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The Role of Female Directors and Female Board Characteristics on Firm Financial Leverage: Evidence from Pakistan

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Abstract

This study aims to examine the influence of female directors and female board characteristics i.e., female leadership and female independence on firm financial leverage. This study uses financial and corporate governance data from annual reports of 236 non-financial firms listed on Pakistan Stock Exchange for the period 2014-2023 and tests the hypotheses using rigorous statistical approaches such as pooled ordinary least square and fixed effects approach. Results provide evidence in favor of hypotheses that presence of female directors in board and presence of female board characteristics significantly reduce firms' financial leverage consistent with resource based theory and resource dependence theory respectively. Two steps system generalized methods of moment and Propensity score matching analysis is employed to address the endogeneity issues. The baseline findings are robust by using alternative definition of female directors. Further this study finds in additional subsample analysis that the presence of three or more female directors show a more pronounced effect on reduction of firm leverage as compared to one female director and support the critical mass theory. To the best of researchers'knowledge, this is the first study that extends literature by empirical analysis of the effect of board gender diversity attributes on firm financial leverage in an underdeveloped market, Pakistan. This study is helpful to the regulators that improving gender diversity through mandatory quotas can be more successful if implemented by functional attributes of females in firm.

Keywords: Female Directors, Firm Financial Leverage, Agency Cost, Fixed Effects, Endogeneity, Critical Mass Theory, Pakistan

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Introduction

Agency theory suggests that managers may act in self-interest leading to agency conflicts that harm firm performance (Aliahmadi, 2024). Corporate governance is a system that oversees and manages how a company operates. The primary objective of corporate governance is to prevent managers from profiting at the company's cost. It also regulates the firm's functions, lessens the impact of agency issues, improves resource allocation, increases the quality of financial reporting, and decreases tax liability (Ahmad, Khan, & Zahid, 2020). According to resource-based theory, optimal use of internal resources maximizes firm value by prioritizing high-NPV investments and minimizing financial distress through lower external capital dependency (Barney, Ketchen Jr, & Wright, 2021).

Board gender diversity, an essential aspect of corporate governance, has been found to improve various firm outcomes, including reduced earnings management, lower leverage, fewer board conflicts, stronger internal governance, higher dividend payouts, and more efficient capital allocation (Mohsni & Shata, 2021). Consequently, numerous studies examine the impact of female directors on various corporate outcomes and business decisions, including performance, investment efficiency, and disclosure quality. The empirical research regarding the impact of female directors and female board characteristics on firm financial leverage is still limited, particularly in developing economies.

Hence, this study aims to examine the relationship between female directors and female board characteristics, specifically leadership and independence, in relation to corporate financial leverage in Pakistan. Female directors contribute various perspectives such as in leadership, talents, skills, and human resources to corporate boards, hence improving the efficacy and diligence of internal governance procedures (Huang & Kisgen, 2013). The Upper Echelons theory suggests that the attributes of executives significantly influence strategic decision-making of firms (Bassyouny, Abdelfattah, & Tao, 2020). Additionally, independent female directors increase the effectiveness of monitoring, which lowers earnings management and increases financial reporting transparency (Lara, Osma, Mora, & Scapin, 2017). Hence based on previous studies, this study hypothesized that presence of female directors and female board attributes reduce firm financial leverage.

Besides mandatory inclusion of female in board in 2017 by Securities and Exchange Commission of Pakistan (SECP), still in Pakistan a male dominant nation, there is gender inequality and women find it extremely difficult to get executives and leadership in firms. Therefore, the dataset from Pakistan comprises 236 firms listed on the PSX, a sample of 2665 firm-year observations, covering the period of 2014-2023 is used for analysis. The regression results confirm a reduction in firm leverage with female directors, in line with resource-based theory. Furthermore, results indicate that independent female directors and female leadership, also play a role in reducing the financial leverage of the company consistent with resource dependence theory. The findings are robust to endogeneity concerns that are addressed by two steps system generalized method of moment (GMM) and propensity score matching (PSM) approach. Additional robustness checks include alternative definition of female directors. This study additionally reveals in subsample analysis that the presence of three or more female directors has a more significant impact on firm financial leverage supporting the critical mass theory.

This study contributes in the literature by examining the relationship between the female directors, female board characteristics with firm financial leverage, supporting the

Vol. 3 No. 9 (2025)

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assertion that appointments of female directors should not be based only on gender rather their specific features are also essential for decision-making, monitoring and governance quality. To the best of researchers' knowledge, this is the first study in the context of Pakistan. This study is likely to benefit to the firm's management, investors, policy makers, and other interested bodies.

Literature Review

Females in board enhance corporate governance practices by strengthening the board's monitoring functions. This is evidenced by higher attendance and active representation of females in board meetings, which collectively improve oversight and accountability (Post & Byron, 2015). Adams and Ferreira (2009) find that companies with more female directors or at least one female director on the board has better profitability and less earnings management. They are also seen as more security-oriented. They are perceived as more responsible, which can lead to reduced agency costs and improved governance quality (Mohsni & Shata, 2021). Female directors are also more likely to improve transparency, lower agency conflict, and reduce information asymmetry (Jurkus, Park, & Woodard, 2011). Female directors are seen as being more careful and thoughtful when making decisions (Huang & Kisgen, 2013). Female directors are less inclined to take aggressive acquisition plans (Levi, Li, & Zhang, 2014). The participation of female board members is associated with improved disclosure quality, which in turn boosts investor confidence and decreases financing frictions (Gul, Srinidhi, & Ng, 2011). Female directors enhance investment efficiency and assist the firm to access debt at lower costs (Naz, Latif, & Irshad, 2025). Chijoke-Mgbame, Boateng, and Mgbame (2020) find a favorable relationship between the representation of women on corporate boards and the success of firms.

Women on board helps to lower the risk premium associated with financing arrangements and helps to reduce the overall cost of financial leverage (Abobakr & Elgiziry, 2016). Poletti-Hughes and Martinez Garcia (2022) find that, initially, family-controlled firms increased leverage to maintain control of the business. It is found that these impacts are mitigated when qualified female board members are included as moderating variables. Mirza, Majeed, and Ahsan (2020) find that female directors are better at investing because they are more powerful monitors, more disciplined managers, more efficient with resources, less prone to agency risks, and have equal access to all relevant information. Song, Yoon, and Kang (2020) find a positive role of women in monitoring of international markets. For corporate boards, having women on the panel improves their ability to keep an eye on social, environmental, and ethical concerns (Cambrea, Tenuta, & Vastola, 2019). We posit that financial institutions significantly appreciate the female directors' capabilities to monitor and oversight the board. Thus, we propose the following hypothesis:

H1: *The presence of female directors in board reduces the firm financial leverage*

Gul et al. (2011) find increase in earnings of Japanese manufacturing businesses when senior executives are female. Female CEOs are more inclined to prioritize profit maximization and execute stock options. Kim and Oh (2017) find profitability and the ratio of net assets to stock price are positively affected by the presence of female CEOs. Wang, Deng, and Alon (2021) examine female CEOs' financing options on the grounds of the pecking order theory, findings show that female CEOs seldom rely on either internal or external finance, suggesting a distinct approach to financial decision making. In addition to lowering agency difficulties. Jurkus et al. (2011) find that FCEOs have a negative

Vol. 3 No. 9 (2025)

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correlation with agency conflict and improves company performance. Atkinson, Baird, and Frye (2003) reveal that with respect to investment behavior, females act differently than males owing to their job characteristics, prior knowledge, and degree of achievement. Bear, Rahman, and Post (2010) show that investors, consumers, and the company's CSR rating all benefit from having women in leadership roles. In addition to increasing business productivity, having more women in executive positions may also help women in lower-level positions progress in their careers (Marlow & Patton, 2005).

Kubo and Nguyen (2021) find that stock market often responds positively when a firm hires its first female CEO, regardless of whether the CEO's gender affects the company's financial health. Faccio, Marchica, and Mura (2016) find that female CEO are connected with low corporate risk-taking. The differing leadership styles of men and women significantly impact on the business performance, risk aversion and decision-making. Generally, females exhibit lower levels of overconfidence, greater legitimacy, heightened risk aversion, and stronger ethical standards compared to their male counterparts. Their characteristics, along with a participatory and democratic leadership approach, render females particularly suitable for leadership positions, potentially enhancing board efficacy and elevating decision-making quality (Halliday, Paustian-Underdahl, & Fainshmidt, 2021). Parrotta and Smith (2013) assert that female directors in the form of female chairpersons and CEOs, generally emphasize monitoring activities and implement more rigorous rules of governance. Schwartz-Ziv (2011) find that boards with a female chair perform better monitoring of financial data than boards with a male chair. Bennouri, Chtioui, Nagati, and Nekhili (2018) report a negative impact of females in the leadership on Tobin's Q. Consequently, organizations led by women may secure financing at reduced rates compared to those led by men, since lenders exhibit increased confidence in female executives. Therefore, next hypothesis is formulated as the following:

H2: *Female leadership (CEO or chairman of board) significantly reduce firm financial leverage.*

Independent directors play a vital role in corporate governance. By improving transparency, accountability, and board efficacy, they protect shareholder interests and create trust in the governance framework. The existing literature indicates that executive directors act for personal gain, often to the detriment of shareholders, whereas independent directors function as monitors to safeguard shareholder interests (Gull, Abid, Latief, & Usman, 2021). Additionally, the independence of the board improves oversight and activity monitoring of the management. In this setting, independent female directors are essential for enhancing board effectiveness and meeting stakeholders' demands (Arena, Catuogno, & Naciti, 2023). Chen, Leung, and Goergen (2017) demonstrate that the presence of independent female directors increases the probability of large dividend distributions. The supervisory function of female directors is significantly enhanced when they are independent, since their independence enables them to apply unbiased judgment and enhance managerial accountability (Balsam, Puthenpurackal, & Upadhyay, 2021). The literature demonstrates that female independent directors mitigate agency costs by enhancing transparency and decreasing the probability of fraudulent acts. They also validate corporate practices that align with society norms and expectations of board independence, serving as vigilant administrators against managerial greed (Cao, Upadhyay, & Zeng, 2024).

Vol. 3 No. 9 (2025)

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Terjesen, Couto, and Francisco (2016) stress that auditors perceive a decreased risk of significant misstatement when independent female directors are involved. Karavitis, Kokas, and Tsoukas (2021) find that independent female directors enhance the transparency of financial reporting, which strengthens bank monitoring. These results imply that the presence of females as independent directors significantly enhances the monitoring functions and overall efficacy of corporate boards. This subsequently conveys a favorable indication to lenders, diminishing their information acquisition expenses and resulting in reduced interest rates on the financing extended. Consequently, we propose the following hypothesis:

H3: *Independent female directors reduce firm financial leverage.*

Data and Methodology

Sample

We select all non-financial companies listed on the Pakistan Stock Exchange (PSX) for the 2014–2023 period in order to test the hypotheses. Financial companies are not included because of the different regulatory environment and the ways in which they borrow from other banks and central banks. We retrieve the financial and corporate governance data from the annual reports of the companies. Finally, the sample contains 2,665 observations from the balanced panel of 236 firms. In this study, we have followed the model used by (Abobakr & Elgiziry, 2016) with some modifications as follow to test the effect of female directors and its attributes on firm leverage. The employed measures of firm leverage are the overall debt ratio, the long-term debt ratio, and the short-term debt ratio.

$$TDA_{it} = \beta_0+\beta_1 FEM\_DIR_{it}+ \beta_2 FEM\_LED_{it}+\beta_3 FEM\_IND_{i,t}+\beta_4 B\_SIZE_{it} +\beta_5 DUAL_{it} +\beta_6 ROA_{it}+\beta_7 CFO_{it} +\beta_8 F\_SIZE_{it}+\varepsilon_{it} \quad 1$$

$$LTDA_{it} = \beta_0+\beta_1 FEM\_DIR_{it}+ \beta_2 FEM\_LED_{it}+\beta_3 FEM\_IND_{i,t}+\beta_4 B\_SIZE_{it} +\beta_5 DUAL_{it} +\beta_6 ROA_{it}+\beta_7 CFO_{it} +\beta_8 F\_SIZE_{it}+\varepsilon_{it} \quad 2$$

$$STDA_{it} = \beta_0+\beta_1 FEM\_DIR_{it}+ \beta_2 FEM\_LED_{it}+\beta_3 FEM\_IND_{i,t}+\beta_4 B\_SIZE_{it} +\beta_5 DUAL_{it} +\beta_6 ROA_{it}+\beta_7 CFO_{it} +\beta_8 F\_SIZE_{it}+\varepsilon_{it} \quad 3$$

Where:

TDA =Total Debt ratio (total debt /total assets) *100%

LTDA = Long-term debt Ratio (long-term debt /total assets) *100%

STDA = Short-term debt Ratio (Short-term debt /total assets) *100%

FEM_DIR = Percentage of female directors to total board.

FEM_LED = Dummy variable for female leadership equal to ‘1’ if female is chairperson or CEO and otherwise '0’.

FEM_IND = Proportion of independent female directors on the board.

B_SIZE = Board size is measured as number of directors on the firm board.

DUAL= Dummy variable for duality equal to 1 if chairperson of the board is also CEO and 0 otherwise.

ROA= Net Profit/loss divided by total assets is return on assets.

CFO= Cash Flow is quantified as ratio of operational cash flow to total assets.

F_SIZE= Firm size is measured as logarithm of its total assets.

$\varepsilon_{i,t}$ = firm-year error term

Empirical Results

Descriptive Analysis

Table 1 presents the descriptive data, indicating that Pakistani firms exhibit an average overall leverage cost of 16%, with a standard deviation of 0.912. The mean (S.D) values for

Vol. 3 No. 9 (2025)

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LTDA and STDA are 0.130 (0.398) and 1.712 (1.540), respectively. The data indicate that females (FEM_DIR) constitute an average of 34% representation on a firm's corporate board. On average, 9% of independent directors are female, whereas the average percentage of female leadership (FEM_LED) is 8%. Within the corporate governance control variables, the average board size (B_SIZE) comprises 30% directors. The average value for DUAL is 0.549. The average values for the company-specific control variables are as follows: return on assets (ROA) is 15.2%, cash flow from operations (CFO) is 59.2%, and firm size is 19.6%.

Table 1: Descriptive Statistics

Variables	N	Mean	SD	Min	Max
TDA	2665	0.163	0.912	0.098	0.350
LTDA	2665	0.130	0.398	0.023	0.230
STDA	2665	1.712	1.540	0.019	2.310
FEM_DIR	2665	0.342	0.861	0.002	1.031
FEM_LED	2665	0.084	0.115	0.003	0.105
FEM_IND	2665	0.092	0.593	0.001	0.139
B_SIZE	2665	0.301	0.802	0.209	0.440
DUAL	2665	0.549	0.452	0	1
ROA	2665	0.152	0.379	0.045	0.214
CFO	2665	0.592	0.501	0.2862	1.3345
F_SIZE	2665	0.196	0.246	0.108	0.571

Correlation Analysis

The results of correlation analysis are reported in Table 2. The coefficients exceeding 0.7 may indicate potential multicollinearity issue (Liu, Wei, & Xie, 2014). As highlighted in Table 2, female related proxies i.e., FEM_DIR, FEM_LED and FEM_IND are negatively and significantly correlated with firm leverage proxies TDA, LTDA and STDA. However, all proxies do not suggest any multicollinearity problems.

Table 2: Pearson Pairwise Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11
TDA	1.000										
LTDA	0.132**	1.000									
STDA	0.105**	0.124*	1.000								
FEM_DIR	-0.072*	-0.012*	0.42**	1.000							
FEM_LED	-0.022*	-0.163*	0.70**	0.245***	1.000						
FEM_IND	-0.013*	-0.323**	-0.51**	0.202*	0.112**	1.000					
B_SIZE	-0.020**	-0.501*	0.11*	0.137**	0.171*	0.24**	1.000				
DUAL	-0.020*	-0.225**	-0.052	-0.149	-0.137	-0.039	-0.074	1.000			
ROA	-0.056	-0.602*	0.24**	0.125**	0.123*	0.106*	0.196*	0.048	1.000		
CFO	-0.121**	-0.147**	0.35***	0.264***	0.326***	0.129*	0.131*	0.129*	0.301*	1.000	
F_SIZE	0.032*	-0.149	0.121	0.064	0.032	0.103	0.032	0.084	0.041	0.022	1.000

Vol. 3 No. 9 (2025)

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***p < 0.01, ** p<0.05 and *p< 0.1

Regression Analysis

Table 3 shows the findings of the impact of female directors and female board characteristics on the firm financial leverage. Model (1), (3) and (5) report Ordinary Least Squares (OLS) regression results with robust standard errors, controlling for industry and year fixed effects. Models 2, 4 and 6 report fixed effect model. Models 1,2,3 and 4 indicate a negative and significant effect of female directors, female leadership and female independence on total debt ratio (TDA) and long term ratio(LTDA), while model 5 shows positive and significant effect of female directors and female independence on short term debt ratio (STDA), though insignificant for female leadership. Model 6 shows negative and significant effect of female directors and female independence on short term debt ratio (STDA), though positive and significant for female leadership. These results suggest that firms with female directors and its attributes tend to reduce firm total and long term financial leverage. While in the context of short term financial leverage, female directors, female leadership and female independence shows different results. Overall, Table 3 provides robust evidence supporting that the female directors and female characteristics reduce the firm financial leverage. Hence, findings support and accept hypothesis 1, hypothesis 2 and hypothesis 3. Regarding control variables, board size, duality, ROA, CFO has a negative impact, indicating a reduction in firm leverage. In contrast, firms with higher firm size tend to exhibit stronger firm leverage.

Table 3. Regression Analysis

	Panel A		**Panel B**		**Panel C**	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	**TDA**	**TDA**	**LTDA**	**LTDA**	**STDA**	**STDA**
FEM_DIR	-0.295**	-0.279*	-0.014**	-1.246**	0.082***	-0.376*
	(-2.192)	(-0.372)	(-2.097)	(-2.395)	(3.546)	(-1.726)
FEM_LED	-1.303**	-0.056**	-0.164**	-0.002***	0.029	0.100***
	(-5.719)	(-0.889)	(-0.826)	(-0.019)	(1.132)	(3.369)
FEM_IND	-0.023**	-1.267*	0.029*	-0.999*	0.005**	-0.737*
	(-2.407)	(-0.756)	(0.513)	(-0.658)	(1.298)	(-1.813)
B_SIZE	-0.019*	-0.675**	-0.107**	-0.118*	0.120***	-0.206
	(-0.109)	(-0.230)	(-2.262)	(-0.269)	(9.208)	(-0.109)
DUAL	-1.039**	-1.409*	-0.729***	-2.056**	-0.269***	-0.075*
	(-4.071)	(-0.498)	(-3.742)	(-3.301)	(-10.471)	(-3.071)
ROA	-0.225**	-0.438**	0.033	-0.072**	0.063	-0.198**
	(-1.269)	(-0.138_	(0.549)	(-0.149)	(1.002)	(-0.259)
CFO	-0.205***	-0.398**	0.097*	-0.104***	0.054***	0.681**
	(-3.129)	(-0.209)	(1.891)	(-2.709)	(11.258)	(3.129)
F_SIZE	0.049***	0.981	0.829***	0.031***	0.289***	0.049***
	(4.271)	(0.639)	(4.742)	(3.509)	(12.471)	(4.271)
Industry & Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.248	-0.677**	0.354	0.540	-0.211***	1.026***
	(-1.390)	(-1.986)	(0.137)	(1.144)	(-4.023)	(5.407)
Observations	2665	2665	2665	2665	2665	2665
R-squared	0.152	0.311	0.182	0.299	0.156	0.289

Vol. 3 No. 9 (2025)

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Robust t-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.1

Robustness Checks

Table 4 reports the results for the impact of board gender diversity on firm leverage when we measure board gender diversity by a dummy variable equal to 1 if there is at least one female present in the boardroom and 0 otherwise (Sila, Gonzalez, & Hagendorff, 2016). Results show a negative and significant association between (F_DUM) and total financial leverage, long term financial leverage and positive association with short term financial leverage. Overall results of table 4 are robust to baseline findings.

Table 4: Alternative Measures of Board Gender Diversity

	Panel A		Panel B		Panel C	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	TDA	TDA	LTDA	LTDA	STDA	STDA
F_DUM	-0.040***	-1.098*	-0.041***	-0.321*	0.015*	0.175*
	(0.03)	(-0.210)	(-0.290)	(-1.312)	(0.006)	(1.726)
FEM_LED	-0.514**	-0.056*	- 0.053*	-0.002	0.023*	0.109*
	(1.251)	(-0.819)	(-0.359)	(-0.019)	(1.002)	(4.093)
FEM_IND	-0.914**	1.264	-0.053*	0.999	0.023	0.871*
	(-1.109)	(0.233)	(-0.213)	(0.289)	(2.152)	(1.621)
Control Variables	Included	Included	Included	Included	Included	Included
Industry & Year Effects	YES	Yes	YES	Yes	YES	Yes
Constant	-0.128	-0.323**	-0.184	0.540	0.331	1.026***
	(-0.480)	(-1.409)	(-0.437)	(1.144)	(5.023)	(5.407)
Observations	2665	2665	2665	2665	2665	2665
R-squared	0.610	0.563	0.252	0.423	0.819	0.209

Robust t-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.1

Endogeneity Concerns

Two-Step System GMM Regression

To mitigate the problems of omitted variables and simultaneity, we conduct two-step system GMM regressions as presented in Table 5. We include lagged dependent variables (TDA, LTDA and STDA) as instruments in the two-step system GMM regressions to account for potential endogeneity and dynamic relationships. Furthermore, the diagnostic statistics support the validity of the GMM estimations. The results of AR (1) are significant while those of AR (2) are insignificant in both panels, indicating no second-order autocorrelation. The Hansen test p-values are insignificant, supporting the validity of the over identifying restrictions and the overall instrument set. Overall findings provide further confirmation of the baseline results.

Table 5: Two Stage System GMM Regressions

VARIABLES	TDA	LTDA	STDA
Lag(TDA)	0.130**		
	(3.213)		
Lag (LTDA)		0.913***	
		(16.212)	
Lag (STDA)			0.231***
			(7.109)
FEM_DIR	-0.120**	-0.038*	0.093**
	(-3.219)	(-1.077)	(2.450)

Vol. 3 No. 9 (2025)

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FEM_LED	-0.872**	-0.109*	0.034**
	(-5.430)	(-1.341)	(3.187)
FEM_IND	-0.098***	0.328	0.034
	(-2.598)	(0.980)	(0.512)
Control Variables	Included	Included	Included
Industry & Year Effects	YES	YES	YES
Constant	-0.278	-0.384	0.623
	(-1.580)	(-0.329)	(0.309)
Observations	1,971	1,971	1,971
R-squared	0.409	0.731	0.352
AR (1) (z, p-value)	-3.224**	-2.099**	-1.095*
	(-0.001)	(-0.034)	(-0.760)
AR (2) (z, p-value)	-0.831	-1.098	-1.092
	(-0.406)	(-0.760)	(-0.234)
Sargan Test (chi square, p-value)	293.9	342.9	120.87
	(0.034)	(0.012)	(0.045)
Hansen Test (chi square, p-value)	134.3	210.0	198.2
	(0.357)	(0.412)	(0.209)

Robust t-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.1

Propensity Score Matching

In PSM, data is divided into the treatment group (at least one female on board) and control groups (no female directors on board). Then, we apply logistic regression to predict propensity scores after inclusion of set of controls and treatment group in Table 6. On matched sample, we re-estimate the baseline regression on OLS model. These results also confirm the baseline findings.

Table 6: PSM

VARIABLES	TDA	LTDA	STDA
FEM_DIR	-0.120**	-0.037	0.096**
	(-3.219)	(-1.077)	(5.826)
FEM_LED	-0.056***	-0.030*	0.023*
	(-1.230)	(-0.513)	(1.002)
FEM_IND	-0.198***	0.164	0.098
	(-3.209)	(0.826)	(0.912)
Control Variables	Included	Included	Included
Industry & Year Effects	YES	YES	YES
Constant	0.309	0.981	0.218
	(3.028)	(2.093)	(0.372)
Observations	1067	1067	1067
R-squared	0.239	0.098	0.181

Robust t-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.1

Additional Subsample Analysis

Role of Number of Representation of Women

Additional tests are applied on sample of firms based on number of females in board in Table 7 based on OLS model. For the subsample, gender diversity in board as firms having

Vol. 3 No. 9 (2025)

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high number of women (N= 3 or more than 3) denotes Female (H)_DUM, medium number of women (N= 2) is Female (M)_DUM and low number of women (N= 1) is Female (L)_DUM. However, the results show a negative coefficient of Female (H)_DUM and Female (M)_DUM to firm financial leverage which suggests that female directors lead to reduce the financial leverage as their number increases in the boardroom. These findings align with critical mass theory.

Table 7: Female Directors, Critical mass of Female Directors and Financial Leverage

VARIABLES	TDA	LTDA	STDA
FD (H)_DUM	-0.056**	-0.972***	-0.348*
	(-2.768)	(-1.890)	(-1.076)
FD (M)_DUM	-0.198*	-0.237**	0.451*
	(-2.760)	(-1.980)	s(2.098)
FD (L)_DUM	0.320	0.120	0.186*
	(0.092)	(0.332)	(0.198)
FEM_LED	-0.029***	-0.027*	0.034*
	(-3.619)	(-2.428)	(2.342)
FEM_IND	-0.205***	-0.291	0.759
	(-2.087)	(-0.309)	(0.006)
Control Variables	Included	Included	Included
Industry & Year Effects	YES	YES	YES
Constant	0.540	0.709	0.912
	(2.450)	(0.413)	(0.209)
Observations	2665	2665	2665
R-squared	0.239	0.109	0.523

Robust t-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.1

Conclusion

This study examines the impact of female directors and its characteristics, i.e. female leadership and female independence on the firm leverage. To accomplish the goal of the research, the sample is selected from companies listed on the Pakistan Stock Exchange. The hypotheses are tested by using multivariate regressions methods. Results in baseline analysis, provide evidence in support of hypothesis that female directors reduce firm leverage consistent with resource based theory. Regarding attributes of female directors, there are evidence that female directors' independence and female leadership positions (female chairperson or CEO) have significant and negative association with firm financial leverage consistent with resource dependence theory. Baseline findings are robust by using alternative definition of female directors. Matched sample findings show that owing females in board reduce firm leverage. Further, tests are applied on firms based on different number of representation of women in firms' boards of directors. This study further strengthens to have more female directors in board for more effective results. This study is beneficial for improvement in governance mechanism in firms by appointing female directors to the boards, by providing leadership positions to the females and by appointing independent female directors on boards.

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