally sensitive firms. High-risk firms are likely to release sustainability reports. Environmentally conscious businesses reveal additional information. Hence, they are more likely to cause environmental damage (Liu and Anbumozhi, 2009; Legendre and Coderre, 2013). Supporting these conclusions, Mukherjee and Nuñez (2019) in their found that sectors with augmented environmental risk adopt the GRI framework.

Table 5.1 Definition of independent variables, dependent variables, and control variable

Variable Name	Variable Abbreviation	Variable Description
Independent variables		
CSD	Corporate sustainability disclosure	Bloomberg rating score for ESG (sustainability reporting)
GRI	GRI compliance of the firm	1 for GRI compliance, 0 otherwise
EDS	Environmental disclosure score	Bloomberg rating score for Environmental disclosure
SDS	Social disclosure score	Bloomberg rating score for social disclosure
GDS	Governance disclosure score	Bloomberg rating score for governance
Dependent variables		
TOBIN	Tobin's Q	Market capitalization plus long-term debt plus short-term debt divided by the total asset.
EVA	Enterprise value-added	Enterprise value divided by total asset
Control variables		
R.D.	Research and development expenditure	Total research expenditure divided by sales.
TURN	Turnover	Net sales divided by total assets
LEV	Debt to equity ratio (times)	Total debt divided by total equity
SIZE	Size	Natural logarithm of total asset
LQDTY	Liquidity ratio (times)	Quick asset divided by current liability
ESI	Environmentally sensitive industries	One is an environmentally sensitive firm, 0 otherwise

(Source- Literature review)

Moreover, sustainability reporting varies greatly depending on the industry, indicating that environmentally damaging discloses the most ecological, social, and governance practices (Dong and Burritt, 2010). Manufacturing firms tend to report more on

sustainability disclosure (Abu-Baker and Naser, 2000). To control the effect of environmental and socially sensitive (ESSI) firms, the study adopted the industrial classification adopted by Shabana *et al.* (2017) and Simoni *et al.* (2020). The ESSI is a dummy variable taking the value of one if the firms belong to ESSI and zero otherwise. All the variables used, and their description is explained in Table 5.1

5.4 METHODOLOGY

The study estimated the association between the CSD and firm value using a balanced panel, and the study adopted a two-step GMM to eliminate the endogeneity bias spurred in this relationship (Arellano and Bover, 1995). The system GMM is a more powerful tool that captures unobservable heterogeneity and simultaneity (Wintoki et al., 2012). Here the lag value of the explanatory variable is used to rectify endogeneity in the dynamic connection (Roodman, 2009; Ullah et al., 2017). This estimator uses two-level equations involving instrumental variables to eliminate the correlation between residuals and independent variables. The dynamic panel data approach GMM was used in this study to examine how CSD is impacting CFP by using GRI compliance as a moderator. According to Roodman (2009), One of the best techniques for handling endogenous relationships is GMM. Here the lag values of the dependent variables are adopted to correct the endogeneity. The modeling strategy assumes the presence of first-order autocorrelation but not second-order autocorrelation. Even when endogeneity exists, this method yields reliable results (Flannery and Hankins, 2013). The empirical estimation used in this study to measure the moderating role of GRI compliance in this linkage is explained here.

$$Tobin_{it} = \alpha + \beta_1 CSD_{it} + \beta_2 GRI_{it} + \beta_3 TURN_{it} + \beta_4 RD_{it} + \beta_5 LQDTY_{it} + \beta_6 SIZE + \beta_7 LEV_{it} + + \beta_8 ESI_{it} + \beta_9 Year\ effect + \varepsilon\ it \quad \textbf{(Base model)} \quad \textbf{(5.1)}$$

$$Tobin's\ q_{it} = \alpha + \beta_1 a\ EDS_{it} + \beta_2 a\ GRIit + \beta_3 a\ TURN\ it + \beta_4 a\ RD_{it} + \beta_5 a\ LQDTY\ it + \beta_6 a\ SIZE + \beta_7 a\ LEVit + \beta_8 a\ ESIit + \beta_9 a\ Year\ effect + \varepsilon\ it \quad \textbf{…… (5.1 a)}$$

$$Tobin's\ q_{it} = \alpha + \beta_{1b} SDS_{it} + \beta_{2b} GRIit + \beta_{3b} TURN\ it + \beta_{4b} RD_{it} + \beta_{5b} LQDTY\ it + \beta_{6b} SIZE + \beta_{7b} LEVit + \beta_{8b} ESIit + \beta_{9b}\ Year\ effect + \varepsilon\ it \quad \ldots\ldots\ldots \quad (5.1\ b)$$

$$Tobin's\ q_{it} = \alpha + \beta_{1c} GDS_{it} + \beta_{2c} GRIit + \beta_{3c} TURN\ it + \beta_{4c} RD_{it} + \beta_{5c} LQDTY\ it + \beta_{6c} SIZE + \beta_{7c} LEVit + \beta_{8c} ESIit + \beta_{9c}\ Year\ effect + \varepsilon\ it \quad \ldots\ldots\ldots\ldots \quad (5.1\ c)$$

$$Tobin's\ q_{it} = \alpha + \beta_1 CSD_{it} + \beta_2 GRI_{it} + \beta_3 (CSD \times GRI_{it}) + \beta_4 TURN_{it} + + \beta_5 RD_{it} + \beta_6 LQDTY_{it} + \beta_7 SIZE + \beta_8 LEV_{it} + \beta_9 ESI_{it} + \beta_{10}\ Year\ effect + \varepsilon it\ (Inter\text{-}effect) \quad (5.2)$$

The preliminary estimate depicted in the model (5.1) explains the direct effect of aggregate sustainability disclosure score and GRI compliance along with the control variables on firm value. At the same time, model (5.2) explains the interaction effect (CSD x GRI) on firm value. The various elements of sustainability disclosure's impact, along with GRI compliance on firm value, are depicted as sub-models which are depicted as (5.1a to c).

5.4.1 DESCRIPTIVE STATISTICS

The descriptive statistics, including mean and standard deviation, are shown in Table 5.2. To control for outliers, winsorization on all continuous variables at the 5% and 95% levels was performed. The mean value of sustainability reporting is 24.14, with a standard deviation of 12.76. The mean values of the individual elements, such as environmental, social, and governance, are 18.24, 29.92, and 48.18, respectively, with a standard deviation of 14.04, 15.38, and 6.86. The key independent variable Tobis q has a mean of 4.48 and a standard deviation of 8.30. The mean of GRI is 0.46, indicating that forty-six percent of the sample firms are GRI compliant. As a result, it was discovered that the values are consistent because they fall within previous studies. Regarding kurtosis, Tobin's q, EVA, research and development intensity, and liquidity are above 3, which means these variables are leptokurtic. Skewness determines the positive or negative outcome of the variable. In the present study, all the variables except the environmentally sensitive dummy variable are positive. Analysis revealed a reasonable range of variations, fair accuracy, and precision among the variables.

Table 5.2 Descriptive statistics

Variables	Mean	St. Dev	Mini	Max	Skewness	Kurtosis
ROA	7.72	5.64	-.32	20.79	0.67	2.73
ROCE	11.5	8.34	-.39	30.63	0.63	2.65
TOBIN	4.489	8.303	0.055	33.05	2.49	8.31
EVA	1.70	1.90	0	7.19	1.57	4.82
CSD	24.14	12.76	9.090	52.69	0.94	2.94
EDS	18.24	14.04	3.876	49.61	1.10	3.07
SDS	29.92	15.38	7.017	59.64	0.21	2.16
GDS	48.18	6.865	39.28	64.28	1.00	3.31
GRI	0.460	.498	0.000	1.00	0.15	1.02
ESI	0.806	0.395	0.000	1.00	-1.55	3.40
TURN	0.880	0.604	0.001	4.540	0.63	2.71
RD	0.008	0.016	0.000	0.063	2.46	8.01
LEV	0.530	0.562	0.000	1.910	1.03	3.00
SIZE	4.677	0.638	2.782	6.536	1.03	3.00
LQDTY	1.030	0.699	0.221	2.850	1.15	3.60

(Source- Data analysis)

5.4.2 CORRELATION FOR THE TOTAL SAMPLE

Table 5.3 depicts the outcome of the correlation between the variables. A positive correlation was found between turnover and liquidity with Tobinsq (Firm value). At the same time, all the other independent and control variables' relationship with Tobin's Q is negative. No high correlation was observed between the variables except for individual elements of sustainability with CSD score. It is expected to be highly correlated since all the individual elements of sustainability are extracted from the total CSD score. The study also employed VIF to check the potential multicollinearity problem in regression. The variance inflation factor in the regression model ranged from 1.05 to 1.75, indicating multicollinearity is not a serious concern (Ryan, T. P, 2008).

Table 5.3 Correlation for the total sample

Variable	TOBIN	CSD	EDS	SDS	GDS	GRI	ESSI	TURN	RD	LEV	SIZE	LQDTY	V I F
TOBIN	**1.000**												
CSD	-0.259*	**1.000**											1.75
EDS	-0.244*****	0.965*	**1.000**										
SDS	-0.213*	0.874*	0.752*****	**1.000**									
GDS	-0.240*	0.813*	0.745*	0.634*****	**1.000**								
GRI	-0.051*	0.330*	0.325*	0.269*	0.298*****	**1.000**							1.20
ESI	-0.152*	0.130*	0.119*	0.114*	0.128*	0.011	**1.000**						1.12
TURN	0.049*	-0.014*	-0.013*	-0.016*	-0.095*	0.020*	-0.133*	**1.000**					1.11
RD	-0.094*	0.057*	0.061*	0.028*	0.028*	-0.072*	0.030*	-0.126*****	**1.000**				1.05
LEV	-0.062*	-0.010*	0.020*	-0.094*	0.041*	0.041*	0.178*	0.0008	-0.152*****	**1.000**			1.40
SIZE	-0.423*	0.594*	0.564*	0.523*	0.505*	0.285*	0.231*	-0.169*	0.057*	0.153*****	**1.000**		1.79
LQDTY	0.056*	-0.004*	-0.050*	0.088*	-0.047*	-0.031*	-0.015*	-0.108*	0.095*	-0.484*	-0.125*	**1.000**	1.32

**Correlation is significant at the 0.05 level*

(Source- Literature review)

5.5 EMPIRICAL RESULTS

Table 5.4 shows the GMM results of the moderating role of GRI compliance on firm value using GMM.

Table 5.4 CSD and GRI compliance relationship with firm value using GMM

Variables	Tobin's Q Model 1 (Base model)	Tobin's Q Model 2 (Interaction model)
CSD	0.0113***	0.0280***
	(0.001)	(0.003)
GRI compliance	1.757***	2.142***
	(0.0691)	(0.170)
(CSD Score X GRI compliance)		0.0102**
		(0.004)
Turnover	0.265***	-0.451***
	(0.0800)	(0.0624)
RD	12.65***	5.581***
	(0.952)	(1.279)
LQDTY	-0.449***	-0.565***
	(0.0358)	(0.0434)
Firm size	-4.641***	-4.938***
	(0.110)	(0.0879)
Leverage	-0.484***	-1.036***
	(0.0383)	(0.0599)
ENV dummy	-4.690***	-6.551***
	(0.144)	(0.171)
L. Tobin's Q	0.535***	0.508***
	(0.001)	(0.002)
Year effect	Yes	Yes
Constant	27.94***	30.18***
	(0.500)	(0.345)
AR 1	0.014	0.011
AR 2	0.683	0.816
Hansen test	0.518	0.197
Number of firms	223	223

(Source- Data analysis)

Note-** The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

The results of the base model are presented in *Model (1)*, and the moderating effect of GRI compliance is presented in *Model (2).* The results of *Model 1* suggest that

sustainability reporting (CSD disclosure) is positively related to firm value (β = 0.011, $p < 0.01$). Further, the coefficient of GRI compliance (β = 1.75, $p < 0.01$) is positive and significant, indicating that the firm value of firms adhering to GRI guidelines is higher than non-GRI-compliant firms. The results support the hypothesis (H_2).

Considering the lagged values of the dependent variable (L. Tobin's) coefficient significantly impacts firm value at a 1 percent level ($p < 0.01$). Regarding the control variables used in the study, research and development intensity is significant and positively impacts firm value at a 1 percent level. While turnover positively impacts *Model 1* while negatively impacting firm value in the interaction effect. In comparison, the size and leverage, environmentally sensitive firm dummy variable, and liquidity coefficient was negative in both *models (1) and (2).*

Model 2 presents the results of the base model, including the interaction variable. The coefficient of the interaction term (CSD × GRI) is positive and significant (β = 0.010, $p < 0.05$). The results support the hypothesis (H_{2a}) that the relationship between CSD and firm value increases when the firms comply with the GRI reporting standards. Hence, in line with the present study argument, GRI compliance is perceived as a strong signal, which could play a crucial role in separating the equilibrium between GRI-compliant and non-GRI firms. Hypotheses H_{2d} and H_{2e} are supported based on the result, implying CSD and GRI compliance enhances the firm's value. Further, GRI compliance is a vital moderator in this nexus. The study further analyzed the relationship between CSD's components (environment, social, and governance) with the firm value, and the results are reported in Table 5.5. The results show that all three components positively relate to the firm value and are statistically significant. Further, in line with the base model, the value of GRI-compliant firms was higher than the non - GRI firms. While except for turnover, all the control variables, such as research and development, expense leverage, firm size, and sensitive environmental firms dummy variable, showed a negative relationship with firm value in all the estimated models. Considering the lagged values of the dependent variable (L. Tobin's) coefficient significantly impacts firm value at a 1 percent level ($p < 0.01$).

Table 5.5 CSD and GRI compliance relationship with firm value using GMM

Variables	Tobin'sQ Model 1	Tobin'sQ Model 2	Tobin's Q Model 3
EDS	0.0102***		
	(0.001)		
SDS		0.0208***	
		(0.001)	
GDS			0.0662***
			(0.0049)
GRI compliance	1.720***	2.444***	1.997***
	(0.0887)	(0.117)	(0.152)
Turnover	0.293***	0.537***	0.181
	(0.111)	(0.112)	(0.130)
RD expense	-16.31***	-13.37***	12.68***
	(2.314)	(1.727)	(2.119)
Liquidity	-0.550***	-0.308***	-0.951***
	(0.0523)	(0.0383)	(0.0724)
Firm size	-4.068***	-3.918***	-5.004***
	(0.128)	(0.115)	(0.171)
Leverage	-0.530***	-0.259***	-0.863***
	(0.0466)	(0.0540)	(0.0736)
ENV dummy	-5.484***	2-	-4.464***
	(0.199)	4.387***	(0.251)
		(0.179)	
L. Tobin's Q	0.504***	0.532***	0.521***
	(0.003)	(0.004)	(0.003)
Year effect	Yes	Yes	Yes
Constant	26.41***	23.14***	27.30***
	(0.604)	(0.575)	(0.826)
AR 1	0.02	0.031	0.014
AR 2	0.509	0.500	0.667
Hansen test	0.375	0.250	0.121
Number of firms	223	223	223

(Source- Data analysis)

Note-** The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

All the hypotheses H2a, $H2_b$ and H2c are supported based on the result. The GMM employs two post-estimation tests for assessing autocorrelation and overriding restrictions. To determine the overall validity of the instrument, the present study employed Hansen J statistics. The post-estimation Hansen test specifies that all the

instruments used in this study are valid and robust in all the models. The value of AR (2)>0.05 specifies that the error term is serially uncorrelated and that the moment condition is correctly specified. It can also infer from the estimation that the number of devices used in this study is less than the cross-section. Hence the model specification and instruments are valid and are in line with the specification of GMM.

5.5.1 ROBUSTNESS CHECK

The study adopted an alternative measure of firm value to check the robustness of the results. Economic value added (EVA) was used as the dependent variable and analyzed. Table 5.6 presents analyses to confirm the validity of the results regarding the sustainability and firm value relationship method.

The relationship between sustainability reporting at the aggregate and individual levels is consistently positive and statistically significant at p (<0.01) for all five models using EVA. This explains that sustainability reporting improves the firm's value. This finding is in line with the result of GMM using Tobinsq as a proxy for firm value. Further, GRI compliance's moderation and direct effect on the firm value were highly significant. The results strongly suggest that disclosing sustainability data adhering to GRI compliance has significantly improved the firm value of GRI-compliant firms more than those not. Considering the other explanatory variables, the lag of the dependent variable, turnover, and R and D is significant and positive. Mixed results, both positive and negative impacts of R&d, indicate that high R&D spending does not ensure higher yields unless handled effectively (Lewin and Chew, 2005).

Leverage and size in all the models, including the robustness check model, indicated a negative impact. A plausible explanation for this negative influence could be that the firm size had a negative effect because larger firms are less valuable than smaller firms (Hou, 2019). As a result, the firm's cost (agency, transactional, and other costs) rises as the firm expands (Al-Malkawi and Javaid, 2017).

Similarly, leverage is viewed as a two-edged sword because it has the potential to surge or decrease a company's value (Hou, 2019). At the same time, liquidity is not significant in most models. The above seems reasonable because manufacturing firms mainly rely

on long-term funds than liquid assets. Further, GRI compliance's moderation and direct effect on the firm value were highly significant. The results strongly suggest that disclosing CSD adhering to GRI compliance has significantly improved firm value than those not.

5.6 DISCUSSION

The study examined the signaling effect of CSD on firm value and addressed whether GRI compliance improves firm value using manufacturing firms in India. GRI compliance moderating and signaling effects on a firm's long-term value creation were also investigated. The study adopted a set of analyses and robustness checks to discover that firms that adopt GRI guidelines for sustainability disclosures have a higher value than those that do not. According to the results, communicating or reporting on sustainability initiatives boosts the firm's value. Furthermore, the findings support the theoretical argument by claiming that GRI-compliant firms have higher firm value in all five models with a p-value of ($p < 0.01$) than those not. This infers that a firm's sustainability reporting under GRI has a higher market value than those without, demonstrating the importance of GRI compliance in CSD disclosure.

The outcome is contrary to (Lopez et al., 2007; Laskar, 2018), the direct impact of CSD and firm value. The plausible elucidation given in the literature for the negative association between CSD disclosure and firm value is owing to the cost involved in the sustainability process. The costs of resource reallocation, training, and technological development are all part of the sustainability model (Lopez et al., 2007). Even though this hurts profitability, it can improve profitability and value over time by lowering overall costs (Laskar, 2018); therefore, even though sustainability creates a short-term disadvantage, literature exhibits a long-term positive influence on firm value (Behl et al., 2022) and profitability. The results align with some prior studies (Friede et al., 2015; Buallay, 2020). The result implies that the market perceives that firms are disclosing the sustainability aspect better due to their improved information system and well-organized structure (Menassa and Dagher, 2020; Kumar et al., 2021). Hence disclosing sustainability aspects to the public assists stakeholders in determining firms' attitudes toward sustainable development.

Table 5.6 Impact of GRI compliance and CSD on EVA using GMM

Variables	EVA Model 1	EVA Model 2	EVA Model 3	EVA Model 4	EVA Model5
EDS	0.0101***				
	(0.000)				
SDS		0.007***			
		(0.000)			
GDS			0.0219***		
			(0.00188)		
CDS				0.009***	0.003**
				(0.001)	(0.001)
GRI compliance	0.801***	0.985***	0.459***	0.631***	0.090*
	(0.0225)	(0.0344)	(0.0364)	(0.0329)	(0.051)
(CSD X GRI compliance)					0.009***
					(0.002)
Turnover	0.659***	0.557***	0.337***	0.234***	-0.019
	(0.0244)	(0.0285)	(0.0438)	(0.0455)	(0.022)
RD expense	11.83***	9.921***	12.08***	11.74***	2.479***
	(0.856)	(0.748)	(0.912)	(0.873)	(0.583)
LQDTY	-0.0539***	-0.0314**	-0.404***	-0.363***	-0.030*
	(0.016)	(0.0158)	(0.0250)	(0.0251)	(0.016)
Firm Size	-0.445***	-0.259***	-0.947***	-0.830***	-0.356***
	(0.0258)	(0.0356)	(0.0317)	(0.0440)	(0.029)
LEV	0.206***	0.130***	-0.0119	-0.0478*	-0.181***
	(0.0237)	(0.0192)	(0.0272)	(0.0272)	(0.017)
ESI	-0.899***	-1.065***	-0.677***	-0.754***	-0.170***
	(0.0375)	(0.0387)	(0.0404)	(0.0527)	(0.052)
L. EVA	0.838***	0.855***	0.835***	0.848***	0.805***
	(0.00199)	(0.00216)	(0.00203)	(0.00207)	(0.004)
Constant	2.269***	1.547***	4.322***	4.612***	2.048***
	(0.127)	(0.159)	(0.195)	(0.185)	(0.128)
Year effect	Yes	Yes	Yes	Yes	Yes
AR 1	0.002	0.002	0.001	0.001	0.001
AR 2	0.962	0.845	0.665	0.656	0.15
Hansen test	0.489	0.439	0.194	0.192	0.20

(Source- Data analysis)

Note**-The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

Moreover, if this communication or adoption does not match the actual firm behavior, the firm's long-term image and stakeholders' readiness to deliver resources will also be affected (Donaldson and Preston, 1995; Schreck and Raithel, 2018). Similarly, by following the guidelines of GRI, firms disclosing CSD convey signals regarding activities to distinguish themselves from non-GRI-compliant firms. When a firm discloses sustainability by adhering to GRI guidelines, it conveys the signal of being legitimate and aids the stakeholders in identifying GRI and non-GRI-compliant firms and separating the equilibrium between high and low performers.

Additionally, sustainability disclosure sticks to GRI reports used by the firm to send signals to interested parties, allowing them to make sound decisions (Levy and Lazarovich, 1995). It is beneficial for organizations to gain a competitive edge by giving stakeholders accurate information. Correspondingly, Baiman and Verrecchia (1996) observed that disclosing non-financial data reduces information unevenness, lowers financing costs, and increases the firm value. The sustainability disclosures under the GRI generate positive publicity for a firm, increasing its value and making it even more intriguing to society. Scrutinizing the result exhibits that information signaling is a viable strategy used by Indian firms to differentiate themselves from GRI-compliant and non-compliant companies. Moreover, it allows for identifying favorable and unfavorable firms and separating the equilibrium between high and low performers.

5.7 CONCLUSION AND SUMMARY

The research only looked at how CSD will affect the firm's value (Aboud and Diab,2018; Buallay, 2019b; Jyothi and Khanna, 2021). Concurrently, the present study observed whether companies benefit from GRI compliance. This research is significant in the Indian context because not all companies follow GRI guidelines. Moreover, no conclusive evidence links CSD and firm value (Fatemi et al., 2017; Laskar, 2019). The findings show that in the Indian manufacturing sector, CSD and GRI compliance positively impact firm value.

Further, the present research expands this linkage in the Indian context by providing empirical evidence that firms adopting the GRI framework have a higher market value

than those not, demonstrating the importance of GRI compliance in CSD. The sustainability voluntary reporting initiative was bolstered even more by signaling theory. Manufacturing industries that follow the CSD guidelines will sign favorable impacts. Furthermore, the findings specify that green manufacturing does not necessitate a heavy investment (Albertini, 2013)**.** The positive association in most base models implies that manufacturing firms should emphasize GRI adoption or voluntary sustainability reporting, despite the cost of undertaking such an aspect. Secondly, the positive moderation effect of GRI compliance on CSD and firm value suggests that firms that disclose GRI adhere to GRI standards valued by the investors more than those not. The study helps the managers and industry understand the significance of implementing voluntary sustainability disclosure practices and signify the importance of being GRI compliant.

CHAPTER 6

THE ROLE OF FIRM LIFE CYCLE ON THE RELATIONSHIP BETWEEN SUSTAINABILITY DISCLOSURE AND CFP

6.1 OVERVIEW

The third objective of the investigation is demonstrated in this chapter. This chapter investigates the role of the firm life cycle in the relationship between CSD and CFP. A series of analyses and robustness checks were carried out to validate the findings. Hence, section 6.2 provides an introduction to the chapter. Section 6.3 discusses the data used in the analysis and is followed by the methodology and empirical results in sections 6.4 and 6.5. Section 6.6 details the discussion of the findings. Finally, section 6.7 concludes the chapter.

6.2 INTRODUCTION

Despite the number of research, the relationship between CSD and CFP at various stages of a firm's life cycle has not received adequate attention in the literature. According to management literature, organizational performance varies depending on the various phases of the firm life cycle (Richardson and Gordon, 1980; Rappaport, 1981). The firm life cycle stages are critical for understanding corporate performance (Anthony and Ramesh, 1992). Considering the literature, the underlying link between social responsibility and financial performance is dynamic, depending on changes in financial fundamentals (such as cash flows, liquidity, and other risks) and prospects available at different times (Al-Hadi et al., 2017). The evidence suggests that sustainability and financial performance may differ depending on the life cycle stage.

One of the less-discussed topics concerning sustainability disclosure is the role of the business lifecycle in the CSD and CFP association. Though there are studies on the firm life cycle in corporate finance (Rakotomavo, 2012; Trihermanto and Nainggolan, 2018), there is still a paucity of literature on the role of the firm life cycle in CSD and CFP nexus. From the literature, it is evident that organizations adopt different financial approaches at various stages of their life cycles and have varying levels of governance mechanisms. Hence, the impact of disclosure policies on CFP is expected to differ

depending on the firm's life cycle (Atif et al., 2022). Based on this evidence, it is presumed that the firm life cycle might mitigate the CSD and CFP links. Adopting CSD in different life cycle stages could impact corporate financial performance differently. Moreover, the strategies of managers also can differ based on where they are in the life cycle. Henceforth, it is assumed that the firm life cycle plays a critical role in CSD and corporate financial performance.

The motivation behind the study is to expand the literature by analyzing the role of the firm life cycle in the CSD and CFP nexus. Therefore, the current study provides answers to the two following questions. *1) Is there a link between CSD and the financial success of corporations? 2) Is there a role for the firm's life cycle in this relationship?* To the best of the author's knowledge, no academic studies have explicitly studied the role of the firm life cycle in the CSD and CFP nexus. Hence, the study explores one of the lesser-known aspects of sustainability disclosure: how the firm life cycle influences the association between CSD and CFP.

6.3 DATA

The data in this study covers the years 2010 to 2019. The sample has 223 manufacturing firms from ten diversified sectors. The NIC code from the prowess database was used to classify the sectors**.** The data on firm life cycle parameters were captured from the prowess database. At the same time, CSD rating scores were collected in the Bloomberg database.

6.3.1 DATA SOURCE

The CSD score calculated by Bloomberg denotes the ESG rating. Bloomberg calculates ESG rating scores ranging from 0.1 to 100 based on information published and available on the company's website, such as annual reports, sustainability reports, and CSR reports. In comparison, the prowess database was used to represent the firm life cycle. To capture the various stages of the firm, Dickinson’s model of the firm life cycle was adopted (Dickinson, 2011). As a result, cash flow patterns are employed to capture the firm's life cycle stage, and a firm's life cycle mapping is created by combining

operating, investment, and financing cash flows. In addition, the prowess database was also used to collect all of the other firm-specific information.

6.3.2 CONTROL VARIABLE

Several firm-specific factors were controlled while investigating the link between CSD, Firm life cycle, and CFP. The growth opportunity outcome was controlled by employing leverage, firm size, liquidity, and research and development intensity (Prasad et al., 2021) as control variables. Most of the sampled firms in the present study fall in the environmentally sensitive category. The previous research suggests a significant nexus between sustainability information and the type of industry. Moreover, sustainability reporting varies greatly depending on the industry, indicating that environmentally damaging discloses the most ecological, social, and governance practices (Dong and Burritt, 2010). To control the effect of environmental and socially sensitive (ESSI) firms, the study used the industrial classification adopted by Shabana *et al.* (2017) and Simoni *et al.* (2020). The ESSI is a dummy variable taking the value of one if the firms belong to ESSI and zero otherwise. Table 6.1 list the variables used for this objective.

6.4 METHODOLOGY

Panel data analysis is the most effective method when both time series and cross-sectional features are in the data (Naciti, 2019). Over time, a cross-sectional unit is investigated. Hence, the current study has data that spans both space and time. Ullah et al. (2017) and Zahid et al. (2020) stated the endogeneity concerns in sustainability and corporate financial performance nexus. The endogeneity in this node will result in inconclusive and misleading results. Further, this can lead to erroneous inferences or incorrect estimations. As a result, the present study adopted a two-step system generalized method of moments (GMM) to tackle the endogeneity generated by unobservable heterogeneity and simultaneity of the variable. Here the lag value of the explanatory variable is used to rectify endogeneity in the dynamic connection (Roodman, 2009; Ullah et al., 2017). This estimator used two-level equations involving instrumental variables to eliminate the correlation between residuals and independent variables. Hence the empirical model adopted for the estimation is explained below.

Table 6.1 Definition of independent variables, dependent variables, and control variable

Variable Name	Variable Abbreviation	Variable Description
Independent variables		
CSD	Corporate sustainability total score (ESG score)	Bloomberg rating score for ESG (sustainability reporting)
INTRO	Introduction stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.
GROW	Growth stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.
MATU	Maturity stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.
SHAKE	Shakeout stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.
DECL	Decline stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.
Dependent variables		
ROA	Return on asset	Net profit divided by total assets of the company
TOBIN'S	**Tobin's Q**	Market capitalization plus long-term debt plus short-term debt divided by the total asset.
Control variables		
RD	Research and development expenditure	Total research expenditure divided by sales.
LEV	Debt to equity ratio (times)	Total debt divided by total equity
TURN	Turnover	Net sales divided by total assets
SIZE	Size	Natural logarithm of total asset
LQDTY	Liquidity ratio (times)	Quick asset divided by current liability
ESI	Dummy variable	One, if an environmentally sensitive firm, 0 otherwise

(Source- Literature review)

$$CFP_{it} = \alpha_{11} + \beta_{11} CSD_{it} + \beta_{21} FLC_{it} + \beta_{31} TURN_{it} + \beta_{41} LQDTY_{it} + \beta_{51} LEV_{it} + \beta_{61} RD_{it} + \beta_{71} Size_{it} + \beta_{81} ESI_{it} + \varepsilon it \ldots\ldots \text{(Base model)} \ldots\ldots\ldots \quad (6.1)$$

The dependent variable used in the study is CFP. Both accounting and market-based measures are used to measure corporate financial performance. Hence ROA is used as a proxy for the accounting-based measure, and EVA is used as a proxy for the market-based measure. Market-based measures are forward-looking measures depicting future income estimates, while accounting-based measures are retrospective and depict past costs. Hence these measures can deal with measurement bias (Al Malkawi and Javed, 2018; Scholtens, 2008). The explanatory variable used in the model (6.1) includes CSD (ESG disclosure rating) and different stages in the firm lifecycle. At the same time, the control variable includes liquidity, research and development intensity, turnover, leverage, firm size, and the environmentally sensitive firm dummy variable.

Model (6.2) examines the primary estimation where the direct and interaction effect of (CSD X *FLC*) CSD rating and different firm life cycle stages are depicted. Hence, the interaction model is explained here.

$$CFP_{it} = \alpha_{12} + \beta_{12} CSD_{it} + \beta_{22} FLC_{it} + \beta_{32} (CSD\ it\ X\ FLC_{it}) + \beta_{42} TURN_{it} + \beta_{52} LQDTY_{it} + \beta_{62} LEV_{it} + \beta_{82} Size_{it} + \beta_{92} RD_{it} + \beta_{10\,2} ESI_{it} + \varepsilon it \ldots\ldots \text{(6.2) (Interaction effect)}$$

Model (6.1) depicts the direct effect of CSD rating on firm life cycle stages, whereas model (6.2) depicts the interaction effect of CSD rating with distinct life cycle stages. Each life cycle stage's impact on CFP and its interaction effect is depicted as a sub-model from '6.2 a' to '6.2 e.'

- $CFP_{it} = \alpha_{it} + \beta_1 CSD_{it} + \beta_2 FLC_{it} + \beta_3 (CSD_{it} X Intro_{it}) + \beta_4 TURN_{it} + \beta_5 LQDTY_{it} + \beta_6 LEV_{it} + \beta_7 RD_{it} + + \beta_8 Size_{it} + \beta_9 ESI_{it} + \varepsilon it \ldots\ldots\ldots \quad (6.2a)$
- $CFP_{it} = \alpha_{it} + \beta_1 CSD_{it} + \beta_2 FLC_{it} + \beta_3 (CSD_{it} X Grow_{it}) + \beta_4 TURN_{it} + \beta_5 LQDTY_{it} + \beta_6 LEV_{it} + \beta_7 RD\ it + + \beta_8 Size_{it} + \beta_9 ESI_{it} + \varepsilon it \ldots\ldots\ldots\ldots\ldots\ldots (6.2b)$
- $CFP_{it} = \alpha_{it} + \beta_1 CSD_{it} + \beta_2 FLC + \beta_3 (CSD_{it} X Matu_{it}) + \beta_4 TURN_{it} + \beta_5 LQDTY_{it} + \beta_6 LEV_{it} + \beta_7 RD_{it} + + \beta_8 Size_{it} + \beta_9 ESI_{it} + \varepsilon it \ldots\ldots\ldots\ldots\ldots \quad (6.2c)$

- $CFP_{it} = \alpha_{it} + \beta_1 CSD_{it} + \beta_2 FLC_{it} + \beta_3 (CSD_{it} X Shake_{it}) + \beta_4 TURN_{it} + \beta_5 LQDTY_{it} + \beta_6 LEV_{it} + \beta_7 RD_{it} + + \beta_8 Size_{it} + \beta_9 ESI_{it} + \varepsilon it \ldots\ldots\ldots\ldots$ *(6.2d)*
- $CFP_{it} = \alpha_{it} + \beta_1 CSD_{it} + \beta_2 FLC + \beta_3 (CSD_{it} X Decli_{it}) + \beta_4 TURN_{it} + \beta_5 LQDTY_{it} + \beta_6 LEV_{it} + \beta_7 RD_{it} + + \beta_8 Size_{it} + \beta_9 ESI_{it} + \varepsilon it \ldots\ldots\ldots\ldots$ *(6.2 e)*

6.4.1 DESCRIPTIVE STATISTICS

Table 6.2 shows the descriptive statistics, including the mean and standard deviation—winsorization has performed at 5 and 95 percent to control the extreme values. With a standard deviation of 12.76, the ESG score has a mean value of 24.14. The mean values of all the other explanatory variables, including the different stages of the firm life cycle and the control variables, are consistent and fall within a consistent range. A firm life cycle dummy variable was created considering the sign of various cash-flow devised by Dickson, 2011. The various life cycle stages depict most sampled firms in the growth and maturity stages. Only a few percent of the sampled firms fall into the declining stage. To validate the result, retained earnings to total asset ratio were also adopted. This ratio is also found to be a good proxy for the firm life cycle (Atif et al., 2021).

6.4.2 CORRELATION FOR THE SAMPLE

The result of the correlation between the variables is shown in Table 6.3. Profitability is observed to have a favorable link with maturity and the shake-out stage. In comparison, profitability is adversely connected with CSD rating. When the control variable is considered, research and development intensity and liquidity are positively associated with profitability. Furthermore, it is observed that there are no multicollinearity issues between the variables. Further introduction and declining stage, turnover, research and development intensity, and liquidity positively correlate with firm value.

Table 6.2 Descriptive statistics

Variables	Mean	St. Dev	Mini	Max
ROA	7.72	5.64	-.32	20.79
ROCE	11.5	8.34	-.39	30.63
TOBIN	4.489	8.303	0.055	33.05
EVA	1.70	1.90	0	7.19
CSD	24.14	12.76	9.090	52.69
INTRO	.040	.196	0	1
GROW	.577	.494	0	1
MATUR	.243	.429	0	1
SHAKE	.125	.331	0	1
RE/TA	.049	.039	-.0163	.129
EDS	18.24	14.04	3.876	49.61
SDS	29.92	15.38	7.017	59.64
GDS	48.18	6.865	39.28	64.28
ESI	0.806	0.395	0.000	1.00
TURN	0.880	0.604	0.001	4.540
RD	0.008	0.016	0.000	0.063
LEV	0.530	0.562	0.000	1.910
SIZE	4.677	0.638	2.782	6.536
LQDTY	1.030	0.699	0.221	2.850

(Source- Data analysis)

Table 6.3 Correlation of the sample

Variable	ROA	Tobin	CSD	INTRO	GROW	MATU	SHAKE	DECL	TURN	RD	LEV	SIZE	LQDTY	ESI
ROA	**1.000**													
Tobin's	0.061*	**1.000**												
CSD	-0.08*	-0.219*	**1.000**											
INTRO	-0.10*	0.049*	-0.026****	**1.000**										
GROW	-0.15*	-0.010*	0.005*	-0.121****	**1.000**									
MATU	0.16*	-0.017	0.039	-0.239*	-0.685****	**1.000**								
SHAKE	0.027	-0.005*	-0.030	-0.075*	-0.216*	-0.426*	**1.000**							
DECL	-0.03*	0.058*	-0.074*	-0.018*	-0.052*	-0.104*	-0.032*	**1.000**						
TURN	0.30*	0.084*	-0.010*	-0.050*	-0.048*	0.105*	-0.043*	-0.080*	**1.000**					
RD	0.07*	-0.027*	0.001*	0.029	0.046*	-0.056*	0.015*	0.030*	-0.146*	**1.000**				
LEV	-0.51*	-0.108*	0.049*	0.044*	0.249*	-0.124*	-0.168*	-0.018	-0.034	-0.106*	**1.000**			
SIZE	-0.24*	-0.409*	0.612*	-0.042*	0.111*	-0.056*	-0.015*	-0.081*	-0.219*	-0.045*	0.201*	**1.000**		
LQDTY	0.45*	0.056*	-0.054*	-0.055*	-0.219*	0.112*	0.143*	0.059*	-0.049*	0.063*	-0.501*	-0.135*	**1.000**	
ESI	-0.03*	-0.164*	0.149*	-0.031	0.111*	-0.021	-0.106*	0.025*	-0.197*	0.086*	0.165*	0.230*	-0.045	**1.000**

**Correlation is significant at the 0.05 level*

(Source- Data analysis)

6.5 EMPIRICAL RESULTS

Owing to the endogeneity and simultaneity issues, the study adopted a two-step system, GMM, to assess the moderating role of the firm life cycle in the CSD and CFP relationship. The direct and moderating effects of CSD and profitability with various life cycle stages are depicted in Table 6.4. Evaluation of the results showed that the sustainability disclosure in all the models adopted positively influences a firm's profitability. CSD is significant in all the models at ($p < 0.01$) the 1 percent level and favorably affects profitability in all the models. For instance, a 1-point increase in CSD results in a 0.04 percent increase in profitability, as shown in Model 1 (Table 6.4). This indicates that higher and better information signals on environmental, social, and governance activities will result in enhanced earnings.

Model 1 explains the direct effect of various life cycle stages on accounting-based performance. Considering the direct effect of various firm life cycles depicts introduction stage has a direct negative impact on profitability. In contrast, the direct effect of the growth and maturity stage is positive and significant. The introduction stage is highly significant and negative at 1 percent (β = -2.447; $p < 0.01$). In comparison, the shake-out stage is insignificant. At the same time, the growth and maturity stages were found to be significant at 5 % and 1 % levels (β =1.413; $p < 0.05$; β =2.106; $p < 0.01$). The results also indicate that each life cycle stage impacts the relationship between CSD and corporate financial performance.

Model 2 to Model 5 explains the interaction effect of CSD with various life cycle stages. The interaction effect shows that all the stages expect maturity, negatively impacting the firm's profitability. The interaction coefficient in *Model 2* shows that the interaction effect is positive and significant at 10 %. While (CSD X GRO) coefficient interaction in *model 3* depicts a positive effect at a 1 % level. In contrast, the interaction effect in the maturity stage was negative and highly significant at (β =-0.0607; $p < 0.01$) at a 1 % level. The interaction coefficient of (CSD X SHAK) was also found to be significant and positive at a 1 % level.

Considering the control variable used in the study, leverage, firm size, and research and development intensity were found to negatively impact profitability, while turnover was found to be positively impacting. Considering the coefficient of the lag value of ROA, it is highly significant at the 1 % level. To determine the overall validity of the instrument, Hansen J statistics are employed. The post-estimation Hansen test specifies that all the instruments used in this study are valid and robust in all the models. The value of AR (2)>0.05 specifies that the error term is serially uncorrelated and that the moment condition is correctly specified. It can also infer from the estimation that the number of devices used in this study is less than the cross-section. Hence the model specification and instruments are valid and are in line with the specification of GMM.

Table 6.5 depicts the impact of various lifecycle stages on firm value. Evaluation of the results shows that the sustainability disclosure in all the models adopted positively influences a firm value, indicating that sustainability disclosure is positively related to the firm's value. CSD is significant in all the models at ($p < 0.01$) the 1 percent level and favorably affects firm value in all the models. For instance, a 1-point increase in CSD results in a 0.04 percent increase in the firm's value, as shown in Model 1 (Table 6.5). This indicates that higher and better information signals on environmental, social, and governance activities will result in visibility and transparency by enhanced firm value. Considering the direct effect of firm life cycle proxy on firm value, all the stages of the firm life cycle positively impact firm value expect introduction.

Considering the interaction effect, the interaction coefficient of all the life cycle stages with firm value is depicted from *model 2 to model 5*. The interaction coefficient of (CSD X INTRO) and (CSD X MAT) is negative and highly significant, while the interaction effect in the growth and shakeout stage is positive. Considering the control variable except for firm size and environmentally sensitive dummy variable, the rest of the variable results were found to be significant and positive. The value of AR (2)>0.05 specifies that the error term is serially uncorrelated and that the moment condition is correctly specified. The post-estimation Hansen test specifies that all the instruments used in this study are valid and robust in all the

Table 6.4 CSD and CFP relationship at various life cycle stages

Variable	Model 1 ROA	Model 2 ROA	Model 3 ROA	Model4 ROA	Model 5 ROA
CSD	0.048*** (0.007)	0.0458*** (0.007)	0.0399*** (0.007)	0.0838*** (0.0102)	0.042*** (0.007)
INTRO	-2.447*** (0.681)	-3.898*** (0.877)	-2.412*** (0.673)	-1.998*** (0.718)	-1.99*** (0.731)
GROWTH	1.413** (0.675)	1.427** (0.714)	0.524 (0.724)	1.667** (0.669)	1.961*** (0.733)
MATURITY	2.106*** (0.677)	2.012*** (0.710)	2.263*** (0.662)	4.127*** (0.810)	2.693*** (0.738)
SHAKEOUT	-0.997 (0.714)	-0.999 (0.728)	-0.988 (0.706)	-0.973 (0.746)	-1.629* (0.865)
CSD X INTRO		0.0637* (0.0354)			
CSD X GRO			0.0363*** (0.011)		
CSD X MAT				-0.0607*** (0.0126)	
CSD X SHAK					0.0401* (0.0218)
TURN	0.760** (0.304)	0.700** (0.310)	0.751** (0.298)	0.731** (0.297)	0.753** (0.307)

RD.	-9.816**	-10.64**	-9.589**	-10.97**	-9.897**
	(4.121)	(4.182)	(4.271)	(4.288)	(4.191)
LQDTY	0.0140	0.0472	0.101	0.273	0.0732
	(0.241)	(0.242)	(0.247)	(0.263)	(0.256)
SIZE	-1.577***	-1.608***	-1.613***	-1.676***	-1.56***
	(0.187)	(0.211)	(0.192)	(0.186)	(0.188)
LEV	-1.657***	-1.684***	-1.624***	-1.643***	-1.63***
	(0.209)	(0.209)	(0.212)	(0.212)	(0.213)
ESI	2.241***	2.262***	2.576***	2.380***	2.031***
	(0.533)	(0.534)	(0.557)	(0.560)	(0.531)
L. ROA	0.591***	0.590***	0.584***	0.570***	0.589***
	(0.018)	(0.0184)	(0.0185)	(0.0178)	(0.0182)
Constant	6.545***	6.842***	6.530***	5.622***	6.251***
	(1.310)	(1.308)	(1.316)	(1.310)	(1.344)
AR 1	0.000	0.000	0.000	0.000	0.000
AR 2	0.685	0.705	0.656	0.775	0.750
Hansen	0.474	0.412	0.483	0.515	0.441
No of Firms	223	223	223	223	223

(Source- Data analysis)

Note- The coefficient is the first value in each estimate, followed by the standard errors in parentheses (* p<0.01, ** p<0.05, * p<0.1).*

Table 6.5 CSD and CFP relationship at various life cycle stages

Variable	Model 1 EVA	Model 2 EVA	Model 3 EVA	Model4 EVA	Model 5 EVA
CSD	0.0429*** (0.004)	0.0516*** (0.00496)	0.0184*** (0.00437)	0.0550*** (0.005)	0.040*** (0.004)
INTRO	0.237 (0.183)	5.594*** (0.355)	0.663*** (0.181)	0.0234 (0.170)	0.161 (0.192)
GROWTH	0.663*** (0.122)	0.911*** (0.127)	-0.870*** (0.155)	0.264** (0.129)	0.620*** (0.132)
MATURITY	0.928*** (0.124)	1.069*** (0.140)	1.316*** (0.144)	1.291*** (0.162)	0.918*** (0.142)
SHAKEOUT	1.661*** (0.136)	1.870*** (0.164)	1.783*** (0.137)	1.331*** (0.132)	0.703*** (0.156)
CSD X INTRO		-0.236*** (0.0191)			
CSD X GRO			0.0659*** (0.004)		
CSD X MAT				-0.024*** (0.003)	
CSD X SHAK					0.039*** (0.006)
TURN	1.518*** (0.0845)	1.786*** (0.110)	1.491*** (0.103)	1.487*** (0.0874)	1.543*** (0.0856)

RD	36.04***	37.64***	33.17***	34.81***	38.13***
	(1.927)	(1.724)	(2.373)	(2.102)	(1.942)
LQDTY	0.896***	0.892***	1.078***	0.915***	0.849***
	(0.0426)	(0.0643)	(0.0636)	(0.0480)	(0.0437)
SIZE	-1.850***	-1.673***	-1.911***	-1.870***	-1.84***
	(0.0887)	(0.0935)	(0.092)	(0.0876)	(0.098)
LEV	2.119***	2.022***	2.260***	2.126***	2.148***
	(0.0839)	(0.121)	(0.081)	(0.0949)	(0.0848)
ESI	-2.052***	-2.591***	-1.634***	-1.847***	-2.22***
	(0.284)	(0.289)	(0.296)	(0.305)	(0.313)
L. EVA	0.723***	0.698***	0.714***	0.722***	0.724***
	(0.00529)	(0.00627)	(0.005)	(0.00442)	(0.005)
Constant	5.707***	4.732***	5.798***	5.658***	5.876***
	(0.367)	(0.396)	(0.393)	(0.371)	(0.431)
AR 1	0.001	0.000	0.000	0.000	0.000
AR 2	0.210	0.666	0.476	0.280	0.228
Hansen	0.120	0.280	0.216	0.158	0.147
Firms	223	223	223	223	223

(Source- Data analysis)

Note-** The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

6.5.1 ROBUSTNESS CHECK

Table 6.6 show an analysis to support the outcome on the moderating influence of firm lifecycle in the CSD and CFP nexus. The outcomes' robustness is tested using an alternate measure of the firm life cycle: retained earnings by the total asset. This proxy is adopted and created by (DeAngelo et al., 2006), which evaluates an organization's reliance on internal solvency and external funding, making it an adequate proxy for the firm life cycle. According to DeAngelo et al., 2006, retained earnings to total asset composition consisting of equity and outside financing makes it an adequate proxy for a firm life cycle. The study divided the life cycle into two stages based on the retained earnings following the literature and the parameters established by (Atif et al., 2021). As a result, businesses with smaller retained earnings are regarded as young and expanding, whereas firms with greater retained ratios are treated as mature. The FLC variable has been mean-centered to account for this effect; values above the new mean (positive and above zero) are viewed as mature firms, while values below the mean are treated as young or growing companies. Dummy variable one is employed if the firms are in the mature stage and zero otherwise.

The results of the robustness check are depicted in 6.6. Both accounting and market-based proxies from *Models 1 to 2* exhibited the same and consistent results with the primary analysis when evaluating the influence of the firm life cycle as a moderator in CSD and CFP linkage. The impact of CSD is significant and favorable to both the proxies of CFP. In addition, the direct effect of FLC is found to be highly significant and positive. Considering the interaction effect, the interaction coefficient is highly significant and negative (β =-0.0183 p <0.01; β =-0.0265 p <0.01). By implication, the result indicated that adopting CSD in the mature stage negatively impacts corporate financial performance. However, the core model's robustness is reaffirmed by the alternative measures employed in the robustness check. The result indicated that CSD adoption in the mature stage could negatively impact profitability and firm value. Considering the lagged value of the dependent variable found to be significant and positive.

Table 6.6 CSD and CFP relationship at different life cycles (Interaction effect)

Variables	ROA Model 1	EVA Model 2
CSD	0.0126**	0.0598***
	(0.006)	(0.004)
FLC	113.3***	7.406***
	(1.872)	(1.199)
TURN	2.297***	1.410***
	(0.258)	(0.133)
R.D.	-43.61***	38.27***
	(3.293)	(2.953)
LQDTY	1.213***	1.071***
	(0.159)	(0.068)
SIZE	1.051***	-2.112***
	(0.168)	(0.129)
LEV	-1.969***	1.714***
	(0.164)	(0.095)
ESI	3.769***	-2.036***
	(0.404)	(0.295)
L. ROA	0.0352***	
	(0.008)	
L.EVA		0.710***
		(0.005)
ESG x FLC	-0.0183***	-0.0265***
	(0.006)	(0.002)
Constant	-8.110***	7.432***
	(0.886)	(0.564)
AR 1	0.000	0.001
AR 2	0.22	0.378
Hansen test	0.405	0.078
No of firms	223	223

(Source- Data analysis)

Note-The coefficient is the first value in each estimate, followed by the standard errors in parentheses (* p<0.01, ** p<0.05, * p<0.1).*

Subsequently, the value of the AR (1) coefficient is significant, and AR (2)>0.05 specifies that the error term is serially uncorrelated and that the moment condition is correctly specified. The post-estimation Hansen test specifies that all the instruments

used in this study are valid and robust in all the models. Hence the model specification and instruments are valid and are in line with the specification of GMM.

6.6 DISCUSSION

The study used measurable analytics and robustness tests to investigate the link between CSD and corporate financial performance. The study findings reveal that the firm life cycle is significant in CSD and CFP association. The firm life cycle moderates the relationship between CSD and CFP substantially. This study examined the impact of the firm life cycle in this nexus, emphasizing one of the least researched aspects of sustainability reporting (CSD).

The study discovered that the firm life cycle plays a crucial role in this nexus. As a result, understanding the firm's life cycle is critical to implementing sustainability disclosure policies. This research could help investors and manufacturing firms better comprehend CSD disclosure's role in each firm life cycle stage. The findings of direct effect are consistent with those of (Albertini, 2013; Friede et al., 2015; Bually, 2019), suggesting that sustainable production has low costs compared to its benefits. Simultaneously, investors value sustainability performance since they enhance value for stakeholders and shareholders. In addition, being socially accountable or improving CSD rating results in increased cash flows and profitability by lowering the discount rate; this eventually improves firm value (Cornell and Damodaran, 2020).

Considering the interaction effect of CSD and profitability. The positive interaction effect of CSD with the introduction, growth, and shake-out stages on firm profitability is reasonable since implementing CSD provides a competitive edge (Kuzey and Uyar, 2017; Laskar, 2018). Secondly, non-financial accounting information discloses insights into how the business manages its risk exposure. Hence the improved CSD score leads to lower risk for businesses (Sharfman and Fernando, 2008). The interaction effect of (CSD x Growth stage) CSD with growth stage is positive, indicating that customers prefer socially responsible firms' products over competitors because of their social mission, helping to acquire market share and increase income. Although adopting CSD raises operating costs in the short term, the cost structure quickly adapts to the norms,

allowing for an equivalent or even superior margin compared to its peers. As a result, firms that adopt socially responsible practices can capitalize more effectively than those not adopting sustainability businesses (Cornell and Damodaran, 2020). Furthermore, CSD is a tool that enhances performance (Kuzey and Uyar, 2017; Laskar, 2018; Bually, 2019).

Considering the moderating role of the firm life cycle in CSD and firm value association, it is found that when CSD and the introduction stage interact, it weakens the association between CSD and CFP and turns this relationship negative. In its most basic form, a firm's value is nothing but one derived from the predicted cash flows it can create over time, which are discounted back at a 'risk-adjusted' discount rate (Cornell and Damodaran, 2020). During the introduction stage, managerial enthusiasm encourages firms to stay invested. Further, this stage suffers from a lack of clients, a knowledge deficit regarding possible income and cost routes, and increased research and development spending (Jovanovic, 1982; Dickson, 2011). Owing to these factors, investing cash flows will be negative for new businesses. Promoting transparency in the introduction stage may increase the cost of implementing and reporting sustainability, hurting the firm value. Growth appeals to both firms and investors as they proceed to the growth stage since it allows them to scale up and turn small operating figures into larger ones.

Additionally, businesses must sell more of their products. Similarly, margin gains resulting from economies of scale and cost-cutting can boost earnings (Cornell and Damodaran, 2020). This backs the conclusion that CSD and growth stage interaction has a favorable, beneficial impact on profitability and value. The outcome indicates that adopting sustainability disclosure in the growth stage enhances profitability and firm value.

When a firm matures from the growth stage, the interaction of the (CSD X mature) stage negatively influences firm profitability and value. According to Jensen (1986), mature organizations produce positive cash flows and, as a result, invest heavily in their primary business (or an unrelated acquisition) but at lower returns. Since they have expanded their positive NPV investment prospects, mature firms may pay debt and

redistribute cash to shareholders or overinvest in inefficient initiatives that reduce overall profitability. Moreover, enhanced expenses and a lack of business investment opportunities will lower the value of anticipated cash flows (Cornell and Damodaran, 2020). Hence, adopting sustainability in the mature stage could negatively impact a firm value and profitability. Hence this could turn the costly investment strategies adopted in the maturity stage to negatively influencing the profitability and value. Similarly, the interaction between the shake-out stage with CSD positively impacts the profitability and firm value. Considering the individual cash flow items declining, firms generally start liquidating the existing asset to pay their obligation and support their activity, resulting in positive cash flow from their investing activity (Dickson,2011). Further adopting sustainability will generate benefits, even in the shakeout stage, since sustainability adoption is considered a tool that can act as a competitive advantage to the firm. When the firm enters a shake-out or decline, the firms start deriving the benefits from sustainability adoption. Moreover, the firm's engagement in society through ESG adoption can fetch stable revenue, reducing the operation cost and enhancing profitability and value.

6.7 CONCLUSION AND SUMMARY

ESG disclosure has become a vital consideration when choosing an investment strategy. As a result, current research into the interactions between CSD and CFP at various stages of the firm's life cycle is necessary. The literature, however, contains no information about the impact of ESG disclosure on CFP at various periods of a firm's life cycle. By delivering empirical data on the effect of ESG disclosure on financial performance at various life-cycle stages, this study contributes to the existing ESG literature. For regulators, investors, and businesses, the current study has ramifications. Importantly, the current research reveals how strong internal and external monitoring methods and recognizing their impact at different phases of the business life contribute to adopting ESG disclosure leading to improved financial policies.

CHAPTER 7

THE IMPACT OF CSD ON FINANCIAL DISTRESS

7.1 OVERVIEW

This chapter outlines whether CSD impacts the firm's financial distress. To study this association, a series of analyses and robustness checks were performed to validate the preliminary results of the model. Hence, section 7.2 provides an introduction to the chapter. Section 7.3 discuss the data used in the analysis and is followed by the methodology and empirical results in section 7.4 and 7.5, respectively. Section 7.6 details the discussion of the findings. Finally, section 7.7 concludes the chapter.

7.2 INTRODUCTION

Businesses are becoming more and more renowned for their non-financial performance all over the world. Due to the desire of many stakeholders to accept ethical and environmental commitments, corporations are increasingly focusing more on non-financial information than financial information (Al-Shaer and Zaman, 2018; Santamaria et al., 2021). Increased levels of involvement at national and international levels are proof of the corporate sustainability disclosure (CSD) revolution. Additionally, it is anticipated that there will be a significant rise in the required reporting of specific information, such as climatic hazards, resilience strategies, and greening of some nations' and regions' financial systems (KPMG,2020). As a result, corporates worldwide increasingly integrate with their internal and external environments considering corporate sustainability disclosure (CSD) considerations. Additionally, the "ESG movement," or the change in CSD norms from discourse to action, is an example of the growing importance of non-financial disclosure aspects (Santamaria et al., 2021).

Based on the previous literature, most studies in corporate sustainability disclosure examined the impact of sustainability on firm-level outcomes, including firm value and corporate financial performance (Behl et al., 2022; Fatemi et al., 2018; Wong et al., 2021). At the same time, some research focused on CSD's impact on the cost of equity

(El Ghoul et al., 2011; Shad et al., 2019), and relatively few investigations into how to gauge the firm's sustainable performance (Hermalin and Weisbach, 2001).

Numerous studies in the recent literature emphasize the importance of corporate sustainability disclosure in raising a firm's financial performance, despite the contradictory results (Chiaramonte et al., 2021). However, little attention has been paid to the studies to explore how CSD may impact the firm's financial distress or default risk. Even a few studies in this field, such as those by (Atif and Ali 2021; Cerqueti et al., 2021; Chiaramonte et al., 2021), concentrated on advanced economies. One of the less-discussed topics related to sustainability disclosure is the direct impact of CSD as well as the role of the firm life cycle in this association. Therefore, the primary motivation behind this study is the lack of research on the connection between CSD and financial distress and identifying the role of the firm life cycle in this association.

The study used signal theory to situate CSD's impact on the firm's default risk. According to the signaling theory, positive information causes stakeholders to react favorably. Strong signals with specific information can elicit a favorable response from stakeholders (Suazo et al., 2011). Adopting CSD transmits a powerful message to the market. Therefore, corporate sustainability initiatives can be seen as a hedging strategy that reduces the likelihood and cost of adverse events, lowering the risk of financial distress. The current study assumes that this relationship is driven by signaling theory, which suggests that investors may view CSD as a positive signal. As a result, improved business sustainability performance sends a strong signal to the market, enhancing the incentive to share information and reducing the risk of inciting unfavorable market sentiment. By doing this, the firm can set itself apart from underperformers.

Against this background, the current research addresses the following two questions. First, does sustainability disclosure reduces the financial distress of a firm? Second, does the firm life cycle influences the association between CSD and financial distress in Indian manufacturing firms?

The main driving forces behind the sectoral choice are the increased impact of manufacturing on human lives, the environment, overconsumption (Haski-Leventhal,

2022), and the growing conversation about implementing sustainability reporting in the manufacturing industry. The manufacturing industry is thought to be essential to both social and economic progress. It is one of the crucial industries that keep the economy moving. When managers make CSD choices, the answer to the question of whether corporate sustainability transparency can be used as a risk mitigation approach has significant ramifications. Therefore, it is intriguing to investigate whether adopting a CSD strategy will reduce the default risk in the Indian manufacturing sector, a worthwhile research topic. Assessing the connection between CSD and financial distress and the role of firm lifecycle in this linkage is necessary to rationalize CSD on sound economic grounds and allay managers' concerns.

This study enhances the understanding of sustainability disclosure by presenting empirical data on the relationship between CSD and CFD in Indian manufacturing enterprises using signaling theory. The outcome of the study depicts that implementing sustainability disclosure will lower the likelihood of default. It is a risk-reduction method that protects from adverse circumstances. Furthermore, the firm life cycle affects the relationship between CSD and corporate financial distress. Additionally, results show that more rigorous CSD disclosure might be employed as a risk-reduction tactic during the introduction, growth, and declining stages. To establish and create appropriate disclosure procedures, the business community and managers will benefit from the study by understanding the combined impact of CSD on various stages of the firm life cycle and the influence of CSD on financial distress.

7.3 DATA

This study's data covers ten years, from 2010 to 2019. The sample includes 223 manufacturing firms from 10 distinct industries. Each business's sector-related information was examined according to the NIC code reported in the prowess database. The financial distress and CSD score data were obtained from the Bloomberg database. The prowess database was used to gather all the companies financial data.

7.3.1 DATA SOURCE

The ESG rating indicates the CSD score that Bloomberg calculates. Based on information released and accessible on the firm's website, such as annual reports, sustainability reports, and CSR reports, Bloomberg determines ESG rating scores ranging from 0.1 to 100. The CSD has been given a final score as a result. In comparison, the prowess database was used to depict the firm life cycle. The Bloomberg database also served as the source for financial distress information, including the Altman Z score, one-year, two-year, three-year, and five-year default risk scores. The present study employed the (Dickinson, 2011) model of the firm life cycle, which has been used in other studies, to capture the various stages of the firm. Cash flow patterns are used to depict the firm's life cycle stage. Operating, investment, and financing cash flows are combined to generate a firm's life cycle mapping. By identifying the sign of the three types of cash flows, Dickinson (2011) created eight unique combinations of cash flow patterns. The current study manually created dummy variables based on the indicators and classified them into introduction, growth, maturity, shakeout, and decline based on the pattern developed by Dickinson (2011). All the additional firm-specific data was also gathered using the prowess database.

7.3.2 CONTROL VARIABLE

Several firm-specific factors were considered to investigate the connection between sustainability disclosure and financial distress. The current regression models incorporate control variables such as turnover, company size, leverage, level of R&D activity, liquidity, and environmentally sensitive firms dummy variables to account for this effect. Due to their more significant economic and political clout compared to smaller businesses, larger organizations can survive better during times of financial crisis. In addition, differences in resources, capacity to handle competition, and funding opportunities change depending on the firm's size (Al- Hadi et al., 2019). Hence to account for this effect, the current study chose firm size as a control variable to consider this effect. At the same time, financial leverage controls firms' indebtedness. The intensity of R and D measures how much money firms spend on research and development. R&D-intensive businesses are more likely to go bankrupt than capital-

intensive businesses (Al- Hadi et al., 2019). Hence, an attempt is made to use R&D intensity as a control variable to account for this effect. Liquidity as a control variable is used to control the effect on a firm's capacity to deal with times of financial constraints. The study classified environmentally sensitive firms as one and others as zero based on the studies by Shabana *et al.* (2017) and Simoni *et al.* (2020) to control for environmentally and socially sensitive firms. Since the environmental sensitivity of a firm can create hinder the stabilized cash flow of the firm. Hence, all these variables are used as control variables to control this effect. All the variables used, and their description is explained in Table 7.1

Table 7.1 Definition of independent variables, dependent variables, and control variable

Variable Name	Variable Abbreviation	Variable Description
Independent variables		
CSD	Corporate sustainability total score (ESG score)	Bloomberg rating score for ESG (sustainability reporting)
EDS	Environmental disclosure score	Bloomberg rating score for Environmental disclosure
SDS	Social disclosure score	Bloomberg rating score for social disclosure
GDS	Governance disclosure score	Bloomberg rating score for governance
INTRO	Introduction stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.
GROW	Growth stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.
MATU	Maturity stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.
SHAKE	Shakeout stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.

DECL	Decline stage	Dummy variables were created based on the signs of the cash flow based on the patterns created by Dickinson, 2011.
Dependent variables		
Z score	Alt men Z score	Altman Z score collected from Bloomberg
F Dis One year	One-year default probability	Bloomberg probability for the firm's year default
F Dis Two year	Two-year default probability	Bloomberg probability for the firm's two-year default
F Dis Three year	Three-year default probability	Bloomberg probability for the firm's three-year default
F Dis five years	Five-year default probability.	Bloomberg probability for the firm's five-year default
Control variables		
RD	Research and development expenditure	Total research expenditure divided by sales.
TURN	Turnover	Net sales divided by total assets
LEV	Debt to equity ratio (times)	Total debt divided by total equity
SIZE	Size	Natural logarithm of total asset
LQDTY	Liquidity ratio (times)	Quick asset divided by current liability
ESI	Dummy variable	One is an environmentally sensitive firm, 0 otherwise

(Source- Literature review)

7.4 METHODOLOGY

It is observed from the literature that endogeneity may have an influence when determining how CSD and financial distress are associated. Reverse causation and omitted variable bias are two significant causes of this endogeneity. These underlying issues may have distorted the essential conclusions on how CSD influences default risks. For instance, this relationship may be impacted by omitted variable bias, both observable and unobservable, as well as time-varying and constant factors. Empirical estimations suffer from omitted variable bias since it is challenging, if not impossible, to account for all causes of financial distress.

Further, there is no obvious direction of causation between CSD and financial distress or default likelihood (Atif and Ali, 2021). Moreover, the corporate governance structure of a corporation is determined endogenously (Hermalin and Weisbach, 2001). According to Bouslah et al. (2013), there is a reciprocal relationship between social performance and default risk. From this point forward, CSD and financial distress may be decided together. Firms may also modify CSD in response to risk exposure (Atif and Ali, 2021). Based on the literature, a two-step GMM method was used to avoid the endogeneity problem. The model created to look at how CSD ratings affect financial distress is given below.

$$\boldsymbol{FD_{it} = \alpha + \beta_1 CSD_{it} + \beta_2 TURN_{it} + \beta_3 LQDTY_{it} + \beta_4 LEV_{it} + \beta_5 RD_{it} + + \beta_6 Firm\ size_{it} + \beta_7 ESI_{it} + \beta_8 Year\ effect + \varepsilon it} \quad \textbf{(7.1)}$$

Model (7.1) indicates how the total CSD rating impacts the financial distress of a firm; at the same time, models (7.2) to (7.4) illustrate the impact of CSD elements on financial distress.

$$FD_{it} = \alpha + \beta_1 EDS\ it + \beta_2 TURN_{it} + \beta_3 LQDTY_{it} + \beta_4 LEV_{it} + \beta_5 RD_{it} + + \beta_6 Firm\ size_{it} + \beta_7 ESI_{it} + \beta_8 Year\ effect + \varepsilon it \quad (7.2)$$

$$FD_{it} = \alpha + \beta_1 SDS\ it + \beta_2 TURN_{it} + \beta_3 LQDTY_{it} + \beta_4 LEV_{it} + \beta_5 RD_{it} + + \beta_6 Firm\ size_{it} + \beta_7 ESI_{it} + \beta_8 Year\ effect + \varepsilon it \quad (7.3)$$

$$FD_{it} = \alpha + \beta_1 GDS\ it + \beta_2 TURN_{it} + \beta_3 LQDTY_{it} + \beta_4 LEV_{it} + \beta_5 RD_{it} + + \beta_6 Firm\ size_{it} + \beta_7 ESI_{it} + \beta_8 Year\ effect + \varepsilon it \quad (7.4)$$

Model (7.2) explains the impact of environmental disclosure on financial distress, while model (7.3) and (7.4) shows the impact of social and governance disclosure impact on financial distress. Based on the analysis, it is assumed that the impact of CSD on financial distress depends upon the life cycle that the firm belongs to. Hence, to capture this effect, the following equations were framed.

$$\boldsymbol{FD_{it} = \alpha + \beta_1 CSD_{it} + \beta_2 FLC_{it} + \beta_3 TURN_{it} + \beta_4 LQDTY_{it} + \beta_5 LEV_{it} + \beta_6 RD_{it} + + \beta_7 Firm\ size_{it} + \beta_8 ESI_{it} + \beta_9 Year\ effect + \varepsilon it} \quad \textbf{(7.5)}$$

$$FD_{it} = \alpha + \beta_1 CSD_{it} + \beta_2 FLC_{it} + \beta_3 (CSD \times FLC) + \beta_4 TURN_{it} + \beta_5 LQDTY_{it} + \beta_6 LEV_{it} + \beta_7 RD_{it} + + \beta_8 Firm\ size_{it} + \beta_9 ESI + \beta_{10s}\ Year\ effect + \varepsilon_{it} \ldots\ldots \quad (7.6)$$

Model (7.5) and model (7.6) indicate the direct and interaction effect of firm life cycle and sustainability on financial distress.

7.4.1 DESCRIPTIVE STATISTICS

The descriptive statistics for different CSD ratings, default probability, and firm-specific variables are depicted in Table 7.2. The average CSD score is 23.73, while environmental, social, and governance disclosure has a mean of 16.58, 27.27, and 47.95, respectively. According to the default risk variable, all the default risk probabilities have an average of less than 1. At the same time, the Altman Z score has an average of 4.52. To control for outliers, winsorization was performed on all continuous variables at 5% and 95% levels. Considering the control variables, consistency was found among them because they fall within previous studies.

7.4.2 CORRELATION FOR THE SAMPLE

Table 7.3 shows the pairwise association among the variables used in the empirical investigation. When CSD is, and default probability is considered, it shows an inverse relationship indicating that higher sustainability disclosure will reduce the default risk. Similarly, default risk was inversely related to environmental, social, and governance disclosure, with values of -0.42, -0.86, and -0.024, respectively, implying that reporting the individual elements of sustainability disclosure is also negatively related to default probability. As predicted, CSD ratings show a significant negative association with financial distress in the relationship between CSD and default risk. These data suggest that businesses with higher CSD scores are less likely to default. However, these findings should be viewed cautiously since the correlation analysis ignores other factors influencing default risk

Table 7.2 Descriptive Statistics of the Variable

Variables	Mean	St. Deviation	Minimum	Maximum
Altman Z score (FD)	4.520	3.91	0.840	14.90
Defa pro one year	0.020	0.03	0.000	0.110
Defa pro-two-year	0.010	0.02	0.000	0.075
Defa pro-three-year	0.000	0.01	0.000	0.050
Defa pro-five-year	0.002	0.00	0.000	0.020
CSD	23.73	12.7	9.090	52.40
EDS	16.58	14.4	0000	49.60
SDS	27.27	17.0	0000	59.64
GDS	47.95	6.92	39.28	64.28
ESI	0.806	0.39	0.000	1.000
TURN	0.880	0.60	0.001	4.540
RD	0.008	0.01	0.000	0.063
LEV	0.530	0.56	0.000	1.910
Size	4.677	0.63	2.782	6.536
LQDTY	1.030	0.69	0.221	2.850

(Source- Data analysis)

Table 7. 3 Correlation for the sample

Variable	Default score	CSD	EDS	SDS	GDS	ESI	TURN	RD Exp	LEV	Size	LQDTY	V I F
Default score	**1.000**											
CSD	-0.055*	**1.000**										1.65
EDS	-0.042*	0.964*	**1.000**									
SDS	-0.086*	0.876*	0.750*	**1.000**								
GDS	-0.024*	0.804*	0.737*	0.628*	**1.000**							
ESI	0.095*	0.130*	0.121*	0.112*	0.131*	**1.000**						1.12
TURN	-0.062*	-0.015*	-0.013*	-0.021*	-0.098*	-0.155	**1.000**					1.10
RD Exp	-0.159*	0.019*	0.033*	0.049*	0.024*	0.021	-0.107*	**1.000**				1.03
LEV	0.460*	0.032*	0.057*	-0.055*	0.088*	0.179	-0.007*	-0.129*	**1.000**			1.40
Size	0.104*	0.608*	0.577*	0.527*	0.524*	0.235	-0.172*	0.040*	0.185*	**1.000**		1.81
LQDTY	-0.298*	-0.045*	-0.088*	0.049*	-0.082*	-0.006	-0.112*	0.099*	-0.493*	-0.160*	**1.000**	1.33

**Correlation is significant at the 0.05 level*

(Source – Data analysis)

However, the correlation study also revealed that increasing research and development investment, liquidity, and turnover will lessen the chance of default. The correlation analysis also shows that collinearity between explanatory factors other than individual elements of sustainability discourse is typically moderate. A correlation of 0.70 or above in absolute value may suggest a multicollinearity problem as a rule of thumb. Other than individual elements of sustainability with an overall CSD score, the highest correlation coefficient (.60) is between CSD and SIZE variables. As a result, multicollinearity may not be a problem in the present study. The study also looked at the variance inflation factor (VIF) to see whether multicollinearity existed. The regression model's variance inflation factor varied from 1.03 to 1.81, showing that multicollinearity is not a significant issue (Ryan, 2008).

7.5 EMPIRICAL RESULTS

A GMM model appears to be more effective and trustworthy in estimating the coefficients than other estimate approaches due to the sensitivity of the data (panel data) and the multidimensionality of the governance and CSD (Ullah et al., 2017). The GMM comparing the CSD and default risk is shown in Table 7.4 from one-year to five-year probability. *Model 1* demonstrates how the sustainability disclosure rating impacts the likelihood of a one-year default. Similarly, the effects of the sustainability disclosure rating on the likelihood of a two-year default, three-year default, and five-year default are depicted in *Models (2), (3), and (4).*

Model 1 indicates that the CSD rating is negative and highly significant at 1 percent ($\beta = -0.009$; $p < 0.01$). The results indicate that sustainability disclosure or higher CSD ratings are inversely connected to default risk, implying that organizations with higher environmental, social, and governance disclosure transparency have lower default risk. Similarly, the result was significant for and negative for two years, three, and five-year defaults. Hence, *models (2), (3),* and *(4)* coefficient is highly significant and inversely impact the default risk indicating that a higher CSD rating can reduce the default likelihood.

Table 7.4 CSD and FD relationship using Bloomberg probability default score

Variables	Model 1 One-year Default score	Model 2 Two-year Default score	Model 3 Four -year Default score	Model 4 Five-year Default score
CSD	-0.009***	-0.0164***	-0.0207***	-0.027***
	(0.000)	(0.001)	(0.00301)	(0.005)
TURN	-0.155***	-0.220***	-0.306***	-0.233*
	(0.029)	(0.0712)	(0.100)	(0.135)
RD expense	-1.960***	-2.908***	-3.123**	2.042
	(0.471)	(1.028)	(1.491)	(2.308)
LQDTY	-0.114***	-0.342***	-0.586***	-0.855***
	(0.012)	(0.036)	(0.047)	(0.064)
Firm size	0.239***	0.532***	0.758***	1.165***
	(0.023)	(0.0556)	(0.0893)	(0.160)
LEV	0.599***	1.618***	2.342***	3.187***
	(0.020)	(0.045)	(0.0613)	(0.092)
ESI	0.426***	0.913***	1.632***	1.997***
	(0.054)	(0.139)	(0.226)	(0.348)
L. 1yr default	0.168***			
	(0.005)			
L. 2yr default		0.176***		
		(0.007)		
L. 3 yr. default			0.174***	
			(0.007)	
L. 5yr default				0.174***
				(0.008)
Year effect	Yes	Yes	Yes	Yes
Constant	-1.064***	-2.386***	-3.470***	-4.830***
	(0.121)	(0.298)	(0.458)	(0.750)
AR 1	0.000	0.000	0.000	0.000
AR 2	0.110	0.590	0.965	0.835
Hansen test	0.145	0.115	0.110	0.115
Number of firms	223	223	223	223

(Source- Data analysis)

Note-** The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

Considering the lagged values of the dependent variable, one-year to five-year default significantly impacts CFP at a 1 percent level (*p < 0.01).* Regarding the control variables used in the study, liquidity, research, and development intensity turnover are significant and negatively impact financial distress. By implication indicating, increased turnover, research and development intensity, and liquidity of the firms will fetch stabilized cashflow which will eventually reduce the distress level of the firm. At the same time, environment-sensitive dummy variables, firm size, and leverage are highly significant and positively impact distress at a 1 percent level. Implying increased leverage and firm size and being highly sensitive to environmental activities will result in low performance.

Tables 7.5, 7.6, and 7.7 demonstrate whether each CSD factor impacts default risk. Table 7.5 indicates the impact of environmental disclosure on default risk. Bloomberg default probability scores for one year, two years, three years, and five years are used as the dependent variable from *model (1)* to *model (4).*

Model 1 indicates that the environmental disclosure rating is negative and highly significant at a 1 percent level (β = -0.0095; $p < 0.01$). Further, model *models* (2), (3), and (4) also implies increased environmental disclosure reduces financial distress. The coefficient of all these models is highly significant. It has an inverse relationship with default risk, showing that a higher environmental rating reduces the possibility of default in the Indian manufacturing sector. When considering the dependent variable's lagged values, one to five years of default substantially impact CFP at a 1% level ($p < 0.01$). Liquidity, research, and development intensity turnover are substantial and have a detrimental effect on financial distress compared to the control variables employed in the study.

While the environmentally sensitive dummy variable is significant and positive, implying highly environmentally sensitive firms have more chance to fall into default. Hence the result indicates that increased environmental sensitivity might increase the chance of default.

Table 7.5 ESD and FD relationship using Bloomberg probability default score

Variables	Model 1 One-year Default score	Model 2 Two-year Default score	Model 3 Four -year Default score	Model 4 Five-year Default score
EDS	-0.009***	-0.0191***	-0.0248***	-0.0278***
	(0.000)	(0.00132)	(0.001)	(0.00297)
Turnover	-0.174***	-0.352***	-0.454***	-0.508***
	(0.0198)	(0.0417)	(0.059)	(0.0846)
RD expense	-3.263***	-5.393***	-6.781***	-2.441*
	(0.329)	(0.759)	(0.961)	(1.418)
Liquidity	-0.0897***	-0.316***	-0.528***	-0.858***
	(0.00874)	(0.0301)	(0.046)	(0.0605)
Firm size	0.284***	0.708***	1.046***	1.387***
	(0.0190)	(0.0394)	(0.059)	(0.107)
Leverage	0.506***	1.306***	1.897***	2.651***
	(0.0125)	(0.0292)	(0.057)	(0.0870)
ENV dummy	0.257***	0.498***	0.822***	0.951***
	(0.0286)	(0.0882)	(0.155)	(0.153)
L. 1yr default	0.231***			
	(0.00362)			
L. 2yr default		0.249***		
		(0.004)		
L. 3 yr. default			0.250***	
			(0.005)	
L. 5yr default				0.247***
				(0.005)
Year effect	Yes	Yes	Yes	Yes
Constant	-1.411***	-2.872***	-5.009***	-5.130***
	(0.107)	(0.240)	(0.386)	(0.630)
AR 1	0.000	0.000	0.000	0.000
AR 2	0.228	0.808	0.907	0.735
Hansen test	0.167	0.132	0.159	0.222
Number of firms	223	223	223	223

(Source- Data analysis)

Note-** The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

Likewise, the result of the social disclosure coefficient is also negative and significant at a 1 percent level (β = -0.006***; β =-0.0143 ***; β =-0.0199***; β = -0.0297***; p *<0.01*). Considering the control variables in all the estimations indicates the following results. The default risk will be reduced through increased turnover, R&D spending, and liquidity. Additionally, it was observed that a firm's risk of default increases as its size and leverage increase. Considering the lagged values of the dependent variable, one-year to five-year default significantly impacts CFP at a 1 percent level ($p < 0.01$).

The result of the impact of governance disclosure on default risk is depicted in Table 7.7. The result of the governance disclosure coefficient is also negative and significant at a 1 percent level. Indicating good governance will reduce the risk of default. At the same time, previous values of default risk also influenced the default probability likelihood. Considering the control variables in all the estimations indicates the following results. The default risk will be reduced through increased turnover, R&D spending, and liquidity. Additionally, it was observed that a firm's risk of default increases as its size and leverage increase. Considering the lagged values of the dependent variable, one-year to five-year default significantly impacted CFP at a 1 percent level ($p < 0.01$).

GMM employs two post-estimation tests for assessing autocorrelation and over-riding restrictions. To determine the overall validity of the instrument, Hansen J statistics were employed. The post-estimation Hansen test specifies that all the instruments used in this study are valid and robust in all the models. The value of AR (2)>0.05 specifies that the error term is serially uncorrelated and that the moment condition is correctly specified. It can also infer from the estimation that the number of devices used in this study is less than the cross-section. Hence the model specification and instruments are valid and are in line with the specification of GMM.

Table 7.6 SDS and FD relationship using Bloomberg probability default score.

Variables	Model 1 One-year Default score	Model 2 Two-year Default score	Model 3 Four -year Default score	Model 4 Five-year Default score
SDS	-0.006***	-0.0143***	-0.0199***	-0.0297***
	(0.000)	(0.00100)	(0.00154)	(0.00286)
TURN	-0.160***	-0.250***	-0.282***	-0.172*
	(0.0178)	(0.0367)	(0.0646)	(0.0999)
RD expense	-5.005***	-10.66***	-12.88***	-11.39***
	(0.353)	(0.886)	(1.447)	(2.380)
LQDTY	-0.0983***	-0.265***	-0.429***	-0.612***
	(0.00559)	(0.0247)	(0.0344)	(0.0496)
Firm size	0.170***	0.484***	0.734***	1.159***
	(0.0176)	(0.0395)	(0.0692)	(0.106)
LEV	0.514***	1.339***	1.977***	2.867***
	(0.0128)	(0.0322)	(0.0572)	(0.0927)
ESI	0.313***	0.485***	0.719***	0.848***
	(0.0304)	(0.0864)	(0.134)	(0.223)
L. 1yr default	0.227***			
	(0.004)			
L. 2yr default		0.249***		
		(0.005)		
L. 3 yr. default			0.256***	
			(0.005)	
L. 5yr default				0.236***
				(0.006)
Year effect	Yes	Yes	Yes	Yes
Constant	-0.850***	-1.698***	-2.585***	-4.984***
	(0.0984)	(0.187)	(0.332)	(0.501)
AR 1	0.000	0.000	0.000	0.000
AR 2	0.196	0.768	0.959	0.733
Hansen test	0.149	0.118	0.162	0.234
Number of firms	223	223	223	223

(Source- Data analysis)

Note-** The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

Table 7.7 GSD and FD relationship using Bloomberg probability default score.

Variables	Model 1 One-year Default score	Model 2 Two-year Default score	Model 3 Four -year Default score	Model 4 Five-year Default score
GDS	-0.016***	-0.0367***	-0.0496***	-0.0752***
	(0.00179)	(0.00432)	(0.00646)	(0.00922)
TURN	-0.230***	-0.484***	-0.635***	-0.603***
	(0.0296)	(0.0723)	(0.0978)	(0.131)
RD expense	-1.681***	-2.194**	-1.123	4.011*
	(0.376)	(0.930)	(1.487)	(2.234)
LQDTY	-0.127***	-0.372***	-0.615***	-0.955***
	(0.0117)	(0.0327)	(0.0490)	(0.0672)
Firm size	0.198***	0.470***	0.637***	1.004***
	(0.0206)	(0.0455)	(0.0740)	(0.116)
LEV	0.607***	1.586***	2.308***	3.211***
	(0.0201)	(0.0493)	(0.0691)	(0.0926)
ESI	0.394***	1.475***	1.475***	1.852***
	(0.0505)	(0.218)	(0.218)	(0.302)
L. 1yr default	0.175***			
	(0.00648)			
L. 2yr default		0.180***		
		(0.00838)		
L. 3 yr. default			0.178***	
			(0.00752)	
L. 5yr default				0.163***
				(0.00575)
Year effect	Yes	Yes	Yes	Yes
Constant	-0.227**	-0.529**	-0.680*	-0.769
	(0.0891)	(0.257)	(0.406)	(0.614)
AR 1	0.000	0.000	0. .000	0.000
AR 2	0.065	0.579	0.965	0.732
Hansen test	0.110	0.097	0.157	0.148
Number of firms	223	223	223	223

(Source- Data analysis)

Note-** The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1). RD expense- Research and development expenditure*

7.5.1 ADDITIONAL ANALYSIS

The literature on social responsibility studies and financial distress observed that the link between social responsibility and financial distress depends on the lifecycle stages. Since the various factors influencing firm profitability may vary depending on the various life cycle stages Al-Hadi et al. (2019), for instance (retained earnings, asset growth, turnover, earning, cash flow, liquidity, etc.). Considering these findings, the current study assumes that the associations between CSD and financial distress may also depend on different life cycle stages. The study used Dickinson's (2011) cash flow-based methodology, which considers firm profitability, growth, and risk fluctuations in the cash flow. Therefore, employing cash from operating, investing, and financing operations, business is separated into five stages using the literature: introduction, growth, maturity, shakeout, and decline. The result of the role of the firm life cycle in the CSD and CFP relationship is presented in Table 7.8

Table 7.7 displays the direct and indirect effects of financial distress and CSD at all stages of the firm life cycle. The results show that financial distress and CSD have a negative relationship that is highly significant at the 1% level. Additionally, every stage of the life cycle has a negative relationship with financial distress. According to the results, only the mature stage has a statistically significant and positive coefficient on (CSD x maturity) with FD. The interaction between (CSD X shakeout) and (CSD X growth) with FD has statistically significant negative coefficients. These results demonstrate that firms with more stringent CSD disclosure requirements only reduce default risk for established, older firms. Additionally, the outcomes show that adopting CSD at the maturity stage might have an inverse impact on the firm's profitability. Which eventually enhances the chance of default.

According to the post-estimation Hansen test, all of the instruments employed in this study are reliable and valid across all models. The error term is serially uncorrelated, and the moment condition is adequately specified according to the value of AR (2)>0.05. The estimation also suggests that the number of instruments employed in this study is lower than the number of cross-sections. As a result, the model's specifications and instrumentation are precise and in line with GMM's requirements.

Table 7.8 Role of firm life cycle

Variables	Model 1	Model 2	Model 3	Model 4
EDS	-0.0060***	-0.003***	-0.006***	-0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Intro	-1.414***	-1.425***	-1.372***	-1.408***
	(0.0495)	(0.0734)	(0.0724)	(0.0792)
Growth	-0.886***	-0.651***	-0.772***	-0.817***
	(0.0531)	(0.0755)	(0.0660)	(0.0717)
Maturity	-0.948***	-0.909***	-0.921***	-0.923***
	(0.0500)	(0.0632)	(0.0606)	(0.0722)
Shakeout	-0.821***	-0.737***	-0.712***	-0.650***
	(0.0491)	(0.0642)	(0.0639)	(0.0770)
TURN	-0.106***	-0.140***	-0.132***	-0.132***
	(0.0167)	(0.0164)	(0.0192)	(0.0198)
RD expense	-0.988***	-1.084***	-1.039***	-1.055***
	(0.231)	(0.181)	(0.192)	(0.237)
LQDTY	-0.101***	-0.116***	-0.114***	-0.112***
	(0.0133)	(0.0108)	(0.0124)	(0.0116)
Firm size	0.293***	0.243***	0.248***	0.249***
	(0.0158)	(0.0128)	(0.0146)	(0.0168)
LEV	0.572***	0.537***	0.540***	0.547***
	(0.0114)	(0.0110)	(0.009)	(0.009)
ESI	0.0894***	0.106***	0.0943***	0.0949***
	(0.0245)	(0.0300)	(0.0250)	(0.0241)
L. 1yr default	0.163***	0.179***	0.182***	0.179***
	(0.003)	(0.005)	(0.005)	(0.006)
CSD X Introd	0.0004			
	(0.001)			
CSD X growth		-0.005***		
		(0.000)		
CSD X Maturity			0.00146***	
			(0.000)	
ESG X Shake				-0.0041***
				(0.001)
Year effect	Yes	Yes	Yes	Yes
Constant	-0.434***	-0.113*	-0.103	-0.113
	(0.07)	(0.06)	(0.07)	(0.08)
AR 1	0.000	0.000	0.000	0.000
AR 2	0.319	0.429	0.393	0.365
Hansen test	0.373	0.323	0.333	0.345
Number of firms	233	233	233	233

(Source- Data analysis)

Note-. The coefficient is the first value in each estimate, followed by the standard errors in parentheses (* p<0.01, ** p<0.05, * p<0.1).*

7.5.2 ROBUSTNESS CHECK

To test the validity of the findings, models using an alternate measure of financial distress were executed, which could be seen in Table 7.9

Table 7.9 Relationship between sustainability reporting and financial distress.

Variables	Model 1 Altman Z score	Model2 Altmen Z score	Model 3 Altman Z score	Model 4 Altman Z score
CSD	0.0176***			
	(0.003)			
EDS		0.005**		
		(0.002)		
SDS			0.0137***	
			(0.002)	
GDS				0.0232***
				(0.006)
Turnover	1.099***	1.301***	0.991***	2.201***
	(0.140)	(0.100)	(0.0950)	(0.142)
RD expense	6.166***	9.994***	4.196**	27.27***
	(1.469)	(2.063)	(1.833)	(2.253)
Liquidity	0.479***	0.869***	0.499***	2.424***
	(0.0682)	(0.0629)	(0.0638)	(0.0712)
Firm size	-1.106***	-0.784***	-0.640***	-2.083***
	(0.0860)	(0.0736)	(0.0813)	(0.107)
Leverage	-0.714***	-0.530***	-0.770***	-0.140*
	(0.0759)	(0.0566)	(0.0653)	(0.0756)
ENV dummy	0.162	0.195	0.169	-0.830***
	(0.153)	(0.155)	(0.160)	(0.221)
l. Altman score	0.694***	0.671***	0.703***	0.349***
	(0.010)	(0.00836)	(0.00794)	(0.00899)
Year effect	Yes	Yes	Yes	Yes
Constant	5.204***	3.411***	3.011***	8.432***
	(0.539)	(0.436)	(0.412)	(0.624)
AR 1	0.000	0.000	0.000	0.000
AR 2	0.209	0.348	0.411	0.11
Hansen test	0.074	0.490	0.413	0.185
Number of firms	233	233	233	233

(Source- Data analysis)

sNote**-. The coefficient is the first value in each estimate, followed by the standard errors in parentheses (p<0.01, ** p<0.05, * p<0.1).*

The study employed the Altman Z score as the dependent variable to run the results. The analyses shown in Table 7.9 supports the validity of the findings regarding the association between sustainability and financial distress. For all five models employing the Altman Z score as a proxy, the link between sustainability reporting at the aggregate and individual levels is consistently positive and statistically significant at p (<0.01). Implying the risk of default is less for financially sound firms. This illustrates how adopting sustainability reporting can lower a company's default risk. This conclusion is consistent with the result of primary analysis using the Bloomberg default score as a proxy for financial distress. The findings strongly imply that information transparency on sustainability data lowers the firm's default risk.

7.6 DISCUSSION

The study used robustness tests and quantified analytics to examine the link between CSD and financial distress. The study's findings validate that implementing CSD helps reduce distress and that the role of the firm life cycle is essential in understanding the relationship between CSD and FD. The firm life cycle significantly alters the relationship between CSD and FD. This investigation examined the relationship between one of the specific elements of sustainability reporting and the firm life cycle (CSD). The study's results align with the results of (Boubaker et al., 2020; Chiaramonte et al., 2021)**.** According to empirical results calculated using the Altman Z score as a proxy, there is a direct relationship between a company's financial soundness and its CSD rating. Firms with higher CSD profiles also show lower levels of distress and are viewed as more creditworthy, making them more accessible to lending institutions. The findings support that firms might lessen their financial distress by improving CSD performance. Low levels of financial distress are associated with high CSD performance. As a result, the outcome is congruent with the initial analysis.

This implies that corporate sustainability disclosure reduces agency costs and eliminates the information gap in the corporate sector (Cormier et al., 2011). The market's accessibility to information gap reduces risks associated with regulations, controversy, management, and reputation. Even investors evaluate organizations based on the availability of non-financial data to determine default likelihood. Such firm-

specific market information increases the availability of finance at comparably lower costs and lowers the cost of capital (Cheng et al., 2014; Cormier et al., 2010; El Ghoul et al., 2011; Waddock and Graves, 1997). Hence, the findings indicate that adopting CSD also signals extra information to the market, which in turn helps create credibility and better access to finance, thereby reducing the firm's distress. Moreover, transparency leads to brand equity, loyalty, and consumer trust. As a result, income streams and profitability are less volatile, especially in times of crisis (Godfrey, 2005; Godfrey et al., 2009). Furthermore, performance variation is less likely to happen when steady cash flows. Corporate sustainability disclosure acts as a type of "assurance" for firms, preventing default by ensuring steady cash flows.

7.7 CONCLUSION AND SUMMARY

CSD performance, often known as extra-financial or non-financial information, has grown in significance as a factor to be considered when making investment decisions. On the other hand, the catastrophic ramifications of default risk have made it a critical indicator of a firm's financial health. However, previous research has not clarified how or via what processes CSD disclosure affects default risk. Using a sample spanning the years 2010 to 2019, the impact of ESG disclosure on default risk for manufacturing companies in the Indian manufacturing sector was investigated. The study investigated how the firm life cycle affects this link. The current study research shows that CSD is linked to a decreased default risk. Lowering the risk of default will be made possible by increased turnover, R&D spending, and liquidity. At the same time, it was observed that a firm's default risk increases along with the size and leverage of the sampled firms. The present study adds to the knowledge concerning the variables affecting a company's default risk. By providing credible statistics on the significance of overall CSD as a significant driver of default risk for Indian manufacturing enterprises, the study contributes to the corpus of knowledge in this area. By examining the influence on one-year to five-year default scores, the current study further helps understand CSD's implications, revealing that ESG disclosure decreases default risk. Further, the firm life cycle plays a vital role in this linkage. However, the results indicate that mature firms have more chances of default than other stages. Hence adopting CSD can act as a protection for firms.

CHAPTER 8

FINDINGS AND CONCLUSION

8.1 OVERVIEW

The key findings of the investigation are explained in this chapter. The findings and implications for academia and business are thoroughly discussed in this chapter. The recommendations are described in great depth. This chapter also encompasses the contribution, limitations, and suggested areas for additional study. The chapter ends with a final observation. Section 8.2 provides an introduction to the chapter. In section 8.3, the findings of the study are described in great depth and followed by implications and contributions to the body of knowledge in sections 8.4 and 8.5, respectively. Section 8.6 details the thesis conclusion. Finally, section 8.7 concludes with limitations and the future scope of the study.

8.2 INTRODUCTION

The purpose of the current study was to address the existing knowledge gap by investigating whether sustainability disclosure can enhance business financial performance and serve as a risk-reduction strategy. Research on the relationship between corporate sustainability disclosure (CSD) and corporate financial performance (CFP) has been available for over four decades. However, the findings have been inconclusive, leaving a gap in the literature, especially regarding industry-specific studies conducted in developing countries characterized by diverse industrial and socio-cultural challenges (Behl et al., 2022). Consequently, considering the increasing global popularity of investments in CSD, the present analysis seeks to fill this void in understanding the link between CSD and CFP. To address the potential endogeneity bias in this association, the current study employs the generalized method of moments (GMM). Moreover, this study significantly contributes to both theory and practice by investigating the impact of environmental, social, and governance (ESG) factors on firms' financial performance and default risk.

Firms gain a lot from investing in sustainable practices, especially in value creation, through sales growth, cost reductions, fewer legal and regulatory interventions, productivity gains, and better market capitalization (KPMG, 2018). However, there is little uniformity in the effects of CSD-CFP development, as the literature reveals that the influence is very dynamic across countries, industries, and business models. The results show that adopting sustainable practices will pay out over time in several ways, and manufacturing organizations should continue investing in this rather than focusing on short-term advantages. Further, it can also be employed as a risk mitigation strategy.

The impact of CSD on performance and default risk of manufacturing in India is empirically analyzed in the current study. The study will assist managers, investors, and regulators in making the best decisions at the correct times. The objective of the study can be divided into four categories. Analyzing the literature, it is observed that there is inconclusive evidence of CSD and CFP linkage. Moreover, the concept of sustainability reporting is evolving in the Indian context. This has motivated us to examine whether CSD adoption improves corporate financial performance. Secondly, it was found that the role of global reporting initiative in this linkage is not examined in the literature; this has made the researcher set the second objective to examine the moderating role of GRI in this association. Based on the literature, it was also observed that the association between CSD and CFP is not explored or studied at various stages of the firm life cycle, hence to fill this gap, a third objective was set to determine whether the relationship between CSD adoption and firm financial performance on the different stages of the life cycle. Finally, the current study attempted to check whether CSD can be used as a risk mitigation strategy. Hence, the following are the significant findings of the current study.

8.3 FINDINGS OF THE STUDY

8.3.1 CSD AND CFP ASSOCIATION IN THE INDIAN MANUFACTURING SECTOR.

This objective examined the impact of CSD on CFP from 2010 to 2019 in the Indian manufacturing sector firms listed in the Nifty 500. The driving force behind establishing

this objective was the evidence of a lack of studies to draw definitive conclusions on the connection between CSD and CFP, the dearth of research on it, and the infancy stage of sustainability disclosure in the Indian context. The study adopted a set of analysis and robustness checks to discover that disclosing CSD will enhance the corporate financial performance of Indian manufacturing firms. A two-step system GMM was adopted to test the association between CSD and CFP. According to the results, communicating or reporting on sustainability initiatives boosts the firm's financial performance. Furthermore, the present findings support the theoretical argument by claiming that adopting CSD in the manufacturing sector will enhance the firm's financial performance in all the models adopted with a p-value of ($p < 0.01$)**.** Further, adopting corporate sustainability enhances not only profitability but also the firm's value. Considering the individual elements of CSD disclosure, including the environmental, social, and governance disclosure, implies that disclosing environmental, social, and governance systems enhances the firm's profitability and value. It can be stated that sound environmental, social, and governance policies will enhance corporate financial performance.

The null hypothesis states that CSD does not have a significant and positive association with the corporate financial performance of the Indian manufacturing sector. While the p-value of the coefficient is significant, indicating a significant and positive relationship between CSD and CFP. Hence, the current study accepts the alternative hypothesis. Based on the result, hypotheses $H_{1,}$ $H_{1\,a}$, $H_{1,\,b}$ $H_{1,\,c}$ are accepted.

The results are in line with the results of Friede et al., (2015) and Buallay (2020). The results indicated that in the manufacturing sector, the benefits of CSD disclosure offset the cost of doing so regardless of the return on assets.

The research also supports the signaling theory, which holds that sustainability disclosure signals sent to interested parties enable investors to make wise decisions (Levy and Lazarovich, 1995). Therefore, it is advantageous for firms to obtain a competitive edge by providing correct information to stakeholders. This further supports the stakeholder's theory; that meeting the demands of the stakeholders will improve the relationship between the stakeholder and the firm, which is substantiated

by the favorable relationship between CSD and CFP in the Indian manufacturing sector. The firm's reputation, visibility, legitimacy, and transaction costs will all eventually rise due to enhanced sustainability disclosure (Barnett2007; Perrini et al.,2009; AlHawaj and Buallay, 2021).

8.3.2. THE ROLE OF GRI COMPLIANCE THE IMPACT OF CSD ON FIRM VALUE

The objective examined the signaling effect of CSD on firm value. The study also examined whether GRI compliance improves firm value in Indian manufacturing firms. GRI compliances moderating and signaling impact on a firm's long-term value creation was also investigated in this objective. The study adopted a set of analysis and robustness checks to discover whether GRI compliance moderates this association. Owing to the endogeneity issues in this linkage, the current study adopted a two-step system GMM. According to the results, communicating or reporting on sustainability initiatives boosts the firm's value. Furthermore, the findings support the theoretical argument that GRI-compliant firms have higher firm value in all five models with a p-value of ($p < 0.01$) than those firms that are not. This implies that a firm's sustainability reporting under GRI leads to a higher market value, demonstrating the importance of GRI compliance in CSD disclosure.

The sustainability disclosures under the GRI generate positive publicity for a firm, increasing its value and making it even more beneficial to society. Scrutiny of this result of the study revealed that information signaling is a viable strategy used by Indian firms to differentiate themselves from non-compliant companies. Moreover, it allows for identifying favorable and unfavorable firms and thus helps separate high and low performers.

The null hypothesis states that CSD does not have a significant and positive association with the firm value of the Indian manufacturing sector (H_2). Further, H_{2d} and H_{2e} state that there is no direct and moderating effect of GRI compliance on CSD and firm value. Hence, the p-value of the coefficient is significant, indicating a significant and positive relationship between CSD and firm value. Further, the coefficient of GRI compliance indicates that GRI compliance moderates the relationship between CSD and firm value.

Hence, the study rejects the null and accepts the alternative hypothesis. Hypotheses H_2, H_{2a}, H_{2b}, H_{2c}, H_{2d}, and H_{2e} are accepted based on the result.

8.3.3 THE ROLE OF FIRM LIFE CYCLE ON THE IMPACT OF CSD ON CFP

An attempt was made to assess the moderating role of the firm life cycle in CSD and CFP linkage. Owing to the endogeneity concern in the basic model, as discussed earlier, a two-step system GMM was adopted to correct the endogeneity. Based on a sample of manufacturing firms covering the 2010-2019 period, the results of the regression showed the following results.

The results indicated that the interaction coefficient adopted CSD in the introduction stage (CSD X INTRO) is positive and significant at a 10 % level with firm profitability. In contrast, it is negative in the case of firm value. At the same time, the coefficient of (CSD X GRO) is positive and significant in the case of firm profitability and value. In contrast, the interaction effect in the maturity stage was negative and highly significant at (β =-0.0607; β = -0.024*** p <0.01) at a 1 % level. Finally, the interaction coefficient of (CSD X SHAK) was also found to be significant and positive in both the models of CFP. This research could help investors and manufacturing firms better comprehend CSD disclosure's role in each firm life cycle stage.

Based on the result, hypotheses H_3, H_{3a} H_{3b} H_{3c}, H_{3e}, H_{3d}, H_{3f}, H_{3g} and H_{3h} were accepted.

The result indicates that adopting CSD in the introduction growth and decline stage enhances the firm's profitability. The combined influence of CSD and firm life cycle on corporate financial performance is relevant for the industries since the findings reveal that the relationship between CSD and CFP differs depending on the various life cycle stage. While considering the firm value, adopting CSD in the growth and shakeout will enhance firm value.

The present study demonstrates that the relationship between CSD and life cycle advancement is linked to CFP. Given that firms' access to resources and competitive edge with their counterparts will vary throughout life cycle phases, these findings have significant implications for firm management and other stakeholders. According to the

findings, firms that engage in CSD activities are more likely to bring benefits if they embrace CSD in the shakeout and initial and growth stages. Further, adopting CSD disclosure also depends on the firm's life cycle. Hence, the combined influence of CSD and firm life cycle on corporate financial performance extends to the current CSD and CFP relationship literature. As a result, determining the joint significance of CSD and firm life cycle assists the industry in developing appropriate disclosure approaches.

8.3.4 THE IMPACT OF CSD ON FINANCIAL DISTRESS

The final objective was to analyze whether CSD helps in mitigating the firm's financial distress by evaluating a sample of 223 manufacturing firms. Due to the endogeneity bias created in this association by reverse causation and omitted variable bias, the current objective also adopted a two-step system GMM.

The result indicates that the CSD rating is negative and highly significant at 1 percent ($\beta = -0.009$; $p < 0.01$) regarding the one-year default score. The result is the same for one-, two-, three- and five-year default scores. An evaluation of the relationship between the individual elements of sustainability disclosure indicates that the environmental disclosure rating is negative and highly significant at a 1 percent level ($\beta = -0.0095$; $p < 0.01$). The result is similar for one-, two-, three- and five-year default scores. Social and governance disclosure score also negatively impacts the firm's financial distress.

The results indicate that disclosing CSD information reduces the distress level of the firm. The findings support that firms lessen their financial distress by improving CSD performance. Low levels of financial distress are associated with high CSD performance. Further, ESG disclosure positively relates to financial soundness, indicating that high disclosure levels improve the firm's financial soundness. Considering the individual elements of CSD, the results indicate that sound environmental policies, socially responsible activities, and better governance mechanisms reduce the chances of default. Hence, the findings indicate that adopting CSD also signals extra information to the market, which in turn helps create credibility

and better access to finance by stabilizing the cashflows, reducing the firm's distress. Hypotheses H_4, H_{4a} H_{4b} H_{4c} were accepted based on the results.

Further analyzing the role of the firm life cycle in this linkage shows that the firm life cycle plays a vital role. However, the results indicate that mature firms have more chances of default than other stages. These findings show that firms with more imperative CSD disclosure only lower default risk for growth and declining firms. In the case of mature firms, adopting CSD in the mature stage can enhance the chance of default. The present research shows that CSD is linked to a decreased default risk. Lowering the risk of default will be made possible by increased turnover, R&D spending, and liquidity. At the same time, it was found that a firm's default risk increases along with its size and leverage. The study adds to the knowledge concerning the variables affecting a company's default risk. Based on the results, hypothesis H_{4d} was also accepted.

8.4 IMPLICATIONS

The study holds amplified significance as the predominant studies conducted in this area focused on examining the nature and content of sustainability disclosure adopted by Indian business firms. However, these studies lack precision in exploring the precise relationship between corporate financial performance and sustainability reporting, thus necessitating a more comprehensive investigation. Consequently, the present study was carried out to address this research gap by offering a thorough analysis. This research is particularly significant as it provides a comprehensive explanation of the potential benefits of implementing sustainability reporting for firms. Hence, this section examines the implications of the study from both theoretical and practical perspectives. The outcomes of this research will serve to assist industry professionals, managers, and academia in gaining a deeper understanding of this association.

8.4.1 MANAGERIAL IMPLICATION

- Based on the results, it is observed that adopting solid environmental, social, and governance disclosure measures are beneficial for manufacturing firms. Hence, adopting sustainability disclosure will help the firm for long-term sustenance. The outcome also indicates that disclosure improves the firm's profitability and value. Hence, based on the result, the study recommends the managers that Industrial firms to adopt sustainability reporting voluntarily and report more on environmental, social, and governance aspects.
- The second objective has several implications; first, the positive association in base models implies that manufacturing firms should emphasize GRI adoption despite the cost involved. Second, the positive moderating effect of GRI compliance on CSD and firm value suggests that the investors value those firms that disclose GRI and adhere to GRI standards more than those that do not. Hence, due to the signaling effect, stakeholders can identify the high and low performers in sustainability adoption, thereby helping to separate the equilibrium.
- The study recommends managers and industrial manufacturing firms that GRI adoption places a strong emphasis on transparency and accountability in reporting, which can increase trust and credibility among stakeholders such as customers, employees, and investors. This favorable reputation may attract new investors, clients, and business partners, which could ultimately result in prospects for business growth and expansion. Hence, the study recommends that businesses should follow GRI guidelines.
- The study recommends that the positive moderation impact of CSD during the introduction shake-out and decline stage indicates several implications. These findings are primarily pragmatic rather than theoretical. Adopting CSD enhances the firm's environmental and social visibility and attracts a better future finance source and cost-cutting strategy. Further, it is a retention strategy that can draw in and keep both customers and employees. The adoption of CSD throughout practically all stages—aside from maturity—indicates that the company can use the disclosure method to outperform its rivals. Adopting CSD

along with various stages shows that CSD aids in the business's comprehensive, concrete, and intangible development, even in the declining introduction and shake-out stage.

- Considering the influence of CSD and firm life cycle on firm value, the study suggests that espousing CSD in the growth and shakeout stage improves firm values. Competitive advantages, resource base, and competencies in the growth stage reduce risks facilitating CSD adoption and improving the firm's value. The study recommends the firm's management adopt strategic methods for CSD involvement depending on its resourcing capabilities and life cycle evolution. The transition from different life cycle stages to others significantly impacts CSD and CFP relations. The results indicate that the profitability of the manufacturing firms and value is boosted by CSD disclosure. Adopting CSD disclosure is also dependent on the firm's life cycle. Moreover, firms in the shakeout stage can adopt CSD to enhance corporate financial performance. The assessment of the joint significance of CSD with various life cycles helps the firm frame better disclosure policies.
- The study also suggests that GRI adherence establishes a benchmark, and this can encourage replication of its practices by other firms. This could increase the firm's influence and open doors for collaboration and industry leadership.
- The study further recommends that managers and industrial firms need to voluntarily adopt sustainable practices since it is associated with lower distress or default risk, which are more likely to result in better corporate investment environments, fewer financial business failures, and more resilient and stable economies. The study demonstrates to the managers that sustainability-oriented business has additional benefits beyond ‘social and economic gain.’ This will help the firm in lessening financial hardship and more appealing to the credit market at a lower rate; a favorable relationship with regulators will eventually enhance the stable and continuous cashflows.

8.4.2 PRACTICAL AND THEORETICAL IMPLICATION

The primary contribution of this study is its insights into the literature on sustainability disclosure and CFP through bibliometric analysis. It is unique since it identifies the most significant studies that offer an insightful knowledge base and categorizes different existing studies into sub-categories or themes to draw attention to understudied areas. Overall, the analysis provides practitioners and scholars with a clear summary of the relationship between CSD and CFP, as well as provides an outline for future research.

Endogeneity bias remains the primary cause of conflicting outcomes in the majority of the studies (Ullah et al., 2017). Studies in this subject exploring the linkage between CSD, CFP, and financial distress generally ignored the endogeneity of this link. The endogeneity of this association has not been extensively studied in the literature. The current study employs a two-step system GMM to eliminate the endogeneity bias in this relationship, which may be used to adopt a robust model that may deliver more reliable and consistent results. This will support further discussion and the validity of the obtained results in comparison to the fundamental model used in this subject.

The study's empirical analysis offers crucial findings that are essential and significantly advance our understanding of the subject. Even though examining the moderating roles played by GRI, the family life cycle, and how CSD affects the firm's level of distress enhanced this association, regarded to be a novel contribution to the corpus of research. Although some of the prior results were partially contradicted by the base assessment of the relationship between CSD and CFP, they are still clearly acceptable results that pave the way to additional validation.

The signaling theory provides additional theoretical underpinnings for the usefulness of the sustainability voluntary reporting initiative. This study's findings have several theoretical implications for the sustainability and GRI reporting research discourse. First, this study's inference that GRI reporting allows for the sender's autonomy, which is implicit in the signaling effort, implies the ability of the firm to use GRI reporting as a signal to investors regarding the positive intentionality of GRI reporting. Second, the

results of the study show the intentionality assumption in conveying the signaling behavior of firms. The findings of the current study opine that GRI reporting provides the beneficial effects of signal intentionality and, therefore, the emergence of separating equilibrium.

8.4.3 POLICY IMPLICATION

To ensure the integrity of sustainability reports, strong regulations should be in place to prevent selective disclosure or "green-washing." Therefore, conducting audits of non-financial disclosure data itself would be a new step toward preventing such fraudulent practices. This measure would maintain transparency in sustainability reporting and safeguard against misleading claims or distorted information.

India is ranked among the top emitters of greenhouse gases (GHG), making it crucial for ESG investments and disclosure to be implemented practically. To enhance the accuracy and transparency of disclosure, regulatory authorities may need to revise their ESG disclosure criteria. This modification would lead to improved ESG disclosure practices across all listed firms, promoting ethical and sustainable business practices. Consequently, it would address investors' concerns regarding the lack of comparable and reliable sustainability reports, bridging the gap between the supply of data by the firms and the demand for ESG data from stakeholders. Thus, regulators should rectify anomalies in the disclosure of sustainability-related activities.

8.5 CONTRIBUTION TO THE BODY OF KNOWLEDGE

The current study makes several contributions to the body of knowledge. Firstly, in India, the idea of sustainability reporting is evolving. Earlier studies were carried out in established markets, while there were relatively few studies on rising markets like India. Even though there is conflicting evidence from the studies done in this field. The current study provides empirical evidence that CSD may be leveraged as a strategic tool to improve the firm's financial performance and that this can be used as coverage against default risk. Secondly, the study contributes to the body of knowledge by analyzing the moderating role of GRI in CSD and firm performance linkage. The study reveals that GRI compliance moderates the relationship between sustainability disclosure and firm

value, such that firm value increases when the firm adopts GRI in sustainability reporting. The study is also valuable for the managers and industry to understand the significance of implementing voluntary sustainability disclosure practices and being GRI compliant.

Thirdly, the study contributes to the current knowledge on sustainability disclosure by providing empirical evidence on the moderating impact of the firm life cycle in CSD and CFP linkage in Indian manufacturing firms. The study discovered that adopting sustainability disclosure will enhance manufacturing firms' profitability and firm value. Moreover, the impact of CSD on corporate financial performance is contingent upon the firm life cycle. CSD has a diverse impact on a firm's financial performance depending on where it is in its life cycle. Understanding the joint significance of CSD on various stages of the firm life cycle can aid the industry and managers in framing and establishing acceptable disclosure methodologies. Adopting CSD along with various stages indicates that CSD aids in the business's comprehensive, concrete, and intangible development, even in the declining introduction and shake-out stage. Finally, the study advances the understanding of sustainability disclosure by presenting empirical data on the relationship between CSD and CFD in Indian manufacturing enterprises using signaling theory. The study found that implementing sustainability disclosure will lower the likelihood of default. It is a risk-reduction method that protects from adverse circumstances. By implication, the result indicates that improved sustainability disclosure performance reduces the firm being into default. Adopting CSD is a shield that will protect the firm from adverse events.

Furthermore, the firm life cycle affects how CSD affects corporate financial distress. Additionally, results show that more rigorous CSD disclosure might be employed as a risk-reduction tactic during the introduction, growth, and declining stages. To establish and create appropriate disclosure procedures, the business community and managers will benefit from the study by understanding the combined impact of CSD on various stages of the firm life cycle and the influence of CSD on financial distress.

Considering the methodology adopted, the use of two-step GMM in the current study is a novel approach that was not adopted in earlier research on the subject. This technique effectively tackles the issue of endogeneity bias in this relationship. It is important to note that endogeneity was not considered in the majority of the studies conducted in this field. Previous research relied on the methods like OLS, fixed, and random effect methods. In the literature, few researchers have shed light on the limitations of basic regression models like OLS in handling endogeneity. Hence these models may produce inaccurate estimates due to the presence of endogeneity bias (Soytas et al., 2019). Even though the panel regression techniques can partially address endogeneity, they may not fully account for these effects. By adopting a two-step system GMM, the current study adds to the literature by providing a more robust analysis by reducing the likelihood of biased results and improving the overall validity of the findings.

8.6 LIMITATIONS AND FUTURE SCOPE OF THE STUDY

The study has some limitations as well. This research examines GRI compliance as a moderator in CSD and firm value relationships. However, this study does not directly assess the sustainability report's quality. Moreover, this study is restricted to the manufacturing industry. More information could be gained by combining and contrasting the manufacturing, finance, and service sectors. It will be fascinating to see how GRI compliance varies across industries. Further classifying the GRI compliance by firms in terms of GRI referenced, comprehensively adopting GRI, and adopting GRI to the core categories can unveil valuable insights. Future studies may focus on how the firm life cycle influences individual elements of CSD reporting by incorporating them into other theoretical frameworks.

Furthermore, spanning ten years, the current research investigated the moderating impact of firm life cycle on CSD and CFP connection in the Indian manufacturing industry. Future contributions could include longitudinal and multi-country data, particularly from emerging economies. As a result, doing comparative cross-country and cross-industry evaluations could be an additional area of research that can strengthen the assessment and broaden the scope of the research. This should also make

it possible to emphasize the distinctions that arise from a country-by-country study. Further, adding an index of Industrial Production (IIP) for capturing the economic life cycle as well as capturing how the firms integrate ESG in the corporate culture can pave the way for further research in this area. Additionally, this study is limited to the manufacturing sector. Including and comparing manufacturing and service industries, as well as evaluating the sectoral variations in sustainability adoption, can be further explored. Since the study focuses on a single country, methodological generalization is limited. Moreover, upcoming research can deepen the evaluation, expanding the scope of the study.

8.7 CONCLUSION

The present study aimed to investigate the connection between corporate sustainability disclosure and firm financial performance in India's manufacturing industry. The study employed a quantitative research approach. Due to the endogeneity problem in the relationship, the current study adopted a two-step GMM methodology throughout the study to address the endogeneity problem that persisted in this association. The outcomes showed that CSD adoption would improve business financial performance. The firm's financial stability can be improved using CSD as a risk mitigation tactic.

Adopting sustainability in the manufacturing sector is a key challenge. Even then, the empirical evidence on the positive impact of sustainability disclosure on financial performance and default risk indicates the necessity of adopting voluntary disclosure by Indian manufacturing firms.

To achieve the goal of sustainable development, the industrial sector in India must go beyond mere compliance with existing regulations and actively adopt sustainable manufacturing practices. While regulations provide a foundation for minimum standards, relying solely on regulatory measures may not be enough to ensure long-term environmental sustainability. Hence, it becomes significant for business to demonstrate their commitment to environmental stewardship by voluntarily implementing practices that surpass the minimum requirements. Through the proactive adoption of sustainable manufacturing practices, industrial sectors can play a crucial

role in mitigating the potential negative environmental impact associated with their operation. This includes minimizing pollution, reducing wastage generation, optimizing resource utilization, and embracing renewable energy resources. Moreover, the integration of sustainable manufacturing can lead to enhanced operational efficiency, cost saving, and improved competitiveness both domestically and globally. Additionally, by proactively adopting sustainable manufacturing techniques, companies can avoid any unforeseen consequences that may result from insufficient laws or reactive actions.

In conclusion, a comprehensive strategy is required to solve the issues with ESG investments and disclosures in India. This entails updating the ESG disclosure standards, enhancing disclosure quality and openness, correcting inconsistencies in sustainability reporting, and setting in place strong restrictions to stop selective disclosure and "greenwashing." By adopting these measures, India can make significant progress toward promoting sustainable and responsible business practices while building trust and confidence among stakeholders.

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ANNEXURE

Table 2.3 Bibliometric coupling

Sl no	Authors	Cluster	Citations	TLS
Red cluster (18 items)				
1	Brown H.S. (2009)	Red	342	6
2	Adams C.A. (2007)	Red	321	16
3	Adams C.A. (2009)	Red	112	32
4	Kolk A. (2004)	Red	221	6.2
5	Frías-Aceituno J.V. (2013)	Red	209	35
6	Dingwerth K. (2010)	Red	148	3
7	Michelon G. (2011)	Red	138	28
8	Vormedal I.H. (2009)	Red	123	11
9	Adams C.A. (2009)	Red	112	32
10	Khan M.H.-U.-Z. (2011)	Red	90	28
11	Maniora J. (2017)	Red	90	30
12	Hummel K. (2019)	Red	51	27
13	Barkemeyer R. (2014)	Red	49	37
14	Yongvanich K. (2005)	Red	47	26
15	Caron M.-A. (2009)	Red	43	19
16	O'Neill S. (2015)	Red	16	17
17	Neumann B.R. (2012)	Red	13	17
18	Turner G. (2006)	Red	10	5
Green (Cluster-2) 16 items				
1	Adams (2014)	Green	103	10
2	Aras. G (2018)	Green	21	20
2	Camilleri M. A (2015)	Green	73	41
3	Clayton A F (2015)	Green	30	9
4	Garcia Torres. S (2017)	Green	37	8
5	Greiling D (2014)	Green	34	13
6	Gulluscio. C.(2020)	Green	13	15
7	Hąbek P. (2014)	Green	39	9
8	Kasbun N.F. (2016)	Green	12	8
9	Knebel S. (2015)	Green	41	17
10	Malik A. (2021)	Green	15	9
11	Manes-Rossi F. (2020)	Green	38	18
12	Opferkuch K. (2021)	Green	19	33
13	Seele P. (2016)	Green	40	20
14	Sridhar K. (2012)	Green	13	12

15	Townsend J. (2015)	Green	62	10
16	Zsóka Á. (2018)	Green	10	11
Blue (Cluster- 3) 14 items				
1	Abdi Y. (2022)	Blue	12	23
2	Arayssi M. (2016)	Blue	112	33
2	Christofi A. (2012)	Blue	98	7
3	Di Vaio A. (2020a)	Blue	29	11
4	Kumar K. (2019)	Blue	29	28
5	Miles K. (2011)	Blue	23	1
6	Moneva J.M. (2007)	Blue	108	26
7	Needles B.E. (2016)	Blue	15	5
9	Ng A.C. (2015)	Blue	151	23
10	Ng A.C. (2020)	Blue	17	35
11	Taliento M. (2019)	Blue	77	46
12	Webber O. (2014)	Blue	64	19
13	Yang Y. (2021)	Blue	22	29
Yellow Cluster 10 items				
1	Ching H.Y. (2017)	Yellow	22	15
2	Goel P. (2017)	Yellow	15	14
2	Hongming X. (2020)	Yellow	11	21
3	Karaman A.S. (2018)	Yellow	55	59
4	Munshi D. (2016)	Yellow	12	11
5	Mynhardt H. (2017)	Yellow	17	6
6	Nigri G. (2018)	Yellow	39	40
7	Oncioiu I. (2020)	Yellow	10	37
8	Pineiro-Chousa J. (2019)	Yellow	18	41
9	Scagnelli S.D. (2013)	Yellow	10	23
10	Wasara T.M. (2019)	Yellow	13	43
Violet cluster (10 items)				
1	Buallay A. (2019)	Violet	25	58
2	Buallay A. (2020a)	Violet	36	49
2	Buallay A. (2020b)	Violet	31	51
3	Buallay A. (2020c)	Violet	35	66
4	Buallay A. (2021)	Violet	12	27
5	Buallay A.M. (2020)	Violet	12	47
6	Consolandi C. (2020)	Violet	19	5
7	Curtó-Pagès F. (2021)	Violet	20	24
8	Izzo M.F. (2020)	Violet	41	38
9	Khan P.A. (2021)	Violet	30	7
10	Mervelskemper L. (2017)	Violet	115	42
Brown cluster (5 items)				
1	Al Hawaj A.Y. (2022)	Brown	22	55
2	Buallay A. (2021)	Brown	12	27

3	Datta P. (2015)	Brown	15	14
4	Hussain N. (2018)	Brown	82	45
5	Oprean-Stan C. (2020)	Brown	15	50
Light blue cluster (7 items)				
1	Adegboyegun A.E. (2020)	Light Blue	18	7
2	Albertini E. (2019)	Light Blue	15	20
3	Bouten L. (2015)	Light Blue	18	13.2
4	Camilleri M.A. (2018)	Light Blue	53	9
5	Hsiao P.-C.K. (2018)	Light Blue	19	30
6	Kannenberg L. (2019)	Light Blue	30	50
7	Mcnally M.-A. (2017)	Light Blue	92	27
Orange Cluster (6 items)				
1	Di Vaio A. (2020b)	Orange	25	28
2	Di Vaio A. (2021)	Orange	16	6
3	Jasch C. (2006)	Orange	23	2
4	Lawal E. (2017)	Orange	16	44
5	Mio C. (2013)	Orange	57	29
6	Unerman J. (2018)	Orange	75	12

Source- Literature review

BIO DATA

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List of Publications

1. *Sreepriya J, Suprabha K R (2021) 'CSR, sustainability and firm performance linkage' current status and future dimensions – A bibliometric review analysis, Int. J. Business Innovation and Research (**Accepted for publication**, Scopus indexed)*
2. *Sreepriya J, Suprabha K R (2022) "Impact of CSR spending on Corporate Financial Performance -An Empirical Evidence from the Indian Manufacturing Sector" Int. J. of Business Excellence (**Article in press**, Scopus indexed).*
3. *Sreepriya J, Suprabha K R, K. Prasad (2022) 'Does GRI Compliance Moderate the Impact of ESG Disclosure on Firm Value? Journal of Society and Business Review 18(1),* 152–174 *(**Accepted Scopus indexed**, Q2 Quartile).*
4. *Sreepriya Jayakumar, Suprabha K R. **(2021)**. Corporate Sustainability Reporting and Firm Performance Linkage-A Literature Review Approach. **Pal Arch's Journal of Archaeology of Egypt / Egyptology**, 17(9), 7519 - 7527. **(Q3 Quartile)***
5. *Sreepriya J, Suprabha K R. (2021) CSR and Corporate Financial Performance: Does Firm Size Play a Moderating Role? **MANAGEMENT DOCTORAL COLLOQUIUMSHODH SAMAGAM** December 9-10, 2021, Organized by **IIM (Indian Institute of Management Visakhapatnam) (Proceedings)***
6. *Sreepriya J, Suprabha K R. (2021) 'Does Sustainability Disclosure Impacts Corporate Financial Performance - Moderating Role of Firm Size? An Empirical Examination' ISDI- Global 2021 Conference Leading business in fluid world Organized by **IIM Nagpur.***
7. *Sreepriya J, Suprabha K R. Prasad K (2023) 'Does Firm Life Cycle Moderate the Impact of ESG Disclosure on Corporate Financial Performance? Journal of Business Life Cycle Research (Under review).*
8. *Sreepriya J, Suprabha K R, Prasad K (2023), 'Differential Impact of CSD on financial distress' international journal for Governance and Disclosure (**Under review**).*

9. *Sreepriya J, Suprabha K R, Prasad K (2023), Impact of CSD on corporate financial performance- A dynamic panel data approach, Asian Journal of Business* ***(communicated).***

Conferences and Workshops

1. ***2 ND MANAGEMENT DOCTORAL COLLOQUIUM SHODH SAMAGAM*** *December 9-10, 2021, Organized by* ***IIM (Indian Institute of Management Visakhapatnam)***
2. ***ISDI- Global 2021 Conference Leading business in a fluid world,*** *does sustainability disclosure influence Corporate financial performance? The moderating role of Firm size- An empirical examination* ***December*** *27- 31, 2021(Organized by* ***IIM Nagpur)***
3. ***International conference on sustainable urban development, resource conservation, and Food security'*** *Beary knowledge campus. Corporate Sustainability Reporting and Firm Performance Linkage-A Literature Review Approach.*
4. *Workshops attended 5 days Continuing Education Program on Computational Intelligence and Statistical Based Data Analytics at NITK, December 2018.*
5. *3 days Faculty development program on Application of Econometrics in Research at CMS B School, October 2019.*
6. *5 days Faculty development program on Application of Econometrics in Research and Panel data analysis, March 2020, Farook College Calicut*
7. *3 Days workshop on Bibliometric Analysis and Systematic Literature Review, October 2020. Research smiths*
8. *5-day workshop on Time Series Analysis using EViews, November 2020, Research smiths*
9. *5-day FDP on Panel Data Analysis, December 2020, Amity College of Commerce and Finance.*
10. *5-day workshop on "Regression and Panel Data Analysis using Stata" January 2021, Research smiths*