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# Female Directors, Firm Risk, and Audit Report Lag: Evidence from Saudi Arabia

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*ABSTRACT*

*This study aims to examine the relationship between the presence of female directors and one of the most important indicators of the efficacy of financial reporting, namely the Audit Report Lag (ARL). Furthermore, it tests the moderating role that firm risk plays in this relationship. To achieve these aims, 514 firm-year observations of Saudi non-financial firms from 2018 to 2021 were used, along with two measures for the ARL and two methods for calculating female directors. The results demonstrate that female directors are associated with shorter ARL. Moreover, the results suggest that firm risk, represented by firm leverage, moderates the relationship between female directors and ARL. The results' robustness has been validated by various tests. These results, the first of their type in the Saudi Arabian context, can assist market regulators and decision-makers in enhancing the timeliness of financial data disclosure in order to increase the efficiency of the capital market and win the trust of investors.*

*Keywords: Female Directors; Audit Report Lag; Firm Risk; Saudi Arabia; Non-Financial Firms*

## INTRODUCTION

The composition of the Board of Directors (BODs) is widely recognized as an important corporate governance mechanism within companies (Ahmed and Che-Ahmad, 2016). As such, the optimal composition of this board has been extensively debated in corporate governance research. The presence of female directors is one of the important factors influencing this composition and its effectiveness (Abbott et al., 2012; Terjesen et al., 2016; Orazalin, 2020). Since the start of the century, more and more governance reforms in different countries started focusing on the inclusion of female board members (Adams & Ferreira, 2009). However, there is a continuous discussion about whether having female directors will increase shareholder value as they contribute diverse perspectives to decision-making (Issa & Fang, 2019); or whether their presence will negatively impact the company's performance as it will be only motivated by societal pressure and regulations (Campbell & Mínguez-Vera, 2008).

Before contributing to this debate, it is important to discuss the distinct traits of female directors. Female directors have different behaviors than male directors, according to Chen et al. (2016). Women tend to engage in less risky behaviors than men, particularly in financial decision-making, as women prefer to invest in asset portfolios with lower risks, even if this means earning lower returns (Eckel & Grossman, 2002). According to Francis et al. (2014), female CFOs are less tax-aggressive than male CFOs. Female directors are likely to speak out against wrongdoing and report fraudulent actions, in addition to being risk averse. This has been noted by Miethe and Rothschild (1994) as well as Kaplan et al. (2009). Chen et al. (2016) discovered that women are more fiscally conservative than men, have better monitoring skills, and are less tolerant of opportunistic behaviors. Moreover, women are less aggressive in their decision-making (Ilaboya & Lodikero, 2017), are better at multitasking (Saidu & Aifuwa, 2020) and are more sensitive to their minority status which entices them always to try and prove their value (Lai et al., 2017).

As a result of these various qualities, several research attempted to examine the effect of female directors on financial reporting. According to Nielsen and Huse (2010), having more female directors strengthens the board's strategic authority over the companies. Chen et al. (2016) discovered having more female directors decreases the incidence of internal control flaws. In addition, Gavious et al. (2012) indicated that when companies have more female directors, there is a much lower possibility of earnings management incidences occurring. Willows and Van der Linde (2016) concluded female directors in South African firms positively influence firm performance when accounting-based measures are used, but negatively influenced when market-based measures are used. Finally, Adams and Ferreira (2009) asserted female directors undermine the effectiveness of well-run businesses.

Although there is a growing amount of research studying how female directors affect financial reporting, few studies are looking at how female directors affect ARL. ARL is the time it takes a corporation's management to release an audit report, beginning with the end of the corporation's fiscal year (Ashton et al., 1987; Hassan, 2016). According to Abdillah et al. (2019) and Alsheikh and Alsheikh (2023), ARL is frequently utilized as a barometer for communicating critical financial information to investors. Numerous scholars have emphasized the

need for timely distribution of financial information. The timeliness of financial reporting, according to Putri et al. (2017), is the capacity of the firm to transmit its financial information to investors before it loses its value, allowing them to make educated judgments. Hence, the timeliness of financial information became the top priority for regulators and policymakers of the capital markets (Aifuwa et al., 2020; Alsheikh & Alsheikh, 2023).

The rise in significance of timely financial reporting and female directors was the impetus for a new line of inquiry on how the latter influences the former. Most studies, however, concentrated on the gender diversity of audit committees, including Harjoto et al. (2015), Akhor and Oseghale (2017), Zaitul and Ilona (2018), Aifuwa et al. (2020), Afenya et al. (2022), and Alkebsee et al. (2022). Simultaneously, the restricted quantity of research that centered on the impact of board gender diversity on ARL yielded contradictory findings. Ahmed and Che-Ahmad (2016) as well as Gacheru (2018) discovered female directors shorten the ARL for Nigerian banks and Kenyan companies, respectively. Conversely, Alsmady (2018) and Bin Kusin and Bin Kadri (2020) observed female directors lead to an increase in the ARL in Jordan and Malaysia, respectively. In contrast to these studies, which discovered female directors had an impact on ARL, a different group of studies discovered board diversity has no appreciable impact on ARL (Singh & Sultana, 2011; Soyemi et al., 2019; Chalu, 2021; Sudradjat & Mai, 2022). This inconsistency in the impact of female directors on ARL suggests that it differs between different countries due to both cultural and regulatory differences; hence, more studies are needed to assess this impact in the countries that have not yet been addressed in the literature.

Therefore, considering the absence of research that has investigated the aforementioned correlation within the context of Saudi Arabia, this research aims to evaluate the influence of female board members on the ARL of non-financial companies in Saudi Arabia. Previous research has demonstrated that some Saudi firms publish their audit reports after more than 60 days, exceeding the regulators' allowable a period of time (Alsheikh & Alsheikh, 2023). Furthermore, previous research has shown female board members are risk-averse (Watson & McNaughton, 2007; Birindelli et al., 2020; Mastella et al., 2021; Menicucci & Paolucci 2022). Consequently, in situations where the level of firm risk is elevated, female directors' effectiveness and efficiency in monitoring roles are expected to be influenced, potentially in the ARL. This research seeks to examine the potential moderating influence of firm risk on the correlation between female directors and ARL, with a focus on female traits. As it clarifies these relationships, this research can be regarded as a pioneering one in this country. As previously stated, further research into the relationships between female directors and ARL in specific companies is required because there is still no conclusive evidence to support them globally. Moreover, based on current available information, this research represents the initial attempt to study the moderating influence of firm risk on the correlation between female directors and ARL. This study contributes to the literature by presenting initial empirical proof of female directors' effect on ARL within the framework of Saudi firms, along with the moderating influence of firm risk on this association.

Studying the relationships in Saudi Arabia is considered a necessity in the current time due to various reasons. First, in 2022, an amended Saudi Corporate Governance Regulations were published which states that the Board members are chosen based on their professional and personal qualifications; inferring that both genders could serve on the board if they meet the requirements. This coupled with the rise in the percentage of women participating in social, cultural, business, economic, and political activities in Saudi Arabia means that there is a potential for an increase in female directors in Saudi companies in the near future (Al- Yahyaee et al., 2017) which currently stands at 8.1% (Shukeri & Alfordy, 2022). Second, the Saudi Arabian government embarked on ambitious reforms and economic plans as part of its Vision 2030 to attract foreign investors in fields other than oil and gas (Al-Faryan & Shil, 2022). As a result of the success of these efforts, a sizable proportion of foreign investors have been drawn into the country, putting a greater emphasis on the timeliness of accounting and financial information (Alsmady, 2018). Third, because Saudi Arabia is the largest capital market in the Middle East and a member of the G20, studying its corporate governance mechanisms is critical for both investors and scholars (Bamahros et al., 2022). Finally, there is a pressing need for further investigation into corporate governance mechanisms within developing countries, including Saudi Arabia, as highlighted by Al-Matari (2022).

The findings of the administered tests indicate the inclusion of female directors is associated with a decrease in ARL for Saudi companies. This result indicates that female directors can serve as an effective governance strategy to enhance the audit report timeliness in Saudi Arabia. This supports the distinctive attributes of female directors that can enhance the supervisory function of the board, consistent with resource-dependence theory. Moreover, results demonstrated that firms with high-risk levels and female directors tend to have longer audit report issuance times than other firms. This discovery adds to the corporate governance literature, as it appears to be the initial research endeavor to explore the impact of female directors' engagement with firm risk on the promptness of audit reports. Furthermore, the present research offers a theoretical contribution through the utilization of agency theory, resource dependence theory, and signaling theory to elucidate the interrelationships among the variables. The relationship between female directors and ARL can be clarified by agency and resource-dependence theories while the moderating role of firm risk in this relationship can be clarified by signaling theory. The present study's results may aid market regulators and decision-makers in enhancing the promptness of

financial information disclosure, thereby enhancing the effectiveness of the capital market and instilling trust in investors.

The subsequent sections of this study are structured in the following manner. The second Section displays a comprehensive analysis of literature and formulation of hypotheses. The research design, sample, and measures are then thoroughly described in the third Section before the study's empirical findings are reported in the fourth Section. The last Section of the report concludes by summarizing the research's findings and conclusions, highlighting its contributions, and making recommendations for future research.

## PRIOR LITERATURE AND HYPOTHESIS DEVELOPMENT

### FEMALE DIRECTORS, FIRM RISK AND AUDIT REPORT TIMELINESS

Many research studies around the world have focused on the influence of the board of directors and its various characteristics on timely financial reporting. Previous research has thoroughly examined the relationship between board of director characteristics and ARL. As a result, most of the investigations focused on the size and composition of the board. For instance, Ahmed and Che-Ahmad (2016) and Alkebsee et al. (2022) discovered board's size has a considerable positive influence on ARL, but Akhor and Oseghale (2017) discovered board's size has a negligible negative influence on ARL. Board composition was often expressed in terms of board independence (Sudradjat & Mai, 2022), board expertise (Ahmed & Che-Ahmad, 2016), and board diversity (Alsmady, 2018). Another characteristic of the board of directors examined by literature is the frequency of board meetings (Ahmed & Che-Ahmad, 2016; Bin Kusin & BinKadri, 2020; Alkebsee et al., 2022). Nonetheless, none of these studies were conducted in Saudi Arabia. The literature on the influence of board characteristics on ARL is very limited in Saudi Arabia as only Ezat et al. (2021) and Gamra et al. (2022) examined this relationship, yet none examined the influence of boards' diversity. Furthermore, the relationship between the gender diversity of the board and ARL is still debatable, as prior research findings are inconclusive. (Gacheru, 2018; Bin Kusin & Bin Kadri, 2020; Chalu, 2021; Sudradjat & Mai, 2022).

Another stream of studies that is relevant to this research is the effect of a firm's leverage on its ARL. Almost all the studies on this relationship found that the higher the leverage, the longer the ARL (Lee & Jahng, 2008; Samaha & Khlif, 2016; Durand, 2019; Nouraldeen et al., 2021). Previous studies have demonstrated a noteworthy correlation between board gender diversity and firm risk. These studies include those conducted by Lenard et al. (2014), Yang et al. (2019), Birindelli et al. (2020), Li et al. (2022), and Menicucci and Paolucci (2022). There have been no studies that have attempted to examine the moderating impact of firm risk on the association between female directors and ARL. Therefore, this study seeks to address this gap by studying how the presence of female directors affects ARL, and how firm risk moderates this relationship for non-financial companies in Saudi Arabia.

## HYPOTHESIS DEVELOPMENT

### ASSOCIATION BETWEEN FEMALE DIRECTORS AND ARL

In the past few years, there has been a significant focus on board gender diversity among scholars, practitioners, and decision-makers. Governance reforms in various nations have placed increasing emphasis on the inclusion of female board members, as noted by Adams and Ferreira in 2009. The existing literature on gender diversity has shown female directors have a noteworthy effect on the timeliness of financial reporting (Ahmed & Che-Ahmad, 2016; Gacheru, 2018; Alsmady, 2018; Bin Kusin & Bin Kadri, 2020). Thus, gender diversity can be considered an important factor in reducing ARL and ensuring timely financial reporting (Merter & Ozer, 2024). As opposed to this, other research (Singh & Sultana, 2011; Soyemi et al., 2019; Chalu, 2021; Sudradjat & Mai, 2022) revealed that female directors had no discernible impact on the ARL. Both agency and resource-dependence theories will be utilized to formulate the study hypothesis, which will look at how female directors affect ARL. First, according to agency theory (Fama & Jensen, 1983), robust oversight procedures will aid in safeguarding shareholders' interests and guaranteeing the integrity of companies' financial reporting. Alkebsee et al. (2022) assert that agency theory has emerged as a primary theoretical framework for investigating the influence of gender diversity on financial reporting. The evidence suggests female directors exhibit risk-averse behavior (Mastella et al., 2021; Eckel & Grossman, 2002), are more likely to speak out against wrongdoing and report fraudulent actions (Kaplan et al., 2009) and are less aggressive in their decision-making (Ilaboya & Lodikero, 2017). Thus, the functional expertise that female directors contribute to the board will enhance board effectiveness, reducing ARL and agency conflicts between managers and shareholders (Aifuwa et al., 2020). The theory of resource dependence posits that firms with superior resources exhibit superior performance (Frooman, 1999). The inclusion of female directors can contribute to diversifying a company's monitoring resources. This, in turn, has the potential to enhance the monitoring process, as suggested by Alkebsee et al. (2022). Accordingly, a hypothesis is formulated as follows:

$H_1$: Female directors have a negative significant influence on audit report lag.

## MODERATING INFLUENCE OF FIRM RISK ON THE ASSOCIATION BETWEEN FEMALE DIRECTORS AND ARL

Leverage is one of the most commonly used indicators of firm risk, as stated by Habib et al. (2019). The lower leverage denotes good governance that limits managers' opportunistic behavior and reduces agency costs (Alsaadi, 2021). The existing literature suggests that leverage has a positive influence on ARL, as noted by Knechel and Sharma (2012) and Shin et al. (2017). According to Yendrawati and Mahendra (2018), a high level of leverage can be attributed to unreliable financial statements, which extends the time it takes to issue an audit report. This is consistent with previous finding (Bahri & Amnia, 2020), which also show a positive effect of leverage on the length of ARL.

In this study, it is predicted that the high level of firm risk with the presence of effective corporate governance will impact the time required to complete the audit. In other words, the high level of risk in a firm with the presence of female directors increases audit report lag. Hence, firm risk is expected to moderate the relationship between female directors and ARL. In this regard, the signaling theory served as a primary theoretical framework for developing the second hypothesis. According to this theory, the high level of leverage can signal bad news for stockholders. Firms with high leverage face risks that negatively affect their going concern, resulting in longer audit report lag times (Antari & Sari, 2023). Therefore, it can be theorized that firm risk with female directors will impact the company's performance and, ultimately, increase audit report lag. Based on this theoretical framework, it is therefore hypothesized:

$H_2$: Firm risk weakens the association between female directors and audit report lag.

## RESEARCH DESIGN AND MEASUREMENTS

### SAMPLE SELECTION AND DATA

This study utilized a sample consisting of 514 firm-year observations derived from 140 non-financial firms that are publicly listed in the Saudi Stock Market. Table 1 displays that the sample was initially 568 observations. However, 53 observations were eliminated from the sample due to the companies' failure to publish a corporate report, which prevented us from collecting non-financial data. Additionally, one observation was excluded as it was deemed an outlier.

Furthermore, the sample consisted of a combination of financial and non-financial data from 140 companies, spanning a duration of four years from 2018 to 2021. The study collected financial data from multiple electronic sources, such as the Thomson Reuters EIKON database, Wall Street Journal, Argaam, and Yahoo Finance websites. Meanwhile, non-financial data were manually gathered from annual reports and corporate annual reports of the firms. The sample did not include information from financial firms because of their unique regulations and reporting practices (Linsley & Shrives, 2006) and to prevent industry bias (Alsheikh et al., 2021; Sudradjat & Mai, 2022).

TABLE 1. Sample

| | |
|---|---|
| No observation for Saudi non-financial firms | 568 |
| (-) Firm-year without corporate report | (53) |
| (-) Outlier Variable | (1) |
| Total firm-year observations | 514 |

### DEPENDENT VARIABLE

The dependent variable pertains to ARL for Saudi non-financial firms. ARL is defined as the total number of days from the fiscal year-end (FYE) to the audit report date (ARD), which is in line with the definition used by previous studies such as Habib (2015), Jha and Chen (2015), Shin et al. (2017), and Alsheikh and Alsheikh (2023).

### INDEPENDENT VARIABLE

This research focuses on analyzing the females on the BODs as the independent variable. In order to evaluate the influence of female directors on ARL, the variable denoted as FDir was quantified by calculating the percentage of female directors present in the BODs. This methodology aligns with previous definitions utilized in the scholarly literature (Mohd Saleh & Sun, 2022; Poletti-Hughes & Martinez Garcia, 2022).

## MODERATING VARIABLE

In this research, firm risk is viewed as a moderating variable. Concerning firm risk, previous ARL literature agreed that firm leverage (Lev) is one of the most commonly used firm risk measures (Habib et al., 2019); thus, firm leverage was used to represent firm risk. As a result, previous research (Khalifa et al., 2019; Ibrahim & Isiaka, 2020), identified firm leverage (Lev) as the ratio of total debt to total equity.

## CONTROL VARIABLES

The study employed ten different control variables to regulate various corporate governance factors and certain firm attributes that were determined to exert significant impacts on the ARL. The set of variables that belong to the first category include board size (BrdSize) (Ahmed & Che-Ahmad, 2016; Alsmady, 2018; Chalu, 2021; Alkebsee et al., 2022), board independence (Brdind) (Singh & Sultana, 2011; Nouraldeen et al., 2021; Sudradjat & Mai, 2022), board meeting (BrdMeet) (Singh & Sultana, 2011; Ahmed & CheAhmad, 2016; Bin Kusin & Bin Kadri, 2020; Alkebsee et al., 2022), AC size (ACSize) (Harjoto et al., 2015; Chalu, 2021; Afenya et al., 2022; Sudradjat & Mai, 2022), AC independence (ACind) (Gacheru, 2018; Zaitul & Ilona, 2018; Soyemi et al., 2019; Nouraldeen et al., 2021), and AC financial expertise (ACFE) (Zaitul & Ilona, 2018; Alkebsee et al., 2022).

Regarding the second category of variables, audit opinion is controlled (AuditOpin) (Harjoto et al., 2015; Alkebsee et al., 2022), audit quality (Big4) (Harjoto et al., 2015; Mathuva et al., 2019; Alkebsee et al., 2022;), firm size (FSize) (Akhor & Oseghale, 2017; Alsmady, 2018; Aifuwa et al., 2020; Omer et al., 2020; Nouraldeen et al., 2021; Afenya et al., 2022), and firm profitability (ROE) (Zaitul & Ilona, 2018; Nouraldeen et al., 2021). Table 2 shows the variables' measurements as well as their descriptions.

TABLE 2. Measurements of Variables

| Variable | Measurement |
|---|---|
| ARL | Number of days from the FYE to ARD. |
| FDir | Female directors as a percentage of total board members. |
| Lev | Total debt to total equity. |
| BrdSize | Number of board members. |
| Brdind | Independent directors as a percentage of total board members. |
| BrdMeet | Number of board meetings held during the year. |
| ACSize | Number of audit committee members. |
| ACind | Proportion of independent members of the audit committee to total audit committee members. |
| ACFE | Proportion of audit committee financial expert to total audit committee members. |
| AuditOpin | A dummy variable takes 1 if the firm-year observations had a qualified audit opinion including going-concern opinion, and 0 otherwise. |
| Big4 | A dummy variable takes 1 if the firm-year observations are audited by a Big 4 audit firm and 0 otherwise. |
| FSize | Natural logarithm of total assets. |
| ROE | Net income is divided by total equity. |

## STATISTICAL MODELS AND ESTIMATION METHOD

The following regression model was specified to test the hypothesis regarding the influence of female directors on audit report lag:

$$ARL_{it} = \beta_0 + \beta_1 \text{FDri}_{it} + \beta_2 \text{Lev}_{it} + \beta_3 \text{BrdSize}_{it} + \beta_4 \text{Brdind}_{it} + \beta_5 \text{BrdMeet}_{it} + \beta_6 \text{ACSize}_{it} + \beta_7 \text{ACind}_{it} + \beta_8 \text{ACFE}_{it} + \beta_9 \text{AuditOpin}_{it} + \beta_{10} \text{Big4}_{it} + \beta_{11} \text{FSize}_{it} + \beta_{12} \text{ROE}_{it} + Year_{it} + \varepsilon_{it} \quad (1)$$

Furthermore, the following regression model was specified to test the hypothesis regarding the influence of firm risk on the association between female directors and audit report lag:

$$ARL_{it} = \beta_0 + \beta_1 \text{FDri}_{it} + \beta_2 \text{Lev}_{it} + \beta_3 \text{FDri} * \text{Lev}_{it} + \beta_4 \text{BrdSize}_{it} + \beta_5 \text{Brdind}_{it} + \beta_6 \text{BrdMeet}_{it} + \beta_7 \text{ACSize}_{it} + \beta_8 \text{ACind}_{it} + \beta_9 \text{ACFE}_{it} + \beta_{10} \text{AuditOpin}_{it} + \beta_{11} \text{Big4}_{it} + \beta_{12} \text{FSize}_{it} + \beta_{13} \text{ROE}_{it} + Year_{it} + \varepsilon_{it} \quad (2)$$

# RESULTS

## DESCRIPTIVE STATISTICS

Table 3 displays some descriptive figures about the model's variables. Non-financial Saudi companies' ARLs varied from 16 days to 197 days, with a mean and standard deviation of 73.718 and 21.33 days, respectively; this suggests, on average, that the sampled firms take about two months after the year-end date to issue their audit reports. The study results indicate that the average percentage of female directors in BODs of our sample

companies is 1.4%, with a standard deviation of 0.043. This suggests that the practice of appointing female members to BODs is not prevalent among Saudi companies, primarily due to cultural factors. Furthermore, firms included in the sample exhibit an average of 1.5x more debt than equity, with a standard deviation of 2.167. For control variables, the average board size in our sample is 8.025 members, as specified by the legislation, with a maximum of 11 directors and a minimum of three. Moreover, boards convene an average of 5.448 times annually and have fewer than 50% independent directors. Regarding the characteristics of the AC, the average size of AC in the sample is 3.483 members, with a limit of 100% independent members. Last but not least, fewer than half of our sample was audited by one of the Big 4 audit firms, and the vast majority lacked a qualified audit opinion, including a going-concern view. The statistical data presented above indicates that the sample under consideration is diverse and can be deemed as a representative of the whole population of non-financial companies in Saudi Arabia.

TABLE 3. Descriptive Statistics

| Panel A: Continuous variables | | | | | |
|---|---|---|---|---|---|
| Variables | N | Mean | Standard Deviation | Minimum | Maximum |
| ARL | 514 | 73.718 | 21.333 | 16 | 197 |
| FDir | 514 | .014 | .0433 | 0 | .25 |
| Lev | 514 | 1.478 | 2.167 | .005 | 17.493 |
| Control variables | | | | | |
| BrdSize | 514 | 8.025 | 1.560 | 3 | 11 |
| Brdind | 514 | .477 | .147 | .09 | 1 |
| BrdMeet | 514 | 5.448 | 2.358 | 1 | 25 |
| ACSize | 514 | 3.483 | .707 | 2 | 5 |
| ACind | 514 | .465 | .234 | .2 | 1 |
| ACFE | 514 | .760 | .251 | 0 | 1 |
| FSize | 514 | 9.306 | .761 | 7.380 | 12.335 |
| ROE | 514 | .028 | .275 | -2.245 | .760 |
| Panel B: Dummy variables | | | | | |
| Variables | N | No of 0 (%) | | No of 1 (%) | |
| AuditOpin | 514 | 467 (90.86%) | | 47 (9.14%) | |
| Big4 | 514 | 292 (56.81%) | | 222 (43.19%) | |

PEARSON CORRELATION COEFFICIENTS

Table 4 shows the correlation among the various variables employed in our model, along with their corresponding levels of significance. Table 4 indicates a noteworthy and negative correlation between ARL and the percentage of female members on the BODs. In contrast, firm risk, as represented by leverage, is substantially and positively correlated with the ARL.

It is concluded that BrdSize, AuditOpin, ACSize, Big4, FSize, and ROE all have substantial negative correlations with the ARL when examining the correlation between control variables and the dependent variable. This conclusion is consistent with Ahmed and CheAhmad (2016), Sudradjat and Mai (2022), Bin Kusin and Bin Kadri (2020), Afenya et al. (2022), and Nouraldeen et al. (2021), respectively. Consistent with the findings of Afenya et al. (2022), however, board independence is the only control variable with a significant positive correlation with the ARL. However, some of our control variables, including ACind and ACFE, did not have a significant influence on ARL of Saudi non-financial firms.

Table 4 reveals there exists no noteworthy correlation between independent variables, and no correlation exceeding 0.8 exists between two or more explanatory variables. Therefore, it can be inferred that the variables do not exhibit any multicollinearity issue, as per Afenya et al.'s (2022) findings. Also shown in Table 5 are the results of the variance inflation factors (VIF) test, which show the study variables are not multicollinear because the result is less than 10.

TABLE 4. Pearson Correlation Matrix

| | ARL | FDir | BrdSize | Brdind | BrdMeet | ACSize | ACind | ACFE | AuditOpin | Big4 | FSize | ROE | Lev |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARL | 1 | | | | | | | | | | | | |
| FDir | -.1196*** | 1 | | | | | | | | | | | |
| BrdSize | -.1573*** | .1267*** | 1 | | | | | | | | | | |
| Brdind | .1235*** | .0003 | -.1622*** | 1 | | | | | | | | | |
| BrdMeet | -.0600 | -.0075 | .1352*** | -.0596 | 1 | | | | | | | | |
| ACSize | -.1488*** | -.0402 | .4078*** | -.0477 | .1661*** | 1 | | | | | | | |
| ACind | .0618 | .0023 | -.0573 | .1785*** | -.1176*** | -.1759*** | 1 | | | | | | |
| ACFE | .0124 | -.0939** | .1570*** | .0348 | -.0160 | .1078** | .0110 | 1 | | | | | |
| AuditOpin | .3931*** | .0066 | -.0398 | .0834* | .0830* | -.0351 | .0156 | -.0298 | 1 | | | | |
| Big4 | -.2161*** | .0326 | .2252*** | -.1537*** | .0961** | .1607*** | .0184 | .0287 | -.2085*** | 1 | | | |
| FSize | -.3068*** | -.0004 | .5151*** | -.2596*** | .1759*** | .4432*** | -.0610 | .0534 | -.2052*** | .4935*** | 1 | | |
| ROE | -.3111*** | .0520 | .0940 | -.1448*** | -.0496 | .0631 | -.1073** | .0753* | -.2918*** | .2140*** | .2010*** | 1 | |
| Lev | .1501*** | -.0414 | .0020 | .0069 | .0612 | -.0206 | .0482 | -.0438 | .2580*** | -.0035 | .0950** | -.5678*** | 1 |

Note: *, **, and *** denote significance at 10%, 5% and 1%, respectively

TABLE 5. Variance Inflation Factors

| Variable | VIF | 1/VIF |
|---|---|---|
| FDir | 1.05 | .953 |
| Lev | 1.66 | .601 |
| BrdSize | 1.54 | .651 |
| Brdind | 1.13 | .883 |
| BrdMeet | 1.08 | .929 |
| ACSize | 1.41 | .708 |
| ACind | 1.09 | .914 |
| ACFE | 1.06 | .947 |
| AuditOpin | 1.19 | .840 |
| Big4 | 1.38 | .726 |
| FSize | 2.16 | .462 |
| ROE | 1.73 | .577 |
| Mean VIF | 1.37 | |

REGRESSION MODELS (RANDOM EFFECT)

Table 6 displays the findings from the various regression models applied in this investigation. Model 1 uses random effect estimates as the primary test to establish the relationship between FDir and ARL, whereas Model 2 examines the effects of interaction between FDir and Lev on ARL. According to the below table (Model 1), beta coefficient of FDir is (-64.83) and is significant at 0.05 level, confirming the percentage of female board members in Saudi non-financial companies contributes to a reduction in the ARL for these companies. This is due to the diversity of functional expertise that female directors bring to the board (Kim & Starks 2016). Consequently, and in accordance with the agency theory, these functional skills will improve the monitoring mechanisms of the board, which will help to an improvement in integrity of financial reporting for companies. Furthermore, the inclusion of female directors with their unique expertise and qualities is expected to improve the reporting performance. The presence of both male and female directors facilitates diversification of the company's resources and expertise. The obtained outcome is consistent with the study's Hypothesis ($H_1$) and is in line with prior studies in the literature (Ahmed and Che-Ahmad, 2016; Gacheru, 2018). Table 6 shows that Lev and ROE have a negative influence on ARL. Higher levels of leverage and ROE results in shorter audit report lag. This evidence is consistent with previous research (Bahri & Amnia 2020). On the other hand, AuditOpin has a significant positive relationship with the ARL. This finding indicates that firms with qualified opinions will experience longer audit and report delays. This finding is consistent with those of previous studies (Harjoto et al., 2015; Alkebsee et al., 2022; Alsheikh & Alsheikh, 2023).

Regarding the investigation of the second hypothesis ($H_2$), Model 2 indicates the beta coefficient of FDir (-100.74) and Lev (-1.44) is negatively and significantly associated with ARL at 0.01 level. Interestingly, the beta coefficient for FDir decreases from (-64.83) in Model 1 to (-100.74) in Model 2 with the moderator, indicating an increase in firm risk would boost the influence of female directors on ARL. However, the interaction coefficient between Lev and FDir is positive and statistically significant (30.842) at 0.01 level. This result demonstrates that this interaction affects the ARL of Saudi non-financial companies. This suggests that a firm's high leverage together with effective governance by female directors increases the time required to publish an audit report. This outcome confirms hypothesis $H_2$ that the firm risk significantly weakens the relationship between female directors and audit report lag. One explanation is that in high-risk firms, female directors have a limited ability to reduce the period it takes to publish audit reports than in other firms. This is because female directors are less risk-taking than their male counterparts. As a result, when firm risk increases, female directors have a tendency to be more cautious and efficient in their evaluation, which increases audit report lag.

TABLE 6. Regression Results (Random effect)

| | ARL<br>Model 1 | | ARL<br>Model 2 |
|---|---|---|---|
| FDir | -64.83** | FDir | -100.746*** |
| | -2.32 | | -3.58 |
| Lev | -1.352** | Lev | -1.444*** |
| | -2.53 | | -2.69 |
| | | FDir * Lev | 30.842*** |
| | | | 3.66 |
| BrdSize | -.345 | BrdSize | -.373 |
| | -.37 | | -.41 |
| Brdind | 7.520 | Brdind | 4.217 |
| | 1.03 | | .60 |
| BrdMeet | -.061 | BrdMeet | -.080 |

| | | | |
|---|---|---|---|
| | -.13 | | -.17 |
| ACSize | -.754 | ACSize | -.864 |
| | -.42 | | -.48 |
| ACind | -.439 | ACind | 1.042 |
| | -.10 | | .26 |
| ACFE | -1.815 | ACFE | -1.665 |
| | -.38 | | -.35 |
| AuditOpin | 20.083*** | AuditOpin | 20.218*** |
| | 3.13 | | 3.16 |
| Big4 | -1.281 | Big4 | -1.198 |
| | -.58 | | -.54 |
| FSize | -3.523 | FSize | -3.654 |
| | -1.49 | | -1.53 |
| ROE | -15.063*** | ROE | -13.208*** |
| | -3.61 | | -3.33 |
| Constant | 109.217*** | Constant | 112.052*** |
| | 5.28 | | 5.35 |
| Years Effect | Yes | Years Effect | Yes |
| No. of Obs | 514 | No. of Obs | 514 |
| R-squared | %24.77 | R-squared | %25.34 |

Note: ** and *** denote significance at 5% and 1%, respectively

## ADDITIONAL ANALYSIS

Robust checks are done in this part to recheck and confirm the results acquired from the generated models in our study. Three robust tests were carried out in this study specifically. We used alternate measures for both dependent and independent variables in the first two checks, ARL2 and FDir2, respectively. Concerning the former (ARL2), the audit report latency was computed as the log number of days between FYE and ARD (Chalu, 2021; Afenya et al., 2022; Alsheikh and Alsheikh, 2023). Similarly, and concerning the latter (FDir2), we chose to capture the influence of the presence of female directors on the boards rather than the impact of their numbers; therefore, we coded FDir2 as 1 if the board has a female director and 0 otherwise (Singh and Sultana, 2011; Chalu, 2021).

Tables 7 and 8 show the outcomes of using these two alternative measures. As seen in both tables, Models 3 and 5 support the findings of our preliminary analysis by demonstrating that female directors of boards on non-financial Saudi companies have a significant negative impact on the ARL after applying the new measures to both the ARL and the FDir. Similarly, Models 4 and 6 demonstrate that, despite using new measures for ARL and FDir, firm risk weakens the influence of female board members on ARL.

Table 7. Regression Results (ALR2)

| | ARL2<br>Model 3 | | ARL2<br>Model 4 |
|---|---|---|---|
| FDir | -.5190** | FDir | -.6779*** |
| | -2.39 | | -2.90 |
| Lev | -.0092*** | Lev | -.0094*** |
| | -2.79 | | -2.87 |
| | | FDir * Lev | .1325*** |
| | | | 3.06 |
| BrdSize | .0015 | BrdSize | .0013 |
| | .26 | | .24 |
| Brdind | .0506 | Brdind | .0351 |
| | 1.15 | | .82 |
| BrdMeet | .0015 | BrdMeet | .0014 |
| | .59 | | .55 |
| ACSize | -.0051 | ACSize | -.0056 |
| | -.46 | | -.15 |
| ACind | -.0029 | ACind | .0039 |
| | -.11 | | .15 |
| ACFE | -.0050 | ACFE | -.0038 |
| | -.18 | | -.13 |
| AuditOpin | .0787*** | AuditOpin | .0794*** |
| | 3.22 | | 3.26 |
| Big4 | -.0061 | Big4 | -.0056 |
| | -.39 | | -.36 |
| FSize | -.0308* | FSize | -.0316* |
| | -1.87 | | -1.90 |

| | | | |
|---|---|---|---|
| ROE | -.0787*** | ROE | -.0699*** |
| | -4.40 | | -4.00 |
| Constant | 2.1126*** | Constant | 2.1265*** |
| | 14.88 | | 14.85 |
| Years Effect | Yes | Years Effect | Yes |
| No. of Obs | 514 | No. of Obs | 514 |
| R-squared | %17.62 | R-squared | %17.95 |

Note: *, **, and *** denote significance at 10%, 5% and 1%, respectively

TABLE 8. Regression Results (FDir2)

| ARL2 Model 5 | | ARL2 Model 6 | |
|---|---|---|---|
| FDir2 | -.0512* | FDir2 | -.0735** |
| | -1.90 | | -2.47 |
| Lev | -.0089*** | Lev | -.0092*** |
| | -2.70 | | -2.80 |
| | | FDir2 * Lev | .0147*** |
| | | | 3.42 |
| BrdSize | .0009 | BrdSize | .0008 |
| | .16 | | .14 |
| Brdind | .0521 | Brdind | .0390 |
| | 1.13 | | .86 |
| BrdMeet | .0013 | BrdMeet | .0013 |
| | .52 | | .50 |
| ACSize | -.0033 | ACSize | -.0038 |
| | -.29 | | -.33 |
| ACind | -.0074 | ACind | -.0015 |
| | -.24 | | -.05 |
| ACFE | -.0049 | ACFE | -.0039 |
| | -.17 | | -.13 |
| AuditOpin | .0786*** | AuditOpin | .0792*** |
| | 3.22 | | 3.25 |
| Big4 | -.0063 | Big4 | -.0059 |
| | -.41 | | -.38 |
| FSize | -.0301* | FSize | -.0303* |
| | -1.83 | | -1.82 |
| ROE | -.0780*** | ROE | -.0701*** |
| | -4.28 | | -3.96 |
| Constant | 2.1040*** | Constant | 2.1128*** |
| | 14.85 | | 14.72 |
| Years Effect | Yes | Years Effect | Yes |
| No. of Obs | 514 | No. of Obs | 514 |
| R-squared | %16.91 | R-squared | %17.19 |

Note: *, **, and *** denote significance at 10%, 5% and 1%, respectively

In our third robustness check, we chose to test our results using other estimators, specifically fixed effects and pooled OLS estimators. Table 9 shows the results of applying these two tests, and as can be seen, both tests confirmed our original findings, indicating that female directors of Saudi non-financial companies help to shorten the time required to publish audit reports. Our second hypothesis, that company risk weakens the connection between FDir and ARL, is supported by both fixed and pooled OLS estimators, which follow the same pattern.

TABLE 9. Regression Results (Fixed Effect & Pooled OLS)

| Fixed effect | | | | Pooled OLS | | | |
|---|---|---|---|---|---|---|---|
| ARL Model 1 | | ARL Model 2 | | ARL Model 1 | | ARL Model 2 | |
| FDir | -77.992** | FDir | -120.667*** | FDir | -58.004*** | FDir | -80.919*** |
| | -2.45 | | -3.78 | | -3.17 | | -4.04 |
| Lev | -3.091*** | Lev | -2.994*** | Lev | -.302 | Lev | -.446 |
| | -3.99 | | -3.87 | | -.56 | | -.83 |
| | | FDir * Lev | 31.103*** | | | FDir * Lev | 21.684** |
| | | | 3.50 | | | | 2.33 |
| BrdSize | -.530 | BrdSize | -.661 | BrdSize | -.002 | BrdSize | .017 |
| | -.29 | | -.36 | | -.00 | | .02 |
| Brdind | 12.465 | Brdind | 7.356 | Brdind | 2.399 | Brdind | .721 |
| | 1.23 | | .75 | | .42 | | .13 |
| BrdMeet | .542 | BrdMeet | .499 | BrdMeet | -.559 | BrdMeet | -.568 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1.47 | | 1.35 | | -1.30 | | -1.31 |
| ACSize | .345 | ACSize | .160 | ACSize | -1.359 | ACSize | -1.462 |
| | .14 | | .06 | | -.96 | | -1.03 |
| ACind | -2.704 | ACind | -.527 | ACind | .662 | ACind | 1.531 |
| | -.50 | | -.09 | | .18 | | .42 |
| ACFE | -7.665 | ACFE | -6.727 | ACFE | 2.489 | ACFE | 2.337 |
| | -1.46 | | -1.28 | | .62 | | .58 |
| AuditOpin | 17.967** | AuditOpin | 18.203** | AuditOpin | 22.795*** | AuditOpin | 22.778*** |
| | 2.53 | | 2.57 | | 4.49 | | 4.51 |
| Big4 | -.955 | Big4 | -.555 | Big4 | -.774 | Big4 | -.742 |
| | -.27 | | -.16 | | -.43 | | -.41 |
| FSize | 9.651 | FSize | 8.767 | FSize | -4.535*** | FSize | -4.560*** |
| | .92 | | .83 | | -2.68 | | -2.68 |
| ROE | -20.164*** | ROE | -17.495*** | ROE | -12.791*** | ROE | -12.116*** |
| | -3.89 | | -3.44 | | -3.37 | | -3.28 |
| Constant | -13.388 | Constant | -2.719 | Constant | 117.289*** | Constant | 118.513*** |
| | -.14 | | -.03 | | 7.93 | | 7.96 |
| Years Effect | Yes | Industry Effect | Yes | Years Effect | Yes | Years Effect | Yes |
| No. of Obs | 514 | No. of Obs | 514 | No. of Obs | 514 | No. of Obs | 514 |
| R-squared | %19 | R-squared | %20.3 | R-squared | %26.5 | R-squared | %27 |
| Adj R-squared | %16.5 | Adj R-squared | %17.7 | Adj R-squared | %24.3 | Adj R-squared | %24.7 |

Note: ** and *** denote significance at 5% and 1%, respectively

## CONCLUSIONS

This research investigates the influence of female directors of Saudi non-financial companies on the audit report lag. The study employs two measures for both dependent and independent variables. Furthermore, an evaluation was conducted on the influence of the firm risk, as indicated by its leverage, on the above-mentioned correlation. The findings showed a substantial inverse relationship between female directors and ARL, indicating that this variable shortens the ARL. The findings also demonstrated that the degree of firm risk weakens the relationship between female directors and ARL. This implies that, due to their more conservative nature, female directors with higher risks in their firms have limited ability to reduce ARL compared to other firms.

This investigation has several important implications. This is the first research to investigate the influence of female directors on ARL in Saudi Arabia and the Gulf region as a whole. Second, to the best of our knowledge, this is the first research to examine the influence of firm risk on the aforementioned relationship. This research contributes to existing literature by highlighting the potential values of gender diversity on boards for companies operating in the Gulf region. The findings may serve as a catalyst for market regulators and decision-makers in these countries to consider mandating diverse boards, as this may facilitate the timely dissemination of financial information to investors and ultimately bolster investor confidence in these capital markets. In addition, the study findings provide beneficial input to management on the effect of female directors on reducing ARL. Female directors play an important role in monitoring managerial performance and thus management will strive to provide timely audited financial statements.

However, similar to all research endeavors, this study possesses certain constraints that offer prospects for forthcoming investigations. Initially, the research focused on analyzing the effects of internal corporate governance factors and company characteristics on the ARL. However, it is recommended that future research should explore external corporate governance factors, including distinct ownership concentration structures. This will provide further insight into the rationales underlying the implementation of the ARL in Saudi Arabia. This study focused solely on ARL of non-financial firms. Therefore, for a comprehensive understanding of ARL of Saudi listed firms and the efficacy of the entire capital market, future research endeavors that encompass both financial and non-financial companies would be advantageous. Ultimately, the scope of this investigation was limited to the determinants of ARL. Consequently, there is a need for further investigation to enhance comprehension of the implications of ARL, including its influence on the capital cost.

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