

BOARD STRUCTURE AND AUDIT EFFECTIVENESS: EXAMINING THE MODERATING EFFECT OF GENDER DIVERSITY

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Abstract

This study investigates the impact of board characteristics on audit quality, focusing on the moderating role of female directors in non-financial companies listed on the Karachi Stock Exchange (KSE-100) from 2019 to 2023. Using secondary data from 70 companies, the research examines board independence, female directors, and board size as key variables, with firm size and auditor fees as controls. Employing correlation analysis and GMM regression, results reveal that gender diversity significantly enhances the positive effect of board independence on audit quality. The findings highlight the importance of inclusive boards and recommend promoting female participation to strengthen governance and audit outcomes. This study offers valuable insights for policymakers and corporate leaders on fostering gender diversity to improve audit effectiveness. Future research could extend to financial firms, other governance factors, and the long-term impact of diverse boards on financial performance and stakeholder trust.

INTRODUCTION

Companies are required to provide high-quality financial statements with affective corporate governance which helps the investors for the decision related to investments. at the same it is essential that company must have sound audit procedures. Audit procedure involves examining financial disclosures in the reports to evaluate the accuracy of accounting valuations made by management. (Saidu, Aifuwa, & Research, 2020).

In this regards audit quality plays a vital role in enhancing the credibility of financial statements. High audit quality will increase the chance of detecting any misstatement in financial statements. Khudhair et al., (2019) of the view that firms with stronger boards make more disclosure, are involved in less manipulation of earnings and lower audit risk. Audit quality plays a pivotal in the process of auditing as it can be viewed that companies at domestic or

international level are only interested in the quality of audit financial report (Suryanto et al., 2017). In this wake it is necessary to understand the audit report quality. Usually audit report quality can be influenced by three things which includes standard setters' decisions, accounting method used by management and the judgment of management. So, enhancing audit report quality even without the highest accounting standards might not be able to give reliable and precise accounting information (Al-ahdal & Hashim, 2022)

Board of directors must monitor the management on behalf of the shareholders. Agency theorists advise that the board of directors needs to take a strong role to safeguard the interests of shareholders. Board of the company must possess characteristics which include diversity, committee, board size (age, gender,

nationality, education) and independence (Fama & Jensen, 1983).

Board diversity is known as the number of females on top managerial staff. According to the norms and values of different societies females are positioned at different levels. In many countries, most of the company's board is dominated by male directors, which results less representation of female directors. According to SECP, one woman must be appointed to the board and 87% of all listed companies in Pakistan have at least 1 female in the board (Securities and Exchange Commission of Pakistan [SECP], 2023).

Lee, Nagy, and Zimmerman (2019) increasing diversity in the board of directors can improve the performance of the organization. Board diversity leads to creativity because they have different demographic backgrounds and different experiences. Having gender diversity in board makes the discussion cheerful and energetic (Al-ahdal & Hashim, 2022). There has been a lack of research exploring the relationship between audit quality and board characteristics, particularly considering the moderating role of female directors, in the context of Pakistan.

Companies operating in today's Dynamic Financial environment must recognize the importance of robust corporate governance and high-quality financial reporting. Effective corporate governance not only enhances transparency and accountability but also minimizes Agency conflicts, ultimately fostering investors' confidence. Audit quality serves as a critical mechanism in the governance Framework. Regulatory bodies and stakeholders emphasize the importance of audit quality in preventing financial misstatements, as stronger oversight mechanisms enhance financial disclosures and minimize earnings manipulation. Moreover, the effectiveness of audit procedures depends on the Independence and expertise of auditors as well as the regulatory environment with in which they operate. Strong audit oversight, coupled with effective board governance contributes to the overall financial stability of a firms.

With in this Governor structure board diversity has emerged as a key factor influencing forward performance and decision-making processes. Gender diversity in particular bring fresh prospectus enhances problem solving capabilities and posters and inclusive

work culture companies with diverse boards tend to engage in more ethical business practices reducing the likely would of fraudulent activities and enhancing audit quality (Adams & Ferreira, 2009; Terjesen, Sealy, & Singh, 2009; Gul, Srinidhi, & Ng, 2011)..

Despite the recognized benefits of gender diversity, many companies still struggle to achieve adequate female representation on their boards—particularly in regions where traditional societal norms limit women's participation in corporate leadership. In Pakistan while regulatory Framework such as the SECP mandate the inclusion of at least one female directed the true impact of general Diversity on financial transparency and Audit quality remains largely unexplored. The existing gap in the literature suggest to examine how the presence of female directors more drives the relationship between board characteristics and Audit qualities providing variable inside into corporate governance practices in emerging economies. This study aims to evaluate the impact of key board attributes such as size, independence on audit effectiveness in publicly listed firms, while exploring how gender diversity moderates this relationship. By examining the interaction between female representation and board characteristics, the research seeks to uncover the conditions under which audit quality is enhanced

Literature Review

Khudhair et al., (2019b) suggested audit quality is the services given by an auditor hired by the client's firm. Audit quality refers to the reliability and accuracy of the information presented by an auditor (Saidu et al., 2020). Based on firm's experience and standards they demand higher audit quality. Higher audit quality will increase the firm performance and attract more investors. Shareholders and investors are more likely to place their trust in companies with higher audit quality, as it reflects the involvement of reputable and experienced auditors. In contrast, lower audit quality often linked with weaker accounting practices can lead to negative perceptions and diminished confidence. (Khudhair et al., 2019b)

In order to reduce opportunistic behavior in an organization and minimize information asymmetry issues, it's the board's responsibility to protect the interests of various stakeholders by sharing

information (Aifuwa, Embele, & Management, 2019). The main role of the board of directors is to minimize agency cost by monitoring management sections to protect the interest of shareholders (M. Hu & Loh, 2018). Board characteristics includes board size, committee structure, independence (age, gender, expertise, education, nationality and functional background) and diversity.

It is important to understand that an independent director is a non-executive member of an organization who does not hold more than 0.1% of the company's paid-up share capital, either directly or indirectly (Aifuwa et al., 2019). Independent director should not have any professional or business relationship with the organization and moreover should not be previously employed by the organization (Ong, 2016). The main responsibility of board of directors is to reduce agency cost by monitoring the activities of management which is hired for the interest of shareholders (Hu & Loh, 2018). Ong (2016) believes that independent directors has a very strong relationship with wider group of stakeholders. Akhidime and Management (2015) stated that higher portion of non-managerial and independent directors on the board enhances the monitoring function, leading to more reliable financial statements or reports. Ahmed, Hassan, Magar, and Accounting (2024) propose influence of audit characteristics on audit quality and discovered a positive correlation between board Independents and audit quality.

Fathelbab and Abu Quba' (2024), Daoud (2020), and Almaqtari et al. (2024) reveals that audit quality and board independence have a negative relationship between them. Adewole and Kahinde (2023) also shown a negative relation between audit quality and board independence in financial services sector. Akhidime and Management (2015), Aree Saeed Mustafa et al. (2018), Al-Najjar and Development (2018), and Sakka et al. (2015) found no relation between board independence and audit quality. On the basis of above stated facts the following hypothesis has been extracted for current study.

H₁: Board independence has a negative effect on audit quality.

Total number of directors sitting in an organization's board at a time is known as board size (Khudhair, Al-

Zubaidi, & Raji, 2019). Jensen and Meckling (2019) narrates that expanding the board size strengthens the boards capacity to sport management there by reducing agency cost resulting from poor managerial decisions. McDonald and Westphal (2013) he believes that having larger board is very good for an organization because they can give more time on looking after managements actions. , D. Khudhair, Al-Zubaidi, and Raji (2019b), and Suryanto, Thalassinos, and Thalassinos (2017) Aree Saeed Mustafa, Che-Ahmad, Chandren, and Horizons (2018) It was observed that the advantages of having a larger board may diminish due to ineffective decision-making within a bigger group. Conversely Al-ahdal and Hashim (2022) argued that having larger board had more time and ability to thoroughly review the management actions. Akhidime and Management (2015), Khudhair, Al-Zubaidi, and Raji (2019b), Sakka, Jarbou, and Studies (2015), and Al-Najjar and Development (2018) identified a positive correlation between board size and audit quality. On the other side Aree Saeed Mustafa, Che-Ahmad, Chandren, et al. (2018), Lee et al. (2019) found negative relation in audit quality and Board size. The stated hypothesis is as follow.

H₂: Board size has positive affect on audit quality.

Current study finding that the moderating impact of female directors and board independence (BI). Aree Saeed Mustafa, Che-Ahmad, and Chandren (2018) believed that board diversity, particularly the presence of female directors, increases the likelihood of high-risk acceptance and decisions such as auditor changes. Female directors are often perceived as more cautious and reputationally conscious, which may lead them to prefer hiring high-quality auditors to safeguard their professional integrity and protect stakeholders' interests Ilaboya and Lodikero (2017). There has been very less work done on female directors and board independence. Velte (2017), Pham, Rizov, and Vo (2024), Sekarlangit and Wardhani (2021) found positive relationship with female directors and board independence. Aree S Mustafa and Che-Ahmad (2017), Aree Saeed Mustafa, Che-Ahmad, and Chandren (2018) they have found no relationship between female directors and board independence. from the above literature following moderator hypothesis is stated.

H₃: Female directors have positive impact on board independence.

Currently the amount of literature about female directors and board size is minimal (Javaid, Ain, & D'Ecclesia, 2023). According to critical mass theory research reveals that having 3 or more female directors is essential for the effective participation and influence. Further their research reveals that having at least 3 female members experience improves decision making and governance. Mwambuli and Mushi (2024) their research reveals that having larger board with more female directors enhances governance quality. From the above literature the stated hypothesis is as follows.

H₄: Female directors have significant impact on board size.

Current study has used auditors fee as a control variable. Hoitash, Markelevich, and Barragato (2007) he believes that giving higher fees to auditor will result in higher audit quality. Because if auditors are paid more they may give more time to audit, they may give more effort to audit. Hoitash et al. (2007) failed to find a significant relationship between auditor fee and audit quality. Van, Thanh, Thanh, Diep, and Hai (2022) they found a negative relationship between auditor fee and audit quality.

Alsmairat, Yusoff, Ali, and Ghazalat (2019) believe that larger firm (firm size) have more resources so they can conduct more audit of higher audit quality. The size of the firm has an effect on audit quality because larger organizations are more likely to hire Big Four auditors (Aifuwa et al., 2019). Nagy, Sherwood, and Zimmerman (2023) their findings reveals that organization with larger firm size tend to have higher audit quality. Chen, Elemes, and Lobo (2023) they have found a negative relationship between firm size and audit quality.

Recent researches have been done and they highlight the importance of top management team diversity and their impact on organization. Hassan, Gulzar, Mahmood, and Mirza (2025) in their research they

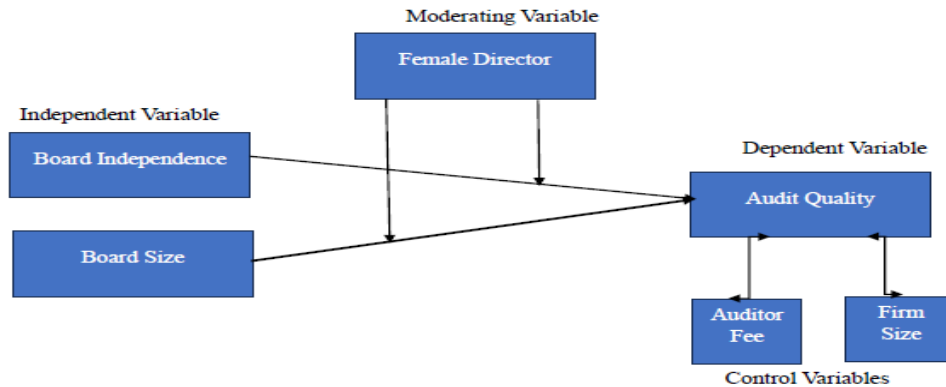
find the impact of TMT diversity on green innovation performance in Pakistan's manufacturing sector. The findings shows that TMT has a negative impact on GIP. Iqbal, Gulzar, Hassan, and Islam (2025) they examined the impact of green banking activities on the environmental performance of commercial banks of Pakistan. They also examined does green finance moderates this relationship. Their results shows that green banking has a significant impact on environmental performance of banks. But they failed to find moderating effect of green finance.

Jamil, Khan, Gulzar, and Shakeel (2025) examined how corporate governance affect corporate social responsibility. For this purpose, they used 55 non-financial companies from Pakistan. The results reveals that board size, female directors, institutional ownership and firm size has a positive and significant relationship with CSR. Kazmi, Rasheed, Malik, Shakeel, and Gulzar (2024) the objective of their research was to find the impact of financial distress on earning management. In this study they used audit quality as a moderator. Their findings reveals that there exist a positive and significant relationship between financial distress and earnings management. Their results also show that increase in audit quality reduces financial distress.

Methodology

This study examines how board characteristics influence audit quality—and how the presence of female directors strengthens that relationship—in seventy leading non-financial firms listed on the Karachi Stock Exchange 100 (KSE-100). Using secondary data from audited annual reports over the five-year period 2019–2023, we analyze the impact of board size, independence, and other governance variables on audit quality, while testing the moderating effect of female board representation. All firm-level data were sourced directly from published financial statements and regulatory filings.

Conceptual Framework



Measurement of Variables

Audit Quality: Dummy variable: “1” if audited by Big 4, “0” otherwise

Board Independence: Percentage of independent directors to total board members

Female Directors: Percentage of women directors to total board members

Board Size: Total number of directors on the board

Audit Fee: Audit fee as disclosed in annual reports

Firm Size: Natural logarithm of total assets

Two examine the relationship between audit quality, board characteristics, and gender diversity we conducted pairwise correlation and regression analysis. Additionally performs of various inflation factor (VIF) test to the text any multicollinearity among our independent variables.

The selected variables in the study have been extracted using the following studies, (DeAngelo, 1981; Fama & Jensen, 1983; Adams & Ferreira, 2009; Yermack, 1996; Simunic, 1980; Becker et al., 1998)

The following econometric models was utilized:

$$AQ_{it} = \beta_0 + \beta_1 BI_{it} + \beta_2 BS_{it} + \beta_3 AF_{it} + \beta_4 FS_{it} + \beta_5 (FD_{it} \times BI_{it}) + \epsilon_{it} \quad (1)$$

$$AQ_{it} = \beta_0 + \beta_1 BI_{it} + \beta_2 BS_{it} + \beta_3 AF_{it} + \beta_4 FS_{it} + \beta_5 (FD_{it} \times BS_{it}) + \epsilon_{it} \quad (2)$$

In this model, AQ is our dependent variable which is audit quality. BI is board independence; this is an independent variable. BS is board size; this is an independent variable. AI is the auditor’s

independence; this is a control variable. FS is firm size; this is the control variable. FD*BI (female directors*board independence) and FD*BS (female directors*board size) has been used as interaction term.

Results and Discussions

Descriptive Statistics

Table 1 presents those descriptive statistics of listed companies on Karachi stock exchange. The main audit quality is 58.6% with a standard aviation of 49.3% ranging from a minimum of 0% to a maximum of 1%. This indicates that big four audit comes are responsible for auditing approximately 58.6% of Karachi stock exchange firm analyzed.

Board independent has an average of 25.13% with a standard deviation of 11.80% signifying a considerable level of independent among Board members. The minimum and maximum values recorded at 1% and 66.67% respectively.

The average board size is 8.36% with a standard deviation of 1.76% ranging from a minimum of 5% to a maximum of 16%. Similarly, the main auditor fees is 7.60% to the standard deviation of 0.61% and varies between 5.56% and 9.30%.

Firm size has a mean value of 16.03% with a standard deviation of 3.22%, ranging from a minimum of 10% to a maximum of 24%. The interaction term FDBI (Female Directors × Board Independence) shows an average of 2.55 times with a standard deviation of 2.64 times, ranging from 0 to 12.24 times. Meanwhile, FDBS (Female Directors × Board Size) has a mean of 0.81 times and a standard deviation of 0.74 times, with values spanning from 0 to 3 times.

Table 1 Descriptive Statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---------------|-----|---------|-----------|--------|---------|
| Audit Quality | 350 | .586 | .493 | 0 | 1 |
| Board Ind. | 350 | 25.137 | 11.809 | 1 | 66.667 |
| Board Size | 350 | 8.363 | 1.762 | 5 | 16 |
| Auditor Fee | 350 | 7.607 | .616 | 5.565 | 9.306 |
| Firm Size | 350 | 16.03 | 3.221 | 10 | 24 |
| FDBI | 350 | 255.284 | 264.524 | 0.001 | 1224.49 |
| FDBS | 350 | 80.988 | 73.984 | 0.0002 | 300 |

Table 1.1 Correlation Matrix

| Variable | Audit Quality | Board Independence | Board Size | Auditor Fee | Firm Size | FDBI | FDBS |
|--------------------|---------------|--------------------|------------|-------------|-----------|--------|-------|
| Audit Quality | 1.000 | | | | | | |
| Board Independence | 0.23** | 1.000 | | | | | |
| Board Size | 0.18** | 0.45** | 1.000 | | | | |
| Auditor Fee | 0.12* | 0.05 | -0.02 | 1.000 | | | |
| Firm Size | 0.05 | 0.12* | -0.10* | 0.30** | 1.000 | | |
| FDBI | 0.21** | 0.34** | 0.25** | 0.15** | 0.08 | 1.000 | |
| FDBS | 0.19** | 0.29** | 0.22** | 0.12* | 0.05 | 0.42** | 1.000 |

Table 1.2: Multicollinearity

| Variable | VIF |
|--------------------|------|
| Board Independence | 1.42 |
| Board Size | 1.79 |
| Auditor Fee | 1.11 |
| Firm Size | 1.12 |
| FDBI | 2.12 |
| FDBS | 2.45 |

Regression Analysis GMM Model 1

The Generalized Method of Moments (GMM) assumes that moment conditions are correctly specified, meaning the instruments are valid (uncorrelated with error terms) and relevant (correlated with endogenous variables). It also requires no perfect multicollinearity among instruments and sufficiently large sample size for consistency. In panel data, it assumes no second-order autocorrelation in error terms and stationarity of variables (Kang, B., Lee, S., & Song, J.)

Initially, Model 1 was applied to assess the moderating effect of female directors on board independence. The findings indicate a significant negative relationship between audit fees and audit quality. This suggests that a decrease in audit fees leads to an improvement

in audit quality. On the other hand, firm size does not show a significant relationship with audit quality.

Board independence demonstrates a significant negative association with audit quality (-0.003, p=0.00), leading to the acceptance of H1. This employee that a one-unit increase involved independent result in a 0.03 decline in audit quality. In contrast firm size shows a significant positive relationship with audit quality (0.023, p=0.00), supporting H2, indicating that a one unit increase in board size enhances audit quality by 2.3.

Furthermore, the infection term FDBI exhibits a significant positive relationship with audit quality (0.023, p=0.00), supporting H2, this suggest that a one unit increase in FDBI leads to an increase of 0.003 in audit quality. These finding highlight the crucial role

of firm characteristics and generate diversity in influencing audit quality.

Table 2 Regression results Model 1

| Audit quality | Coef. | St. Err. | t-value | p-value | [95% Conf Interval] | Sig |
|--------------------|-------|----------|------------------|---------|---------------------|-----|
| L | .675 | .092 | 7.37 | 0 | .496 .855 | *** |
| Audit fee | -.003 | .001 | -5.80 | 0 | -.005 -.002 | *** |
| Firm size | -.031 | .02 | -1.54 | .124 | -.071 .009 | |
| Board ind. | -.003 | 0 | -8.92 | 0 | -.003 -.002 | *** |
| Board size | .023 | .007 | 3.55 | 0 | .01 .036 | *** |
| FDBI | 0 | 0 | 2.98 | .003 | 0.001 0 | *** |
| Constant | .573 | .339 | 1.69 | .091 | -.092 1.238 | * |
| Mean dependent var | 0.586 | | SD dependent var | | 0.493 | |
| Number of obs | 210 | | Chi-square | | 188.721 | |

*** $p < .01$, ** $p < .05$, * $p < .1$

Regression Analysis GMM Model 2

In second model female directors which is our moderator shows the effect on board size. Audit fee has a negative and significant relationship with audit quality (-0.004,0). If audit fee decreases by 1 then audit quality will increase by 0. Firm size has insignificant relationship with audit quality. Board independence has significant and negative relationship with audit quality (-0.002,0). We have accepted H1if board

independence increases by 1 then audit quality will increase by 0.2. Board size has significant and positive relationship with audit quality (0.017, 0.008). We have accepted H2. If board size increases by 1 then audit quality will also increase by 1.7. FD*BS has positive and significant relationship with audit quality (0,0.002). we have accepted H4. if FD*BS increases by 1 then audit quality will also increase by 0.2.

Table 3 Regression results Model 2

| Audit quality | Coef. | St. Err. | t-value | p-value | [95% Conf Interval] | Sig |
|--------------------|-------|----------|------------------|---------|---------------------|-----|
| L | .628 | .095 | 6.61 | 0 | .442 .814 | *** |
| Audit fee | -.004 | .001 | -5.90 | 0 | -.005 -.003 | *** |
| Firm size | -.024 | .018 | -1.33 | .183 | -.059 .011 | |
| Board ind. | -.002 | 0 | -7.67 | 0 | -.003 -.002 | *** |
| Board size | .017 | .007 | 2.66 | .008 | .005 .03 | *** |
| FDBS | 0 | 0 | 3.09 | .002 | 0 0 | *** |
| Constant | .528 | .307 | 1.72 | .085 | -.074 1.129 | * |
| Mean dependent var | 0.586 | | SD dependent var | | 0.493 | |
| Number of obs | 210 | | Chi-square | | 123.471 | |

*** $p < .01$, ** $p < .05$, * $p < .1$

The objective of this study is to find the effect of board characteristics on audit quality and a moderating role of female directors. For this purpose, this study has used descriptive statistics and GMM regression analysis. From our findings this study has accepted H1, H2, H3, and H4. This study shows that board

independence has significant and negative impact on audit quality. this finding is in line with (Saidu et al., 2020). Our findings deviates from the findings of (Aree Saeed Mustafa, Che-Ahmad, Chandren, et al., 2018) and (Al-Najjar & Development, 2018).

We find a significant, positive relationship between board size and audit quality—larger boards tend to engage higher-quality auditors. This result is consistent with prior studies (Sakka, Jarboui, & Studies, 2015; Al-Najjar & Development, 2018; Khudhair, Al-Zubaidi, & Raji, 2019). Moreover, female directorship significantly strengthens the effects of board independence and board size on audit quality. In other words, the presence of women on the board further enhances audit quality. Ilaboya, Lodikero, and Review (2017) argue that female directors are especially inclined to appoint higher-quality auditors to safeguard both firm reputation and shareholder interests.

Conclusion

This study examines the impact of board characteristics (like board independence and board size), audit fee, and firm size on audit quality with the moderating effect of female directors. This study selected the top 70 companies listed on Karachi Stock Exchange (KSE-100) from 2019-2023. From the above findings, this study concludes that there exists a relationship between audit quality and board characteristics in Pakistan. Having female directors in company will increase audit quality in Pakistan.

Findings of this research suggested that female directors in the board should be encouraged. Female directors should be given good environment. Moreover, providing a supportive and conducive environment for female directors can contribute meaningfully to enhanced governance and audit outcomes

Future researchers are encouraged to explore this domain further, as limited empirical research exists on the impact of board characteristics on audit quality, especially when incorporating the moderating role of female directors. Upcoming studies could extend this work by examining female directors as a mediating variable, offering deeper insights into the causal pathways between board structure and audit outcomes. While this study analyzed data from 70 listed non-financial companies, future studies could increase the sample size or expand the scope to include cross-sectoral or cross-country comparisons. Additionally, exploring other governance-related variables such as board tenure, diversity of expertise,

or ownership concentration may enrich the findings and improve the generalizability of the results.

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