Corporate Social Responsibility and CEO Pay Performance Sensitivity: Evidence from Chinese listed firms

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Abstract

This study examines the impact of CSR on CEO pay performance sensitivity of Chinese listed firms from 2008 to 2016. Our results reveal that CSR performance as well as CSR report disclosure could increase CEO pay performance sensitivity. We find that the increased monitoring towards CEO power is the channel through which CSR impacts on CEO pay performance sensitivity by showing that the positive impact is more profound among SOEs, firms with CEOs taking dual roles and CEOs having political connections. We further show that mandatory feature itself does not contribute to the impact of CSR on CEO pay performance sensitivity in China. Our findings are obtained after controlling firm and year fixed effects, and further confirmed with Generalised Method of Moments IV (IV-GMM) estimation, as well as alternative instrumental variable and different measurement of key variables.

Keywords: CSR, CEO pay performance sensitivity, Mandatory

JEL classification: G32; G34; J33; M14

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1. Introduction

Corporate social responsibility (CSR) has become an important corporate trend over the last decades. According to an economic consulting firm EPG, Fortune Global 500 companies spend an average of 19.9 billion US dollars annually on activities associated with CSR between the years of 2011 and 2013 (EPG, 2015). Meanwhile, more and more companies release detailed information about their CSR activities and achievements, either in standalone CSR reports or as part of their annual reports. Because of the different interests represented, the definitions of CSR are proposed with little consensus. Generally, CSR is acknowledged as actions that appear to benefit various stakeholders (eg. customers, employees, suppliers, community groups and governments) beyond the interests of the shareholders and legal requirements (McWilliams and Siegel 2001; McWilliams et al., 2006). Despite the popularity of CSR, the fundamental question remains unanswered: whether CSR could bring benefit to the firm, if so, in what ways?

There are primarily two competing arguments explaining corporate social responsibility. The first one is based on agency theory emphasising shareholders wealth maximisation. Friedman (1970) argues that the responsibility of managers is to maximise shareholders wealth, and any actions that go beyond for social good is simply a manifestation of agency problem, i.e. managers use corporate resources for CSR activities to accomplish his own values or agendas at the expense of shareholder wealth. In line with this argument, Barnea and Rubin (2010) and Masulis and Reza (2015) further show that managers tend to overinvest in CSR activities for the purposes of improving personal reputation and maintaining social networks, which consequently decreases firm value and sacrifices shareholders' interests. On the contrary, Freeman (1984) proposes the stakeholder theory contending that managers should consider the interests of various stakeholders because the long-term survival and prosper of the firm cannot continue without the support of stakeholders. Specifically, CSR could help firm reduce cost of capital and get access to finance (El Gohoul et al., 2011; Cheng et al., 2014), improve employee

productivity and attract and retain talents (Greening and Turban, 2000; Roberts & Dowling, 2002), enhance brand value and firm reputation (Menon & Kahm, 2003; Linthicum et al., 2010).

In this study, we use a sample of listed Chinese firms to examine the impact of CSR on CEO pay performance sensitivity to shed some light on the debate. Specifically, we intend to answer the question, whether CSR could bring benefit to the firm by aligning CEO compensation with firm performance. We focus on CEO pay performance sensitivity due to the reason that CEO compensation has a significant economic impact on shareholders and economy (Bebchuk, 2005), and the sky-high compensation of CEO has attracted a lot of attention and public anger. According to Focke et al. (2017), the ratio of aggregate top-five executives pay to corporate net income in US between 1992 and 2010 is about 10%. As Bebchuk (2015) addressed that if the compensation level could be cut without weakening managerial incentives, it would have significant impact on firm value. In Jensen and Murphy's (1990) seminal work, 'pay for performance' is proposed due to the conflict of interests between managers and shareholders, and compensation therefore becomes a mechanism to decrease agency problems. As a tool to provide incentive for managers to make effort maximising shareholders' wealth, the CEO pay would be legitimate if it is closely tied to firm performance. It is interesting to explore whether socially responsible firms would pay their CEOs more rationally to maintain their good corporate citizen image in the eyes of the public.

China offers good laboratory settings for our study. First, unlike other countries where CSR disclosure is initiated voluntarily by companies, CSR disclosure in China is primarily advocated and encouraged by the government. If CSR could better facilitate CEOs to gain personal benefits as previous studies contended, the decision for CSR investment would have been voluntarily promoted by CEOs before the government's intervention. It is interesting to examine whether CSR has a different impact on firm's behaviour under strong government intervention. Secondly, China has long been criticised for the weak corporate governance and

inadequate disclosure and transparency. As an important non-financial disclosure, CSR report provides information on economic, environmental, social and governance performance. It is worthwhile exploring whether CSR disclosure could complement other information to increase the transparency of the firm in the context of China. Third, due to intensive initiatives that have taken place by the Chinese government to encourage CSR since 2006, more and more firms have started to release their CSR reports with detailed information on their CSR activities and achievements. At the same time, the media have started to pay attention to firms' CSR activities, and independent rating agencies emerged. Therefore, although China is still in the premature stage of CSR like other developing countries, relatively comprehensive and objective data is available for the study. The results of this study have implication for other developing countries that their CSR is under the pre-mature stage.

Using a sample of all Chinese listed firms that release their CSR reports during the period from 2008 to 2016, we first examine the impact of CSR performance on CEO pay performance sensitivity. Our result supports the view that CSR could bring benefit to the firm by showing that 'socially responsible firms' have higher CEO pay performance sensitivity. Instead of merely considering the pay CEO could receive, our study examines CEO pay performance sensitivity which could rule out the intermediate effect of performance through which CSR impacts CEO pay. Although we have considered both unidentified time-invariant firm characteristic and time variance by using firm and year fixed effects in our main regression, we also verify our results by implementing IV-GMM estimation to control for endogeneity problems, and the instrumental variables are justified by comprehensive diagnostic tests. In order to further support our hypothesis, we implement Propensity score matching approach to match firms in our original sample (those that release their CSR report) with control firms that do not release CSR report. By introducing a dummy variable representing whether a firm

releases its CSR report, we find that those firms release their CSR report have higher CEO pay performance sensitivity compared with those firms that do not release CSR report.

In order to explore the channels through which CSR affects CEO pay, we first split our sample into SOEs and non-SOEs. SOEs are widely acknowledged to have more severe agency problems than non-SOEs, as Shleifer (1998) argues that due to the diffused nature of the real shareholders, i.e. the national citizens, it is less likely to have complete contracts with managers which makes it harder to constrain the conflict interests between managers and shareholders. So, CEOs of SOEs have more incentive to use their power to gain personal benefit by having excess compensation. Our result shows that the positive impact of CSR on CEO pay performance sensitivity is only significant among SOEs. It implies that good CSR performance could restrict CEO's power to pursue personal benefit in SOEs in which CEOs' power are less controlled by shareholders. We further split our sample according to whether CEOs take dual roles as both CEO and chair of the board and whether CEOs are politically connected, because those two explicit indicators show the relative power of CEOs in the firm. Our results show that the positive relationship between CSR and CEO pay performance sensitivity is more profound in samples of CEOs having dual roles and CEOs with political connections. The results again show that CEOs' power could be well restrained in firms with good CSR performance.

Moreover, a group of firms in China are required to release their CSR report. Specifically, firms listed in SSE that belong to 'Corporate Governance Sector', firms that listed shares overseas, and firms in the financial sector, as well as firms listed in SZSE that are part of its 'Shenzhen 100 Index' are required to release their CSR report mandatorily. To examine whether mandatory and voluntary disclosure has any impact on our results, we divide our sample according to whether CSR reports are mandatorily required by authorities or not. Our results reveal that CSR positively impacts CEO pay performance sensitivity for both samples.

Although previous studies emphasise the distinct impact of CSR mandatory feature on firm behaviour in China (Huang et al., 2013; Chen et al., 2018), our results imply that there is no difference on the CEO pay performance sensitivity.

A number of extant studies have explored the relationship between CSR and CEO pay, our paper is different from theirs in the following ways. First, most of these studies focus on the U.S. markets (Mohoney and Thorne, 2006; Cai et al., 2011; Jian and Lee, 2015; Karim et al., 2015; Hong et al., 2018; Mo et al., 2018), while the focus of our paper is on Chinese market. The awareness of CSR has emerged in the US market back in 1950s (Webel and Carter, 2002), and KLD started to rank companies' CSR performance since 1991 (Cai et al., 2011). However, it has only been about 10 years since Chinese government recognised the necessary of encouraging CSR, and the release of CSR report has been developed since 2008. This indicates that the stage of CSR development is very different in US and China. Moreover, CSR reporting or disclosure in US market is generally voluntary, while the majority of CSR reporting or disclosure are mandatory [1] released due to authorities' requirement. Thus, our study complements the literature by focusing on an emerging market that has different institutional environment. In other words, the different stage of CSR development as well as the government intervention in CSR disclosure may make the impact of CSR on CEO pay very distinct from the previous studies. Second, most of the previous studies that examined the relationship between CSR and CEO compensation have not taken into consideration of the moderating effect on CEO pay of CSR via firm performance. Although a few exceptions included performance in their analysis (Miles and Miles, 2013; Mo et al., 2018), their studies are either with econometric problems or different from our research interest.

[1] In our sample, the mandatory disclosure is about 70% among the total disclosure.

A paper closely related to our paper is Chang et al (2018). Using a sample of listed firms in Shanghai Stock Exchange from 2009 to 2013, Chang et al. (2018) mainly examine the impact of CSR on firm performance. They also examine the impact of CSR on top manager team's pay performance sensitivity as a further test to support their main findings. The authors use SSE (Shanghai Stock Exchange) Social Responsibility Index that covers the top 100 good CSR performer each year as the proxy for CSR. This index is problematic in the following sense. First, this index only considers top 100 CSR performers, meaning that a large number of good CSR performer listed on Shenzhen Stock Exchange is not included in the analysis. Second, SSE social responsibility Index is based on 'social contribution value per share' which is disclosed voluntarily by listed firms. As such, the index is likely subject to the self-selection bias problem as firms may choose (not) to disclose CSR information voluntarily at good (bad) times. Moreover, Hong and Jin (2014) point out some potential data quality issue with the index such as lack of consistency in the calculation of 'social contribution value per share' as well as lack of supervision of the disclosure. As discussed later, our CSR data do not suffer from these problems.

Our study contributes to the literature in several ways. First, prior studies examine the impact of CSR on firm behaviour from the perspectives of overall financial performance (Chen and Wang, 2011; Wang and Qian, 2011; Lau et al., 2016; Kao et al., 2018), access to finance (Cheng et al,, 2014), tunning activity (Chen et al., 2018), information asymmetry (Huang et al., 2013), CEO pay receives little attention. Our study is the first one, to the best of our knowledge, comprehensively examine the impact of CSR pay performance sensitivity, and show that CSR in China could restrain CEO's power by aligning CEO pay with firm performance. Moreover, most of the previous studies focusing on China are using philanthropy as a proxy for CSR which is only a narrow part of CSR (Du et al., 2014; Du 2015; Li et al., 2015; Lin et al., 2015; Chen et al., 2018). Our study uses third-party CSR rating scores to examine CSR performance,

and we not only focus on years that CSR just emerged but also span our data to reflect the most updated status of CSR in China. Second, due to endogenous problems of OLS, our result is further verified with IV-GMM estimation. We introduce CSR's industry mean and province mean as our instruments[2], and perform three diagnostic postestimations to prove the validity of our instruments. In our robustness test, we also use an alternative instrument with cross-dimensions taking both industry and province into consideration. Third, more recent studies have examined the mandatory disclosure of CSR report in China, by assuming a different impact of mandatory feature, they normally delete firms that voluntarily disclosure their CSR report. By examining the impact of CSR on CEO pay performance sensitivity between mandatory and voluntary disclosure firm, we find consistent results. Our results refer that although voluntarily disclosure their CSR report, firms disclose or make CSR investments may still be out of government intervention.

The remainder of the paper is organised as follows. Section 2 presents the institutional background and hypothesis development. Section 3 illustrates the methodology by introducing our data, the variables and the econometric models. Section 4 presents the empirical results and interpretations, and Section 5 provides the concluding remarks.

2. Institutional background and hypothesis development

2.1 Corporate social responsibility in China

After Deng Xiaoping's 'Opening-up' policy in 1978, the Chinese economy has grown extraordinarily. Obviously, economic interests become the primary goal of Chinese firms and public interests are sacrificed. China has drawn international criticism for the human right

[2] There are altogether four instruments used in our study, and two of them arise from the presence of an interaction term. Our interested interaction term is between the potential endogenous variable CSR and firm performance, so we include CSR's two instrument variables with firm performance as our third and fourth instruments.

abuses, poisonous food, serious environmental pollution and so forth. In order to participate in the international market and regulate social contradictions, Chinese government has undertaken a number corporate social responsibility (CSR) initiatives, especially since 2006. As one of the very first explicit requirements, the 2006 Chinese Company Law in Article 5 states that a company has to undertake social responsibility in the course of doing business[3]. Meanwhile, at the Six General Meeting of the Sixteen Central Committee of the Chinese Communist Party (CCP) in 2006, the concept of 'harmonious society' became an important agenda to ensure sustainable development, and CSR was emphasised. In January 2008, the State-Owned Assets Supervision and Administration Commission of the State Council (SASAC) issued the Guide Opinion on the CSR for the state-owned enterprises (SOEs) under direct control by the central government. In December 2008, both Shanghai (SSE) and Shenzhen (SZSE) stock exchange announced the mandatory disclosure of CSR reports for a certain group of firms. Specifically, SSE required firms that belong to 'Corporate Governance Sector', firms that listed shares overseas, and firms in the financial sector to release their CSR reports along with their annual reports. SZSE at the same time, mandated firms listed in its 'Shenzhen 100 Index' to release their CSR reports. Both SSE and SZSE encouraged all the firms listed to release their CSR reports. As a result, more and more companies release their CSR reports along with their annual reports either mandatorily or voluntarily. According to The Blue Book of CSR report drafted by Rankins CSR Rating China, there are about 140 CSR reports released between the year of 2005 and 2007, while there are almost 400 CSR reports released in the year 2008. Ever since, the number is increasing each year, and reached almost 800 in 2016.

2.2 Related literature and hypothesis development

[3] See 2006 Chinese Company Law, http://english.sse.com.cn/laws/framework/c/3978492.pdf.

A large body of literature examines the impact of CSR on firm value, but the results have contradictory findings. One strand of literature argues that CSR unnecessarily increases a firm's cost, and therefore deteriorates firm's performance (Fridman, 1970; McWilliams and Siegel, 1997; Jensen, 2002). Predominantly drawn on agency theory, studies contend that using corporate resources to conduct CSR activities results in significant managerial benefits but at the cost of shareholders' interests. Using data consists of the largest 3000 U.S. companies, Barnea and Rubin (2010) claim that insiders (managers and blockholders) tend to overinvest in CSR activities to improve their personal reputation, and destroy firm value as a result. Similarly, focusing on the Fortune 500 companies in the years of 1996 to 2006, Masulis and Reza (2015) prove that due to the large discretion of CEOs on CSR activities, the purpose of corporate giving is not to increase firm value, but to increase personal reputation and social networks by making contribution to CEO- and independent director-affiliated charities.

In contrast, other scholars have argued that CSR could become a strategic tool to minimise transaction costs and potential conflict interests among stakeholders which eventually increases firm value (Deng et al., 2013; Arouri and Pijourlet, 2017; Ferrell et al., 2016; Lins et al., 2017). Specifically, CSR could help firm reduce cost of capital and get access to finance (El Gohoul et al., 2011; Cheng et al., 2014), improve employee productivity and attract and retain talents (Greening and Turban, 2000; Roberts & Dowling, 2002), enhance brand value and firm reputation (Menon & Kahm, 2003; Linthicum et al., 2010). For example, using the sample of 50 countries between 2005 and 2009, Arouri and Pijourlet (2017) find that CSR has positive impact on the value of firms' cashing holding, and explain that the possible reason for the relationship is due to the appreciation of investors towards the CSR activities which they believe encourage managers to make better use of cash resources. To examine the relationship between CSR and seasoned equity offerings (SEOs), Feng et al. (2018) reveal that socially responsible firms in the US have more incentive to make extensive and informative disclosures,

which mitigates the information asymmetry between insiders and outsiders, and consequently decreases SEO underpricing.

CEO compensation has a significant economic impact on shareholders' wealth, i.e. the value of the firm. The high and dramatic rise in CEO pay could impose substantial costs on shareholders, and the discrepancy between CEO compensation and firm performance distorts the incentive components of compensation that supposed to lead managers' effort to maximise shareholders' wealth. According to Tosi et al. (1999), the distortion between CEO pay and firm performance is power imbalance between CEOs and shareholders. Later, Grabke-Rundell and Gomez-Mejia (2002) propose a managerial power model emphasises that CEOs ability to influence pay decision that cause excess pay problems. In this study, we try to contribute to the emerging literature that investigates the impact of CSR on firm behaviour by focusing on the impact of CSR on CEO pay performance sensitivity. Unlike prior studies that mainly focus on U.S. markets (both CSR and CEO compensation), our finding are based on an emerging market with strong government intervention in CSR disclosure and activities. The feature is very unique compared with most of other economies that CSR is a self-selected decision of the firms. More importantly, this study identifies that it is the reduced CEO power through which CSR impacts on CEO pay performance sensitivity.

In this study, we posit that the impact of CSR on CEO pay performance sensitivity would be positive. First, CSR could improve the information transparency, hence better monitor CEO power. Prior studies have proved that firms with superior CSR performance are willing to publicly disclose their CSR strategies which contains information about economic, environmental, social and governance performance. As a result, the CSR disclosure would enhance the information transparency and may lead to changes in internal control system (Cheng et al., 2014). China has long been criticised for excess power of CEOs and inadequate disclosure and transparency (Liu, 2006; Zou et al., 2008; Wu et al., 2018). CSR report could

therefore become a complementary resource of information to the public which would provide an opportunity for outsiders to monitor CEO's power as well as improve the management of corporate asset (Ioannou and Serafeim, 2011), particularly the cash allocation to CEO compensation. Second, CSR initiatives could enhance stakeholder engagement and encourage them to monitor CEO power. Good CSR performance reflects firm's commitment to and engagement with stakeholders (Cheng et al., 2014). The ethical behaviour of firms will enable them to develop a good and lasting relationship with stakeholders which in turn encourage stakeholders to actively engage and monitor the firm's behaviour (Jones, 1995). Therefore, CEO's power could be better supervised, and CEO's excess pay (the part that is not contingent to firm performance) would be reduced. Third, establishing a good image in the eyes of the public after investing a large amount of capital, 'good socially responsible' performers would take more effort to maintain their reputation as a good citizen. Therefore, they would be more reluctant to pay excess to their CEOs. Accordingly, our first hypothesis is as follows:

H1: CSR performance is positively related to CEO pay performance sensitivity.

In China, non-SOEs are typically characterized by a highly concentrated ownership structure and combined ownership and control. So, CEOs would be either a representative closely monitored and controlled by controlling shareholders, or CEOs themselves are the member of the controlling families or the founder of the firm. Therefore, the excess power of CEOs that could influence their compensation would either be less or irrelevant. However, as Shleifer (1998) argues that due to the diffused nature of the real shareholders of SOEs, i.e. the national citizens, it is less likely to have complete contracts with managers which makes it harder to constrain the conflict interests between managers and shareholders. CEOs in SOEs would have more incentive to use their power to influence their compensation diverting from firm performance. Therefore, the function of CSR to monitor CEO's power could be more significant in SOEs than non-SOEs. Our second hypothesis is developed as follows.

H2: The positive impact of CSR on CEO pay performance sensitivity is higher in SOEs than non-SOEs.

CEO taking dual roles, which refers to the situation in which a CEO serves as both CEO and the chair of the board. As a result, CEO could evaluate their own performance (Jensen, 1993; Wu et al., 2018). Accompanied with Chinese underdeveloped financial markets and ill-defined legal system (Chen et al., 2010), the incentive of CEO to use his power to influence his compensation is enhanced. Previous studies also have shown that CEO with political connections are strategically important for firms to gain government support and political legitimacy, and therefore more powerful to bargain for their compensation (Chen et al., 2011; Wu et al., 2018). By increasing the information transparency and stakeholder engagement, CSR would have more profound impact on firms with CEO duality and political connections. We thus developing the following hypothesis.

H3: The positive impact of CSR on CEO pay performance sensitivity is higher in firms CEOs taking dual roles and CEOs with political connections.

3. Methodology

3.1 The sample

We obtain all the financial data from the China Security Market and Accounting Research (CSMAR) database. Our sample consists of all Chinese firms listed on the Shanghai and Shenzhen stock exchanges that release their corporate social responsibility reports during the period from 2008 to 2016. Our data starts in 2008 because of the popularity of CSR report releases due to the mandatory requirement for specific firms as well as encouragement to all the listed firms from authorities. We exclude financial firms and B-share firms, as well as the

firm-year observations with missing data for the variables used in our model, which gives a total of 3863 firm-year observations.

3.2 Measurement of variables

3.2.1 CEO pay performance sensitivity

In this study, we define CEO pay as the reported sum of salary, bonus and allowance which is consistent with prior literature (Firth et al., 2007; Lin et al., 2011; Hu et al., 2013; Conyon and He, 2016). We have excluded long-term incentives[4], such as stock options and restricted stocks because of the scarcity of such grant in China as well as the inefficiency of the Chinese stock markets[5]. Perquisites are also excluded from our definition because of the potential self-selection problem. Because perks disclosure is not mandatory in China, it is possible that only those without excessive perks choose to disclose this information (Conyon and He, 2016).

To capture the pay performance sensitivity, return on assets ('ROA') is used as the independent variable. We use an accounting-based measurement instead of market-based[6] because compared with stock returns, ROA is under greater control by CEO and is more likely to capture the alignment of CEO pay with his effort to maximise the profit. Previous studies also provide evidence that Chinese firms rely heavily on accounting-based measurement to determine CEO pay (Firth et al.,2007; Wu et al.,2018). In this study, we lag ROA to year t-1 to better capture the contingency of CEO pay on firm performance[7] (Firth et al., 2007; Cao et al., 2018).

3.2.2 CSR

[4] We have included long-term incentives in our robustness test.
[5] The inefficiency of the markets makes many firms terminate their long-term incentives due to the large stock price fluctuation, as well as the divergence between stock price and firm performance (Sun and Guan, 2012).
[6] We use annual stock return to replace ROA in our robustness test.
[7] We also use non-lagged ROA in our robustness test.

In this study, CSR is captured by the overall CSR scores from rating agency Runling (also called RKS: www.rksratings.cn). Like Kinder, Lydenberg, Domini & Co., Inc. (KLD), Runling is an independent and leading rating agency in China. The scores are given based on firms' CSR reports as well as other information like firms' websites and media releases which aim to reflect firms' actual CSR efforts as well the substantiveness of their CSR reports (Marquis and Qian, 2014; Luo et al., 2017). Runling follows international standard ISO62000 and adapts to the Chinese context. Its scores are given from four dimensions: macrocosm, content, technique and industry[8], with almost 80 subdimensions that cover firms' CSR activities comprehensively. The score ranges from 0 to 100 with 30% of macrocosm, 45% of content, 15% of technique and 10% of industry.

3.2.3 Other variables

In our regression analysis, we include a series of control variables in the regression models to control for factors that may affect CEO pay. CEO's age ('AGE'), gender ('GENDER'), educational background ('EDUCATION'), tenure ('TENURE') as well as the percentage of his/her shares among total number of shares outstanding in a given year ('CEO SHARE') are included as those CEO's personal characteristics determine his/her value and power in the company, therefore influence their pay (Li et al., 2008; Chen et al., 2011; Focke et al., 2017; Cao et al., 2018; Wu et al., 2018). Remarkably, CEO's political connection ('PC') and dual roles of CEO and chairman of the board ('DUALITY') are also included since both of the indicators could reflect CEO's power to negotiate and obtain personal interests which have the

[8] Macrocosm covers CSR strategy, corporate governance and related parties; Content coverss economic performance, employment relations and human rights, environment, fair trading, customer and community; Technique covers areas related to the quality of the report itself; and Industry covers specific indicators for different industries. Compared with the seven qualitative issue areas of KLD (community, corporate governance, diversity, employment relation, environment, human rights and product), we can see that diversity and product are missing in Runling's rating system, while CSR strategy, related parties, economic performance, fair trading and customer are emphasised by Runling. Due to the premature stage of CSR reporting in China, the technique dimension is included to evaluate the quality of the report per se.

potential to lead to excess CEO pay (Firth et al., 2007; Chen et al., 2011; Wu et al., 2018). A number of corporate governance indicators are controlled for the regression model. The more frequently held shareholders general meetings ('MEETING'), the greater number of directors in the boards ('BOARDSIZE'), the higher percentage of independent board of directors indicate better supervision of the CEO which could restrain unreasonable pay (Firth et al., 2007; Chen et al., 2011; Lin et al., 2011). Meanwhile the percentage of shares held by controlling shareholders ('CONTROLLING') as well as the excess control right of controlling shareholders ('EXCESS') reflect the power of controlling shareholders over manager team which could influence CEO pay (Hu et al., 2013). Previous studies prove that SOEs and non-SOEs in China are very different in many aspects, like control and monitoring mechanism as well as CEO appointment and promotion, therefore a dummy variable 'SOE' is included to control for the difference for CEO pay and sensitivity. Followed by Wu et al. (2018), we also control for regional GDP ('REGIONAL GDP') since the regional economic development of the firm located is very likely to lead CEO pay. Besides, some important firm's attributes, firm's size ('SIZE'), its debt ratio ('LEVERAGE') and growth opportunity ('GROWTH') are also included in the regression model. The definitions and/or calculations of variables are shown in detail in Appendix A.

3.3 Research design and econometric model

To examine how CSR affects CEO pay performance sensitivity, we first regress the natural logarithm of CEO pay ('ln(CEO PAY)') on 'CSR' showing the overall CSR performance of the firm, 'ROA_{t-1}' indicating the financial performance of the firm in the previous year, and their interaction term. In our regression, we include firm fixed effects to mitigate concerns that the results are driven by unidentified time-invariant firm characteristic that is correlated with bot the CSR and CEO pay. We also control for year fixed effects and a series of control variables that may have impact on CEO pay. Specifically, our regression model is as follows:

$$ln(\,CEO\ PAY) = \alpha_0 + \alpha_1 \times CSR_{i,t} + \alpha_2 \times ROA_{i,t-1} + \alpha_3 \times CSR_{i,t} * ROA_{i,t-1} + \alpha_4 \times ControlVariables_{i,t} + \alpha_5 \times YEAR + \varepsilon. \quad (1)$$

Our variable of interest in the preceding model is the coefficient on the interaction term, α_3, which capture the impact of CSR on CEO pay performance sensitivity. The overall CEO pay performance sensitivity is captured by $\alpha_2 + \alpha_3 \times CSR_{i,t}$. As such, the marginal impact of CSR on pay performance sensitivity could be reflected from α_3,

$$\frac{\partial\ [\ln(CEO\ PAY)]/\partial(ROA_{t-1})}{\partial(CSR)} = \frac{\alpha_2 + \alpha_3 \times CSR_{i,t}}{\partial(CSR)} = \alpha_3$$

One may argue that the impact of CSR on CEO pay performance sensitivity could be determined by other factors that influence both CEO pay and CSR at the same time, which is the omitted variable problems. Moreover, there is a possibility of simultaneity bias that CSR is jointly determined with CEO pay. To minimise the above two sources of endogeneity problem, we use the IV-GMM estimation to verify our main tests[9]. Four instrumental variables are introduced for the procedure. The first two instrumental variables are average CSR score for each industry and province[10]. We follow Cheng et al. (2014) to exclude the contribution of the focal firm's CSR scores towards industry and province averages to provide variations of the instrument variables even within same industry and province. The rationale behind the instruments is that firm's CSR score would systematically influence by other firms within the same industry and in the same province. However, industry and province CSR means are unlikely to influence focal firm's CEO pay. Beside the rationale, we also perform diagnostic tests to verify our instrument variables. Lagrange multiplier (LM) test of whether the equation is underidentified, i.e., whether the excluded instruments are correlated with the endogenous

[9] According to Baum et al. (2003), in the presence of heteroskedasticity, two-stage least squares IV estimation is no longer efficient. Therefore, in our study, we apply IV-GMM estimation to verify our results.

[10] Previous studies used the industry or country average of independent variables as their instrument variables (Hanlon et al., 2003; Ioannou and Serafeim, 2012; Cheng et al., 2014).

variables. A rejection of the null hypothesis shows that the model is not under-identified. To further test whether our instrument variables are weak, we report a more robust F statistic, that is Kleibergen-Paap Wald rk F statistic which is valid even when heteroskedasticity exists. The Sargan-Hansen test is also performed to verify whether our instrument variables are valid, that is whether they are uncorrelated with the error term. The null hypothesis is that the instruments are valid instruments. We also include two other instrument variables which are the interaction terms between above mentioned instruments and 'ROA_{t-1}'. The reason is that by conjecturing the endogenous property of CSR, the interaction term between 'CSR' and 'ROA_{t-1}' in the model is endogenous as well. Another reason for us to include four instrumental variables altogether is to avoid just identified situation[11], so we can perform Sargan-Hansen test to verify the validity of our instruments.

In order to further verify our results, we implement propensity score matching (PSM) procedure to select comparable firms which do not release their CSR reports into our sample. We select control firms (those firms that do not release CSR reports) that are as close as possible to treatment firms (those firms that release their CSR reports) in terms of growth, leverage, size, industry affiliation and whether it belongs to SOEs or non-SOEs. We use the nearest neighbour matching technique without replacement, which gives us a total of 7726 observations. Then we introduce a dummy variable 'CSR_D' which equals 1 if the firm belongs to treatment group, and equals 0 if the firm belongs to control group. We interact 'CSR_D' with 'ROA_{t-1}' to capture the impact of CSR release on CEO pay performance sensitivity. Firm and year fixed effects are also controlled for this model. Specifically, we use the following model:

[11] Hansen J statistic could only be performed if the number of instrument variables is larger than the number of endogenous variables which verifies the uncorrelation of instrumental variables and an error term.

$$ln(\,CEO\ PAY) = \alpha_0 + \alpha_1 \times CSR\_D_{i,t} + \alpha_2 \times ROA_{i,t-1} + \alpha_3 \times CSR\_D_{i,t} * ROA_{i,t-1} + \alpha_4 \times ControlVariables_{i,t} + \alpha_5 \times YEAR + \varepsilon \quad (2)$$

Our interested variable is still the coefficient on the interaction term, α_3, which capture the impact of CSR disclosure on CEO pay performance sensitivity.

In order to verify the channels through which CSR affects CEO pay and pay-performance sensitivity, we first split our sample into SOEs and non-SOEs to explore whether the impact of CSR varies under different ownership structure. Then, we divide our sample into subsamples based on whether CEOs take dual roles (DUAL vs. NON-DUAL) and have political connections (PC vs. WITHOUT-PC). Those subsamples reflect the different strength of power CEOs could have to negotiate and manipulate their compensation, and by testing whether CSR has a different impact on CEO pay performance sensitivity among those subsamples could reflect whether restraining CEO power is a channel through which CSR influences the CEO compensation sensitivity. We also split our sample into firms mandatorily required to disclose their CSR reports and those voluntarily to explore whether the mandatory feature of CSR has any impact on our results. All above tests are based on model (1) as well.

4. Empirical Results

4.1 Descriptive statistics

Table 1 shows the descriptive statistics for the variables used in our main tests. Note that all the continuous variables are winsorised at 1% and 99% of the distribution. We report the mean, median, standard deviation and values at 25% and 75% percentile of each variable. The average CEO pay is 839,237 in our sample starting from 2008 to 2016, while it is only 521,234 in Cao et al.'s (2018) study for the sample period of 2005 to 2011and 85,000 for year 2000 as reported

by Firth et al. (2007). It is clear that CEO pay increased dramatically from 2000 to 2011, but the trend becomes steady in recent years. However, with standard deviation of 902,500, the variation of CEO pay is very large. The mean CSR score is 38.17. Considering the full score of 100, it is relatively low which shows the premature stage of corporate social responsibility of listed Chinese firms.

For the characteristics of CEOs in our sample, the average age of CEO ('AGE') is about 49 and almost 95% are male. The mean education level ('EDUCATION') is more than 3 which shows that CEOs obtain bachelor degree or higher in general. Compared with 11.6 years for CEOs' tenure in the US (Vo and Canil, 2016), CEOs only hold the position ('TENURE') for 3.62 years (43.45 months) in average in our sample which indicates the high turnover rate of the CEOs in China. Although the average percentage of shares held by CEOs ('CEO SHARE') is 4.3%, the median is 0 and only 0.03% in 75% percentile which reflects that only a small number of CEOs hold firm stocks in China.

<TABLE 1>

4.2 Main results

4.2.1 CSR performance and CEO pay performance sensitivity

In this section, we conduct regression analysis to explore the impact of CSR on CEO pay performance sensitivity. Table 2 shows our results. Specifically, after controlling for firm and year fixed effect, the coefficient on '$CSR*ROA_{t-1}$' under column (1) is significantly positive at p-value less than 1%, indicating that CEO pay performance sensitivity is higher in those firms with better CSR performance. In order to minimise the endogeneity problem of the OLS estimation, that is the model may have omitted variables that determine both CEO pay and CSR, or/and simultaneous problems that CSR and CEO pay are jointly determined, we also use

Generalised Method of Moments IV estimation to verify our results which shown under column (2).

Three postestimation tests are performed to verify the relevance and validity of our instruments. Lagrange multiplier (LM) test aims to test whether the instruments are correlated with the endogenous variables. However, if the heteroskedasticity appears, the Anderson LM statistic is no longer valid, so we report the LM version of the Kleibergen-Paap (2006) rk statistics instead. The statistic shows that we get a rejection of the null which indicates that the instruments are correlated to the endogenous variables which meets the relevance requirement. However, estimation can be poor if the instruments are weak, so we report the Kleibergen-Paap rk Wald F statistic[12] for the weak identification. Given the highest critical value for weak instrument test is 19.93[13] (Stock and Yogo, 2005), the weak instrument is not a concern since the F-statistic in our model is 29.6430, which are above the critical value. The last important criterion of valid instruments is that instruments should be uncorrelated with error terms. Only if more instruments are included than the number of endogenous variables, overidentification test can be performed, so we include four instrumental variables for those two endogenous variables in our estimation. The null hypothesis of Sargan-Hansen test is that the instruments are valid instruments. So, a rejection of the null casts doubts about the validity of the instruments. The p-value of our Hansen J statistic is 0.2584 which fails to reject the null hypothesis, and shows that our instrumental variables are not correlated with error terms.

Those tests show that our instruments are valid, satisfying the conditions of strong relevance to endogenous variables and independence to unobserved error terms. The coefficients of '$CSR*ROA_{t-1}$' stay significantly positive. Our results are therefore verified.

[12] Reporting Kleibergen-Paar rk Wald F statistic instead of the Cragg-Donald Wald F statistic is also due to heteroskedasticity concerns.

[13] Table 1 and Table 2 in Stock and Yogo (2005)'s show the critical values that are based on 2SLS bias and 2SLS size and dependent on the number of endogenous variables and instruments.

<TABLE 2>

4.2.2 CSR release and CEO pay performance sensitivity

In the previous sections, we only include firms that release their CSR reports in our sample which may cause some concern. In order to further verify our results and explore the impact of CSR release on the CEO pay performance sensitivity, we implement propensity score matching (PSM) procedure to select comparable firms which do not release their CSR reports into our sample. We select control firms (those firms that do not release CSR reports) that are as close as possible to treatment firms (those firms that release their CSR reports) in terms of growth, leverage, size, industry affiliation and whether it belongs to SOEs or non-SOEs. We use the nearest neighbour matching technique without replacement, which gives us a total of 7726 observations. Then we introduce a dummy variable 'CSR_D' which equals 1 if the firm belongs to treatment group, and equals 0 if the firm belongs to control group. We interact 'CSR_D' with 'ROA_{t-1}' to capture the impact of CSR release on CEO pay performance sensitivity. Table 3 shows our results. In the same vein, the coefficient of 'CSR_D*ROA_{t-1}' is significantly positive which echo our main results that the release of CSR report increase CEO pay performance sensitivity. This table also reveals that the overall pay performance sensitivity in the sample is significantly positive regardless of whether releasing CSR report or not.

<TABLE 3>

4.2.3 CSR performance and CEO pay performance sensitivity in different subsamples

The above analysis shows that CSR has significantly positive impact on CEO pay performance sensitivity. In this section, we first explore whether reduced CEO power is the channel through which CSR impacts on CEO pay performance sensitivity. First, we explore whether the impact of CSR varies under different ownership structure. Table 4 shows that only in SOEs that the

CSR has positive impact on CEO pay performance sensitivity, while the impact is not significant among non-SOEs.

<TABLE 4>

Further, we split the full sample according to whether the CEOs take dual roles as both CEO and chair of the board, and whether CEOs are politically connected. The results in table 5 show that the positive impact of CSR on CEO pay performance sensitivity is more profound for firms with those CEOs having dual roles and political connections. Overall, results in table 4 & 5 suggest that reducing CEO power is the channel through which CSR increases CEO pay performance sensitivity.

<TABLE 5>

Then, we explore whether the impact of CSR on CEO pay performance sensitivities is different between firms that release their report mandatorily and voluntarily by dividing our sample into 'MANDATORY' and 'VOLUNTARY'. The results are shown in Table 6. Our results reveal that the coefficients on '$CSR*ROA_{t-1}$' are significantly positive for both mandatory and voluntary firms. It infers that the impact of CSR on CEO pay performance sensitivity is consistent regardless of whether the firms mandatorily required to disclose their CSR report by the authority.

<TABLE 6>

4.3 Other robustness tests

In order to further verify our results, we conduct several robustness tests by using different instrumental variable for IV-GMM estimation and alternative measurements of key variables in the OLS, and show the results in Table 7. First, we rerun the IV-GMM estimation with alternative instrumental variables. Inspired by Karpoff et al. (2017), our first new instrument

(CSR_INDUSTRYPROVINCE) is based on the CSR performance of firms in the same industry as the focus firm, but are not in the same province. The rationale is that firm's CSR activities would be largely influence by regulation, advocacy, traditions and other peer firms in the same industry. However, industry CSR mean excluding firms in the same province with focal firm is unlikely to influence focal firm's CEO pay. We also include instrument variable, CSR_INDUSTRYPROVINCE* ROA_{t-1}, which is the interaction term between CSR_INDUSTRYPROVINCE and 'ROA_{t-1}'. Diagnostic tests shown in the table proves that our instruments are valid, satisfying the conditions of strong relevance to endogenous variables[14], and the coefficients of 'CSR*ROA_{t-1}' under column (1) stay significantly positive. Second, we include long-term incentives into CEOs' compensation, and rerun our regression. Following Cao et al. (2018), we define 'TOTAL PAY' as the sum of salary, bonus, allowance and the value of long-term incentives which is calculated as multiplying the number of shares and stock options with the closing stock price at the end of the year. We get consistent result in Column (2). Third, we replace the proxy for performance with annual stock returns and non-lagged ROA, and show the results in column (3) and (4), respectively. To be noted, we do not get significant result for the proxy of annual stock return which may reflect that market performance is not a stable indicator to determine CEO compensation in China. Last, we lag our main independent variable 'CSR' to year t-1 to further mitigate the simultaneous bias as well as to dispel the concerns that the effect of CSR ranking on CEO pay will lag. Column (5) shows the results. In general, all the results are consistent with our findings.

<TABLE 7>

5. Conclusion

[14] We could not performance Hansen J test because of just identification situation.

By using the sample of all Chinese firms listed on the Shanghai and Shenzhen stock exchanges that release their CSR reports during the period from 2008 to 2016, we examine the impact of CSR on CEO pay performance sensitivity. We find that CEO pay performance sensitivity is higher in firms with good CSR performance, and also in firms release their CSR report compared with those do not release their CSR report. By further splitting our sample according to ownership structure, and whether CEOs take dual roles and whether they are politically connected, we find that the positive impact of CSR on pay performance sensitivity is more profound in firms where managers are enabled to exercise greater power over their compensation. Moreover, we also show that the impact of CSR on CEO pay performance sensitivity is not only present in firms mandatorily required to disclose their CSR report, but also in firms voluntarily disclosed. All the results are drawn after controlling for firm fixed effect and year fixed effect, and the main results are further verified with IV-GMM estimation with comprehensive diagnostic tests for the relevance and validity of our instrumental variables. We also do some robustness tests with alternative instruments and alternative measurement of key variables.

Overall, our study sheds light on the debate about the impact of CSR on firm behaviour. Different from other developed countries that the CSR is mainly based on voluntary initiatives, CSR is initially encouraged and mandatorily (for some firms) required in China. With strong government intervention, CSR could bring value-added benefit to firms by better aligning the CEO compensation with firm performance. Although predominantly by mandatory feature, there is no difference for the impact of CSR on CEO pay performance sensitivity between mandatory and voluntary firms which may infer that even with voluntary initiative, firms disclose or conduct CSR activities are still out of political pressure.

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Table 1 Summary Statistics

This table presents the summary statistics for the variables used in our tests. Mean, median, standard deviation and values at 25% and 75% percentile of each variable are reported. All the continuous variables are winsorised at the 1% and 99% distribution. We report absolute figure instead of the natural logarithm of the values in this stable.

VARIABLE NAME	Mean	St.dev	25^{th} percentile	Median	75^{th} percentile
CEO PAY	839,237	902,500	360,000	600,000	944,250
CSR	38.1728	11.8220	29.8900	35.5600	43.8400
CSR_INDUSTRY	37.1555	5.5667	33.5641	37.5293	40.8849
CSR_PROVINCE	37.2189	6.3439	33.1016	37.2324	41.9744
CSR_D	0.5000	0.5000	0.0000	0.5000	1.0000
ROA_{t-1}	0.0491	0.0493	0.0199	0.0416	0.0726
SOE	0.6247	0.4843	0.0000	1.0000	1.0000
DUAL	0.1574	0.3642	0.0000	0.0000	0.0000
PC	0.1929	0.3946	0.0000	0.0000	0.0000
SIZE	2.8469e+10	6.7494e+10	3.1446e+09	7.6702e+09	2.1317e+10
LEVERAGE	0.4937	0.1996	0.3458	0.5082	0.6488
EXCESS	5.6887	8.3225	0.0000	0.0000	10.6613
GROWTH	-0.2188	3.3549	-0.3255	0.0749	0.3665
CONTROLLING	35.1794	18.0532	20.5150	34.3910	49.1360
INDEPENDENT	0.3737	0.0569	0.3333	0.3571	0.4000
MEETING	3.0891	1.6510	2.0000	3.0000	4.0000
BOARD SIZE	9.3003	1.9472	9.0000	9.0000	10.0000
REGIONAL GDP	5.8157	2.5983	3.7027	5.5506	7.4369
AGE	49.3296	5.8563	45.0000	49.0000	53.0000
GENDER	0.9460	0.2261	1.0000	1.0000	1.0000
EDUCATION	3.5970	0.8303	3.0000	4.0000	4.0000
TENURE	43.4517	38.6518	15.0000	30.0000	65.0000
CEO SHARE	0.0429	0.1621	0.0000	0.0000	0.0003

Table 2 The impact of CSR on CEO pay performance sensitivity

This table represents the regression results for the impact of CSR on CEO pay performance sensitivity. We have used both firm fixed effect and IV-GMM estimations, and the results are shown under column (1) and (2), respectively. Full sample is used for both estimation which is all firms listed on the Shanghai and Shenzhen stock exchanges that release their CSR reports during the period from 2008 to 2016. The dependent variable 'CEO PAY' is the reported total sum of salary, bonus and allowance of CEO in a given firm. 'CSR' is the firm's overall CSR score from rating agency Runling. 'ROA_{t-1}' is the lagged ROA to year t-1 for a given year. 'CSR* ROA_{t-1}' is the interaction term between 'CSR' and 'ROA_{t-1}'. Under IV-GMM estimation, the instrumented endogenous variables are 'CSR' and 'CSR*ROA_{t-1}', and instrumental variables are 'CSR_INDUSTRY', 'CSR_PROVINCE', 'CSR _INDUSTRY* ROA_{t-1}' and CSR _PROVINCE* ROA_{t-1}'. 'CSR_INDUSTRY' is the industry average CSR score excluding the contribution of the focal firm. 'CSR_PROVINCE' is the province average CSR score excluding the contribution of the focal firm. 'CSR_INDUSTRY* ROA_{t-1}'is the interaction term between 'CSR_INDUSTRY' and 'ROA_{t-1}'. 'CSR _PROVINCE* ROA_{t-1}'is the interaction term between 'CSR_PROVINCE' and 'ROA_{t-1}'. Lagrange multiplier (LM) test, Kleibergenn-Paap rk Wald F statistics and Hansen's J statistics are reported for underidentification, weak identification and overidentification, respectively. Control variables are defined in Appendix A. Standardised beta coefficients; p-values in parentheses. *, **, *** represent significance at the 10%, 5% and 1% levels respectively.

	(1)	(2)
Dependent variable: ln(CEO PAY)		
CSR	-0.0012	0.0291***
	(0.5036)	(0.0000)
ROA_{t-1}	0.3822	-0.0074
	(0.5944)	(0.9974)
CSR*ROA_{t-1}	0.0593***	0.1215*
	(0.0023)	(0.0521)
SOE	0.0368	-0.0806***
	(0.9326)	(0.0085)
DUAL	0.0649*	0.1767***
	(0.0618)	(0.0000)
PC	0.0159	0.0807**
	(0.6145)	(0.0146)
SIZE	0.1808***	0.0929***
	(0.0000)	(0.0007)
LEVERAGE	0.0565	0.3056***
	(0.5864)	(0.0019)
EXCESS	-0.0046**	-0.0016
	(0.0438)	(0.3057)

GROWTH	0.0119***	0.0200***
	(0.0000)	(0.0000)
CONTROLLING	0.0002	-0.0078***
	(0.8208)	(0.0000)
INDEPENDENT	0.3077	-0.1757
	(0.2132)	(0.4100)
MEETING	-0.0288*	0.0202
	(0.0879)	(0.3724)
BOARD SIZE	0.2587***	0.0875
	(0.0024)	(0.2155)
REGIONAL GDP	0.0022	0.0387***
	(0.9031)	(0.0000)
AGE	0.0548	0.4493***
	(0.6247)	(0.0000)
GENDER	0.1709***	-0.0010
	(0.0031)	(0.9882)
EDUCATION	-0.0060	0.0450***
	(0.7459)	(0.0046)
CEO SHARE	-0.1462	-0.5822***
	(0.2165)	(0.0000)
TENURE	0.0452***	0.0588***
	(0.0000)	(0.0000)
INTERCEPT	7.6396***	7.4697***
	(0.0000)	(0.0000)
FIRM FE	YES	NO
YEAR	YES	YES
INDUSTRY	NO	YES
N	3863	3863
R-sq	0.1795	0.2400
	(within)	(adj.)
Kleibergen-Paap rk LM statistic (Underidentification)		113.4310
		(0.0000)

Kleibergen-Paap rk Wald F statistic (Weak identification)	29.6430
Hansen J statistic (Overidentification)	2.7070
	(0.2584)
Instrumented variables: CSR; CSR*ROA_{t-1}	
Excluded instruments: CSR_INDUSTRY; CSR_PROVINCE; CSR_INDUSTRY* ROA_{t-1}; CSR_PROVINCE* ROA_{t-1}	

Table 3 The impact of CSR report release on CEO pay performance sensitivity

This table represents the regression results for the impact of CSR report release on CEO pay performance sensitivity. The sample includes firms listed on the Shanghai and Shenzhen stock exchanges that release their CSR reports (treatment group) during the period from 2008 to 2016 and their matching firms that do not release CSR reports (control group). The dependent variable 'CEO PAY' is the reported total sum of salary, bonus and allowance of CEO in a given firm. 'CSR_D' is a dummy variable that equals 1 if firms belong to treatment group. 'ROA_{t-1}' is the lagged ROA to year t-1 for a given year. 'CSR_D* ROA_{t-1}' is the interaction term between 'CSR_D' and 'ROA_{t-1}'. Control variables are defined in Appendix A. Standardised beta coefficients; p-values in parentheses. *, **, *** represent significance at the 10%, 5% and 1% levels respectively.

Dependent variable: ln(CEO PAY)	
CSR_D	-0.0491**
	(0.0126)
ROA_{t-1}	1.1731***
	(0.0000)
CSR_D*ROA_{t-1}	0.3822*
	(0.0715)
SOE	-0.0369
	(0.5551)
DUAL	-0.0173
	(0.4761)
PC	0.0329
	(0.1771)
SIZE	0.2229***
	(0.0000)
LEVERAGE	-0.0709
	(0.2934)
EXCESS	-0.0017
	(0.2950)
GROWTH	0.0033**
	(0.0328)
CONTROLLING	-0.0006
	(0.3999)
INDEPENDENT	-0.2879
	(0.1086)
MEETING	-0.0394***
	(0.0008)
BOARD SIZE	0.1888***
	(0.0021)
REGIONAL GDP	0.0005
	(0.9682)
AGE	0.0007
	(0.9939)
GENDER	0.0941**
	(0.0418)
EDUCATION	0.1152***
	(0.0016)
CEO SHARE	-0.0690**

	(0.0262)
TENURE	0.0315***
	(0.0000)
INTERCEPT	7.4456***
	(0.0000)
FIRM FIXED EFFECT	YES
YEAR	YES
N	7726
R-sq (within)	0.1507

Table 4 The impact of CSR on CEO pay performance sensitivity between SOEs and non-SOEs

This table represents the regression results for the impact of CSR on CEO pay performance sensitivity between SOEs and non-SOEs. 'SOE' includes listed firms that are ultimately controlled by the state and release their CSR reports. 'NON-SOE' includes listed firms that are not ultimately controlled by the state and release their CSR reports. The dependent variable 'CEO PAY' is the reported total sum of salary, bonus and allowance of CEO in a given firm. 'CSR' is the firm's overall CSR score from rating agency Runling. 'ROA_{t-1}' is the lagged ROA to year t-1 for a given year. '$CSR* ROA_{t-1}$' is the interaction term between 'CSR' and 'ROA_{t-1}'. Control variables are defined in Appendix A. Standardised beta coefficients; p-values in parentheses. *, **, *** represent significance at the 10%, 5% and 1% levels respectively.

	SOE	NON-SOE
Dependent variable: ln(CEO PAY)		
CSR	0.0004	-0.0040
	(0.8750)	(0.2254)
ROA_{t-1}	0.0860	0.9118
	(0.9279)	(0.4309)
$CSR*ROA_{t-1}$	0.0640***	0.0480
	(0.0095)	(0.1536)
DUAL	0.0209	0.0914*
	(0.6554)	(0.0724)
PC	0.0581	-0.0348
	(0.1883)	(0.4311)
SIZE	0.1452***	0.1963***
	(0.0004)	(0.0000)
LEVERAGE	0.0616	0.1097
	(0.6678)	(0.4573)
EXCESS	-0.0034	-0.0040
	(0.3461)	(0.1648)
GROWTH	0.0120***	0.0095*
	(0.0000)	(0.0591)
CONTROLLING	-0.0024	0.0025**
	(0.2318)	(0.0375)
INDEPENDENT	0.0716	0.6369
	(0.8229)	(0.1005)
MEETING	-0.0455**	0.0049

	(0.0424)	(0.8461)
BOARD SIZE	0.2545**	0.2349*
	(0.0293)	(0.0548)
REGIONAL GDP	0.0271	-0.0287
	(0.2118)	(0.3899)
AGE	-0.1332	0.3306**
	(0.3966)	(0.0350)
GENDER	0.0898	0.1898**
	(0.2961)	(0.0125)
EDUCATION	-0.0034	0.0071
	(0.8874)	(0.8115)
CEO SHARE	3.4836**	-0.1299
	(0.0493)	(0.2598)
TENURE	0.0662***	-0.0071
	(0.0000)	(0.6040)
INTERCEPT	9.2393***	6.3640***
	(0.0000)	(0.0000)
FIRM FE	YES	YES
YEAR	YES	YES
N	2343	1520
R-sq (within)	0.1533	0.2740

Table 5 The impact of CSR on CEO pay performance sensitivity among subsamples

This table represents the regression results for the impact of CSR on CEO pay performance sensitivity among subsamples. 'DUAL' includes listed firms that release their CSR reports and whose CEO is also the chair of the board. 'NON-DUAL' includes listed firms that release their CSR reports and whose CEO is not the chair of the board. 'PC' includes listed firms that release their CSR reports and whose CEO is politically connected. 'WITHOUT-PC' includes listed firms that release their CSR reports and whose CEO is not politically connected. The dependent variable 'CEO PAY' is the reported total sum of salary, bonus and allowance of CEO in a given firm. 'CSR' is the firm's overall CSR score from rating agency Runling. 'ROA_{t-1}' is the lagged ROA to year t-1 for a given year. '$CSR* ROA_{t-1}$' is the interaction term between 'CSR' and 'ROA_{t-1}'. Control variables are defined in Appendix A. Standardised beta coefficients; p-values in parentheses. *, **, *** represent significance at the 10%, 5% and 1% levels respectively.

Dependent variable: ln(CEO PAY)	DUAL	NON-DUAL	PC	WITHOUT-PC
CSR	-0.0112*	-0.0012	-0.0068	-0.0000
	(0.0573)	(0.5347)	(0.1265)	(0.9916)
ROA_{t-1}	-6.5055***	1.3899*	0.0856	1.0424
	(0.0007)	(0.0840)	(0.9602)	(0.2040)
$CSR*ROA_{t-1}$	0.2125***	0.0364*	0.0814*	0.0439**
	(0.0002)	(0.0894)	(0.0921)	(0.0455)
SOE	0.0000	0.0259	0.0000	0.3302
	(.)	(0.9527)	(.)	(0.4586)
DUAL			0.0673	0.0544
			(0.3197)	(0.1909)
PC	-0.0075	0.0177		
	(0.9067)	(0.6381)		
SIZE	0.0282	0.2182***	0.1076	0.1308***
	(0.5945)	(0.0000)	(0.1748)	(0.0001)
LEVERAGE	0.2156	0.0273	-0.3342	0.0815
	(0.3985)	(0.8154)	(0.1828)	(0.4795)
EXCESS	-0.0006	-0.0051**	-0.0040	-0.0032
	(0.9306)	(0.0382)	(0.4124)	(0.2087)
GROWTH	0.0016	0.0109***	0.0169**	0.0114***
	(0.8737)	(0.0000)	(0.0247)	(0.0000)
CONTROLLING	0.0050**	-0.0006	-0.0004	0.0012
	(0.0187)	(0.6439)	(0.8779)	(0.3170)
INDEPENDENT	-2.1817***	0.4193	-0.8255	0.4206
	(0.0006)	(0.1245)	(0.1256)	(0.1283)
MEETING	-0.0844*	-0.0151	-0.0416	-0.0221
	(0.0510)	(0.4139)	(0.2470)	(0.2401)
BOARD SIZE	-0.3025	0.2968***	0.1711	0.2780***
	(0.1976)	(0.0015)	(0.2893)	(0.0058)
REGIONAL GDP	-0.0929	0.0084	-0.1349**	0.0148
	(0.1136)	(0.6636)	(0.0208)	(0.4503)
AGE	0.0376	0.0382	-0.4355	0.0658
	(0.9229)	(0.7585)	(0.2989)	(0.6069)
GENDER	-0.2460	0.1526**	0.2706	0.1286*
	(0.4353)	(0.0144)	(0.1191)	(0.0636)

EDUCATION	0.0560	-0.0048	-0.0013	0.0157
	(0.5165)	(0.8115)	(0.9872)	(0.4483)
CEO SHARE	-0.0884	-0.1214	-0.0011	-0.1513
	(0.5950)	(0.5290)	(0.9955)	(0.3279)
TENURE	-0.0253	0.0553***	0.0286	0.0462***
	(0.2988)	(0.0000)	(0.1860)	(0.0000)
INTERCEPT	14.2874***	6.7113***	12.6361***	8.2742***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
FIRM FE	YES	YES	YES	YES
YEAR	YES	YES	YES	YES
N	585	3278	719	3144
R-sq (within)	0.3747	0.1737	0.2429	0.1694

Table 6 The impact of CSR on CEO pay performance sensitivity between mandatory disclosure firms and voluntary disclosure firms

This table represents the regression results for the impact of CSR on CEO pay performance sensitivity between mandatory disclosure firms and voluntary disclosure firms. 'MANDATORY' includes listed firms that release their CSR reports mandatorily by regulations. 'VOLUNTARY' includes listed firms that voluntarily release their CSR reports. The dependent variable 'CEO PAY' is the reported total sum of salary, bonus and allowance of CEO in a given firm. 'CSR' is the firm's overall CSR score from rating agency Runling. 'ROA_{t-1}' is the lagged ROA to year t-1 for a given year. '$CSR* ROA_{t-1}$' is the interaction term between 'CSR' and 'ROA_{t-1}'. Control variables are defined in Appendix A. Standardised beta coefficients; p-values in parentheses. *, **, *** represent significance at the 10%, 5% and 1% levels respectively.

Dependent variable: ln(CEO PAY)	MANDATORY	VOLUNTARY
CSR	0.0002	-0.0087**
	(0.9397)	(0.0250)
ROA_{t-1}	0.9370	-1.8061
	(0.2678)	(0.1947)
$CSR*ROA_{t-1}$	0.0547**	0.0906**
	(0.0167)	(0.0170)
SOE	0.0401	0.0000
	(0.9289)	(.)
DUAL	0.0354	0.1469**
	(0.4113)	(0.0105)
PC	0.0606	-0.0773
	(0.1175)	(0.1684)
SIZE	0.1511***	0.2188***
	(0.0001)	(0.0000)
LEVERAGE	0.1059	0.1093
	(0.4470)	(0.4688)
EXCESS	-0.0086***	0.0024
	(0.0033)	(0.5252)
GROWTH	0.0134***	0.0106**
	(0.0000)	(0.0196)
CONTROLLING	-0.0027	0.0030**
	(0.1081)	(0.0217)
INDEPENDENT	0.2032	0.5238
	(0.4918)	(0.2523)
MEETING	-0.0360*	-0.0147
	(0.0792)	(0.6159)
BOARD SIZE	0.2907***	0.1680
	(0.0035)	(0.3117)
REGIONAL GDP	0.0087	-0.0803*
	(0.6667)	(0.0561)
AGE	0.1130	-0.3685*
	(0.4030)	(0.0780)
GENDER	0.0468	0.5164***
	(0.4954)	(0.0000)
EDUCATION	0.0160	-0.0517

	(0.4615)	(0.2020)
CEO SHARE	-0.7043	-0.1077
	(0.3428)	(0.3571)
TENURE	0.0457***	0.0461***
	(0.0000)	(0.0026)
INTERCEPT	8.1786***	8.6027***
	(0.0000)	(0.0000)
FIRM FE	YES	YES
YEAR	YES	YES
N	2740	1123
R-sq (within)	0.1799	0.2406

Table 7 Robustness tests based on different IV and different measurement of key variables

This table represents the regression results for the robustness tests using different IV and different measurements of key variables. Results under column (1) is based on IV-GMM estimation, the instrumented endogenous variables are 'CSR' and 'CSR*ROA_{t-1}', and instrumental variables are 'CSR_INDUSTRYPROVINCE' and 'CSR_INDUSTRYPROVINCE*ROA_{t-1}'. 'CSR_INDUSTRYPROVINCE' is the industry average CSR score excluding the contribution of the focal firm's industry. 'CSR_INDUSTRYPROVINCE* ROA_{t-1}' is the interaction term between 'CSR_INDUSTRYPROVINCE' and 'ROA_{t-1}'. Firm fixed effect is used for results under column (2) to (5). The dependent variable 'TOTAL PAY' for column (2) is the sum of salary, bonus, allowance and the value of long-term incentives which is calculated as multiplying the number of shares and stock options with the closing stock price at the end of the year. '$Return_{t-1}$' in column (3) is the annual stock return at year t-1. 'ROA' in column (4) is the return on asset (calculated as net income divided by total asset) in a given year. 'CSR_{t-1}' in column (5) is the lagged overall CSR score from rating agency Runling to year t-1 for a given year. Besides, 'CSR' is firm's overall CSR score from rating agency Runling. 'ROA_{t-1}' is the lagged ROA to year t-1 for a given year. Control variables (the same as in Table 2) are included but not reported to save space. Standardised beta coefficients; p-values in parentheses. *, **, *** represent significance at the 10%, 5% and 1% level respectively.

	(1)	(2)	(3)	(4)	(5)
Dependent variable	ln(CEO PAY)	ln(TOTAL PAY)	ln(CEO PAY)	ln(CEO PAY)	ln(CEO PAY)
CSR	0.0143*	-0.0013	0.0016	-0.0009	
	(0.0950)	(0.7381)	(0.3559)	(0.6218)	
ROA_{t-1}	-1.3775	-2.1056			0.4746
	(0.5604)	(0.1479)			(0.5676)
CSR*ROA_{t-1}	0.1569**	0.1221***			
	(0.0161)	(0.0017)			
$RETURN_{t-1}$			0.0384		
			(0.2827)		
CSR*$RETURN_{t-1}$			0.0009		
			(0.3517)		
ROA				-0.4039	
				(0.5630)	
CSR*ROA				0.0540***	
				(0.0032)	
CSR_{t-1}					0.0004
					(0.8377)
CSR_{t-1}*ROA_{t-1}					0.0567***
					(0.0093)

INTERCEPT	-0.0764***	-0.4680	-0.1416	0.0029	0.0458
	(0.0094)	(0.5983)	(0.7500)	(0.9947)	(0.9149)
CONTROL VARIABLE	YES	YES	YES	YES	YES
FIRM FE	NO	YES	YES	YES	YES
YEAR	YES	YES	YES	YES	YES
INDUSTRY	YES	NO	NO	NO	NO
N	3863	3863	3863	3863	3553
R-sq	0.3132 (adj.)	0.2760 (within)	0.1527 (within)	0.1638 (within)	0.1900 (within)
Kleibergen-Paap rk LM statistic (Underidentification)				70.4240	
				(0.0000)	
Kleibergen-Paap rk Wald F statistic (Weak identification)				29.9890	
Instrumented variables: CSR; CSR*ROA_{t-1}					
Excluded instruments: CSR_INDUSTRYPROVINCE; CSR_INDUSTRYPROVINCE* ROA_{t-1}					

Appendix A. Definitions of variables

Variable	Definition and/or Calculation
CEO PAY	The reported sum of salary, bonus and allowance. The natural logarithm of this value is used in the regression.
TOTAL PAY	The reported sum of salary, bonus, allowance and long term incentives (multiplying the number of shares and stock options with the closing stock price at the end of the year). The natural logarithm of this value is used in the regression.
BANK LOAN	(Long-term loan+ short-term loan)/total assets
INVEST	Net capital expenditure/total assets
CSR	Overall CSR scores from Runling, ranging from 0 to 100.
CSR_D	The dummy equals 1 if the firm release CSR report.
CSR_H	Overall CSR scores from Hexun, ranging from 0 to 100.
CSR_INDUSTRY	Industry average CSR score excluding the contribution of the focal firm.
CSR_PROVINCE	Province average CSR score excluding the contribution of the focal firm.
ROA	Net income/ total assets
RETURN	Annual stock return: (closing price in the last day of the year/closing price in the last day one year before)-1
SOE	The dummy equals 1 if the firm is ultimately controlled by the state and 0 otherwise.
DUAL	The dummy equals 1 if the CEO is also the chair of the board and 0 otherwise.
PC	The dummy equals 1 if the CEO is politically connected (a former or current government officials, military officer, or a member of the NPC or CPPCC) and 0 otherwise.
SIZE	The natural logarithm of a firm's total assets.
LEVERAGE	Total liabilities/ total assets
EXCESS	The difference between the ultimate controlling shareholder's control right and cash flow rights.
GROWTH	The sale growth calculated as (total sales this year – total sales last year) / total sales last year.
CONTROLLING	Percentage of shares held by the controlling shareholder.
INDEPENDENT	Independent board of directors/ total board directors.
MEETING	The natural logarithm of the number of shareholders' general meetings in a given year.
BOARD SIZE	The natural logarithm of the number of directors on the board.
REGIONAL GDP	GDP per capita (in 10 thousands of RMB) in the province where the firm is registered.
AGE	The age of the CEO in a given year. The natural logarithm of this value is used in the regression.
GENDER	The dummy equals 1 if CEO is male, and equals 0 if CEO is female.
EDUCATION	The level of CEO's education (1=secondary vocational diploma or below; 2= three-year college diploma; 3=bachelor; 4=master; 5= PhD). The natural logarithm of this value is used in the regression.
CEO SHARE	Percentage of shares held by the CEO.
TENURE	The number of months as the firm's CEO. The natural logarithm of this value is used in the regression.
YEAR & INDUSTRY	Dummy variables that control for year and industry fixed effects.