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Article

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Cogent Business & Management

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Suggested Citation: Elzahar, Hany; Zalata, Alaa; Hassaan, Marwa (2022) : Attributes of female directors and accruals-based earnings management, Cogent Business & Management, ISSN 2331-1975, Taylor & Francis, Abingdon, Vol. 9, Iss. 1, pp. 1-18, <https://doi.org/10.1080/23311975.2022.2139212>

This Version is available at:

<https://hdl.handle.net/10419/289311>

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To cite this article: Hany Elzahar, Alaa Zalata & Marwa Hassaan (2022) Attributes of female directors and accruals-based earnings management, Cogent Business & Management, 9:1, 2139212, DOI: [10.1080/23311975.2022.2139212](https://doi.org/10.1080/23311975.2022.2139212)

To link to this article: <https://doi.org/10.1080/23311975.2022.2139212>



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Received: 01 August 2022
Accepted: 19 October 2022

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Reviewing editor:
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ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

Attributes of female directors and accruals-based earnings management

Hany Elzahar^{1,2}, Alaa Zalata³ and Marwa Hassan^{3*}

Abstract: *Based on the notion that female directors are superior in monitoring and informed by a theoretical framework that draws insights from agency, resource dependence, and upper echelon theories, this study investigates the impact of female monitoring director's tenure and busyness on mitigating managerial opportunistic behavior, applying to a sample of US firms over the period from 1998 to 2014. In line with the theoretical foundation, results demonstrate that both long tenure and more directorships have a positive impact on female directors monitoring competency. This finding is auxiliary supported by the further analysis considering the impact of the Sarbanes-Oxley act on the association between monitoring female directors' attributes and earnings management practices. Accordingly, this study contributes to the literature on the influence of different attributes of female monitoring directors on their monitoring competency. This in turn provides an insight to decision makers that could help in recruitment of female directors that can better enhance monitoring effectiveness of corporate boards.*

Subjects: Financial Accounting; Financial Statement Analysis; Corporate Governance

Keywords: Monitoring female directors; earnings management; agency theory; resource dependence theory; upper echelon theory; SOX

1. Introduction

The objective of this paper is to investigate whether female directors' attributes matter. Despite the fact that females constitute an enormous part of the workforce worldwide, unexpectedly, their representation in corporate boards of directors is still symbolic, even in developed countries (Zalata et al., 2019b; Adams, 2016; Adams & Ferreira, 2009; Dobija et al., 2021; Srinidhi et al., 2020). The underrepresentation of female directors within boardrooms is seen as a kind of inefficient utilization of the corporate board talent pool (García Lara et al., 2017), resulting in suboptimal corporate boards, and a reflection of glass-ceiling culture that stands as a barrier to the appointment of females in directorship positions (Martínez & Rambaud, 2019).

Recent years have witnessed a significant improvement in the participation of female directors within boardrooms, and indeed gender equality has become a top priority for international bodies, governments, policymakers, practitioners and academics (Bohren & Staubo, 2016; Shahab et al., 2020; Nguyen et al., 2020). In particular, many European and non-European countries have taken pivotal steps towards increasing female representation within boards, ranging from requiring listed companies to disclose their diversity policy (e.g., Australia, Denmark, New Zealand), to issuing laws that mandate hiring a specified quota of female directors on firms' boards (e.g., Austria, Belgium, France, Iceland, Italy, Netherlands, Norway, Spain, Germany, India, Malaysia).

In response to the growing female empowerment trend worldwide, and the board diversity campaign led by ‘The Big Three’¹ US institutional investors since 2017 (State Street Global Advisors, 2017), in September 2018, California was the first state in the US that obligated the participation of female directors within boardrooms by passing Senate Bill 826. According to that bill, all publicly listed companies, headquartered in California, are required to have at least one female director by the end of 2019. Furthermore, by the end of 2021, these firms should have a minimum of two female directors if the board has five members, and at least three female directors if the board has at least six members (2018, 2018). Additionally, in December, 2020, the NASDAQ has filed a proposal with the Securities and Exchange Commission (SEC) to issue new listing requirements aiming at improving diversity within firms’ boardrooms (NASDAQ Press release, 2020). This step is considered more effective in improving female representation on the US corporate boards, compared to the SEC earlier requirement that gave listed companies flexibility in defining diversity in the way they believe appropriate (SEC, 2009).

Indeed, arguably, while these regulations are partially driven by the fact that females’ representation within boardrooms is consistent with fairness-based case (gender diversity is required to achieve equality and moral justice), other commentators contend that firms object the appointment of females for just gender diversity and there should be a business case. For instance, gender diversity bring some kind of instrumental benefit to the board (Zalata et al., 2019b; Nicholls, 2020; Rosenblum, 2018). In particular, the business case is based on the fact that gender diversity can maximize shareholders’ wealth via effective monitoring exerted by female directors. In a similar vein, many researchers suggest that female representation on corporate boards should extend beyond the moral aspect, to affect corporate performance (A.M. Zalata et al., 2019b; Poletti-Hughes & Briano-Turrent, 2019), and that female directors’ representation on boards will be normally enhanced, without a need for issuing mandatory quotas, if they simply help in increasing the economic value of the firm (Luo et al., 2017).

The last three decades have witnessed an increasing debate regarding the advancement in corporate governance quality that could be achieved by improving board diversity in general and female representation on boards in particular. Several studies have investigated the impact of female representation within boardrooms on the different aspects of company performance (e.g., Terjesen, et al., 2016; Adams, 2016; Farag and Mallin, 2017; Fan et al., (2019); Zalata et al., 2019b; Naaraayanan and Nielsen, 2020; Shahab et al., 2020; Dobija et al., 2021). In a considerable number of cases, results support the fact that there is a business case for appointing more female directors. In particular, prior studies show empirically that firms with female CEOs have lower leverage and less volatile earnings, compared to those managed by male CEOs (Faccio et al., 2016). Female directors mitigate the CEO’s power to upsurge the stock price crash risk possibility (Shahab et al., 2020). Their presence improves the quality of sustainability reporting (Al-Shaer & Zaman, 2016), advances corporate occupational wellbeing, and governance (Fine et al., 2020). Female directors show more commitment by a better attendance and more independent than their male counterparts (Dang et al., 2020). They are more risk averse (Zalata et al., 2019b) and more innovative (Díaz-García et al., (2013)). Female empowerment in corporate boards is associated with improved profitability (Joecks et al., 2013), higher firm value (Carter et al., 2003), and can boost strategic control (Nielsen & Huse, 2010). Females have a unique cooperative leadership style as being more transformational, democratic, moral, communal and participative compared to their male counterparts (Bart & McQueen, 2013; Dang et al., 2020; Eagly et al., 2003).

Among all, gender diversity improves the quality of financial reporting by decreasing the possibility and severity of fraud (Cumming et al., 2015). Female directors are less likely to engage in malpractices (Shahab et al., 2020), more ethical and less tolerant with managerial opportunism, more risk averse and less overconfident (Usman et al., 2022; Zalata & Abdelfattah, 2021; Zalata et al., 2019b; Zalata et al., 2018; Gull et al., 2018; Luo et al., 2017; Srinidhi et al., 2011). Consequently, improved female presence in boardrooms improves corporate governance practices and restricts earnings management (Adams & Ferreira, 2009; Gul et al., 2011; Luo et al., 2017; Gull et al., 2018; Zalata et al., 2019b; Zalata et al., 2022; Dobija et al., 2021).

To sum up, the possible consequences of female empowerment in relation to different aspects of corporate outcomes are a momentum, because female directors have unique attributes that differentiate them from their male counterparts. Hence, this may play a crucial role in improving efficiency and effectiveness of corporate boards. In a similar vein, Shahab et al. (2020) argues that gender diversity is an increasingly evolving research topic in accounting and governance fields. On the other hand, enhancing female representation in boardrooms is considered by many researchers (e.g., Zalata et al., 2019b; Adams & Ferreira, 2009; Dobija et al., 2021) as a corporate governance tool that can better enhance the monitoring function of corporate boards, as female directors are found to be more effective monitors than male counterparts.

Nevertheless, while the finding of prior studies is important, notably they focused on all female directors. Indeed, Zalata et al. (2019b) suggest that only female directors appointed in monitoring committees play a key role in mitigating managerial opportunism. Furthermore, the results of Gull et al. (2018) reveal that certain attributes, namely business expertise and audit committee leadership increase the effectiveness of monitoring female directors, while female's leadership and experience are positively associated with earnings management. Accordingly, this supports the argument that mitigating managerial opportunism is not only subject to improved female representation on boards but is also influenced by females' cognitive attributes. We, therefore, contend that monitoring female directors requires more time and effort to oversee managers; hence, in order to create value to firms, directors should make themselves available and devote sufficient time and effort to each board they serve on. Additionally, they should have the required firm-specific expertise to monitor and scrutinise actions and decisions of managers. That is, in this study, we extend Zalata et al. (2019a) analysis by considering the impact of time factor ("busyness" or busy directors) and tenure on monitoring female directors' behaviour.

In order to explore the personal attributes of monitoring female directors that can better enhance their monitoring capabilities within the US context, we employ tenure, and busyness (outside directorship). In our investigation, we estimate earnings management using the modified Jones model. Additionally, to further ascertain the robustness of our analysis, we consider the impact of the Sarbanes-Oxley (SOX) act on the association between monitoring female directors and earnings management. The results of the main and further analyses indicate the superiority of monitoring female directors with long tenure and outside directorships in mitigating earnings management practices.

The evidence demonstrated by the current study further inform policymakers about the main attributes that matter for making monitoring female directorship more effective, as only female presence on corporate boards does not seem to make a difference. Accordingly, the study results would enable decision makers to recruit female directors that can better enhance monitoring effectiveness of corporate boards.

The rest of our paper proceeds as follows. Section 2 reviews the theoretical background and the related literature, and puts forward the hypotheses to be tested. Section 3 demonstrates research design. Section 4 reports and discuss study findings. Finally, section 5 concludes the paper and suggests avenues for future research.

2. Theoretical framework, literature review and hypotheses development

2.1. Theoretical background

For the board to carry out its monitoring role effectively, diversity of its members is considered to be one of the key drivers to this (Nguyen et al., 2020; Ozdemir, 2020). Board diversity might be demographic (e.g., gender, race and age), cognitive (e.g., education, professional/occupational background, expertise, tenure and personal characteristics) attributes (Hafsi & Turgut, 2013; Ozdemir, 2020), as well as fiduciary/statutory (e.g., independence, board monitoring committees' membership, leadership) attributes (Ben-Amar et al., 2017; Gull et al., 2018). For the monitoring

board to be effective, it is important to have the right combination of resources and capabilities including knowledge and skills of board members (Dobija et al., 2021).

Based on the evidence provided by existing studies, female directors are the best to do the monitoring function, so their presence on boards can better mitigate managerial opportunism (e.g., Zalata et al., 2019b; Arun et al., (2015); Gavius et al., 2012; Gull et al., 2018; Srinidhi et al., 2011). This raises the need to explore the attributes that can further support female directors' effectiveness in monitoring managers. On the other hand, there are different strands of theories (economic, governance, sociological and psychological) that can help in interpreting the different outcomes of empirical investigations on enhanced female presence in boardrooms. The current study employs a multi-theoretical approach that integrates the notions of a number of well-established theories (agency theory, resource dependence theory, and upper echelon theory).

2.2. Agency theory

The monitoring function of the board is the core of the agency theory (EF Fama & MCJensen, 1983; Jensen & Meckling, 1976). That is, to protect shareholders (principal) from managers' opportunistic behaviour (agents), the board of directors is required to effectively monitor managerial decisions (Martínez & Rambaud, 2019). On the other hand, the broader the skills, backgrounds and knowledge of board members, the more effective the board in carrying out its monitoring function (Hillman and Dalziel, 2003; Martínez & Rambaud, 2019). According to gender diversity realm of research, females are better monitors (Zalata et al., 2019b; Nguyen, 2020). Additionally, as female directors are unlikely to belong to the "old boys club", this enhances their independence (Adams & Ferreira, 2009), so it is unlikely for them to collude with management against the interests of shareholders. Hence, improved female presence in boardrooms would mitigate managerial opportunism (Zalata et al., 2019b; Arun et al., (2015); Dobija et al., 2021; Srinidhi et al., 2011). The arguments of the agency theory raise the need to further investigate what qualities that can better enable female directors to be more effective monitors, further protect the interests of shareholders and enhance the integrity of the corporate financial statements. In a similar vein, Mateus et al. (2020) point out that board intellectual capital composition should be considered, as it influences board effectiveness and governance outcomes of business entities.

2.3. Resource dependence theory

Resource dependence theory, introduced by Pfeffer and Salancik (1978), argues that the main role of corporate boards is to find access to resources and to secure them in order to best serve the interests of shareholders. From the lenses of resource dependence theory, minority directors including female directors are valuable resources because they can bring valuable competencies to the boardrooms as they most likely have advanced education, financial expertise, and strong ties with external environment (Liao et al., 2018; Nguyen, 2020; Ozdemir, 2020). Furthermore, female presence on boards is a proof of adoption of gender equality policies, which in turn encourage talented females to join in the future (Nguyen, 2020). The main heterogeneity argument for women being particularly suitable for monitoring related tasks is attributed to their special talents in tasks of qualitative nature such as strategic control (Dobija et al., 2021; Huse et al., 2009). The questioning mind of females supports the professional scepticism needed by anyone responsible for monitoring (Dobija et al., 2021).

2.4. Upper echelon theory

According to upper echelon theory, there are differences in cognitive frames among corporate directors, which in turn affect experiences, knowledge, values and interpretative capabilities, and hence the decision-making process (Dang et al., 2020; Hambrick, 2007; Post & Byron, 2015). Accordingly, upper echelon theory assumes that board composition significantly influences decision-making strategy, as boards' decisions reflect the experiences and knowledge of their members (Post & Byron, 2015; Graham et al., 2017; Nguyen et al., 2020). Applying to the gender diverse boards, Dang et al. (2020) point out that cognitive differences between female and male directors are clearly recognized. Female directors are most likely to have a better education in terms of holding a university degree and a higher degree (Singh et al., 2008; Dang et al., 2014, 2020); female directors

are more likely to have business backgrounds (Singh et al., 2008; Dang et al., 2020). Additionally, female presence on boards results in improved operating performance (Hsu et al., 2019; Nguyen et al., 2020). We build on this, by assuming that cognitive differences among monitoring female directors are likely to influence their effectiveness in mitigating managerial opportunism.

3. Prior research and hypotheses development

Prior research confirms that female directors play a key role in mitigating firms' opportunism, and improving the quality of financial reporting (e.g., Zalata et al., 2019b; Adams & Ferreira, 2009; Adams et al., 2012; Dobija et al., 2021; Gull et al., 2018; Luo et al., 2017). As pointed out by Luo et al. (2017), the detection of earnings management is not an easy task and hence requires special capabilities that female directors might have. Furthermore, female directors can think more independently than their male counterparts (Adams et al., 2012), likely to be more ethical and less tolerant with managerial opportunism (Gull et al., 2018; Luo et al., 2017). Several studies (e.g., Zalata et al., 2019b; Boussaid et al., 2015; Dobija et al., 2021; Fan et al., (2019); Panzer & Muller, 2015; Srinidhi et al., 2011; Strydom et al., 2017), argue that female presence on boards is proved to have a positive impact on mitigating managerial opportunistic behavior, in terms of improving accruals and enhancing earnings quality. Additionally, it improves the accuracy of earnings forecasts (Gul et al., 2013). However, on the contrary, some other researchers report a negative or non-association between female presence on boards and managerial opportunism (e.g., Elghuweel et al., 2017; Hagendorff & Keasey, 2012; Sun et al., 2011).

These inconclusive findings can be attributed to the necessity of taking into consideration the impact of the attributes of female monitoring directors that may influence their effectiveness on corporate boards. In a similar vein, Nguyen et al. (2020) point out examples of some factors that are likely to affect the capabilities of female directors, such as religious beliefs, occupational diversity, in addition to their personal characteristics. Furthermore, Zalata et al. (2019b) highlighted the importance of focusing on monitoring female directors. Therefore, in this study, we extend prior research by focusing on the attributes of monitoring female directors. In particular, we focus on monitoring female directors outside directorships and their tenure.

3.1. Outside directorship and the effectiveness of monitoring female directors

Based on resource dependence theory, appointing board members who are members of other corporate boards enables corporate access to other valuable resource networks and scarce external knowledge (Al-Mamun & Seamer, 2021; Ismail & Manaf, 2016; Menon & Pfeffer, 2003), and provides directors with experience on how to develop corporate strategies and get access to business support (Al-Mamun & Seamer, 2021). Additionally, holding multiple board seats enables directors to become well-known monitoring experts (Gull et al., 2018). Although some researchers argue that multiple directorship may have a negative impact on corporate governance quality and firm performance, as it may encourage earnings management (Beasley, 1996; Cashman et al., 2012; Chiu et al., 2013), other researchers claim that, outside directorship enhances directors' understanding of the business environment and related issues, hence, improves the efficiency of directors and enables better evaluation of emerging opportunities (Connelly & Van Slyke, 2012). In a similar vein, Field et al. (2013) argue that busy directors are well connected and possess more industry knowledge. More recently, it is proved by Lee (2020) that firms rely more on reputable directors (those with multiple directorships). Outside directorship is proved to limit managerial opportunism, as multiple directorships improve experience gained by directors (Shu et al., 2015). However, according to Zona et al. (2018), the impact of multiple directorships on company performance is subject to a number of factors, mainly, company's relative resources, power imbalance, ownership concentration, and CEO ownership. Overall, outside directorship of corporate board members increases the effectiveness of the board functioning (Ozdemir, 2020). Accordingly, the first research hypothesis can be stated as follows:

H1: The effectiveness of monitoring female directors is significantly influenced by their outside directorship.

3.2. Tenure and the effectiveness of monitoring female directors

Board member tenure is seen by many researchers, as one of the drivers of effective monitoring function (Livnat et al., 2021). Tenure can enhance the efficiency of board decision-making process (Hillman and Dalziel, 2003; Ozdemir, 2020), as long tenured directors are highly skilled due to the valuable information and knowledge they accumulate over time (Bonini et al., 2016). The longer tenured chairpersons improve the quality of internal control within the business firm (Lu & Cao, 2018). Although some researchers claim that longer board tenure weaken Corporate governance (Niu & Berberich, 2015), the majority of researchers (e.g., Beasley, 1996; Bonini et al., 2016; Schnake et al., 2005) argue that longer tenured directors are better monitors to management, and can better prevent fraud and protect the firm from financial scandals. It is pointed out by Gull et al. (2018) that directors need three to five years to gain a sufficient understanding of the company and its operations. Additionally, Lee (2020) claims that firms rely more heavily on long tenured directors. Accordingly, the second research hypothesis can be stated as follows:

H2: The effectiveness of monitoring female directors is significantly influenced by their tenure.

4. Empirical model

In order to investigate H1 and H2, we employ the following two equations, respectively

$$\begin{aligned} ABS_DACC = & FMONT_OUT + FMONT_LESS_OUT + SIZE + LEV + OCF + ROA + MBV + LOSS \\ & + L_ACC + L_NOA + BSIZE + BIND \end{aligned} \quad (1)$$

$$\begin{aligned} ABS_DACC = & FMONT_LONG + FMONT_SHORT \\ & + SIZE + LEV + OCF + ROA + MBV + LOSS + L_ACC + L_NOA + BSIZE + BIND \end{aligned} \quad (2)$$

Where *ABS_DACC* is our proxy for earnings management measured using adjusted Jones model as follows.

$$\begin{aligned} ACCRUALS_{i,t}/ASSETS_{i,t-1} = & \beta_0 + \beta_1 \Delta SALES_{i,t}/ASSETS_{i,t-1} + \beta_2 \Delta CREDIT_{i,t}/ASSETS_{i,t-1} + \beta_3 ROA_t \\ & + \varepsilon_{it} \end{aligned} \quad (3)$$

Where *ACCRUALS* is working capital accruals, *ASSETS* is total assets, *Adj_SALES* is the change in revenues minus the change in accounts receivable and *ROA* is the return on assets. As a robustness analysis, we follow McNichols (2002) and use Accruals Estimation Errors. In both methods, *ABS_DACC* is the absolute value of the residuals from estimating these expectation equations annually for each two-digit SIC industry with at least 10 observations.

FMONT_OUT is monitoring female directors with at least three outside directorships and *FMONT_LESS_OUT* is monitoring female directors with a maximum of two outside directorships. *FMONT_LONG* is monitoring female directors with long tenure and *FMONT_SHORT* is monitoring female directors with short tenure. In addition to these main variables, we control for firm size (*SIZE*), Leverage (*LEV*), operating cash flows (*OCF*), Return on Assets (*ROA*), Market to Book Value (*MBV*), Losses (*LOSS*), Lagged Accruals (*L_ACC*), Lagged Net Operating Assets (*L_NOA*), Board Size (*BSIZE*) and the percentage of Independent Directors (*BIND*). We define these variables in Table 1.

5. Sample and data

In order to investigate our research hypotheses, we use a sample of US firms over the period from 1998 to 2014. However, we eliminate firms operating in financial industries given its different

Table 1. Descriptive statistics

Variable	Mean	Maiden	St.D.	Q1	Q3
ABS_DACC	0.06	0.04	0.08	0.02	0.08
FMONT_OUT	0.01	0.00	0.06	0.00	0.00
FMONT_LEE_OUT	0.10	0.00	0.15	0.00	0.20
FMONT_LONG	0.05	0.00	0.11	0.00	0.00
FMONT_SHORT	0.06	0.00	0.12	0.00	0.00
SIZE	7.54	7.38	1.56	6.44	8.52
LEV	0.59	0.35	1.06	0.01	0.80
OCF	0.12	0.11	0.09	0.07	0.17
ROA	0.05	0.06	0.10	0.02	0.10
MBV	3.06	2.21	3.16	1.45	3.56
LOSS	0.16	0.00	0.37	0.00	0.00
L_ACC	0.01	0.00	0.06	-0.02	0.03
L_NOA	0.79	0.58	0.69	0.35	0.98
BSIZE	0.93	1.00	0.25	1.00	1.00
BIND	0.72	0.75	0.16	0.62	0.86

ABS_DACC is the absolute value of discretionary accruals estimated using adjusted Jones model.

FMONT_OUT is the percentage of monitoring female directors with at least three outside directorships.

FMONT_LEE_OUT is the percentage of monitoring female directors with maximum of two outside directorships.

FMONT_LONG is the percentage of monitoring female directors with long tenure.

FMONT_SHORT is the percentage of monitoring female directors with short tenure.

SIZE is firm size measured as the natural logarithm of firms' market value.

LEV is leverage measured as the proportion of long term debt to book value of equity.

OCF is cash flows from operations measured as the proportion of operating cash flows to lagged total assets.

ROA is return on assets measured as net income divided by lagged total assets.

MBV is market to book value measured as the proportion of firms' market value to equity book value.

LOSS is an indicator variable set to one if the firm achieve net losses and zero otherwise.

L_ACC is lagged working capital accruals.

L_NOA is firms net operating assets at the beginning of the year.

BSIZE is board size measured as an indicator variable set to one if the board size is between 5 and 12 and zero otherwise.

BIND is independent directors measured as proportion of independent directors to the total number of directors.

financial reporting/regulatory environment. Furthermore, in order to ensure sufficient observation required to estimate our expectation models, we exclude non-financial industries with less than 10 firm-year observations. Finally, we exclude firms with missing variables required to run equations (1) (2), (3) and (4). These procedures lead to a final sample of 15,234 firm-year observations over the period from 1998 to 2014.

6. Descriptive statistics

The descriptive statistics for the full sample are summarized in Table 1. These show that **ABS_DACC** has mean of 0.06 for all firms. Notably, monitoring female directors with more outside directorships (**FMONT_OUT**) represents, on average, 1%, while female directors holding less outside directorships (**FMONT_LESS_OUT**) represents 10%. This suggests a variation in the level of their representation in our sample. Furthermore, the mean of monitoring female with long serving period on the board is 5%, showing insignificant difference in females' representation if compared with those with short tenure (6%). Table 2 presents correlation matrix and in general there is not multicollinearity problem.

Table 2. Correlation matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 ABS_DACC	1.00														
2 FMONT_OUT	-0.03***	1.00													
3 FMONT_LESS_OUT	-0.03***	-0.06***	1.00												
4 FMONT_LONG	-0.04***	0.24***	0.59***	1.00											
5 FMONT_SHORT	-0.02*	0.19***	0.65***	-0.10***	1.00										
6 SIZE	-0.02**	0.14***	0.16***	0.19***	0.09***	1.00									
7 LEV	-0.07***	0.02**	0.07***	0.06***	0.04***	0.04***	1.00								
8 OCF	0.10***	0.01	0.01	0.00	0.01	0.27***	-0.13***	1.00							
9 ROA	0.04***	0.03***	0.04***	0.05***	0.02**	0.31***	-0.12***	0.67***	1.00						
10 MBV	0.12***	0.03***	0.03***	0.05***	0.01	0.32***	0.36***	0.33***	0.28***	1.00					
11 LOSS	0.03***	-0.03***	-0.07***	-0.08***	-0.04***	-0.28***	0.06**	-0.39***	-0.68***	-0.12***	1.00				
12 L_ACC	0.01	-0.01	-0.03***	-0.04***	-0.01*	-0.03***	-0.01	0.03***	0.07***	-0.02***	-0.05***	1.00			
13 L_NOA	-0.12***	-0.05***	-0.02**	-0.02**	-0.03***	0.12***	0.20***	-0.16***	-0.23***	-0.16***	0.10***	0.00	1.00		
14 BSIZE	0.04***	-0.06***	-0.05***	-0.06***	-0.03***	-0.26***	-0.05***	0.02**	0.00	0.00	0.04***	0.01	-0.08***	1.00	
15 BIND	0.00	0.06***	0.19***	0.18***	0.10***	0.21***	0.06***	0.00	0.03***	0.02**	-0.06***	-0.03***	-0.01	0.02***	1.00

***, **, * Indicate significance at 1 percent, 5 percent, and 10 percent levels in a two-tailed test, respectively.

Variables are defined in the Table 1.

7. Multivariate analysis

Table 3 presents our regression analysis with *ABS_DACC* as a dependent variable. In addition to other control variables, Model (1) contains regression estimates of discretionary accruals on monitoring female directors who serve on at least three corporate boards (*FMONT_OUT*), while in Model (2), we regress discretionary accruals on directors who serve on less than three corporate boards (*FMONT_LESS_OUT*). Furthermore, we regress discretionary accruals on both types of monitoring female directors—(*FMONT_OUT*) and (*FMONT_LESS_OUT*)—in Model (3).

In general, the results suggest that female directors are associated with high earnings quality (i.e., less earnings management). It is shown that the outside directorships improve monitoring female directors' ability to constrain earnings management. The estimated coefficient on *FMONT_OUT*, as presented in Table 3 under Model 1 and Model 3 is negative and significant at 1%. However, as reported under Model 2 of Table 3, the coefficient of *FMONT_LESS_OUT* is negative and significant at 10%. Interestingly, as reported under Model 3, the coefficient on *FMONT_OUT* (-0.46) seems to be lower than that of *FMONT_LESS_OUT* (-0.014) demonstrating that monitoring female directors holding outside directorships would improve directors' monitoring skills and expertise. This is in line with Fama and Jensen's (1983) argument that these directors could improve board-monitoring effectiveness as they utilize their experience and knowledge gained from other boards. That is, female directors holding more outside directorships would learn more about corporate governance mechanisms to achieve high board monitoring in different firms. Moreover, these directors are more likely to mitigate financial reporting opportunism in their firms to protect their reputation and to avoid any potential litigation. Consequently, holding outside directorships would lead monitoring female directors to fulfill their duties to maintain current outside directorships and to gain more future ones (Helland, 2006; Sharma & Iselin, 2012).

Furthermore, we classify monitoring female directors into two groups based on their tenure: short (*FMONT_SHORT*) and long tenure (*FMONT_LONG*). Arguably, directors serving for long periods are more likely to develop close relationships with firms' management, while new directors are more likely to be more independent (Beasley, 1996). Nevertheless, short tenured directors are more likely to be nominated and appointed by the current CEO that might negatively affect their independence (Sun & Cahan, 2009; Sun et al., 2009). On the other hand, according to Aldefer (1986), serving on the board for a long time is beneficial as longer tenure enables directors to become more familiar with firms' organizational practices, functions and operations (Singh & Harianto, 1989; Yang & Krishnan, 2019a). Compared to new directors, long-tenure directors would also benefit from training programs throughout their tenure that adds to their firm essential expertise, and hence can complement their financial background. That could better contribute to the quality of financial reporting.

To obtain better knowledge and new evidence to understand the monitoring quality of monitoring female directors, we report regression estimates of monitoring female directors with long and short tenure in Table 4. The results show that the long tenure improves monitoring female directors' ability to constrain earnings management. The estimated coefficient on *FMONT_LONG*, as presented in Table 4 under Model 1 and Model 3 is negative and significant at 1%. Interestingly, as reported under Model 2 and Model 3 of Table 4, the coefficient of *FMONT_SHORT* is negative but insignificant as well as it seems higher than the coefficient on *FMONT_LONG*. The results suggest that the long tenure enhances monitoring female directors' ability to oversight the financial reporting process. Thus, our results show that the longer the period served on the board, the greater the knowledge gained by monitoring female directors about the accounting practices by their firms. Thus, when they serve on firm's board for a long period, monitoring female directors would employ their awareness with firm's business along with related experience to control earning management practices. In line with Bedard et al. (2004), Yang and Krishnan (2019a), as well as Zalata and Roberts (2016) who find that earnings management is less pronounced in firms with long-tenure directors, we report that long serving period on the board is associated with the

Table 3. Regression estimates of monitoring female directors with and without outside directorships

Variables	Model (1)		Model (2)		Model (3)	
	Coef.	t	Coef.	t	Coef.	t
FMONT_OUT	-0.042	-3.23***			-0.046	-3.46***
FMONT_LESS_OUT			-0.012	-1.83*	-0.014	-2.08**
SIZE	-0.004	-4.20***	-0.004	-4.35***	-0.003	-3.98***
LEV	-0.008	-7.31***	-0.008	-7.23***	-0.008	-7.15***
OCF	0.076	4.64***	0.076	4.67***	0.075	4.63***
ROA	-0.028	-1.45	-0.029	-1.46	-0.029	-1.48
MBV	0.004	8.79***	0.004	8.83***	0.004	8.76***
LOSS	0.012	3.87***	0.012	3.82***	0.012	3.81***
L_ACC	0.015	1.06	0.015	1.02	0.014	0.99
L_NOA	-0.008	-5.97***	-0.008	-5.87***	-0.008	-6.14***
BSIZE	0.003	0.42	0.003	0.53	0.004	0.65
BIND	0.002	0.53	0.002	0.54	0.002	0.47
_CONS	0.079	9.93***	0.08	9.93***	0.078	9.79***
YEARS	YES		YES		YES	
R2	0.069		0.069		0.070	
F	21.00		21.09		20.57	
OBS	15234		15,234		15,234	

***, **, * Indicate significance at 1 percent, 5 percent, and 10 percent levels in a two-tailed test, respectively. Variables are defined in the Table 1.

Table 4. Regression estimates of monitoring female directors with long and short tenure

Variables	Model (1)		Model (2)		Model (3)	
	Coef.	t	Coef.	t	Coef.	t
FMONT_LONG	-0.027	-3.27***			-0.028	-3.35***
FMONT_SHORT			-0.006	-0.88	-0.01	-1.34
SIZE	-0.004	-4.19***	-0.004	-4.46***	-0.003	-4.07***
LEV	-0.008	-7.26***	-0.008	-7.30***	-0.008	-7.16***
OCF	0.075	4.60***	0.076	4.69***	0.075	4.61***
ROA	-0.028	-1.45	-0.028	-1.45	-0.029	-1.47
MBV	0.004	8.89***	0.004	8.80***	0.004	8.83***
LOSS	0.012	3.77***	0.012	3.86***	0.012	3.76***
L_ACC	0.014	0.98	0.015	1.07	0.014	0.96
L_NOA	-0.008	-5.95***	-0.008	-5.78***	-0.008	-6.04***
BSIZE	0.004	0.62	0.002	0.39	0.004	0.71
BIND	0.002	0.48	0.002	0.58	0.002	0.46
_CONS	0.079	9.80***	0.08	10.02***	0.078	9.75***
YEARS	YES		YES		YES	
R2	0.069		0.068		0.070	
F	21.24		20.89		20.59	
OBS	15234		15,234		15,234	

***, **, * Indicate significance at 1 percent, 5 percent, and 10 percent levels in a two-tailed test, respectively.

Variables are defined in the [Table 1](#).

ability to mitigate earnings management. This implies that long tenure monitoring female directors work as an effective monitoring mechanism to oversight the financial reporting process.

8. Further analysis

Our analysis suggests that monitoring female directors—especially those holding more outside directorships and serving longer on the board—are associated with a higher ability to mitigate earnings management. However, the above analysis has not considered the impact of the Sarbanes–Oxley act (SOX), which might have influenced female directors’ perception towards earnings management. In this section, we go further and investigate whether SOX affects female directors’ behaviours in this regard.

SOX is considered as the most important US reform that significantly affected business practices (Cohen & Zarowin, 2010). For corporate directors involved in illegal practices, SOX has magnified litigation risks and costs with lengthier prison terms and bigger fines (Zalata et al., 2019a). Therefore, it is expected that SOX affected financial reporting decisions. For instance, extant research suggests that corporate directors are more likely to avoid Accrual Earnings Management because of the increased detection costs after the passage of SOX (Cohen et al., 2008).

This regulatory environment introduces an interesting setting to see whether our previous results are attributed to SOX. Thus, it can be argued that female directors would show high level of compliance with laws, codes, and regulations to avoid future lawsuits. Apparently, female directors—compared to their male counterparts—are more likely to be more risk averse when they adopt specific firm policies or make financial decisions (Adhikari et al., 2018; Barber & Odean, 2001; Lenard et al., 2017). Therefore, one might argue that SOX act might have motivated female directors to exercise close monitoring over financial reporting or earning management practices.

Table 5. Regression estimates of monitoring female controlling for the impact of SOX

Variables	Monitoring female directors with and without outside directorships				Monitoring female directors long and short tenure.			
	Model (1) Post SOX period		Model (2) Pre SOX period		Model (3) Post SOX period		Model (4) Pre SOX period	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
FMONT_OUT	-0.046	-2.85***	-0.041	-1.82*				
FMONT_LESS_OUT	-0.013	-1.57	-0.016	-1.76*				
FMONT_LONG					-0.028	-2.71***	-0.028	-2.68***
FMONT_SHORT					-0.008	-0.80	-0.016	-1.55
SIZE	-0.004	-3.57***	-0.002	-1.97**	-0.004	-3.63***	-0.002	-2.03**
LEV	-0.011	-6.82***	-0.004	-3.17***	-0.011	-6.84***	-0.004	-3.16***
OCF	0.067	3.37***	0.075	2.93***	0.067	3.35***	0.075	2.93***
ROA	0.002	0.09	-0.07	-2.53**	0.002	0.09	-0.07	-2.53**
MBV	0.005	7.48***	0.003	4.13***	0.005	7.55***	0.003	4.13***
LOSS	0.014	3.21***	0.009	2.24**	0.014	3.18***	0.008	2.18**
L_ACC	0.019	0.92	0.01	0.50	0.019	0.88	0.009	0.49
L_NOA	-0.006	-3.50***	-0.011	-6.55***	-0.006	-3.44***	-0.011	-6.48***
BSIZE	0.015	1.45	-0.007	-1.23	0.015	1.51	-0.007	-1.20
BIND	-0.002	-0.51	0.008	2.29**	-0.003	-0.52	0.008	2.29**
_CONS	0.071	6.20***	0.076	8.13***	0.071	6.15***	0.077	8.13***
YEARS	YES		YES		YES		YES	
R2	0.075		0.060		0.075		0.060	
F	16.89		15.39		16.89		15.29	
OBS	10673		4561		10,673		4561	

***, **, * Indicate significance at 1 percent, 5 percent, and 10 percent levels in a two-tailed test, respectively. Variables are defined in the Table 1.

Considering the impact of SOX, the results of the analysis are reported in Table 5. We regress discretionary accruals on monitoring female directors who hold outside directorships (*FMONT_OUT*) and those hold fewer outside directorships (*FMONT_LESS_OUT*). In general, our results on *FMONT_OUT* are negative and significant at 10% before the passage of SOX. However, it is still negative but becomes more significant (at 1%) after the passage of SOX. This suggests that *FMONT_OUT* play a critical role in mitigating accruals-based earnings management, especially in post-SOX era. On the other hand, the coefficient of *FMONT_LESS_OUT* was negative and significant at 10%, but it becomes insignificant in the post SOX era. This confirms our finding that monitoring female directors holding more outside directorships could improve their monitoring skills. Furthermore, they will be keen to keep good reputation by avoiding risky and costly policies that might lead to potential litigations.

As reported in Table 5, we regress discretionary accruals on monitoring female directors who have long tenure (*FMONT_LONG*) and those having short tenure (*FMONT_SHORT*). The results indicate that the coefficient of *FMONT_LONG* is negative and significant at 1% in both samples. In contrast, the coefficient of *FMONT_SHORT* is negative but insignificant either before or after the passage of SOX. Therefore, the results with regard to directors' tenure have not been impacted by SOX passage. These relationships provide support to our argument that firms with long tenure female directors would show higher degree of oversight over financial reporting process than those firms with short tenure female directors. In line with past studies (e.g., Yang & Krishnan, 2019a; Zalata & Roberts, 2016), the results indicate that earnings management is less pronounced in firms with long-tenure directors. However, our results provide evidence that this association is not driven by SOX act. These results support our suggestion that long tenure female directors work as an effective monitoring mechanism. Thus, these directors employ their accumulated knowledge about firms' business and accounting practices to control earnings management practices by firms.

9. Robustness analysis

As a robustness analysis, we follow McNichols (2002) and use Accruals Estimation Errors as a proxy for earnings management as follows.

$$\begin{aligned} \text{ACCRUALS}_{i,t}/\text{ASSETS}_{i,t-1} = & \beta_0 + \beta_1 \text{OCF}_{i,t-1}/\text{ASSETS}_{i,t-2} + \beta_2 \text{OCF}_{i,t}/\text{ASSETS}_{i,t-1} \\ & + \beta_3 \text{OCF}_{i,t+1}/\text{ASSETS}_{i,t} + \beta_4 \Delta \text{SALES}_{i,t}/\text{ASSETS}_{i,t-1} \\ & + \beta_5 \text{PPE}_{i,t}/\text{ASSETS}_{i,t-1} + \varepsilon_{it} \end{aligned} \quad (4)$$

where *OCF* is the cash flows from operations and ΔSALES is the change in sales. *PPE* is property, plant and equipment. We then run Eq 4 annually for each two-digit SIC industry code with at least 10 observations and estimate the Accruals Estimation Errors (*AEE*) as the residuals. Using the absolute value of *AEE* as our dependent variables, un-tabulated results are still qualitatively similar to our main analysis.

10. Conclusion

Given the escalating trend worldwide towards women empowerment and the contribution of gender diversity in enhancing corporate boards' performance, this study sheds light on the main attributes that adds to the superiority of female directors in monitoring corporate management. We examine the influence of female directors' tenure and busyness on their effectiveness in mitigating earnings management using a sample of 15,234 firm-year observations of non-financial firms listed on the US over the period from 1998 to 2014. In line with the theoretical foundation of this study, our analysis supports a positive influence of long tenure and more directorships on monitoring female directors' ability to mitigate earnings management. Additionally, considering the impact of the SOX act on female directors' tendency towards earnings management, results confirm our finding that monitoring female directors holding more outside directorships could improve their monitoring skills and are more keen to keep good reputation by avoiding risky and costly policies that might lead to potential litigations.

However, with regard to directors' tenure, results do not demonstrate SOX effect, thus support our evidence that long tenure female directors work as an effective monitoring mechanism.

Despite the contribution of this study to the current debate on the role of female directors on boardrooms, and the specific attributes that strengthen their competency, it has some limitations. We investigate the influence of tenure and busyness of female directors on mitigating earnings management applying to non-financial institutions operating in the US. Future research may investigate the influence of other attributes (e.g., education, ethnic diversity, nationality). Additionally, future research may investigate the same issue in other developed or less developed contexts and compare the results, as well as it may apply to financial institutions. This study employs agency theory, resource dependence theory; upper echelon theory to interpret the association between monitoring female directors' attributes and earnings management. Future research may interpret such association from the lenses of other theories such as critical mass theory and human capital theory. Future research also may examine the influence of some variables such as economic crisis, and firm financial distress on the association between female monitoring directors attributes and earnings management practices.

Acknowledgements

We are very grateful for helpful comments received from the anonymous reviewers and Professor Collins Ntim. We also gratefully acknowledge the financial support received from the research sector, Arab Open University, Kuwait Branch under decision number 22069'2022

Funding

This research was supported and funded by the research sector, Arab Open University, Kuwait Branch under decision number 22069

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Disclosure statement

No potential conflict of interest was reported by the authors

Correction

This article has been republished with minor changes. These changes do not impact the academic content of the article.

Citation information

Cite this article as: Attributes of female directors and accruals-based earnings management, Hany Elzahar, Alaa Zalata & Marwa Hassaan, *Cogent Business & Management* (2022), 9: 2139212.

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