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| RESEARCH ARTICLE

Gender Diversity and Decision-Making in Firms: Quantile Regression Approach for Indian Companies

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| ABSTRACT
This study investigates the influence of gender diversity on corporate decision-making in the context of Indian non-financial firms. It examines how the presence of women on boards affects capital structure decisions—measured through the debt-to-equity ratio—and sustainability decisions—measured through corporate social responsibility (CSR) expenditures. Using cross-sectional data from 648 companies listed on the National Stock Exchange of India (NSE), the study employs both Ordinary Least Squares (OLS) and quantile regression techniques. The results indicate that a low representation of women on boards exerts minimal influence on strategic decisions, suggesting tokenism. However, a higher representation is significantly associated with lower financial leverage in the third quartile and increased CSR spending in the first quartile. These findings lend empirical support to the critical mass theory, which posits that a certain threshold of minority representation is necessary for meaningful influence. The study contributes to the growing literature on gender diversity and its impact on corporate governance in several ways. Firstly, it offers empirical insights into how gender diversity shapes financial and sustainability-related decisions in Indian corporate governance. Secondly, it is one of the primary studies to evaluate the impact of women leadership on corporate decision making in the Indian context.

| KEYWORDS

Corporate Governance, Corporate Social Responsibility, Decision making, Gender diversity, Quantile Regression.

| ARTICLE INFORMATION

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1. Introduction

Gender equality is an important yardstick of social development in any society. Social development has a favourable influence on the growth of a nation. It is particularly important for emerging economies to provide equal opportunity and representation to women in all walks of life. Only by fully utilizing the potential of half their population can these nations achieve inclusive and sustainable growth. Gender diversity in business leadership is a frequently discussed topic, with researchers, managers, and policymakers recognizing its importance.

It is believed that gender has a psychological effect on a leader's decision-making in business. Men and women demonstrate different decision-making strategies under different scenarios. Men and women often approach leadership differently due to societal expectations and gender stereotypes (Eagly and Carli, 2007 and Kinahan et al., 2025). Men tend to make riskier decisions, while women are more risk-averse. Additionally, women are often perceived as more compassionate and caring towards social issues. These differences in decision-making approaches have led to a growing interest in gender diversity as a means to enhance business performance at all levels.

By incorporating diverse perspectives, organizations can tap into the unused potential of their workforce, resulting in better management, cognitive discussions, and decision-making processes. Gender diversity is seen as an essential attribute of efficient corporate governance. It is believed that a more diverse board brings a variety of skills, expertise, and experience to the table,

ultimately leading to better governance mechanisms and decision-making. This has prompted policymakers, academicians, and researchers to focus on promoting gender diversity in corporate settings.

Zaid *et al.* (2020), in their study on 33 Palestinian listed companies, examined the moderating role of gender diversity in the relationship between board structure and firm financing decisions which highlights that board diversity inclusive of females reduces the cost of borrowings for the firm as a diverse board will have a diverse set of knowledge, skills and ideas. This is supported by various works revolving around the psychological insights that women are risk-averse than men (Bernile *et al.*, 2018; Sengupta et al., 2024). Further, men are expected to be more involved in risky experiments like gambling, making men overconfident in decision-making as suggested by Barber & Odean (2001) and Huang and Kisgen (2013).

Another crucial aspect of gender diversity in business leadership is its role in building a more equitable workforce. Female Directors show better attentiveness to stakeholders' needs and practice more efficient environmental and sustainability practices (Khan et al., 2024). In the context of European non-financial enterprises, Garcia Martin and Herrero (2019) indicate that presence of women directors in the board has a favorable influence on environmental performance of the organization. According to the study by Glass *et al.* (2016) on Fortune 500 companies, firms with more diversified board compositions are better capable of executing environmentally friendly initiatives such as CSR. Globally, various countries have passed several legislations regarding CSR to move companies to incorporate effective sustainable practices in business operations. For example, France passed a Vigilance Law, (French Corporate Duty of Vigilance Law, 2016) protecting the consumers and the environment against any corporate non-fulfillment of duty. In China, companies are required to perform CSRs mandatorily. Companies in India that fall under section 135 of the Companies Act 2013 are required to allocate at least 2% of their net earnings from the three years before to CSR. An insignificant positive relation was found between the gender diverse boards and sustainability for NIFTY 50 companies from 2014-2019 by Singh *et al.* 2021.

Studies have consistently demonstrated the favorable impact of gender diversity on organizational performance, profitability, and sustainability. As a result, this topic has gained significant attention from researchers, managers, and policymakers. Consequently, the study of gender diversity and decision-making has seen increased interest, where scholars have focused on the overall trends as well as some niche areas, understanding the linkages between top-management teams' cognition and gender diversity (Kaur and Arora, 2021; Müller-Horn *et al.*, 2022).

In alignment with these findings, many countries have implemented minimum quotas or percentages for women directors on corporate boards to promote gender diversity and equality. For example, in Norway, at least 40% of women directors representation is mandatory for Publicly listed companies (Fouche G., 2020). In France, a law was passed to achieve at least 40% women representation by 2017 (Lépinard E. and Lieber M., 2015). In India section 149 of the Companies Act, 2013 (ICSI, 2013) makes the presence of a one-woman director mandatory on the board for certain classes of companies. In 2015, the regulatory body, Securities & Exchange Board of India (SEBI, 2015) also made it mandatory to have at least one woman director on the boards of all listed companies. Through these provisions and several other initiatives, the percentage of women on board in India has witnessed an increase in recent years.

According to an Ernst & Young (EY) report, 2022, women representation on boards has increased from 6% in 2013 to 18% in 2022. While progress has been made in India in recent years, there is continued need of improvement as the women's representation on board in India still lags behind many developed countries. It is important to note that the representation of women across different sectors is not uniform due to cultural, social, and economic reasons. Moreover, historically, women primarily occupy places in grievances and CSR committees (Ernst & Young, 2022). Unlike male, they do not find places in leadership and decision making positions. Traditionally the business world has been male-dominated, and women face hurdles and discriminatory behaviour when putting forward their opinions or exercising their right to influence any decision in the process. Therefore, in accordance with critical mass theory or Tokenism (Kanter, 1977), the proportion of women on board is increased by various voluntary and mandatory approaches to enhance their ability to influence business decisions.

Although scholars and researchers have widely discussed the effectiveness of gender diversity in companies' decision-making processes, their results are strikingly contradictory. Further, limited studies have been conducted with a focus on capital structure decisions. Present study attempts to examine whether gender impacts decision-making at top levels in a firm. 'Debt to equity ratio' and 'Corporate Social Responsibility (CSR)' are taken as the proxies for decision making in the firms. The percentage of women on board is taken as an independent variable. The promoters holding in equity is also considered as another variable affecting the capital structure of a firm. Gender diversity and promoters holding as independent variables have been included in the study to gauge the potential influence of these factors on corporate decision-making. Data from 685 non-financial companies listed in 2021-22 with National Stock Exchange of India (NSE) were considered to investigate the relationship. To carry out the study, exploratory data analysis (EDA), ordinary least squares (OLS) regression, and quantile regression techniques

have been employed. EDA provides an initial overview of the data through descriptive statistics and graphs. OLS regression is used to examine the overall relationship between the variables. The results obtained through OLS regression suggest that the relationship between the debt-to-equity ratio and the independent variables is negative. However, the result is statistically insignificant. It is important to note that the debt-to-equity ratio revealed a skewed pattern.

To further examine the relationship, quantile regression was employed, which allows for examining the relationship at different points of the distribution. To have a clearer understanding of the impact of gender diversity, only companies with more than 30 percent women on board were considered in the quantile regression model. The results of quantile regression revealed a statistically significant relationship between the variables for the third quartile, indicating that the impact of gender diversity and promoters holding on the debt-to-equity ratio may vary across different levels of debt. This finding implies that as the debt-to-equity ratio increases towards the higher end, the presence of women on the board and promoter's holding becomes more influential in shaping the capital structure decisions of the firms. The paper also investigates the impact of percentage of women on CSR. The quantile regression result suggests that the relationship is statistically significant for the first quartile for CSR. This indicates that the presence of a greater number of women on boards has a more pronounced positive impact on CSR outcomes for companies that already have relatively lower CSR performance. The present study contributes to the existing literature by employing both traditional OLS regression and quantile regression techniques. To the best of our knowledge, there is a scarcity of research available for non-financial Indian companies in the present context.

The rest of the paper is organized as follows. Section 2 provides a review of the relevant literature on gender diversity, corporate social responsibility, and their impact on decision-making processes. Section 3 outlines the research methodology employed in this study. It describes the data collection process, sample selection criteria, and variables used in the analysis. Section 4 presents the results of the analysis. It begins by providing descriptive statistics of the variables under investigation. Then, the findings from the OLS regression model are discussed, followed by the results of the quantile regression analysis. Section 5 presents the conclusion and implications of the findings and their significance for various stakeholders. The limitations of the study are also presented. Suggestions for future research are provided at the end.

2. Literature review and Hypothesis development

The present literature and research on corporate governance have given considerable attention to gender diversity as a factor affecting decision-making, performance, and the overall firm value. Thus, gender diversity is an essential factor affecting a business entity in a multi-dimensional manner. This paper focuses on two aspects: capital structure decisions and sustainability practices being affected by gender diversity on the board. Referring to the colossal array of prior research and literature, some key works and theories relevant to this paper are discussed.

Ideas of 'tokenism' and 'critical mass theory' play an evident role in shaping the academic literature pertaining to gender diversity in decision making (Kanter, 1977), iterating over the proposition that the strength of women on board is considered effective enough to influence the decision only when there count is at least 30% of the board composition. The mandatory quotas defined for equitable participation of women in the workforce have triggered tokenism in business organizations, highlighting the fact that women have merely been appointed to shut down criticism and play no major role in affecting the decision making process. According to the upper echelons hypothesis (Hambrick, 2007; Hambrick and Mason, 1984), executives and directors formulate competitive strategies and the characteristics of the board affect corporate performance.

As Gender diversity is regarded as an essential attribute of an efficient board, it is expected to bring good corporate governance mechanisms into practice. This significantly impacts an organization's profits, survival, and growth. Markets with good corporate governance mechanisms also experienced enormous growth and eventually gathered large capital (Ahmed Sheikh and Wang, 2012). Therefore, gender diversity as an attribute plays a key role in monitoring and management and also affects the key decisions like capital structure choices of the firm. Myers (1984) in his study found that an information policy in terms of quality, quantity, and symmetricity affects the capital structure decisions of a firm, leading to some possible indirect relationship between board gender diversity and capital structure. It is believed that firms become more transparent in terms of information symmetricity among women. As indicated by Gul *et al.* (2011) and Mazumder Mohammed (2024), gender diversity increases voluntary public disclosures in large organizations, highlighting the correlation between gender diversity and stock price informativeness. Moreover, Ghaleb *et al.* (2021) analysed 475 firms in the Jordanian market from 2011- 2016 and concluded that there exists negative relation between board diversity and earnings management. Thus, preventing earnings manipulation and leading to better financial reporting quality.

Further, varied work from behavioral and financial economics revealed the effect of gender on the psychology of decision-making, revealing that women are more conservative in risky investment decision-making than men (Croson and Gneezy, 2009).

Female CEOs had consistent profitability and reduced corporate risk-taking, as shown by Faccio *et al.* (2016) in their analysis of a sample of privately and publicly listed European firms. Furthermore, Perryman *et al*. (2016) found that companies with a more gender-diverse top management team exhibit reduced company risk and provide better results. Benkraiem *et al*. (2018) examined the connection between board gender diversity and capital structure choices made by 89 French businesses listed from 2008 to 2016 based on the risk-taking behaviors of women. Better corporate operations were demonstrated to be substantially linked with gender diversity or having more female CEOs. Li *et al*. (2023), using a panel data set from 2009 to 2021, concluded a negative connection between Board diversity and the leverage composition of companies in the UK, France, Germany, and China using a fixed effects model. Therefore, gender had an influence on corporate financing decisions. Similarly, a study by Cole (2013) on privately held US firms found that gender impacts firm's leverage with female owned firms having less leverage as compared to men owned firms.

Moreno Gomez *et al*. (2018), illustrated these findings by constructing a hypothesis based on the Upper Echelon theory and examining a sample of Colombian public firms from 2008 to 2015, where women participation is not fostered by regulatory pressures or mandatory quotas. Saad and Belkacem (2021), in their quantitative study using structural equations modeling on french firms for a duration from 2006-2019, concluded that the strategy used for boosting women's involvement in the boardroom (voluntary, enabling, and coercive) has an impact on the relation between board gender diversity and capital structure decisions. Kaur and Arora (2021) analysed the impact of gender diversity at all managerial levels on overall firm growth highlighting that gender diversity inclusive of women participation assists in attaining competitive edge and delivering business growth. They suggest that gender diversity influences an organization holistically by improving its productivity, transparency, decision-making and performance.

Studies conducted by Orazalin and Baydauletov (2020), Ghaleb *et al.* (2021), Wu *et al.* (2021) and Yang *et al*. (2019) analyzed the moderating effects of gender diversity on corporate social responsibility. Orazalin and Baydauletov (2020) in their findings, highlighted the positive relationship between gender diversity and environmental and sustainable performance of the firm. According to Post *et al*. (2015) analysis of the upper echelons hypothesis, businesses that have more female directors on their boards perform better in terms of the environmental initiatives by implementing sustainable business practices. Similarly in the Indian context, Singh *et al.* (2021) and Kaur *et al.* (2024) conducted a study on the sample of Nifty 50 index from 2014-2019 and concluded that gender diversity promotes sustainability practices by the firms.

In many situations, researchers aim to measure influence of some covariates on different parts of the distribution of the response variable other than the average (Conyon *et al.,* 2017)) In such contexts, quantile regression proves valuable as it addresses different parts of the distribution effectively. Quantile regression approach provides a robust analysis in the event of heterogeneity and skewed distribution of the response variable. There has been a growing interest among the researchers to explore the influence of independent variables on response variable using quantile regression approach. Researchers in corporate governance are interested in analyzing whether a given governance attribute has a varying quantitative impact across different parts of the distribution (Arora *et al.*, 2023; Maji *et al.*, 2021; Shawtari, 2016; Hallock *et al.,* 2010)

Based on the review of related literature, the hypothesis under study are:

H_1: There is a negative relationship between the capital structure and the percentage of women directors on the board.

H_2: Capital structure is associated with promoters' holding.

H_3: There is a positive relationship between corporate social responsibility expenditure and the percentage of women directors.

3. Research Methodology

3.1 Data and Methodology

This paper has considered cross-sectional data of non-financial Indian companies listed on NSE for 2021-2022. The required data has been collected from ProwessIQ software and annual reports of the companies. For the collected data, exploratory data analysis was employed to gain an initial understanding of the data. Subsequently, both ordinary least square (OLS) and quantile regression (QR) were applied to study the relationship between the variables. Four models were formulated, and analysis was carried out accordingly.

3.2 Quantile Regression

Ordinary least regression (OLS) model explores the relationship between two or more variables using the conditional mean approach. Researchers investigate how the mean of the dependent variable changes for each unit change in the value of predictor variables (Li, 2015). However, the OLS regression is not suitable in the event of heterogeneity and skewed distribution

of the response variable (Maji *et al.*, 2021). The quantile regression model (QRM) is an alternative approach capable of overcoming the problems associated with using a conditional mean framework (Li, 2015, Koenker et al., 1978). A quantile regression model provides a framework to estimate the relationship at different locations of the conditional distribution of the response variable (Koenker and Gilbert, 1978; Koenker and Hallock, 2001). Thus, conditional quantile regression provides a better understanding of the regression function compared to the OLS regression commonly observed in many areas of research (Conyon *et al.,* 2017).

The quantile regression at quantile level τ of the response variable can be expressed as the following equation (Rodriguez *et al.,* 2017):

$Q_\tau(y_i) = \beta_0(\tau) + \beta_1(\tau)\, x_{i1} + \ldots + \beta_p(\tau)\, x_{ip}$, $i = 1,2,\ldots, n$

The parameters of the quantile regression model are estimated by finding the values that minimize the sum of absolute residuals, and it does not require any distributional assumption for the residuals. The estimators have similar interpretations as that in conventional regression model. For instance, the estimators of the pth quantile regression model can be interpreted as marginal change in the pth conditional quantile due to marginal changes in independent variables (Li, 2015).

3.3 Model Description

For the Model I, the research population was reduced to 869 companies from a preliminary sample of 1141 companies when financial listed companies were eliminated because of their complex capital structures. Companies with missing annual reports or with any missing data point for the variables under study were also excluded. As a result, the sample size was reduced to 685 non-financial companies. Further, outliers for debt to equity ratio were removed using a standard and general method of Inter-Quartile Range, yielding a final sample size of 648 companies. For the Model II, the sample was reduced to 500 companies from a preliminary sample of 648 companies due to absence of data points regarding corporate social responsibility (CSR) expenditures by the firm. This paper employs a linear regression model, for understanding the relationships between data variables, in both the models.

For the Model III and IV, a subset of data from Model I and II respectively, has been extracted wherein companies witnessed a participation of women directors greater than or equal to 30%, generating a sample of 52 and 30 companies respectively. Quantile regression analysis has been used for these models using the 'quantreg' package of R-Studio to identify the impact of increased women leadership on the decision making of the firm, like capital structure decisions and sustainability decisions. This provides greater flexibility to obtain a significant relation between gender diversity and decision making of the firm.

3.4 Variable Definitions

3.4.1 Dependent Variables

- Debt-to-equity (DER): It is used as a proxy to the capital structure decision making of a firm. It evaluates a company's financial leverage.
- Logarithm of corporate social responsibility expenditure (Ln(CSR)): It is used as a proxy to the sustainability decision making of a firm. It evaluates the financial contribution of a firm towards sustainability.

3.4.2 Independent Variables

- Promoter holding (Prom (%)): It is the percentage of equity shares held by promoters excluding the pledged shares.
- Women participation in the board of directors (WP1): It is a categorical variable where a value of 1 is assigned when the percentage of women participation is greater than or equal to 20%.
- Women participation in the board of directors (WP2): It is a continuous variable where the percentage of women participation is greater than or equal to 30%.
  Also, Women participation in the board of directors is represented as WP (%).

3.5 Econometric Model

This paper examines the relationship of gender diversity with corporate decision making through four models, consistent with the above stated hypothesis, as follows:

Model I

$DER_i = \alpha + \beta_1 * WP1_i + \beta_2 * Prom\ (\%)_i + \mu_i$

Model II

$Ln(CSR)_i = \alpha + \beta_1 * WP1_i + \mu_i$

Model III

$Q(DER)_i = \alpha + \beta_1 * WP2_i + \mu_i$

Here, quartile III is taken as the central tendency.

Model IV

$Q(Ln(CSR))_i = \alpha + \beta_1 * WP2_i + \mu_i$

Here, quartile I is taken as the central tendency

4. Empirical Result

4.1 Descriptive statistics

Table I shows descriptive statistics of the variables. The table depicts the mean of women directors as 1.81 and median as 2, which indicates the presence of women according to the power of three by Kristie (2011). The mean and median for WP (%) is 15.35% and 14.29% respectively, whereas the maximum participation is 50%. In addition to this, the distribution in fig I suggests that most companies have exactly 1 or 2 women directors. There is a sharp decline beyond two directors — with only a handful of companies having more than three. The reason for this skewed distribution is tokenism. Tokenism is a symbolism approach to the inclusiveness of minorities and is used to explain the difficulties women face in male dominated occupations. In addition to this, India's section 149 of Companies Act 2013 (ICSI, 2013) makes it mandatory that there should be at least one woman director on each board, but many firms met this requirement by employing their female relatives and further strengthening the argument of tokenism. Empirical studies have shown that women may face the limitations of tokenism (Kramer *et al.*, 2006). It is observed from the dataset that in firms where the percentage of women directors is high, those firms are inherently created and built by females. Also, in fig. II, it is observed the number of companies belonging to category 1 (More than 20% women) is 30.4% or 197 companies whereas companies lying in the base category are 69.9% or 451 companies. DER ranges from 0.01 to 1.88 with a mean of 0.45. Average Prom (%) in the sample data is 55.5% and it should be noted that SEBI (2017) mandates that promoters should bring down their holding to 75% within three years of listing. Table I also shows that mean & median of CSR spending by sample firms is Rs 138.16 mn and Rs 17.75 mn respectively and minimum amount is Rs 0.1 mn which goes upto the maximum of Rs 9220 mn. Due to this high variation by the scale of operations of firms, the variable is standardized by taking a natural log. It is important to note that Ln(CSR) is positively correlated with CSR spending because it is an increasing function of CSR.

Table I: Descriptive statistics

Statistic	**No. of women directors (n=648)**	**WP (%) (n=648)**	**DER (n=648)**	**Prom (%) (n=648)**	**CSR (Rs Mn) (n=500)**	**Ln(CSR) (n=500)**
Minimum	0.00	0.00	0.01	0.00	0.1	2.30
First Quartile	1.00	9.09	0.09	46.80	5.1	1.63
Median	2.00	14.29	0.32	57.71	17.75	2.88
Mean	1.81	15.35	0.45	55.50	138.16	2.96
Third Quartile	2.00	20.00	0.69	68.84	69.75	4.24
Maximum	6.00	50.00	1.88	99.03	9220	9.13

Fig I : Distribution of 'Number of Women Directors'

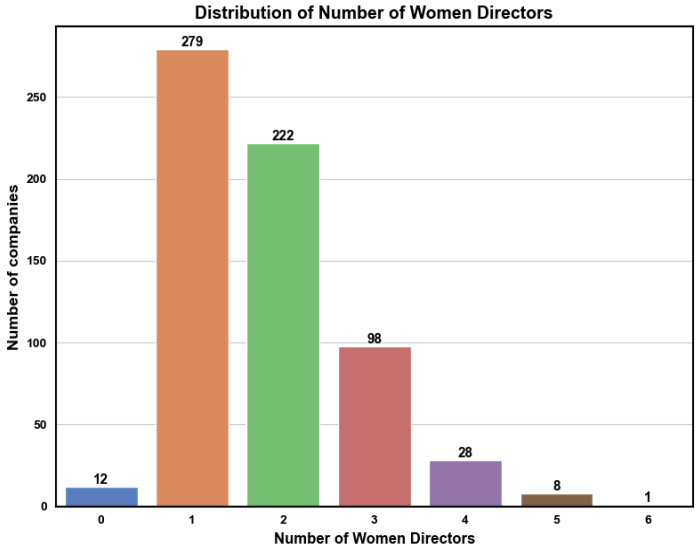
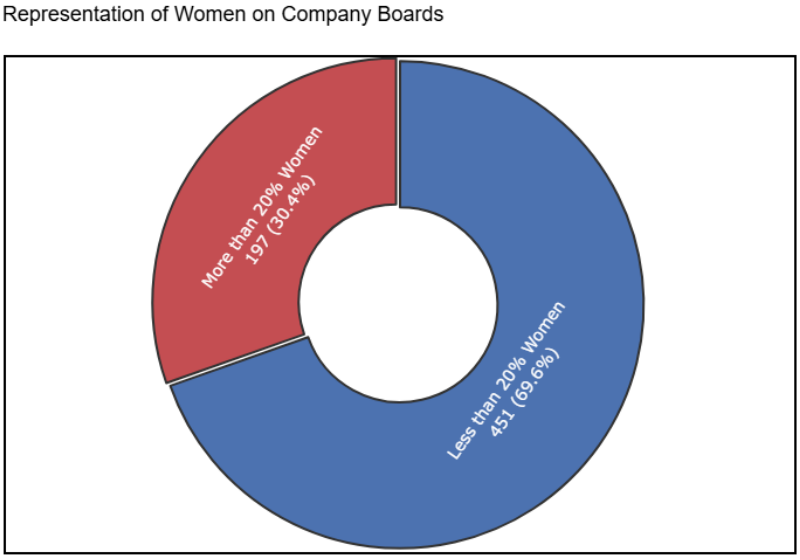


Fig II: Distribution of 'Less than 20% vs More than 20% women representation'



4.2 Regression analysis and discussion

Table II represents the regression results for each of the four models and the regression equations obtained are:

Model I

DER = 0.518059 - 0.023714*WP1 - 0.001027*Prom (%)

Model II

Ln(CSR) = 2.94916 + 0.02902*WP1

Model III

Q(DER) = 1.410 - 0.025* Q(WP2)

Model IV

Q(Ln(CSR)) = - 11.0483533 + 0.3839452 * Q(WP2)

In Panel A, table II, it is observed that WP1 is negatively related with the DER which is in congruence with the first hypothesis. This shows women are less risk averse to men and this psychology is incorporated into the decision making of the firm. It indicates that gender diversity ensures a more efficient utilization of existing resources since their debt to equity is marginally lower. This result supports the observations by Saad and Belkacem (2021) and is in contrast to Li, Y., & Wang, X. (2024) that highlights gender diversity increases the possibility of risk taking. Similarly, Prom (%) is negatively related to the DER.

From Panel B, it is found that WP1 is positively related with the Ln(CSR). It suggests that gender diversity is more efficient in adopting sustainability practices. The results for Model II support the empirical studies of Garcia Martin and Herrero (2019) and Glass *et al.* (2016). Although the coefficient for WP1 is not significant, due to tokenism, it is sufficient to conclude there exists a positive relationship between gender diversity & efficient sustainability practices.

In Panel C, it is observed that WP2 is negatively related to DER with a coefficient of - 0.025, suggesting that as the proportion of women directors in board of directors reaches a significant number or beyond that, the proportion of debt in the capital structure reduces, displaying the risk averse nature of women which corroborates the critical mass theory proposed by Kanter (1977). This negative relationship was found to be statistically significant and in coherence with previous studies (Benkraiem *et al*., 2018; Li *et al*., 2023).

From Panel D, it is found that WP2 is positively related to Ln(CSR) with a coefficient of 0.383. The result is statistically significant and aligns with the results by empirical studies (Kassinis *et al.*, 2016 and Singh *et al*., 2021) that show as the boards get more gender diverse, their sustainability practices improve.

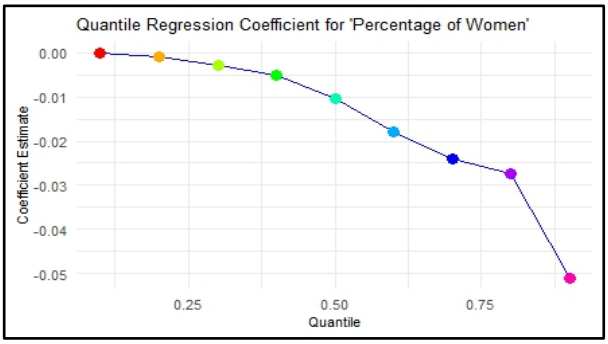
Table II: Regression results

Coefficients	**Estimate**	**Std. Error**	**t value**	**Pr(>|t|)**
Panel A : Model 1				
Intercept	0.518059	0.059842	8.657	<2e-16***
WP1	-0.023714	0.038127	-0.622	0.534
Prom (%)	-0.001027	0.001004	-1.023	0.307
Panel B : Model 2				
Intercept	2.94916	0.09983	29.54	<2e-16***
WP1	0.02902	0.19283	0.15	0.88
Panel C : Model 3				
Intercept	1.41	0.422375902	3.338259	0.001598042
WP2	-0.025	0.008633195	-2.895799	0.005595298
Panel D : Model 4				

Intercept	-11.0483533	6.0934544	-1.813151	0.08054247
WP2	0.3839452	0.1868293	2.055059	0.04930972

Fig. III graph depicts quantile estimates for different quantiles with regard to Model III. It clearly shows a smaller negative value of the estimates of quantile regression coefficients. Moreover, the estimated values are decreasing with different quantiles of the debt to equity distribution. It is noteworthy to mention here that for the quantiles ranging between 0.51 and 0.84, the estimate of the coefficients were found to be statistically significant.

Fig III: Quantile Regression Coefficient for 'Percentage of Women'



5. Conclusion and Implications

This study attempts to understand the impact of board gender diversity on business decision making. Since this study is first in its attempt in the Indian context, it provides a source for planning and discussion to the policymakers regarding regulations or other policy tools for making the boards more gender diverse in India. Observing the data regarding women directors, it can be clearly concluded that: (i) the representation of women directors is too low; (ii) even if it exists, the primary reason is the women directors are family members. Since, gender diversity is an important characteristic of board structure, it is expected to considerably affect the corporate governance mechanism. In Model I & III, business decision-making is considered in the form of capital structure decisions and in Model II and IV, through sustainability decisions.

Firstly, it is observed that the result for Model I is not statistically significant when there is a categorization at 20% on participation of women directors, due to tokenism. But as there is an increase in the percentage of women directors to 30% or beyond it in Model III, it significantly shows the risk averse nature of women directors and consequent efficient utilization of resources, resulting in reduction of the debt component.

Secondly, similarly, the result for Model II is not significant due to the tokenism of women participation in board of directors. As this participation is increased to 30% or beyond in the Model IV, it is observed that gender diversity helps in more adaptability of sustainable practices as women tend to bring transparency in the decision making and tend to meet the needs of all stakeholders. This realigns with the proposition of critical mass theory that as the women reach a required proportion, they are able to influence decision making at the top management level.

On the basis of the results of this paper, the following recommendations are made: i) adequate measures should be undertaken to counter tokenism by incentivizing gender diversity in boardrooms; ii) the spectrum of CSR practices should be expanded to include non-monetary contribution to the society if the company is facing losses or not being obligated under law to conduct CSR expenditures; and iii) Legislative measures should be undertaken to increase the minimum participation of women directors, in accordance with the critical mass theory, as a fair representation of women directors is necessary to affect the business decisions and policy changes in the firm.

This study has its own limitations which could be addressed by further research. These are i) CSR is considered as the only proxy for sustainability practice; ii) the scope of the study is confined to determining the effect of gender diversity on business decision making, contrary to the macro level where business decisions are affected by enormous external factors; iii) the study is limited to the geography of Indian listed non-financial companies due to paucity of data required for the study in the region. Despite all

these limitations, this study extends the current literature by providing significant practical implications for managers, practitioners, and policy-makers in the context of the Indian economy.

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References

[1] Ahmed S, N. and Wang, Z. (2012). Effects of corporate governance on capital structure: empirical evidence from Pakistan. *Corporate Governance: The International Journal of Business in Society* 12(5): 629-641.
[2] Arora, N., & Singh, B. (2023). Do female directors signal Indian SME IPOs quality? Evidence from a quantile regression approach. *Global Business Review* 24(1): 185-205.
[3] Benkraiem, R., Hamrouni, A., Miloudi, A. and Uyar, A. (2018). Access to finance for french firms: do boardroom attributes matter?. *Economics Bulletin* 38(3): 1267-1278.
[4] Bernile, G., Bhagwat, V. and Yonker, S. (2018). Board diversity, firm risk, and corporate policies. *Journal of Financial Economics* 127(3): 588-612.
[5] Barber, B & Odean, T. (2001). Boys Will Be Boys: Gender, Overconfidence, And Common Stock Investment, *Quarterly Journal of Economics* 116: 261-292.
[6] Cole, R.A. (2013) . What do we know about the capital structure of privately held US firms? Evidence from the surveys of small business finance, *Financial Management* 42(4): 777-813.
[7] Conyon, M. J., & He, L. (2017). Firm performance and boardroom gender diversity: A quantile regression approach. *Journal of Business Research* 79: 198-211.
[8] Croson, R, and Uri G. (2009). Gender Differences in Preferences. *Journal of Economic Literature* 47(2): 448-74. https://doi.org/10.1257/jel.47.2.448
[9] Eagly, A & Carli, L. (2007). Women and the labyrinth of leadership. *Harvard business review* 85: 62-71. https://doi.org/10.1037/e664062007-001
[10] EY (2022). Women's representation on Indian Boards has tripled in 10 years. https://www.ey.com/en_in/news/2022/10/womens-representation-on-indian-boards-has-tripled-in-10-years
[11] Faccio, M., Marchica, M.T. and Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance* 39: 193-209. https://doi.org/10.1016/j.jcorpfin.2016.02.008
[12] Fouche G. (2022). In wider diversity push, Norway proposes 40% gender quota for large unlisted firms. https://www.reuters.com/business/wider-diversity-push-norway-proposes-40-gender-quota-large-unlisted-firms-2022-12-12/
[13] French Corporate Duty of Vigilance Law (2016). https://respect.international/french-corporate-duty-of-vigilance-law-english-translation/.
[14] García M, C. J., & Herrero, B. (2019). Do board characteristics affect environmental performance? A study of EU firms. *Corporate Social Responsibility and Environmental Management* 27(1): 74–94. https:// doi.org/10.1002/csr.1775
[15] Ghaleb A. A., B., Ayesh Qaderi,S., Almashaqbeh, A. & Qasem, A. (2021). Corporate social responsibility, board gender diversity and real earnings management: The case of Jordan. *Cogent Business & Management* 8(1). https://doi.org/10.1080/23311975.2021.1883222
[16] Glass, C., Cook, A., & Ingersoll, A. R. (2016). Do women leaders promote sustainability? Analyzing the effect of corporate governance composition on environmental performance. *Business Strategy and the Environment* 25(7): 495–511. https://doi.org/10.1002/bse.1879
[17] Gul, F.A., Srinidhi, B. and Ng, A.C. (2011). Does board gender diversity improve the informativeness of stock prices?. *Journal of Accounting and Economics*, 51(3): 314-338.
[18] Hallock, K. F., Madalozzo, R., & Reck, C. G. (2010). CEO pay-for-performance heterogeneity using quantile regression. *Financial Review* 45(1): 1-19.
[19] Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review* 9(2): 193–206. https://doi.org/10.5465/AMR.1984.4277628
[20] Hambrick, D. C. (2007). Upper echelons theory: An update. *Academy of Management Review*, 32(2): 334–343. https://doi.org/10.5465/AM.2007.24345254
[21] Huang, J. and Kisgen, D. (2013). Gender and corporate finance: are male executives overconfident relative to female executives. *Journal of Financial Economics* 108(3): 822-839.
[22] ICSI, Companies Act (2013), Appointments and Qualifications of Directors
[23] Kanter, R.M. (1977). *Men and Women of the Corporation*, Basic Books, New York, NY, GM.
[24] Kaur, A., Joshi, M., Sharma, S. and Singh, G. (2024). Revisiting tokenism: impact of gender diversity on corporate social performance of Indian companies. *International Journal of Productivity and Performance Management*.
[25] Kassinis, G., Panayiotou, A., Dimou, A., & Katsifaraki, G. (2016). Gender and environmental sustainability: A longitudinal analysis. *Corporate Social Responsibility and Environmental Management* 23(6): 399–412. https://doi.org/10.1002/csr.1386
[26] Kaur, Navjeet & Arora, Pallvi. (2021). Acknowledging gender diversity and inclusion as key to organizational growth: a review and trends. *Journal of Critical Review* 7. https://doi.org/10.31838/jcr.07.06.25.
[27] Khan, K.U., Ali, W., Atlas, F. and Khan, F. (2024). Driving change: the influence of female directors on ESG performance in the automotive industry. *Discover Sustainability*. https://doi.org/10.1007/s43621-024-00743-z.
[28] Kinahan, M & Bosak, J & Eagly, A (2025). Where and why do women lead? The importance of leadership for private profit versus purpose beyond profit. *British Journal of Social Psychology* 64(2).

[29] Koenker, R., & Bassett Jr, G. (1978). Regression quantiles. *Econometrica: journal of the Econometric Society*: 33-50.
[30] Koenker, R., & Hallock, K. F. (2001). Quantile regression. *Journal of economic perspectives*, 15(4): 143-156.
[31] Kramer, V.W., Konrad, A.M., Erkut, S. and Hooper, M.J. (2006). Critical Mass on Corporate Boards: Why Three or More Women Enhance Governance. *Wellesley Centers for Women*, *Wellesley, MA* 31.
[32] Kristie, J. (2011). The power of three. *Directors and Boards* 35(5): 22-32.
[33] Lépinard E. and Lieber M. (2015). The Policy on Gender Equality in France. https://www.europarl.europa.eu/RegData/etudes/IDAN/2015/510024/IPOL_IDA(2015)510024_EN.pdf
[34] Li, F & Gong, Y & Tang, Y. (2023). The Effect of Board Characteristics on Capital Structure—Evidence from UK, France, Germany, and China. *2nd International Conference on Business Administration and Data Science (BADS 2022)*. 10.2991/978-94-6463-102-9_113.
[35] Li, M. (2015). Moving beyond the linear regression model: Advantages of the quantile regression model. *Journal of Management* 41(1): 71-98.
[36] Li, Y., & Wang, X. (2024). Board gender diversity and innovation performance in manufacturing firms: What is the role of risk-taking?. *Finance Research Letters* 68. https://doi.org/10.1016/j.frl.2024.105936
[37] Maji, S. G., & Saha, R. (2021). Gender diversity and financial performance in an emerging economy: Empirical evidence from India. *Management Research Review* 44(12): 1660-1683.
[38] Mazumder M (2024). An empirical analysis of SDG disclosure (SDGD) and board gender diversity: insights from the banking sector in an emerging economy. *International Journal of Disclosure and Governance* 22: 47–63.
[39] Moreno-Gómez, J., Lafuente, E. and Vaillant, Y. (2018). Gender diversity in the board, women's leadership and business performance. *Gender in Management* 33(2): 104-122. https://doi.org/10.1108/GM-05-2017-0058
[40] Müller-Horn, F., Fourné, S.P.L., Arndt, F. and Obembe D. (2022). Cognition and gender diversity in top management teams: what do we know and where do we go?. *Management Review Quarterly*. https://doi.org/10.1007/s11301-022-00310-8
[41] Myers, S.C. (1984). Capital Structure Puzzle. *National Bureau of Economic Research,* https://doi.org/10.3386/w1393
[42] Orazalin N, Baydauletov M. (2020). Corporate social responsibility strategy and corporate environmental and social performance: The moderating role of board gender diversity. *Corporate Social Responsibility Environmental Management*: 1664–1676. https://doi.org/10.1002/csr.1915
[43] Perryman, A.A., Fernando, G.D. and Tripathy, A. (2016). Do gender differences persist? An examination of gender diversity on firm performance, risk, and executive compensation. *Journal of Business Research* 69(2): 579-586. https://doi.org/10.1016/j.jbusres.2015.05.013
[44] Post, C., Rahman, N., & McQuillen, C. (2015). From board composition to corporate environmental performance through sustainability-themed alliances. *Journal of Business Ethics* 130(2): 423–435. https://doi.org/10.1007/s10551-014-2231-7
[45] Rodriguez, R. N., & Yao, Y. (2017). Five things you should know about quantile regression. *SAS global forum conference 2017, Orlando* (pp. 2-5)
[46] Saad, S & Belkacem, L. (2021). Does board gender diversity affect capital structure decisions?. *Corporate Governance: The International Journal of Business in Society,* ahead-of-print, https://doi.org/10.1108/CG-12-2020-0575.
[47] SEBI, Securities and Exchange Board of India Regulations, (2015), Non-compliance with the Minimum Public Shareholding (MPS) requirements (2017).
[48] Section 135, Corporate Social Responsibility, Companies Act (2013)
[49] Sengupta, S & Mitra, S (2024). Are women more risk-Averse than men regarding investment decision?*., Journal of Management Research and Analysis* 11: 118-122.
[50] Shawtari, F. A., Salem, M. A., Hussain, H. I., Alaeddin, O., & Thabit, O. B. (2016). Corporate governance characteristics and valuation: Inferences from quantile regression. *Journal of Economics, Finance and Administrative Science* 21(41): 81-88.
[51] Singh, A K; Kota, H B; Sardana, V; and Singhania, S. (2021). Does Gender Diversity on Board Promote Corporate Social Responsibility? An Empirical Analysis of Sustainable Development Goals. *Australasian Accounting, Business and Finance Journal* 15(5): 22-40, 10.14453/aabfj.v15i5.3
[52] Wu, Q & Furuoka, F & Lau, S C. (2021). Corporate social responsibility and board gender diversity: a meta-analysis. *Management Research Review*. ahead-of-print. 10.1108/MRR-03-2021-0236.
[53] Yang, W., Yang, J. and Gao, Z. (2019). Do female board directors promote corporate social responsibility? An empirical study based on the critical mass theory. *Emerging Markets Finance and Trade* 55(15): 3452-3471. https://doi.org/10.1080/1540496X.2019.1657402
[54] Zaid A.A, Wang M.,, Abuhijleh M., T.F., Issa S.,, Saleh A., W.A., M. and Ali, F. (2020). Corporate governance practices and capital structure decisions: the moderating effect of gender diversity. *Corporate Governance* 20(5): 939-964. https://doi.org/10.1108/CG-11-2019-0343