CEO power and CSR: 
the moderating role 
of CEO characteristics

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Abstract

Purpose – The purpose of this study is to examine the moderating role of the characteristics of the chief executive officer (CEO) on the association between CEO power and corporate social responsibility (CSR) performance.

Design/methodology/approach – This paper conducts multiple regression analyses to empirically test the proposed hypotheses based on a sample of US-based publicly held companies. The sample period extends from 2000 to 2018. Firm-level CSR ratings are obtained from the Kinder, Lydenberg and Domini (KLD) database (currently known as MSCI ESG STATS). Financial data and CEO data are retrieved from Compustat and ExecuComp databases, respectively. Additional test and robustness analysis are performed.

Findings – This paper shows that firms with more powerful CEOs are less likely to engage in CSR activities. The negative association between CEO power and CSR is found to be exacerbated by CEOs who are younger, more competent and overconfident; however, this negative association is mitigated by CEOs who are female. This paper also finds that gender plays a more important role among CEO characteristics. Collectively, the findings highlight the potential opportunities to better understand the role of various CEO characteristics that jointly affect CSR.

Originality/value – First, this is the first study providing a comprehensive empirical analysis of how various CEO characteristics jointly affect CSR. Prior studies that focus on standalone CEO characteristics offer an incomplete picture of the relation between a single CEO characteristic and a firm's CSR performance. The current study thus extends the research field by examining the association between seemingly unrelated CEO characteristics and CSR performance. The results also highlight that gender is the critical factor moderating the relationship between CEO power and CSR performance when it is compared with CEO age, ability and overconfidence. Second, the authors add to the literature on employee selection by showing that female CEOs mitigate the negative effect of managerial power on CSR performance. Although the currently available empirical research in management control systems focuses on ex-post analyses of moral hazard mitigation for incumbent employees, both the economics and management literature acknowledge ex ante evidence suggesting that employee selection is even more important. Our findings may provide insight into the selection of CEOs.

Keywords Corporate social responsibility, Managerial power, CEO characteristics, CEO gender

Paper type Research paper

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1. Introduction

Corporate social responsibility (CSR) performance has been gaining importance over the last few decades for business firms and in academic research [1]. Empirical studies suggest that CSR is popular among firms because it positively impacts firm reputation (Du & Vieira, 2012; Panwar, Paul, Nybak, Hansen, & Thompson, 2014; Chakravarthy, deHaan, & Rajgopal, 2014; Tan, Tsang, Wang, & Zhang, 2020) and firm value (Dhaliwal et al., 2011, 2012; Cheng, Ioannou, & Serafeim, 2014; Flammer, 2015; Journeault, 2016; Joshi & Li, 2016; Liao, San, Tsang, & Yu, 2021). Due to its importance, there has been an extensive body of literature that examines the determinants of CSR performance and documents that a firm’s CSR policy can be significantly explained through the characteristics of the chief executive officer (CEO) (Manner, 2010; Tang, Qian, Chen, & Shen, 2015; Petrenko, Aime, Ridge, & Hill, 2016; Kang, 2017; McCarthy, Oliver, & Song, 2017; Harper & Sun, 2019; Sheikh, 2019). For example, Harper and Sun (2019) and Sheikh (2019) find that companies with more powerful CEOs enact fewer CSR activities, while McCarthy et al. (2017) observe that CSR performance is poor for companies with overconfident CEOs; finally, Yuan, Tian, Lu, and Yu (2019) show a positive association of CSR performance with the managerial ability of CEOs.

However, although researchers continue to search for individual CEO attributes that independently influence a firm’s CSR performance, we argue that a narrow focus on any standalone CEO attribute provides an incomplete picture of the relation between CEO attributes and a firm’s CSR performance. Therefore, a key objective of this study is to reexamine the many one-off findings and conclusions relating CEO attributes to a firm’s CSR performance using a much broader portfolio approach by investigating the association between CSR performance and multiple seemingly unrelated CEO characteristics. To our knowledge, this is the first study providing a comprehensive empirical analysis of how various CEO characteristics jointly affect CSR.

Specifically, in our study, CEO characteristics are captured with four popular, publicly available measures of CEO characteristics: age, gender, ability and overconfidence. We propose two hypotheses: the first explores how the four measures of CEO characteristics affect the relationship between CEO power and CSR performance; the second hypothesis explores the relative importance of the four measures of CEO characteristics in the relationship between CEO power and CSR performance. We conduct multiple regression analyses to empirically test these hypotheses based on a sample of US-based publicly held companies with CSR ratings available from the Kinder, Lydenberg, and Domini (KLD) database (currently known as MSCI ESG STATS) during the period between 2000 and 2018.

In the analysis of the effects of CEO power on CSR performance, the findings indicate that powerful CEOs are associated with low CSR performance. Consistent with prior research (Harper & Sun, 2019; Sheikh, 2019), these findings indicate that powerful CEOs are less responsive to stakeholder demands for social responsibility. In analyzing the effects of individual CEO characteristics on CSR performance, we find that younger, more competent and overconfident CEOs are associated with lower CSR performance when they have greater managerial power. In contrast, female CEOs are associated with high CSR performance when they have greater managerial power. In addition, when we simultaneously consider how these CEO characteristics affect the impact of CEO power on CSR performance, the results reveal that female CEOs mitigate the negative impact of CEO power on CSR performance when controlling for an array of key CEO attributes, including age, ability and overconfidence.

Our study contributes to the literature in two ways. First, to our knowledge, this is the first study providing a comprehensive empirical analysis of how various CEO characteristics jointly affect CSR. Prior studies that focus on standalone CEO characteristics offer an incomplete picture of the relation between a single CEO characteristic and a firm’s CSR performance.
performance. The current study thus extends the research field by examining the association between seemingly unrelated CEO characteristics and CSR performance. The results also highlight that gender is the critical factor moderating the relationship between CEO power and CSR performance when it is compared with CEO age, ability and overconfidence. Second, we add to the literature on employee selection by showing that female CEOs mitigate the negative effect of managerial power on CSR performance. Although the currently available empirical research in management control systems focuses on ex-post analyses of moral hazard mitigation for incumbent employees (Tosi, Katz, & Gomez-Mejia, 1997; Deyá-Tortella, Gomez-Mejia, De Castro, & Wiseman, 2005), both the economics and management literature acknowledge ex ante evidence suggesting that employee selection is even more important (Campbell, 2012; Abernethy, Dekker, & Schulz, 2015; Grabner & Speckbacher, 2016). Our findings may provide insight into the selection of CEOs.

2. Theoretical framework and research hypotheses

In this section, we review the literature with related theories and develop our hypotheses.

2.1 CEO power and CSR

A few global studies investigate whether managerial power on the part of CEOs is associated with CSR performance (Muttakin, Khan, & Mihret, 2018; Harper & Sun, 2019; Rashid, Shams, Bose, & Khan, 2020). These scholars argue that CEOs tend to entrench themselves when they have greater managerial power, which means that they may not act in the best interests of different stakeholders. For example, Harper and Sun (2019) find that more powerful CEOs are less likely to engage in CSR activities because they are more likely to take actions to maintain or increase their power at the expense of stakeholders. Rashid et al. (2020) indicate that CEO power is negatively associated with the level of CSR disclosure because powerful CEOs prefer to invest in profit-making activities and are not interested in disclosing CSR information.

2.2 The moderating effect of CEO characteristics on the relationship between CEO power and CSR performance

Prior studies in the field of upper echelons theory have highlighted the critical role of CEO personality traits in their decision-making processes (Heaton, 2002; Chatterjee & Hambrick, 2007, 2011; Resick, Whitman, Weingarden, & Hiller, 2009; Tang et al., 2015; Kang, 2017). Typical examples of CEO characteristics are age (El Ghoul, Guedhami, Wang, & Kwok, 2016), gender (Hoang, Nguyen, & Van Tran, 2019), ability (Yuan et al., 2019) and confidence (Malmendier & Tate, 2005, 2008). Likewise, powerful CEOs’ managerial decisions on corporate social responsibility may be affected by their personality traits. Prior research suggests that older CEOs have incentives to influence stock prices during the period leading up to their retirement (Cassell, Huang, & Sanchez, 2013). Most studies investigating the relationship between CEO age and CSR find that older CEOs tend to dedicate effort toward CSR performance (e.g. Luo & Bhattacharya, 2006; Godos-Díez, Fernández-Gago, & Martínez-Campillo, 2011; El Ghoul et al., 2016; McCarthy et al., 2017). Accordingly, we expect the negative impact of managerial power on CSR performance to be exacerbated for firms led by younger CEOs. We develop the following hypothesis:

H1. The negative relationship between CEO power and CSR performance is more pronounced for firms led by younger CEOs.

Chen, Ma and Schumacher (2020) indicate that female CEOs are perceived as more prosocial than male CEOs. Some studies also find that female CEOs are more likely to encourage CSR reporting and exhibit higher CSR performance than male CEOs (Manner, 2010; McCarthy et al., 2017; Zou, Wu, Zhu, & Yang, 2018; Lim & Chung, 2021). Thus, female CEOs may pay
more attention and dedicate more effort to CSR activities. Therefore, we expect that powerful female CEOs are more willing to engage in CSR activities than powerful male CEOs and develop the following hypothesis:

**H2.** The negative relationship between CEO power and CSR performance is mitigated in firms led by female CEOs.

There are two competing views on how managerial ability affects powerful CEOs’ CSR decisions. On the one hand, prior research suggests that managers with greater managerial ability tend to expropriate firm resources when they acquire more power (Jensen & Ruback, 1983). Thus, powerful CEOs with greater managerial ability may not have the interests of stakeholders in mind and reject any CSR proposals that cannot bring immediate benefits for shareholders. On the other hand, Yuan et al. (2019) indicate that firms led by CEOs with greater managerial ability are associated with better CSR performance because more able CEOs have fewer career concerns and are thus more willing to invest in CSR projects. Accordingly, we posit that the negative impact of managerial power on CSR performance is affected by managerial ability. We develop the following hypothesis:

**H3.** Managerial ability affects the relationship between CEO power and CSR performance.

Prior studies suggest that overconfident CEOs tend to assign fewer resources to the needs of stakeholders and thus put less effort toward CSR (Panwar et al., 2014; Tang et al., 2015; McCarthy et al., 2017). Accordingly, we expect the negative impact of managerial power on CSR performance to be exacerbated if overconfident CEOs manage the firm. We develop the following hypothesis:

**H4.** The negative relationship between CEO power and CSR performance is more pronounced for firms led by overconfident CEOs.

### 3. Methodology

#### 3.1 Sample and data

We investigate a sample of US-based publicly held companies with CSR ratings in the KLD database spanning a period between 2000 and 2018. The KLD database ranks the strengths and weaknesses of CSR at the firm level in terms of seven dimensions, which are widely used by related studies to obtain firm-level CSR scores: corporate governance, community, diversity, employee relations, environment, human rights and product (Harjoto & Jo, 2011; Jian & Lee, 2015; Karim, Lee, & Suh, 2018; Davidson, Dey, & Smith, 2019) [2]. The initial CSR dataset comprises 60,276 firm-year observations. Next, we used the Compustat database to obtain financial statement data over the period from 1999 to 2018. This database comprises 74,162 firm-year observations. Then, we obtained CEO data, including CEO age, gender and stock ownership, from the ExecuComp database, which consists of 234,618 firm-year observations from 1999 to 2018. Finally, we obtained CEO ability data from documented literature, including fiscal years 1980–2018, with 221,922 observations (Demerjian, Lev, & McVay, 2012). We merged the above-referenced data and deleted all observations with values missing for any of the variables of interest. The constructed data sample consists of 12,974 firm-year observations, representing 1,213 unique firms in the USA from 2000 to 2018.

#### 3.2 Model specification for hypotheses

Our hypotheses examine how different CEO personality traits affect the relationship between CEO power and CSR performance. Following previous studies (Kim, Park, & Wier, 2012; Davidson et al., 2019; Tsang, Hu, & Li, 2021), the proxy of CSR performance ($CSP_{it}$) is measured as total strengths minus total concerns among KLD’s five social rating categories:
community, diversity, employee relations, environment and product (Appendix 1 provides a
detailed summary of the five categories and subcategories). We excluded the human rights
category from our analysis because the data available for analysis is limited as it is often only
measured for a few years at a time. In addition, corporate governance is perceived as a
construct that is distinct from CSR, so we left this category out of our CSR performance
measure but included corporate governance as a dimension (COGit) in the regression model as
a control variable. COG was constructed in the same manner as the other dimensions.

For the CEO power construct, we followed prior studies (Janakiraman, Radhakrishnan, &
Tsang, 2010; Lewellyn & Muller-Kahle, 2012; Choe, Tian, & Yin, 2014) and used the
percentage of shares owned by the CEO to measure CEO power (Powerit). Missing values on
CEO ownership are set to zero for measurement purposes (Janakiraman et al., 2010).

Four CEO characteristics – age, gender, ability and overconfidence – are considered to
substantially influence CSR performance. We followed previous research and applied these
four CEO characteristics (Manner, 2010; Eweje & Brunton, 2010; Huang, Rose-Green, & Lee,
2012; McCarthy et al., 2017; Yuan et al., 2019). The first CEO characteristic variable is CEO
age. This study used an indicator variable (Youngit) that equals one if the CEO’s age is
younger than the median age of CEOs in their industry based on the two-digit SIC codes and
zero otherwise. The second CEO characteristic variable is CEO gender, which is an indicator
variable (Femaleit) that equals one if the CEO’s gender is female. The third CEO characteristic
variable is CEO ability. To measure this, we also used a dummy variable (Abilityit), which
equals one if the CEO’s ability score (the MA score in Demerjian et al., 2012) is above the
median value of the CEO’s ability score in the industry based on the two-digit SIC codes, and
zero otherwise. The final CEO characteristic variable is the overconfidence level of the CEOs
(OCit). We followed Hirsleifer, Low and Teoh (2012) and first constructed the value-per-
option by dividing the value of CEO’s unexercised-but-vested option holdings by the number
of such options. Then, we constructed our CEO overconfidence by dividing the value-per-
option by the year-end stock price.

We included control variables that affect CEO characteristics following prior research
protocols. We used the score for the corporate governance dimension (COGit) because
stronger corporate governance is associated with greater CSR investment effectiveness
(Johnson & Greening, 1999; Kim et al., 2012). We also included ROAit−1 because a firm’s past
operating performance can affect CSR performance (Harjoto & Jo, 2011). Leverage (Leverageit)
and the market-to-book ratio (MBit) were also used because stable firms with lower levels of
risk are more likely to invest in CSR (Orlitzky & Benjamin, 2001). We included the dividend
payout ratio (Dividendit) because firm dividend policies affect CSR performance (Cheung, Hu,
& Schwiebert, 2018) and also CurrentRatioit because firms with higher liquidity are more able
to engage in CSR activities. Finally, we controlled for industry and year effects. A detailed
summary of the variable definitions is provided in Appendix 2. The regression models for H1,
H2, H3 and H4 are as follows:

$$CSP_{it} = \alpha_0 + \alpha_1 Power_{it} + \alpha_2 Young_{it} + \alpha_3 Power_{it} \times Young_{it} + \alpha_4 COG_{it}$$
$$+ \alpha_5 ROA_{it-1} + \alpha_6 Leverage_{it} + \alpha_7 Dividend_{it} + \alpha_8 MB_{it} + \alpha_9 CurrentRatio_{it} + \sum Industry + \sum Year + \varepsilon$$

(1)

$$CSP_{it} = \alpha_0 + \alpha_1 Power_{it} + \alpha_2 Female_{it} + \alpha_3 Power_{it} \times Female_{it} + \alpha_4 COG_{it}$$
$$+ \alpha_5 ROA_{it-1} + \alpha_6 Leverage_{it} + \alpha_7 Dividend_{it} + \alpha_8 MB_{it} + \alpha_9 CurrentRatio_{it} + \sum Industry + \sum Year + \varepsilon$$

(2)
4. Empirical analysis

4.1 Descriptive statistics and Pearson correlation

Panel A of Table 1 reports the distribution of firm-year observations by fiscal year for the sample firms. Panel A of Table 1 shows that 2016 has the largest number of observations (1,255); 2018 has the smallest number of observations (58). Panel A also tabulates the average value for $CSP_{it}$, $Power_{it}$, $Young_{it}$, $Female_{it}$, $Ability_{it}$ and $OC_{it}$. Column (3) describes the trend in $CSP_{it}$ over the 19-year sample period. In 2000, the average score for $CSP_{it}$ was 0.75, but the average score increased to 2.00 in 2018. This finding may suggest an increase in the public awareness of a firm’s CSR engagement, thereby causing firms to engage in more CSR activities. Columns 4–8, respectively, present the trend of percentage of share owned by CEOs ($Power_{it}$), the proportion of younger CEOs ($Young_{it}$), the proportion of female CEOs ($Female_{it}$), the proportion of better ability CEOs ($Ability_{it}$) and the level of overconfident CEOs ($OC_{it}$). From Columns (4) to (8), we observe an increase in the proportion of younger and female CEOs across the sample period.

Panel B presents the industry composition of our sample, based on the 23 industry classifications of Barth, Beaver, Han and Landsman (2005) [3]. From Panel B, it is clear that the most heavily represented industry in our sample is Computers (16.35%), followed by Services (9.58%) and Manf: instruments (6.57%). Column (3) in Panel B shows that Pharmaceuticals dominate the sample with an average $CSP_{it}$ score of 1.16. Food dominates the sample in Column (4) with an average percentage of CEO-owned shares at 12%, compared with the sample average of 4%. Column (5) in Panel B shows that Financial has the largest proportion of younger CEOs and Retail: Misc. dominates the sample in Column (6) with the largest proportion of female CEOs [4]. The results suggest substantial heterogeneity in CSR performance, CEO power and CEO characteristics.

Table 2 reports the sample descriptive statistics. Table 2 shows that the mean and median $CSP_{it}$ values are 0.25 and 0.00, respectively. On average, the proportions of young CEOs, female CEOs and high-ability CEOs in our sample are 44, 3 and 51%, respectively. On average, the percentage of CEO ownership is 4%, the value of $COG_{it}$ is $-0.27$, the value of $ROA_{it-1}$ is 6%, the value of leverage is 0.50, the value of the market-to-book value is 3.37, the value of dividends is 0.14 and the value of the current ratio is 2.47. Note that the mean (median) value of $CSP_{it}$ is 0.25 (0.00) and the interquartile range is from $-1.00$ to $1.00$. This reveals significant variation in firm-level CSR performance in our sample. In addition, Table 2 also reveals the unbalanced proportion of female CEOs and male CEOs though the unbalanced sample size may have created bias in our results. To alleviate this concern, we applied a propensity score matching process in our sensitivity tests to further validate our findings.

Table 3 presents the Pearson correlations for the variables selected in this research. The Pearson correlations show that $CSP_{it}$ is significantly and positively related to younger CEOs ($Young_{it}$), female CEOs ($Female_{it}$) and CEOs with better ability ($Ability_{it}$), but is negatively
Panel A: Firm-year observations by fiscal year

| Fiscal Year | Obs. | Percent | CSP\_it | Power\_it | Young\_it | Female\_it | Ability\_it | OC\_it |
|-------------|------|---------|---------|-----------|-----------|------------|-------------|--------|
| 2000        | 189  | 1.46    | 0.75    | 0.00      | 0.05      | 0.01       | 0.55        | 0.35   |
| 2001        | 273  | 2.1     | 0.39    | 0.00      | 0.08      | 0.01       | 0.68        | 0.33   |
| 2002        | 297  | 2.29    | 0.39    | 0.01      | 0.09      | 0.01       | 0.55        | 0.25   |
| 2003        | 550  | 4.24    | 0.07    | 0.04      | 0.14      | 0.02       | 0.44        | 0.32   |
| 2004        | 579  | 4.46    | -0.09   | 0.04      | 0.18      | 0.02       | 0.47        | 0.35   |
| 2005        | 610  | 4.7     | -0.13   | 0.03      | 0.21      | 0.02       | 0.45        | 0.34   |
| 2006        | 678  | 5.23    | -0.29   | 0.03      | 0.28      | 0.02       | 0.43        | 0.35   |
| 2007        | 841  | 6.48    | -0.34   | 0.05      | 0.35      | 0.02       | 0.51        | 0.32   |
| 2008        | 869  | 6.7     | -0.34   | 0.06      | 0.39      | 0.03       | 0.47        | 0.17   |
| 2009        | 917  | 7.07    | -0.36   | 0.06      | 0.43      | 0.02       | 0.59        | 0.20   |
| 2010        | 976  | 7.52    | -0.32   | 0.06      | 0.46      | 0.03       | 0.56        | 0.26   |
| 2011        | 973  | 7.5     | -0.01   | 0.06      | 0.49      | 0.03       | 0.59        | 0.25   |
| 2012        | 970  | 7.48    | 0.71    | 0.06      | 0.52      | 0.03       | 0.48        | 0.26   |
| 2013        | 523  | 4.03    | 0.86    | 0.05      | 0.57      | 0.03       | 0.46        | 0.31   |
| 2014        | 570  | 4.39    | 0.42    | 0.05      | 0.62      | 0.04       | 0.48        | 0.29   |
| 2015        | 606  | 4.67    | 0.78    | 0.04      | 0.67      | 0.04       | 0.52        | 0.24   |
| 2016        | 1,255| 9.67    | 1.00    | 0.04      | 0.63      | 0.04       | 0.51        | 0.24   |
| 2017        | 1,240| 9.56    | 0.97    | 0.04      | 0.67      | 0.04       | 0.47        | 0.18   |
| 2018        | 58   | 0.45    | 2.00    | 0.02      | 0.60      | 0.03       | 0.40        | 0.15   |
| Overall     | 12,974| 100     | 0.25    | 0.04      | 0.44      | 0.03       | 0.51        | 0.26   |

Panel B: Firm-year observations by industry

| Industry | Obs. | Percent | CSP\_it | Power\_it | Young\_it | Female\_it | Ability\_it | OC\_it |
|----------|------|---------|---------|-----------|-----------|------------|-------------|--------|
| 01 Mining/Construction | 333  | 2.57    | -0.65   | 0.01      | 0.47      | 0.00       | 0.51        | 0.21   |
| 02 Food   | 495  | 3.82    | 0.97    | 0.12      | 0.39      | 0.06       | 0.54        | 0.24   |
| 03 Textiles/Print/Publish | 777  | 5.99    | 0.57    | 0.06      | 0.37      | 0.03       | 0.50        | 0.23   |
| 04 Chemicals | 673  | 5.19    | 0.34    | 0.04      | 0.47      | 0.01       | 0.28        | 0.25   |
| 05 Pharmaceuticals | 444  | 3.42    | 1.16    | 0.02      | 0.42      | 0.04       | 0.82        | 0.33   |
| 06 Extractive | 645  | 4.97    | -0.94   | 0.01      | 0.43      | 0.01       | 0.53        | 0.27   |
| 07 Manf: Rubber/Glass/Etc | 308  | 2.37    | 0.18    | 0.01      | 0.42      | 0.04       | 0.50        | 0.25   |
| 08 Manf: Metal | 525  | 4.05    | -0.70   | 0.06      | 0.42      | 0.06       | 0.52        | 0.23   |
| 09 Manf: Machinery | 639  | 4.93    | -0.20   | 0.02      | 0.40      | 0.02       | 0.47        | 0.28   |
| 10 Manf: Electrical equipment | 519  | 4.      | 0.29    | 0.02      | 0.46      | 0.00       | 0.35        | 0.25   |
| 11 Manf: Transport equipment | 437  | 3.37    | -0.13   | 0.01      | 0.45      | 0.06       | 0.51        | 0.29   |
| 12 Manf: Instruments | 853  | 6.57    | 0.40    | 0.03      | 0.48      | 0.01       | 0.53        | 0.29   |
| 13 Manf: Misc | 142  | 1.09    | 0.99    | 0.02      | 0.48      | 0.01       | 0.49        | 0.27   |
| 14 Computers | 2,121| 16.35   | 0.90    | 0.05      | 0.50      | 0.01       | 0.58        | 0.27   |
| 15 Transportation | 799  | 6.16    | 0.07    | 0.05      | 0.45      | 0.02       | 0.51        | 0.25   |
| 16 Retail: Wholesale | 537  | 4.14    | -0.01   | 0.05      | 0.43      | 0.00       | 0.47        | 0.24   |
| 17 Retail: Misc. | 1,077| 8.3     | 0.23    | 0.04      | 0.42      | 0.09       | 0.50        | 0.26   |
| 18 Retail: Restaurant | 311  | 2.4     | 0.35    | 0.07      | 0.45      | 0.08       | 0.49        | 0.31   |
| 19 Financial | 7    | 0.05    | -0.29   | 0.00      | 0.57      | 0.00       | 0.29        | 0.28   |
| 20 Services | 1,243| 9.58    | 0.05    | 0.06      | 0.42      | 0.03       | 0.48        | 0.26   |
| 21 Others | 89   | 0.69    | -0.98   | 0.04      | 0.15      | 0.00       | 0.28        | 0.30   |
| Overall     | 12,974| 100     | 0.25    | 0.04      | 0.44      | 0.03       | 0.51        | 0.26   |

Table 1. Sample distribution

CEO power and CSR
related to CEO ownership (Powerit). The positive associations suggest that firms with younger, female and more capable CEOs are more likely to engage in CSR activities. However, the negative relationships suggest that firms with more powerful CEOs engage in less CSR activity. We also observe that CSPit is positively related to COGiti, ROAiti-1, Leverageiti, Dividenditi and the market-to-book ratio (MBiti), but negatively related to the current ratio (CurrentRatioiti). Although significant and strongly correlated coefficients are found between the independent variables in Table 3, multicollinearity is unlikely to be a concern as the variance inflation factor (VIF) values are lower than 10 (Kutner, Neter, Nachtsheim, & Li, 2004).

4.2 Regression results

Tables 4–7 report the regression results for H1, H2, H3 and H4, respectively. The coefficients on Poweriti are statistically negative in all tables. Consistent with prior studies (Harper & Sun, 2019), this evidence indicates that firms with more powerful CEOs are less likely to engage in CSR activities.

Table 4 shows the results for H1. The coefficient on Youngiti is significantly negative at the 5% significance level (−0.09, t = −2.15) in Column (1), which indicates that younger CEOs exhibit lower CSR performance. In Column (2) of Table 4, the coefficient on Youngiti×Poweriti is significantly negative at the 5% significance level (−0.62, t = −2.36). This indicates that the negative impact of CEO power on CSR performance is more pronounced for firms led by younger CEOs. The results for the control variables in Table 4 indicate that outstanding CSR performance is associated with a higher level of corporate governance (COGiti), better past operating performance (ROAiti−1), a higher level of leverage (Leverageiti), a higher level of dividend (Dividenditi), a higher market-to-book ratio (MBiti) and a lower current ratio (CurrentRatioiti).

Table 5 shows the results for H2. The coefficient on Femaleiti is significantly positive (1.01, t = 8.87) in Column (1), which indicates that female CEOs exhibit higher CSR performance than male CEOs. In Column (2) of Table 5, the coefficient on Femaleiti×Poweriti is significantly positive (1.65, t = 3.58). This suggests that powerful female CEOs exhibit higher CSR performance than others, consistent with H2.

Table 6 presents the results for H3. The coefficient on Abilityiti is significantly positive (0.52, t = 13.74) in Column (1), which indicates that more able CEOs have higher CSR performance than others. In Column (2) of Table 6, the coefficient on Abilityiti×Poweriti is
### Table 3: Pearson correlation coefficients for the main variables used in the study

|     | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1.  | CSPit | 1.00  |       |       |       |       |       |       |       |       |       |       |
| 2.  | Powerit | -0.10*** | 1.00  |       |       |       |       |       |       |       |       |       |
| 3.  | Youngit | 0.04*** | -0.04*** | 1.00  |       |       |       |       |       |       |       |       |
| 4.  | Femaleit | 0.08*** | 0.03*** | 0.05*** | 1.00  |       |       |       |       |       |       |       |
| 5.  | Abilityit | 0.11*** |       | -0.01 | 0.01  | -0.01 |       |       |       |       |       | 1.00  |
| 6.  | OCit |       | -0.05*** | -0.04*** | -0.02*** | 0.05*** |       |       |       |       |       | 1.00  |
| 7.  | COGI | 0.09*** | 0.09*** | 0.08*** | 0.01  | -0.07*** | -0.01 | 1.00  |       |       |       |       |
| 8.  | ROAit | 0.09*** | 0.02*** | -0.02*** | 0.02** | 0.15*** | 0.15*** | 0.01  | 1.00  |       |       |       |
| 9.  | Leverageit | 0.09*** | -0.14*** | 0.01  | 0.01  | -0.02** | -0.03*** | -0.05*** | -0.10*** | 1.00  |       |       |
| 10. | Dividendit | 0.10*** | 0.017*  | -0.03*** | 0.02** | 0.01  | -0.11*** | 0.04*** | 0.09*** | 0.08*** | 1.00  |       |
| 11. | MBit | 0.14*** | -0.03*** | 0.03*** | 0.02*** | 0.11*** | 0.15*** | 0.02** | 0.19*** | 0.06*** | 0.04*** | 1.00  |
| 12. | CurrentRatioit | -0.08*** | 0.07*** | 0.02*  |       | -0.01 | 0.05*** | -0.01 | 0.08*** | 0.07*** | -0.54*** | -0.02*** | -0.06*** | 1.00  |

**Note(s):** Table 3 provides the Pearson correlation coefficients for the main variables used in the study. See Appendix 2 for detailed variable definitions. ***p < 0.01; **p < 0.05; *p < 0.10
significantly negative at the 10% significance level \((-0.42, t = -1.74)\). This result suggests that powerful CEOs with greater managerial ability exhibit lower CSR performance than others.

Table 7 reports the results for H4. The coefficient on \(OC_{it}\) is significantly negative \((-0.19, t = -2.61)\) in Column (1), which indicates that overconfident CEOs exhibit lower CSR performance than others. The negative coefficient on \(OC_{it} \times Power_{it}\) in Column (2) of Table 7 further indicates that powerful CEOs with greater managerial overconfidence exhibit lower CSR performance than others.

Collectively, these findings show that the negative impact of powerful CEOs on CSR activities is mitigated by female CEOs but exacerbated by CEOs who are younger, more able and overconfident. Specifically, we find that the negative effects of CEO power on CSR are attenuated only by female CEOs. The joint effect of \(Female_{it}\) and \(Power_{it}\) is also economically
significant. A one standard deviation increase in \( \text{Female}_{it} \times \text{Power}_{it} \) leads to an increase in the mean of \( \text{CSP}_{it} \) by 26% [5].

4.3 Additional test

Gender among the personality traits might play a more important role than other personality traits in the impact of CEO power on CSR performance. Compared with age, managerial ability and managerial overconfidence, the effect of gender is constant and is less likely to vary with time. In addition, gender has also been found easy to identify by stakeholders (Eweje & Brunton, 2010; Chen et al., 2020). Thus, female CEOs’ CSR decisions are more likely to be supported and perceived by stakeholders than others. Accordingly, the CSR performance of powerful CEOs with higher age, lower managerial ability and lower managerial overconfidence are expected to be lower than those by powerful female CEOs.

|        | \( \text{CSP}_{it} \) | \( \text{CSP}_{it} \) |
|--------|-----------------|-----------------|
| Power\(_{it}\) | \(-1.40^{***} (-11.24)\) | \(-1.17^{***} (-6.57)\) |
| Ability\(_{it}\) | \(0.52^{***} (13.74)\) | \(0.54^{***} (13.70)\) |
| \(\text{Ability}_{it} \times \text{Power}_{it}\) | \(0.22^{***} (7.00)\) | \(-0.22^{*} (-1.74)\) |
| \(\text{COG}_{it}\) | \(1.28^{***} (5.91)\) | \(1.28^{***} (5.91)\) |
| \(\text{ROA}_{it-1}\) | \(0.46^{***} (4.37)\) | \(0.46^{***} (4.33)\) |
| \(\text{Leverage}_{it}\) | \(0.49^{***} (7.50)\) | \(0.49^{***} (7.52)\) |
| \(\text{Dividend}_{it}\) | \(0.03^{***} (7.26)\) | \(0.03^{***} (7.25)\) |
| \(\text{CurrentRatio}_{it}\) | \(-0.12^{***} (-9.25)\) | \(-0.12^{***} (-9.26)\) |
| \(\text{Industry}\) | Included | Included |
| \(\text{Year}\) | Included | Included |
| \(F\)-value | \(33.85^{***}\) | \(33.48^{***}\) |
| Adjusted \(R^{2}\)-squared | 0.17 | 0.17 |
| Observations | 12,947 | 12,947 |

**Note(s):** Table 6 presents the regression results examining the third hypothesis. See Appendix 2 for detailed variable definitions. * significant at 10% levels; ** significant at 5% levels; *** significant at 1% levels

|        | \( \text{CSP}_{it} \) | \( \text{CSP}_{it} \) |
|--------|-----------------|-----------------|
| Power\(_{it}\) | \(-1.42^{***} (-11.35)\) | \(-1.21^{***} (-1.21)\) |
| OC\(_{it}\) | \(-0.19^{***} (-2.61)\) | \(-0.14^{*} (-1.82)\) |
| \(\text{OC}_{it} \times \text{Power}_{it}\) | \(-1.03^{**} (-2.41)\) | Included |
| \(\text{COG}_{it}\) | \(0.19^{***} (6.00)\) | \(0.19^{***} (6.00)\) |
| \(\text{ROA}_{it-1}\) | \(1.78^{***} (8.19)\) | \(1.78^{***} (8.17)\) |
| \(\text{Leverage}_{it}\) | \(0.47^{***} (4.41)\) | \(0.47^{***} (4.36)\) |
| \(\text{Dividend}_{it}\) | \(0.47^{***} (7.10)\) | \(0.47^{***} (7.06)\) |
| \(\text{MB}_{it}\) | \(0.04^{***} (8.90)\) | \(0.04^{***} (8.84)\) |
| \(\text{CurrentRatio}_{it}\) | \(-0.11^{***} (-8.53)\) | \(-0.11^{***} (-8.55)\) |
| \(\text{Industry}\) | Included | Included |
| \(\text{Year}\) | Included | Included |
| \(F\)-value | \(31.39^{***}\) | \(30.90^{***}\) |
| Adjusted \(R^{2}\)-squared | 0.16 | 0.16 |
| Observations | 12,947 | 12,947 |

**Note(s):** Table 7 presents the regression results examining the fourth hypothesis. See Appendix 2 for detailed variable definitions. * significant at 10% levels; ** significant at 5% levels; *** significant at 1% levels

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CEO power and CSR
This inherent trait is expected to have more significant impact on powerful CEOs’ decisions on CSR activities. Accordingly, we state our second hypothesis as follows:

To test our conjecture, we further investigate if female CEOs have more significant effects on the relationship between CEO power and CSR performance than the other three personality traits. We included all of the CEO personality traits, the interaction terms of CEO personality traits and CEO power and the same set of control variables into the regression model and standardized the regression coefficient. The standardization of the coefficient is usually considered a general measure of effect size, which measures the strength of the relationship between variables, where a larger absolute value indicates a stronger effect (Kutner et al., 2004). Variable definitions are detailed in Appendix 2.

$$CSP_{it} = \beta_0 + \beta_1 Power_{it} + \beta_2 Young_{it} + \beta_3 Female_{it} + \beta_4 Ability_{it} + \beta_5 OC_{it}$$

$$+ \beta_6 Young_{it} \times Power_{it} + \beta_7 Female_{it} \times Power_{it} + \beta_8 Ability_{it} \times Power_{it}$$

$$+ \beta_9 OC_{it} \times Power_{it} + \beta_{10} COG_{it} + \beta_{11} ROA_{it-1} + \beta_{12} Leverage_{it} + \beta_{13} Dividend_{it}$$

$$+ \beta_{14} MB_{it} + \beta_{15} CurrentRatio_{it} + \sum Industry + \sum Year + \varepsilon$$ (5)

Table 8 lists the regression results for the relative importance of CEO gender. From Column (2) in Table 8, we observe that $Ability_{it}$ has the largest absolute beta value (0.10), followed by $Female_{it}$ (0.08), $Young_{it}$ (0.03) and $OC_{it}$ (0.02). The regression results in Column (2) suggest that ability has the strongest effect on $CSP_{it}$ and thus that more capable CEOs are more likely to engage in CSR activities, followed by female CEOs.

Furthermore, among all the intersect terms, we find that only $Female_{it} \times Power_{it}$ ($t = 2.85$) is positive and significant. These results suggest that CEO gender is the characteristic with

|                     | (1) CSP_{it} | (2) Beta | (3) CSP_{it} | (4) Beta |
|---------------------|-------------|----------|-------------|----------|
| $Power_{it}$        | -1.50*** (-12.20) | -0.10    | -1.22*** (-5.86) | -0.08 |
| $Young_{it}$        | -0.13*** (-3.31)  | -0.03    | -0.11*** (-2.67) | -0.02 |
| $Female_{it}$       | 1.06*** (9.45)    | 0.08     | 0.95*** (8.18)  | 0.07   |
| $Ability_{it}$      | 0.45*** (11.79)   | 0.10     | 0.47*** (11.71) | 0.10   |
| $OC_{it}$           | -0.21*** (-2.91)  | -0.02    | -0.18*** (-2.40) | -0.02 |
| $Young_{it} \times Power_{it}$ | -0.35 (-1.31) | -0.01 |
| $Female_{it} \times Power_{it}$ | 1.34*** (2.85) | 0.03   |
| $Ability_{it} \times Power_{it}$ | -0.37 (-1.50) | -0.02 |
| $OC_{it} \times Power_{it}$ | -0.42 (-0.96) | -0.01 |
| $COG_{it}$          | 0.27*** (8.47)    | 0.07     | 0.27*** (8.50)  | 0.07   |
| $ROA_{it-1}$        | 1.30*** (6.03)    | 0.05     | 1.30*** (6.02)  | 0.05   |
| $Leverage_{it}$     | 0.64*** (6.09)    | 0.06     | 0.64*** (6.10)  | 0.06   |
| $Dividend_{it}$     | 0.49*** (7.42)    | 0.06     | 0.48*** (7.29)  | 0.06   |
| $MB_{it}$           | 0.03*** (6.50)    | 0.05     | 0.03*** (6.48)  | 0.05   |
| $CurrentRatio_{it}$ | -0.12*** (-9.59)  | -0.10    | -0.12*** (-9.70) | -0.10 |

Table 8. Regression results – the relative importance of CEO gender

Note(s): Table 8 presents the regression results examining the relative importance of CEO gender. See Appendix 2 for detailed variable definitions. * significant at 10% levels; ** significant at 5% levels; *** significant at 1% levels
more significant effects on the relationship between CEO power and CSR performance. This finding may indicate that gender dominates ability, age and confidence level and is more likely to be the key determinant that drives a CEO’s propensity to engage in CSR activities, given the existence of a negative effect of CEO power on CSR engagement.

4.4 Robustness test

In this section, we performed several sensitivity tests to check the robustness of our findings. First, two-stage least squared regression (2SLS) models are used to account for the potential endogeneity between CEO power and CSR. Second, we used a propensity score matching (PSM) model to ease concerns over sample selection bias from only 3% of female CEOs. Third, we used industry-adjusted CSR performance scores to measure CSPit. Fourth, we explore the robustness of our results to an alternative measure of CEO overconfidence. Finally, we dropped the firm-year observations in 2018.

4.4.1 Two-stage least squared regression (2SLS) models. To account for the potential endogeneity between CEO power and CSR, we used 2SLS models. Models 1–5 in the previous section are the first-stage regression models; subsequently, we regressed CEO power on CSR and a set of control variables [6] as our second-stage regression model. These results are reported in Table 9 and are very similar to what we observe in Tables 4–8. Female CEOs are apt to engage in more CSR activities and mitigate the negative influence of CEO power on CSR activities (t = 2.95) and have the greatest influence on the negative effect of CEO power (t = 2.95).

4.4.2 Propensity score matching model. The third robustness test considered potential sample selection bias from only 3% of female CEOs. We used a PSM model to ease concerns over sample selection bias. Our matching is based on the probability that the firm has a female CEO based on the firms’ conditions. Specifically, we used a logit model that includes identifiable variables that could explain a firm’s decision on hiring a female CEO [7]. We matched each treatment firm without replacement with the nearest control firm that had a propensity score within a caliper distance of 0.03. The results are presented in Table 10. Columns (2) and (4) show that female CEOs are apt to engage in more CSR activities and mitigate the negative influence of CEO power on CSR activities (t = 2.35), and it is only the female characteristic that has an influence on the negative effect of CEO power on CSR performance (t = 1.79).

4.4.3 Industry-adjusted CSR performance scores. We followed Dhaliwal et al. (2011) and used industry-adjusted CSR performance scores, which capture a relative CSR performance score that is comparable across industries. We respectively adjusted the firm’s aggregate CSR strength scores and aggregate concern scores each year by industry medians. The firm’s industry-adjusted CSR performance score of the year (CSP_adjustit) is calculated as the difference between the adjusted strength score and the adjusted concern score. Similar to those in Tables 4–8, the un-tabulated results show that female CEOs are more likely to attenuate the negative influence of power on CSR activities (t = 3.58); among all the intersect terms, gender has the greatest and most significant influence on the negative effect of CEO power on CSR performance (t = 2.42).

4.4.4 Alternative measure of CEO overconfidence. As a robustness check, we employ the option-based overconfidence measure as our alternative measure of CEO overconfidence. Following Malmendier and Tate (2005), we created a dummy variable to gauge CEO overconfidence by constructing the moneyness of a CEO’s year-end option holding (Holder67it). This was achieved by first constructing a continuous confidence measure by dividing the value per vested option by the average strike price. The value per vested option was the total value of the executive’s vested but unexercised options, scaled by the number of those options. The average strike price equals the firm’s stock price less the value per vested
|          | CSP_{it} |          | CSP_{it} |          | CSP_{it} |
|----------|----------|----------|----------|----------|----------|
|          | (1)      | (2)      | (3)      | (4)      | (5)      |
| Power_{it} | -1.24*** (-8.35) | -1.59*** (-12.29) | -1.23*** (-6.93) | -1.26*** (-8.33) | -1.29*** (-6.20) |
| Young_{it} | -0.08* (-1.92) |                    |                    |          |          |
| Female_{it} |          | 0.92*** (7.90) |          |          |          |
| Ability_{it} |          |          | 0.46*** (11.56) |          |          |
| OC_{it} |          |          |          | -0.16** (-2.06) | -0.17** (-2.29) |
| Young_{it} × Power_{it} | -0.74*** (-2.81) |                    |          |          |          |
| Female_{it} × Power_{it} |          | 1.64*** (3.59) |          |          |          |
| Ability_{it} × Power_{it} |          |          | -0.39 (-1.61) |          |          |
| OC_{it} × Power_{it} |          |          | -0.98** (-2.31) | -0.43 (-1.55) | -0.01 |
| COG_{it} | 0.24*** (7.66)*** | 0.24*** (7.59) | 0.26*** (8.30) | 0.24*** (7.60) | 0.29 (-0.98) |
| ROA_{it-1} | 1.59*** (7.43) | 1.59*** (7.45) | 1.23*** (5.72) | 1.66*** (7.69) | 1.28*** (9.14) |
| Leverage_{it} | 0.68*** (6.24) | 0.68*** (6.54) | 0.62*** (5.88) | 0.65*** (6.20) | 0.64*** (6.00) |
| Dividend_{it} | 0.51*** (7.81) | 0.52*** (7.93) | 0.53*** (8.08) | 0.51*** (7.69) | 0.49*** (6.09) |
| MB_{it} | 0.04*** (7.43) | 0.03*** (7.18) | 0.03*** (6.30) | 0.04*** (7.57) | 0.03** (7.40) |
| CurrentRatio_{it} | -0.12*** (-9.06) | -0.12*** (-9.15) | -0.12*** (-9.58) | -0.12*** (-9.17) | -0.13*** (-9.98) |
| Industry | Included | Included | Included | Included | Included |
| Year | Included | Included | Included | Included | Included |
| F-value | 51.59*** | 53.68** | 54.63*** | 51.53*** | 60.55*** |
| Adjusted R-squared | 0.16 | 0.16 | 0.17 | 0.16 | 0.16 |
| Observations | 12,974 | 12,974 | 12,974 | 12,974 | 12,974 |

**Note(s):** See Appendix 2 for detailed variable definitions. * significant at 10% levels; ** significant at 5% levels; *** significant at 1% levels
option. An indicator equals one from the first time if the continuous confidence measure equals at least 0.67.

The untabulated results are consistent with those in Tables 4–8. The results suggest that overconfident CEOs tend to engage in fewer CSR activities ($t = -3.81$) and to strengthen the negative influence of CEO power ($t = -1.91$). In addition, female is the only CEO characteristic that mitigates the negative effect of CEO power on CSR performance ($t = -2.92$).

4.4.5 Deleting the 2018 observations. We dropped the 2018 observations from the sample because firm-year observations in 2018 accounted for only 0.45% of the sample. These observations were most likely underrepresented. The untabulated results are similar to what we find in Tables 4–8. The results indicate that younger ($t = -2.34$), more capable ($t = -1.76$) and overconfident CEOs ($t = -2.42$) strengthen the negative impact of CEO power on CSR engagement. However, female CEOs mitigate the negative influence of CEO power on CSR activities ($t = 3.56$) and have the greatest influence on the negative effect of CEO power ($t = 2.82$).

5. Conclusion
This paper investigates how CEO characteristics moderate the effects of CEO power on CSR performance. The results suggest that powerful CEOs are less responsive to stakeholder demands for social responsibility, which is consistent with prior studies. The results also show that the negative effects are exacerbated by CEOs being younger, more competent and overconfident, but are mitigated by CEOs being female. Furthermore, when we simultaneously consider CEO characteristics, the impact of CEO power on CSR is mitigated by female CEOs. In summary, the findings confirm the premise that the inherent traits of CEOs affect the CSR decisions of powerful CEOs and that the negative effects of CEO power on CSR performance are attenuated by the CEOs being female. We further contribute

| Power | $-0.38 (-1.03)$ | $-1.22** (-2.39)$ | $-1.74* (-1.95)$ | $-0.17$ |
|-------|-----------------|-------------------|-----------------|--------|
| Young | $-0.22 (-1.12)$ |                   |                 | $-0.05$ |
| Female| $0.89*** (5.54)$ | $0.75*** (4.40)$ | $0.81*** (4.62)$ | $0.17$ |
| Ability| $0.20* (1.70)$ |                   |                 | $0.06$ |
| OC | $0.04 (0.12)$ | $0.01$ | $0.04 (0.12)$ | $0.01$ |
| Young×Power | $1.04 (1.00)$ | $0.05$ | $0.04 (0.65)$ | $0.03$ |
| Female×Power | $1.66** (2.35)$ | $1.70* (1.79)$ | $0.13$ | $0.13$ |
| COG | $0.36** (2.59)$ | $0.36*** (2.61)$ | $0.40*** (2.83)$ | $0.11$ |
| ROA | $2.06** (2.05)$ | $2.07** (2.07)$ | $1.67 (1.63)$ | $0.06$ |
| Leverage | $2.30*** (5.16)$ | $2.30*** (5.18)$ | $2.23*** (4.96)$ | $0.22$ |
| Dividend | $0.45* (1.74)$ | $0.41 (1.59)$ | $0.41 (1.58)$ | $0.06$ |
| MB | $0.06*** (3.23)$ | $0.07*** (3.29)$ | $0.06*** (3.15)$ | $0.11$ |
| CurrentRatio | $-0.04 (-0.63)$ | $-0.05 (-0.87)$ | $-0.06 (-0.93)$ | $-0.04$ |
| Industry | Included | Included | Included | |
| Year | Included | Included | Included | |
| F-value | $5.36***$ | $5.40**$ | $4.96***$ | |
| Adjusted R-squared | $0.23$ | $0.25$ | $0.24$ | |
| Observations | 744 | 744 | 744 | |

**Table 10.** Propensity score matching model

Note(s): See Appendix 2 for detailed variable definitions. * significant at 10% levels; ** significant at 5% levels; *** significant at 1% levels
to the literature by showing that female CEOs exhibit superior CSR performance. This finding implies the following recommendation: companies can support stakeholder interests by involving more female managers or female employees in CSR activities.

There are several caveats in our study. First, the CSR ratings developed by the KLD are based on a set of indicator variables that equal one if the company is engaged in a specified CSR activity. Therefore, we were unable to investigate the level of CEO efforts related to engaging in a specified CSR activity. Second, the specification of CEO characteristic measures (e.g. power and ability) are limited to a single proxy only. Therefore, our results hold only if characteristics are measured based on the proxy used.

Notes
1. For example, Apple Inc. (AAPL) stated in its 2021 CSR annual report that it issued US$ 2.2 billion green bonds in 2019 to support its projects intended to decarbonize the US economy.
2. The KLD produces a CSR rating for a company for each year based on a review of several company documents (such as annual reports, corporate social responsibility reports and corporate websites).
3. In our study, there were no observations for the Utility and insurance/Real estate industries after merging data and deleting all observations with values missing for any of the variables of interest.
4. There were no female CEOs in several industries such as Mining/Construction, Manf: Electrical equipment, Retail: Wholesale, Financial and others.
5. We multiplied 1.65 (the coefficient of Femaleit × Powerit) by 0.04 (the standard deviation of Femaleit × Powerit) and divided this by 0.25 (the mean of CSP) to calculate the economic significance for the joint effect of Femaleit and Powerit.
6. We use the net score of the corporate governance dimension (COG), return on assets and firm industry as our control variables. All these control variables have been found to have a certain impact on the CEO’s power (Albuquerque & Miao, 2013; Han, Nanda, & Silveri, 2016).
7. Our logit model includes the net score of corporate governance (COG), a firm’s total assets, return on assets, market to book value, leverage and firm industry which were identified in prior studies as having influences on a firm’s decision to hire a female CEO (Solakoglu & Demir, 2016; Khan & Vieito, 2013).

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## Appendix 1

### Table A1.
Description of KLD CSR categories, strengths and concerns

| CSR category       | Strength (STR)/ concern (CON) | Subcategories                                                                 |
|--------------------|--------------------------------|-------------------------------------------------------------------------------|
| Environment (ENV)  | ENV_STR                        | (1) Beneficial products and services, (2) pollution prevention, (3) recycling, (4) clean energy, (5) management systems and (6) other strengths |
|                    | ENV_CON                        | (1) Hazardous waste, (2) regulatory problems, (3) ozone-depleting chemicals, (4) substantial emissions, (5) agricultural chemicals, (6) climate change and (7) other concerns |
| Employee relations (EMP) | EMP_STR                     | (1) Union relations, (2) cash profit sharing, (3) employee involvement, (4) retirement benefits, (5) health and safety and (6) other strengths |
|                    | EMP_CON                        | (1) Union relations, (2) health and safety concerns, (3) workforce reductions, (4) retirement benefits and (5) other concerns |
| Product (PRO)      | PRO_STR                        | (1) Benefits for the economically disadvantaged, (2) quality, (3) R&D/innovation and (4) other strengths |
|                    | PRO_CON                        | (1) Product safety, (2) marketing/contracting concern, (3) antitrust and (4) other concerns |
| Community (COM)    | COM_STR                        | (1) Charitable giving, (2) innovative giving, (3) non-US charitable giving, (4) support for housing, (5) support for education, (6) volunteer programs and (7) other strengths |
|                    | COM_CON                        | (1) Investment controversies, (2) negative economic effect, (3) tax disputes and (4) other concerns |
| Diversity (DIV)    | DIV_STR                        | (1) CEO, (2) promotion, (3) board of directors, (4) work/life benefits, (5) women and minority contracting, (6) employment of the disabled, (7) gay and lesbian policies, and (8) other strengths |
|                    | DIV_CON                        | (1) Controversies, (2) nonrepresentation and (3) other concerns |
## Appendix 2

**CEO power and CSR**

| Variables | Definition | Source |
|-----------|------------|--------|
| CSP\(_{it}\) | CSR performance scores for firm \(i\) in year \(t\). \(\text{CSP}_{it}\) is measured as total strengths minus total concerns in KLD’s five social rating categories: community, diversity, employee relations, environment, and product | KLD |
| Young\(_{it}\) | An indicator variable that equals one if the CEO’s age is smaller than the median age of the CEOs’ age in the industry based on two-digit SIC codes, and zero otherwise | ExecuComp |
| Female\(_{it}\) | An indicator variable that equals one if the CEO is female, and zero otherwise | ExecuComp |
| Ability\(_{it}\) | An indicator variable that equals one if the CEO’s ability score (MA score in Demerjian et al., 2012) is above the median value of CEO’s ability score in the industry based on two-digit SIC codes, and zero otherwise | ExecuComp |
| OC\(_{it}\) | CEO overconfidence equals the value-per-option divided by year-end stock price. The value-per-option is constructed by dividing the value of a CEO’s unexercised-but-vested option holdings by the number of such options | Compustat/ExecuComp |
| Power\(_{it}\) | Percentage of shared owned by CEO for firm \(i\) in year \(t\). Power is measured as total CEO share owned divided by the total number of shares outstanding at the end of the calendar year | S&P Capital IQ/Compustat |
| COG\(_{it}\) | The net score of the corporate governance dimension for firm \(i\) in year \(t\), where the calculation procedure is in accordance with Harjoto and Jo (2011) | KLD |
| ROA\(_{it-1}\) | Return on total assets for firm \(i\) in year \(t-1\). Return on total assets is measured as net income divided by ending total assets | Compustat |
| Leverage\(_{it}\) | The total debt-to-total asset ratio for firm \(i\) in year \(t\) | Compustat |
| Dividend\(_{it}\) | Dividends divided by earnings before interest and tax for firm \(i\) in year \(t\) | Compustat |
| MB\(_{it}\) | The market to book ratio for firm \(i\) in year \(t\), which is measured as the market value of equity at the end of the year divided by the book value of equity at the end of year | Compustat |
| CurrentRatio\(_{it}\) | The current ratio for firm \(i\) in year \(t\), which is measured as ending current assets divided by ending current liabilities | Compustat |
| \(\Sigma\)Industry | A set of indicator variables representing industries based on the two-digit SIC codes | Compustat |
| \(\Sigma\)Year | A set of indicator variables representing fiscal years | Compustat |
| CSP_adjust\(_{it}\) | The firm’s industry-adjusted CSR performance score of the year is calculated as the difference between the adjusted strength score and the adjusted concern score. The adjusted strength (concern) score is calculated as total number of CSR strengths (concerns) each year adjusted by the median CSR strengths (concerns) of the industry | KLD |
| Holder67\(_{it}\) | Holder67 is calculated as the value per vested option by the average strike price | ExecuComp |

### Table A2.

Variable definitions and data sources

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