

**Female CFOs and corporate accounting fraud: Do board
characteristics play a role?**

Jing Liao
School of Economics and Finance,
Massey University (Manawatu Campus)
Private Bag 11-222, Palmerston North 4410, New Zealand

Xutang Liu
School of Economics and Finance,
Massey University (Manawatu Campus)
Private Bag 11-222, Palmerston North 4410, New Zealand

David Smith
School of Economics and Finance,
Massey University (Manawatu Campus)
Private Bag 11-222, Palmerston North 4410, New Zealand

Female CFOs and corporate accounting fraud: Do board characteristics play a role?

Abstract

We investigate the influence of female chief financial officers (CFOs) on corporate accounting fraud. Using a sample of 2,290 Chinese listed firms for the period from 2003 to 2015, we find female CFOs are significantly less likely to engage in accounting fraud. Interestingly, the strength of gender effect is subject to the characteristics of the board. The CFO gender effect is only significant in subsamples with boards that do not discriminate against women in access to directorships. In addition, such an effect is more pronounced when the firm has a less powerful CEO and when the CFO holds the directorship simultaneously. These results indicate that when overall absence of gender parity is prevalent, such as in the Chinese setting, female executives are able to provide effective monitoring only in better-governed firms with less gender discrimination.

Key words: Female CFO, board characteristics, corporate accounting fraud

JEL classification: G30, K42

Female CFOs and corporate accounting fraud: Do board characteristics play a role?

1. Introduction

The purpose of this study is to examine whether the gender of chief financial officers (CFOs) has an impact on corporate accounting fraud. CFOs typically oversee the firm's financial processes and therefore they are likely to have the most direct impact among top management on the accounting related decisions of the firm (Ge, Matsumoto and Zhang, 2011). Motivations to link CFO gender with accounting fraud comes from the existing studies related to the role of the CFO in ensuring financial reporting quality (Barua, Davidson, Rama and Thiruvadi, 2010; Geiger and North, 2006; Francis, Hasan, Park and Wu, 2015) and the line of research that explores whether gender-based psychological differences apply to leadership positions. (e.g., Faccio, Marchica and Mura, 2016; Hanousek, Shamshur and Tresl, 2017; Lara, Osma, Mora and Scapin, 2017).

China provides an interesting setting to examine the above research question. If gender parity is a worldwide issue, this is particularly the case in China. According to the Global Gender Gap Report (GGGR) 2017, the gap between both the achievements and well-being of men and women widened in 2017, while China's progress towards gender parity has slowed markedly. While China was ranked 63rd out of 144 countries in the Global Gender Gap Index in 2006¹, the ranking dropped to 100th out of 144 in 2017. According to the GGGR 2017, women earn on average 36% less than men for doing similar work in China. It is therefore not surprising that Chinese firms represent a clear case of male dominance in top management. We

¹ The Global Gender Gap Index measures the relative gaps between women and men in 144 countries from four key areas: health, education, economy and politics.

report preliminary statistics that show only 4.7% of our sample firms have female CEOs.² However, accounting tends to be the area where women are likely to play a role in Chinese corporations. According to statistics, there were more than 100,000 chartered accountants in China in 2015, and 49.35% of those were female.³ Our preliminary statistics show that 34.7% of CFOs in sample firms were female in 2015. Therefore, it becomes an interesting question as to whether female CFOs can influence firms' accounting related decisions (an area where females appear to have a say) given the lack of gender parity in China.

Generally, women are more interpersonally sensitive, more cooperative and collaborative, more risk adverse and less self-confident than men (Byrnes, Miller and Schaefer, 1999; Eagly, Wood and Diekmann, 2000; Moskowitz, Suh, and Desaulniers, 1994; Powell and Ansic, 1997; Rosener, 1995). However, it is debatable whether the gender-based psychological differences apply to leadership positions, and in turn lead to different decision-making and firm outcomes. Literature has shown the presence of women directors is associated with less risky decision-making and increases the board's monitoring intensity. For example, firms run by female CEOs have lower debt ratios, less volatile earnings, and are more likely to remain in operation than firms that have male CEOs (Faccio et al. 2016). Hanousek et al. (2017) document that firms run by a female CEO are reluctant to engage in corruption. The proportion of female independent directors on the board is associated with higher dividend payout, which mitigates the free cash flow problem (Chen, Leung and Coergen, 2017). Board gender diversity is also found to be positively related to research and development (R&D) expenses (Miller and Triana, 2009).

However, another strand of the literature also proposes that women and men who occupy the same leadership role could behave very similarly (Eagly and Johnson, 1990). Specifically,

² Faccio, Marchica and Mura (2016) examine the impact of CEO gender on firm risk-taking in US firms and report that 9.4% of the CEOs in the sample are women.

³ The resource is from <http://kjs.mof.gov.cn>

while women in the specialized fields of economics, finance and business are different from those in the general population, men are not more overconfident than women in these disciplines (Deaves, Luders and Luo, 2009). Lara et al. (2017) examine the monitoring role of female directors over accounting quality using the data of UK firms. They find that a percentage of female independent directors is associated with improved earnings management practices. But, they further report such monitoring effects disappear in firms that do not discriminate against women in access to directorships. They argue that discrimination against women actually shapes the association between the presence of female directors and the monitoring role of the board. Alternatively, in better-governed firms with less gender discrimination, female and male executives provide the same effectiveness of monitoring. Sila, Gonzalez and Hagendorff (2016) demonstrate that after controlling for endogeneity, there is no evidence that female boardroom representation affects a firm's equity risk, a range of policy measures or an operating measure of risk. They caution that studies that attempt to link the demographic characteristics of corporate executives to firm outcomes have to consider how to causally isolate firm outcomes from between-firm heterogeneous factors that influence both the demographic characteristics of executives and firm outcomes.

Using a sample of 2,290 listed firms that consist of 10,073 firm-year observations, we find female CFOs in China are significantly less likely to engage in accounting fraud. However, this gender effect is subject to the gender discrimination of the firm. In particular, the CFO gender effect is only significant in subsamples with boards that do not discriminate against women in access to directorships. When the firm appears to be gender-friendly in the boardroom, female CFOs are able to reduce the likelihood of accounting fraud. In addition, we find that the CFO gender effect is more pronounced when the firm has a less powerful CEO and when the CFO holds the directorship simultaneously.

Our result is opposite to Lara et al. (2017) who document female independent directors

are not able to improve earnings management practices when firms do not discriminate against women in access to directorships. We argue the difference is mainly due to the fact that in China overall corporate governance and gender parity is much weaker than that of most developed economies., and therefore only in boards that don't discriminate female CFOs have the ability to reduce fraud.

In support of this argument we first note that women have to meet a higher standard of effectiveness than men to attain executive positions and to retain them over time (Eagly and Johannesen-Schmidt, 2001), and this is particularly true in China. According to the Global Gender Gap Report 2017, the labour force participation of females as a percentage of males is 83%, but only 16.8% of Chinese firms have female top executives. Survey results indicate that more than 72% of women believe they were not hired or promoted just due to gender discrimination (Yang, 2012). Both male and female CFOs have strong incentives to avoid accounting fraud because it will hurt their career development badly. However, due to the strong gender bias in the overall Chinese environment, female CFOs have particularly strong incentives to avoid violations. In addition, biases against women may create a better pool of female candidates. Hence, firms with better gender parity are more likely to hire the most talented female candidates (Lara et al., 2017).

Second, managers occupy roles defined by their specific position in a corporation but also simultaneously function under the constraints of their gender roles (Eagly and Johannesen-Schmidt, 2001). Eagly and Johannesen-Schmidt (2001) argue that although some gender-stereotypic differences may be diminished or even eliminated by managerial roles, certain gender roles still spill over to organizations. Gender provides an “implicit, background identity” (Ridgeway 1997, p. 231) in the workplace. The expectation for female CFOs is that they are more cautious and conservative than men in making financial decisions (Riley and Chow, 1992). Female CFOs have to perform their managerial roles and basically conservative gender

roles simultaneously. In addition, small differences repeatedly made by individuals can produce huge consequences (Martell, Lane, and Emrich, 1996). If female CFOs are able to change the accounting practices in just a minor way but have the ability to keep making those changes over time, the accounting related decisions of the firm are likely to improve. Consistent with these ideas, our results show that female CFOs in China are more effective at avoiding accounting violations, particularly when there is less discrimination against women in access to directorships.

Third, according to Chinese culture, females are expected to be introverted (Wu, 2006). Dong Mingzhu, the chairman of Gree Electric, is known as “one of the toughest businesswomen in China”. Since she became the chairman in 2001, Gree Electric has become the world’s largest specialized air conditioner company. Dong is known primarily for her determination among most Chinese people. Some male competitors said: “Where sister Dong walks, no grass grows”⁴. Dong resigned as the chairman of Gree Group in November 2016. No specific reason was announced for the termination, but media reported that it might be due to a proposed takeover of an electric-car manufacturer. Shareholders were expressing skepticism about her acquisition plans as being aggressive. There’s a Chinese saying (“di diao zuo ren, gao diao zuo shi”) about being low key in how you conduct yourself. Dong’s resignation may indicate that being understated in their behaviour, at least occasionally, might be helpful for female managers who wish to maintain their leadership positions in China. A conservative approach by female CFOs with respect to accounting fraud is consistent with such a cultural influence.

Fourth, overall corporate governance is much less efficient in China than in most developed countries. For example, business operations of Chinese listed firms are normally constrained by political and social objectives, which include politically motivated job

⁴ Source: Brand International

placement (Clarke, 2003). In addition, investor protection in China is weaker than in developed economies (Allen, Qian and Qian, 2005). Female CFOs' voices are most likely to be ignored in such a weak corporate governance setting. However, firm-level gender discrimination shapes the impact of female CFOs on accounting fraud. More specifically, the greater firm-level gender parity enhances female CFOs' mitigating effect.

Our main contribution is twofold. First, this study further contributes to the ongoing debate on the importance of promoting gender diversity as a corporate governance mechanism. Our results highlight that female CFOs in China provide effective oversight of a firm's accounting related decision-making. This is mainly because female CFOs need to perform their managerial roles and basically conservative gender roles simultaneously to secure their leadership position. Second, our results convey that the strength of the CFO gender effect is subject to board characteristics. In particular, such an effect is more pronounced in firms with greater gender parity. This result indicates that when the overall lack of gender parity is prevalent, such as in the Chinese setting, female executives are more likely to play a role in more conservative areas, such as accounting. In addition, female executives are able to provide effective monitoring in better-governed firms with less gender discrimination.

The remainder of the paper is organized as follows: Section 2 discusses the literature and hypotheses development. The data and methodology are explained in Section 3, while the main results and analysis controlling for endogeneity are presented in Section 4. Section 5 concludes the study.

2. Literature and hypotheses development

Neoclassical economic theory and agency theory both tend to support the view that managers of firms should behave rationally and therefore their personal attributes will not impact on the decisions they make (see for example Jensen and Meckling (1976) and Bamber, Jiang and Wang (2010)). In contrast upper echelons theory proposes that differences in

psychological factors such as managers' personal values, perceptions and biases may in fact have implications for corporate decision making (see for example Hambrick and Mason (1984); Hambrick (2007)). Demographic characteristics such as age, gender and educational background have been identified as factors that may be used to proxy for these psychological characteristics (Bamber, Jiang and Wang, 2010). It then becomes an empirical question as to how particular demographic characteristics, such as gender, may impact on areas such as the accounting choices firms make.

There now exists a considerable body of literature that examines whether the presence of women in management and board of director roles influences firm performance, firm risk and firms' accounting choices. However it is apparent that the results of this research are not conclusive with respect to whether gender diversity has a positive or negative impact or no impact at all. Thus Faccio et al (2016) find that firms managed by female CEOs take on less debt, have less volatile earnings, and have better survival prospects; moreover, the appointment of a female CEO is associated with less risk-taking. Gul, Srinidhi and Ng (2011) present evidence that gender diversity improves the informativeness of stock prices. Srinidhi, Gul and Tsui (2011) find that firms with female directors have higher quality earnings. Using evidence from the Chinese market, Liu, Wei and Xie (2014) find that a positive and significant relationship exists between the gender composition of the board and firm performance.

On the other hand, Sila et al. (2016) find no evidence that female representation on the board has an impact on firm risk. Adams and Raganathan (2015) examine evidence from the banking sector and conclude that women are not more risk averse than men, but also find that gender diversity results in better performance. Ahern and Dittmar (2012) look at evidence from Norway, where a law mandating female representation on boards was introduced in 2003. They find that the imposition of quotas resulted in declines in stock price and firm performance. Adams and Ferreira (2009), while finding that boards with more female members put more

effort into their monitoring role, also conclude that gender diversity has on average a negative impact on firm performance.

Our paper focuses on the role of female CFOs in particular, and the literature that examines the association between female CFOs and accounting quality also has mixed results. Thus, Francis et al. (2015) find that accounting conservatism increases significantly subsequent to the hiring of a female CFO. Female CFOs are less likely to receive equity-based compensation than their male colleagues, more likely to invest in tangible assets, and more likely to reduce dividend payouts. Barua et al. (2010) document that the presence of female CFOs is associated with higher quality financial reporting, including lower accrual estimation errors. Peni and Vahamaa (2010), on the other hand, find evidence of a relationship between female CFOs and income-decreasing discretionary accruals, which may be indicative of a more conservative approach to earnings management. Ge et al. (2011) examine the impact of a range of CFO-specific factors on accounting practices and find only limited evidence that characteristics such as gender, age and education have an impact on accounting choices.

So far we have looked at papers that investigate the association between gender diversity and accounting choices in general. A smaller strand of the literature examines the relationship between gender and accounting fraud, which is another focus of our paper. Sun, Kent, Chi and Wang (2017) study the association between CFO characteristics and fraudulent financial reporting using evidence from China. Their results include the finding that female CFOs are less likely to engage in fraudulent financial reporting. Wahid (2018) finds that boards that are more gender diverse are less likely to engage in financial manipulation. Thus there is some evidence to suggest that gender may have a mitigating effect on accounting fraud. Given that corporate governance in China is already relatively weak and that gender diversity may be a partial remedy for such weakness (Gul et al., 2011) and Liu et al. (2014) we therefore propose the following hypothesis:

H1: the presence of female CFOs is associated with lower levels of accounting fraud

Scholars have presented evidence that men and women behave similarly in managerial roles (Eagly and Johnson, 1990) and have argued that they have similar attitudes with respect to issues such as risk in the context of managing organisations (Croson and Gneezy, 2009). However a small number of papers examine whether there is discrimination with respect to the hiring of women in the first instance, and whether such discrimination subsequently influences the relationship between gender and the monitoring role of the board. Thus, Bilimoria and Piderit (1994) find a bias in favour of men when it comes to making appointments to various board committees. Farrel and Hersch (2005) find that the appointment of directors is influenced by gender. They show, for example, that the number of women currently on the board makes it less likely that the firm will appoint another woman. Therefore, it is argued that the effects of gender cannot be properly estimated without controlling for discrimination bias in the nomination process (De Cabo, Gimeno and Escot, 2011). Lara et al. (2017) in particular document that discrimination shapes the association between the presence of female directors and accounting practices due mainly to three reasons. First, biases against women may create a larger pool of available female candidates for directorships. Hence, firms with better gender parity are more likely to hire the most talented candidates. Second, females who obtain the directorship are more likely to exert greater effort than their male counterparts due to the barriers that females have to overcome to become directors. Third, the presence of female directors (gender parity) may be a proxy for better corporate governance structure. Firms with greater female director representation can have also other governance provisions that improve the financial reporting process.

Empirical studies examine whether a firm's corporate governance quality shapes the

association between the presence of female directors and firm behaviour. Chen et al. (2017) show that firms with greater female director representation have higher dividend payouts, and they further report gender diversity is more pronounced in firms with weak corporate governance, where managers are more likely to be entrenched and where the CEO also serves as the board chairman. Lara et al. (2017) use a sample of UK firms to examine the association between gender diversity on boards and the quality of earnings management. While they find that a higher percentage of female independent directors is associated with better earnings management practices, they also report that these monitoring effects disappear in firms that do not discriminate against women in access to directorships. Based on the empirical results reported in Lara et al we propose the following second hypothesis:

H2: in the absence of discrimination, the mitigating impact of female CFOs on accounting fraud is not significant

3. Data and Variable construction

3.1 Data

The initial sample of this study includes all companies listed on the Shanghai and Shenzhen Stock Exchanges from 2003 to 2015. All data are from the China Listed Firms Research Database of China Stock Market and Accounting Research (CSMAR). We also hand collect the profiles of the CEOs from websites (e.g. Yahoo finance, Sina finance). We exclude financial firms, which is a common practice of similar studies (e.g., Lara et al., 2017). We remove observations with missing information and delete the top and bottom percentile of observations. The final sample includes 2,290 listed firms that consist of 10,073 firm-year observations.

3.2 Variable construction

3.2.1 Accounting fraud

The CSMAR's Enforcement Actions Research Database details the punishment of violations cases of Chinese listed firms. Following literature studying corporate accounting fraud (Conyon and He, 2016; Liu, 2016; Sun et al., 2017), we first construct the accounting fraud dummy (*Fraud*) that equals one (zero otherwise) if the firm has conducted one of the accounting violations.⁵ CSMAR provides data on the number of years affected by the accounting fraud. We also construct a *Serious Fraud* dummy that equals one if the enforcement action affects multiple financial years and zero otherwise (Conyon and He, 2016).

3.2.2 CFO characteristics

Ge, Matsumoto and Zhang (2011) document that firms' accounting choices vary systematically across individual CFOs. In this study, we focus on the impact of CFO gender on accounting fraud. We construct a variable *Female CFO* dummy variable that is equal to one if the CFO of the firm is female and zero otherwise. We also control for CFO age and CFO directorships. *LnCFO age* refers to the natural logarithm of the age of the CFO. Literature has shown that risk aversion appears to increase with age (Palsson 1996). Older CFOs are less aggressive in their accounting choices (Ge et al. 2011). *CFO duality* is a dummy variable equal to one if the CFO also holds directorships simultaneously and zero otherwise. It is interesting to explore whether CFOs holding a directorship at the same time have a more powerful decision-making role and therefore are more likely to reduce accounting fraud.

3.2.3 CEO characteristics

We use four variables to measure CEO characteristics. Politicians serving on the board is captured in this study by a dummy variable *Political CEO* equal to one if the CEO is currently

⁵ Those violations include Fictitious Profit; Fictitious Assets; False Recordation (Misleading Statements); Delayed Disclosure; False Information Disclosure; Fraudulent Listing; False Capital Contribution; Unauthorized Changes in Capital Usage; Occupancy of Company's Assets; Illegal Insider Trading; Illegal Stock Trading; Stock Price Manipulation; Illegal Guarantee; Mishandling of General Accounting.

or was formerly an officer within the central or local government, or within the military (Fan, Wong and Zhang 2007). Government interference is suggested as a concern for Chinese corporate governance (Fan, Wong and Zhang 2007). Politicians strongly influence firms to pursue political objectives rather than value maximization (Shleifer and Vishny, 1994). Politicians are more likely to serve on boards in countries with high levels of corruption and a weak legal system (Faccio, 2006). Chaney, Faccio and Parsley (2011) show the quality of earnings reported by firms with politicians on the board is significantly poorer than that of non-connected firms. Bona-Sánchez et al. (2014) also report that the presence of politicians on the board negatively affects earnings informativeness. Therefore we expect firms that have politically connected CEOs are more likely to engage in accounting fraud. We also control for CEO duality, gender and age. *CEO duality* is a dummy equal to one if the Chairman of the Board also holds the position of CEO. The monitoring role of the board is found to be weak when CEO duality is present (Tuggle, Sirmon, Reutzel and Bierman, 2010). *Female CEO* is a dummy variable equal to one if the CEO of the firm is female and zero otherwise. Women are found to be risk averse compared to men, and thus are more likely to take less risk (Byrnes et al., 1999). We expect accounting fraud is less likely in firms with female CEOs. *LnCEO age* is calculated as the natural logarithm of the age of the CEO. Andreou, Louca and Petrou (2017) indicate that it is more costly for younger CEOs to disclose negative information. As a result, firms with younger CEOs would be less likely to conduct fraud.

3.2.4 Board gender diversity

We use two variables to proxy the gender diversity of the firm. *Gender diversity* refers to the proportion of female directors to total number of directors on the board. *Female independence* refers to the proportion of female independent directors to total number of directors on the board. Board gender diversity has received considerable attention within the issues of corporate governance in recent years. Lara et al. (2017) find that the percentage of

female independent directors on the board is negatively related to earnings management measures in UK firms. We expect accounting fraud is less likely in firms with a higher proportion of female (independent) directors on the board.

3.2.5 Control variables

Following the literature, we employ a series of variables to control for other determinants of accounting fraud (e.g., Conyon and He, 2016; Liu, 2016). We first include board composition variables. *LnBoard size* is calculated as the natural logarithm of the total number of directors on the board. *Board independence* is the ratio of number of independent directors to total number of directors. Smaller boards with more independent directors are associated with more efficient monitoring (Raheja, 2005). In line with the literature, board size (board independence) is expected to be positively (negatively) related to accounting fraud. We also control for firm specific factors. *Firm size* is calculated as the natural logarithm of total assets. *Leverage* is total debt to total assets. *ROA* is calculated as the ratio of net profits to total assets. *State* is a dummy that equals one if the ultimate controller of the firm is a state-owned enterprise (SOE) or government agency and zero otherwise. Conyon and He (2016) find state controlled firms are less like to conduct accounting fraud. We summarize the variable descriptions in Appendix A.

3.3 Summary statistics

Table 1 reports the summary statistics of the variables used in this study. On average, 28.7% of the sample firms have female CFOs. The average CFO age is 43 years with the youngest age 27 and the oldest 67. On average, 24.7% of CFO hold a directorship simultaneously. For CEO characteristic measures, 18.6% of CEOs are politically connected. Chairman-CEO dual role represents 22.3% of the sample. Males dominate the board composition with females constituting only 4.7% of CEOs, 12.1% of directors on the board and only 5.1% of independent directors to total number of directors. The average board size is 9 directors with the minimum 4 and maximum 19. Chinese government agencies or SOEs maintain the ultimate control in

41.3% of the sample firms.

Insert Table 1 here

Table 2 reports the time trend of the CFO and CEO characteristics and board composition variables included in the analysis. There is a slight increase of the presence of female CFOs since 2009 and the female CFO ratio reached 34.7% in 2015. Politically connected CEOs shows a decreasing trend over the sample period, while the dual role CEO increased from 8.1% in 2003 to 32% in 2015. More females are able to get the directorship role during the sample period and the proportion of female directors on the board reached 15.5% in 2015. Female independent director representation also increases slightly from 3.3% in 2003 to 6.8% in 2015.

Insert Table 2 here

The pairwise correlation matrix of the key variables, which is not tabulated here, does not suggest any serious multicollinearity concerns, except the highly significant correlation between board gender diversity and female independent director ratio.

4. Results, discussion and robustness checks

4.1 Female CFO and accounting fraud

To examine the impact of female CFO on accounting fraud, we use a panel data probit specification to model the likelihood that a firm conducts a fraud (Eq. (1) below). We add year dummies into the regression and control for CFO effect by clustering standard errors by CFO.⁶ The motivation for clustering standard errors by CFO is to incorporate the correlation of regression residuals across time for a given CFO. The initial regression specification is as follows:

$$\begin{aligned} \text{Fraud/Serious Fraud} = & \alpha + \beta_1 \text{Female CFO} + \beta_2 \text{LnCFO age} + \beta_3 \text{CFO duality} + \beta_4 \text{PCEO} \\ & + \beta_5 \text{CEO duality} + \beta_6 \text{Female CEO} + \beta_7 \text{LnCEO age} + \beta_8 \text{Gender diversity/Female} \\ & \text{independence} + \beta_9 \text{LnBoard Size} + \beta_{10} \text{Board independence} + \beta_{11} \text{Firm Size} + \beta_{12} \text{Leverage} \\ & + \beta_{13} \text{ROA} + \beta_{14} \text{State} + \varepsilon \end{aligned} \quad (1)$$

⁶ For robustness checks, we perform regressions controlling for industry and year effects for the analyses reported in Tables 4. The results are qualitatively similar to the main results reported. We also perform regressions controlling for firm and year effects and again the results are qualitatively similar to those presented in the current tables.

Table 3 reports the probit regression results. In line with our H₁, Female CFO dummy is negatively related to *Fraud* and *Serious fraud* dummy, and significant at the 1% and 5% level, respectively. This result indicates that female CFOs are less likely to engage in fraud. It is harder for women than men to get leadership roles in China. The Global Gender Gap Report 2016 shows that women make up just 17% of all legislators and senior officials in China; similarly, only 17.5% of Chinese corporations have female top managers. When women get top management positions they would have a stronger incentive to avoid fraud given it will hurt their career badly. Our results provide further evidence to support the proposal that differences in managerial characteristics, in particular gender, have implications for corporate decision making (Faccio et al., 2016). Women are more conservative and less likely to conduct fraud.

In Models 1 and 2 in Table 3 we use the proportion of female directors on the board to proxy board gender diversity, while in Models 3 and 4 we use the proportion of female independent directors on the board as an alternative gender diversity measure. However, neither measure is significantly related to the fraud measures. We also fail to find significant results from other CFO or CEO characteristics and board composition variables. We find accounting fraud is less likely in well performing firms, large firms and firms controlled by the state. Firms with higher debt ratios are more likely to conduct accounting fraud. These results are in line with Conyon and He (2016).

Insert Table 3 here

4.2 Endogeneity

Establishing a causal relationship between CFO gender and corporate fraud is challenging. Literature has argued that executive characteristics are not always exogenous random variables; firms may choose executives with certain characteristics to suit their operating and contracting environment variables (Sila et al. 2016). Our results reported in Table 3 have mainly assumed

that the presence of female CFO in sample firms is exogenous. However, our results may be subject to possible endogeneity concerns. First, female CFOs may choose to serve in firms with better corporate governance that reduces the likelihood of accounting violation. Second, our models may not adequately account for the possible selection bias. Put differently, the presence of female CFOs may not be assigned randomly. For example, firms with female directors on the board might be more likely to appoint a female CFO. Third, our results in Table 3 could suffer from omitted variables that correlate with both CFO gender and violation likelihood. For example, literature suggests that unobserved CEO abilities and preferences might be related to both board gender diversification and firm risk-taking behaviour (Sila et al. 2016). It is possible to have unobservable variables, e.g., CEO preferences or abilities, related to both the presence of female CFOs and accounting fraud.

4.2.1 Difference-in-difference approach

As discussed above, it is a concern that female CFOs may choose to serve in firms with better corporate governance. We address this causality issue by using a difference-in-difference approach. We first exclude the firms that only have male or female CFOs over the sample period and just include the firms that have both male and female CFOs over the sample period. We get a sample of 523 firms that consists of 3,066 firm-year observations. This sample includes the firms having a female CFO for at least one observation year and therefore can potentially address the reversal selection issue. Namely, these 523 sample firms appear not to have obvious gender discrimination, hence the CFO gender effect captured in the following test is less likely driven by other factors that influence both the representation of a female CFO and the likelihood of fraud. We construct a *Loss* dummy equal to one if the firm changes from having a female CFO to male CFO in any given year and zero otherwise. *Loss* dummy is expected to have a positive relationship to fraud variables. We also include the interaction term $Loss \times State$ into the regression. Firms with state-concentrated ownership are normally

constrained by political and social objectives, e.g., maintenance of employment levels or politically motivated job placement (Clarke, 2003) Therefore, state-controlled firms are less likely to promote risky projects (Boubakri, Cosset and Saffar, 2013). We interact the effect of losing a female CFO with state control because the CFO gender effect may be subject to the identity of controlling shareholders. Government control is always an important issue in the Chinese context. When the controlling shareholder is risk adverse, the change from a female CFO to male CFO may not change the fraud likelihood significantly. The regression specification is as follows:

$$\begin{aligned}
 \text{Fraud/Serious Fraud} = & \alpha + \beta_1 \text{Loss} + \beta_2 \text{State} + \beta_3 \text{Loss} \times \text{State} + \beta_4 \text{LnCFO age} + \beta_5 \text{PCEO} + \\
 & \beta_6 \text{CEO Duality} + \beta_7 \text{Female CEO} + \beta_8 \text{LnCEO age} + \beta_9 \text{Gender diversity/Female} \\
 & \text{independence} + \beta_{10} \text{LnBoard Size} + \beta_{11} \text{Board independence} + \beta_{12} \text{Firm Size} + \\
 & \beta_{13} \text{Leverage} + \beta_{14} \text{ROA} + \varepsilon
 \end{aligned}
 \tag{2}^7$$

Consistent with our expectation, the results in Table 4 show that *Loss* dummy has a positive relationship with fraud variables. In Model 1, *Loss* dummy is significant at the 5% level. This suggests changing from a female CFO to male CFO significantly increases the likelihood of conducting accounting fraud. In Models 2, we add the interaction term *Loss* × *State* into the regression. *Loss* dummy is positively related to *Fraud* dummy, significant at the 1% level. The interaction term *Loss* × *State* has negative coefficients in Models 2, but is not significant, suggesting the change from female to male CFO does not significantly increase the likelihood of accounting fraud in state-controlled firms. This could be due to the conservatism of controlling state shareholders. In Model 3, *Loss* dummy is significant when regressing on *Serious fraud*, but not statistically significant. When adding the interaction term in Model 4, *Loss* dummy becomes significant at the 10% level, and the interaction term *Loss* × *State* has a negative coefficient, but is not significant. Overall, results reported in Table 4 confirm our main hypothesis that female CFOs are less likely to conduct accounting fraud. The results for other

⁷ We use the proportion of female independent directors on board as the alternative measure for *Gender diversity*; the results are similar to the results reported in Table 4.

variables are similar to those reported in Table 3.

Insert Table 4 here

4.2.2 Propensity score matching (PSM) analysis

Following the literature (Angrist and Pischke 2009; Conyon and He, 2016), we use propensity score matching (PSM) methods to address selection effects. The PSM approach introduced by Rosenbaum and Rubin (1983) reduces model dependence in parametric causal inference (Ho, Li, Tam and Zhang, 2007). It reduces selection bias by equating groups based on the covariates. As discussed, the presence of female CFOs may not be assigned randomly, and firms with certain observable characteristics might be more likely to have female CFOs.

Table 5 presents our estimates of the basic propensity score model. We first estimate a probit model to predict the likelihood of having a female CFO by incorporating a set of CEO characteristics, and firm specific variables as well as year dummy variables. Firm effects are addressed by clustering the errors at the firm level. We do not claim to model precisely the likelihood of having a female CFO. The aim of the propensity score method is to produce two statistically similar samples with and without female CFOs, respectively.

$$\begin{aligned} \text{Female CFO} = & \alpha + \beta_1 PCEO + \beta_2 CEO \text{ Duality} + \beta_3 \text{Female CEO} + \beta_4 \text{LnCEO age} + \\ & \beta_5 \text{Gender diversity/Female independence} + \beta_6 \text{LnBoard Size} + \beta_7 \text{Board independence} + \\ & \beta_8 \text{Firm Size} + \beta_9 \text{Leverage} + \beta_{10} \text{ROA} + \beta_{11} \text{State} + \varepsilon \end{aligned} \quad (3)$$

As shown in Table 5, the likelihood of having a female CFO is significantly higher in firms with a higher proportion of female directors on the board. This effect is confirmed by using female independent director ratio as an alternative measure of gender diversity in Model 2. Firms with politically connected CEOs and CEO duality are more like to have a female CFO. In addition, firms having a higher debt ratio are less likely to have a female CFO. The results indicate that the presence of female CFOs is determined by a set of CEO characteristics, board composition and firm specific variables.

Insert Table 5 here

We use the predicted propensity score from Table 5 to perform a one-to-one PSM procedure and end up with the treatment group with a female CFO and the control group with a male CFO, which consists of 5788 firm-year observations in total.⁸ Although PSM reduces the sample size, it enables us to correct for possible selection bias due to observable differences between the treatment and control groups. This PSM sample enables us to compare the treatment group (firms with female CFO) to statistically similar controls using a matching algorithm. If two firms have the same propensity category and they are in different groups, then it indicates that these two firms were randomly assigned to the treatment (having a female CFO) (D'Agostino, 1998).

Table 6 reports the treatment effects analysis of the impact of female CFOs on accounting fraud. ATET refers to the average treatment effect on the treated. On average 11.4% of firms with male CFOs conduct an accounting fraud, while the average likelihood of conducting a fraud is 3.7% less when the firm has a female CFO. These effects are both highly significant at the 1% level. Similarly, as shown in Model 2 the average likelihood of conducting a serious fraud is 1.1% less when the firm has a female CFO. The likelihood of firms with male CFOs engaging in a serious fraud is 4.6%, which is significant at the 1% level. The treatment effect analyses confirm that female CFOs are less likely to conduct accounting fraud than male CFOs.

Insert Table 6 here

4.2.3 The Heckman two-stage analysis approach

We next employ the Heckman two-stage procedure to address the concern that the observed association between CFO gender and accounting fraud is caused by unobservable correlated variables, such as CEO ability and preference. The first stage regression analysis is the same as that reported in Table 5 to predict the likelihood of having female CFOs (the probit

⁸ The PSM process is done basing on Model 1 of Table 5. We use Model 2 for robustness check of the impact of gender diversity on the likelihood of having a female CFO.

first-stage equation). We first estimate the inverse Mills ratio (*Mills*). Then in the second stage, we include *Mills* as an additional independent variable in the accounting fraud regression. The results shown in Table 7 are statistically similar to those reported in Table 3. The coefficients on female CFO dummy are negative and statistically significant when the inverse Mills ratio is controlled for. These results suggest that the identified relationship between CFO gender and likelihood of accounting fraud from our main regressions is valid.

Insert Table 7 here

4.3 Female CFO and accounting fraud: does board gender discrimination matter

Lara et al. (2017) find that gender biases in the boardroom play a significant role that shapes the relationship between board gender diversity and accounting quality. They report that the higher the percentage of female independent directors on the board, the better the earnings management practices in UK firms. However, this relationship disappears in firms that do not discriminate against females in access to directorships.

Gender bias is a critical issue in the Chinese professional labour market. According to the Global Gender Gap Report 2016, women earn on average 35% less than men for doing similar work in China, ranking 99th out of 144 countries in the Global Gender Gap Index. In addition, survey results indicate that more than 72% of women believe they were not hired or promoted due to gender discrimination (Yang, 2012). As discussed, according to the Global Gender Gap Report 2016, only 17.5% of Chinese firms have female top managers. We expect that the female CFO effect will be influenced by the overall gender discrimination in the boardroom. Following Lara et al. (2017), we use two approaches to proxy whether the firm discriminates against women in access to directorships. The first approach is to identify non-discriminating firms as firms that have at least one female director during the sample period, while discriminating firms are those firms that never have a female director during the sample period. The second approach is to apply the discrimination criterion at the firm-year level instead of at

the firm level. That is, a single firm would be recognized as discriminating in some years (when the firm has only male directors on board) and as non-discriminating in other years (when the firm has a gender-mixed board).

Using the propensity score matched sample of 5,788 firm-year observations, we divide the observations into subsamples with and without gender discrimination according to the two approaches discussed above. The results in Table 8 show that the CFO gender effect is only significant in subsamples with boards that do not discriminate against women in the access to directorships. These results indicate that the female gender effect is shaped by the gender discrimination of the firm. When the overall environment is gender-friendly, female CFOs are able to reduce the likelihood of accounting fraud. This result is opposite to Lara et al. (2007) who find female independent directors cannot improve earnings management practices when firms do not discriminate against women in access to directorships. We argue that in China the overall gender discrimination is more serious than that of most developed economies, and therefore a gender-friendly board will enhance the female CFO's mitigating effect on accounting fraud.

Insert Table 8 here

4.4 Additional tests

4.4.1. Female CFO and accounting fraud: does a powerful CEO matter?

In this section, we examine the CFO gender effect under a setting of CEO power. A key reason that boards may not provide sufficient control over management is due to a powerful CEO, who often has significant say over the board composition (Baldenius, Melumad and Meng, 2014). It is possible that CEOs will set most of the tone for decisions from the top, which would potentially dominate CFOs' accounting choices (Ge et al., 2011). A proportion of CEOs in Chinese listed firms are politically connected and they tend to have strong connections with government sectors due to their previous working experience. Politically connected CEOs

appear to be more powerful than those who do not have previous experience in government sectors. We argue that the impact of female CFOs on accounting fraud is subject to the CEO power effect. As discussed, there is evidence that the quality of earnings reported by politically connected firms is significantly poorer than that of non-connected firms (Chaney, Faccio and Parsley, 2011; Bona-Sánchez, Pérez-Alemán and Santana-Martín, 2014). Therefore we expect the female CFO effect should be more pronounced in firms without politically connected CEOs. We also use conventional CEO duality as the other CEO power measure.

Using the propensity score matched sample of 5,778 firm-year observations, we divide the observations into subsamples with and without politically connected CEOs. The results reported in Table 9 are in line with our expectation that the CFO gender effect is subject to CEO power. The coefficients of *female CFO* is significant at the 5% level in the subsample of firms without politically connected CEOs, while in firms with politically connected CEOs, the CFO gender effect becomes less pronounced. These results indicate that when there is a powerful CEO, female CFOs are less capable of reducing the likelihood of accounting fraud. We provide empirical evidence for the argument that the monitoring mechanism may not be effective if the CEO is powerful (Baldenius et al. 2014). Models 3 and 4 report the results using CEO duality as an alternative proxy for CEO power as a robustness check. The results show that the CFO gender effect is only significant in firms without CEO duality.

Insert Table 9 here

4.4.2. Female CFO and accounting fraud: does directorship matter

On average, 24.7% of CFOs in our sample hold a directorship simultaneously. It is interesting to examine whether such CFO-director duality matters for decision-making. Using the same propensity score matched sample of 5,778 firm-year observations, we divide the observations into subsamples with and without CFO-director duality. The results in Table 10 show that the CFO gender effect is only significant in the subsample with CFO-director duality.

In firms where CFOs do not have a directorship simultaneously, the CFO gender effect becomes insignificant. This result indicates that the directorship of a CFO enhances their power in decision-making.

Insert Table 10 here

5. Conclusion

We investigate the influence of chief financial officers (CFOs) on corporate accounting fraud. Using a sample of 2,290 Chinese listed firms for the period from 2003 to 2015, we find female CFOs are significantly less likely to engage in accounting fraud. We further find that the female CFO gender effect is subject to the characteristics of the board. Specifically, the CFO gender effect is only significant in subsamples with boards that do not discriminate against women in access to directorships. In addition, the CFO gender effect is more pronounced when the firm has a less powerful CEO and when the CFO holds the directorship simultaneously.

We argue that these results are mainly due to the following reasons. First, women have to meet a higher standard of effectiveness than men to attain executive positions and to retain them over time. Hence, female CFOs have strong incentives to avoid accounting violations. This is particularly the case in Chinese settings. Second, female CFOs are expected to be more cautious and conservative than men in making financial decisions. Female executives have to perform their managerial roles and basically conservative gender roles simultaneously, and again this is more pronounced in China. Third, according to Chinese culture, females are expected to be particularly low key in how they conduct themselves. A conservative approach by female CFOs with respect to accounting fraud is consistent with such a cultural influence. In addition, the overall gender discrimination in China is more prevalent than that of most developed economies, therefore a board with better gender parity will enhance the female CFO's ability to reduce accounting fraud. Overall, our results highlight that female CFOs are able to provide effective oversight of a firm's accounting related decision-making.

Appendix A: Variable definitions

This appendix reports the variables and definitions used in this study.

Variables	Definition
<i>Fraud</i>	A dummy variable that equals one if there is an accounting enforcement action in a given year and zero otherwise
<i>Serious Fraud</i>	A dummy variable that equals one if a dummy variable equals one when if the accounting enforcement action affects multiple financial years and zero otherwise
<i>Female CFO</i>	A dummy variable that equals one if the CFO of the firm is female, and zero otherwise
<i>LnCFO age</i>	The natural logarithm of the age of the CFO
<i>CFO duality</i>	A dummy variable equals one if the CFO of the firm also holds directorship and zero otherwise
<i>PCEO</i>	A dummy variable that equals one if the CEO is politically related and zero otherwise
<i>CEO duality</i>	A dummy that equals one if the CEO is also the general manager of the firm.
<i>Female CEO</i>	A dummy variable that equals one if the CEO of the firm is female, and zero otherwise
<i>LnCEO age</i>	The natural logarithm of the age of the CEO
<i>Gender diversity</i>	The proportion of female directors to total number of directors on board
<i>Female independence</i>	The proportion of female independent directors to total number of directors on board
<i>InBoard size</i>	The natural logarithm of the total number of directors on the board
<i>Board independence</i>	The number of independent directors to total number of directors on the board
<i>Firm Size</i>	The natural logarithm of the total number of directors on the board
<i>Leverage</i>	Total debts to total assets
<i>ROA</i>	Net profits to total assets
<i>State</i>	A dummy that equals one if the ultimate controller is a SOE or government agency and zero otherwise

References

- Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, 94(2), 291-309. doi:<https://doi.org/10.1016/j.jfineco.2008.10.007>
- Adams, R. B., & Raganathan, V. (2015). Lehman Sisters (August 1, 2015). FIRN Research Paper.
- Adhikari, A., Derashid, C., & Zhang, H. (2006). Public policy, political connections, and effective tax rates: Longitudinal evidence from Malaysia. *Journal of Accounting and Public Policy*, 25(5), 574-595. doi:10.1016/j.jaccpubpol.2006.07.001
- Ahern, K. R., & Dittmar, A. K. (2012). The Changing of the Boards: The Impact on Firm Valuation of Mandated Female Board Representation. *The Quarterly Journal of Economics*, 127(1), 137-197. doi:10.1093/qje/qjr049.
- Allen, F. Qian, J., & Qian, M. (2005). Law, finance, and economic growth in China. *Journal of Financial Economics*, 77 (1), 57-116. doi.org/10.1016/j.pacfin.2016.06.002
- Andreou, P. C., Louca, C., & Petrou, A. P. (2017). CEO Age and Stock Price Crash Risk. *Review of Finance*, 21(3), 1287-1325. doi:10.1093/rof/rfw056
- Baldenius, T., Melumad, N., & Meng, X. (2014). Board composition and CEO power. *Journal of Financial Economics*, 112(1), 53-68. doi:10.1016/j.jfineco.2013.10.004
- Bamber, L. S., Jiang, J. X., & Wang, I. Y. (2010). What's My Style? The Influence of Top Managers on Voluntary Corporate Financial Disclosure. *The Accounting Review*, 85(4), 1131-1162.
- Barua, A., Davidson, L. F., Rama, D. V., & Thiruvadi, S. (2010). CFO Gender and Accruals Quality. *Accounting Horizons*, 24(1), 25-39. doi:10.2308/acch.2010.24.1.25
- Bona-Sánchez, C., Pérez-Alemán, J., & Santana-Martín, D. J. (2014). Politically Connected Firms and Earnings Informativeness in the Controlling versus Minority Shareholders Context: European Evidence. *Corporate Governance: An International Review*, 22(4), 330-346. doi:10.1111/corg.12064
- Boubakri, N., Cosset, J C., & Saffar, W. (2013). The role of state and foreign owners in corporate risk-taking: evidence from privatization. *Journal of Financial Economics*, 108, 641-658.
- Byrness, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin*, 125(3), 367-383.
- Cann, A., & Siegfried, W. D. (1990). Gender stereotypes and dimensions of effective leader behavior. *Sex Roles*, 23(7), 413-419. doi:10.1007/bf00289229
- Chaney, P. K., Faccio, M., & Parsley, D. (2011). The quality of accounting information in politically connected firms. *Journal of Accounting and Economics*, 51(1), 58-76. doi:10.1016/j.jacceco.2010.07.003
- Chen, J., Leung, W. S., & Goergen, M. (2017). The impact of board gender composition on dividend payouts. *Journal of Corporate Finance*, 43, 86-105. doi:10.1016/j.jcorpfin.2017.01.001
- Clarke, D. (2003). Corporate governance in China: An overview. *China Economic Review*, 14, 494-507.
- Canyon, M. J., & He, L. (2016). Executive Compensation and Corporate Fraud in China. *Journal of Business Ethics*, 134(4), 669-691. doi:10.1007/s10551-014-2390-6.
- D'Agostino, R. B. (1998). Propensity score methods for bias reduction in the comparison of a treatment to a non-randomized control group. *Statistics in Medicine*, 17, 2265-2281.
- De Cabo, R. M., Gimeno, R., & Escot, L. (2011). Disentangling Discrimination on Spanish Boards of Directors. *Corporate Governance: An International Review*, 19(1), 77-95. doi:10.1111/j.1467-8683.2010.00837.x

- Deaves, R., Lüders, E., & Luo, G. Y. (2009). An Experimental Test of the Impact of Overconfidence and Gender on Trading Activity. *Review of Finance*, 13(3), 555-575. doi:10.1093/rof/rfn023
- Eagly, A. H., & Johannesen-Schmidt, M. C. (2001). The Leadership Styles of Women and Men. *Journal of social issues*, 57(4), 781-797.
- Eagly, A. H., & Johnson, B. T. (1990). Gender and leadership style: A meta-analysis. *Psychological Bulletin*, 108(2), 233-256.
- Eagly, A. H., Wood, W., & Diekmann, A. B. (2000). Social role theory of sex differences and similarities: A current appraisal. In E. Thomas & T. Hanns M (Eds.), *The developmental social psychology of gender* (pp. 123-174). Mahwah, New Jersey: Erlbaum.
- Faccio, M. (2006). Politically Connected Firms. *American Economic Review*, 96(1), 369-386. doi:10.1257/000282806776157704
- Faccio, M., Marchica, M.-T., & Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance*, 39, 193-209. doi:10.1016/j.jcorpfin.2016.02.008
- Faccio, M., Masulis, R. W., & McConnell, J. J. (2006). Political Connections and Corporate Bailouts. *The Journal of Finance*, 61(6), 2597-2635. doi:10.1111/j.1540-6261.2006.01000.x
- Fan, J. P. H., Wong, T. J., & Zhang, T. (2007). Politically connected CEOs, corporate governance, and Post-IPO performance of China's newly partially privatized firms. *Journal of Financial Economics*, 84(2), 330-357. doi:10.1016/j.jfineco.2006.03.008
- Francis, P. A., Regan, M. M., Fleming, G. F., Láng, I., Ciruelos, E., Bellet, M., . . . Gelber, R. D. (2015). Adjuvant Ovarian Suppression in Premenopausal Breast Cancer. *New England Journal of Medicine*, 372(5), 436-446. doi:10.1056/NEJMoa1412379
- Ge, W., Matsumoto, D., & Zhang, J. L. (2011). Do CFOs Have Style? An Empirical Investigation of the Effect of Individual CFOs on Accounting Practices. *Contemporary Accounting Research*, 28(4), 1141-1179.
- Geiger, M. A., & North, D. S. (2006). Does Hiring a New CFO Change Things? An Investigation of Changes in Discretionary Accruals. *The Accounting Review*, 81(4), 781-809.
- Goldman, E., Rocholl, J., & So, J. (2013). Politically Connected Boards of Directors and The Allocation of Procurement Contracts. *Review of Finance*, 17(5), 1617-1648. doi:10.1093/rof/rfs039
- Gul, F. A., Srinidhi, B., & Ng, A. C. (2011). Does board gender diversity improve the informativeness of stock prices? *Journal of Accounting and Economics*, 51(3), 314-338. doi:10.1016/j.jacceco.2011.01.005
- Hambrick, D. C. (2007). Upper Echelons Theory: An Update. *Academy of Management Review*, 32(2), 334-343. doi:10.5465/amr.2007.24345254
- Hambrick, D. C., & Mason, P. A. (1984). Upper Echelons: The Organization as a Reflection of Its Top Managers. *Academy of Management Review*, 9(2), 193-206. doi:10.5465/amr.1984.4277628
- Hanousek, J., Shamshur, A., & Tressl, J. (2017). Firm efficiency, foreign ownership and CEO gender in corrupt environments. *Journal of Corporate Finance*. doi:10.1016/j.jcorpfin.2017.06.008
- Ho, S. S. M., Li, A. Y., Tam, K., & Zhang, F. (2015). CEO Gender, Ethical Leadership, and Accounting Conservatism. *Journal of Business Ethics*, 127(2), 351-370. doi:10.1007/s10551-013-2044-0
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360. doi:10.1016/0304-405X(76)90026-X

- Lara, J. M., Osma, B., Mora, A., & Scapin, M. (2017). The monitoring role of female directors over accounting quality. *Journal of Corporate Finance*, 45(8), 651-668. doi:10.1016/j.jcorpfin.2017.05.016
- Liu, X. (2016). Corruption culture and corporate misconduct. *Journal of Financial Economics*, 122(2), 307-327. doi:10.1016/j.jfineco.2016.06.005
- Liu, Y., Wei, Z., & Xie, F. (2014). Do women directors improve firm performance in China? *Journal of Corporate Finance*, 28(10), 169-184. doi:10.1016/j.jcorpfin.2013.11.016
- Martell, R. F., Lane, D. M., & Emrich, C. (1996). Male-female differences: A computer simulation. *American Psychologist*, 51(2), 157-158.
- Miller, T., & Del Carmen Triana, M. (2009). Demographic Diversity in the Boardroom: Mediators of the Board Diversity-Firm Performance Relationship. *Journal of Management Studies*, 46(5), 755-786. doi:10.1111/j.1467-6486.2009.00839.x
- Moskowitz, D. S., Suh, E. J., & Desaulniers, J. (1994). Situational influences on gender differences in agency and communion. *Journal of Personality and Social Psychology*, 66(4), 753-761.
- Pålsson, A.-M. (1996). Does the degree of relative risk aversion vary with household characteristics? *Journal of Economic Psychology*, 17(6), 771-787. doi:10.1016/S0167-4870(96)00039-6
- Peni, E., & Vähämaa, S. (2010). Female executives and earnings management. *Managerial Finance*, 36(7), 629-645. doi:10.1108/03074351011050343
- Petersen, M. A. (2009). Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. *The Review of Financial Studies*, 22(1), 435-480. doi:10.1093/rfs/hhn053
- Powell, M., & Ansic, D. (1997). Gender differences in risk behaviour in financial decision-making: An experimental analysis. *Journal of Economic Psychology*, 18(6), 605-628. doi:10.1016/S0167-4870(97)00026-3
- Ridgeway, C. L. (1997). Interaction and the Conservation of Gender Inparity: Considering Employment. *American Sociological Review*, 62(2), 218-235.
- Riley, J., William B., & Chow, K. V. (1992). Asset Allocation and Individual Risk Aversion. *Financial Analysts Journal*, 48(6), 32-37.
- Rosener, J. B. (1995). *America's competitive secret: Utilizing women as a management strategy*. New York: Oxford University Press.
- Shaukat, A., Qiu, Y., & Trojanowski, G. (2016). Board Attributes, Corporate Social Responsibility Strategy, and Corporate Environmental and Social Performance. *Journal of Business Ethics*, 135(3), 569-585. doi:10.1007/s10551-014-2460-9
- Shleifer, A., & Vishny, R. W. (1994). Politicians and Firms. *The Quarterly Journal of Economics*, 109(4), 995-1025. doi:10.2307/2118354
- Sila, V., Gonzalez, A., & Hagendorff, J. (2016). Women on board: Does boardroom gender diversity affect firm risk? *Journal of Corporate Finance*, 36(2), 26-53. doi:10.1016/j.jcorpfin.2015.10.003
- Srinidhi, B., Gul, F. A., & Tsui, J. (2011). Female Directors and Earnings Quality. *Contemporary Accounting Research*, 28(5), 1610-1644. doi:10.1111/j.1911-3846.2011.01071.x
- Sun, J., Kent, P., Qi, B., & Wang, J. (2017). Chief financial officer demographic characteristics and fraudulent financial reporting in China. *Accounting & Finance*(7), 1-30. doi:10.1111/acfi.12286
- Toyah, M., & María, D. C. T. (2009). Demographic Diversity in the Boardroom: Mediators of the Board Diversity-Firm Performance Relationship. *Journal of Management Studies*, 46(5), 755-786. doi:10.1111/j.1467-6486.2009.00839.x
- Tuggle, C. S., Sirmon, D. G., Reutzell, C. R., & Bierman, L. (2010). Commanding board of director attention: investigating how organizational performance and CEO duality affect

- board members' attention to monitoring. *Strategic Management Journal*, 31(9), 946-968. doi:10.1002/smj.847
- Wahid, A. S. (2018). The Effects and the Mechanisms of Board Gender Diversity: Evidence from Financial Manipulation. *Journal of Business Ethics*(1), 1-21. doi:10.1007/s10551-018-3785-6
- Wu, M. Y. (2006). Hofstede's cultural dimensions 30 years later: a study of Taiwan and the United States. *Intercultural Communication Studies*, XV, 33–42.
- Yang, H. (2012). Urban Women's Gender Discrimination Issues in Employment. Retrieved September 6, 2012 from <http://www.womenofchina.cn/html/report/144652-1.htm>

Table 1: Descriptive statistics

This table reports the summary statistics of the variables included in the analysis. *CFO age* refers to the age of the CFOs. *CEO age* refers to the age of the CEOs. *Board size* refers to the total number of directors on board. The description of other variable is summarized in the Appendix A.

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Fraud</i>	10073	0.100	0.300	0	1
<i>Serious Fraud</i>	10073	0.041	0.199	0	1
<i>Female CFO</i>	10073	0.287	0.453	0	1
<i>CFO age</i>	10073	43	6.763	27	67
<i>CFO duality</i>	10073	0.247	0.432	0	1
<i>Political CEO</i>	10073	0.186	0.389	0	1
<i>CEO duality</i>	10073	0.223	0.416	0	1
<i>Female CEO</i>	10073	0.047	0.212	0	1
<i>CEO age</i>	10073	51	7.330	29	74
<i>Gender diversity</i>	10073	0.121	0.117	0.000	0.833
<i>Board size</i>	10073	9	1.815	4	19
<i>Board independence</i>	10073	0.363	0.051	0.083	0.714
<i>Female independence</i>	10073	0.051	0.073	0.000	0.500
<i>Firm size</i>	10073	21.466	1.162	15.468	28.004
<i>Leverage</i>	10073	0.448	0.223	0.014	1.591
<i>ROA</i>	10073	0.042	0.076	-1.454	1.756
<i>State</i>	10073	0.413	0.492	0	1

Table 2: Time trend of CFO/CEO characteristic and board composition variables

This table reports the time trend of Fraud and CFO/CEO characteristic and board composition variables included in the analysis. *CFO age* refers to the age of the CFOs. *CEO age* refers to the age of the CEOs. *Board size* refers to the total number of directors on board. The description of other variable is summarized in the Appendix A.

Year	<i>Female CFO</i>	<i>CFO age</i>	<i>CFO director dual</i>	<i>PCEO</i>	<i>CEO Duality</i>	<i>Female CEO</i>	<i>CEO age</i>	<i>Gender Diversity</i>	<i>Board size</i>	<i>Board Independence</i>	<i>Female independence</i>
2003	0.253	41.6	0.233	0.267	0.081	0.049	48.0	0.096	9.802	0.334	0.033
2004	0.249	41.9	0.237	0.225	0.105	0.045	48.6	0.092	9.658	0.343	0.034
2005	0.251	41.9	0.253	0.211	0.112	0.045	49.2	0.098	9.425	0.349	0.041
2006	0.262	42.1	0.247	0.212	0.120	0.046	49.6	0.103	9.296	0.352	0.042
2007	0.256	42.5	0.235	0.207	0.148	0.045	49.9	0.105	9.245	0.358	0.046
2008	0.248	42.8	0.241	0.178	0.173	0.040	50.1	0.111	9.109	0.360	0.046
2009	0.286	43.1	0.254	0.180	0.220	0.046	50.3	0.119	8.899	0.363	0.052
2010	0.295	43.3	0.245	0.169	0.268	0.043	50.8	0.124	8.892	0.365	0.054
2011	0.306	43.6	0.240	0.165	0.279	0.050	51.1	0.133	8.759	0.369	0.057
2012	0.320	44.1	0.253	0.169	0.311	0.054	51.7	0.131	8.728	0.370	0.055
2013	0.305	44.9	0.250	0.170	0.287	0.053	52.4	0.133	8.651	0.372	0.057
2014	0.314	44.9	0.245	0.168	0.300	0.048	52.6	0.141	8.332	0.376	0.062
2015	0.347	45.8	0.279	0.173	0.320	0.045	53.7	0.155	8.296	0.376	0.068

Table 3: Female CFO and accounting fraud

This table reports the estimates of the probit regression model, controlling for CFO effect and year effect.

$$\begin{aligned}
 \text{Fraud/Serious Fraud} = & \alpha + \beta_1 \text{Female CFO} + \beta_2 \text{LnCFO age} + \beta_3 \text{CFO duality} + \beta_4 \text{PCEO} + \beta_5 \text{CEO} \\
 & \text{duality} + \beta_6 \text{Female CEO} + \beta_7 \text{LnCEO age} + \beta_8 \text{Gender diversity/Female independence} + \beta_9 \text{LnBoard} \\
 & \text{Size} + \beta_{10} \text{Board independence} + \beta_{11} \text{Firm Size} + \beta_{12} \text{Leverage} + \beta_{13} \text{ROA} + \beta_{14} \text{State} + \varepsilon
 \end{aligned}$$

The variable descriptions are summarized in the Appendix. The superscripts *, **, and *** indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

	Model 1	Model 2	Model 3	Model 4
	<i>Fraud</i>	<i>Serious Fraud</i>	<i>Fraud</i>	<i>Serious Fraud</i>
<i>Female CFO</i>	-0.120*** (-2.79)	-0.127** (-2.21)	-0.117*** (-2.74)	-0.127** (-2.25)
<i>LnCFO age</i>	-0.074 (-0.56)	0.11 (0.65)	-0.079 (-0.60)	0.117 (0.69)
<i>CFO duality</i>	-0.026 (-0.60)	-0.001 (-0.02)	-0.024 (-0.56)	-0.002 (-0.03)
<i>Political CEO</i>	-0.034 (-0.69)	0.011 (0.17)	-0.035 (-0.69)	0.012 (0.18)
<i>CEO duality</i>	0.059 (1.26)	0.021 (0.32)	0.059 (1.26)	0.021 (0.33)
<i>Female CEO</i>	0.089 (0.94)	0.179 (1.40)	0.099 (1.09)	0.172 (1.41)
<i>LnCEO age</i>	-0.081 (-0.61)	-0.151 (-0.83)	-0.078 (-0.59)	-0.153 (-0.84)
<i>Gender diversity</i>	0.096 (0.58)	-0.068 (-0.29)		
<i>Female independence</i>			0.165 (0.68)	-0.253 (-0.73)
<i>LnBoard size</i>	-0.023 (-0.21)	-0.136 (-0.92)	-0.022 (-0.20)	-0.138 (-0.93)
<i>Board independence</i>	0.004 (0.01)	0.028 (0.05)	-0.012 (-0.03)	0.056 (0.11)
<i>Firm size</i>	-0.072*** (-3.99)	-0.083*** (-3.44)	-0.072*** (-4.01)	-0.083*** (-3.45)
<i>Leverage</i>	0.316*** (3.17)	0.344*** (2.65)	0.316*** (3.17)	0.343*** (2.65)
<i>ROA</i>	-1.187*** (-4.48)	-1.102*** (-3.96)	-1.187*** (-4.48)	-1.103*** (-3.97)
<i>State</i>	-0.186*** (-4.05)	-0.091 (-1.56)	-0.187*** (-4.08)	-0.091 (-1.56)
CFO effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
No. of Obs.	10073	10073	10073	10073
Pseudo R ²	0.0364	0.0339	0.0364	0.0341

Table 4: Losing female CFOs and accounting fraud, difference-in-difference approach
This table reports the estimates of the probit regression model, controlling for CFO effect and year effect.

$$\begin{aligned}
\text{Fraud/Serious Fraud} = & \alpha + \beta_1 \text{Loss} + \beta_2 \text{LnCFO age} + \beta_3 \text{PCEO} + \beta_4 \text{CEO Duality} + \beta_5 \text{Female CEO} + \\
& \beta_6 \text{LnCEO age} + \beta_7 \text{Gender diversity/Female independence} + \beta_8 \text{LnBoard Size} + \beta_9 \text{Board independence} \\
& + \beta_{10} \text{Firm Size} + \beta_{11} \text{Leverage} + \beta_{12} \text{ROA} + \beta_{13} \text{State} + \varepsilon
\end{aligned}$$

The sample for regression include the firms that have mixed CFO gender over the sample period, which consists of 3243 firm-year observation. *Loss* is a dummy variable equals one if the gender of the CFO changes from female to male in the given year otherwise zero. The other variable descriptions are summarized in the Appendix. The superscripts *, **, and *** indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

	Model 1	Model 2	Model 3	Model 4
	<i>Fraud</i>	<i>Fraud</i>	<i>Serious Fraud</i>	<i>Serious Fraud</i>
<i>Loss</i>	0.245** (2.46)	0.337*** (2.84)	0.151 (1.16)	0.295* (1.90)
<i>State</i>	-0.268*** (-3.39)	-0.237*** (-2.86)	-0.017 (-0.17)	0.023 -0.23
<i>Loss × State</i>		-0.313 (-1.38)		-0.457 (-1.49)
<i>LnCFO age</i>	-0.497** (-2.29)	-0.492** (-2.27)	-0.109 (-0.43)	-0.103 (-0.40)
<i>CFO duality</i>	-0.076 (-0.78)	-0.075 (-0.77)	0.045 (0.40)	0.047 (0.42)
<i>Political CEO</i>	0.000 (-0.00)	0.002 (0.02)	-0.006 (-0.06)	-0.003 (-0.03)
<i>CEO duality</i>	0.155* (1.71)	0.152* (1.68)	0.132 (1.18)	0.126 (1.13)
<i>Female CEO</i>	0.152 (0.60)	0.159 (0.62)	0.025 (0.08)	0.026 (0.08)
<i>LnCEO age</i>	-0.177 (-1.03)	-0.175 (-1.02)	-0.039 (-0.15)	-0.032 (-0.13)
<i>Gender diversity</i>	0.232 (0.84)	0.222 (0.80)	-0.011 (-0.03)	-0.033 (-0.08)
<i>LnBoard size</i>	0.103 -0.59	0.106 (0.61)	-0.1 (-0.44)	-0.092 (-0.40)
<i>Board independence</i>	1.594** (2.44)	1.608** (2.47)	1.894** (2.44)	1.929** (2.49)
<i>Firm size</i>	-0.067** (-2.25)	-0.068** (-2.29)	-0.084** (-2.39)	-0.086** (-2.44)
<i>Leverage</i>	0.479*** (2.68)	0.484*** (2.70)	0.571*** (2.76)	0.580*** (2.78)
<i>ROA</i>	-0.695* (-1.72)	-0.687* (-1.70)	-0.847** (-1.98)	-0.831** (-1.97)
CFO effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
No. of Obs.	3066	3066	3066	3066
Pseudo R ²	0.0606	0.0616	0.0431	0.0452

Table 5: Determinants of presence of female CFO

This table reports the estimates of the probit regression model, controlling for firm effect and year effect.

$$\text{Female CFO} = \alpha + \beta_1 \text{PCEO} + \beta_2 \text{CEO Duality} + \beta_3 \text{Female CEO} + \beta_4 \text{LnCEO age} + \beta_5 \text{Gender diversity/Female independence} + \beta_6 \text{LnBoard Size} + \beta_7 \text{Board independence} + \beta_8 \text{Firm Size} + \beta_9 \text{Leverage} + \beta_{10} \text{ROA} + \beta_{11} \text{State} + \varepsilon$$

The variable descriptions are summarized in the Appendix. The superscripts *, **, and *** indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

	Model 1 <i>Female CFO</i>	Model 2 <i>Female CFO</i>
<i>Political CEO</i>	0.113* (1.73)	0.107 (1.64)
<i>CEO duality</i>	0.089 (1.53)	0.104* (1.80)
<i>Female CEO</i>	0.047 (0.39)	0.268** (2.34)
<i>LnCEO age</i>	-0.083 (-0.47)	-0.050 (-0.28)
<i>Gender diversity</i>	1.899*** (9.22)	
<i>Female Independence</i>		0.847*** (2.70)
<i>LnBoard size</i>	-0.13 (-0.86)	-0.145 (-0.97)
<i>Board independence</i>	-0.545 (-1.07)	-0.582 (-1.14)
<i>Firm size</i>	-0.009 (-0.36)	-0.022 (-0.88)
<i>Leverage</i>	-0.274** (-2.25)	-0.265** (-2.17)
<i>ROA</i>	-0.073 (-0.29)	-0.037 (-0.15)
<i>State</i>	-0.032 (-0.54)	-0.064 (-1.07)
Firm effect	Yes	Yes
Year effect	Yes	Yes
No. of Obs.	10073	10073
Pseudo R ²	0.0332	0.0173

Table 6: Female CFO and accounting fraud-treatment effects analysis

This table reports the treatment effect of female CFO on accounting fraud. The dependent variable in Models 1 and 2 is the Fraud and Serious Fraud dummy, respectively. ATET refers to the average treatment effect of the treated. First stage is a probit equation containing all variables listed in Table 5 to estimate the propensity score. The pomeans section of the output displays the potential-outcome means (POMs) for the two treatment groups. 1 refers to the outcome of the treatment group (firms with female CFO), and 0 refers to the outcome of the control group (firms with male CFO). The superscripts *, **, and *** indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

	Model 1: <i>Fraud</i>		Model 2: <i>Serious Fraud</i>	
	Coef.	z	Coef.	z
<hr/>				
ATET				
<i>Female CFO</i>	-0.037***	-3.01	-0.011**	-2.23
1 vs 0				
<hr/>				
Pomean				
<i>Female CFO</i>	0.114***	19.33	0.046***	11.70
0				

Table 7: Female CFO and accounting fraud, Heckman two-stage analysis
This table presents results of a Heckman two-stage procedure to further address endogeneity issues.

$$\text{Fraud/Serious Fraud} = \alpha + \beta_1 \text{Female CFO} + \beta_2 \text{LnCFO age} + \beta_3 \text{CFO duality} + \beta_4 \text{PCEO} + \beta_5 \text{CEO duality} + \beta_6 \text{Female CEO} + \beta_7 \text{LnCEO age} + \beta_8 \text{Gender diversity/Female independence} + \beta_9 \text{Mills} + \beta_{10} \text{LnBoard Size} + \beta_{11} \text{Board independence} + \beta_{12} \text{Firm Size} + \beta_{13} \text{Leverage} + \beta_{14} \text{ROA} + \beta_{15} \text{State} + \varepsilon$$

The variable descriptions are summarized in the Appendix. The superscripts *, **, and *** indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

	Model 1	Model 2	Model 3	Model 4
	<i>Fraud</i>	<i>Serious Fraud</i>	<i>Fraud</i>	<i>Serious Fraud</i>
<i>Female CFO</i>	-0.120*** (-2.78)	-0.126** (-2.19)	-0.119*** (-2.76)	-0.130** (-2.26)
<i>LnCFO age</i>	-0.054 (-0.41)	0.095 (0.56)	-0.039 (-0.29)	0.088 -0.52
<i>CFO duality</i>	-0.026 (-0.60)	-0.002 (-0.03)	-0.025 (-0.57)	-0.004 (-0.07)
<i>Political CEO</i>	-0.093 (-0.55)	0.140 (0.66)	-0.044 (-0.85)	0.014 -0.21
<i>CEO duality</i>	0.019 -0.14	0.119 (0.69)	0.062 -1.28	0.013 -0.2
<i>Female CEO</i>	0.065 (0.59)	0.232 (1.62)	0.084 (0.85)	0.171 (1.30)
<i>LnCEO age</i>	-0.021 (-0.12)	-0.256 (-1.12)	-0.03 (-0.23)	-0.199 (-1.09)
<i>Gender diversity</i>	-0.825 (-0.31)	2.039 (0.61)		
<i>Female independence</i>			0.088 -0.26	-0.29 (-0.63)
<i>Mills</i>	-2.386 (-0.35)	5.417 (0.64)	-0.288 (-0.49)	-0.007 (-0.01)
<i>Other controls</i>	Yes	Yes	Yes	Yes
CFO effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
No. of Obs.	10073	10073	10073	10073
Pseudo R ²	0.0359	0.0337	0.0351	0.0326

Table 8: Female CFO and accounting fraud, does gender-friendly board matter

This table presents results of regression using the sample of the propensity score matched 5788 observations to examine the impact of gender-friendly board.

$$\text{Fraud/Serious Fraud} = \alpha + \beta_1 \text{Female CFO} + \beta_2 \text{LnCFO age} + \beta_3 \text{CFO duality} + \beta_4 \text{CEO duality} + \beta_5 \text{Female CEO} + \beta_6 \text{LnCEO age} + \beta_7 \text{LnBoard Size} + \beta_8 \text{Board independence} + \beta_9 \text{Firm Size} + \beta_{10} \text{Leverage} + \beta_{11} \text{ROA} + \beta_{12} \text{State} + \varepsilon$$

The variable descriptions are summarized in the Appendix. The superscripts *, **, and *** indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Panel A of this table reports the results of the subsample with non-discriminating board

	Approach I		Approach II	
	Model 1	Model 2	Model 3	Model 4
	<i>Fraud</i>	<i>Serious Fraud</i>	<i>Fraud</i>	<i>Serious Fraud</i>
<i>Female CFO</i>	-0.114** (-2.10)	-0.150** (-2.18)	-0.131** (-2.28)	-0.152* (-1.79)
<i>InCFO age</i>	-0.210 (-1.09)	0.198 (0.84)	-0.191 (-0.95)	0.15 (-0.53)
<i>CFO duality</i>	-0.029 (-0.42)	0.008 (0.10)	-0.030 (-0.40)	-0.042 (-0.39)
<i>Other controls</i>	Yes	Yes	Yes	Yes
CFO effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
No. of Obs.	5162	5162	4447	4447
Pseudo R ²	0.0333	0.0421	0.0325	0.0614

Panel B of this table reports the results of the subsample with discriminating board

	Approach I		Approach II	
	Model 1	Model 2	Model 3	Model 4
	<i>Fraud</i>	<i>Serious Fraud</i>	<i>Fraud</i>	<i>Serious Fraud</i>
<i>Female CFO</i>	-0.153 (-0.78)	0.152 (0.67)	-0.007 (-0.05)	0.133 (0.90)
<i>InCFO age</i>	-0.269 (-0.43)	-0.181 (-0.27)	-0.639 (-1.49)	-0.471 (-1.02)
<i>CFO duality</i>	0.311 (1.39)	0.480* (-1.75)	0.249 (1.51)	0.393** (2.06)
<i>Other controls</i>	Yes	Yes	Yes	Yes
CFO effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
No. of Obs.	626	626	1341	1341
Pseudo R ²	0.1163	0.1470	0.0870	0.0877

Table 9: Female CFO and accounting fraud, does a powerful CEO matter

This table presents results of subsample analysis to further examine the impact of CEO power on accounting fraud. The variable descriptions are summarized in the Appendix. The superscripts *, **, and *** indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Panel A of this table reports the results of the subsample with politically connected CEO

$$Fraud/Serious\ Fraud = \alpha + \beta_1 Female\ CFO + \beta_2 LnCFO\ age + \beta_3 CFO\ duality + \beta_4 CEO\ duality + \beta_5 Female\ CEO + \beta_6 LnCEO\ age + \beta_7 Gender\ diversity + \beta_8 LnBoard\ Size + \beta_9 Board\ independence + \beta_{10} Firm\ Size + \beta_{11} Leverage + \beta_{12} ROA + \beta_{13} State + \varepsilon$$

	PCEO subsample		CEO-duality subsample	
	Model 1 Fraud	Model 2 Serious Fraud	Model 3 Fraud	Model 4 Serious Fraud
<i>Female CFO</i>	-0.204* (-1.79)	-0.111 (-0.77)	-0.0718 (-0.74)	-0.0427 (-0.36)
<i>InCFO age</i>	-0.820** (-2.08)	-0.644 (-1.23)	-0.0006 (-0.00)	0.2541 (0.64)
<i>CFO duality</i>	0.131 (0.88)	0.069 (0.37)	0.0243 (0.19)	0.4258 (0.31)
Other controls	Yes	Yes	Yes	Yes
CFO effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
No. of Obs.	1142	1142	1534	1534
Pseudo R ²	0.0829	0.0606	0.0563	0.0614

Panel B of this table reports the results of the subsample without powerful CEO

$$Fraud/Serious\ Fraud = \alpha + \beta_1 Female\ CFO + \beta_2 LnCFO\ age + \beta_3 CFO\ duality + \beta_4 CEO\ duality + \beta_5 Female\ CEO + \beta_6 LnCEO\ age + \beta_7 Gender\ diversity + \beta_8 LnBoard\ Size + \beta_9 Board\ independence + \beta_{10} Firm\ Size + \beta_{11} Leverage + \beta_{12} ROA + \beta_{13} State + \varepsilon$$

	Non-PCEO subsample		Non-CEO-duality subsample	
	Model 1 Fraud	Model 2 Serious Fraud	Model 3 Fraud	Model 4 Serious Fraud
<i>Female CFO</i>	-0.127** (-2.40)	-0.147** (-2.04)	-0.1330** (-2.14)	-0.1639** (-2.15)
<i>InCFO age</i>	-0.008 (-0.04)	0.333 (1.35)	-0.4297* (-1.93)	0.1246 (0.47)
<i>CFO duality</i>	-0.025 (-0.39)	0.024 (0.28)	-0.0109 (-0.14)	0.0263 (0.28)
Other controls	Yes	Yes	Yes	Yes
CFO effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
No. of Obs.	4646	4646	4254	4254
Pseudo R ²	0.0375	0.0477	0.0425	0.0457

Table 10: Female CFO and accounting fraud, does CFO-directorship matter

This table presents results of regression using the sample of the propensity score matched 5788 observations to examine the impact of CFO-director duality on the likelihood of accounting fraud.

$$\text{Fraud/Serious Fraud} = \alpha + \beta_1 \text{Female CFO} + \beta_2 \text{LnCFO age} + \beta_3 \text{CEO duality} + \beta_4 \text{Female CEO} + \beta_5 \text{LnCEO age} + \beta_6 \text{Gender diversity} + \beta_7 \text{Board Size} + \beta_8 \text{Board independence} + \beta_9 \text{Firm Size} + \beta_{10} \text{Leverage} + \beta_{11} \text{ROA} + \beta_{12} \text{State} + \varepsilon$$

The variable descriptions are summarized in the Appendix. The superscripts *, **, and *** indicate significance at the 90%, 95%, and 99% confidence levels, respectively.

Panel A of this table reports the results of the subsample of firms with CFO-director duality

	Model 1 <i>Fraud</i>	Model 2 <i>Serious Fraud</i>
<i>Female CFO</i>	-0.233** (-2.28)	-0.250* (-1.80)
<i>InCFO age</i>	0.293 (0.79)	0.795 (-1.81)
<i>Other controls</i>	Yes	Yes
CFO effect	Yes	Yes
Year effect	Yes	Yes
No. of Obs.	1372	1372
Pseudo R ²	0.0522	0.0880

Panel B of this table reports the results of the subsample of firms without CFO-director duality

	Model 1 <i>Fraud</i>	Model 2 <i>Serious Fraud</i>
<i>Female CFO</i>	-0.0917 (-1.65)	-0.073 (-0.97)
<i>InCFO age</i>	-0.270 (-1.39)	-0.031 (-0.12)
<i>Other controls</i>	Yes	Yes
CFO effect	Yes	Yes
Year effect	Yes	Yes
No. of Obs.	4416	4416
Pseudo R ²	0.0414	0.0459