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Does gender promote ethical and risk-averse behavior among CEOs? An illustration through related-party transactions

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**Does gender promote ethical and risk-averse behavior among CEOs?
An illustration through related-party transactions**

Abstract

This study provides direct evidence of whether female CEOs are more ethical or risk-averse by investigating the relationship between female CEOs and related-party transactions (hereafter RPTs). Using a sample of Chinese listed firms over 2005–2018, we find evidence that female CEO firms engage in fewer RPTs, suggesting that female CEOs are not only risk-averse but also more ethical. Moreover, we show that firm performance increases when these firms allow RPTs, suggesting that female CEOs are less likely to allow opportunistic RPTs. Finally, we find that negative association between female CEOs and RPTs is more pronounced in firms more likely to use RPTs (i.e., state-owned enterprises).

Keywords: Female CEOs; RPTs; Ethical; Risk-averse

JEL Classification: J1; G3

1. Introduction

The literature on female CEOs is not abundant because there have been very few of them. However, women at key positions are increasing because of recent regulations promoting gender diversity within organizations. Consequently, the number of female CEOs is also increasing gradually (Gull *et al.*, 2021; Usman *et al.*, 2019). Prior studies explore the association between female CEOs and firm performance (Vo *et al.*, 2021), risk-taking (Shropshire *et al.*, 2021), earnings management (Zalata *et al.*, 2019), and bank misconduct (Arnaboldi *et al.*, 2021) by arguing that men and women behave differently, which affects their decisions concerning the protection of shareholders' interests and financial reporting quality. To date, few studies have examined the intriguing question of whether female CEOs tend to act more ethically or risk-averse than men (e.g., Ho *et al.*, 2015; Sun *et al.*, 2021; Zalata *et al.* 2019). By exploring the relationship between CEO gender and earnings management, Zalata *et al.* (2019) conclude that female CEOs are more risk-averse than male CEOs, while Ho *et al.* (2015) conclude that female CEOs are more ethical and risk-averse than male CEOs. Arguably, earnings management is subject to higher scrutiny by external auditors, that is, less involvement in earnings management may evidence that female CEOs are more risk-averse but not necessarily more ethical because the risk of getting caught is high. This argument is supported by Ho *et al.* (2015), who find that the negative association between female CEOs and total accruals is stronger in the presence of high litigation risk. However, Sun *et al.* (2021) used a more relevant proxy (i.e., stock-trade profitability) to capture the effect of females' ethical values. They used a broad measure of female insiders, including female directors, executives, and board chairs, making it difficult to infer whether the association between female insiders and stock-trade profitability is driven by female directors or female executives (i.e., CEOs or CFOs). Therefore, we endeavor to clearly answer the question of whether female CEOs are more ethical or more risk-averse by exploiting a setting where the risk of getting caught is significantly less than earnings management; namely, RPTs.

RPTs can be legitimate business transactions conducted between an organization and its directors, managers, controlling shareholders, and other related parties or used to expropriate resources from minority shareholders (Ryngaert & Thomas, 2012). However, due to their involvement in high-profile accounting scams (e.g., Adelphia and Enron), RPTs are generally perceived as a sign of expropriation (Lo & Wong, 2016). Auditors may always not perceive RPTs as harmful for shareholders because such transactions can be legitimate (Hope *et al.*, 2019). Even if

they consider RPTs as harmful, these transactions are difficult to be audited because RPTs are described by the lack of an 'arm's length' relationship, which increases the probability of collusion between related parties to affect the terms of RPTs. So, auditors cannot ensure the efficiency of RPTs in the absence of sufficient information and means to seek cross-confirmation from the parties involved (Fang *et al.*, 2018). This suggests that RPTs can be used opportunistically and are difficult to detect by external auditors. Therefore, we believe that RPTs is a more relevant setting to answer the female ethics versus risk-aversion puzzle. We propose that if female CEOs consider RPTs unethical, they exert more effort and allocate additional resources to get cross-confirmation and sufficient information from the related parties. Consequently, firms with female CEOs will not engage in RPTs that result in opportunistic gains for a given party but allow only efficient transactions. In other words, we expect that firms with female CEOs will engage in fewer RPTs.

To test this notion, we focus on Chinese firms because the number and volume of RPTs is significantly high in China (e.g., Lo & Wong, 2016) and firms use RPTs to manage earnings (e.g., Habib *et al.*, 2021). Besides, it is not mandatory for external auditor to ensure the quality of internal controls, which diminishes the external auditor's ability to detect and disclose opportunistic RPTs (Fang *et al.*, 2018). They further highlight that in many cases auditors were unable to detect opportunistic RPTs which resulted in huge losses for shareholders. Therefore, given the weak governance system (Chen *et al.*, 2009), poor protection of minority shareholders (Djankov *et al.*, 2008), and poor financial reporting transparency (Fang *et al.*, 2018) along with the absence of strong monitoring from external auditors (Jian & Wong, 2010), the Chinese shareholder are at high risk of being misled by RPTs. Given these characteristics, the Chinese setting is of significant relevance to examine whether female CEOs protect the shareholders' interest by monitoring the opportunistic use of RPTs.

Using data on Chinese listed firms between 2005–2018, we document three main findings. First, firms with female CEOs engage in fewer RPTs, suggesting that female CEOs are more risk-averse and act ethically. Second, allowing fewer RPTs increases the financial performance of these firms, implying that female CEOs do not allow opportunistic RPTs. Finally, we find that the negative association between female CEOs and RPTs is more pronounced when firms are more likely to use RPTs, such as state-owned enterprises (hereafter SOEs).

This study contributes to prior literature in several ways. First, we extend the CEO demography literature by pioneering the study of the CEO gender-RPTs nexus (Gull *et al.*, 2021; Zalata *et al.*, 2019). Second, we contribute to the RPTs literature by showing that RPTs depend on the CEO gender (Hope *et al.*, 2019; Ryngaert & Thomas, 2012). Third, unlike prior studies (e.g., Zalata *et al.*, 2019), we exploit a more relevant setting (i.e., RPTs) and contribute to the debate concerning the female ethics versus risk-aversion puzzle by providing direct evidence that female CEOs are not only more risk-averse but also more ethical.

The rest of the paper is organized as follows. Section 2 presents institutional background. Section 3 describes the data and methodology. Section 4 provides the empirical results. Section 5 concludes.

2. Institutional background

In China business groups are common and most of the listed companies are managed and controlled by their parent SOEs (e.g., see Habib *et al.*, 2021). The use of RPTs for transferring resources within the business group is also common (Chen *et al.*, 2009). For example, in 2015, Chinese firms conducted RPTs of worth 2.353 trillion RMB and around 86% of listed firms were involved in RPTs (CSMAR, 2015). These RPTs may enhance firm value or being used for opportunistic purpose but extant studies support the later (e.g., Habib *et al.*, 2021). Additionally, Chinese firm disclose RPTs as footnote to their financial reports which makes it difficult for investors to distinguish between legitimate and abusive RPTs. This might lead to the use of questionable transactions by firms (Chen *et al.*, 2009), especially in the context of China given its weak legal and market institutions as well in the absence of effective monitoring from external auditors. However, to discourage the opportunistic use of RPTs, Shanghai Stock exchange issued guidelines in 2013 which allow audit committees to examine and verify RPTs to form written opinion and submit it to the board of directors for deliberation.

3. Methodology

3.1. Data and sample

We obtained the data of all A-share non-financial Chinese firms listed on Shanghai and Shenzhen stock exchanges between 2005 and 2018 from the China Stock Market and Accounting Research (CSMAR) database. Sample period starts from 2005 because the data of all variables were not available for earlier years especially the ultimate ownership data to identify SOEs. Consistent with existing studies (e.g., Hope *et al.*, 2019), we exclude financial firms because they belong to highly

and differently regulated industries. Firms operating in highly regulated industries are significantly different from unregulated sectors due to the higher scrutiny by the government. Finally, we delete observations with missing data, which leads to a final sample of 27,337 firm-year observations

3.2. Variables

Our main variable of interest is RPTs. Existing studies mainly use two proxies for RPTs, i.e., the number of RPTs (Bennouri *et al.*, 2015; Nekhili *et al.*, 2021; Usman *et al.*, 2021) and the amount of RPTs (Ryngaert & Thomas, 2012). In this study, we privilege the use of RPTs number^[1] over the amount for two reasons. First, there is no threshold on the number of RPTs. So, stakeholders are more concerned about the occurrence of RPTs than their amount (Bennouri *et al.*, 2015). Second, we answer the question of whether female CEOs are more ethical or risk-averse by exploring the CEO gender-RPTs nexus. Therefore, we believe that the use of RPTs amount may contradict the ethical judgment arguments used in this study. Female CEO (*Female_CEO*) is a dummy variable coded 1 if the CEO is female and 0 otherwise.

Following prior literature (e.g., Hope *et al.*, 2019; Bennouri *et al.*, 2015), we control for *Board_Size* (the number of directors on the board), *Board_Independence* (the proportion of non-executive directors on the board), *Board_Diversity*, proxied by the Blau index, calculated as $1 \sum_{i=1}^n p_i^2$, where p_i is the percentage of male and female directors on the board and n is 2, representing two categories (i.e., male and female), *Board_Meetings* (the number of board meetings), *CEO_Duality* (a dummy variable coded 1 if the CEO is also board chairperson and 0 otherwise), *Institutional_Equity* (the proportion of equity held by institutions), *SOE* (a dummy variable coded 1 if the ultimate owner is state and 0 otherwise), *Tobins_Q* is the market value of assets over book value of assets [(the number of shares tradable \times stock price at year-end + the number of shares non-tradable \times net assets per share + total liabilities at year-end)/book value of assets], *Firm_Size* (the natural logarithm of total assets), *Firm_Age* (the natural logarithm of the number of years since the first listing on the stock exchange), and *Financial_Leverage* (the ratio of total debt to total assets).

3.3. Model

To examine the female CEO-RPTs nexus, we estimate the following equation using OLS regression.

$$RPT_{sit} = \beta_0 + \beta_1 Female_CEO_{it} + \beta_n Controls_{it} + Industry\ dummies + Year\ dummies + \varepsilon_{it} \quad (1)$$

where i and t refer to firm and time, respectively. $RPTs$ and $Female_CEO$ is dependent and independent variable, respectively. $Controls$ refer to all control variables. $Industry\ dummies$ and $Year\ dummies$ control for the industry- and year-fixed effects.

4. Empirical results

Table 1 (Columns 1–2) presents the mean and standard deviation for all variables. On average, 5.5% of sample firms have female CEOs, and the average number of RPTs is 26.389. Columns 5–7 (Table 1) show that firms with female CEOs use fewer RPTs than firms with male CEOs, and both sub-samples differ significantly across firm-specific variables. Table 2 shows that correlation coefficients among all variables are less than 0.5, suggesting that multicollinearity is not a severe issue. The unreported VIFs further confirm this conclusion as the maximum (average) VIF value is 1.84 (1.25).

[Please insert Table 1 & 2 about here]

Column 1 (Table 3) shows the results of the multivariate analysis. The coefficient on $Female_CEO$ is negative and significant, suggesting that firms with female CEOs engage in fewer RPTs. The plausible explanation for this negative relationship is that female CEOs are both more ethical and risk-averse; therefore, they may consider RPTs a tool for opportunistic gains by some related parties at the expense of minority shareholders. Consequently, they exert more effort to monitor RPTs to avoid risky and unethical behavior. Overall, unlike prior studies (e.g., Zalata *et al.*, 2019), our results provide direct evidence that female CEOs are not only risk-averse but also behave in an ethical fashion.

4.1. Additional analyses

SOEs vs. non-SOEs

In China, the state ownership of listed companies is common. For example, 42% of our sample firms are also controlled by the local or central government and SOEs are more likely to use RPTs (as noted in Column 1 of Table 3). Previous studies (e.g., Jiang & Kim, 2020) argue that SOEs are the firms with weak internal corporate governance and severe agency issues because of the separation between ownership (i.e., the citizens) and control (i.e., the executives or bureaucrats). We

therefore argue that impact of female CEOs on RPTs should be more pronounced in SOEs than in non-SOEs if they are more ethical and create value to shareholders because female directors are more beneficial for firms with poor governance (i.e., SOEs) as compared to for firms with good governance (i.e., non-SOEs) due to their tendency to monitor intensely (Adams & Ferreira, 2009).

To test this proposition, we estimate Equation 1 for SOEs and non-SOEs sub-samples. The results of this analysis (Columns 2–3; Table 3) demonstrate that the coefficient of *Female_CEO* remains negative and statistically significant only for SOEs subsample, which indicates that female CEOs exert more influence on RPTs in SOEs than non-SOEs^[2]. Overall, these findings imply that the benefit of having female CEOs is more pronounced in firms with weak corporate governance i.e., SOEs (Adams & Ferreira, 2009).

Female CEOs, RPTs, and firm performance nexus

Our results show so far that firms led by female CEOs use fewer RPTs, which does not necessarily mean that female CEOs completely prevent the misuse of RPTs. In an additional analysis, we assess whether the allowed RPTs are efficient (i.e., legitimate) or opportunistic transactions. To answer this question, we examine the moderating effect of CEO gender on the relationship between RPTs and firm performance. To do so, we use firm performance (*Tobin's Q*) as the dependent variable and CEO gender (*Female_CEO*), *RPTs*, and the interaction term between CEO gender and RPTs (*Female_CEO*RPTs*) as independent variables. If female CEOs allow only efficient RPTs, we should find the interaction term positive and significant. The results of this analysis (Column 4 of Table 3) show that the coefficient on *RPTs (Female_CEO)* is negative (positive) and statistically significant, suggesting that *Female_CEO (RPTs)* is positively (negatively) associated with firm performance. More interestingly, the coefficient on *Female_CEO*RPTs* is positively and significant, suggesting that RPTs in firms with female CEOs are associated with improved performance. Hence, confirming that firms with female CEOs engage only in efficient RPTs.

[Please insert Table 3 about here]

4.2. Controlling endogeneity

We acknowledge that using OLS regression to estimate Equation (1) might be subject to endogeneity concerns, i.e., reverse causality and self-selection bias. Therefore, following the existing studies (e.g., Gull *et al.*, 2021; Vo *et al.*, 2021; Gull *et al.*, 2018; Usman *et al.*, 2018; 2021), we use

two-stage least square (2SLS) regression, two-step Heckman model, and propensity score matching (PSM) method to mitigate the endogeneity concern.

We use a standard remedy to control for reverse causality, i.e., 2SLS regression. In 2SLS regression, we employ two instrument variables. First, we use the industry average of female executives (*Female_Industry*) as an instrumental variable because the probability of hiring female CEOs is higher in firms operating in an industry where it is common to hire women at the helm of firms (e.g., Vo *et al.*, 2021). Second, we use the proportion of female to the male executive in the province (*Female_Region*) where the firms headquarter is situated as an instrumental variable because the probability of appointing female CEO is high for firms operating in provinces where the talented pool of female executives is large (Chen *et al.*, 2017). These two variables can be used as valid instruments because both are highly likely to affect the firms' decision to appoint female CEOs, but unlikely to directly affect the use of RPTs. As expected, the first stage results of 2SLS (Column 1 of Table 4) show that the coefficient on both instruments is positively significant.

Moreover, the F-statistics of the first-stage regression is higher than the threshold value of 10. The weak identification tests also show that the Cragg-Donald Wald F-statistic is higher than Stock-Yogo's critical value, suggesting that our instruments are not weak. The Hansen J-statistic also remains insignificant, conforming that our instruments are jointly exogenous. Overall, these results indicate that our instruments are relevant and valid. The results for the second stage are reported in Column 2 (Table 4) also shows that CEO gender is negatively associated with RPTs.

To control for the self-selection bias, we follow previous studies (e.g., Gull *et al.*, 2021; Usman *et al.*, 2021) and use the two-step Heckman model. In the first stage, we identify possible determinants of female CEOs. Following Vo *et al.* (2021) and Chen *et al.* (2017), we use *Female_Industry* and *Female_Region* as key variables that influence a firms' decision to have female CEOs along with all the control variables. In the first stage, we compute the Inverse Mills Ratio (*Mills_Ratio*) and use it as an additional control variable in the second stage regression. Columns 3 and 4 (Table 4) contain the results of the two-step Heckman model. The coefficient on *Mills_Ratio* is statistically insignificant and that on *Female_CEO* remains negative, which supports our main findings.

To mitigate the possible issue of self-selection bias (i.e., fewer RPTs are due to other firm-level characteristics such as board structure, ownership structure, and firm economic conditions rather than CEO gender), we use the PSM. PSM allows us to find a control group (i.e., firms with male CEOs)

that is nearly identical to the treatment group (i.e., firms with female CEOs) based on firm-level characteristics. Our matching is based on the probability of having female CEO based on all control variables. After finalizing the matched sample (a sample almost similar in all respects except the CEO gender), we then re-estimate Equation (1) using the matched sample. The results for the first and second stages of PSM are reported in Columns 5–6 (Table 4). The coefficient on *Female_CEO* is again negatively significant.

4.3. Robustness analysis

So far, we assume that all RPTs are opportunistic. Yet, prior studies (e.g., Ryngaert & Thomas, 2012) suggest that RPTs may also be efficient or normal transactions. Therefore, we distinguish between RPTs by using the expectation model of Jian and Wong (2010). These authors consider that normal RPTs depend on firm size, leverage, market-to-book ratio, and industry classification. Abnormal RPTs refer to the unexplained component of RPTs using this model, i.e., residuals obtained from the expectation model. The results using abnormal RPTs (i.e., residuals obtained from the expectation model) as dependent variable are reported in Column 7 (Table 4). They consistently show a negatively significant coefficient on *Female_CEO*, suggesting that female CEOs engage in fewer RPTs, especially those of opportunistic nature.

[Please insert Table 4 about here]

5. Conclusion

The number of studies exploring the effect of female executives on corporate outcomes has increased recently due to the enactment of gender quota legislation in many countries. We go beyond existing studies and first time investigate the association between CEO gender and RPTs. We contribute to the female ethics versus risk-aversion puzzle by providing more direct evidence on this relationship. Prior studies (e.g., Ho *et al.*, 2015; Zalata *et al.*, 2019) use earnings management as a research setting to solve the female ethics versus risk-aversion puzzle, which is subject to intense scrutiny by external auditors, implying that the risk of getting caught is higher in case of earnings management. Therefore, the negative association between female CEOs and earnings management may not necessarily portray them as more ethical but risk-averse. We believe that our research setting is more relevant (i.e., RPTs where the risk of getting caught is significantly low than earnings management) to solve the puzzle of whether female executives are more ethical or risk-averse. Our findings show that firms with female CEOs engage in fewer RPTs, suggesting that female CEOs are

not only risk-averse but also adopt a more ethical behavior. Further, analysis shows that female CEO-RPTs nexus is more pronounced in firms with weak corporate governance mechanisms and extensive use of RPTs (i.e., SOEs). Finally, we document that RPTs in female CEO firms enhance financial performance, confirming that female CEOs allow efficient but not opportunistic RPTs which may harm the shareholders' interests.

Notes

^[1] Unlike Nekhili *et al.*, (2021), we are unable to use different types or measures of RPTs (e.g., the number of RPTs with directors, managers, and affiliated firms) due to unavailability of data. However, we reperform main analysis using RPTs amount. The unreported results also show a negative and statistically significant coefficient on female CEO.

^[2] In unreported results, we find insignificant effect of female CEOs on RPTs in family-owned firms. This finding is consistent with Nekhili *et al.*, (2018), who report that female CEOs are less effective in family-owned firms.

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Table 1: Descriptive statistics and mean comparison analysis for firms with and without female CEO

Variables	Mean	Standard deviation	Minimum	Maximum	Female CEO (N=1,517)	Male CEO (N=25,820)	Mean difference test
RPTs	26.389	30.877	1	175	21.474	26.678	6.384***
Female_CEO	0.055	0.229	0	1	–	–	–
Board_Size	10.129	2.652	4	27	9.668	10.156	6.981***
Board_Independence	0.376	0.070	0.143	0.800	0.387	0.376	–6.297***
Board_Diversity	0.201	0.153	0	0.500	0.342	0.193	–37.507***
Board_Meetings	9.636	4.129	1	58	9.746	9.63	–1.068
CEO_Duality	0.26	0.438	0	1	0.239	0.261	1.848*
Institutional_Equity	0.067	0.081	0	0.751	0.069	0.067	–1.192
SOE	0.42	0.493	0	1	0.284	0.428	11.025***
Tobins_Q	2.008	1.329	0.889	9.163	2.093	2.004	–2.545**
Firm_Size	22.047	1.452	12.314	30.952	21.883	22.057	4.524***
Firm_Age	2.641	0.454	0	3.932	2.676	2.639	–3.147***
Financial_Leverage	0.443	0.218	0.049	0.950	0.421	0.445	4.175***

Note: All continuous variables are winsorized at the 1st and 99th percentiles.

Table 2: Correlation matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. RPTs	1.000												
2. Female_CEO	-0.044***	1.000											
3. Board_Size	0.215***	-0.042***	1.000										
4. Board_Independence	-0.071***	0.038***	-0.121***	1.000									
5. Board_Diversity	-0.108***	0.221***	-0.029***	0.054***	1.000								
6. Board_Meetings	0.238***	0.006	0.100***	0.050***	0.025***	1.000							
7. CEO_Duality	-0.170***	-0.011*	-0.133***	0.104***	0.105***	0.016***	1.000						
8. Institutional_Equity	0.059***	0.007	0.054***	-0.002	-0.019***	0.099***	-0.032***	1.000					
9. SOE	0.301***	-0.067***	0.217***	-0.148***	-0.179***	-0.062***	-0.300***	0.040***	1.000				
10. Tobins_Q	-0.212***	0.015**	-0.079***	0.071***	0.048***	-0.046***	0.062***	0.135***	-0.152***	1.000			
11. Firm_Size	0.528***	-0.027***	0.337***	-0.022***	-0.101***	0.244***	-0.147***	0.216***	0.287***	-0.392***	1.000		
12. Firm_Age	0.194***	0.019***	0.110***	-0.003	0.062***	0.129***	-0.057***	0.011*	0.094***	0.077***	0.191***	1.000	
13. Financial_Leverage	0.453***	-0.025***	0.204***	-0.074***	-0.091***	0.206***	-0.161***	0.079***	0.296***	-0.220***	0.476***	0.167***	1.000

Note: *, **, *** shows statistical significance at the 10%, 5% and 1% levels, respectively.

Table 3: Female CEOs, RPTs, and firm performance (whole sample, SOEs and Non-SOEs sample)

Variables	<i>RPTs</i>			<i>Tobins_Q</i>
	Column 1	Column 2	Column 3	Column 4
	Whole Sample	SOEs Sample	Non-SOEs Sample	Whole Sample
Female_CEO	-0.035** (-2.31)	-0.116** (-2.45)	0.030 (0.94)	0.139** (2.40)
Female_CEO*RPTs	-	-	-	0.059*** (2.73)
RPTs	-	-	-	-0.033*** (-5.00)
Board_Size	0.002 (0.81)	0.002 (0.59)	-0.000 (-0.05)	0.021*** (7.88)
Board_Independence	-0.820*** (-9.36)	-0.803*** (-5.82)	-0.625*** (-5.66)	0.518*** (5.54)
Board_Diversity	-0.322*** (-7.85)	-0.512*** (-7.93)	-0.177*** (-3.42)	-0.260*** (-5.92)
Board_Meetings	0.032*** (20.77)	0.025*** (11.29)	0.035*** (16.85)	0.001 (0.86)
CEO_Duality	-0.178*** (-12.37)	-0.187*** (-6.53)	-0.117*** (-7.13)	-0.057*** (-3.70)
Institutional_Equity	-0.450*** (-5.65)	-0.641*** (-5.97)	-0.364*** (-3.20)	3.588*** (43.65)
SOE	0.413*** (28.60)	-	-	0.050*** (3.17)
Tobins_Q	-0.026*** (-4.57)	-0.056*** (-5.69)	-0.014* (-1.95)	-
Firm_Size	0.300*** (47.54)	0.231*** (27.55)	0.371*** (39.02)	-0.490*** (-77.12)
Firm_Age	-0.005 (-0.34)	-0.153*** (-5.70)	0.031 (1.62)	0.262*** (15.68)
Financial_Leverage	1.694*** (49.35)	0.993*** (19.35)	2.040*** (44.52)	0.184*** (4.83)
Year-fixed effects	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes
Constant	-5.096*** (-35.24)	-2.636*** (-13.06)	-6.915*** (-32.22)	10.553*** (73.18)
Adj. R ²	0.43	0.34	0.43	0.39
F-statistics	451.87***	135.99***	273.77***	373.82***
N	27,337	11,470	15,867	11,470

Note: T-values are reported in parenthesis. *, **, *** shows statistical significance at the 10%, 5% and 1% levels, respectively.

Table 4: Female CEOs and RPTs (Endogeneity and robustness analysis)

Variables	2SLS		Heckman		PSM		Abnormal RPTs
	Column 1 1 st Stage	Column 2 2 nd Stage	Column 3 1 st Stage	Column 4 2 nd Stage	Column 5 1 st Stage	Column 6 2 nd Stage	Column 7
	<i>Female_CEO</i>	<i>RPTs</i>	<i>Female_CEO</i>	<i>RPTs</i>	<i>Female_CEO</i>	<i>RPTs</i>	<i>Abnormal RPTs</i>
Female_CEO	–	–0.321** (–1.98)	–	–0.282*** (–2.71)	–	–0.046** (–2.25)	–0.043** (–2.45)
Mills_Ratio	–	–	–	0.124 (1.52)	–	–	–
Board_Size	–0.003*** (–5.24)	0.001 (0.46)	–0.023*** (–3.85)	0.001 (0.50)	–0.020*** (–3.40)	0.012 (1.48)	0.005 (0.61)
Board_Independence	0.074*** (3.76)	–0.799*** (–9.01)	0.728*** (3.67)	–0.800*** (–9.04)	0.712*** (3.63)	–0.714*** (–2.88)	–1.123*** (–3.57)
Board_Diversity	0.310*** (34.66)	–0.229*** (–3.13)	3.491*** (31.07)	–0.241*** (–3.59)	3.571*** (31.91)	–0.634*** (–3.60)	–0.600*** (–4.07)
Board_Meetings	–0.000 (–1.15)	0.032*** (20.63)	–0.001 (–0.39)	0.032*** (20.73)	–0.003 (–0.83)	0.043*** (8.92)	0.078*** (13.98)
CEO_Duality	–0.024*** (–7.47)	–0.185*** (–12.23)	–0.229*** (–6.85)	–0.184*** (–12.32)	–0.244*** (–7.37)	–0.073* (–1.67)	–0.319*** (–6.19)
Institutional_Equity	0.005 (0.28)	–0.446*** (–5.59)	0.162 (0.89)	–0.444*** (–5.57)	0.144 (0.80)	–1.908*** (–8.16)	–0.989*** (–3.46)
SOE	–0.013*** (–3.90)	0.408*** (27.47)	–0.152*** (–4.39)	0.408*** (27.66)	–0.186*** (–5.40)	0.202*** (4.33)	0.680*** (13.15)
Tobins_Q	0.000 (0.28)	–0.026*** (–4.56)	0.003 (0.23)	–0.026*** (–4.55)	0.000 (0.03)	0.051*** (3.06)	0.034* (1.66)
Firm_Size	0.003** (2.02)	0.301*** (47.51)	0.020 (1.38)	0.301*** (47.56)	0.004 (0.23)	0.378*** (18.32)	–0.212*** (–9.36)
Firm_Age	0.004 (1.11)	–0.004 (–0.25)	0.066* (1.82)	–0.003 (–0.21)	0.062* (1.71)	–0.069 (–1.41)	0.041 (0.72)
Financial_Leverage	–0.014* (–1.83)	1.690*** (49.01)	–0.138* (–1.72)	1.693*** (49.29)	–0.164** (–2.03)	1.599*** (15.02)	–0.055 (–0.45)
Female_Region	0.012** (1.98)	–	0.989** (2.54)	–	–	–	–
Female_Industry	0.899*** (28.11)	–	6.694*** (23.02)	–	–	–	–
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	–0.093*** (–2.95)	–5.092*** (–35.16)	–3.617*** (–10.54)	–5.112*** (–35.26)	–2.390*** (–6.96)	–6.583*** (–14.09)	3.067*** (5.92)
Adj. R ² / Pseudo R ²	0.08	0.42	0.18	0.43	0.16	0.40	0.25
F-test/ Chi-square	89.34***	20284.03***	2154.44***	442.12***	1853.59***	46.18***	29.65***
Cragg-Donald Wald F statistic	279.151	–	–	–	–	–	–
Kleibergen-Paap F statistic	79.065	–	–	–	–	–	–
Stock-Yogo weak ID test	19.93	–	–	–	–	–	–
Hansen J (<i>P-value</i>)	–	0.754	–	–	–	–	–
<i>N</i>	27,337	27,337	27,337	27,337	27,337	3,034	27,337

Note: t-values are reported in parenthesis. *, **, *** shows statistical significance at the 10%, 5% and 1% levels, respectively.