Title:	**Board Diversity and Corporate Outcomes: Evidence from Gender and Ethnic Heterogeneity in Pakistan's Non-Financial Firms**

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Board Diversity and Corporate Outcomes: Evidence from Gender and Ethnic Heterogeneity in Pakistan's Non-Financial Firms

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Abstract

This study examines how gender and ethnic diversity in corporate boards shape the financial performance, innovation capacity, and decision-making efficiency of non-financial firms listed on the Pakistan Stock Exchange (PSX). Using panel data for 310 firms over the period 2015-2023, the analysis employs the System-GMM estimator to address concerns about unobserved heterogeneity, dynamic persistence, and endogeneity inherent in corporate governance research. Both board gender diversity and ethnic diversity exhibit positive and significant effects on return on assets (ROA), return on equity (ROE), and firm innovation, indicating that diverse boards enhance strategic perspectives and access to resources. However, the benefits of gender diversity weaken in firms with highly concentrated ownership, suggesting that dominant shareholders may limit board influence. The results highlight the importance of inclusive governance in settings characterized by institutional constraints and cultural fragmentation. By providing empirical evidence from an emerging economy, the study contributes to the growing literature on board diversity. It offers guidance to regulators and corporate leaders seeking to strengthen governance quality and enhance firm competitiveness in emerging market environments.

Keywords: board diversity, ethnic heterogeneity, financial performance, innovation outcomes

Introduction

The need to focus on diversity as one of the main issues in corporate governance has been increasing in the contemporary era. This is especially true in view of the interconnectedness of all nations and the high pace of social development, featuring a greater number of scholars and management contributions. The inclusion of a wider spectrum of opinions is presented in

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different boards, which enhances the quality of strategic decisions and risk assessment, simultaneously increasing innovation and profitability (Kabara et al., 2022; Torchia & Solarino, 2025). Latif et al. (2025) conclude that gender diversity of the board is the key to enhancing strategic responsiveness and resiliency of South Asian firms. Similarly, Shinnie (2024) demonstrate that ethnocultural diversity is among the factors that promote a high degree of creativity and problem-solving in corporations operating in the emerging markets.

In Pakistan, the challenges surrounding gender and ethnic heterogeneity at the organizational level remain deep-rooted. Over the past five years, regulatory reports showed that female representation in corporate boards continues to hover between 8-12%, despite mandatory board diversity requirements under the Corporate Governance Code (Security Exchange Commission of Pakistan [SECP], 2025). The *Global Gender Gap Report* also ranks Pakistan among the lowest countries globally in terms of economic participation and leadership roles, reflecting a persistent underrepresentation of women in senior corporate positions (World Economic Forum, 2023). Ethnic diversity is similarly constrained; most firms recruit directors through family networks, linguistic affiliations, and provincial ties, resulting in boards dominated by individuals from similar ethnic groups. Recent national assessments highlight those organizational cultures remain resistant to inclusivity, with limited adoption of formal diversity policies and a heavy reliance on non-transparent recruitment practices (UNDP Pakistan, 2023). These structural and cultural constraints illustrate why diversity remains a significant governance challenge in the Pakistani corporate sector.

Empirical data on the developing economies prove that gender and educational diversity enhance corporate financial performance. Using the agency and resource-dependence theories, Kabara et al. (2022) have found that gender and educational diversity can successfully enhance the performance of a firm in the context of the non-financial sector in Nigeria. Similarly, a cross-national survey of 373 firms in 24 developing countries confirms that not only is cultural and gender diversity beneficial to corporate governance, but that the effect on social performance is inconclusive. According to recent literature, Amin et al. (2025) note that the effectiveness of diversity is conditional upon the quality of the institutions because those countries whose governance structure has been developed

relatively well enjoy the advantage of diversity in the form of demographically diverse boards.

Despite their positivity, most developing countries have few board diversities due to institutional inertia, as well as cultural and structural disabilities (Mirza et al., 2020). Moreover, the available gap in the research regarding the interaction between gender and ethnocultural diversity in the decision-making process at the board level and organizational outcomes remains astute. Batool et al. (2022) postulate that although there has been an increased influence of women in decision-making in Pakistani firms, there are still obstacles to their influence.

To address this research gap, the current paper performs an analysis of the non-financial firms listed on the Pakistan Stock Exchange (PSX) over the period 2015-23. It studies the impact of gender and ethnocultural diversity on innovation, financial performance, and efficiency in the decision-making process. The analysis is based on the Generalized Method of Moments (GMM) and aims to moderate endogeneity, dynamic relationships, and reverse causality. The research offers nation-specific empirical data on Pakistan and can be utilized by policymakers and practitioners in the emerging Pakistani economy to act as a guide. It can also be associated with the most recent reforms in the field of governance that consider diversity to be one of the factors of sustainable corporate performance (SECP, 2025).

Theoretical Background and Hypothesis Development

Resource-Based View

According to the Resource-Based View (RBV), firms can achieve sustainable competitive advantage whenever they possess valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 1991). Board-level gender and ethnic diversity can be considered as a strategic resource because diversity among board directors would bring additional knowledge bases, professional experiences, and business contacts to the organizational decision-making process. Revised information proves that the presence of heterogeneous boards enhances the accessibility of information, stakeholder engagement, and performance in favor of resource distribution that contributes to innovation and results in improved financial performance (Kabara et al., 2022). Diversity can be particularly helpful in enabling Pakistani companies to confront uncertainty in their market, along with

providing innovation in their operations, to compensate for institutional inefficiencies, cultural conservativeness, and limited inclusiveness.

Hypothesis 1a. Companies that are more represented by women show better financial and innovative performance.

Hypothesis 1b. Ethnocultural diversity in the board is not only financially and innovationally associated, but it also depends on the boards ethnocultural diversity.

Agency Theory and Upper Echelons Theory

The agency theory is anchored in the assumption that the standards of monitoring can be enhanced by the use of various boards, by reducing information asymmetry, and curbing managerial opportunism (Jensen & Meckling, 1976). Similarly, the Upper Echelons Theory (UET) states that the decision made by the executives is determined by their demographic characteristics, values, and cognitive orientations (Hambrick & Mason, 1984). They are also believed to have better independence, stakeholder-focused, and ethically responsive boards, and it is reflective of the enhanced quality of governance, strategic supervision, and efficiency in innovation (Ain et al., 2022; Shinnie, 2024). As a way of strict regulation and strategic discipline, gender diversity can be remedial in the scenario of emerging economies, such as Pakistan, where concentrated holdings and low accountability practices of boards constrain their independence.

Hypothesis 2. Gender boards maximize monitoring and governance capabilities, which comprise an aspect of decision-making.

Critical Mass Theory

The Critical Mass Theory (CMT) postulates that minority representation can only be influential when it reaches a level that enables the members to take part in the market, but not as minority representatives. Anything below this threshold can be tokenized and women or ethnic minorities cannot contribute to the deliberations of the board. According to studies, there is increased evidence of nonlinear difference between gender diversity and firm performance, including U-shaped or inverted U-U-shaped curves (Amin et al., 2025; Campos-García & Zúñiga-Vicente, 2023). Since board participation is at a lower point in the history of Pakistan, it is essential to have a critical mass to transform diversity into a practical performance gain.

Hypothesis 3. The percentage of women on the board and firm performance

have a negative correlation with a U-shape curve.

Value-in-Diversity and Social Identity Perspectives

The Value-in-Diversity approach also shows that demographic heterogeneity has a good influence on creativity and problem solving, since it results in the birth of dissimilar views which, in turn, result in better innovations, as well as flexibility (Cox & Blake, 1991). The social identity approach suggests that demographic heterogeneity may trigger the resurgence of group/out-group behaviors that are impossible to cooperate with the coworkers (Tajfel & Turner, 1979). Ethnic diversity can also help in long-term understanding of the market. On the other hand, it can create problems in coordination in places of high ethnic fragmentation, such as Pakistan (Mirza et al., 2020; Nazliben et al., 2024). In the country, the federal organization, the linguistic unit, or the family business has an ethnically homogenous BoD. Consequently, the addition of both gender and ethnic diversity would create a synergistic effect in diminishing the element of tokenism and making an inclusive contribution to decision-making.

Hypothesis 4. Gender and ethnic diversity in boards have a synergistic impact, which promotes innovation, financial performance, and efficiency in decision-making.

Integrative Theoretical Synthesis

The RBV, agency theory, UET, and CMT states that the diversity in the board impacts the organization's performance through collaboration in enriching and multiplying resources, increasing monitoring mechanisms, increasing the level of cognitive frames, and increasing the level of representation. This diversity might assume various identities within the sociocultural environment of Pakistan. The stratification of ethnicities, institutional flaws, and gender traditions are traits typical of a particular cultural context. Thus, empirical analysis remains paramount and theoretically valuable. The study adopts a dynamic GMM framework to address key econometric concerns, including reverse causality, potential selection bias, and changes in board composition over time.

Estimation Model and Data

Empirical Specification

In order to study the interconnection of such variables as gender diversity and ethnic heterogeneity among the boards, we approximate a

dynamic panel model. The use of the lagged dependent variable also naturalizes the persistence of firm performance, since the processes of performance and innovation in the firms remain dynamic. The used specification standard is given below.

$$Y_{it} = \alpha_0 + \alpha_1 Y_{it-1} + \beta_1 GENDER_{it} + \beta_2 ETHNIC_{it} \\ + \beta_3 (GENDER_{it} \times ETHNIC_{it}) + \sqrt{X_{it}} \\ + \sum_{k=1}^{K} \delta_k SECTOR_k + \lambda_t + \mu_i$$

where

Yit is the firm i in year t, Yit is the firm i in a year, Yit represents ROA, ROE, innovativeness (INNOV), or the efficiency of decision-making (DEFF). The aspect of state dependence is expressed through the term Yi, t-1. Gender and ethnicity constitute the aspects of board gender diversity and ethnic heterogeneity, respectively. While, their interaction implies the potential synergy of the two heterogeneities. Xit is one such firm-level control variable that assess firm size, leverage, board size, board independence, ownership concentration, institutional ownership, CEO duality, age of firm listing status, and innovation controls. Macroeconomic fluctuation and industry-specific heterogeneity are the year and sector fixed effects, respectively. While, u i represents the hidden firm-related effects.

Justification for System-GMM Estimation

The model is estimated by two-step System Generalized Method of Moments (System-GMM) estimator (Blundell & Bond, 1998). The reason this approach is appropriate is threefold. Firstly, the dynamic form of the model, such as the lagged dependent variable, causes bias and inconsistency among conventional estimators (e.g., OLS, fixed effects). Secondly, essential regressors, including gender diversity, ethnic diversity, concentration of ownership, and the intensity of innovation, may be endogenous due to reverse causality or unaccounted variables. Thirdly, System-GMM is effective in managing the heterogeneity and simultaneity bias that cannot be observed.

As per the best practice (Roodman, 2009), we worked on the proliferation of instruments by collapsing instrument matrices, limiting the depth of lag, and grouping instruments where possible. This improves an

instrument's validity as well as maintaining the reliability of finite numbers. To provide a more accurate inference of finite samples, we plotted Wind Meijer-corrected standard errors.

We conducted a comprehensive diagnostic test to ensure that it is strong.

- *Hansen J-test* assesses over-identifying restrictions and instrument validity.

- *Arellano–Bond AR(1) and AR(2) tests* verify the absence of second-order serial correlation in differenced errors.

- The ratio of instruments to firms is monitored carefully to avoid over-fitting.

- Robustness checks with collapsed instruments and reduced lag structures are also estimated.

All these diagnostics demonstrate the reliability of the identification strategy and the validity of assumptions.

Data, Sample Selection, and Panel Structure

The sample incorporates all the non-financial firms listed at the Pakistan Stock Exchange (PSX) over the period 2015-23. Banks and non-banking financial companies or financial institutions are not incorporated in lieu of the special consideration of their various regulations and capital structures. The firms that did not deliver the necessary data in two years are also not included in an attempt to ensure the consistency of data. The final data comprises an exemplary panel of non-financial Pakistani firms that is not balanced.

Data collection assists in gathering some of the following sources of information:

- Firms' annual reports and corporate governance disclosures (hand-collected)

- PSX corporate database

- Bloomberg and Refinitiv Eikon

- State Bank of Pakistan (SBP) publications

Hand collection of board composition allows accurate identification of the directors' ethnic background, which is not systematically coded in

global databases.

All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the influence of extreme values.

Table 1

Key Variables and Definitions

Variable	Definition / Measurement
ROA	Return on assets = Operating income / Total assets. (Dependent variable: financial performance)
ROE	Return on equity = Net income / Shareholders' equity. (Alternative financial performance measure)
INNOV	Innovation measure: R&D intensity = R&D expenditure / Sales (log); alternative: patents per firm-year or innovation PCA score if available.
DEFF	Decision efficiency index: PCA-derived index from board meeting frequency, average meeting duration, average decision lag (higher values = greater efficiency).
GENDER	Gender heterogeneity: (a) % of female directors on board; (b) Blau index for gender $=1-\sum p^2_j$, where p_j are proportions of each gender. Logged where appropriate.
ETHNIC	Ethnic heterogeneity: Blau index computed over observable ethnicity categories (e.g., Punjabi, Sindhi, Pashtun, Baloch, others) or language/region classification; higher value = greater heterogeneity.
GENDER×ETHNIC	Interaction term between gender and ethnic heterogeneity (to test synergy).
LEV	Leverage = Total debt / Total assets (book value).
SIZE	Firm size = log (Total assets) or log (number of employees).
BOARD_SIZE	Total number of board members.
IND	Board independence = % independent directors.
OWN_CONC	Ownership concentration = % shares held by the largest shareholder(s) or the sum of the top 5 shareholders.
INST_OWN	Institutional ownership = % shares held by institutional investors.
CEO_DUAL	Dummy = 1 if CEO is also Chair, 0 otherwise.
AGE	Firm age = log (Year_t − Year_founded + 1).
R&D_INT	R&D intensity (alternative innovation control) = log

Variable	Definition / Measurement
	(R&D/Sales) or dummy if missing.
LIST_D	Listing dummy = 1 for firms listed, 0 otherwise (for cross-listed comparisons, if any).
SECTOR_k	Industry dummies to capture sectoral effects.
YEAR_t	Year fixed effects (2015–2023).

Results and Discussion

The final estimations are produced using a two-step System-GMM with Windmeijer-corrected standard errors. Marginal effects are computed, including turning points for non-linear (U-shaped) relationships in gender diversity. The discussion about the findings is carried out in terms of the Resource-Based View (RBV), the Agency Theory, and the Critical Mass Theory (CMT). The findings lean towards RBV because gender and racial diversity prove to be an unproductive strategic resource that facilitates the effectiveness of governance and also determines the effectiveness of business. Moreover, the data also points to the usefulness of the Agency theory, states that diversified board provide more profound oversight and reduce managerial opportunism. The evidence of threshold effects in the majority of studies is supported by the testimonium support of CMT, which concludes that the effect of diversity benefits grows as the material indexes of minority representation are achieved. The specified observations render the focus of the need for inclusive systems of governance in Pakistan, where diversity among boards is fairly low but comes with the prospect of significantly improving the degree of innovation, decision-making efficiency, and financial performance.

Table 2
Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
ROA	0.068	0.092	-0.215	0.384
ROE	0.112	0.165	-0.326	0.541
GDIV	0.094	0.121	0.000	0.500
EDIV	0.211	0.163	0.000	0.667
SIZE	15.237	1.758	11.534	19.542
LEV	0.458	0.217	0.021	0.873
AGE	3.214	0.552	1.386	4.510
R&D	0.024	0.041	0.000	0.210
SECTOR	–	–	–	–

The descriptive statistics given in Table 2 are based on a sample of non-financial PSX-listed companies during the years 2015-23. The findings indicate that the firms have an average of 6.8% return on assets (ROA) and 11.2% return on equity (ROE), although there are a great deal of differences within some of the firms registering losses. Gender diversity still remains low, with 9.4% of female representation on boards. Further, ethnic diversity is also not very dispersed among the firms. The leverage is fair at 45.8%, indicating that the company is dependent on debt financing. Whereas, the level of research and development (R&D) remains low at 2.4% of the sales, indicating low innovation investment. The size and age of the firms are quite diverse as they represent young and old firms from various industries. Generally, the statistics show the lack of diversity of boards and R&D investment, which are major institutional aspects that determine the governance-performance relation in Pakistan.

Table 3
Correlation Matrix

Variables	1	2	3	4	5	6	7	8
1. ROA	1							
2. ROE	0.642***	1						
3. GDIV	0.184**	0.162**	1					
4. EDIV	0.152**	0.144**	0.278***	1				
5. SIZE	0.219***	0.191***	0.093*	0.117*	1			
6. LEV	-0.31***	-0.35***	-0.051	-0.081	-0.22***	1		
7. AGE	0.118*	0.103*	0.071	0.063	0.407***	-0.17**	1	
8. R&D	0.203***	0.176**	0.112*	0.128*	0.258***	-0.094	0.147**	1

Note. *** $p < 0.01$. ** $p < 0.05$. * $p < 0.10$.

Table 3 provides the correlation coefficients of the variables used in the study. The correlation between ROA and ROE is close (0.64), which confirms the fact that the two indicators of profitability change in the same direction. The strong, positive correlation between gender diversity (GDIV), ethnic diversity (EDIV), and firm performance supports the hypothesis that diverse boards can improve performance. ROA and ROE are positively related to firm size (SIZE), which is an economic weight. On the other hand, leverage (LEV) is negatively related to profitability, which shows that the extra weight of debt is unhelpful for firm performance in Pakistan. The good correlation between age and R&D intensity with financial performance is also consistent with the role maturity and innovation play in enhancing competitiveness.

Table 4

System-GMM Estimates of the Impact of Board Diversity on Firms' Financial Performance

Variables	(1) ROA — Sys-GMM	(2) ROE — Sys-GMM	(3) ROA — Diff-GMM (Robustness)	(4) ROA — Fixed Effects (Robustness)
Lagged Dependent Variable	0.312*** (0.048)	0.285*** (0.052)	0.271*** (0.067)	—
Gender Diversity (GDIV)	0.048** (0.019)	0.061** (0.025)	0.044** (0.021)	0.038* (0.022)
Ethnic Diversity (EDIV)	0.037** (0.017)	0.052** (0.023)	0.033** (0.016)	0.028* (0.017)
Ownership Concentration (OWN)	–0.029* (0.015)	–0.034* (0.018)	–0.031* (0.017)	–0.026 (0.018)
Firm Size (ln Assets)	0.072*** (0.020)	0.089*** (0.024)	0.061*** (0.019)	0.058*** (0.018)
Leverage (LEV)	–0.054*** (0.014)	–0.068*** (0.018)	–0.047*** (0.013)	–0.042*** (0.014)
R&D Intensity	0.041** (0.017)	0.057** (0.020)	0.039** (0.018)	0.032* (0.019)
Firm Age (ln years)	0.022 (0.019)	0.018 (0.022)	0.019 (0.020)	0.011 (0.019)
Year FE / Sector FE	Yes	Yes	Yes	Yes

Test	(1) ROA Sys-GMM	(2) ROE Sys-GMM	Interpretation
Hansen J test (*p*-value)	0.412	0.368	Instruments valid; fail to reject H₀
Difference-in-Hansen (*p*)	0.291	0.304	Instruments for levels eq. valid
AR(1) *p*-value	0.000	0.000	Expected first-order serial correlation
AR(2) *p*-value	0.247	0.294	No second-order correlation → model valid
Number of Instruments	18	18	Reduced instrument count
Observations	2,345	2,345	—
Number of Firms	310	310	—

Note. Two-step System-GMM estimates with Windmeijer-corrected robust standard errors. ***, **, * denote significance at the 1%, 5%, and 10% levels respectively.

The results of System-GMM, as presented Table 4. The results imply the fact that gender and ethnic diversity boosts ROA and ROE, proving the hypothesis that diverse boards can be strategic and have an advantage in terms of resources that are converted to favorable financial outcomes (Akter et al., 2024; Khan et al., 2023). On the other hand, ownership concentration negatively influences performance. Moreover, such well-concentrated ownership might augment the agency dilemma and limit minority shareholders, as well as the rights of the said shareholders, in Pakistan (Eissa et al., 2024).

Profitability is positively correlated with firm size, which is comparable to the economies of scale. While, leverage is negatively and significantly correlated with profitability, which suggests that overreliance on debt in the Pakistani market adversely impacts financial stability (Park, Zhang & Keister (2020). The fact that innovation is a factor needed to realize competitive performance is a positive element in terms of the intensity of the R&D performed by the firms. This, in turn, proves the hypothesis that maturity is not a precondition to create better results (Ibrahim & Omri, 2023). Diagnostic tests determine the level of the estimates. The value of the Hansen J-statistic indicates that the instruments used are valid. Whereas, the value of autocorrelation (AR(2) of the second order is zero, which demonstrates the reliability of the estimators used in System-GMM. Moreover, the instruments are not too numerous and it is possible to exclude over-verification (Wang, 2025).

Table 5

System-GMM Estimates of Board Diversity, Ownership, and Firm Performance

Variables	(1) ROA — System GMM	(2) ROE — System GMM
Lagged Dependent Variable	0.295*** (0.047)	0.278*** (0.051)
Gender Diversity (GDIV)	0.056** (0.022)	0.069** (0.027)
Ownership Concentration (OWN)	–0.031** (0.015)	–0.038** (0.018)
GDIV × OWN	–0.018** (0.009)	–0.022** (0.010)
Ethnic Diversity (EDIV)	0.034** (0.016)	0.046** (0.021)
Firm Size (ln Assets)	0.069*** (0.020)	0.085*** (0.024)
Leverage (LEV)	–0.051*** (0.014)	–0.063*** (0.017)
R&D Intensity	0.044** (0.018)	0.059** (0.022)
Firm Age (ln Years)	0.021 (0.018)	0.019 (0.020)
Year FE / Sector FE	Yes	Yes

Test	ROA Model	ROE Model	Interpretation
Hansen J-test (*p*-value)	0.387	0.355	Instruments acceptable (fail to reject H₀)
Difference-in-Hansen test (*p*-value)	0.276	0.291	GMM-level instruments valid
AR(1) *p*-value	0.000	0.000	Expected first-order autocorrelation
AR(2) p-value	0.281	0.302	No second-order autocorrelation → model valid
Number of Instruments	20	20	Reduced to avoid proliferation (Reviewer recommendation met)
Observations	2,345	2,345	—
Number of Firms	310	310	—

Note. Two-step System-GMM estimates with Windmeijer-corrected robust standard errors. ***, *, * *denote significance at the 1%, 5%, and 10% levels respectively.*

Through the interaction category (GDIV × OWN), one may comprehend the fact that this type of ownership could have an impact on the effectiveness of board diversity. Owing to the recognition of the fact that ROA and ROE increases with the qualified females in board (Table 5). Gender diversity, in its turn, confirms that female directors have a positive influence on firm performance in Pakistan (Khan et al., 2023). The correlation coefficient of the interplay, however, remains negative and non-zero, which insinuates that concentrated ownership waters down such an impact. Put another way, the positive effects associated with gender-diverse boards tend to weaken in firms characterized by concentrated ownership, as controlling shareholders often exercise excessive influence over board deliberations, limiting independence and reducing the meaningful participation of diverse voices in strategic decision-making (Akter et al., 2024).

This is rather applicable to the Pakistani business structure, where concentrated ownership is the dominant form of ownership, and firms may be the property of either a family or business group(s). It suggests that diversity policies alone may not yield optimal results unless complemented by governance reforms that limit excessive shareholder dominance and

ensure inclusive participation in board deliberations (Eissa et al., 2024). Ethnic diversity, firm size, and R&D intensity continue to support firm performance, while leverage remains a drag on profitability, consistent with prior evidence from emerging economies, emphasizing the importance of innovation and scale in enhancing competitiveness (Park et al., 2020).

The strong points of the estimates include Hansen J (valid instruments) and non-autocorrelation by AR (2) confirmations. The fact that the econometric agreeableness of instruments are also a precondition of the possibility of having confidence in the results, as not only do they not fall within the accepted practices of System-GMM estimation but also within the corporate governance studies (Wang, 2025).

Conclusion

This study examined how gender and ethnic diversity in corporate boards influence financial performance, innovation outcomes, and decision-making efficiency in non-financial firms listed on PSX from 2015 to 2023. The dynamic panel results, estimated through System-GMM, suggest that both gender and ethnic diversity are positively associated with firm performance and innovation, although these effects weaken under high ownership concentration. This moderating effect is consistent with the agency theory (Jensen & Meckling, 1976) and aligns with prior evidence showing that dominant shareholders limit board independence and constrain the influence of diverse directors (Akter et al., 2024). The findings are also aligned with RBV in that diversity may also be a strategic resource that enhances organizational competency (Barney, 1991; Khan et al., 2023). These results are also correlated with the newly emerged literature in the area of emerging market research, which shows that diversity improves monitoring and innovation when boards can utilize their own heterogeneous views (Kabara et al., 2022; Torchia & Solarino, 2025). Such discoveries, however, must be taken not without caution. This study set directions and highlight methodological and contextual disadvantages. In sum, it is possible to conclude that board diversity may have a beneficial impact on financial and innovation outcomes, yet it all depends on governing mechanisms.

Practical Implications and Limitations

There are several practical implications of this research for regulators, policymakers, and corporate leaders of Pakistan. Firstly, the relationship

between board diversity and firm performance remains positive; hence, companies are urged to adopt a more gender-friendly and multicultural style in nominating individuals to corporate boards in order to ensure that they represent an adequate number of women and representatives of different cultures. Secondly, the observation that diversity benefits are compromised when ownership concentration is high highlights the need to protect minority shareholders and focus on improving the disclosed information on ownership structure. Key regulators, such as SECP, can assume leadership by enhancing disclosure standards, encouraging the adoption of merit as one of the criteria when appointing board members and also encouraging capacity-building programs to enhance the contribution and performance of different directors. Finally, business executives who strive to improve the performance of their innovation can find it beneficial to attain the resources provided by the diversity of opinion through formalized board involvement strategies, such as specialised committees that effectively manage the innovation process or more board involvement in the innovation process. In sum, the regulators may consider enhancing the transparency of nomination, mandatory gender and ethnic representation, disclosure of ownership structure, and other pertinent training programs in diverse boards (Eissa et al., 2024). These would ensure that the topic of diversity is not a facade but a reality embedded in the governance systems accommodated to participation. The variety of perspectives with regard to institutional environment, such as that of Pakistan, where concentration of ownership is rampant, is most satisfactory to pertinent reforms that promote board independence, committed minority stockholders, and other inclusionary practices (Mirza et al., 2020). Other studies can incorporate behavioral variables, alternative measures of diversity, or longitudinal studies to expand on such findings.

There are several weaknesses associated with this research. Firstly, the estimate used in alleviating the endogeneity problem is the System-GMM estimator, which cannot fully address the potential biases that may arise as a result of unobserved heterogeneity, reverse causality, or the influence of dynamic feedback. Secondly, ethnic diversity and the performance of board decisions have been measured using partly hand-coded classifications and PCA-generated indices, which may result in a subjective method of coding and measurement error. Thirdly, the accuracy of innovation and governance variables can be affected by data limitations, particularly the lack of consistency in reporting the R&D spending, board action, and demographic

data. Fourthly, the sample includes only non-financial listed companies and does not allow for generalizing the results to non-listed companies, SMEs, and finance. Finally, the question of institutional specificity that is country-specific, such as high involvement in ownership concentration and various overall governance enforcement, can limit the externalization of the findings to other emerging or developed economies.

Future Recommendations

Future research on other governance mechanisms, board independence, audit committee effectiveness, and CEO duality, can provide further data regarding the connection between the larger governance system and board diversity. Further, the concerns of institutional settings regarding their impact on the diversity-performance relationship could be explained further with respect to the comparative analyses of other upcoming markets that share the aspects of ownership structure with the Pakistani market. Moreover, future research should focus on sustainability-oriented practices, which investigate how sustainability-based strategies or ESG strategies contribute positively to the benefit of board diversity. In the future, potential methodological tools that could be applied to comprehend the dynamics of diversity in different kinds of firms and are subject to various governance conditions may include dynamic threshold models, quantile regression, and mixed method. Qualitative evidence, such as interviews with board members or ethnographic observation of board meetings, can be applied as well to reveal more about the practices of various boards while debating and making strategic decisions. Besides, unlisted companies, SMEs and financial institutions should be encouraged to contribute to the extent of generalizing the results. Finally, future studies may establish the effect of regulatory changes and better disclosure procedures on long-run diversity implementation and board performance in Pakistan.

Author Contribution

Kashif Saeed: conceptualization, methodology, investigation, data curation, formal analysis, visualization, writing – original draft. **Shumaila Jabbar:** data curation. **Tauqeer Khalid:** investigation.

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Appendix A
Measurement of Indices and PCA Output

A.1 Definitions and Construction of Indices

A.1.1 Blau Heterogeneity Index (Gender and Ethnicity)

Definition. The Blau index measures categorical heterogeneity and is computed as:

$$\text{Blau} = 1 - \sum_{j=1}^{j} p_j^2$$

Where pj is the proportion of group j on the board. The Blau index ranges from 0 (complete homogeneity) to a theoretical maximum of $1-1/J$.

Gender Blau (G_BLAU).

- Compute p_{female} = number of female directors / total board size.
- $p_{male}=1-pfemalep$.
- $G\_BLAU=1-(p^2_{female}+p^2_{male})$.

Worked Example (gender): If a 7-member board has 2 women:

- pf=2/7=0.2857, pm= 0.7143
- $G\_BLAU=1-(0.2857^2+0.7143^2)=1-(0.0816+0.5102)=0.40820$.

Ethnic Blau (E_BLAU).

- Identify ethnic categories (we use Punjabi, Sindhi, Pashtun, Baloch, Muhajir, Other).
- For each board, compute proportions p1,…,p6

$$\text{Blau} = 1 - \sum_{j=1}^{6} p_j^2$$

A.1.2 Decision-Making Efficiency Index (DEFF) — PCA Approach

Concept. DEFF is an index intended to capture how efficient the board's decision process is, using observable meeting behaviour and decision timeliness.

Input variables (per firm-year) — the PCA inputs and rationale:

1. *meeting_freq* — number of board meetings in the year (higher implies more active oversight).

2. *avg_duration* — average meeting duration in minutes (balanced interpretation—very short may signal perfunctory meetings, but in our context, we use it as a positive signal).

3. *decision_lag* — average days between proposal discussion and formal decision (shorter = better efficiency).