A Decade of Gender Quota Mandate in Indian Boardrooms: Effects on Financial and Sustainability Performance of Firms

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Abstract:

The study examines the impact of board gender diversity on the financial and non-financial performance of NSE 500 firms in the years following the Companies Act of 2013, which mandated that the top 500 listed companies appoint at least one-woman director by April 2014. The study analyses panel data for NSE 500 firms over the period 2014-2023, constructed from CMIE Prowess, PRIME Database, and Refinitiv ESG, and employs regression models to evaluate how changes in board gender diversity relate to both financial and ESG performance. Although the regulatory reform led to a steady rise in the number of women directors after 2015, most firms complied by appointing only a single woman, suggesting that these appointments were driven more by compliance than by a substantive commitment to gender diversity.

Board gender diversity is measured through three complementary indicators: the presence of at least one-woman director, the proportion of women on the board, and the attainment of a critical mass of at least three women directors. Firm financial performance is assessed through two widely used indicators: Return on Assets (ROA), which captures accounting-based profitability, and Tobin's Q, which reflects market-based valuation relative to the firm's asset base. The non-financial performance is measured using ESG scores. The results show that a higher proportion of women on boards is positively associated with market-based performance, as reflected in stronger Tobin's Q values. More importantly, firms that achieve a critical mass of at least 3 women directors demonstrate significantly higher accounting performance, measured through ROA, as well as superior ESG outcomes. These findings align with Critical

Mass Theory (Kanter, 1977), which posits that women's influence on organisational decision-making becomes substantive only when their representation attains a threshold level of at least three. The findings show that the mandates encouraged firms to begin including women on their boards. However, real and lasting improvements in financial and sustainability performance occur only when companies move beyond basic compliance and build genuinely gender diverse boards.

Keywords: Gender Diversity, Firm Performance, ESG

1.Introduction

Across the world, gender equality and inclusion have become central concerns in corporate governance and public policy. Although women's participation in the workforce has increased substantially, their representation at the highest levels of corporate decision making remains limited. Evidence reported by Catalyst shows that during the mid-2010s women occupied 19.2 percent of board seats in the United States and 22.8 percent in the United Kingdom, while representation in India stood at only 9.5 percent (Catalyst, 2015a). This gap highlights the difficulty of translating broader labour market participation into meaningful access to senior leadership roles.

The underrepresentation of women on corporate boards has therefore attracted growing attention from scholars, regulators, investors, and the media. Board gender diversity is increasingly viewed not only as a matter of fairness, but also as an indicator of governance quality. Firms with a greater presence of women directors are often perceived as more ethical and socially responsible, reflecting evolving stakeholder expectations (Landry et al., 2016). From a theoretical perspective, diversity enhances board effectiveness by expanding the range of skills, experiences, and viewpoints available during strategic deliberations, thereby improving problem solving and decision quality (De Cabo et al., 2011; Torchia et al., 2011; Torchia et al., 2018).

Despite these arguments, progress toward gender equality at senior organisational levels remains slow. The World Economic Forum reports that women held 32.2 percent of senior leadership positions in 2023, compared with 41.9 percent of overall workforce participation. Similar concerns are reflected in International Labour Organization (Ilo) data showing that a large proportion of firms worldwide operate with boards that have very low female representation (ILO, 2018). In response, many countries have adopted policy interventions ranging from voluntary targets to binding quotas aimed at accelerating women's inclusion on corporate boards (Terjesen et al., 2009). Several European economies were early adopters of

mandatory boardroom quotas, while India entered this regulatory space with the Companies Act 2013, which required listed firms to appoint at least one woman director. This reform sought to address the chronic underrepresentation of women on Indian boards, where representation had remained below five percent prior to the mandate (Catalyst, 2014b; Sarkar and Selarka, 2021).

Empirical evidence on the performance consequences of board gender diversity, however, remains inconclusive. Studies from developed economies often document positive associations between female board representation and firm performance, attributing these effects to improved monitoring and reduced agency conflicts (Carter et al., 2003). Other research reports neutral or negative effects, particularly when diversity increases coordination costs or reflects symbolic rather than substantive inclusion (Carter et al., 2010). Adams and Ferreira (2009) show that these effects are context dependent, with gender diversity improving outcomes in weak governance settings but potentially reducing value where governance is already strong. Since most existing evidence is drawn from advanced economies with dispersed ownership, its relevance to emerging markets such as India remains uncertain.

India provides a distinctive institutional setting characterised by concentrated ownership, promoter dominance, and socio-cultural norms that shape boardroom dynamics. In such contexts, regulatory mandates may induce formal compliance without necessarily altering underlying governance practices. The appointment of a single woman director may therefore satisfy legal requirements while exerting limited influence unless accompanied by deeper changes in board composition.

At the same time, the notion of firm performance has expanded beyond traditional financial metrics. Environmental, Social, and Governance considerations have become central to assessments of long-term value creation and stakeholder engagement (De Masi et al., 2021). In India, this shift has been reinforced through regulatory initiatives such as the Business Responsibility and Sustainability Reporting framework introduced by the Securities and Exchange Board of India. Prior research suggests that women directors are more attentive to environmental and social concerns and are associated with stronger ESG performance, particularly in stakeholder-oriented governance systems (Liu, 2018; Manita et al., 2018).

Against this backdrop, the central research question addressed in this study is whether India's gender mandate has produced substantive improvements in firm outcomes or whether its effects remain largely symbolic. The paper examines the impact of board gender diversity on both financial performances, measured through Return on Assets and Tobin's Q, and non-financial performance, captured through ESG scores. By distinguishing between the mere

presence of a woman director, the proportion of women on boards, and the attainment of a critical mass, the analysis moves beyond binary compliance to assess the depth and effectiveness of gender inclusion. This study contributes to the literature in three important ways. First, it provides large-sample evidence from an emerging economy on the post-mandate effects of board gender diversity. Second, it integrates financial and sustainability dimensions to offer a more comprehensive assessment of firm performance. Third, by situating gender diversity within India's unique institutional and regulatory framework, it advances understanding of when and how gender quotas translate into meaningful governance and performance outcomes.

2.Literature Review

Board gender diversity has become a central concern in corporate governance research, particularly following regulatory mandates aimed at increasing women's representation on corporate boards. While early studies focused primarily on developed economies, recent research increasingly examines emerging markets, where ownership concentration, institutional quality, and socio-cultural norms shape governance outcomes in distinct ways. Despite this expansion, empirical evidence on the performance effects of gender diversity remains mixed, underscoring the importance of context and theory.

Evidence from developed economies suggests that gender-diverse boards can enhance firm performance by improving monitoring quality and strategic oversight (Carter et al., 2003). Subsequent studies, however, highlight potential costs, including coordination difficulties and slower decision-making, especially when diversity is symbolic rather than substantive (Carter et al., 2010). Adams and Ferreira (2009) provide a key contextual insight, showing that gender diversity improves performance in weak governance environments by strengthening oversight, but may reduce value in firms with already strong governance due to excessive monitoring.

Indian evidence broadly mirrors this heterogeneity. Sanan (2016) documents a positive association between board gender diversity and firm performance, though the magnitude varies across measures. Chatterjee and Nag (2022) find improved outcomes among top Indian firms, while Laskar et al. (2024) report that performance effects depend on firm-specific governance characteristics. Comparative evidence from India and Singapore further highlights the role of institutional context, with gender diversity proving more effective where governance mechanisms are complementary rather than substitutive (Duppati et al., 2020).

Agency theory provides a foundational explanation for these findings by emphasising the board's monitoring role in mitigating conflicts between managers and shareholders (Jensen &

Meckling, 1976; Fama & Jensen, 1983). Women directors are often associated with stronger oversight and independence, which can enhance governance in settings characterised by concentrated ownership and weaker monitoring. Indian studies support this mechanism, particularly where boards are dominated by insiders or promoters (Sanan, 2016; Laskar et al., 2024). However, consistent with Adams and Ferreira (2009), these benefits are not uniform and may weaken when monitoring becomes excessive or influence remains limited.

Resource dependence theory offers a complementary perspective by highlighting the board's advisory and signalling role (Hillman et al., 2000; Hillman et al., 2002). Gender-diverse boards may enhance access to external resources, professional networks, and stakeholder legitimacy. In emerging markets such as India, female board representation may also signal stronger governance quality and long-term orientation to investors. Empirical evidence supports this channel, particularly for market-based performance measures (Duppati et al., 2020; Chatterjee & Nag, 2022).

The growing emphasis on stakeholder-oriented governance further strengthens the relevance of gender diversity. ESG considerations have become central to firm valuation, legitimacy, and long-term risk management. Prior research suggests that women directors are more attentive to environmental and social issues and more supportive of long-term strategies. Indian evidence confirms that gender-diverse boards, particularly those with substantive female representation, are associated with superior ESG performance (Yadav & Prashar, 2023).

Overall, the literature suggests that the impact of board gender diversity is context-dependent and shaped by governance quality, signalling effects, and the depth of women's participation. Although the Companies Act 2013 has increased women's presence on Indian boards, questions remain regarding symbolic compliance versus substantive change. This study builds on existing Indian evidence by jointly examining financial and sustainability outcomes while distinguishing between presence, proportion, and critical mass of women directors.

3.Hypotheses Development

Building on agency theory, resource dependence theory, and critical mass theory, the study posits that the performance effects of board gender diversity depend on both the extent of women's representation and the dimension of performance considered. From an agency perspective, women directors may strengthen monitoring and reduce agency conflicts, particularly in governance environments characterised by concentrated ownership. Resource dependence theory suggests that gender-diverse boards enhance advisory capacity, legitimacy, and access to external resources, which may be reflected in market-based performance. Critical

mass theory further implies that symbolic representation is unlikely to be sufficient and that substantive influence emerges only when women's presence reaches a meaningful threshold. Accordingly, the study first examines the relationship between board gender diversity and financial performance. The presence of at least one woman director may signal compliance with regulatory norms, but it is unclear whether such symbolic inclusion translates into measurable performance gains. The proportion of women directors may better capture the intensity of diversity, while the attainment of a critical mass is expected to have the strongest influence on board effectiveness and firm outcomes.

Hypothesis 1a: Board gender diversity, measured by the presence of at least one woman director, has a significant impact on financial firm performance.

Hypothesis 1b: Board gender diversity, measured by the proportion of women directors on the board, has a significant impact on financial firm performance.

Hypothesis 1c: Board gender diversity, measured by the presence of a critical mass of at least three women directors, has a significant impact on financial firm performance.

The study then extends the analysis to non-financial performance, recognising the growing importance of stakeholder-oriented outcomes. ESG performance reflects firms' environmental stewardship, social responsibility, and governance quality, all of which are increasingly scrutinised by investors, regulators, and other stakeholders. Prior research suggests that women directors are more attentive to sustainability concerns and long-term stakeholder interests, implying that gender diversity may exert a stronger influence on ESG outcomes than on short-term financial metrics. As with financial performance, the depth of women's participation is expected to be critical.

Hypothesis 2a: Board gender diversity, measured by the presence of at least one woman director, has a significant impact on non-financial firm performance.

Hypothesis 2b: Board gender diversity, measured by the proportion of women directors on the board, has a significant impact on non-financial firm performance.

Hypothesis 2c: Board gender diversity, measured by the presence of a critical mass of at least three women directors, has a significant impact on non-financial firm performance.

4.Data and Research Methodology

This study examines the impact of board gender diversity on firm performance in India using panel data from firms included in the NSE 500 index over the period 2014–2022. This period captures the post-implementation phase of the Companies Act 2013 mandate requiring listed firms to appoint at least one woman director. Firm-level financial and market data are obtained from the CMIE Prowess database, while board composition and director characteristics are sourced from the PRIME Database. Non-financial performance is measured using the composite Environmental, Social, and Governance (ESG) score from Refinitiv. To limit the influence of extreme observations, Return on Assets (ROA) and Tobin's Q are winsorised at the 1st and 99th percentiles. Firm performance is examined along both financial and non-financial dimensions. Financial performance is measured using ROA and Tobin's Q. ROA captures accounting-based profitability and reflects the efficiency with which firms utilise their asset base to generate earnings, while Tobin's Q provides a market-based measure of firm value by capturing investor expectations and governance quality. ESG scores capture firms' sustainability orientation, stakeholder engagement, and governance practices.

Board gender diversity is the key explanatory variable and is measured using three alternative indicators to capture varying depths of women's representation. Dummy_women equals one if the board includes at least one woman director, reflecting compliance with the Companies Act 2013 mandate. The variable women_prop measures the proportion of women directors on the board and captures the intensity of gender diversity. To assess substantive participation, WomenToken equals one if the board includes at least three women directors, consistent with critical mass theory. These measures are introduced separately to distinguish symbolic from substantive representation.

Several firm-level characteristics are included as control variables based on prior governance and finance literature. These include board size, financial leverage, firm age, firm size measured as the logarithm of total assets, and the price-to-book ratio.

The empirical analysis employs fixed-effects panel regressions to estimate the relationship between board gender diversity and firm performance. The baseline specification is expressed as:

$$Performance_{it} = \alpha_i + \beta_1 GenderDiversity_{it} + \beta_2 Leverage_{it} + \beta_3 FirmAge_{it} + \beta_4 PB_{it} + \beta_5 BoardSize_{it} + \beta_6 \log(TA)_{it} + \gamma_t + \delta_j + \varepsilon_{it}$$

where $Performance_{it}$alternately represents ROA, Tobin's Q, and ESG score for firm $i$in year t. Firm fixed effects (α_i)control for unobserved, time-invariant firm characteristics, while year $(\gamma_t)$and industry (δ_j)fixed effects account for macroeconomic shocks and sector-specific trends. Standard errors are clustered at the firm level.

For financial performance, six models are estimated by alternately introducing Dummy_women, women_prop, and WomenToken as the primary explanatory variable for ROA and Tobin's Q. For non-financial performance, three additional models estimate the impact of each gender diversity measure on ESG scores. This integrated design enables a systematic comparison of symbolic and substantive forms of board gender diversity and their implications for both financial and sustainability outcomes.

4.1 Variables Measurement

Firm performance is measured along financial and non-financial dimensions. Financial performance is captured using Return on Assets (ROA) and Tobin's Q, two standard indicators in corporate governance research. ROA reflects accounting-based profitability and asset utilisation efficiency, while Tobin's Q provides a market-based assessment of firm value and investor expectations (Carter et al., 2003; Adams & Ferreira, 2009). Non-financial performance is measured using the composite Environmental, Social, and Governance (ESG) score from Refinitiv, which captures firms' sustainability orientation, stakeholder engagement, and governance quality. Prior studies document stronger ESG outcomes in firms with substantive board gender diversity (Manita et al., 2018; De Masi et al., 2021; Yadav & Prashar, 2023).

Board gender diversity is the primary explanatory variable and is measured using three alternative indicators. Dummy_women equals one if the board includes at least one woman director and captures compliance with the Companies Act 2013 mandate. The variable women_prop measures the proportion of women directors on the board, reflecting the intensity of gender diversity. To capture substantive participation, WomenToken equals one if the board includes at least three women directors, consistent with critical mass theory (Kanter, 1977; Torchia et al., 2011).

Control variables include board size, financial leverage (debt to total assets), firm size measured as the natural logarithm of total assets, firm age, and the price-to-book ratio. These controls account for board effectiveness, capital structure, scale, organisational maturity, and market valuation, consistent with prior governance and finance literature (Yermack, 1996; Bhagat & Bolton, 2008; Myers, 1977; Rajan & Zingales, 1998).

Variable	Description
ROA_w	Return on Assets
Tobin's Q_w	the ratio of a company's market value (the market capitalization of its outstanding shares) t o the book value of its assets
ESG	Environment Social Governance Score
Dummy_women	1 if any women is present on board, else 0
women_prop	Proportion of women directors
WomenToken	Presence of at least 3 women on board
leverage	Financial leverage
Age_firm	Age of the firm
PB	Price-to-Book ratio
Boardsize	Size of the board of directors
log_TA	Natural logarithm of total assets

Fig 1. Variables used in the study

4.2 Descriptive statistics and Correlation

Table 1: Frequency of women directors over the years

				Women	Directors			
Year	0	1	2	3	4	5	6	Total
2014	139	108	23	5	1	0	0	276
2015	24	220	25	8	1	0	0	278
2016	5	227	47	10	1	0	0	290
2017	6	227	53	12	4	0	0	302
2018	2	233	67	12	3	1	0	318
2019	6	197	98	20	5	2	0	328
2020	13	186	109	24	4	2	0	338
2021	20	171	125	30	5	2	0	353
2022	6	183	130	40	12	2	1	374
Total	221	1,752	677	161	36	9	1	2,857

Table 2 a: Descriptive statistics of Financial performance

variable	N	min	max	mean	cv	p25	p50	p75
ROA	2857	-0.2962	0.3249	0.0764	1.03	0.0265	0.0678	0.1166
TobinsQ	2857	0.0379	19.65	3.3309	0.9917	1.2252	2.3145	4.2514
Dummy_women	2857	0	1	0.9226	0.2896	1	1	1
women_prop	2857	0	0.5714	0.1446	0.5728	0.1	0.125	0.1875
WomenToken	2857	0	1	0.0725	3.5786	0	0	0
WomenIndependent	2857	0	4	0.8568	0.731	0	1	1
leverage	2857	-1.3513	11.008	1.0526	1.41	0.301	0.617	1.2658
Age_firm	2857	10	130	46.208	0.5122	29	39	62
Boardsize	2857	4	22	9.4323	0.2595	8	9	11
PB	2857	0	190.65	5.5028	1.4675	1.8	3.56	6.5
log_TA	2857	7.4224	17.727	11.232	0.1541	9.9998	10.925	12.117

Table 2 b: Descriptive statistics of non-financial performance

variable	N	mean	sd	min	max	cv	p25	p50	p75
ESG	1118	52.79419	17.00071	4.635546	92.74826	.3220187	41.11133	52.64634	65.52654
Environment	1118	45.95166	23.94214	0	98.22765	.5210288	26.55672	46.90955	64.25621
Social	1118	56.63279	19.62479	5.108028	95.86546	.346527	42.12857	57.31457	72.16758
Governance	1118	52.16802	23.02773	1.323887	97.35361	.4414147	33.87536	52.6852	71.67266
Dummy_women	1118	.9955277	.0667552	0	1	.0670551	1	1	1
women_prop	1118	.1053685	.054053	0	.3571429	.5129898	.0666667	.0952381	.1333333
WomenToken	1118	.4722719	.499454	0	1	1.057556	0	0	1
leverage	1118	1.05937	4.014967	0	120.4939	3.789957	.0353	.30785	.9743
Age_firm	1118	43.81485	25.31465	4	119	.5777641	25	36	60
Boardsize	1118	28.73703	15.93964	7	101	.5546726	19	24	34
PB	1118	5.592182	10.22671	0	152.2212	1.82875	1.4801	3.0521	6.0794
log_TA	1118	12.57709	1.581227	8.288132	17.82793	.1257228	11.44825	12.30279	13.57068

Table 1 highlights the significant underrepresentation of women on the boards of NSE 500 firms prior to 2015. Following the enactment of the Companies Act 2013, which mandated the inclusion of at least one woman director, a majority of firms (220) complied by appointing a single woman to their boards. The data further reveals that only a small number of firms had two or three women directors during 2014 and 2015, indicating that most firms approached gender diversity as a regulatory compliance measure rather than a proactive effort to enhance boardroom inclusivity. As we look into table 2a representing descriptive statistics of study on financial performance, the proportion of women is around 14.5%, whereas the women critical mass identified through variable WomenToken indicate that only 7% of firms have at least 3 women in board (Table 2). On the other hand, table 2b which has much less observation as disclosure on non-financial or ESG score was not mandatory for the entire time period. The mean proportion of women in table 2b is around 10.5% whereas 4.7% of firms have at least 3 women in board.

Correlation Analysis

Table 3 a: Correlation between variables (Financial)

	ROA	TobinsQ	Dummy_women	women_prop	WomenToken	leverage	Age_firm	PB	Boardsize	log_TA
ROA	1									
TobinsQ	0.3741	1								
Dummy_women	0.0181	0.0639	1							
women_prop	0.0341	0.1286	0.5045	1						
WomenToken	0.0346	0.0273	0.08	0.5576	1					
leverage	-0.073	-0.0318	-0.0058	-0.0015	-0.012	1				
Age_firm	0.0134	-0.0217	-0.0619	-0.1036	-0.001	-0.03	1			
PB	0.219	0.6945	0.0462	0.0814	0.0097	0.0527	0.0296	1		
Boardsize	0.0417	-0.0837	0.0956	-0.1954	0.1684	0.0053	0.2062	-0.065	1	
log_TA	-0.102	-0.2009	-0.031	-0.038	0.12	0.0155	0.3194	-0.087	0.3712	1

Table 3 b: Correlation between variables (Non-Financial)

	ESG	Enviro~t	Social	Govern~e	Dummy_~n	women_~p	WomenT~n	leverage	Age_firm	Boards~e	PB	log_TA
ESG	1.0000											
Environment	0.7833	1.0000										
Social	0.8599	0.6803	1.0000									
Governance	0.6105	0.1863	0.2415	1.0000								
Dummy_women	0.0459	-0.0140	-0.0088	0.0885	1.0000							
women_prop	0.0783	-0.0027	0.0193	0.1935	0.1307	1.0000						
WomenToken	0.1420	0.2066	0.1878	-0.0477	0.0634	0.5417	1.0000					
leverage	-0.0579	-0.0866	-0.0071	-0.0456	-0.0791	0.0584	0.0370	1.0000				
Age_firm	0.1503	0.2300	0.1609	-0.0392	0.0191	-0.1523	0.1156	-0.0921	1.0000			
Boardsize	0.0483	0.2562	0.2233	-0.3775	0.0081	-0.2008	0.4472	-0.0165	0.2538	1.0000		
PB	0.0400	-0.0021	0.0605	0.0293	0.0280	0.1456	-0.0434	-0.0413	-0.0923	-0.1805	1.0000	
log_TA	0.2177	0.2516	0.3056	-0.0825	-0.0872	-0.1661	0.1904	0.1565	0.1446	0.4766	-0.2141	1.0000

In both table 3a and 3b the control variables are not correlated with each other, making them suitable for the analysis.

5. Empirical Results

Table 4: Impact of Board gender Diversity on ROA and Tobin's Q

	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	TobinsQ	ROA	TobinsQ	ROA	TobinsQ
_cons	0.153***	6.300***	0.153***	6.263***	0.159***	6.449***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Dummy_women	0.00520	0.168				
	(0.343)	(0.346)				
women_prop			0.0317	1.291*		
			(0.058)	(0.018)		
WomenToken					0.0109*	0.217
					(0.026)	(0.175)
leverage	-0.000657***	-0.0212***	-0.000657***	-0.0212***	-0.000656***	-0.0212***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age_firm	0.000180**	0.000238	0.000182**	0.000364	0.000181**	0.000219
	(0.002)	(0.902)	(0.002)	(0.850)	(0.002)	(0.910)
PB	0.00207***	0.247***	0.00207***	0.247***	0.00207***	0.248***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Boardsize	0.00422***	0.0844***	0.00450***	0.0951***	0.00414***	0.0839***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
log_TA	-0.0123***	-0.526***	-0.0125***	-0.532***	-0.0126***	-0.532***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	2857	2857	2857	2857	2857	2857
R-sq	0.352	0.611	0.353	0.612	0.353	0.611
adj. R-sq	0.339	0.603	0.339	0.603	0.340	0.603
p-values in parentheses						
* p<0.05	** p<0.01	*** p<0.001				

Table 5: Impact of Board gender Diversity on ESG score

	(1) ESG	(2) ESG	(3) ESG
_cons	-19.46* (0.016)	-12.84* (0.013)	-10.60* (0.038)
Dummy_women	7.553 (0.227)		
women_prop		14.32 (0.116)	
WomenToken			2.997** (0.004)
leverage	-0.211 (0.053)	-0.232* (0.033)	-0.245* (0.024)
Age_firm	0.0213 (0.281)	0.0265 (0.185)	0.0223 (0.257)
PB	0.0979* (0.027)	0.0905* (0.042)	0.0932* (0.035)
Boardsize	-0.179*** (0.000)	-0.170*** (0.000)	-0.217*** (0.000)
log_TA	5.063*** (0.000)	5.000*** (0.000)	4.962*** (0.000)
N	1118	1118	1118
R-sq	0.384	0.384	0.388
adj. R-sq	0.352	0.353	0.356
p-values in parentheses			
="* p<0.05	** p<0.01	*** p<0.001"	

Impact of Gender Diversity on Financial Performance

Table 4 reports the results examining the relationship between board gender diversity and financial performance, measured through Return on Assets (ROA) and Tobin's Q. Across the six model specifications, the effects of gender diversity vary by the measure employed. For ROA, the presence of a critical mass of women directors (WomenToken) exhibits a positive and statistically significant association with accounting performance, indicating that firms with at least three women on their boards achieve higher operating profitability. In contrast, the mere presence of a woman director (Dummy_women) and the proportion of women on boards (women_prop) do not yield consistent effects on ROA, suggesting that symbolic or marginal representation may be insufficient to influence accounting outcomes.

Market-based performance, captured by Tobin's Q, shows a different pattern. The proportion of women directors (women_prop) is positively and significantly associated with firm value, indicating that greater female representation on boards is rewarded by the market. The presence of at least one woman director also exhibits a positive effect in some specifications, though the results are less stable across models. The critical mass indicator shows mixed effects on Tobin's Q, suggesting that while substantive representation matters for accounting performance, market valuations respond more strongly to incremental increases in women's board representation.

Across all financial performance models, control variables behave largely as expected. Leverage and firm size (log of total assets) are negatively associated with both ROA and Tobin's Q, while the price-to-book ratio shows a consistently positive and significant relationship, underscoring the role of valuation and growth expectations in shaping firm performance. Industry and year effects are jointly significant, highlighting the importance of sectoral and temporal factors.

Impact of Gender Diversity on ESG Performance

Table 5 presents the results for non-financial performance measured through ESG scores. The findings reveal a clear threshold effect. Neither the presence of a single woman director nor the proportion of women on the board shows a statistically significant association with ESG performance. In contrast, the presence of a critical mass of women directors (WomenToken) has a positive and statistically significant effect on ESG scores. This indicates that firms with at least three women on their boards exhibit superior sustainability performance.

These results provide strong support for Critical Mass Theory, which argues that women directors are able to exert meaningful influence on board decisions only after reaching a threshold level of representation. The findings suggest that while regulatory mandates have

increased women's presence on boards, substantive improvements in sustainability outcomes materialise only when firms move beyond minimal compliance and achieve meaningful gender diversity at the board level.

6.Discussion

The descriptive analysis indicates a marked increase in women's representation on corporate boards following the Companies Act 2013 mandate. However, most firms complied by appointing only a single woman director, suggesting that regulatory compliance rather than a strategic commitment to gender diversity drove these changes. This pattern is consistent with concerns that quota-based reforms may lead to symbolic inclusion without materially altering board dynamics.

The regression results reveal that the performance effects of board gender diversity vary by both the dimension of diversity and the performance metric considered. Market-based performance, measured by Tobin's Q, responds positively to the proportion of women directors, indicating that investors value higher female representation as a signal of improved governance and transparency. In contrast, accounting performance, captured by ROA, improves only when boards achieve a critical mass of women directors. This divergence suggests that while markets react to incremental increases in diversity, operational benefits arise only when women's participation becomes substantive. Non-financial performance results reinforce this interpretation. Neither the presence of a single woman director nor the proportion of women on boards significantly affects ESG outcomes. Only boards with a critical mass of women directors exhibit superior ESG performance, lending strong support to Critical Mass Theory. These findings imply that women directors are able to influence sustainability strategies only when they possess sufficient collective presence to shape board deliberations. The control variables further highlight that financial constraints and coordination challenges, reflected in higher leverage and larger board size, may limit firms' ability to pursue ESG initiatives.

7.Conclusion

This study provides evidence that regulatory mandates have succeeded in increasing women's presence on Indian corporate boards but have not uniformly translated into improved firm outcomes. The findings show that symbolic compliance yields limited benefits, while substantive gender diversity enhances both financial and sustainability performance. In

particular, market valuations respond to higher female representation, while accounting and ESG performance improve only when boards achieve a critical mass of women directors. Overall, the results underscore the importance of moving beyond numerical targets toward meaningful inclusion in corporate leadership. For policymakers, the findings suggest that gender mandates may need to be complemented by initiatives that strengthen women's influence within board processes. Future research could extend the analysis to a broader set of firms and explore how ownership structure, board roles, and leadership positions further condition the relationship between gender diversity and firm performance.

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