

Non-executive Female Directors and Earnings Management using Classification Shifting

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ABSTRACT: Prior business studies have focused on the role of female directors in constraining accruals-based earnings management with relatively less attention paid to other less risky earnings management methods. In contrast to these studies, we investigate whether non-executive female directors go beyond the neoclassical measurement and recognition-based accounting issues and pay more attention to the classification of core expenses within the income statement. We find evidence supporting the ongoing debate that classification shifting is less likely to attract the attention of either external or internal monitors. We did not find evidence that non-executive female directors are more likely to challenge managers' opportunistic classificatory practices; rather, the results reveal a significant positive relationship between non-executive female directors and classification shifting. Finally, our finding remains robust after controlling for potential endogeneity problems and tokenism.

Keywords: Female directors, Gender diversity, Earnings management, Classification shifting.

1. Introduction

The objective of this study is to investigate whether non-executive female directors mitigate earnings management using classification shifting; a relatively under-investigated earnings management method¹. The debate on gender diversity has received growing attention from policymakers, regulators, market participants and academics. In recent years, a remarkable effort to increase female representation on corporate boards has become evident around the world² and noticeably most female directors hold non-executive positions³. Arguably, women are appointed to firms' board because this is their right (justice case). However, and in addition to the justice case, the presence of female members on the board of directors has been widely justified by the business case where female inclusion enhances shareholder value (Gul, Srinidhi, & Ng, 2011; Habib & Hossain, 2013; Kang, Ding, & Charoenwong, 2010). Prior studies (e.g., Lara, Osma, Mora, & Scapin, 2017; Srinidhi, Gul, & Tsui, 2011; Zalata, Tauringana & Tingbani, 2018) also highlight that female directors play a role in improving board of directors' decisions, particularly those related to financial reporting decisions.

Several theories predict the value added by female participation on corporate boards. For example, the organizational theory claims that gender-diversified boards have better organizational performance due to the different views, skills and attitudes brought by females (Brammer, Millington, & Pavelin, 2009). Gender-diversified boards pay more attention and effort to oversight and monitoring, where female directors are more likely to sit in monitoring positions such as audit committees (Adams & Ferreira, 2009). Furthermore, the upper echelons theory predicts that the values and perceptions of top management affect firms' choices, performance and outcomes (Hambrick & Mason, 1984). On the other hand, some studies contend that gender differences are not applicable in specialized disciplines, high-profile jobs, and leadership positions (Adams & Funk, 2012; Adams & Rangunathan, 2015; Deaves, Lüders, & Luo, 2009) and gender diversity

¹ Classification shifting refers to the opportunistic categorization of some core expenses as special items in order to inflate core earnings and thereby signal strong core and persistent profitability (Fan, Barua, Cready, & Thomas, 2010).

² For example, the European Commission's target is to increase the number of women on European public company boards to 40% by 2020.

³ For instance, non-executive female directors in the UK represent about 92%, while 93% of women hold directorship on FTSE 100, and FTSE 250 boards (Vinnicombe, Atewologun, & Battista, 2019). A similar case is in the EU; women hold 29.3% of non-executive positions and 16.6% of executive positions (European Commission, 2019).

might be used as a signal to improve firm reputation (Brammer et al., 2009) suggesting therefore that female directors may not impact financial reporting decisions.

Nevertheless, as shown in Appendix A, the majority of prior empirical studies already suggest that the participation of female directors is associated with less accruals-based earnings management (e.g., Arun, Almahrog, & Aribi 2015; Gull, Nekhili, Nagati, & Chtioui 2018; Srinidhi et al., 2011). Since the revaluation of more rigorous regulations in the post-Enron 2001 financial collapse era, regulators, auditors and academics have directed a close spotlight on firms' accruals-earnings management and, as such, it would make it easier to assess the accounting treatment of these blatant book-cooking methods. Therefore, one might argue that, given the notion that females are more risk-averse than men are, it is reasonable to find them associated with fewer accruals-earnings management activities (Zalata, Ntim, Aboud & Gyapong, 2019). In other words, this negative relationship might be explained by the high litigation risk as this type of manipulation affects the reported income and, as such, attracts the attention of regulators, auditors and non-executive directors.

While we know how a negative relationship can develop, less is known about how females behave in dilemma situations where there are many interpretations and judgments as well as flexibility within Generally Accepted Accounting Principles (GAAP). It is not clear whether the value that non-executive female directors create for their firms' shareholders can be extended to other less risky forms of earnings management. We argue that understanding the impact of female directors on different firms' outcomes plays a significant role in informing increasing worldwide reforms requiring more female representation within corporate boards. That is, in this paper, we aim to extend prior gender studies by investigating the role of non-executive female directors in mitigating a less costly earnings management method that is widely used to achieve managers' opportunistic targets – namely, *classification shifting-based earnings management*.

Contrary to accruals earnings management, classification shifting does not alter the reported net income or affect the future economic benefits (Malikov, Manson, & Coakley, 2018; McVay, 2006; Zalata & Roberts, 2016, 2017). The motives for employing classification shifting are based on the importance of core earnings to the decisions taken by investors, particularly less sophisticated investors (Bhattacharya, Black, Christensen, & Mergenthaler, 2007; Bradshaw & Sloan, 2002; Elliott, 2006). That is, if firms engage in classification shifting, less sophisticated investors would be at risk of being misled by such practices (Allee, Bhattacharya, Black, & Christensen, 2007; Fan et al., 2010; McVay

2006). Extant research (i.e., Alfonso, Cheng, & Pan., 2015; McVay 2006) suggests that investors are indeed not able to discover such opportunistic misclassification of core operating expenses given the information asymmetry between what managers know and what they (the investors) know about such core operating expenses. In addition, managers' compensation and debt contracts are largely dependent on firms' core earnings performance (Bentley, Christensen, Gee, & Whipple, 2018; Cain, Kolev, & McVay, 2019; Dyreng, Vashishtha, & Weber 2017; Li, 2010, 2016). All suggest that the surrounding environment strongly motivates managers to misclassify some of their core expenses as special items and therefore improve their core profitability in order to affect not only investors' or lenders' perceptions but also their compensation. Prior classification shifting studies (i.e., Fan et al., 2010, 2019; McVay, 2006) strongly evince that that US firms are motivated to engage in such practices. However, these studies contend, albeit with less direct less direct empirical evidence, that classification shifting is less subject to vigorous scrutiny by either internal or external monitors. Different from extant classification shifting and gender studies, we therefore investigate whether non-executive female directors scrutinize the classification of core expenses and thereby constrain any opportunistic misclassification (classification shifting).

Arguably, females' appointment within boardrooms is, to some extent, based upon their superior monitoring skills and, therefore, one might posit that it is reasonable to extend prior accruals-based earnings management to classification shifting. However, we should differentiate between accruals-based and classification shifting-based earnings management. Different from accruals-based earnings management, classification shifting is subject to significant managerial judgment and fewer disclosure requirements (McVay 2006). In addition, it is not concomitant of either the measurement or the recognition of expenses; instead, it is associated with the disclosure of expenses under the inappropriate category within the income statement. Consequently, it will not affect the bottom-line GAAP net income. As such, regulators and probably external auditors are less likely to closely scrutinize the proper classification of core expenses within the income statement (McVay 2006; Nelson, Elliott, & Tarpley, 2002). This illustrates why classification shifting might be considered as a desirable, less costly and less risky tool for earnings management (Zalata & Roberts 2016, 2017). Such misclassification may mislead decision makers and expose them to more risk. That is, classification shifting is a different setting that constitutes a powerful method to investigate the role of non-executive female directors in protecting investors' interests.

In a related study, Zalata et al. (2019a) evince that firms with female CEOs do not perceive classification shifting as a viable earnings management method post- Sarbanes–Oxley Act (SOX). However, it is worth noting that they focused on female CEOs who are required to certify the material accuracy and completeness of their firms’ financial statements, and they might face criminal penalties of \$5million and 20 years in prison if they file misstated financial statements (Lobo & Zhou, 2006). As such, it is reasonable to find that female CEOs are less likely to engage in classification shifting and it is possible that this certification drives the findings reported by Zalata et al. (2019a). Indeed, the results of Zalata et al. (2019a) cannot be complete without investigating the monitoring role of non-executive female directors and we believe that, since non-executive female directors are not required to certify the financial statements, they might exhibit different behavior from female CEOs. In addition, Gallhofer (1998) criticizes extant research for using the term “Female” as a universal and unitary category which might lead to the erroneous conclusion that the observed behavior is of equal relevance for all females, while failing to address the individual differences between women themselves. This highlights the need for more research focusing on another female category within the boardroom (e.g., non-executive female directors). That is, our paper, complements Zalata et al. (2019a) work and investigates the monitoring role of non-executive female directors in constraining classification shifting. In doing this we provide some evidence on whether it is gender *per se* that drives female behavior or whether it is their position within the boardroom.

Using a sample of US firms from 2007 to 2014, and in contrast to accruals-based earnings management studies (e.g., Srinidhi et al., 2011), we find that classification shifting is positively associated with the participation of non-executive female directors on either a firm’s board or on its audit committee. Besides, our findings do not seem to be driven by firms operating in less litigious industries. In particular, we find that non-executive female directors do not mitigate classification shifting in both high and low litigious industries. Furthermore, it seems that non-executive female directors with long career horizons do not significantly mitigate firms’ classification shifting.

Our study makes several contributions to gender and earnings management literature included in Appendix A. *First*, we extend prior gender studies and accruals-based earnings management (Lara et al., 2017; Qi et al., 2018; Srinidhi, Gul, & Tsui, 2011) by investigating the role of non-executive female directors in mitigating a less costly form of earnings management – *classification shifting*. Prior accounting studies (i.e., Fan et al., 2010) suggest that when firms are constrained from using accruals, they are more likely to shift to another less costly method; for example, in our case, classification shifting. Consequently, the analysis of extant gender and earnings

management studies cannot be complete without investigating whether non-executive female directors mitigate classification shifting. Our findings suggest that the monitoring role of non-executive females varies according to the form of earnings management applied. In particular, while our findings show that non-executive females mitigate accruals earnings management, classification shifting represents an unintended consequence of female directors' participation within the boardroom. Our paper, therefore, contributes to accounting studies by gauging the impact of accruals-based earnings management detection costs (in our case, the participation of non-executive female directors) on classification shifting. To the best of our knowledge, this study is the first to offer empirical evidence for the role of non-executive females on core earnings quality.

Second, our findings add to prior classification shifting studies by documenting a new determinant from the gender of non-executive directors. This finding has an important implication for the board of directors in general and female directors in particular focusing to a greater extent on the measurement and recognition of expenses with little courtesy to the classification of expenses within the income statement. Classification shifting-based earnings management is widely used by some firms, and therefore it deserves vigorous scrutiny by non-executive female directors. Finally, our study responds to the call for more research to provide further evidence on what diversity mixes most benefit firms and the economy overall (Lara et al., 2017). There is limited archival research on the effect of non-executive female directors on classification shifting.

The rest of the study is organized as follows. Section 2 presents the extant literature and develops research hypotheses. The research design, sample, data and research model are presented in section 3, while section 4 discusses the empirical findings. Section 5 concludes the study, states its limitations, and sets out avenues for future research.

2. Literature review and hypotheses development

According to social cognitive theory, personal characteristics affect individuals' behavior and help others understand and predict their performance differences (Bandura, 1986). Prior studies suggest that women possess soft skills that lead them to behave differently from men. For instance, females are more risk-averse (Byrnes, Miller, & Schafer, 1999; O'Fallon & Butterfield, 2005), more likely to avoid competition (Adams & Funk, 2012; Gneezy, Niederle, & Rustichini, 2003; Hogarth, Karelai, & Trujillo, 2012), more ethical,

and have higher levels of moral reasoning than their male counterparts (e.g., Ford & Richardson, 1994; Harjoto & Rossi, 2019; Sweeney, Arnold, & Pierce, 2010; Thorne, Massey, & Magnan, 2003).

Additionally, the selectivity hypothesis assumes different information-processing strategies; females are more comprehensive information processors focusing on details while males are selective information processors who use heuristics and miss subtle cues (Darley & Smith, 1995; Meyers-Levy, 1986). While men are overconfident, overestimate their abilities, and believe they have greater control over uncertain events (Larwood & Whittaker, 1977), women are less likely to be overconfident, particularly in making financial decisions (Barber & Odean, 2001). Women are less optimistic (Abdelfattah, Elmahgoub, & Elamer, 2020; Libby & Rennekamp, 2012; Skala, 2008); they tend to overestimate their responsibilities and to take decisions that may affect the scope and performance of their tasks (Fondas & Sasselos, 2000; Ittonen, Vähämaa, & Vähämaa, 2013).

Extant gender studies suggest that, given these soft behavioral differences between women and men, female representation on the boards brings different perspectives, skills, and attitudes that enhance boards' and audit committees' monitoring, and add value to the shareholders (Adams, 2016; Carter, Simkins, & Simpson, 2003; Zalata, Ntim, Choudhry, Hassanein, & Elzahr, 2019). As more risk-averse and less risk-tolerant, female directors participate in less risky behavior and choices (Abdelfattah et al., 2020; Ho, Li, Tam, & Zhang, 2015), and report earnings more conservatively, particularly in firms with higher litigation risks (Francis, Hasan, Park, & Wu, 2015; Ho et al., 2015). On the other hand, male directors are found to engage more in unethical behavior such as insider trading and managing earnings opportunistically, such practices continued after the regulatory change of SOX (Betz, O'Connell, & Shepard, 1989; Hsieh, Bedard, & Johnstone, 2014).

Contrary to the assumption of gender differences in business studies, some argue that not all gendered behavior characteristics are applicable in managerial positions particularly when men and women hold the same organizational position or work in specialized disciplines (Croson & Gneezy, 2009; Deaves et al., 2009; Eagly & Johnson, 1990). For instance, prior studies in the banking industry find no evidence of the expected gender differences related to risk aversion, as women in in this area of the financial industry are more likely to be more risk-tolerant and less risk-averse than women in other industries (Adams & Ragunathan, 2015; Sapienza, Zingales, & Maestripieri, 2009).

Similarly, Sila, Gonzalez and Hagedorff (2016) find no evidence of female directors' impact on risk-taking behaviors.

The role of female directors in constraining opportunistic managerial behavior has been widely investigated but the evidence from prior earnings management studies, as shown in Appendix A, is rather mixed. For instance, prior studies provide evidence of a positive impact of gender-diversified boards on the financial reporting quality in general and particularly on earnings management (e.g., Labelle, Gargouri, & Francoeur, 2010; Lara et al., 2017; Gul, Hutchinson, & Lai, 2013; Zalata et. al., 2018). However, other studies find no gender effects on earnings management practices (e.g., Sun, Liu, & Lan, 2011).

Nevertheless, as shown in Appendix A, most of these studies focus on accruals-based earnings management and, to a significant extent, disregard other financial reporting decisions that can be used to affect the perception of investors about the underlying performance of their firms. Arguably, accruals-based earnings management is a costly earnings management method that is more likely to attract the attention of regulators, auditors and investors. That is, it is reasonable to find that female directors, as more risk-averse, tend to mitigate such practice in order to avoid any potential litigation or to protect their reputation. Consequently, one might argue that when the litigation risk or reputation concerns are minimal, female directors might behave similarly to male directors, and therefore we should not observe any differences between them. Hence, it is not clear how female directors behave in a dilemma situation where litigation risk and reputation concerns are minimal. Classification shifting provides us with the persuasive setting to investigate such a question. Arguably, and on the one hand, classification shifting is part of the financial reporting decisions that should be discussed during board and audit committee meetings, and therefore female directors might adequately scrutinize the classification of core expenses and consequently mitigate any potential purposeful misclassification of these items within the income statement.

On the other hand, since classification shifting is not related to the measurement and recognition of core expenses and has no impact on the bottom-line net income, it is less likely to signal high litigation and reputation concerns for either firms or directors. As such, non-executive female directors might pay less attention to the classification of expenses within the income statement than they do to accruals-based earnings management. In addition, the information asymmetry paradox between managers and non-executive directors (Brennan, Kirwan, & Redmond, 2016) may partially explain why non-

executive female directors tend to have a less effective role in mitigating classification shifting. The intended consequences of having non-executive directors on the board depend on the healthy communication between managers and non-executives, which is essential for both monitoring and advisory roles (Roberts, McNulty, & Stiles, 2005). Classification shifting is subject to high managerial discretion over the classification of items and less disclosure requirements (McVay, 2006) and, therefore, there would be high information asymmetry between what managers know and what non-executive female directors know about the nature of core expenses. That is, non-executive female directors may not be aware of all the components of core earnings, the recurring core expenses, special items, and the correct way of classification.

Additionally, such healthy communication between managers and non-executives requires the respect of each member's expertise and contribution, and seeks to combine all members' insights in creative, synergistic ways (Forbes & Milliken, 1999). However, this is not the case in all boards. A recent study on conflict and tension in the boardroom highlights the conflicting views as to whether women are valued equally on boards, or whether females' presence is merely a token gesture (Kakabadse, Kakabadse, Moore, Morais, & Goyal, 2017). As such, the information asymmetry paradox between managers and non-executive female directors will continue to be a problem particularly when managers consider female representation as a way to comply with the legal requirement or when they feel that non-executive female directors monitor or challenge their discretionary decisions including the classification of core items. Hence, despite the fact that female directors might be willing to mitigate all types of opportunistic practices, since the proper categorization of core expenses may not be clear-cut to female directors, female directors may not be able to mitigate such practices, and therefore this might motivate firms with non-executive female directors to engage more in classification shifting.

Based on the above contradictory arguments on the role of non-executive female directors in constraining classification shifting, we do not predict a sign on the relationship between non-executive female directors and classification shifting, and test the following hypothesis:

H1: *There is a significant relationship between non-executive female directors and earnings management using classification shifting.*

3. Research design

3.1 Research Model

To investigate our research question, we should estimate the inflated or abnormal core earnings. To do this, we follow McVay (2006) and run the following expectation model:

$$COR_E_{i,t} = \gamma_0 + \gamma_1 COR_E_{i,t-1} + \gamma_2 ACC_{i,t} + \gamma_3 ACC_{i,t-1} + \gamma_4 ATOV_{i,t} + \gamma_5 CH_SALES_{i,t} + \gamma_6 NEG_CH_SALES_{i,t} + u_{i,t} \quad (1)$$

where COR_E refers to firms' core earnings divided by lagged sales and we measure core earnings as the difference between sales, cost of sales and general and administrative expenses. In addition, ACC is working capital accruals divided by lagged sales. $ATOV$ is assets turnover estimated as sales scaled by firms' average net operating assets⁴. CH_SALES is the change percentage in sales calculated as the difference between current and last year sales scaled by lagged sales. Finally, Neg_CH_SALES equals CH_SALES if CH_SALES is negative, and zero otherwise.

We run equation (1) for each industry-year with at least 20 observations and then obtain the abnormal core earnings ($ABNORMAL_CORE_EARNINGS$) as the residuals. Finally, we run the following equation to investigate whether female directors mitigate classification shifting⁵:

$$ABNORMAL_CORE_EARNINGS_t = \beta_0 + \beta_1 SPECIAL_ITEMS_t + \beta_2 FEMALE_t + \beta_3 SPECIAL_ITEMS_t \times FEMALE_t + Control\ variables_t \quad (2)$$

$SPECIAL_ITEMS$ refers to special items estimated as special items scaled by sales. Consistent with Fan et al. (2010), Haw et al. (2011) and McVay (2006), we multiply special items by -1 and set it to zero when the firm has income-increasing special items. Since classification shifters are characterized by high core earnings and income-decreasing special items, if firms perceive classification shifting as a viable earnings management method, we should observe a positive relationship between $SPECIAL_ITEMS$ and

⁴ Net operating assets are estimated as the difference between operating assets and liabilities where operating assets refers to total assets minus cash and cash equivalent. Operating liabilities are estimated as total assets minus common and preferred equity, total debt and minority interest. We exclude firms with negative $ATOV$.

⁵ Following Petersen (2009), we include year fixed effects and estimate least squares regressions allowing the standard errors to be clustered by firms.

ABNORMAL_CORE_EARNINGS. In other words, the relationship between *SPECIAL_ITEMS* and *ABNORMAL_CORE_EARNINGS* is the factor that might suggest the presence of classification shifting. Consequently, to investigate whether female directors mitigate these practices, we interact between *SPECIAL_ITEMS* and *FEMALE*. That is, the coefficient on *SPECIAL_ITEMS*×*FEMALE* represents the incremental impact of *FEMALEs* on classification shifting. If non-executive female directors can mitigate this practice, the coefficient on *SPECIAL_ITEMS*×*FEMALE* should be negative; otherwise, it would be positive.

In addition to the variables of interest (*SPECIAL_ITEMS* and *FEMALE*), we include other control variables proven to affect the level of firms' earnings management. Particularly, we control for firms' size (*SIZE*), leverage (*LEVERAGE*), cash flows from operating activities (*OPERATING_CASH_FLOWS*), return on assets (*RETURN_ON_ASSETS*), growth firms (*GROWTH*) and current year accruals (*ACCRUALS*). In addition, since firms might use accruals-based earnings management (*ACCRUALS_EM*) and classification shifting as a substitute, we add *ACCRUALS_EM* as an additional control variable to our model. Finally, extant studies already suggest that firms' corporate governance plays a critical role in mitigating opaque financial reporting decisions, and therefore we control for board (*BOARD_SIZE*) and audit committee size (*AUDIT_COMMITTEE_SIZE*) and the percentage of independent directors (*%INDEPENDENT*). All variables are defined in Appendix B⁶.

3.2 Sample selection and data sources

We obtain the required financial information for all firms from COMPUSTAT for the period 2007 to 2014. We start from 2007, arguably, to avoid any potential impact of SOX on directors' behavior towards classification shifting. We exclude firms with missing information required to run our expectation equations and exclude firms with negative ATOV. Similar to prior accounting studies, we exclude firms belonging to financial industries given the different financial environment (Barua, Davidson, Rama, & Thiruvadi, 2010). We require each non-financial industry to have at least sufficient observation of 20 observations each year in order to run our expectation models and, therefore, industries with fewer than 20 industry-year observations are excluded. Finally, after estimating our dependent variable, we merge these financial data with female

⁶ We winsorized variables at 1% and 99%.

directors' data obtained from the ISS (formerly RiskMetrics) database and exclude firm-year observations with missing gender and other financial data. These procedures lead to a final sample of 6459 firm-year observations over the period from 2007 to 2014.

4. Results

4.1 Descriptive statistics

Before our multivariate analysis, we report the descriptive statistics in Table 1. It shows that non-executive female directors only represent 11% and 13% of board and audit committee members, respectively, suggesting that female directors in the US are still underrepresented either on board or audit committees. In addition, in line with prior research, Table 1 shows that the average abnormal core earnings are 4%. Similarly, special items represent, on average, 2% of firms' sales. In addition, we report the Pearson correlation matrix and VIF in Table 2 and, in general, VIF suggests that there are no multicollinearity issues.

[Insert Table 1 here]

[Insert Table 2 here]

4.2 Multivariate analysis

In this section, we investigate whether the results of previous accruals-based earnings management (*ACCRUALS_EM*) pertain to classification shifting-based earnings management. However, before doing this, we use our current sample to replicate extant gender and *ACCRUALS_EM* studies and report this analysis in Table 3. Consistent with our expectation, our reported results in Table 3 under columns 1 and 2 suggest that non-executive female directors (either on board or on audit committee) play a significant role in mitigating managers' opaque accruals-based decisions and, therefore, their firms are characterized by less *ACCRUALS_EM*.

[Insert Table 3 here]

Table 4 reports our main analysis investigating the role of non-executive female directors in constraining classification shifting. It shows a significant positive relationship between special items (*SPECIAL_ITEMS*) and unexpected core earnings (*ABNORMAL_CORE_EARNINGS*). In addition, it reports our variable of interest – the

interaction between *SPECIAL_ITEMS*⁷ and non-executive female directors on the board and audit committee (*FEMALE*). The coefficient on *SPECIAL_ITEMS*×*FEMALE* tests the incremental impact of non-executive female directors on classification shifting. In contrast to the general agreement that non-executive female directors are associated with high earnings quality (e.g., Lara et al., 2017; Zalata et al., 2018), the coefficient on *SPECIAL_ITEMS*×*FEMALE* is significantly positive in the first and the second columns, suggesting that non-executive female directors appear to be less effective in constraining classification shifting, and therefore their firms seem to exploit this situation and engage more in misclassifying the presentation of some of their core expenses as special items.

[Insert Table 4 here]

One potential explanation for this positive relationship is the information asymmetry between non-executive female directors and executive directors on the proper classification of the expenses within the income statement. In particular, the proper categorization of items is subject to much managerial discretion and opaque disclosure requirements (Athanasakou, Strong, & Walker, 2009; McVay, 2006). Furthermore, and arguably, non-executive female directors might be seen by some managers as less friendly directors who are more likely to challenge their financial reporting decisions, and therefore executive directors might reveal less information about the nature of the expenses to female directors. That is, while we acknowledge that non-executive female directors possess unique skills that enable them to better perform the requirements of their roles within the board than men do, they will not be able to mitigate classification shifting given the opportunistic information asymmetry between them and executive directors, and it seems that some firms exploit this and engage in more classification shifting.

Nevertheless, our analysis, so far, neglects the fact that female directors might be more efficient in some settings and, therefore, in the following sections we investigate whether our results are driven by non-growth firms, less litigious industries, female directors with short career horizon, female directors with no financial background, and/or tokenism. We also investigate whether our results are driven by any endogeneity concerns. Finally, we investigate whether executive female directors are associated with higher classification shifting as well.

⁷ As discussed, in order to investigate whether female directors mitigate classification shifting, we interact between *SPECIAL_ITEMS* and *FEMALE*.

4.3 Growth firms

Extant research suggests that growth firms are more likely to engage in earnings management. In particular, since the stock market is more likely to penalize growth firms missing their earnings benchmark than other firms (Skinner & Sloan, 2002), these firms might try to avoid this by engaging in more earnings management (i.e., McVay, 2006; Roychowdhury, 2006). In these firms, one might argue that non-executive female directors, as risk-averse, are more likely to exercise more sophisticated analysis and might challenge core expenses misclassification. That is, in these types of firms, non-executive female directors are more likely to constrain classification shifting. In order to investigate our proposition, we split our sample into two groups - *growth* firms and *non-growth* firms. We allocate firms to the growth group if its market to book value ratio is in the highest quintile. We report the findings of this analysis in Table 5 and, consistent with our findings reported in Tables 4, we could not find any evidence suggesting that non-executive female directors mitigate classification shifting either in growth firms or non-growth firms and indeed the results are more significant under growth firms.

[Insert Table 5 here]

4.4 Litigation risks

So far, our analysis, unexpectedly, suggests that higher classification shifting is a characteristic of firms with high numbers of non-executive female directors. However, this analysis disregards the communal rhetoric on gender differences that female directors are less overconfident and more risk-averse than men and they are more likely to avoid decisions that jeopardize their security (Cumming, Leung, & Rui, 2015) particularly when they operate in risky business environments and therefore might confront high litigation risk (Ho et al., 2015). One might argue that such an environment might reinforce female directors' risk-averse mind-set and therefore they might seek to challenge any opaque financial reporting decisions to avoid any legal consequences if these opaque financial reporting decisions have been detected. As such, we might find our previous findings are driven by less risky industries and, therefore, in litigious industries, we might find a more rigorous impact of non-executive female directors on classification shifting. To investigate this proposition, we split our sample into two groups – *high litigious* industries and *low litigious* industries. Following Ho et al. (2015), firms with SIC industry codes of 2833–

2836, 3570–3577, 3600–3674, 5200–5961, and 7370–7374 are classified as firms with high potential litigation risk. As shown in Table 6, we still could not find evidence suggesting that non-executive female directors mitigate classification shifting and indeed the results are more prominent in high litigious industries.

[Insert Table 6 here]

4.5 Female directors' career horizon

Directors' age might represent an important factor that influences their behavior. For instance, age can be used as a measure for the time remaining before directors' retirement or career horizon (Andreou, Louca, & Petrou, 2017; Krause & Semadeni, 2014; McClelland, Barker III, & Oh, 2012). Young directors have long career horizons and, therefore, are more concerned about their reputation (Yim, 2013). Consequently, arguably, young female directors might be more motivated to demonstrate their ability to lead the company and meet shareholder expectations; otherwise, they might lose their reputation and probably their job (McClelland et al., 2012). In other words, young female directors might exert much effort to avoid any misclassification of core expenses and therefore mitigate classification shifting.

To investigate this proposition, we classify non-executive female directors using their age into two groups —*short career horizons* and *long career horizons*. We consider non-executive female directors as having a short career horizon (*FEMALE_SC*) if their age is at least 63 years, and a long career horizon (*FEMALE_LC*) if their age is less than 63 years⁸. Then, on the firm level, we calculate *FEMALE_SC* as the percentage of non-executive female directors who are at least 63 years old and *FEMALE_LC* as the percentage of non-executive female directors who are less than 63 years old. Finally, we interact between these two variables and *SPECIAL_ITEMS*. The results of this analysis are reported in Table 7 and our results do not support the fact that female directors having long career horizons (*SPECIAL_ITEMS*×*FEMALE_LC*) might mitigate classification shifting compared to other female directors with short career horizons (*SPECIAL_ITEMS*×*FEMALE_SC*). In addition, we investigate this proposition in growth firms and in high litigious industries⁹ and, as reported in Table 8, we find less evidence

⁸63 years is the median age of all directors in the ISS database.

⁹ As previously illustrated, in these settings, one could argue that female directors might exert much effort and challenge classification shifting.

suggesting that non-executive female directors with long career horizon would mitigate classification shifting as compared with non-executive female directors with short career horizon.

[Insert Table 7 here]

[Insert Table 8 here]

4.6 Female directors' financial background

Prior research suggests that directors' financial background plays a crucial role in constraining managerial opportunism. For instance, Beekes, Pope and Young (2004), Kalbers and Fogarty (1993) and DeZoort and Salterio (2000) note that outside directors will only add value to their firms if they understand the consequences of financial reporting decisions and understand auditors' judgments and, indeed, this can be achieved if non-executive directors possess relevant financial background. Already prior research shows that non-executive directors' ability in constraining earnings management depends partially on their financial background (i.e., Abbott, Parker, & Peters, 2004; Bedard Chtourou, & Courteau, 2004; Xie, Davidson & DaDalt, 2003). As such, one might argue that our reported results are driven by female directors without relevant financial background and that non-executive female directors who possess relevant financial background might challenge firms' classificatory decisions.

To investigate this proposition, we split non-executive female directors into two groups based on their financial background as reported on the ISS database. Then, on the firm level, we calculate non-executive female directors with relevant financial background (*FEMALE_FB*) as the percentage of non-executive female directors who possess relevant financial background and non-executive female directors with no financial background (*FEMALE_NFB*) as the percentage of non-executive female directors who have no financial background. Finally, we interact between these two variables and *SPECIAL_ITEMS*. We report the findings of this analysis in Table 9 and, on average, we find less evidence to support the fact that non-executive female directors with financial background ($SPECIAL_ITEMS \times FEMALE_FB^{10}$) would mitigate classification shifting as compared with those without such background ($SPECIAL_ITEMS \times FEMALE_NFB$).

¹⁰ It worth noting that the coefficient on $SPECIAL_ITEMS \times FEMALE_FB$ is insignificant albeit it is still positive.

That is, in contrast to prior accruals-based earnings management studies (e.g., Gull et al., 2018; Lara et al., 2017; Zalata et al., 2018) and our finding reported in Table 3, it seems that non-executive female directors are less likely to challenge classification shifting. Alternatively, given that the nature and the classification of expenses are significantly subject to managers' discretion, they are not able to differentiate between recurring core expenses and special items. It appears that firms with female representatives take advantage of this and engage more in classification shifting because of its lower detection costs by female directors. The ineffective role of female directors suggests that when the cost of accrual-based manipulation is high (e.g., higher detection costs because of non-executive female directors), self-interested managers will seek another earnings management method.

[Insert Table 9 here]

4.7 Controlling for tokenism

Prior studies suggest that some firms might appoint one female director in order to meet regulators' expectations and satisfy the social expectations and, therefore, this single director would be less influential and may not be able to perform her duties efficiently (Bourez, 2005; Branson, 2006; Erkut, Kramer, & Konrad, 2008; Kramer, Konrad, Erkut, & Hooper, 2006). That is, firms with a single female director might bias our analysis, and therefore these firms may drive the aforementioned results. On the other hand, and given the bias towards appointing female directors, in contrast to the tokenism argument, Lara et al. (2017) noted that a lone female director who succeeds in securing such a position is more likely to have greater reputational concerns and face greater public scrutiny. As such, these directors are more likely to attend board meetings and exercise much effort in scrutinizing firms' financial reporting decisions than their male counterparts are, which in turn can be translated into a high-quality information environment. That is, the impact of non-executive female directors in constraining classification shifting should be more pronounced in firms with only one female director.

In order to investigate these contradicting conjectures, we create other proxies for the participation of non-executive female directors within boardrooms. Particularly, we define *FEMALE_ONE* as a dummy variable set to one if the firm has one non-executive

female director, and zero otherwise¹¹. Similarly, we define *FEMALE_TWO* as a dummy variable set to one if the firm has at least two non-executive female directors, and zero otherwise. We report the findings of this analysis in Table 10, which still shows no evidence for the ability of non-executive female directors in constraining classification shifting significantly. In particular, both variables are positively associated with classification shifting.

[Insert Table 10 here]

4.8 Controlling for endogeneity

Our findings suggest that female directors are less likely to challenge classification shifting. However, reverse causality might represent an alternative explanation of the reported positive relationship. In particular, classification shifters might recruit more non-executive female directors in an effort to camouflage their bad performance. This self-selection process might lead to a positive relationship between classification shifting and the participation of non-executive female directors within boardrooms or audit committees. We address this potential endogeneity by re-estimating our main analysis using one-year lag measures of our independent variables. However, using these measures, our reported analysis results in Table 11 are still qualitatively similar to our findings reported under the main analysis, and therefore it seems that our conclusion drawn from our main analysis is not subject to more potential endogeneity concerns.

[Insert Table 11 here]

In addition, we follow extant accounting studies (i.e., Lara et al., 2017; Srinidhi et al., 2011) and estimate Heckman's (1976) two-stage model. Specifically, we run a probit model to capture the factors that predict the probability of recruiting female directors on firms' board. From this probit model, we estimate the inverse Mills ratio (*INVERSE_MILLS_RATIO*) which is then added as an additional control variable to equation (2). In this probit model, our dependent variable is an indicator variable set to one if the firm has at least one female director and zero otherwise. In addition, we control for the percentage of female directors within each two-digit SIC industry, the percentage of independent directors, firm age, firm size, firm performance measured by sales growth,

¹¹ If the firm has other executive female directors in addition to one non-executive female director, we set *FEMALE_ONE* to zero.

Tobin's Q, and return on assets¹². Again, after controlling for the inverse Mills ratio, our findings reported in Table 12 are still qualitatively similar to our findings reported under the main analysis.

[Insert Table 12 here]

As a final method to address potential endogeneity issues, we apply Propensity Score Matching (PSM). We should first transfer *FEMALE* both in the board and audit committee into an indicator variable that is set to one if the firm has a non-executive female director on the board and audit committees, respectively, and zero otherwise. We then use this indicator variable as a dependent variable to run a Tobit regression controlling for *SPECIAL_ITEMS*, *SIZE*, *LEVERAGE*, *OPERATING_CASH_FLOWS*, *RETURN_ON_ASSETS*, *GROWTH*, *ACCRUALS*, *ACCRUALS_EM*, *BOARD_SIZE*, *AUDIT_COMMITTEE_SIZE* and *%INDEPENDENT* and predict the probability of having *FEMALE*. Finally, we match firms with *FEMALE* with other firms without *FEMALE* based on the predicted values obtained from the Tobit regression and using the nearest-neighbor approach. Following these procedures, we find 1,707 firm-year matches for observations with *FEMALE* on the board and 2,001 firm-year observations for observations with *FEMALE* on the audit committee. We re-estimate equation (2) using firms with *FEMALE* and their matches and report the findings in Table 13 and they are qualitatively similar to the findings reported under main analysis.

[Insert Table 13 here]

4.9 Executive female directors

While our analysis, so far, focused on non-executive female directors, Lara et al. (2017) show that executive and non-executive female directors behave differentially and find that only non-executive female directors are associated with less earnings management. Therefore, as further analysis, we investigate whether executive female directors are associated with higher classification shifting. We measure the participation of executive

¹² We measure Tobin's Q as total assets minus total equity plus the market value of equity, scaled by total assets and we measure firm's age as the number of years during which the firm has reported total assets on COMPUSTAT since 1977.

female directors as the proportion of executive female directors to the total number of directors. We report the findings of this analysis in Table 14 and, interestingly, it shows that $SPECIAL_ITEMS \times FEMALE$ is negative, albeit insignificant, which provides moderate evidence that classification shifting is moderately lower in firms with executive female directors. Our unreported finding suggests that this finding is robust after controlling for potential endogeneity concerns using lagged independent variable or the inverse Mills ratio. Finally, this finding persists when using propensity score-matching as reported in Table 14.

[Insert Table 14 here]

5. Discussion, implications and conclusion

5.1 Discussion of the findings

Gender diversity has received considerable attention from business studies and, increasingly, extant research shows that the participation of female directors has an impact on financial reporting quality and in particular, their participation within boardrooms mitigates earnings management (Lara et al. 2011; Srinidhi et al., 2011). However, notably, most prior studies focused extensively on the role of female directors in constraining accruals-based earnings management with relatively less attention to other less risky earnings management methods that are more difficult to detect. In this paper, therefore, we investigate whether non-executive female directors go beyond the neoclassical measurement and recognition-based accounting issues and pay more attention to the classification of core expenses within the income statement. Particularly, we investigate whether non-executive female directors constrain classification shifting-based earnings management.

Using a sample of US firms over the period from 2007 to 2014, we find evidence contradicting previous accruals-based earnings management studies (e.g., Lara et al., 2017; Srinidhi et al., 2011; Zalata et al., 2018). In particular, while these studies suggest that less earnings management is a common characteristic of firms with non-executive female directors, we find evidence suggesting that non-executive female directors are less likely to challenge classification shifting and it seems that some firms might exploit this and engage in more classification shifting. This partially supports the view that when firms are constrained from using accruals-based earnings management by the participation of, for example, non-executive female directors, they shift to other earnings management methods. Interestingly, unlike Zalata et al.'s (2019a) finding that firms with female CEOs are less likely to engage in classification shifting post-SOX, we find that non-executive female directors are

less likely to challenge such practices, therefore reinforcing the importance of differentiating between the position of female directors by future gender studies. Our evidence, thereby, supports the ongoing debate that classification shifting is less likely to attract the attention of either external or internal monitors (Fan et al., 2010; McVay 2006) and it seems that the time has come to extend the certification of financial statement to include non-executive directors.

5.2 Practical implications

The findings of our study have important implications for stakeholders and boards of directors. While prior studies showed that not only investors but also lenders perceive financial statement quality to increase with the participation of female directors (e.g., Gul et al., 2011; Pandey, Biswas, Ali, & Mansi, 2020), the results of this study show that classification shifting is more pervasive in firms with more female directors. Our results, therefore, alert different stakeholders to the fact that, while the appointment of female directors might improve accruals quality, it could potentially have unintended consequences of high classification shifting; a finding that would inform the current political contentions on the underrepresentation of women at senior management levels and the target of gender-balanced corporate boards. That is, stakeholders should exercise more scrutiny when assessing the underlying performance of firms with non-executive female representatives. In addition, since extant research suggests that firms increasingly perceive the misclassification of core expenses as viable earnings management method (e.g., Fan et al., 2010; McVay, 2006; Zalata & Roberts, 2017), the time has come for non-executive female directors to go beyond the measurement and recognition-based earnings management and pay greater attention to the classification of expenses within the income statement.

5.3 Limitations and guidance for future research

Although we have tried to use a battery of robustness checks to validate our findings, our paper is still subject to some limitations. For example, reflecting extant earnings management studies, it is difficult to reach a precise measure for earnings management, and consequently our findings might be an explanation classification shifting model bias. While we used a battery of methods in order to adjust for endogeneity concerns, we believe that the endogeneity problem cannot be entirely solved and therefore readers should interpret our findings with caution. Additionally, future research might consider

other variables such as ownership structure, particularly institutional ownership, to investigate any moderating effect on the female-classification shifting link. Finally, future research might investigate our research question in other countries. For instance, the EU requires more female representation within the boardroom. Therefore, one might expect that non-executive female directors are subject to more public monitoring in EU countries and therefore should expect different behavior from that of female directors in the USA with less formal regulations. Finally, future research might investigate other specific attributes of females such as business experience and cross directorship.

5.4 Concluding remarks

Our paper extends prior accruals-based earnings management by examining the role of non-executive female directors in mitigating a less costly earnings management method – namely, *classification shifting*. Our reported findings support the ongoing debate that classification shifting is less likely to attract the attention of monitors in general (Fan et al., 2010; McVay 2006) and, in our case, non-executive female directors. It seems that some firms with non-executive female directors exploit such situations and misclassify some of their core expenses. We hope that our findings inform non-executive female directors to go further and pay more nuanced consideration to other financial reporting decisions (e.g., the classification of expenses within the income statement) to protect shareholders' interests.

[Insert Appendix A here]

[Insert Appendix B here]

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Table 1

Descriptive statistics

Variable	Mean	Median	ST DEV	Q1	Q3
ABNORMAL_CORE_EARNINGS	0.04	0.02	0.13	-0.02	0.09
SPECIAL_ITEMS	0.02	0.00	0.05	0.00	0.02
FEMALE ^b	0.11	0.11	0.10	0.00	0.18
FEMALE ^a	0.13	0.00	0.17	0.00	0.25
SIZE	7.64	7.49	1.52	6.52	8.60
LEVERAGE	0.55	0.30	1.05	0.01	0.65
OPERATING_CASH_FLOWS	0.13	0.12	0.08	0.08	0.17
RETURN_ON_ASSETS	0.06	0.06	0.08	0.03	0.10
GROWTH	3.02	2.26	2.80	1.47	3.54
ACCRUALS	0.01	0.00	0.04	-0.02	0.03
ACCRUALS_EM	0.03	0.02	0.03	0.01	0.04
BOARD_SIZE	0.94	1.00	0.23	1.00	1.00
AUDIT_COMMITTEE_SIZE	3.70	4.00	0.91	3.00	4.00
%INDEPENDENT	0.79	0.82	0.11	0.71	0.88
We define all variables in Appendix B.					

Table 2

Correlation matrix

	VIF ¹³	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(2)	1.66	0.037***	1												
(3)	1.20	-0.004	0.006	1											
(4)	1.08	0.004	-0.003	0.658***	1										
(5)	1.37	0.106***	0.003	0.322***	0.230***	1									
(6)	1.72	-0.012	0.094***	0.125***	0.095***	0.201***	1								
(7)	2.41	0.198***	-0.185***	-0.038***	-0.019	-0.019	-0.103***	1							
(8)	3.54	0.137***	-0.553***	0.024 [†]	0.023 [†]	0.051***	-0.145***	0.635***	1						
(9)	1.99	0.036***	-0.054***	0.110***	0.074***	0.046***	0.498***	0.344***	0.338***	1					
(10)	1.36	-0.101***	-0.078***	-0.034***	-0.001	-0.026**	0.009	-0.206***	0.190***	0.010	1				
(11)	1.03	0.029**	0.047***	-0.084***	-0.058***	-0.120***	0.012	0.054***	0.001	0.064***	-0.004	1			
(12)	1.10	0.009	-0.005	-0.104***	-0.081***	-0.245***	-0.010	0.011	-0.019	0.000	0.002	0.001	1		
(13)	1.19	-0.004	-0.032**	0.190***	0.144***	0.307***	0.093***	-0.045***	0.028**	0.028**	0.000	-0.028**	-0.173***	1	
(14)	1.18	0.037***	0.027**	0.255***	0.120***	0.231***	0.111***	-0.046***	-0.035***	0.068***	-0.036***	-0.046***	0.041***	0.264***	1

***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

Where (1) is ABNORMAL_CORE_EARNINGS, (2) is SPECIAL_ITEMS, (3) is FEMALE^b, (4) FEMALE^a, (5) is SIZE, (6) is LEVERAGE, (7) is OPERATING_CASH_FLOWS, (8) is RETURN_ON_ASSETS, (9) is GROWTH, (10) is ACCRUALS, (11) is ACCRUALS_EM, (12) is BOARD_SIZE, (13) is AUDIT_COMMITTEE_SIZE, (14) is %INDEPENDENT

We define all variables in Appendix B.

¹³ VIFs are reported based on the estimation obtained after running equation (2) using non-executive female directors on the board. However, for FEMALE^a, we obtain its VIF by replacing non-executive female on board by female on audit committee and other variables VIFs are qualitatively similar to that using non-executive female directors on the board.

Table 3

Regression estimates of accruals-based earnings management and non-executive female directors.

Under column 1, we regress accruals-based earnings management on non-executive female directors on the board. Under column 2, we regress accruals-based earnings management on non-executive female directors on the audit committee.

Variables	Column 1		Column 2	
	Coef.	t-Stat	Coef.	t-Stat
FEMALE	-0.015	-3.19***	-0.005	-2.13**
SIZE	-0.002	-6.24***	-0.002	-6.67***
LEVERAGE	0.000	0.06	0.000	0.08
OPERATING_CASH_FLOWS	0.023	2.29**	0.024	2.41**
RETURN_ON_ASSETS	-0.022	-2.33**	-0.022	-2.41**
GROWTH	0.001	2.62***	0.001	2.50**
ACCRUALS	0.009	0.49	0.011	0.57
BOARD_SIZE	-0.003	-1.96*	-0.003	-1.89*
AUDIT_COMMITTEE_SIZE	0.001	1.15	0.001	1.09
%INDEPENDENT	-0.003	-0.65	-0.005	-1.11
INTERCEPT	0.046	10.36***	0.047	10.82***
YEARS	YES		YES	
Adj_R ²	2.58%		2.45%	
F-statistic	7.34		7.11	
Number of Observations	6459		6459	
***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.				

Table 4

Regression estimates of classification shifting and non-executive female directors (full sample).

Under column 1, we regress abnormal core earnings on special items and non-executive female directors on the board. Under column 2, we regress abnormal core earnings on special items, and non-executive female directors on the audit committee.

Variables	Column 1 Females on the board		Column 2 Females on the audit committee	
	Coef.	t-Stat	Coef.	t-Stat
SPECIAL_ITEMS	0.411	7.11***	0.407	6.90***
FEMALE	-0.057	-2.62***	-0.011	-0.97
SPECIAL_ITEMS × FEMALE	1.841	3.52***	0.579	1.83*
SIZE	0.010	5.55***	0.010	5.34***
LEVERAGE	0.005	1.92*	0.005	1.96*
OPERATING_CASH_FLOWS	0.190	3.53***	0.197	3.61***
RETURN_ON_ASSETS	0.332	5.70***	0.332	5.67***
GROWTH	-0.004	-3.98***	-0.004	-4.16***
ACCRUALS	-0.327	-5.47***	-0.316	-5.27***
ACCRUALS_EM	0.147	1.75*	0.155	1.84*
BOARD_SIZE	0.017	2.00**	0.018	2.13**
AUDIT_COMMITTEE_SIZE	-0.005	-1.90*	-0.005	-1.94*
%INDEPENDENT	0.046	2.50**	0.037	2.01**
INTERCEPT	-0.093	-4.29***	-0.083	-3.93***
YEARS	YES		YES	
Adj_R ²	8.27%		7.81%	
F-statistic	15.96		15.32	
Number of Observations	6459		6459	
***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.				
We define all variables in Appendix B.				

Table 5

Regression estimates of classification shifting and non-executive female directors (Growth versus non-Growth firms).

Under columns 1 and 2, we regress abnormal core earnings on special items, non-executive female directors on the board and on the audit committee, respectively, using a sample of growth firms. Under columns 3 and 4, we regress abnormal core earnings on special items, non-executive female directors on the board and on the audit committee, respectively, using a sample of non-growth firms.

Variables	Growth Firms				Non-Growth Firms			
	Column 1 Females on the board		Column 2 Females on the audit committee		Column 3 Females on the board		Column 4 Females on the audit committee	
	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat
SPECIAL_ITEMS	0.457	3.38***	0.445	2.86***	0.410	6.73***	0.406	6.57***
FEMALE	-0.076	-1.73*	-0.049	-2.27**	-0.046	-1.90*	0.004	0.28
SPECIAL_ITEMS × FEMALE	4.832	3.84***	1.936	2.07**	1.370	2.59**	0.338	1.03
SIZE	0.015	5.04***	0.016	5.16***	0.008	3.57***	0.007	3.34***
LEVERAGE	0.001	0.19	0.001	0.30	0.010	2.28**	0.010	2.30**
OPERATING_CASH_FLOWS	0.188	1.88*	0.186	1.86*	0.198	3.13***	0.206	3.22***
RETURN_ON_ASSETS	0.321	2.69***	0.323	2.67***	0.360	5.78***	0.361	5.79***
GROWTH	-0.002	-1.86*	-0.003	-2.00**	-0.008	-2.34**	-0.008	-2.42**
ACCRUALS	-0.317	-2.62***	-0.304	-2.52**	-0.325	-4.81***	-0.315	-4.66***
ACCRUALS_EM	0.385	2.08**	0.413	2.24**	0.035	0.39	0.041	0.45
BOARD_SIZE	0.019	1.24	0.024	1.56	0.013	1.40	0.014	1.47
AUDIT_COMMITTEE_SIZE	-0.007	-1.83*	-0.007	-1.70*	-0.004	-1.29	-0.004	-1.37
%INDEPENDENT	0.111	3.01***	0.095	2.64***	0.027	1.33	0.020	0.97
INTERCEPT	-0.181	-3.91***	-0.175	-3.99***	-0.059	-2.43**	-0.050	-2.07**
YEARS	YES		YES		YES		YES	
Adj_R ²	13.18%		12.17%		7.32%		7.01%	

F-statistic	7.86		7.32		11.53		11.08	
Number of Observations	1614		1614		4845		4845	
<p>***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.</p> <p>We define all variables in Appendix B.</p>								

Table 6

Regression estimates of classification shifting and non-executive female directors (High litigious versus Low litigious industries).

Under columns 1 and 2, we regress abnormal core earnings on special items, non-executive female directors on the board and on the audit committee, respectively, using a sample of firms operating in high litigious industries. Under columns 3 and 4, we regress abnormal core earnings on special items, non-executive female directors on the board and on the audit committees, respectively, using a sample of firms operating in low litigious industries.

Variables	High litigious industries				Low litigious industries			
	Column 1		Column 2		Column 3		Column 4	
	Females on the board		Females on the audit committee		Females on the board		Females on the audit committee	
	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat
SPECIAL_ITEMS	0.514	6.09***	0.499	5.67***	0.338	4.49***	0.334	4.37***
FEMALE	-0.025	-0.75	-0.008	-0.51	-0.065	-2.28**	-0.008	-0.55
SPECIAL_ITEMS × FEMALE	2.184	3.85***	0.997	2.53**	1.629	2.19**	0.311	0.70
SIZE	0.010	3.63***	0.010	3.77***	0.009	3.82***	0.009	3.65***
LEVERAGE	0.006	1.39	0.006	1.44	0.004	1.12	0.003	1.09
OPERATING_CASH_FLOWS	0.176	2.26**	0.177	2.28**	0.205	2.89***	0.215	3.00***
RETURN_ON_ASSETS	0.400	4.52***	0.401	4.50***	0.279	3.61***	0.277	3.59***
GROWTH	-0.001	-0.92	-0.002	-0.95	-0.005	-4.02***	-0.006	-4.27***
ACCRUALS	-0.402	-3.64***	-0.396	-3.58***	-0.283	-4.00***	-0.271	-3.81***
ACCRUALS_EM	0.119	0.77	0.127	0.81	0.125	1.32	0.133	1.40
BOARD_SIZE	0.014	0.74	0.014	0.71	0.017	1.89*	0.019	2.09**
AUDIT_COMMITTEE_SIZE	-0.002	-0.35	-0.001	-0.29	-0.007	-2.40**	-0.007	-2.46**
%INDEPENDENT	0.061	2.14**	0.055	1.98**	0.044	1.83*	0.032	1.36
INTERCEPT	-0.123	-3.04***	-0.117	-3.09***	-0.069	-2.70***	-0.058	-2.28**
YEARS	YES		YES		YES		YES	
Adj_R ²	15.67%		15.26%		5.96%		5.52%	

F-statistic	13.73		13.29		7.47		6.97	
Number of Observations	2274		2274		4185		4185	
<p>***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.</p> <p>We define all variables in Appendix B.</p>								

Table 7

Regression estimates of classification shifting and non-executive female directors with long and short career horizon.

Under column 1, we regress abnormal core earnings on special items, long and short career horizons non-executive female directors on the board. Under column 2, we regress abnormal core earnings on special items, long and short career horizons non-executive female directors on the audit committee.

Variables	Column 1 Females on the board		Column 2 Females on the audit committee	
	Coef.	t-Stat	Coef.	t-Stat
SPECIAL_ITEMS	0.421	7.26***	0.410	6.90***
FEMALE_LC	-0.055	-2.21**	-0.007	-0.47
FEMALE_SC	-0.069	-2.06**	-0.026	-1.33
SPECIAL_ITEMS × FEMALE_LC	1.347	2.18**	0.387	1.09
SPECIAL_ITEMS × FEMALE_SC	2.965	3.79***	1.420	2.60***
SIZE	0.010	5.64***	0.010	5.41***
LEVERAGE	0.005	1.93*	0.005	1.99**
OPERATING_CASH_FLOWS	0.192	3.56***	0.197	3.61***
RETURN_ON_ASSETS	0.332	5.69***	0.331	5.65***
GROWTH	-0.004	-4.03***	-0.005	-4.23***
ACCRUALS	-0.325	-5.45***	-0.315	-5.26***
ACCRUALS_EM	0.146	1.74*	0.156	1.85*
BOARD_SIZE	0.016	1.98**	0.017	2.07**
AUDIT_COMMITTEE_SIZE	-0.005	-1.88*	-0.005	-1.88*
%INDEPENDENT	0.047	2.53**	0.038	2.07**
INTERCEPT	-0.095	-4.35***	-0.085	-4.01***
YEARS	YES		YES	
Adj_R ²	8.33%		7.88%	
F-statistic	14.63		14.24	
Number of Observations	6459		6459	
***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.				
We define all variables in Appendix B.				



Table 8

Regression estimates of classification shifting and non-executive female directors with long and short career horizons (In growth firms and firms operating in high litigious industries).

Under column 1 and 2, we regress abnormal core earnings on special items, long and short career horizons non-executive female directors on the board and on the audit committee, respectively, using a sample of growth firms. Under column 3 and 4, we regress abnormal core earnings on special items, long and short career horizons non-executive female directors on the board and on the audit committee, respectively, using a sample of firms operating in high litigious industries.

Variables	Growth Firms				High litigious industries			
	Column 1 Females on the board		Column 2 Females on the audit committee		Column 3 Females on the board		Column 4 Females on the audit committee	
	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat
SPECIAL_ITEMS	0.444	3.35***	0.440	2.86***	0.527	6.27***	0.501	5.56***
FEMALE_LC	-0.094	-1.93*	-0.059	-2.40**	-0.062	-1.73*	-0.006	-0.30
FEMALE_SC	-0.039	-0.55	-0.043	-1.02	0.049	0.93	-0.011	-0.39
SPECIAL_ITEMS × FEMALE_LC	4.056	2.59**	2.010	1.86*	1.189	2.05**	0.679	1.56
SPECIAL_ITEMS × FEMALE_SC	6.109	2.64***	1.892	1.25	4.811	3.44***	2.079	2.16**
SIZE	0.015	4.97***	0.015	5.16***	0.010	3.66***	0.010	3.80***
LEVERAGE	0.001	0.27	0.001	0.33	0.006	1.50	0.007	1.52
OPERATING_CASH_FLOWS	0.198	1.95*	0.186	1.81*	0.192	2.46**	0.185	2.34**
RETURN_ON_ASSETS	0.312	2.59**	0.323	2.64***	0.385	4.37***	0.395	4.38***
GROWTH	-0.002	-1.94*	-0.003	-2.00**	-0.002	-0.96	-0.002	-1.06
ACCRUALS	-0.305	-2.48**	-0.305	-2.47**	-0.387	-3.52***	-0.395	-3.55***
ACCRUALS_EM	0.385	2.09**	0.412	2.24**	0.113	0.74	0.131	0.84
BOARD_SIZE	0.019	1.24	0.024	1.56	0.017	0.91	0.013	0.66
AUDIT_COMMITTEE_SIZE	-0.007	-1.87*	-0.006	-1.66*	-0.002	-0.50	-0.001	-0.26

%INDEPENDENT	0.112	3.02***	0.095	2.66***	0.060	2.13**	0.058	2.07**
INTERCEPT	-0.181	-3.88***	-0.175	-3.95***	-0.123	-3.03***	-0.120	-3.14***
YEARS	YES		YES		YES		YES	
Adj_R ²	13.13%		12.15%		16.27%		15.39%	
F-statistic	7.28		6.72		13.20		12.09	
Number of Observations	1614		1614		2274		2274	

***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

We define all variables in Appendix B.

Table 9

Regression estimates of classification shifting and non-executive female directors with and without relevant financial background.

Under column 1, we regress abnormal core earnings on special items, non-executive female directors on the board with and without relevant financial background. Under column 2, we regress classification shifting on special items, non-executive female on the audit committee members with and without relevant financial background.

Variables	Column 1		Column 2	
	Coef.	t-Stat	Coef.	t-Stat
SPECIAL_ITEMS	0.406	7.03***	0.403	6.95***
FEMALE_FB	-0.017	-0.41	-0.006	-0.37
FEMALE_NFB	-0.068	-2.88***	-0.017	-1.10
SPECIAL_ITEMS × FEMALE_FB	0.189	0.15	0.088	0.19
SPECIAL_ITEMS × FEMALE_NFB	2.204	4.29***	1.023	2.56**
SIZE	0.010	5.51***	0.010	5.31***
LEVERAGE	0.005	1.97**	0.005	2.03**
OPERATING_CASH_FLOWS	0.189	3.51***	0.197	3.61***
RETURN_ON_ASSETS	0.334	5.73***	0.333	5.70***
GROWTH	-0.004	-4.02***	-0.005	-4.22***
ACCRUALS	-0.330	-5.52***	-0.318	-5.31***
ACCRUALS_EM	0.148	1.76*	0.155	1.84*
BOARD_SIZE	0.016	1.93*	0.018	2.09**
AUDIT_COMMITTEE_SIZE	-0.005	-1.91*	-0.004	-1.84*
%INDEPENDENT	0.047	2.54**	0.036	1.97**
INTERCEPT	-0.092	-4.21***	-0.083	-3.90***
YEARS	YES		YES	
Adj_R ²	8.36%		7.87%	
F-statistic	15.12		14.29	
Number of Observations	6459		6459	
***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.				
We define all variables in Appendix B.				

Table 10

Regression estimates of classification shifting and non-executive female directors after controlling for tokenism

Variables	Coef.	t-Stat
SPECIAL_ITEMS	0.183	2.36**
FEMALE_ONE	-0.005	-1.02
EMALE_TWO	-0.018	-3.29***
SPECIAL_ITEMS × EEMALE_ONE	0.261	2.43**
SPECIAL_ITEMS × EEMALE_TWO	0.482	4.10***
SIZE	0.011	5.80***
LEVERAGE	0.005	1.97**
OPERATING_CASH_FLOWS	0.188	3.50***
RETURN_ON_ASSETS	0.335	5.78***
GROWTH	-0.004	-3.94***
ACCRUALS	-0.331	-5.57***
ACCRUALS_EM	0.143	1.71*
BOARD_SIZE	0.014	1.71*
AUDIT_COMMITTEE_SIZE	-0.004	-1.67*
%INDEPENDENT	0.049	2.65***
INTERCEPT	-0.093	-4.34***
YEARS	YES	
Adj_R ²	8.40%	
F-statistic	15.20	
Number of Observations	6459	
<p>***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.</p> <p>FEMALE_ONE and FEMALE_TWO refer to the probability of having one non-executive female director and the probability of having at least two non-executive female directors, respectively. Other variables are defined in Appendix B.</p>		

Table 11

Regression estimates of classification shifting and non-executive female directors after controlling for endogeneity using lagged independent variables.

Under column 1, we regress abnormal core earnings on special items and non-executive female directors on the board. Under column 2, we regress abnormal core earnings on special items and non-executive female directors on the audit committee.

Variables	Column 1 Females on the board		Column 2 Females on the audit committee	
	Coef.	t-Stat	Coef.	t-Stat
SPECIAL_ITEMS	0.071	0.98	0.071	0.96
FEMALE	-0.052	-2.21**	0.002	0.15
SPECIAL_ITEMS × FEMALE	1.432	3.14***	0.782	2.66***
SIZE	0.013	6.72***	0.012	6.40
LEVERAGE	-0.001	-0.55	-0.001	-0.52
OPERATING_CASH_FLOWS	0.282	4.73***	0.290	4.83***
RETURN_ON_ASSETS	-0.207	-2.54**	-0.212	-2.58**
GROWTH	0.002	1.61	0.002	1.41
ACCRUALS	0.208	3.19***	0.220	3.39***
ACCRUALS_EM	-0.010	-0.11	-0.002	-0.03
BOARD_SIZE	0.016	1.78*	0.017	1.89*
AUDIT_COMMITTEE_SIZE	-0.006	-2.34**	-0.006	-2.48**
%INDEPENDENT	0.035	1.81*	0.026	1.36
INTERCEPT	-0.102	-4.44***	-0.089	-3.98***
YEARS	YES		YES	
Adj_R ²	3.92%		3.70%	
F-statistic	6.78		6.50	
Number of Observations	5126		5126	
***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.				
We define all variables in Appendix B.				

Table 12

Regression estimates of classification shifting and non-executive female directors after controlling for endogeneity using inverse Mills ratio.

Under column 1, we regress abnormal core earnings on special items and non-executive female directors on the board. Under column 2, we regress abnormal core earnings on special items, and non-executive female directors on the audit committee.

Variables	Column 1 Females on the board		Column 2 Females on the audit committee	
	Coef.	t-Stat	Coef.	t-Stat
SPECIAL_ITEMS	0.411	7.16***	0.409	6.98***
FEMALE	-0.022	-1.00	0.001	0.09
SPECIAL_ITEMS × FEMALE	1.817	3.44***	0.581	1.83*
SIZE	0.018	6.95***	0.018	7.06***
LEVERAGE	0.005	2.03**	0.005	2.07**
OPERATING_CASH_FLOWS	0.179	3.47***	0.182	3.51***
RETURN_ON_ASSETS	0.352	6.16***	0.355	6.21***
GROWTH	-0.004	-3.71***	-0.004	-3.82***
ACCRUALS	-0.349	-5.91***	-0.344	-5.81***
ACCRUALS_EM	0.135	1.62	0.138	1.65*
BOARD_SIZE	0.016	1.93*	0.017	2.00**
AUDIT_COMMITTEE_SIZE	-0.004	-1.53	-0.004	-1.52
%INDEPENDENT	0.093	4.45***	0.091	4.33***
INVERSE_MILLS_RATIO	0.058	4.84***	0.061	5.23***
INTERCEPT	-0.228	-6.14***	-0.231	-6.19***
YEARS	YES		YES	
Adj_R ²	8.93%		8.58%	
F-statistic	15.66		15.32	
Number of Observations	6459		6459	
***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.				

We define all variables in Appendix B.

Table 13

Regression estimates of classification shifting and non-executive female directors after controlling for endogeneity using propensity score matching.

Under column 1, we regress abnormal core earnings on special items and non-executive female directors on the board. Under column 2, we regress abnormal core earnings on special items and non-executive female directors on the audit committee.

Variables	Column 1 Females on the board		Column 2 Females on the audit committee	
	Coef.	t-Stat	Coef.	t-Stat
SPECIAL_ITEMS	0.234	2.67***	0.339	4.21***
FEMALE	-0.076	-2.87***	0.001	0.10
SPECIAL_ITEMS × FEMALE	1.517	2.12**	0.843	2.46**
SIZE	0.011	4.18***	0.010	5.02***
LEVERAGE	0.005	1.20	0.008	2.70***
OPERATING_CASH_FLOWS	0.218	2.99***	0.230	3.17***
RETURN_ON_ASSETS	0.218	2.79***	0.328	4.09***
GROWTH	-0.003	-1.78*	-0.006	-4.46***
ACCRUALS	-0.240	-3.22***	-0.203	-2.57**
ACCRUALS_EM	0.191	1.75*	0.124	1.15
BOARD_SIZE	0.012	0.64	0.021	2.12**
AUDIT_COMMITTEE_SIZE	-0.005	-1.41	-0.004	-1.39
%INDEPENDENT	0.034	1.44	0.044	2.06**
INTERCEPT	-0.084	-2.54**	-0.099	-3.63***
YEARS	YES		YES	
Adj_R ²	6.71%		7.64%	
F-statistic	8.58		9.86	
Number of Observations	3414		4002	
***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.				
We define all variables in Appendix B.				

Table 14

Regression estimates of classification shifting and executive female directors.

Under column 1, we regress abnormal core earnings on special items and executive female directors. Under column 2, we regress abnormal core earnings on special items and executive female directors using propensity score matching.

Variables	Column 1		Column 2	
	Full sample		Propensity score matching	
	Coef.	t-Stat	Coef.	t-Stat
SPECIAL_ITEMS	0.405	6.88***	0.361	1.24
FEMALE	-0.152	-2.51**	-0.128	-1.66*
SPECIAL_ITEMS × FEMALE	-1.913	-0.88	-2.232	-0.75
SIZE	0.009	5.32***	0.010	2.36**
LEVERAGE	0.005	1.99**	-0.006	-0.91
OPERATING_CASH_FLOWS	0.195	3.54***	-0.041	-0.23
RETURN_ON_ASSETS	0.337	5.68***	0.322	1.39
GROWTH	-0.005	-4.22***	-0.001	-0.70
ACCRUALS	-0.317	-5.27***	-0.628	-2.73***
ACCRUALS_EM	0.156	1.84*	-0.443	-1.71*
BOARD_SIZE	0.018	2.15**	0.005	0.33
AUDIT_COMMITTEE_SIZE	-0.005	-2.06**	-0.007	-1.09
%INDEPENDENT	0.030	1.63	-0.006	-0.15
INTERCEPT	-0.077	-3.61***	0.012	0.28
YEARS	YES		YES	
Adj_R ²	7.82%		5.96%	
F-statistic	15.67		2.97	
Number of Observations	6459		788	
<p>***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.</p> <p>In this table, FEMALE refers to the proportion of executive female directors to the total number of board members. Other variables are defined in Appendix B.</p>				

Appendix A: Empirical research examining the gender diversity and earnings management link

Study	Country	EM method	Findings/results
Krishnan and Parsons (2008)	US	Earnings quality measures	Firms with more women in senior management or on boards report high quality earnings.
Barua et al. (2010)	US	Discretionary accruals	Firms with female CFOs will experience lower discretionary accruals and higher accruals quality.
Labelle et al. (2010)	Canada	Discretionary accruals	Firms with more female directors are less likely to manage their earnings.
Peni and Vahamaa (2010)	US	Discretionary accruals	While female CFOs are associated with EM, there is no relationship between the gender of the CEO and EM.
Ye et al. (2010)	China	Discretionary accruals	They found no evidence that gender is associated with EM and earnings quality.
Ge et al. (2011)	US	Discretionary accruals	No effect of CFOs' gender on accounting choices.
Srinidhi et al. (2011)	US	Discretionary accruals	The presence of female directors on the board improves earnings quality.
Sun et al. (2011)	US	Discretionary accruals	Female directors on the audit committees have no impact on EM.
Thiruvadi and Huang (2011)	US	Discretionary accruals	Firms with gender-diversified audit committee are less likely to manage their earnings.
Gavious et al. (2012)	US	Discretionary accruals	Negative relationship between female CEO or female CFO and EM practices.
Arun et al. (2015)	UK	Discretionary accruals	Firms with more female members on the board adopt downward earnings management practices.
Duong and Evans (2016)	Australia	Discretionary accruals and Real earnings management	Firms with female CFOs are less likely to engage in both accruals and real earnings management than their male counterparts are.
Liu et al. (2016)	China	Discretionary accruals and Real earnings management	Female CFOs are associated with lower discretionary accrual and lower abnormal production costs than their male counterparts. In addition, male CFOs engage in more EM in periods surrounding CFO transitions.

Lara et al. (2017)	UK	Discretionary accruals	They found that only independent female directors are associated with less earnings management.
Gull et al. (2018)	French	Discretionary accruals	The participation of female directors on the board mitigates earnings management particularly when they have relevant business expertise. In addition, firms with female CFOs are less likely to engage in EM.
Qi et al. (2018)	China	Discretionary accruals and Real earnings management	Female executives are less likely to engage in EM either through discretionary accruals or real earnings management activities.
Zalata et al. (2018)	US	Discretionary accruals	They found that female financial experts on the audit committee are associated with less EM. But this is not the case with male financial experts on the AC as they are not associated with less EM.
Harris et al. (2019)	US	Discretionary accruals and Real earnings management	There is no impact of the CEO gender on earnings management at higher levels of equity-based compensation. However, they found that at lower levels of equity-based compensation, female CEOs manage earnings to a lesser degree than their male counterparts do.
Zalata et al. (2019a)	US	Classification shifting	The magnitude of classification-shifting practices is higher in firms with female CEOs pre-SOX. However, post-SOX, such practices declined significantly in firms with female CEOs, but not in firms with male CEOs.
Zalata et al. (2019b)	US	Discretionary accruals	Female directors with monitoring roles constrain EM. But female directors with advisory roles are not associated with lower EM.

Appendix B: Variables' definitions

Variables	Definition
ABNORMAL_CORE_EARNINGS	Abnormal core earnings and represents the residuals from estimating equation (1).
SPECIAL_ITEMS	Income-decreasing special items as a percentage of sales calculated as [(special items × -1)/sales]. We set <i>SPECIAL_ITEMS</i> to zero if the special items are income-increasing special items.
FEMALE	The proportion of female directors. In Tables 1 and 2, <i>FEMALE^b</i> refers to the proportion of non-executive female directors to the total number of board members. <i>FEMALE^a</i> refers to the proportion of non-executive female directors on the audit committee to the total number of audit committee members.
SIZE	Firm size measured as the natural logarithm of firms' total assets.
LEVERAGE	Leverage measured as long-term debt divided by common equity.
OPERATING_CASH_FLOWS	Operating cash flows measured as cash flows from operating activities divided by lagged total assets.
RETURN_ON_ASSETS	Return on assets measured as net income before extraordinary items divided by average total assets.
GROWTH	The proportion of market value to book value of common equity.
ACCRUALS	Working capital accruals measured as working capital accruals divided by lagged total assets. We measure working capital accruals as (change in current assets net of change in cash and short-term investment) – (change in current liabilities net of change in the current portion of long-term debt).
ACCRUALS_EM	<p>Accruals earnings management measured as the absolute value of the residual from the adjusted Jones model adopted from Athanasakou, Strong and Walker (2011) as follows</p> $ACCRUALS_{i,t} / AT_{i,t-1} = \beta_0 + \beta_1 1/AT_{i,t-1} + \beta_2 Adj_sale_{i,t} / AT_{i,t-1} + \beta_3 ROA_{i,t} + \beta_4 OCF_CH_{i,t} / AT_{i,t-1} + \beta_5 NEG_OCF_CH_{i,t} + \beta_6 (OCF_CH_{i,t} / AT_{i,t-1} \times NEG_OCF_CH_{i,t}) + \varepsilon_{i,t}$ <p>where <i>ACC</i> is working capital accruals. <i>AT</i> is total assets.</p>

	<i>Adj_sale</i> is change in sales less change in accounts receivables. <i>ROA</i> is return on assets. <i>OCF_CH</i> is the change in operating cash flows and <i>NEG_OCF_CH</i> is an indicator variable set to one if <i>OCF_CH</i> is negative and zero otherwise.
BOARD_SIZE	Board size measured as an indicator variable set to one if the number of directors is between five and twelve and zero otherwise.
AUDIT_COMMITTEE_SIZE	Audit committee size measured as the number of directors on the audit committee.
%INDEPENDENT	Independent directors measured as the number of independent directors divided by the total number of directors.
FEMALE_LC	The proportion of non-executive female directors who are less than 63 years old.
FEMALE_SC	The proportion of non-executive female directors who are at least 63 years old.
FEMALE_FB	The proportion of non-executive female directors with relevant financial background as reported on ISS database.
FEMALE_NFB	The proportion of non-executive female directors without relevant financial background as reported on the ISS database.