

Waiting for Certainty: The Effect of the Economic Policy Uncertainty on Corporate Social Responsibility

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Abstract

This study examines how economic policy uncertainty affects a firm's investment in corporate social responsibility (CSR). Using a Chinese sample, we find a significant and negative relationship between economic policy uncertainty and a firm's CSR investment. Results show that a firm tends to delay its investments to avoid the opportunity costs associated with an irreversible investment in the face of uncertainty, thus supporting the "option to wait" in real options theory. The negative association is more significant for SOEs and mandatory CSR reporting firms but less significant for firms located in high marketization regions. Results are robust to a variety of model specifications and endogeneity problems.

Keywords: economic policy uncertainty, corporate social responsibility, investment, real options theory

1. Introduction

Real options theory states that uncertainty plays an important role whenever an investment decision is characterized by some degree of irreversibility, and the future exercise of managerial discretion has potential (Kogut and Kulatilaka, 2001). However, even within real options theory, the conflict between the “option to wait” and the “option to grow” drives a lengthy discussion over how uncertainty affects a firm’s investment. “Option to grow” suggests that uncertainty may promote investments under imperfect competition. Although future opportunity can be contestable and uncertain, the exercise of an option by a firm to invest can enhance its competitive advantage and erode the value of the option to wait by rival firms (Kulatilaka and Perotti, 1998). “Option to wait” predicts that a firm may delay its investment to avoid the opportunity costs associated with an irreversible investment when uncertainty is high (McDonald and Siegel, 1986; Dixit and Pindyck, 1994). Our current study adds to the debate by assessing the role of economic policy uncertainty in a firm’s investment on corporate social responsibility (CSR).

CSR consists of three elements: some degree of irreversibility, uncertainty over expected benefits in the future, and flexibility about timing (Dixit and Pindyck, 1994). CSR investment can be viewed as a long-term investment in intangible assets in response to a broad range of stakeholder interests (Edmans, 2011; Bae et al., 2011). Thus, the economic mechanism that affects CSR investment may be different from that which affects regular investment in tangible assets.² Existing literature shows that economic policy uncertainty has a negative effect on investment in tangible assets (Julio and Yook, 2012; Gulen and Ion, 2016), but how it affects a firm’s CSR investment that responds to stakeholder interests remains unclear.

² Many studies have suggested that a firm maintains a favorable relationship with its stakeholders by investing in its CSR engagement. However, Du et al. (2010) indicate that, unlike investment on tangible assets, stakeholders who have limited awareness and unfavorable attributions toward a firm’s CSR engagement may question whether a firm’s CSR investment could maximize business benefit (Bhattacharya et al., 2008). The firm should create the awareness of and manage the attribution of CSR engagement to its stakeholders to increase the benefit of the CSR investment to both internal stakeholders (i.e., employee) and external stakeholders (i.e., customer). Bhattacharya et al., (2017) suggest that firms prefer increasing their capital expenditure using funds raised from the stock market but prefer investing in their innovations using funds raised from private investors. Private ownership has a higher tolerance for failure than public ownership (Lerner et al., 2011).

China provides an ideal setting for testing the relationship between a firm's CSR investment and economic policy uncertainty. Gulen and Ion (2016) argue the importance of studying policy-related uncertainty on the economic consequence, because firms often face a considerable uncertainty in operational environments with regard to the timing, content, and potential impact of policy decisions. Given that China is still in the transition period, Chinese firms face a volatile business environment because of policy-related uncertainty. For example, the China Security Regulatory Commission (CSRC) stopped initial public offerings nine times in the last 27 years without notifying the participants of the stock markets. The policy imposed by the CSRC significantly affects Chinese firms' financial planning, specifically their financing and investment activities. Thus, managers in Chinese firms must consider policy uncertainty when they make investment decisions. Economic policy uncertainty is most likely to be exogenous to Chinese firms because these firms do not have an official channel to lobby the government for making a favorable economic policy. This feature helps us alleviate endogeneity issues to identify the causal effect of economic policy uncertainty. Finally, the Shanghai and Shenzhen stock exchanges mandated a subset of listed Chinese firms to issue CSR reports at the end of 2008. Some firms choose to disclose their CSR report voluntarily. Voluntary adopters self-select into disclosing CSR based on their firm-specific factors. However, mandatory adopters are forced to disclose their CSR under the "one-size-fits-all" regulation in China. The Chinese data allow us to examine the differential effect of economic policy uncertainty in voluntary and mandatory CSR reporting firms.

We attempt to capture the overall level of economic policy uncertainty by adopting an index of aggregated economic policy uncertainty developed by Baker et al. (2016) (hereafter, BBD index). BBD index is a weighted average of three types of underlying components: news-based component (one-half), tax component (one-sixth), and forecaster disagreement component (one-third).³ We aggregate the monthly BBD index to the annual level by calculating the average value, median value, and geometric average value of the BBD index in a year. Moreover, we employ RKS CSR rating to measure the CSR investment of Chinese firms. A high CSR score indicates more

³ Recent studies adopting the BBD index to capture economic policy uncertainty include Gulen and Ion (2016), Husted and Saffar (2016), Brogaard and Detzel (2015), Kang et al., (2014), Wang et al., (2014), and Pastor and Verobesi (2013).

intensive engagement in CSR. Financial data and ownership data are obtained from CSMAR. The final sample contains 4,179 firm-year observations from 2008 to 2015. A significant and negative relationship is found between a firm's CSR investment and economic policy uncertainty after controlling for firm characteristics and macroeconomic variables. Our finding indicates that a firm tends to delay its investments to avoid the opportunity costs associated with an irreversible investment in the face of uncertainty, thus supporting the "option to wait" in real options theory. To identify the underlying economic mechanism of our findings, we explore whether the negative association between economic policy uncertainty and a firm's CSR exhibits heterogeneity in the cross-section along some firm characteristics. We find that the negative relationship between economic policy uncertainty and firm's CSR investment is more significant for SOEs and mandatory CSR reporting firms and less significant for firms located in high marketization regions.

As a robustness check, alternative measures are adopted to proxy for CSR investment and policy uncertainty. We use the sub-categories of the RKS CSR rating (macrocosm score and content score) to proxy for the CSR investment. We also adopt the political election at the 18th National Congress of the Communist Party of China in 2012 (*POL_TURNOVER*) as an alternative proxy for economic policy uncertainty. The results remain unchanged. Although policy uncertainty is most likely to be exogenous in China, we still adopt several approaches to alleviate its potential endogeneity problem. First, firm-specific risks and macroeconomic risks may be correlated with a firm's CSR investment and economic policy uncertainty. Thus, we directly control for firm-specific risks and macroeconomics risks in the regression. Second, our measure of economic policy uncertainty suffers from a measurement error bias because the BBD index may capture non-policy-related economic uncertainty. Thus, we follow Gulen and Ion (2016) in removing the confounding part of the BBD index by extracting the component of the BBD index in China that is orthogonal to the BBD index in the US.⁴ We then adopt the residual as a cleaner measure of economic policy uncertainty in

⁴ China and the US are the two largest economies in the world. The extensive international trade activities between these two economies possibly create a tight link between them. Thus, we expect that many of the shocks that affect the general economic uncertainty in one economy also affect the general economic uncertainty in another. We apply the same method to extract the component of the BBD index in China that is orthogonal to the BBD indices in Korea and Japan. We apply the residuals as a clean measure of economic policy uncertainty in China and rerun our regression. Our findings are qualitatively the same.

China and rerun our regression. Third, large firms may be expected to have a considerable influence on policy makers, resulting in a reverse causality. Thus, we add an interaction term between the BBD index and a dummy variable of large firms in the regression. Our results show that the interaction term is statistically insignificant, which indicates that reverse causality is unlikely to drive our findings. Finally, we run a 2SLS regression to alleviate the endogeneity issue. We adopt a dummy variable that measures the political power transition in 2012 (POL_TURNOVER) as our instrumental variable. The coefficient on POL_TURNOVER is positive and highly significant in the first stage, which indicates that POL_TURNOVER is a strong instrument. The coefficient on the BBD index in the second stage remains negative and statistically significant.

The present study contributes to three streams of literature. First, it adds to the growing literature on the effect of policy uncertainty on a firm's investment decision. While existing work mainly focuses on the impact of policy uncertainty on capital investment (Bloom et al., 2007; Julio and Yook, 2012; Gulen and Ion, 2016) and stock returns in the financial markets (Boutchkova et al., 2012; Pástor and Veronesi, 2013), the current study emphasizes the effect of economic policy uncertainty on long-term investment in intangible assets. This study answers the call of Kelly et al. (2016) to improve the understanding of the role of policy uncertainty in the real economy. Second, the present study provides additional evidence on the determinants of corporate CSR investment. While existing literature focuses on the cross-sectional determinants of CSR investments (Stanwick and Stanwick, 1998; Li and Zhang, 2010; Ioannou and Serafeim, 2012; Fabrizi et al., 2014; El Ghouli et al., 2016; Liang and Renneboog, 2016), the present study emphasizes the intertemporal changes in CSR investment. It examines when a firm invests in CSR. Third, this study contributes to the literature on real options theory. We provide empirical evidence on whether the "option to wait" dominates the "option to grow" or vice versa in the event of uncertainty.

The rest of the paper is organized as follows. Section 2 reviews important literature. Section 3 develops the research hypotheses. Section 4 describes the construction of our data sample. Section 5 presents the empirical results. Section 6 discusses the robustness analysis. Section 7 concludes the paper.

2. Literature Review

2.1 Real Option Theory

Myers (1977) defines “real options” as “opportunities to purchase real assets on possible favorable terms.” A financial option is a right but not an obligation to take some future specific action by paying a specific cost. The future decision must be beneficial to decision makers. Otherwise, there is no meaning to obtain this option by carrying on extra cost (Trigeorgis and Reuer, 2017). Real options theory regards uncertainty as a critical factor whenever a firm makes an investment decision with the characteristics of irreversibility and a potential for the future exercise of managerial discretion (Kogut and Kulatilaka, 2001). A firm that faces uncertainty has two options: investing immediately to avoid losing its competitive advantage or delaying the investment to avert a loss in the future. Thus, the central debate of real options theory is between the option to defer and the option to grow (Folta and O’Brien, 2004). The neoclassical investment theory cannot accurately account for the value of the uncertainty in an investment project for two reasons. First, most investments contain some degrees of irreversibility because they cannot be fully recovered, that is, the sunk cost, and being redeployed without cost in a negative outcome. Second, managers cannot revise their investment strategies when the market is developed to an unexpected direction, thus causing cash flow to deviate from their expectation (Folta and O’Brien, 2004). Therefore, real options theory sets an investment threshold for a firm whenever it makes investment decisions other than neoclassical investment theory, that is, the NPV approach (Folta and O’Brien, 2004).

The value of the option depends on whenever an investment decision contains enormous uncertainty and costs to redeem. The value of the option to grow is an increased function with the uncertainty. If the project has great potential for growth, high uncertainty will reduce the investment threshold and result in a positive relationship between the uncertainty and the investment because the growth opportunity would be embedded in the investment (Kester, 1984). The high growth opportunity embedded in the project increases the value of the option to grow. Lieberman and Montgomery (1998) state that early investment helps a firm build technological advantage or develop brand recognition compared with later investment. The value of the option to grow has no upper bound because the value of the investment project is increased with the potential economic value of winning a competitive advantage caused by the uncertainty of the industry condition (Folta and O’Brien, 2004).

The value of the option to defer investment is from the firm that keeps its option open and avoids the opportunity cost associated with making an irreversibility

investment (McDonald and Siegel, 1986; Folta and O'Brien, 2004). A firm that sacrifices its option to defer an investment loses a potential investment when new information arrives and affects the desirability and timing of the new investment when the firm has made an irreversibility investment. The irreversibility investment of the firm can be regarded as an opportunity cost, which should be equal to the value of the option to defer. Therefore, the firm should increase its investment threshold for the option to defer because the firm's investment is discouraged with great uncertainty given that the opportunity cost escalated with uncertainty (Folta and O'Brien, 2004). The opportunity cost is always greater than zero. The firm should defer its investment on a project if the sum of the NPV and the future cash flow are less than zero. The maximum value of the option to defer should be under the total irreversibility investment (the opportunity cost) (Li and Chi, 2013), which is different to the value of the option to grow.

2.2 Policy Uncertainty and Firm Investment

Uncertainty is an unexpected change that influences the business environment, which would modify the discount factor that firms use to lower their future cash flow (Hartman, 1972; Abel, 1983; Bar-Ilan and Strange, 1996). Real options theory suggests that firms could either invest for growth or delay their investment when facing uncertainty. Kulatilaka and Perotti (1998) present a theory of strategic growth option, which suggests uncertainty that encourages firms' investment in a growth option under imperfect competition. Firms may regard uncertainty as a growth option, but any delayed investment could discourage entrants and reduce market share and profit. Delayed investments under an uncertain business environment would also leave investment opportunities to the firms' competitors. Therefore, companies should increase capital investment and maintain a competitive advantage in the future (Kulatilaka and Perotti, 1998; Vo and Le, 2017). Abel and Blanchard (1986) empirically suggest that firms would increase their investment to boost the expected profit margin of capital when they face a high level of uncertainty. Vo and Le (2017) find that firms likely raise the investment on their R&D activities during a significant uncertainty period, as supported by Stein and Stone (2010). Authors further explain that firms under the competition implement preemptive strategies when they face high uncertainty; their results empirically support the theory of strategic growth options.

Bernanke (1983) presents that increased uncertainty motivate firms to delay their investment and hiring because undertaking the project or hiring new workers would be costly. Bernanke (1983) further suggests that firms have a different weight on the current profit and future profit due to the sunk cost or the irreversibility nature of investment projects. To face increased uncertainty, the high return on waiting for future investment results in a high value on the option to defer, causing firms to reduce their current investment expenditure (McDonald and Siegel, 1986; Pindyck, 1988; Dixit and Pindyck 1994; Abel and Eberly, 1996; Gulen and Ion, 2016). Caballero (1991) finds a decreased firms' capital expenditure during an uncertainty period. The uncertainty also has other depressive effects on economic activities, such as managerial risk aversion (Panousi and Papanikolaou, 2012), cut back on household spending, increased cost of capital (Pástor and Veronesi, 2012), and an interactional effect between nominal rigidities and search frictions (Leduc and Liu, 2016).

The literature has employed economic policy uncertainty to be a proxy of the uncertain because policies respond to the change of economic environment. Thus, the literature has found a significant influential relationship between policy uncertainty and firms' investment behavior (Baker et al., 2016). Jeong (2002) finds that firms would reduce their long-term investment during a period of policy uncertainty. Julio and Yook (2012) find that the average capital expenditure of firms in a presidential election year would be appropriately 4.8% lower than other years. The authors suggest that political uncertainty is an important channel in affecting economic outcomes. Gulen and Ion (2016) document a significant relationship between the firms' capital expenditure and the level of economic policy uncertainty, which employ Baker et al.'s (2016) news-based economic policy index to represent the level of economic policy uncertainty. Gulen and Ion (2016) also suggest that firms with a high degree of investment irreversibility or heavily relying on government spending would be more sensitive to policy changes. Im et al. (2017) find that firms may hold more cash when they are in a high uncertainty environment, and thus reduce their investment during the period of 1980 to 2015, especially for financially constrained firms (Han and Qiu, 2007). The investment ratios of firms significantly dropped during two recent years of uncertainty, the Dot-com Crash and the Global Financial Crisis, respectively (Im et al., 2017). Rodrik (1991) finds that firms in the emerging economy in developing countries would stop any further investment when they face policy changes until the uncertainty associated with policy reform has been eliminated.

2.3 Corporate Social Responsibility

Most studies have focused on how firms could benefit from their CSR engagement. However, literature related to the factors that affect firms' CSR investment is rare. Stanwick and Stanwick (1998) find that firm's size, financial performance, and competitive environment are three important factors related to the firm's CSR implement. Jones (1999) investigate how the institutional determinants of social responsibility affect a firm's CSR engagement worldwide. Jones (1999) argues that social culture, economic development, industry features, firm characteristics, and individual backgrounds have an effect on a firm's decision to engage in CSR. The latter research also confirms that a firm's CSR investment is affected by its ownership structure (Johnson and Greening, 1999). Fabrizi et al. (2014) analyze 597 US firms from 2005 to 2009 and find that the CEO's age and the design of executive remuneration (compensation) plans dramatically affect the CEO's decisions on a firm's CSR investment.

With the increased importance of emerging economies in the global business system, the literature focuses on examining factors that impact the firm's CSR investment in emerging markets. Chapple and Moon (2005) surveyed 50 firms in seven Asian countries and find that the national economic business cycle has a great influence on firm's CSR investment. Firms are more willing to increase their CSR investment during a booming economic period. Muller and Kolk (2010) survey 121 automotive suppliers in Mexico and find that firms with highly ethical managers perform well on the firms' CSR engagement.

Zu and Song (2009) find that small SOEs located in poor regions in China and in traditional lines of business invest more on CSR engagement. They conclude that the firm's CSR investment in China is highly related to the firm's characteristics. Li and Zhang (2010) point out that a company's ownership influences Chinese firm's CSR engagement. For example, a positive relationship exists between the corporate ownership dispersion and firm's CSR engagement for only non-SOEs, but this relationship is even reversed for SOEs. Zhang et al. (2016) find that the percentage of directors with foreign experience in a firm, such as overseas study and working experience, is positively associated with a firm's CSR engagement in China. Firms with more directors with foreign experience would do more on its CSR engagement.

3. Hypothesis Development

Real options theory indicates that uncertainty plays an important role whenever an investment decision is characterized by some degree of irreversibility and the future exercise of managerial discretion has potential (Kogut and Kulatilaka, 2001). Firms cannot fully recover and redeploy their investment at no cost in case of a negative shock when investments are at least partially irreversible. Moreover, the future cash flow generated by the investment may deviate from the managers' initial estimation due to unexpected shocks. A firm has difficulty identifying the NPV of the investment when uncertainty is high. CSR investment is a special long-term investment and consists of three characteristics: some degree of irreversibility, uncertainty over expected benefits in the future, and flexibility about timing (Dixit and Pindyck, 1994). Given the nature of the CSR investment, real options theory predicts that the firm is more likely to delay their investment in CSR until some of the uncertainty is resolved.

Prior works show that firms become more prudent and hold back investment in the face of uncertainty. Rodrik (1991) finds that firms in developing countries delay their investment until policy uncertainty is resolved. Jeong (2002) finds that firms reduce their long-term investment during a period of policy uncertainty. Julio and Yook (2012) note that the average capital expenditure of firms in a presidential election year is appropriately 4.8% lower than other years. They suggest that political uncertainty is an important channel in affecting economic outcomes. Gulen and Ion (2016) document a significant relationship between the capital expenditure of firms and the level of economic policy uncertainty. They argue that firms with a high degree of investment irreversibility or those that heavily rely on government spending are highly sensitive to policy changes. Im et al. (2017) find that firms may hold more cash and reduce their investment when they are in a high uncertainty environment. The investment tendency of firms dropped significantly during two recent uncertainty shocks, namely, the Dot-com Crash and the Global Financial Crisis. Therefore, the following hypothesis is proposed.

H1A: The economic policy uncertainty and a firm's CSR investment have a negative relationship.

Kulatilaka and Perotti (1998) argue that strategic investment that has a preemptive effect results in a high market share and the great convexity of ex-post profits. Thus, even though the value of delaying investment increases with uncertainty, the value of strategic investment increases even more. Although future opportunity can

be contestable and uncertain, the exercise of an option by a firm to invest can enhance its competitive advantage and erode the value of the option to wait by rival firms. Gilbert (1989) argues that the commitment of an irreversible investment can be viewed as a strategic investment with preemptive effects. Examples are R&D for building a technological advantage, advertisement for name recognition, and logistic planning for lowering production cost. Given the nature of irreversibility, CSR investment may have preemptive effects to help firms seize future growth opportunities in the face of high uncertainty.

Moreover, we can view firms as a nexus of explicit contracts (e.g., compensation contracts and debt contracts) and implicit contracts (e.g., employee welfare and customer services) among stakeholders. If one party reneges on implicit or explicit contractual obligations, the other party may bear additional costs in their relationship-specific investment. Thus, firms may use CSR investment to signal their commitment to honoring contracts, especially when asymmetric information exists (Bowen et al., 1995; Deng et al., 2013; Dou et al., 2013; Raman and Shahrur, 2008). Economic policy uncertainty may increase the stakeholders' concern in a firm's ability to fulfill its implicit contractual obligations. Therefore, firms may engage in socially responsible activities to signal its commitment to honoring the contract in the event of uncertainty shocks. Thus, we propose a competing hypothesis as follows.

H1B: Economic policy uncertainty and a firm's CSR investment have a positive relationship.

4. Data and sample selection

We adopt a firm's CSR score to proxy for a firm's CSR investment because most firms do not directly disclose how much they exactly invest in CSR. A higher CSR score indicates more CSR investment. We obtain the CSR scores of Chinese listed firms from the RKS CSR rating, which is widely used for evaluating the CSR engagement of Chinese firms (Marquis and Qian, 2013; Gong et al., 2016; Lau et al., 2016; McGuinness et al., 2017). The Shanghai and Shenzhen stock exchanges mandated a subset of listed Chinese firms to issue CSR reports at the end of 2008; RKS starts to rate the CSR report and assigns a score for each of them from 2008. The CSR score is a weighted average of four aspects, namely, macrocosm (30%), content (45%),

technique (15%), and industry (10%).⁵

We adopt the BBD index of China constructed by Baker et al. (2016) to measure the economic policy uncertainty in China. This economic policy uncertainty index is a weighted average of three types of underlying components: news-based component (one-half), tax component (one-sixth), and forecaster disagreement component (one-third). The BBD index of China is constructed by a scaled frequency count of articles about policy-related economic uncertainty in a leading English-language newspaper in Hong Kong, the South China Morning Post (SCMP). They first collect all SCMP's articles related to at least one term from each of the Chinese economic uncertainty terms, such as China, Chinese, economy, economic, uncertainty, and uncertain. They identify whether the sample articles contain any of the following terms: policy, spending, budget, interest rates, reform, tax, government, Beijing, authorities, central bank, People's Bank of China, regulation, deficit, and WTO. Finally, they divide the numbers of selected articles in a particular month using the total numbers of all SCMP articles in the same month and normalize the resulting series to a mean value of 100 from January 1995 to the most recent by applying a multiplicative factor.⁶ The BBD index is widely used to measure the economic policy uncertainty in China (Christou et al., 2017; Li et al., 2016; Wang et al., 2014).

Figure 1 indicates the trend of the BBD index in China. During the sample period, the maximum value of BBD index is 393 in September 2015, and the minimum value is on 26 May 2011. Economic policy uncertainty shows a decreasing trend since 2009, reaching its lowest level in May 2011. The BBD index exhibits a sharp increase in the second half of 2011, declines again from the beginning of 2013, and remains relatively stable to the middle of 2015. A relatively high uncertainty period is observed in 2012, when the 18th CPC Central Committee meeting is held.

The BBD index is constructed on a monthly basis. In our firm-year level analysis, we aggregate the BBD index up to an annual level by calculating its average value (*PU_mean*), median value (*PU_median*), and geometric average value (*PU_geomean*) in a year. We adopt the annualized BBD index as the proxy for the economic policy uncertainty in China.

⁵ More details about the RKS rating can be found at <http://www.rksratings.com/>.

⁶ A more detailed construction of the BBD index in China can be found on Scott R. Baker's website at www.policyuncertainty.com.

[Insert Figure 1 about here]

We collect financial and ownership data from CSMAR. We follow the literature and exclude firms in the financial industry, which are coded as “J” in the 2012 CSRC industry classification. After merging all of the data, we have a total of 4,733 firm-year observations from 2008 to 2015 in our final sample. All variables are Winsorized at the 1% and 99% levels. Variable definitions are listed in Appendix I.

Table 1 reports the summary statistics for all variables. The average CSR score for our sample firms is approximately 38.59, with a standard deviation of 12.80, which is of a similar magnitude to that of other studies (Zhang et al., 2016; McGuinness et al., 2017). The mean value of PU_mean is 155, which is at the similar magnitude as that of PU_median and PU_geomean. The average age of CEOs is 49 [$\exp(3.89) = 49$] years old, 96% of whom are male. An average firm in the sample has a firm size (log value of total assets) of 22.98 and a Tobin’s Q of 1.69, indicating the presence of large and growing firms in the sample. This finding is consistent with the fact that the subset of listed firms mandated to issue CSR reports is mostly large firms. The average board size is approximately 10 members, and 37% of board members are independent. This finding is consistent with the CSRC requirement about board independence. The government holds approximately 10% of shares in the firm, and other significant shareholders are executives, foreign investors, and institutional investors, with 4%, 0.3%, and 47% of shares, respectively

[Insert Table 1 about here]

5. Regression results

To capture the relationship between economic policy uncertainty and a firm’s CSR investment, we estimate the following regression:

$$CSR_{it} = \alpha + \beta_1 * BBD_t + \gamma * Controls_{it} + Industry\ dummies + Province\ dummies + \varepsilon_{it},$$

where t indexes years, i indexes firms, and ε_{it} is the associated error term. CSR_{it} is a firm’s CSR score obtained from the RKS CSR rating. BBD_t is the annualized economic policy uncertainty index in year t . $Controls_{it}$ is a vector of firm characteristics and country characteristics, which include financial information (e.g., firm size, ROA, leverage, Tobin’s Q, PPE, capital expenditure, sales, and cash holding volatility), corporate governance (e.g., board size, percentage of independent director, analyst

coverage, and institutional ownership), CEO characteristics (e.g., CEO age and CEO gender), ownership information (e.g., government ownership, executive ownership, foreign ownership, top five ownership, and top five concentration), firm risk (e.g., standard deviation of ROA and stock return volatility), and real GDP per capita growth.

Table 2 reports the results of the OLS regression. We find that economic policy uncertainty has a negative effect on a firm's CSR investment. Our finding supports *H1A*, which is consistent with the real option theory that the "option to wait" leads firms to avoid the opportunity costs associated with making an irreversible investment (McDonald and Siegel, 1986). One standard deviation increase in *PU_mean* leads to a 6% standard deviation in the decrease of CSR score. *PU_median* and *PU_geomean* generate similar results. Moreover, a significant and positive relationship is observed between firm size and a firm's CSR investment. Large firms are less likely to face tremendous survival pressure in the short run and can afford the long-term investment in CSR. A large board is associated with a high degree of CSR investment and may be associated with less intensive monitoring due to the free-riding problem (Hermalin & Weisbach, 2003; Boone et al., 2007). Thus, managers face less pressure from a large board to meet a short-term target (Pathan et al., 2007; Coles et al., 2008), which results in long-term investment in intangible assets. Growth firms likely have asymmetric information regarding their growth opportunity (Aboody and Lev, 2000); thus, firms with high Tobin's Q have strong incentives to signal their financial status by engaging in CSR investment (McWilliams and Siegel, 2001). Government ownership can be viewed as an informal guarantee on the firm's sustainability because the government is likely to bail out the firm it controls whenever the firm is in trouble (Jones, 1999; Li and Zhang, 2010). Thus, firms without government ownership have incentives to invest in CSR engagement to send signals to stakeholders regarding firm prospects. The coefficient on executive ownership is positive and statistically significant. Barnea and Rubin (2010) argue that executives who become shareholders could gain utility from a firm with a high CSR rating. We find a negative association between GDP growth and CSR investment. Li and Zhang (2010) argue that CSR investment is negatively related to regional economic development in China.

[Insert Table 2 about here]

We conduct several cross-sectional tests to identify the underlying economic mechanism of our findings. First, the investment decisions of CEOs are "pro-policy" because SOEs are controlled by the government (Wang et al., 2014). Huang et al. (2011)

also suggest that SOEs are likely to invest by policies. Deng et al. (2015) find that the promotions of managers in SOEs are mainly driven by whether they strictly follow the government economic policy. Thus, whenever the government's economic policy changes, SOEs must adjust their investment strategies immediately. Otherwise, managers in SOEs may lose the trust of the government and ruin their career prospects. However, firms cannot fully recover and redeploy their CSR investment at no cost because CSR investment is at least partially irreversible. Thus, one may expect that SOEs have more incentives to delay their investment in CSR until the economic policy uncertainty is resolved. We add interaction terms between the BBD index and a dummy variable that indicates SOEs in our regression in Table 3 to examine the channel of SOEs. We find that the coefficients on the BBD index remain negative and statistically significant. Moreover, the coefficient on the interaction term is negative and statistically significant, which suggests that SOEs have more incentives to hold back their investment in CSR when economic uncertainty is high.

[Insert Table 3 about here]

Second, voluntary CSR disclosure is likely to be part of a firm's strategic plan to communicate with stakeholders given that a firm may use CSR investment to signal its financial status (Dye 1990; Zhang, 2001). However, mandatory CSR disclosure may simply be window dressing or greenwashing, which implies that it may not contain valuable information (SRI, 2010). Economic policy uncertainty may enhance the firm's incentives to communicate with stakeholders owing to strong information asymmetry in the face of uncertainty shocks. Thus, voluntary CSR reporting firms may be active in CSR engagement to signal their stakeholders in response to economic policy uncertainty. However, mandatory CSR reporting firms may delay their investment in CSR in the event of policy uncertainty because they have less incentive to adopt CSR investment to signal their types. To test this conjecture, we add an interaction term between the BBD index and a dummy variable, which indicates mandatory reporting firms in the regression in Table 4. We find that the coefficients on the BBD index are still negative and statistically significant. Moreover, the coefficient on the interaction term is negative and statistically significant, which implies that mandatory reporting firms have more incentives to hold back their investment in CSR when economic uncertainty is high.

[Insert Table 4 about here]

Finally, China has great asymmetry in economic development and the level of marketization. Provinces in the eastern regions, such as Beijing, Shanghai, and Guangdong, have a higher degree of marketization than provinces in the western region, such as Gansu, Qinghai, and Sichuan. High marketization regions are likely to be the pilot regions in Chinese reform and openness. Thus, firms in high marketization regions are likely to be exposed to the global market. Those firms must consider various economic factors, such as domestic and international factors, when they make investment decisions. The effect of domestic economic factors may be cancelled out by that of international economic conditions because of the diversified economic conditions. Thus, firms in high marketization regions are less sensitive to the domestic economic policy uncertainty. We test this conjecture by adding an interaction term between the BBD index and a dummy variable, which indicates the high marketization regions in the regression in Table 5. The coefficients on the BBD index remain negative and statistically significant. Moreover, the coefficient on the interaction term is positive and statistically significant, which shows that firms in high marketization regions are less sensitive to domestic economic policy uncertainty.

[Insert Table 5 about here]

6. Robustness analysis

6.1 Alternative measure for CSR investment

RKS rates the CSR report of a firm in four categories: (1) macrocosm score, which is an evaluation score based on CSR strategic effectiveness, stakeholder participation, and information comparability; (2) content score, which is a rating score based on financial information, employment, human rights, environmental protection, customer relationships, and participation in local social development; (3) technique score, which is an evaluation score based on the clarity, consistency, and presentation formats of the CSR report; and (4) industry score, which is a rating score based on industry-specific CSR investment.⁷ Within the subcategories of RKS CSR rating, macrocosm score and content score are the most relevant parts of a firm's CSR investment. Thus, we extract macrocosm and content scores, the most relevant subcategories, as alternative proxies for a firm's CSR investment in Table 6 when the

⁷ The industry score is only available for several industries. For the firms not in those industries, the CSR rating is calculated as a weighted average of macrocosm (30%), content (50%), and technique (20%).

overall RKS CSR rating is a noisy measure of a firm's CSR investment. We find the same result qualitatively.⁸

[Insert Table 6 about here]

6.2 Alternative measure of economic policy uncertainty

The literature has mainly two proxies for economic policy uncertainty: BBD index (Gulen and Ion, 2016; Husted and Saffar, 2016; Brogaard and Detzel, 2015; Kang et al., 2014; and Pastor and Verobesi, 2013) and national elections (Colak et al., 2017; Jens, 2017; Julio and Yook, 2012; and Biakowski et al., 2008). Bhattacharya et al. (2015) find that the proxies are significantly and positively correlated. The election outcomes are related to economic and political policies. During our sample period, the 18th National Congress of the Communist Party of China, the national election, was held on the 14th November 2012. The political power of the China Communist Party officially transferred from the current general secretary to the next person in this congress. Thus, we define a dummy (*POL_TURNOVER*), which indicates whether it is the national election year. We re-estimate the regression of Table 2 with *POL_TURNOVER* as the proxy for policy uncertainty. We find that the coefficient on *POL_TURNOVER* remains negative and statistically significant.

[Insert Table 7 about here]

6.3 Endogeneity problems

Endogeneity is always challenging in empirical research. We believe that economic policy uncertainty is most likely to be exogenous to a firm's investment decisions, though we still perform a battery of additional tests to alleviate the endogeneity concerns.

6.3.1 Omitted variable bias

McGuire et al. (1988) find that a firm's CSR investment is highly related to its previous financial performance, which is measured by stock market returns and accounting-based measures. Wang et al. (2014) further suggest that a firm's CSR

⁸ The observations in regressions using macrocosm score and content score as dependent variables are less than those in regressions that use the overall CSR rating as a dependent variable. The reason is that RKS does not report the macrocosm score and content score for every CSR rating.

investment is positively related to a firm's return to invested capitals. Moreover, Baker et al. (2016) suggest that government turnover may induce considerable macroeconomic uncertainty after the turnover year. Thus, firm-specific and macroeconomic risks may be correlated with corporate CSR investment and macroeconomic uncertainty. We employ the standard deviation of ROA (*SDROA*) and stock return volatility (*SDRET*) to control for firm-specific risk and minimize the omitted variable bias. We likewise control for macroeconomic uncertainty using a dummy variable (*XJP*) that measures the post period of the 18th National Congress of the Communist Party of China. We re-estimate our regression in Table 8, but our findings are not changed.

[Insert Table 8 about here]

6.3.2 Measurement error bias

The BBD index may capture economic policy uncertainty and non-policy-related economic uncertainty (Gulen and Ion, 2016; Wang et al., 2014; Tian and Ye, 2016). The economies of China and the US are tightly interrelated as the two largest economies in the world. For example, the trading data issued by the Office of the United States Trade Representative reveal that China is currently the largest goods trading partner of the US, with \$578.6 billion in total (two way) goods trade in 2016. Moreover, China holds approximately USD \$1,270 billion US Treasury securities, which is around one-fifth of the total US treasury securities in 2015. We expect that numerous shocks that affect economic uncertainty in China also influence US economic uncertainty, and the BBD index measures a part of non-policy related economic uncertainty. We can follow Gulen and Ion (2016) to remove the confounding part of the BBD index by extracting the index component in China that is orthogonal to the BBD index in the US. We apply the residual part to proxy for the economic policy uncertainty and re-estimate our regression. Table 9 shows that the new proxy for the economic policy uncertainty still has a negative and statistically significant coefficient.⁹

[Insert Table 9 about here]

⁹ We do not report the first-stage regression with the BBD index in China as dependent variable and the BBD index in US as the independent variable to save space. The coefficient on the BBD index in the US is positive and statistically significant at the 1% level. Given that the BBD index may capture regional non-policy related uncertainty, we conduct a similar test using the BBD index in Japan and the BBD index in Korea. Our findings are not altered.

6.3.3 Reverse causality bias

Demsetz (1973) suggests that large corporations, especially companies in the monopoly industry, are strongly motivated to lobby policy makers to favor themselves. Thus, causation may run from a firm's CSR investment to economic policy uncertainty, but not vice versa. We test the reverse causality by adding an interaction term between the BBD index and a dummy variable (*LARGE*), which indicates that the firm size is above the sample median in the regression. If a reverse causality issue exists, the coefficient on the interaction term will be negative and statistically significant. However, no such pattern is found, implying that reverse causality bias is unlikely in our results.

[Insert Table 10 about here]

6.3.4 Instrumental variables regression

Finally, we employ an IV estimation technique to minimize potential endogeneity problems. Prior work suggests that political election and economic policy uncertainty are highly correlated (Julio and Yook, 2012; Bhattacharya et al., 2015; Jens, 2017;). The only nationwide political election in our sample period is the 18th National Congress of the Communist Party of China in 2012, when the China Communist Party selected their new general secretary. President Xi Jinping officially took office after the election. We apply the dummy variable (*POL_TURNOVER*) to indicate the election year as our instrument variable in a 2SLS regression. The coefficient estimates on *POL_TURNOVER* in the first-stage regressions are positive and highly significant, as predicted. The second-stage regressions reveal that the coefficient on the predicted value of the BBD index is negative and statistically significant, which is consistent with our findings in OLS regression.

[Insert Table 11 about here]

7 Conclusion

This study examines the effect of economic policy uncertainty on a firm's CSR investment. A firm's CSR score is obtained from the RKS CSR rating to measure a firm's CSR investment. We adopt the BBD index from Baker et al. (2016) to proxy for economic policy uncertainty. First, we find a significantly negative relationship between economic policy uncertainty and a firm's CSR investment from 2008 to 2015.

Second, we show that the negative association between policy uncertainty and a firm's CSR investment is more significant in SOEs and mandatory CSR reporting firms but less significant in firms located in high marketization regions. Moreover, our findings are robust to a variety of model specifications and endogeneity problems. Overall, our empirical findings support real options theory, which indicate that firms delay their investment until uncertainty is resolved.

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Table1 Summary statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
CSR	4,541	38.59	12.80	18.34	79.60
PU_mean	4,733	155.4	44.48	98.89	244.4
PU_median	4,733	142.2	43.74	99.61	239.4
PU_geomean	4,733	142.8	43.76	94.64	237.9
CEOAGE	4,514	3.891	0.122	3.555	4.170
TOBINQ	4,482	1.698	1.576	0.069	8.472
INSTOWN	4,733	0.434	0.258	0.000	0.921
GOVOWN	4,578	0.099	0.191	0.000	0.736
RGDPGROWTH	4,733	0.084	0.012	0.069	0.104
SIZE	4,579	22.98	1.743	20.03	28.93
BOARDSIZE	4,556	9.620	2.319	5.000	18.00
INDEP%	4,556	0.371	0.056	0.286	0.571
CEOGENDER	4,528	0.956	0.205	0.000	1.000
LEV	4,579	0.501	0.213	0.061	0.945
ROA	4,579	0.046	0.051	-0.112	0.212
CAPEX_AT	4,579	0.058	0.051	0.0003	0.235
PPE_AT	4,579	0.252	0.189	0.002	0.760
QFII	4,733	0.003	0.012	0.000	0.104
EXEOWN	4,578	0.039	0.116	0.000	0.580
GOVOWN	4,746	0.092	0.187	0.000	0.863
INSTOWN	4,541	0.479	0.235	0.000	0.925
ANALYST	4,733	12.39	11.87	0.000	49.46
TOP5OWN	4,578	0.557	0.173	0.186	0.946
TOP5CON	4,578	0.196	0.135	0.012	0.612
SALES	4,579	0.664	0.470	0.027	2.438
CASHSD	4,638	0.053	0.039	0.008	0.231

Table 2 CSR Investment and Economic Policy Uncertainty

Variable definition is listed in Appendix I. We adopt the robust standard errors clustered in the firm level in the regression. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

VARIABLES	(1) Model	(2) Model	(3) Model
PU_mean	-0.016*** (-7.563)		
PU_median		-0.014*** (-6.125)	
PU_geomean			-0.019*** (-8.498)
SIZE	3.554*** (9.041)	3.536*** (8.923)	3.520*** (8.926)
BOARDSIZE	0.475*** (2.587)	0.478*** (2.608)	0.478*** (2.605)
INDEP%	3.507 (0.668)	3.611 (0.688)	3.524 (0.672)
CEOAGE	1.298 (0.499)	1.381 (0.531)	1.235 (0.475)
CEOGENDER	-1.813 (-1.286)	-1.804 (-1.279)	-1.805 (-1.282)
LEV	-2.795 (-1.359)	-2.811 (-1.366)	-2.747 (-1.336)
ROA	-7.076 (-1.061)	-6.930 (-1.039)	-7.179 (-1.078)
TOBINQ	0.576*** (2.915)	0.553*** (2.737)	0.563*** (2.850)
PPT_AT	0.622 (0.280)	0.604 (0.271)	0.623 (0.280)
CAPEX_AT	0.858 (0.159)	0.762 (0.141)	1.024 (0.190)
GOVOWN	-4.457*** (-2.816)	-4.504*** (-2.845)	-4.261*** (-2.682)
QFII	-16.944 (-0.630)	-16.946 (-0.631)	-16.650 (-0.619)
EXEOWN	5.236** (2.130)	5.393** (2.197)	5.247** (2.136)
INSTOWN	0.804 (0.668)	0.891 (0.742)	0.876 (0.730)
ANALYST	0.016 (0.466)	0.017 (0.495)	0.018 (0.540)
TOP5OWN	15.570*** (3.839)	15.527*** (3.829)	15.504*** (3.824)
CON5OWN	-9.504* (-1.827)	-9.431* (-1.812)	-9.413* (-1.809)
SALES	1.358* (1.812)	1.360* (1.815)	1.363* (1.820)

CASHSD	-34.971*** (-3.996)	-34.992*** (-3.996)	-35.088*** (-4.006)
RGDPGROWTH	-235.913*** (-12.548)	-223.717*** (-12.371)	-242.309*** (-12.616)
Constant	-39.791*** (-3.210)	-41.267*** (-3.331)	-38.174*** (-3.071)
Industry dummy	Yes	Yes	Yes
Province dummy	Yes	Yes	Yes
Observations	4,179	4,179	4,179
R-squared	0.474	0.474	0.475

**Table 3 CSR Investment and Economic Policy Uncertainty in SOEs
versus non-SOEs**

Variable definition is listed in Appendix I. We adopt the robust standard errors clustered in the firm level in the regression. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

VARIABLES	(1) CSR	(2) CSR	(3) CSR
PU_mean	-0.012*** (-4.266)		
PU_mean*SOEs	-0.006* (-1.804)		
PU_median		-0.009*** (-2.757)	
PU_median*SOEs		-0.008** (-2.144)	
PU_geomean			-0.015*** (-4.993)
PU_geomean*SOEs			-0.006* (-1.933)
SOEs	1.317 (1.365)	1.492 (1.577)	1.284 (1.364)
SIZE	3.546*** (8.982)	3.530*** (8.870)	3.513*** (8.869)
BOARDSIZE	0.468** (2.528)	0.472** (2.548)	0.472** (2.547)
INDEP%	3.523 (0.671)	3.632 (0.692)	3.539 (0.675)
CEOAGE	1.162 (0.450)	1.254 (0.486)	1.103 (0.427)
CEOGENDER	-1.828 (-1.301)	-1.811 (-1.288)	-1.821 (-1.297)
LEV	-2.757 (-1.341)	-2.752 (-1.339)	-2.712 (-1.320)
ROA	-6.756 (-1.018)	-6.625 (-0.997)	-6.892 (-1.039)
TOBINQ	0.592*** (3.008)	0.573*** (2.851)	0.579*** (2.945)
PPT_AT	0.606 (0.273)	0.596 (0.269)	0.605 (0.273)
CAPEX_AT	0.981 (0.181)	0.866 (0.159)	1.153 (0.213)
GOVOWN	-4.725*** (-2.938)	-4.751*** (-2.956)	-4.507*** (-2.795)
QFII	-16.429 (-0.615)	-16.538 (-0.620)	-16.157 (-0.605)
EXEOWN	5.488** (2.219)	5.607** (2.269)	5.500** (2.227)

INSTOWN	0.663 (0.540)	0.744 (0.607)	0.750 (0.614)
ANALYST	0.017 (0.494)	0.018 (0.530)	0.019 (0.565)
TOP5OWN	15.658*** (3.849)	15.592*** (3.834)	15.580*** (3.830)
CON5OWN	-9.650* (-1.841)	-9.569* (-1.825)	-9.552* (-1.822)
SALES	1.358* (1.808)	1.362* (1.813)	1.363* (1.817)
CASHSD	-35.080*** (-4.016)	-35.097*** (-4.016)	-35.198*** (-4.026)
RGDPGROWTH	-236.789*** (-12.506)	-224.727*** (-12.342)	-243.106*** (-12.574)
Constant	-39.696*** (-3.202)	-41.368*** (-3.337)	-38.097*** (-3.062)
Industry dummy	Yes	Yes	Yes
Province dummy	Yes	Yes	Yes
Observations	4,179	4,179	4,179
R-squared	0.474	0.474	0.475

**Table 4 CSR Investment and Economic Policy Uncertainty in
Mandatory CSR Reporting Firms versus Voluntary CSR Reporting**

Firms

Variable definition is listed in Appendix I. We adopt the robust standard errors clustered in the firm level in the regression. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

VARIABLES	(1) CSR	(2) CSR	(3) CSR
PU_mean	-0.010*** (-3.271)		
PU_mean*MCSR	-0.008** (-2.076)		
PU_median		-0.008** (-2.273)	
PU_median* MCSR		-0.009** (-2.163)	
PU_geomean			-0.013*** (-3.888)
PU_geomean* MCSR			-0.009** (-2.351)
MCSR	-0.211 (-0.235)	-0.190 (-0.218)	-0.165 (-0.191)
SIZE	3.719*** (9.166)	3.704*** (9.055)	3.684*** (9.043)
BOARDSIZE	0.469** (2.553)	0.473** (2.575)	0.472** (2.570)
INDEP%	3.228 (0.621)	3.321 (0.639)	3.248 (0.626)
CEOAGE	1.371 (0.528)	1.451 (0.559)	1.310 (0.505)
CEOGENDER	-1.742 (-1.220)	-1.732 (-1.213)	-1.736 (-1.219)
LEV	-2.911 (-1.422)	-2.915 (-1.424)	-2.867 (-1.401)
ROA	-6.838 (-1.032)	-6.838 (-1.031)	-6.963 (-1.051)
TOBINQ	0.567*** (2.903)	0.549*** (2.749)	0.555*** (2.842)
PPT_AT	0.468 (0.213)	0.465 (0.211)	0.474 (0.215)
CAPEX_AT	0.238 (0.044)	0.088 (0.016)	0.396 (0.074)
GOVOWN	-4.512*** (-2.849)	-4.560*** (-2.880)	-4.303*** (-2.705)
QFII	-17.838 (-0.659)	-17.784 (-0.657)	-17.510 (-0.647)

EXEOWN	4.322*	4.421*	4.368*
	(1.753)	(1.793)	(1.774)
INSTOWN	1.049	1.141	1.126
	(0.866)	(0.943)	(0.932)
ANALYST	0.019	0.020	0.021
	(0.550)	(0.594)	(0.617)
TOP5OWN	14.324***	14.233***	14.276***
	(3.482)	(3.461)	(3.472)
CON5OWN	-9.118*	-9.023*	-9.039*
	(-1.754)	(-1.735)	(-1.738)
SALES	1.390*	1.392*	1.394*
	(1.853)	(1.855)	(1.860)
CASHSD	-33.365***	-33.354***	-33.490***
	(-3.756)	(-3.752)	(-3.766)
RGDPGROWTH	-227.470***	-215.732***	-233.535***
	(-11.878)	(-11.730)	(-11.929)
Constant	-43.775***	-45.258***	-42.213***
	(-3.484)	(-3.604)	(-3.348)
Industry dummy	Yes	Yes	Yes
Province dummy	Yes	Yes	Yes
Observations	4,179	4,179	4,179
R-squared	0.476	0.476	0.477

**Table 5 CSR Investment and Economic Policy Uncertainty under
different degree of Marketization**

Variable definition is listed in Appendix I. We adopt the robust standard errors clustered in the firm level in the regression. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

VARIABLES	(1) CSR	(2) CSR	(3) CSR
PU_mean	-0.018*** (-7.540)		
PU_mean* marketization	0.008** (2.235)		
PU_median		-0.016*** (-6.342)	
PU_median* marketization		0.010** (2.576)	
PU_geomean			-0.021*** (-8.491)
PU_geomean* marketization			0.009** (2.464)
MARKETIZATION	0.030 (0.011)	-0.120 (-0.043)	0.016 (0.006)
SIZE	3.553*** (9.038)	3.534*** (8.918)	3.519*** (8.922)
BOARDSIZE	0.475*** (2.589)	0.479*** (2.611)	0.478*** (2.606)
INDEP%	3.480 (0.663)	3.576 (0.681)	3.493 (0.666)
CEOAGE	1.300 (0.500)	1.390 (0.535)	1.235 (0.475)
CEOGENDER	-1.801 (-1.277)	-1.793 (-1.271)	-1.792 (-1.272)
LEV	-2.795 (-1.359)	-2.811 (-1.367)	-2.744 (-1.335)
ROA	-7.028 (-1.054)	-6.844 (-1.026)	-7.141 (-1.072)
TOBINQ	0.575*** (2.906)	0.550*** (2.721)	0.562*** (2.841)
PPT_AT	0.623 (0.280)	0.606 (0.272)	0.622 (0.280)
CAPEX_AT	0.849 (0.157)	0.762 (0.141)	1.039 (0.192)
GOVOWN	-4.464*** (-2.819)	-4.516*** (-2.852)	-4.266*** (-2.685)
QFII	-16.958 (-0.631)	-16.830 (-0.626)	-16.623 (-0.618)
EXEOWN	5.216** (2.121)	5.361** (2.183)	5.222** (2.125)

INSTOWN	0.818 (0.680)	0.907 (0.755)	0.890 (0.742)
ANALYST	0.016 (0.468)	0.017 (0.495)	0.018 (0.543)
TOP5OWN	15.560*** (3.837)	15.512*** (3.825)	15.490*** (3.821)
CON5OWN	-9.493* (-1.825)	-9.408* (-1.808)	-9.399* (-1.807)
SALES	1.357* (1.811)	1.357* (1.810)	1.363* (1.820)
CASHSD	-34.990*** (-3.998)	-35.026*** (-4.000)	-35.100*** (-4.007)
RGDPGROWTH	-236.267*** (-12.558)	-224.012*** (-12.377)	-242.713*** (-12.627)
Constant	-39.452*** (-3.179)	-40.899*** (-3.299)	-37.819*** (-3.040)
Industry dummy	Yes	Yes	Yes
Province dummy	Yes	Yes	Yes
Observations	4,179	4,179	4,179
R-squared	0.474	0.474	0.475

Table 6 CSR Investment and Economic Policy Uncertainty

Using Alternative Measure for CSR investment

Variable definition is listed in Appendix I. We adopt the robust standard errors clustered in the firm level in the regression. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

VARIABLES	(1) Macrocsm	(2) Content
uncertain_mean	-0.011*** (-8.900)	-0.005*** (-2.906)
size	1.202*** (8.476)	1.382*** (7.515)
board	0.158** (2.471)	0.283*** (3.258)
ind	1.909 (0.977)	1.240 (0.477)
age	0.208 (0.229)	0.533 (0.423)
gender	-0.781 (-1.585)	-1.058 (-1.513)
lev	-1.648** (-2.203)	-1.606 (-1.633)
roa	-4.909* (-1.959)	-2.248 (-0.678)
tobinq	0.208*** (2.845)	0.056 (0.547)
ppe	-0.342 (-0.425)	0.502 (0.479)
cap	0.582 (0.272)	1.614 (0.544)
gov	-1.543** (-2.376)	-0.332 (-0.378)
qfii	-3.252 (-0.362)	-2.817 (-0.207)
manage	2.876*** (3.153)	1.457 (1.133)
institute	0.352 (0.772)	0.989 (1.604)
analyst	-0.010 (-0.788)	0.034** (2.037)
top5	5.435*** (3.873)	6.601*** (3.502)
con5	-4.028** (-2.279)	-3.634 (-1.502)
sale	0.435 (1.521)	0.918** (2.442)
cash_sd	-9.247***	-19.685***

	(-2.915)	(-4.482)
realgdpgrowth	-147.893***	-37.520***
	(-22.184)	(-4.175)
Constant	-4.318	-20.781***
	(-0.946)	(-3.415)
Industry fixed effect	Yes	Yes
Province fixed effect	Yes	Yes
Observations	3,316	3,315
R-squared	0.459	0.407

Table 7 CSR Investment and Economic Policy Uncertainty

Using Alternative Measure for Policy Uncertainty

Variable definition is listed in Appendix I. We adopt the robust standard errors clustered in the firm level in the regression. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

VARIABLES	(1) CSR
POL_TURNOVER	-1.258*** (-4.218)
SIZE	3.566*** (8.979)
BOARDSIZE	0.478*** (2.605)
INDEP%	3.578 (0.682)
CEOAGE	1.468 (0.565)
CEOGENDER	-1.807 (-1.280)
LEV	-2.711 (-1.316)
ROA	-7.369 (-1.103)
TOBINQ	0.612*** (3.060)
PPT_AT	0.682 (0.307)
CAPEX_AT	0.093 (0.017)
GOVOWN	-4.610*** (-2.916)
QFII	-17.028 (-0.635)
EXEOWN	5.511** (2.244)
INSTOWN	0.993 (0.824)
ANALYST	0.015 (0.451)
TOP5OWN	15.424*** (3.803)
CON5OWN	-9.369* (-1.799)
SALES	1.323* (1.765)
CASHSD	-34.934*** (-3.992)

RGDPGROWTH	-222.430***
	(-12.046)
Constant	-44.277***
	(-3.610)
Industry dummy	Yes
Province dummy	Yes
Observations	4,179
R-squared	0.472

Table 8 CSR Investment and Economic Policy Uncertainty with**Additional Controls for Firm Risk**

Variable definition is listed in Appendix I. We adopt the robust standard errors clustered in the firm level in the regression. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

VARIABLES	(1) CSR	(2) CSR	(3) CSR
PU_mean	-0.014*** (-5.963)		
PU_median		-0.015*** (-6.165)	
PU_geomean			-0.017*** (-6.814)
SIZE	3.422*** (8.475)	3.384*** (8.324)	3.395*** (8.387)
BOARDSIZE	0.483** (2.555)	0.485** (2.564)	0.485** (2.569)
INDEP%	4.004 (0.763)	4.050 (0.771)	3.977 (0.758)
CEOAGE	0.859 (0.323)	0.851 (0.320)	0.773 (0.291)
CEOGENDER	-2.133 (-1.456)	-2.119 (-1.447)	-2.127 (-1.455)
LEV	-2.085 (-0.999)	-2.027 (-0.971)	-2.060 (-0.988)
ROA	-7.968 (-1.148)	-8.010 (-1.154)	-7.923 (-1.141)
TOBINQ	0.681*** (3.044)	0.663*** (2.951)	0.663*** (2.969)
PPT_AT	0.713 (0.313)	0.671 (0.295)	0.725 (0.319)
CAPEX_AT	1.198 (0.214)	1.357 (0.242)	1.384 (0.247)
GOVOWN	-3.616** (-2.105)	-3.535** (-2.055)	-3.430** (-1.990)
QFII	-15.783 (-0.579)	-15.896 (-0.582)	-15.369 (-0.564)
EXEOWN	4.256 (1.387)	4.301 (1.402)	4.199 (1.368)
INSTOWN	0.481 (0.362)	0.508 (0.383)	0.518 (0.391)
ANALYST	0.020 (0.573)	0.022 (0.620)	0.023 (0.639)
TOP5OWN	16.572*** (3.888)	16.548*** (3.883)	16.541*** (3.880)
CON5OWN	-10.585** (-1.990)	-10.545** (-1.982)	-10.513** (-1.976)

SALES	1.099 (1.481)	1.106 (1.491)	1.103 (1.487)
CASHSD	-37.794*** (-4.177)	-37.713*** (-4.167)	-37.997*** (-4.195)
RGDPGROWTH	-248.097*** (-7.692)	-230.609*** (-7.322)	-228.423*** (-7.384)
SDROA	3.028 (0.241)	3.111 (0.248)	3.119 (0.249)
SDRET	-72.359*** (-3.800)	-82.362*** (-4.403)	-66.656*** (-3.453)
XJP	0.140 (0.220)	0.396 (0.620)	0.781 (1.211)
Constant	-33.176** (-2.496)	-33.733** (-2.538)	-34.274*** (-2.601)
Industry dummy	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes
Observations	3,953	3,953	3,953
R-squared	0.483	0.484	0.484

**Table 9 CSR Investment and Economic Policy Uncertainty
Controlling for Common Economic Shocks Between US and
China**

Variable definition is listed in Appendix I. We adopt the robust standard errors clustered in the firm level in the regression. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

VARIABLES	(1) CSR	(2) CSR	(3) CSR
PU_meanres	-0.028*** (-7.572)		
PU_medianres		-0.029*** (-6.792)	
PU_geomeanres			-0.029*** (-8.309)
SIZE	3.665*** (9.439)	3.670*** (9.464)	3.674*** (9.474)
BOARDSIZE	0.468** (2.545)	0.469** (2.551)	0.468** (2.549)
INDEP%	3.234 (0.618)	3.281 (0.626)	3.266 (0.624)
CEOAGE	1.546 (0.594)	1.577 (0.606)	1.585 (0.609)
CEOGENDER	-1.866 (-1.327)	-1.866 (-1.328)	-1.868 (-1.331)
LEV	-2.698 (-1.313)	-2.719 (-1.324)	-2.723 (-1.326)
ROA	-7.840 (-1.175)	-7.803 (-1.170)	-7.893 (-1.183)
TOBINQ	0.701*** (3.632)	0.701*** (3.647)	0.705*** (3.657)
PPT_AT	0.769 (0.347)	0.752 (0.339)	0.747 (0.338)
CAPEX_AT	-0.679 (-0.127)	-0.675 (-0.126)	-0.727 (-0.136)
GOVOWN	-4.816*** (-3.069)	-4.824*** (-3.079)	-4.838*** (-3.088)
QFII	-17.606 (-0.654)	-17.630 (-0.654)	-17.743 (-0.659)
EXEOWN	5.520** (2.246)	5.523** (2.249)	5.553** (2.261)
INSTOWN	0.937 (0.780)	0.940 (0.782)	0.951 (0.793)
ANALYST	0.010 (0.285)	0.009 (0.281)	0.010 (0.286)
TOP5OWN	15.272*** (3.763)	15.250*** (3.754)	15.220*** (3.751)

CON5OWN	-9.439*	-9.397*	-9.374*
	(-1.813)	(-1.804)	(-1.800)
SALES	1.308*	1.315*	1.315*
	(1.749)	(1.758)	(1.759)
CASHSD	-34.683***	-34.814***	-34.797***
	(-3.972)	(-3.982)	(-3.980)
RGDPGROWTH	-214.384***	-213.878***	-214.325***
	(-12.554)	(-12.503)	(-12.540)
Constant	-47.378***	-47.650***	-47.739***
	(-3.927)	(-3.955)	(-3.962)
Industry dummy	Yes	Yes	Yes
Province dummy	Yes	Yes	Yes
Observations	4,179	4,179	4,179
R-squared	0.475	0.474	0.476

Table 10 Reverse Causality Test

Variable definition is listed in Appendix I. We adopt the robust standard errors clustered in the firm level in the regression. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

VARIABLES	(1) CSR	(2) CSR	(3) CSR
PU_mean	-0.025*** (-8.320)		
PU_mean*LARGE	0.004 (1.138)		
PU_median		-0.024*** (-7.531)	
PU_median*LARGE		0.002 (0.541)	
PU_geomean			-0.028*** (-9.410)
PU_geomean*LARGE			0.004 (1.009)
LARGE	1.251 (1.286)	1.548* (1.659)	1.313 (1.384)
BOARDSIZE	0.743*** (4.062)	0.747*** (4.086)	0.744*** (4.071)
INDEP%	11.066** (2.000)	11.155** (2.015)	10.989** (1.989)
CEOAGE	4.968* (1.912)	5.015* (1.931)	4.832* (1.860)
CEOGENDER	-1.514 (-1.046)	-1.500 (-1.038)	-1.507 (-1.044)
LEV	4.333** (2.189)	4.213** (2.127)	4.338** (2.196)
ROA	-2.820 (-0.410)	-2.548 (-0.371)	-2.991 (-0.436)
TOBINQ	-0.248 (-1.214)	-0.297 (-1.425)	-0.260 (-1.273)
PPT_AT	0.971 (0.411)	0.903 (0.382)	0.965 (0.409)
CAPEX_AT	-2.547 (-0.419)	-2.418 (-0.398)	-2.251 (-0.372)
GOVOWN	-4.259*** (-2.608)	-4.295*** (-2.632)	-3.982*** (-2.435)
QFII	-3.764 (-0.133)	-3.950 (-0.140)	-3.566 (-0.126)
EXEOWN	2.753 (1.095)	2.993 (1.192)	2.774 (1.105)
INSTOWN	0.604 (0.492)	0.733 (0.597)	0.703 (0.574)
ANALYST	0.158*** (4.205)	0.159*** (4.237)	0.160*** (4.262)

TOP5OWN	17.742*** (4.175)	17.677*** (4.160)	17.631*** (4.151)
CON5OWN	-5.040 (-0.920)	-4.971 (-0.908)	-4.960 (-0.906)
SALES	1.198 (1.533)	1.216 (1.555)	1.210 (1.550)
CASHSD	-52.825*** (-5.803)	-52.625*** (-5.774)	-52.707*** (-5.786)
RGDPGROWTH	-317.038*** (-17.842)	-301.596*** (-17.716)	-325.610*** (-17.978)
Constant	21.279* (1.732)	19.361 (1.580)	22.719* (1.848)
Industry dummy	Yes	Yes	Yes
Province dummy	Yes	Yes	Yes
Observations	4,179	4,179	4,179
R-squared	0.428	0.428	0.430

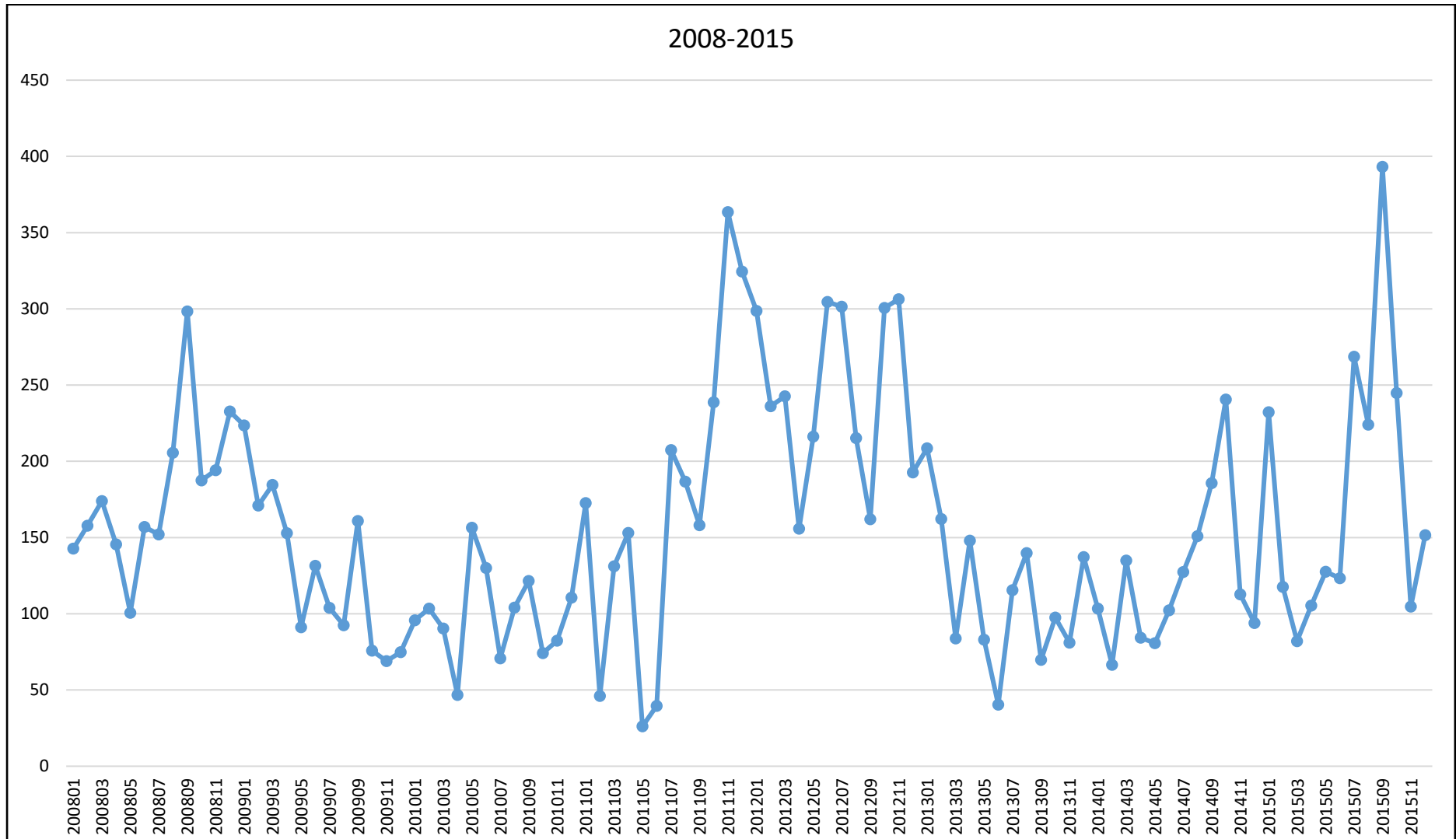
Table 11 CSR Investment and Economic Policy Uncertainty in 2SLS regression

Variable definition is listed in Appendix I. We adopt the robust standard errors clustered in the firm level in the regression. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

VARIABLES	(1)		(2)		(3)	
	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
PU_mean		-0.013*** (-4.253)				
PU_median				-0.011*** (-4.253)		
PU_geomean						-0.012*** (-4.254)
SIZE	0.588* (1.776)	3.574*** (9.091)	-0.607** (-2.303)	3.559*** (9.021)	0.159 (0.501)	3.568*** (9.066)
BOARDSIZE	-0.357** (-2.547)	0.473*** (2.599)	-0.153 (-1.357)	0.476*** (2.615)	-0.324** (-2.442)	0.474*** (2.604)
INDEP%	-8.121 (-1.364)	3.475 (0.668)	-1.943 (-0.424)	3.556 (0.683)	-10.086* (-1.859)	3.460 (0.665)
CEOAGE	-10.146*** (-3.929)	1.340 (0.520)	-5.610*** (-2.737)	1.406 (0.545)	-11.378*** (-4.731)	1.335 (0.518)
CEOGENDER	-1.013 (-0.721)	-1.820 (-1.301)	-0.521 (-0.473)	-1.813 (-1.296)	-1.194 (-0.965)	-1.821 (-1.302)
LEV	-4.564** (-2.088)	-2.769 (-1.357)	-6.267*** (-3.531)	-2.781 (-1.363)	-0.529 (-0.261)	-2.718 (-1.332)
ROA	16.787* (1.809)	-7.157 (-1.082)	29.292*** (3.937)	-7.044 (-1.064)	6.947 (0.837)	-7.287 (-1.101)
TOBINQ	-0.964*** (-3.057)	0.600*** (3.007)	-2.739*** (-10.412)	0.582*** (2.891)	-0.116 (-0.420)	0.611*** (3.077)
PPT_AT	-2.009	0.657	-3.537**	0.643	0.272	0.685

	(-1.100)	(0.298)	(-2.353)	(0.291)	(0.156)	(0.311)
CAPEX_AT	40.182***	0.601	38.426***	0.519	34.250***	0.495
	(4.790)	(0.112)	(5.609)	(0.097)	(4.461)	(0.092)
GOVOWN	8.128***	-4.508***	5.834***	-4.546***	15.677***	-4.426***
	(3.545)	(-2.872)	(3.154)	(-2.898)	(6.915)	(-2.818)
QFII	6.358	-16.948	7.036	-16.950	22.199	-16.768
	(0.304)	(-0.636)	(0.431)	(-0.636)	(1.093)	(-0.630)
EXEOWN	-20.172***	5.256**	-11.779***	5.380**	-19.792***	5.279**
	(-6.786)	(2.157)	(-4.698)	(2.209)	(-8.050)	(2.167)
INSTOWN	-13.926***	0.817	-9.618***	0.887	-10.205***	0.873
	(-6.269)	(0.686)	(-5.382)	(0.743)	(-6.048)	(0.733)
ANALYST	-0.094**	0.014	-0.032	0.015	-0.068*	0.015
	(-2.339)	(0.422)	(-1.011)	(0.445)	(-1.864)	(0.433)
TOP5OWN	9.813***	15.548***	8.077***	15.514***	5.488**	15.488***
	(3.416)	(3.868)	(3.534)	(3.858)	(1.977)	(3.852)
CON5OWN	-11.642***	-9.516*	-8.136***	-9.460*	-8.613**	-9.470*
	(-3.346)	(-1.844)	(-2.985)	(-1.832)	(-2.479)	(-1.834)
SALES	1.878***	1.347*	2.298***	1.348*	1.548**	1.341*
	(2.616)	(1.812)	(4.010)	(1.814)	(2.108)	(1.805)
CASHSD	-0.893	-34.945***	-2.457	-34.961***	-5.408	-34.997***
	(-0.146)	(-4.028)	(-0.499)	(-4.028)	(-0.852)	(-4.033)
RGDPGROWTH	-652.316***	-230.669***	133.571***	-220.949***	-679.467***	-230.396***
	(-29.473)	(-11.820)	(6.973)	(-12.206)	(-35.426)	(-11.832)
POL_TURNOVER	99.585***		113.468***		107.282***	
	(274.738)		(393.220)		(329.429)	
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Province dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,179	4,179	4,179	4,179	4,179	4,179
R-squared	0.647	0.392	0.763	0.391	0.764	0.393

Figure 1 The trend of Economic Policy Uncertainty in China



APPENDIX I

Appendix I: Variable definition		
Variables	Definition	Data Source
CSR	The total CSR score of the public firm obtained from the RKS CSR rating	RKS CSR rating
PU_mean	The simple average of the Economic Policy Uncertainty Index in a calendar year;	Baker, Bloom, and Davis's website;
PU_median	The median of the Economic Policy Uncertainty Index in a calendar year;	
PU_geomean	The geometric average of the Economic Policy Uncertainty Index in a calendar year;	
RGDPGROWTH	The log of real GDP growth for China;	CSMAR
SIZE	The log of total assets;	CSMAR
BOARDSIZE	The board size of the firm;	CSMAR
INDEP%	The percentage of the independent director in the board;	CSMAR
CEOAGE	The log value of CEO age	CSMAR
CEOGENDER	A dummy variable defined as 1 if the firm's CEO is male, otherwise is 0;	CSMAR
LEV	The ratio of total debt over total asset;	CSMAR
ROA	The return on assets;	CSMAR
TOBINQ	The firm's Tobin's Q value;	CSMAR
PPE_AT	The value of a firm's plant, property, and equipment over total asset;	CSMAR
CAPEX_AT	A firm's capital expenditure divided by total asset;	CSMAR
GOVOWN	The shares owned by the government divided by the total number of shares outstanding;	CSMAR
QFII	The shares owned by the foreign investors divided by the total number of shares outstanding;	CSMAR
EXEOWN	The shares owned by the Executives divided by the total number of shares outstanding;	CSMAR
INSTOWN	Total number of shares held by institution over the total number outstanding shares of the firm;	CSMAR
ANALYST	The number of analysts following the firm;	CSMAR
TOP5OWN	The total number of shares held by the top 5 shareholders divided by the total number of shares outstanding;	CSMAR

TOP5CON	The Herfindahl-Hirschmann Index of shares held by the top 5 shareholders;	CSMAR
SALES	The firm's total sales divided by the firm's total assets;	CSMAR
CASHSD	The Standard deviation of a firm's operating cash flow divided by the firm's total assets.	CSMAR
POL_TURNOVER	A dummy variable defined as 1 for the election year of 2012, otherwise zero.	
LARGE	A dummy variable defined as 1 for firm size is above the sample median, otherwise zero.	CSMAR
PU_meanres	The residual value of PU_mean (China) regress on the PU_mean (US) and all other independent variables	Bloom et al. (2016)
PU_medianres	The residual value of China PU_median regress on the US PU_median and all other independent variables	Bloom et al. (2016)
PU_geomeanres	The residual value of China PU_geomean regress on the US PU_geomean and all other independent variables	Bloom et al. (2016)
SDROA	Standard deviation of ROA	CSMAR
SDRET	Standard deviation of return	CSMAR
XJP	A dummy variable defined as 1 for the year after 2012.	
MCSR	A dummy variable defined as 1 for mandatory CSR report, otherwise zero.	RKS CSR rating
MKT	A dummy variable defined as 1 for the 4 th quantile of average marketization index, otherwise zero.	Wang et al. (2016)
SOEs	A dummy variable defined as 1 for SOEs, otherwise zero.	CSMAR
POL_TURNOVER	A dummy variable defined as 1 for the year 2012, otherwise zero.	