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Corporate philanthropy, public awareness, and the cost of equity capital: Evidence from China

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This study examines whether a firm's philanthropic behavior affects its cost of equity capital and whether public awareness about the firm influences this effect in the context of China. We find that firms experience an increase in their cost of equity capital when the probability or the amount of philanthropic giving increases, and this effect is moderated when firms have high public awareness. Furthermore, for firms in the eastern region or those in less competitive industries, the positive effect of corporate philanthropic giving on the cost of equity capital can be moderated as the firms' public awareness increases.

Key Words: Corporate Philanthropy; Cost of Equity Capital; Public Awareness; Corporate Social Responsibility.

JEL Classification Numbers: G30, P31, M14.

1. INTRODUCTION

Corporate social responsibility (CSR) has become an important criterion for business practices. As a unique component of CSR activities, corporate philanthropic giving (CPG) continues its growth momentum worldwide. Firms tend to engage in philanthropic activities for both altruistic and for-profit motivations (Sánchez, 2000; Maas and Liket, 2011; Hogarth et al., 2018; Yang and Tang, 2020), and the extant literature has given particular attention to the economic consequences of corporate philanthropy (Brammer and Millington, 2005; Godfrey, 2005; Wang and Qian, 2011; Chen et al., 2018b). However, whether CPG is value-increasing, decreasing, or

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neutral still remains controversial. On the one hand, previous studies suggest that CPG promotes a firm's public image, strengthens its relationship with stakeholders, and thus, enhances its future performance (Berman et al., 1999; Godfrey, 2005; Lev et al., 2010; Chen et al., 2018b). On the other hand, empirical results also show the possibility that CPG is conducted by self-interested managers to extract wealth from shareholders, promote individual reputation, and advance their personal careers, which may worsen the firms' financial performance (Wang and Coffey, 1992; Marquis and Lee, 2013; Masulis and Reza, 2015; Wang et al., 2015).

As the expected rate of return on equity investment, the cost of equity capital is one of the most important factors which are closely related to firm value. Even though there is extensive literature investigating the financial outcomes of CPG from various perspectives, very few of them examine the capital market participants' perceptions of CPG and the effect of CPG on the firm's cost of equity capital is also subject to debate (Judd and Lusch, 2018; Zolotoy et al., 2019). Because CPG can be used as a tool by managers to pursue their own interests and as a result, the stockholders' value is expropriated, CPG will increase the cost of equity capital (Judd and Lusch, 2018). However, if CPG acts as a mechanism for developing a firm's relationship with stakeholders and thereby enhances investors' perceptions of a firm's characteristics, then the cost of equity capital would decrease because of the reduction of the firm's business risk (Zolotoy et al., 2019). Hence, the effect of CPG on the cost of equity capital is unclear and it is necessary to investigate the factors that may have significant impacts on the CPG's effect on the cost of equity capital. In this paper, we argue that the impact of CPG on the cost of equity capital depends on the capacity of such CPG activities to influence the firm's stakeholders, and the precondition for CPG to modify stakeholders' behavior is the stakeholders' awareness of the firm's CPG activities. Servaes and Tamayo (2013) advocate that the consumers are more likely to respond to a firm's CSR activities if they are aware of them. However, Pomering and Dolnicar (2009) indicate that consumers' awareness level of CSR is quite low so that a firm's CSR activities fail to prove their effectiveness in the marketplace. This phenomenon arouses our interests to re-examine the effects of CPG on the cost of equity capital by focusing on one indirect factor, the public awareness of the firm, and this study tries to find out how public awareness adjusts the effects of CPG on the cost of equity capital.

Although some literature has examined the impact of CSR on the cost of equity capital (Dhaliwal et al., 2011; Xu et al., 2015), we argue that it is necessary to re-examine this issue by focusing on CPG. First, CSR is a broad concept which includes various aspects of social responsibilities that firms are expected to fulfill. Thus, the components within CSR may have different and sometimes even competing influential mechanisms. Sec-

ond, CSR measures consist of many subjective factors and their quality always raise questions. Hence, it is significant to separate the individual components of CSR (Moser and Martin, 2012; Judd and Lusch, 2018).

In this study, we argue that public awareness, which is proxied by advertising intensity, can have significant impacts on the effect of CPG on the cost of equity capital. The public awareness of a firm is associated with visibility, familiarity, and social judgment. The psychological literature shows that human behaviors and cognitive activities are largely influenced by the perceivers' familiarity with or awareness of the target (Fiske and Cox, 1979; Reis et al., 2011; Finkel et al., 2015). A higher level of brand familiarity leads to greater brand trust, and consumers show an overwhelming preference and purchase intention for the brands that they are most aware of (Keller, 1993; Laroche et al., 1996; Macdonald and Sharp, 2000; Ha and Perks, 2005; Esch et al., 2006; Foroudi et al., 2018). Accordingly, firms tend to invest in advertising activities to reduce the information gap between the public and themselves, and improve public awareness (Servaes and Tamayo, 2013). In finance, the extant literature argues that investment decision-making is highly correlated with investors' awareness of the stock. Grullon et al. (2004) provide evidence that firms with higher advertising intensity attract a larger number of both individual and institutional investors. Yung and Nafar (2017) and Meng et al. (2020) demonstrate that the expected returns of securities are negatively associated with the level of investors' awareness because of the compensation for being imperfectly diversified. The home bias theory also proposes that investors prefer to hold the stocks of locally headquartered firms, and that they ignore foreign investment opportunities (French and Poterba, 1991; Coval and Moskowitz, 1999; Nieuwerburgh and Veldkamp, 2009; Levy and Levy, 2014). Riff and Yagil (2020) examine the effects of branding and location on the willingness to invest, and their results show that people are more willing to invest in local and high-branded firms.

The extant literature on the effect of CPG on the cost of equity capital is limited to western developed countries. As the largest emerging country, China is an especially interesting setting for this research topic because its economic and institutional environments are quite different from those of western countries. First, nearly 69% of charitable giving in China is attributable to corporate donors, which is much higher than the proportion of U.S. corporate donors. However, charitable donations from Chinese individuals' account for merely 11%, which is far lower than the average level worldwide (Schrader and Xie, 2016). Hence, in China, CPG plays a major role in the area of charitable giving. Second, the motives for CPG are much more complicated in China, where governments at all levels have significant influence on CPG decisions. Due to market inefficiencies, it is difficult for small and medium-sized enterprises and non-state-owned en-

terprises (NSOEs) to obtain economic resources via market competition. To reduce financing constraints or obtain better investment opportunities, firms have to build political connections with the government through charitable giving (Wang and Qian, 2011; Gao et al., 2012; Chen et al., 2015; Chen et al., 2018b). Furthermore, firms that receive government support are also expected to reciprocate by engaging in more CPG, such that politically connected firms are more likely to respond to the government's call for CPG (Li et al., 2015; Yang and Tang, 2020). Third, China provides a unique environment based on the co-existence of both state-owned enterprises (SOEs) and NSOEs (Allen et al., 2005). More than half of the listed companies in China are still state-owned and their CEOs are often appointed by the government. These firms are politically connected and need to achieve political and social targets aside from their operational objectives (Kato and Long, 2006; Chen et al., 2011b; Xu et al., 2015). Therefore, an investigation in the Chinese context can present different and remarkable results and improve our understanding of the role of CPG in economies in which politics interact widely and deeply with firms' behaviors.

We examine the effect of CPG on the cost of equity capital based on a sample of A-share-listed Chinese companies from 2004 to 2017. The empirical results demonstrate that firms experience an increase in their cost of equity capital when the probability or the amount of philanthropic giving increases. However, this positive effect is moderated when firms have high public awareness. These results are consistent with the idea that firms can benefit from CPG if their behaviors are highly visible. Second, we divide the sample into SOE and NSOE subsamples and find that the moderating effect of public awareness exists only for NSOEs. Furthermore, in cases where firms are located in the eastern region or are engaged in less competitive industries, the positive effect of corporate philanthropy on the cost of equity capital is moderated by an increase in public awareness. Our results are consistent with a battery of robustness tests.

Our research contributes to the literature in several ways. First, this study advances our understanding of the determinants of a firm's cost of equity capital. The extant literature tries to explain the variation of the cost of equity capital by focusing on internal control quality (Ashbaugh-Skaife et al., 2009; Gao and Jia, 2017; Khlif et al., 2019), ownership structure (Chu et al., 2014; Boubakri et al., 2016; Chu et al., 2019), information disclosure (Richardson and Welker, 2001; Dhaliwal et al., 2011; Li and Liu, 2018), and political connection (Boubakri et al., 2012; Pham, 2019). This study provides evidence that public awareness can be an important moderating factor affecting a firm's cost of equity capital. Second, this study enriches the philanthropy literature on the consequences of CPG activities. To the best of our knowledge, only two articles discuss how CPG affects a firm's cost of equity capital, and they draw divergent results in the U.S.

context (Judd and Lusch, 2018; Zolotoy et al., 2019). By documenting the positive relationship between CPG and the cost of equity capital based on the data of Chinese listed companies, we show that CPG increases a firm's equity cost and provide another perspective to understand the passive consequences of philanthropy. Third, our research underlines the moderating effect of public awareness on the effect of CPG on the firm's cost of equity capital. We argue that investors' responses to CPG are subject to their familiarity with the firm and public awareness is an important factor that affects the influence of CPG on the cost of equity capital. Our results show that the positive effect of CPG on the cost of equity capital is mitigated as public awareness increases, which indicates that an "information-friendly" environment is necessary for firms to reduce business risks that originate from CPG involvement. Furthermore, we find that the moderating effect of public awareness is subject to other conditions such as ultimate ownership, the region in which the firm is located, and the conditions of market competition. Fourth, China is an especially interesting setting for this research because its economic and institutional environments are quite different from those in developed countries. Due to the immature development of market mechanisms and legal protection in China, CPG can be used as a tool to hide environmental misconduct (Du, 2015), obtain crucial resources (Chen et al., 2018b), or improve CEO's personal welfare (Masulis and Reza, 2015). Moreover, government intervention plays an important role in firms' CPG decision (Li et al., 2015). Hence, the incentives and economic outcomes of CPG are rather confusing in China, and this study provides unique insight on the role of CPG in emerging markets.

The remainder of this article is organized as follows. Section 2 discusses the prior literature and develops our hypothesis. Section 3 describes our data and methodology. Section 4 provides the empirical results and Section 5 presents the robustness tests. Finally, Section 6 concludes.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The existing literature documents that CPG can be used by CEOs in pursuit of their personal goals rather than for stockholder value maximization, and the agency costs inherent in CPG can be a type of risk that increases firms' cost of equity capital (Masulis and Reza, 2015; Judd and Lusch, 2018). Philanthropic giving is often utilized by self-interested managers to promote their personal reputation, build social networks, and advance their careers (Werbel and Carter, 2002; Wang et al., 2008; Masulis and Reza, 2015). For example, Werbel and Carter (2002) examine the relationship between CEOs' personal interests and philanthropic giving and find that CEOs' membership in non-profit organizations increases a firm's donation

toward such groups. By donating a portion of the firm's profits to charitable causes, CEOs may gain access to elite circles or enhance their social power (Atkinson and Galaskiewicz, 1988; Marquis et al., 2007). In addition, narcissistic CEOs have stronger personal need to attract public attention and gain praise; thus, they are more likely to seek recognition through philanthropic behavior (Petrenko et al., 2016). Corporate donations can also be authorized by top managers out of an altruistic belief, and such philanthropic behavior indulges the manager's wish for "doing good" while leading to shareholders' loss (Brown et al., 2006). In the above-mentioned cases, the welfare of shareholders is violated because the firm's cash is spent to satisfy managers' personal preferences instead of rewarding shareholders or making investments in profitable projects. As such, these opportunistic CPG behaviors eventually lead to a decrease in firm value. Masulis and Reza (2015) find that the market valuation of firm cash holdings is lower if a firm engages in philanthropic activities, and this relation is more pronounced for firms with poor governance. Based on the data of Australian listed firms, Hogarth et al. (2018) indicate that a firm's Tobin's Q falls by approximately 0.413% for every cent spent on CPG. Wang et al. (2008) propose that CPG improves a firm's financial performance within certain limits; however, the benefits of CPG is offset by constantly growing costs as CPG increases beyond a certain level. Hence, the existence of agency conflicts and the exorbitant costs caused by CPG may augment the firm's business risk, and CPG would increase a firm's cost of equity capital.

However, previous literature also provides evidence that CPG can reduce a firm's business risk. Based on the strategic philanthropy theory, commitment to corporate philanthropy not only benefits the community, but also the firm itself (Varadarajan and Menon, 1988; Saiia et al., 2003; Liket and Maas, 2016; Chen et al., 2020). These studies argue that CPG helps a firm improve its reputation (Godfrey, 2005; Maas and Liket, 2011; Gardberg et al., 2019), enhance employee morale (Brown et al., 2006; Balakrishnan et al., 2011), maintain customer loyalty (Zhang et al., 2010; Mandhachitara and Poolthong, 2011; Aramburu and Pescador, 2019), and build political connections (Scherer and Palazzo, 2007; Wang and Qian, 2011; Chen et al., 2020). By engaging in CPG activities, a firm can generate moral capital and build its reputation as being honest and reliable (McWilliams and Siegel, 2001; Brammer and Millington, 2005; Zhang et al., 2010). Customers believe that the products of socially responsible companies are of higher quality; thus, they prefer to buy goods from companies that make more charitable donations (Lee and Shin, 2010). Accordingly, CPG activities are associated with subsequent sales growth (Lev et al., 2010). Furthermore, CPG motivates employees' efforts, boosts their loyalty, and increases the efficacy of implicit contracts (Brown et al., 2006; Balakrishnan et al., 2011). Moreover, socially responsible firms also have

incentives to protect their reputation and tend to behave well in subsequent business activities. As Chen et al. (2020) put forward, firms that engage in philanthropic activities have stronger willingness to prevent future corporate misconduct, and these firms are less likely to be penalized by the China Securities Regulatory Commission (CSRC). In addition, investors believe that socially responsible firms are less likely to shirk their responsibility to shareholders; thus, agency conflicts are less severe in these firms (Chen et al., 2018b; Zolotoy et al., 2019). Overall, considering the effects of CPG on improving a firm's relationship with stakeholders and reducing corporate misconduct, the business risk of a firm could be mitigated as it engages in CPG activities. Hence, CPG can lower a firm's cost of equity capital.

The motives of firms in making charitable donations are even more intricate in China, where the institutional environment is less developed and government intervention plays an important role in economy. Due to geographic or economic reasons, firms cannot control some of the resources necessary for their development. However, engaging in CPG can help firms build political connections to gain access to valuable resources that are crucial to their long-term growth (Wang and Qian, 2011; Chen et al., 2018b). Chen et al. (2015) find that CPG provides firms an advantage in gaining access to bank loans, and this relationship is stronger for NSOEs because SOEs enjoy privileges in the Chinese banking system and are less likely to curry favor with the government through philanthropic activities. Hence, the government protection and preferential benefits that firms obtain through philanthropic giving may decrease their business risk. Meanwhile, the Chinese government needs resources from society to realize its social responsibilities, and thus encourages firms to make charitable donations. Li et al. (2015) illustrate that politically connected firms have motives to reciprocate government support and that they are subject to stronger political intervention. Hence, politically connected firms tend to contribute more to philanthropic causes, which may add burden to the firms. In addition, Yang and Tang (2020) argue that entrepreneurs who hold a political office have stronger pro-social values and sense of social responsibility; thus, their firms are more likely to donate for the "common good" and ask for nothing in return. This altruistic, philanthropic behavior increases the firm's costs and business risk. Moreover, due to the loopholes and grey areas in China's institutional environment, CPG could be used to divert public attention and disguise corporate misconduct (Chen et al., 2018a). Du (2015) indicates that incidences of corporate environmental misconduct are positively connected to CPG, which implies that misconduct-dressing is also an incentive to engage in CPG. Thus, we propose the following hypotheses.

HYPOTHESIS 1a. Firms that engage in CPG activities have a higher cost of equity capital relative to firms that do not engage in CPG activities

in a given year, and the cost of equity capital increases as the amount of CPG increases.

HYPOTHESIS 1b. Firms that engage in CPG activities have a lower cost of equity capital relative to firms that do not engage in CPG activities in a given year, and the cost of equity capital decreases as the amount of CPG increases.

Next, we investigate the influence of public awareness on the impact of CPG on a firm's cost of equity capital. Previous literature on social psychology has highlighted the importance of available information in shaping people's perception of others (Fiske and Cox, 1979). The perceiver relies on available cognitive resources, such as observed actions, to make inferences about a person's internal characteristics (Jones and Davis, 1965). However, cognitive resources are sometimes insufficient, and thus hinder the perceivers' capacity to develop an accurate understanding of an item that receives limited attention (Falkinger, 2008). Following this logic, the prerequisite for CSR to obtain feedback is that such activities must first be noticed; however, consumers' awareness of CSR is quite low, such that a firm's CSR activities fail to prove their effectiveness in the marketplace (Pomering and Dolnicar, 2009). Schuler and Cording (2006) indicate that information intensity is a major factor that affects customers' awareness of CSR initiatives and further influences customers' brand attitudes. The extant literature suggests that advertising can enhance a firm's information environment and raise the awareness of stakeholders who are interested in a firm's CSR attributes (McWilliams and Siegel, 2001; Servaes and Tamayo, 2013). Based on the data of U.S. firms, Servaes and Tamayo (2013) find that firm value is positively associated with CSR for firms with high customer awareness, whereas the relation turns either negative or insignificant for firms with low customer awareness. Rhou et al. (2016) indicate that the positive relation between CSR initiatives and financial performance is more pronounced when public awareness is high. We reason that a high level of public awareness strengthens the stakeholders' capacity to respond to a firm's CPG activities and enables CPG to produce economic benefits. Hence, the business risk arising from CPG activities is mitigated as public awareness increases. In addition, firms with high public awareness attract more institutional investors and have higher liquidity of their common stock, which can improve corporate governance and reduce misconduct (Grullon et al., 2004; Mizuno, 2010; Brogaard et al., 2017). High public awareness of a firm creates better visibility for the firm, and firms with high visibility face greater pressure from public scrutiny; thus, they are more likely to behave well, thereby minimizing business risk (Gupta et al., 2018).

Based the discussion above, we predict that the business risk arising from CPG activities is lower for firms with higher public awareness. Therefore,

we infer that the interaction term between CPG and public awareness is negatively associated with a firm's cost of equity capital. We state our hypotheses 2a and 2b as follows:

HYPOTHESIS 2a. If CPG activities positively affect a firm's cost of equity capital, then the effect would be mitigated as the level of public awareness increases.

HYPOTHESIS 2b. If CPG activities negatively affect a firm's cost of equity capital, then the effect would be enhanced as the level of public awareness increases.

3. RESEARCH DESIGN

3.1. Sample selection and data sources

This study employs panel data of Chinese firms listed on the Shanghai and Shenzhen Stock Exchanges for period 2004-2017. We collect our data on CPG from the China Stock Market and Accounting Research (CSMAR) Database. Financial data and industry affiliation data are also taken from the CSMAR database, and the consensus earnings forecasts data is provided by the Wind Financial Database. The CPG and other financial data are collected from the annual reports of listed companies by the CSMAR database. The CSMAR database makes use of the industry classification scheme prescribed by the China Securities Regulatory Commission (CSRC). The Wind Financial Database has a wide coverage of analysts' earnings forecasts of listed firms based on analyst reports and the consensus earnings forecasts are calculated as the average of the analysts' earnings forecasts. Following Chen et al. (2011b) and Xie (2015), a firm is considered as an SOE if it is ultimately controlled by the Chinese central government; local governments at the provincial, municipal, and county level; or other governmental institutions. Conversely, a firm is considered as a NSOE if it is ultimately controlled by an individual or a non-state entity (e.g., town-village enterprise, foreign enterprise, or other non-state-controlled enterprise). The ultimate controlling shareholder data is obtained from the CSMAR database.

We exclude financial firms and special treatment (ST) firms because both of them are subject to special regulations and ST firms suffer from financial and operational problems. We use the mean of four different estimates of the cost of equity capital to mitigate measurement errors; thus, some observations with insufficient data to estimate the cost of equity capital are eliminated. All continuous variables are winsorized at the top and bottom 5%. This procedure yields a final sample of 12,612 firm-year observations, which accounts for 36.6% of the 34,466 firm-year observations in the initial data (excluding financial firms). We use unbalanced panel data in our analysis, because the number of listed firms in China has been

TABLE 1.

The yearly and industrial distributions of the sample.

	N	The proportion of total sample
Panel A: Distribution by year		
2004	188	1.49%
2005	247	1.96%
2006	384	3.04%
2007	422	3.35%
2008	543	4.31%
2009	767	6.08%
2010	1042	8.26%
2011	1203	9.54%
2012	1165	9.24%
2013	1087	8.62%
2014	1187	9.41%
2015	1318	10.45%
2016	1447	11.47%
2017	1612	12.78%
Total	12612	100.00%
Panel B: Distribution by industry		
A	201	1.59%
B	379	3.01%
C	8236	65.30%
D	376	2.98%
E	389	3.08%
F	685	5.43%
G	345	2.74%
H	43	0.34%
I	707	5.61%
K	555	4.40%
L	176	1.40%
M	83	0.66%
N	127	1.01%
O	10	0.08%
P	7	0.06%
Q	32	0.25%
R	161	1.28%
S	100	0.79%
Total	12612	100.00%

Notes: This table presents the yearly and industrial distributions of the sample. Industry categories are prescribed by the CSRC, including agriculture, forestry, livestock rearing, and fishing (A); mining (B); manufacturing (C); electric power, gas, and water production and supply (D); construction (E); wholesale and retail (F); transportation, storage and postal services (G); hotel and catering services (H); information transmission, software and information technology services (I); finance (J); real estate (K); leasing and commercial services (L); scientific research and technical services (M); water conservancy, environment and public facilities management (N); residential service, repairing and other services (O); education (P); health and social work (Q); culture, sports and entertainment (R); and conglomerate (S).

increasing rapidly in the past years. Table 1 shows the yearly and industrial distributions of our sample. The number of firms demonstrates a nearly monotonically increasing trend from 2004 to 2017, and the manufacturing industry represents a strong majority.

3.2. Variable construction

3.2.1. Measures of CPG

Consistent with the related literature (e.g., Wang and Qian, 2011; Zhang et al., 2016; Chen et al., 2018b), we employ two measures for CPG in our main empirical tests. The first measure PHI_D is a dummy variable that equals 1 if the amount of a firm's donation expenditures in a specific fiscal year is positive and 0 otherwise. To alleviate skewness, we define our second measure, PHI_M, as a continuous variable calculated as the natural logarithm of 1 plus the amount of a firm's donation expenditures in a specific fiscal year. PHI_D measures whether a firm engages in any CPG activities in a fiscal year, while PHI_M presents the amount of CPG of a firm in a fiscal year.

3.2.2. Measures of the cost of equity capital

Following Chen et al. (2011a), Xu et al. (2015), and Dhaliwal et al. (2016), we construct our dependent variable using the ex-ante implied cost of equity capital which is defined as the internal rate of return that equates the present value of the expected future cash flows to the current market price. Compared with ex-ante measures, the ex-post realized returns are noisier and face more severe estimation errors because they also capture shocks to a firm's growth opportunities (Stulz, 1999). This defect is magnified in Chinese stock market where many listed firms are at the growth stage (Kim et al., 2015). Hence, the ex-ante measures that control for both future cash flow and growth potential (Hail and Leuz, 2006) are better proxies for the cost of equity capital in the Chinese stock market. We use four different measures which are constructed by Claus and Thomas (2001) (R_{CT}), Gebhardt et al. (2001) (R_{GLS}), Easton (2004) (R_{PEG}), and Ohlson and Juettner-Nauroth (2005) (R_{OJN}). The four models can avoid the long time-series requirement of realized returns to estimate an unbiased expected return, because they use the analysts' future earnings forecasts to estimate the cost of equity capital. The first two models are based on the residual income valuation model in Ohlson (1995), while the latter two models are developed from Ohlson and Juettner-Nauroth (2000)'s abnormal earnings growth valuation model. All of these models are essentially variations of discounted cash flow valuation. However, they differ in terms

of the duration of forecast horizons, assumptions about the future earnings growth rate, and exploitation of analyst forecasts. To address the concern of spurious results caused by one particular model, we use the arithmetic average of the four commonly accepted models to calculate the cost of equity capital (Hail and Leuz, 2006; Chen et al., 2011a; Dhaliwal et al., 2016; Judd and Lusch, 2018).

The variables used in the following four models are as follows. P_t is the market price of a firm's stock at the end of year t, while B_t is the book value per share of a firm at the beginning of year t. $FEPS_{t+i}$ is the forecast earnings per share of a firm in year $t+i$. $POUT$ is the forecast dividends payout ratio of a firm and is calculated as a firm's historical three-year average dividend payout ratio. R_f is the yield on a 10-year Treasury note in June of year t. g is calculated as R_f minus 3%.

R_{GLS} is estimated from the model of Gebhardt et al. (2001).

$$P_t = B_t + \sum_{i=1}^{11} \frac{(FROE_{t+i} - R_{GLS}) \times B_{t+i-1}}{(1+R_{GLS})^i} + \frac{(FROE_{t+12} - R_{GLS}) \times B_{t+11}}{R_{GLS} \times (1+R_{GLS})^{11}} \tag{1}$$

where $B_{t+i} = B_{t+i-1} + (1 - POUT) \times FEPS_{t+i}$. For the first three years, $FROE_{t+i}$ is equal to $FEPS_{t+i}/B_{t+i-1}$. Thereafter, we forecast $FROE_{t+i}$ using a linear interpolation to the industry median ROE from the 4^{th} year to the 12^{th} year. From the 12^{th} year onward, $FROE_{t+i}$ is assumed to be constant.

R_{CT} is estimated from the model of Claus and Thomas (2001).

$$P_t = B_t + \sum_{i=1}^{5} \frac{FEPS_{t+i} - R_{CT} \times B_{t+i-1}}{(1+R_{CT})^i} + \frac{(FEPS_{t+5} - R_{CT} \times B_{t+4}) \times (1+g)}{(R_{CT} - g) \times (1+R_{CT})^5} \tag{2}$$

where $B_{t+i} = B_{t+i-1} + (1 - POUT) \times FEPS_{t+i}$. $FEPS_{t+4}$ and $FEPS_{t+5}$ are calculated based on $FEPS_{t+3}$ and the long-term earnings growth rate. The long-term earnings growth rate is calculated as the implied earnings growth rate from $FEPS_{t+1}$ to $FEPS_{t+3}$.

R_{OJN} is estimated from the model of Ohlson and Juettner-Nauroth (2005).

$$P_t = \frac{FEPS_{t+1}}{R_{OJN}} + \frac{(FEPS_{t+2} - FEPS_{t+1} - R_{OJN} \times FEPS_{t+1} \times (1 - POUT))}{R_{OJN} \times (R_{OJN} - g)} \tag{3}$$

which suggests that

$$R_{OJN} = A + \sqrt{A^2 + \frac{FEPS_{t+1}}{P_t} \times \left(\frac{FEPS_{t+2} - FEPS_{t+1}}{FEPS_{t+1}} - g\right)} \quad (4)$$

where $A = \frac{1}{2} \times \left(g + \frac{FEPS_{t+1} \times POUT}{P_t}\right)$. The calculation of this model requires that $FEPS_{t+1} > 0$ and $FEPS_{t+2} > 0$.

R_{PEG} is estimated from the model of Easton (2004).

$$P_t = \frac{FEPS_{t+2} - FEPS_{t+1} + R_{PEG} \times FEPS_{t+1} \times POUT}{R_{PEG}^2} \quad (5)$$

The implementation of this model requires that $FEPS_{t+2} \geq FEPS_{t+1} > 0$.

3.2.3. Measures of public awareness

Following Wang and Qian (2011) and Servaes and Tamayo (2013), we use the intensity of a firm's advertising as a proxy for its public awareness. Intensive advertising improves a firm's visibility and attracts more attention from the public; thus, it increases the likelihood of stakeholders noticing the firm's CPG activities (Wang and Qian, 2011). Following Zhang et al. (2010) and Kashmiri et al. (2019), we define $ADVERT$ as the ratio of advertising expenditures to total asset. The data on advertising expenditures is shown as a sub-item of sales expenses in annual reports, which is the sum of various advertising expenditures (e.g., TV, newspaper, billboards, and internet advertising costs). Similar to Servaes and Tamayo (2013), the data of advertising expenditures are missing for nearly half of the observations (47.99%) because firms do not need to disclose advertising expenditures if they are immaterial (Servaes and Tamayo 2013, p. 1051). Hence, we follow prior studies (e.g., Fee et al., 2009; Servaes and Tamayo, 2013) and set advertising expenditure to zero when the data are missing. We define $HighAwareness$ as a dummy variable that equals 1 if the $ADVERT$ of a firm is above the sample mean in a fiscal year and 0 otherwise.

3.2.4. Control variables

Following the related studies (Chen et al., 2011a; Xu et al., 2015; Dhaliwal et al., 2016; Judd and Lusch, 2018), we control for firm size, the book-to-market ratio, leverage, price momentum, liquidity, and forecast long term growth rate in our regressions.

Fama and French (1992) find that stock returns are negatively correlated with firm size and are positively correlated with book-to-market equity

TABLE 2.

Variable definitions.

Variable	Definition
Dependent Variables	
R_{AVE}	The arithmetic average of the four individual estimates of the cost of equity capital. (i.e., R_{GLS}, R_{CT}, R_{OJN}, and R_{PEG}).
R_{GLS}	The cost of equity capital estimated from the model of Gebhardt et al. (2001).
R_{CT}	The cost of equity capital estimated from the model of Claus and Thomas (2001).
R_{OJN}	The cost of equity capital estimated from the model of Ohlson and Juettner-Nauroth (2005).
R_{PEG}	The cost of equity capital estimated from the model of Easton (2004).
Independent Variables	
PHI_D	A dummy variable that equals 1 if the amount of a firm's donation expenditures in a specific fiscal year is positive and 0 otherwise.
PHI_M	A continuous variable calculated as the natural logarithm of one plus the amount of a firm's donation expenditures in a specific fiscal year.
$ADVERT$	Ratio of advertising expenditures to total asset of a firm.
$HighAwareness$	A dummy variable that equals one if the $ADVERT$ of a firm is above the sample mean in a fiscal year and zero otherwise.
Control Variables	
MVE	Natural logarithm of the firm's market value of equity.
BTM	Ratio of the book value of equity to the market value of equity.
LEV	Book value of total liabilities deflated by the book value of total assets.
$MTUM$	Stock return over the fiscal year.
$LIQUID$	Ratio of the number of shares traded in a year to the total shares outstanding at the end of that year.
LTG	Difference between the mean of two-year-ahead analyst consensus EPS forecast and the mean of one-year-ahead analyst consensus EPS forecast divided by the mean of one-year-ahead analyst consensus EPS forecast.

value. Firm size (MVE) is calculated as the natural logarithm of the market value of equity, while the book-to-market ratio (BTM) is measured as the ratio of the book value of equity to the market value of equity. Because Dhaliwal et al. (2016) show that the cost of equity capital is positively related to the firm's leverage, we also include leverage ratio (LEV), which is measured as the book value of total liabilities deflated by the book value of total assets. The estimates of ex-ante cost of equity capital may be biased because of the use of analysts' forecasts, which are sluggish with respect to the information in past returns on equity (Guay et al., 2011). Hence, we

include price momentum ($MTUM$) as a control variable, calculated as the stock return over the fiscal year. We also control for liquidity ($LIQUID$) which is the ratio of the number of shares traded in a year to the total shares outstanding at the end of that year, as prior studies suggest that expected returns should be higher for illiquid stock to compensate for higher transaction costs (Amihud and Mendelson, 1986). Following Chen et al. (2011a), we include forecast long-term growth rate (LTG) to control for the potential estimation biases of the ex-ante cost of equity capital and LTG is calculated as the difference between the mean of the two-year-ahead analyst consensus EPS forecast and the mean of the one-year-ahead analyst consensus EPS forecast divided by the mean of the one-year-ahead analyst consensus EPS forecast. Finally, we control for industry and time fixed effects by introducing industry and year dummies.

The detailed definitions of variables are presented in Table 2.

TABLE 3.

Descriptive statistics.

Variable	N	Mean	Median	Min	Max	Standard deviation
R_{AVE}	12612	0.0867	0.0836	0.0430	0.1474	0.0282
R_{GLS}	12612	0.0463	0.0442	0.0197	0.0827	0.0174
R_{CT}	12612	0.0825	0.0771	0.0312	0.1636	0.0353
R_{PEG}	12612	0.1075	0.1046	0.0539	0.1767	0.0331
R_{OJN}	12612	0.1096	0.1067	0.0554	0.1793	0.0333
PHI_D	12612	0.9034	1.0000	0.0000	1.0000	0.2954
PHI_M	12612	11.4378	12.5179	0.0000	15.9277	4.1890
$ADVERT$	12612	0.0025	0.0000	0.0000	0.0205	0.0053
MVE	12612	15.7515	15.7030	14.2489	17.5110	0.8888
BTM	12612	0.6110	0.6153	0.2342	0.9724	0.2189
LEV	12612	0.4238	0.4226	0.0997	0.7636	0.1977
$MTUM$	12612	0.2300	0.0019	−0.4779	1.7598	0.5918
$LIQUID$	12612	3.1019	2.5795	0.6270	7.9124	2.0216
LTG	12612	0.4133	0.3135	0.0988	1.4059	0.3217

3.3. Summary statistics

Table 3 provides the descriptive statistics for the variables used in our main analysis. The mean of R_{AVE} is 8.67%, and the means of $RPEG$ and R_{OJN} (10.75% and 10.96%, respectively) are higher than those of R_{GLS} and R_{CT} (4.63% and 8.25%, respectively), which are similar to the prior research (Hail and Leuz, 2006; Xu et al., 2015; Dhaliwal et al., 2016;

Judd and Lusch, 2018). The mean of the CPG measure PHI_D is 0.9034, suggesting that 90.34% of the firms in our sample are involved in CPG activities. On average, the firms in our sample have a market value of equity (in logarithmic form) of 15.7515, book-to-market ratio of 61.10%, leverage ratio of 42.38%, momentum ratio of 23.00%, liquidity ratio of 3.1019, and long-term growth rate of 41.33%, which are similar to the extant literature (Xu et al., 2015; Dhaliwal et al., 2016; Judd and Lusch, 2018).

TABLE 4.

Correlations matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) R_{AVE}	1.0000										
(2) PHI_D	0.0614^{***}	1.0000									
(3) PHI_M	0.1173^{***}	0.8928^{***}	1.0000								
(4) $ADVERT$	-0.0809^{***}	0.0468^{***}	0.0985^{***}	1.0000							
(5) SOE	0.0644^{***}	-0.0054	0.0175^{**}	-0.0772^{***}	1.0000						
(6) MVE	-0.1228^{***}	0.0739^{***}	0.2189^{***}	0.1079^{***}	0.1349^{***}	1.0000					
(7) BTM	0.4740^{***}	0.0654^{***}	0.1177^{***}	-0.1673^{***}	0.2318^{***}	-0.1758^{***}	1.0000				
(8) LEV	0.2985^{***}	0.0611^{***}	0.1312^{***}	-0.1316^{***}	0.3394^{***}	0.1646^{***}	0.3990^{***}	1.0000			
(9) $MTUM$	-0.2053^{***}	-0.0298^{***}	-0.0447^{***}	-0.0668^{***}	0.0457^{***}	0.1567^{***}	-0.3300^{***}	0.0830^{***}	1.0000		
(10) $LIQUID$	-0.1999^{***}	-0.0683^{***}	-0.1243^{***}	-0.0688^{***}	-0.0085	-0.1019^{***}	-0.3325^{***}	0.0432^{***}	0.3431^{***}	1.0000	
(11) LTG	0.3588^{***}	-0.0489^{***}	-0.0908^{***}	-0.0996^{***}	-0.0557^{***}	-0.0929^{***}	-0.0883^{***}	0.1148^{***}	0.1555^{***}	0.1937^{***}	1.0000

Notes: *, ** and *** represent significance at the 10%, 5% and 1% levels.

Table 4 presents the Pearson correlation coefficients between the variables. Both measures of CPG (PHI_D and PHI_M) are significantly and positively correlated with the cost of equity capital (R_{AVE}). This result suggests that a firm's cost of equity capital increases with the possibility and the level of CPG engagement. It is noteworthy that R_{AVE} is positively correlated with SOE, which means that state-owned enterprises have higher costs of equity capital. In addition, consistent with the prior studies (Xu et al., 2015; Dhaliwal et al., 2016), we find that RAVE is positively correlated with the book-to-market ratio (BTM), leverage (LEV), and long-term growth rate (LTG), whereas it is negatively correlated with a firm's market value of equity (MVE), momentum ($MTUM$), and liquidity ($LIQUID$).

4. EMPIRICAL RESULTS

4.1. Univariate tests

Table 5 shows the results of the univariate tests. We partition the sample by PHI_D and analyze the data using mean comparison t-tests and Wilcoxon rank-sum test. The cost of equity capital (R_{AVE}, R_{GLS}, R_{CT}, R_{PEG}, and R_{OJN}) is lower for firms with $PHI\_D = 0$, which provides evidence that CPG is associated with a higher cost of equity capital. These results are consistent with hypothesis 1a. Advertising intensity ($ADVERT$) is higher when firms engage in CPG activities, suggesting that firms that spend more on advertising also tend to give more to charity (McWilliams and Siegel, 2000; Zhang et al., 2010). In addition, Table 5 demonstrates that MVE, BTM, and LEV are higher for firms that make donations, whereas the other control variables ($MTUM$, $LIQUID$, and LTG) are higher for firms that do not make donations.

TABLE 5.

Univariate tests.

	Independent samples t-test		Wilcoxon rank-sum test	
	$PHI\_D = 0$ VS. $PHI\_D = 1$		$PHI\_D = 0$ VS. $PHI\_D = 1$	
	t-statistic	Significance	Z statistic	Significance
R_{AVE}	−6.9070	0.0000	−7.0944	0.0000
R_{GLS}	−8.6216	0.0000	−8.6729	0.0000
R_{CT}	−6.2576	0.0000	−6.9016	0.0000
R_{PEG}	−6.3676	0.0000	−6.4304	0.0000
R_{OJN}	−6.3235	0.0000	−6.3792	0.0000
$ADVERT$	−5.2570	0.0000	−3.4189	0.0006
MVE	−8.3214	0.0000	−8.2347	0.0000
BTM	−7.3561	0.0000	−7.2374	0.0000
LEV	−6.8753	0.0000	−6.8128	0.0000
$MTUM$	3.3449	0.0008	3.4671	0.0005
$LIQUID$	7.6870	0.0000	7.3454	0.0000
LTG	5.4967	0.0000	4.8337	0.0000

4.2. Multivariate regressions

4.2.1. The effects of CPG on the cost of equity capital

To test hypothesis 1, we run the following regression model:

$$\begin{aligned} R_{i,t} &= \beta_0 + \beta_1 PHI\_D_{i,t}(PHI\_M_{i,t}) + \beta_2 MVE_{i,t} + \beta_3 BTM_{i,t} + \beta_4 LEV_{i,t} \\ &+ \beta_5 MTUM_{i,t} + \beta_6 LIQUID_{i,t} + \beta_8 LTG_{i,t} + \gamma YearFE_t + \delta IndustryFE_i + \varepsilon_{i,t} \end{aligned} \quad (6)$$

where $R_{i,t}$ is the cost of equity capital measures. Industry dummies ($IndustryFE$) and year dummies ($YearFE$) are included in the model

to control for unobservable macro-economic factors and industry characteristics. We use the firm fixed-effects method to address the model misspecification problem, and standard errors are clustered at the firm level.

TABLE 6.

The effect of CPG on the cost of equity capital.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	R_{AVE}		R_{GLS}		R_{CT}		R_{PEG}		R_{OJN}	
PHI_D	0.0025***		0.0011***		0.0032***		0.0027***		0.0026***	
	(3.8991)		(3.7587)		(3.8963)		(3.4072)		(3.3812)	
PHI_M		0.0003***		0.0001***		0.0004***		0.0003***		0.0003***
		(5.9825)		(5.4560)		(5.7903)		(5.5022)		(5.4733)
MVE	−0.0001	−0.0003	−0.0022***	−0.0023***	−0.0002	−0.0005	0.0012	0.0009	0.0012	0.0009
	(−0.0787)	(−0.4025)	(−5.9196)	(−6.1852)	(−0.2635)	(−0.5812)	(1.4881)	(1.1767)	(1.4386)	(1.1277)
BTM	0.0164***	0.0162***	0.0226***	0.0225***	0.0158***	0.0155***	0.0141***	0.0139***	0.0138***	0.0135***
	(8.3809)	(8.2940)	(20.3448)	(20.2973)	(6.2717)	(6.1874)	(5.9470)	(5.8521)	(5.7741)	(5.6787)
LEV	0.0110***	0.0109***	0.0060***	0.0059***	0.0109***	0.0107***	0.0139***	0.0138***	0.0139***	0.0138***
	(5.0342)	(4.9863)	(4.8117)	(4.7732)	(3.8304)	(3.7839)	(5.2204)	(5.1737)	(5.2130)	(5.1665)
$MTUM$	−0.0074***	−0.0074***	−0.0042***	−0.0042***	−0.0094***	−0.0094***	−0.0081***	−0.0081***	−0.0080***	−0.0080***
	(−15.6940)	(−15.6599)	(−16.8137)	(−16.7803)	(−15.5844)	(−15.5552)	(−13.8294)	(−13.7963)	(−13.6414)	(−13.6085)
$LIQUID$	−0.0002	−0.0002	−0.0001	−0.0001	−0.0001	−0.0001	−0.0004*	−0.0004**	−0.0004**	−0.0004**
	(−1.5349)	(−1.5855)	(−0.7304)	(−0.7717)	(−0.4728)	(−0.5178)	(−1.9434)	(−1.9921)	(−2.0986)	(−2.1476)
LTG	0.0390***	0.0391***	−0.0013***	−0.0013***	0.0491***	0.0492***	0.0504***	0.0505***	0.0514***	0.0514***
	(45.1495)	(45.2488)	(−3.2498)	(−3.1864)	(43.3649)	(43.4870)	(45.4614)	(45.5509)	(46.0853)	(46.1752)
$\_CONS$	0.0567***	0.0591***	0.0538***	0.0548***	0.0612***	0.0642***	0.0500***	0.0527***	0.0549***	0.0575***
	(4.9225)	(5.1548)	(8.4648)	(8.6429)	(4.2715)	(4.4878)	(3.2541)	(3.4527)	(3.5589)	(3.7586)
$IndustryFE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$YearFE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	12612	12612	12612	12612	12612	12612	12612	12612	12612	12612
R^2(Within)	0.5297	0.5308	0.5962	0.5969	0.5007	0.5017	0.4900	0.4911	0.4983	0.4993

Notes: The equations are estimated based on the fixed-effects model and standard errors are clustered at the firm level (t-statistics are in parentheses). *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

The results are reported in Table 6. The dependent variable in columns (1) and (2) is R_{AVE} which is the average of the four cost of equity capital estimates, and the dependent variables in columns (3)-(10) are R_{GLS}, R_{CT}, R_{PEG}, and R_{OJN}, respectively. The measure for CPG in columns (1), (3), (5), (7), and (9) is PHI_D, while the measure for CPG in columns (2), (4), (6), (8), and (10) is PHI_M. The results show that the coefficients of the CPG measures in all columns are positively and statistically significant at the 1% level, suggesting that firms suffer an increase in the cost of equity capital when they engage in CPG activities or spend more on CPG

activities. These results support hypothesis 1a and are consistent with Judd and Lusch (2018). We also find that the cost of equity capital is negatively associated with the market value of equity, momentum, and liquidity; and positively associated with book-to-market ratio, leverage, and long-term growth rate, similar to the results of the previous studies (Xu et al., 2015; Dhaliwal et al., 2016). However, the coefficients on MVE and $LIQUID$ lose their statistical significance in some regressions.

4.2.2. The effects of public awareness on the CPG - cost of equity capital relation

We test hypothesis 2 by estimating the following model:

$$\begin{aligned} R_{i,t} &= \beta_0 + \beta_1 PHI\_D_{i,t}(PHI\_M_{i,t}) + \beta_2 PHI\_D_{i,t}(PHI\_M_{i,t}) \times HighAwareness_{i,t} \\ &+ \beta_3 HighAwareness_{i,t} + \beta_4 MVE_{i,t} + \beta_5 BTM_{i,t} + \beta_6 LEV_{i,t} + \beta_7 MTUM_{i,t} \\ &+ \beta_8 LIQUID_{i,t} + \beta_9 LTG_{i,t} \\ &+ \gamma YearFE_t + \delta IndustryFE_i + \varepsilon_{i,t} \end{aligned} \tag{7}$$

The equation is estimated based on the firm fixed-effects model and standard errors are clustered at the firm level. The regression results are reported in Table 7. The dependent variable in columns (1) and (2) is R_{AVE}, which is the average of the four cost of equity capital estimates. The dependent variables in columns (3)-(10), are R_{GLS}, R_{CT}, R_{PEG}, and R_{OJN}, respectively. The measure for CPG in columns (1), (3), (5), (7) and (9) is PHI_D, and the measure for CPG in columns (2), (4), (6), (8) and (10) is PHI_M. The results in columns (1) and (2) are the most important because the mean of the four different estimates of the cost of equity capital can mitigate measurement errors. There are two main facts from columns (1) and (2) that deserve to be highlighted. First, the coefficients on the CPG proxies are still significantly positive, which means that CPG leads to a higher cost of equity capital. Second, the coefficients on the interaction terms of $HighAwareness$ and CPG proxies are significantly negative, which suggests that the positive effect of CPG on a firm's cost of equity capital is alleviated for firms with a high level of public awareness, thereby supporting hypothesis 2a. In addition, we find that the coefficients on $HighAwareness$ are significantly positive. Servaes and Tamayo (2013) show that firms' advertising expenses negatively affect their operating return on sales after controlling for firm fixed effects. We argue that overspending on advertising raises a firm's sales expenses and reduces its profitability, and hence increases a firm's business risk.

TABLE 7.

The effect of public awareness on the CPG — cost of equity capital relation.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	R_{AVE}		R_{GLS}		R_{CT}		R_{PEG}		R_{OJN}	
PHI_D	0.0029***		0.0012***		0.0038***		0.0030***		0.0029***	
	(4.1370)		(3.6604)		(4.1682)		(3.4305)		(3.3870)	
PHI_M		0.0003***		0.0001***		0.0004***		0.0004***		0.0004***
		(6.0024)		(5.2975)		(5.7316)		(5.3652)		(5.3149)
$HighAwareness$	0.0040**	0.0038**	0.0006	0.0007	0.0059***	0.0049**	0.0039**	0.0041**	0.0038**	0.0039**
	(2.5096)	(2.3920)	(0.7383)	(0.7801)	(3.0447)	(2.4998)	(2.0181)	(2.1261)	(1.9613)	(2.0725)
PHI_D*	−0.0029*		−0.0005		−0.0044**		−0.0023		−0.0021	
$HighAwareness$	(−1.8657)		(−0.5584)		(−2.2892)		(−1.1978)		(−1.1424)	
PHI_M*		−0.0002*		−0.0000		−0.0003*		−0.0002		−0.0002
$HighAwareness$		(−1.7129)		(−0.6212)		(−1.6727)		(−1.3046)		(−1.2504)
MVE	−0.0000	−0.0003	−0.0022***	−0.0023***	−0.0002	−0.0005	0.0012	0.0010	0.0012	0.0009
	(−0.0626)	(−0.3839)	(−5.8962)	(−6.1610)	(−0.2451)	(−0.5581)	(1.5075)	(1.1971)	(1.4582)	(1.1483)
BTM	0.0166***	0.0164***	0.0226***	0.0225***	0.0160***	0.0157***	0.0143***	0.0141***	0.0140***	0.0137***
	(8.4092)	(8.3194)	(20.2824)	(20.2288)	(6.3270)	(6.2411)	(5.9946)	(5.8963)	(5.8230)	(5.7242)
LEV	0.0111***	0.0109***	0.0060***	0.0059***	0.0109***	0.0107***	0.0139***	0.0138***	0.0139***	0.0138***
	(5.0440)	(4.9842)	(4.8134)	(4.7719)	(3.8409)	(3.7816)	(5.2264)	(5.1715)	(5.2187)	(5.1643)
$MTUM$	−0.0074***	−0.0074***	−0.0042***	−0.0042***	−0.0094***	−0.0094***	−0.0081***	−0.0080***	−0.0080***	−0.0079***
	(−15.6401)	(−15.6137)	(−16.8110)	(−16.7783)	(−15.5294)	(−15.5118)	(−13.7778)	(−13.7466)	(−13.5915)	(−13.5605)
$LIQUID$	−0.0002	−0.0002	−0.0001	−0.0001	−0.0001	−0.0001	−0.0003*	−0.0004**	−0.0004**	−0.0004**
	(−1.5139)	(−1.5689)	(−0.7231)	(−0.7663)	(−0.4496)	(−0.4985)	(−1.9197)	(−1.9717)	(−2.0752)	(−2.1273)
LTG	0.0391***	0.0391***	−0.0013***	−0.0013***	0.0492***	0.0493***	0.0505***	0.0505***	0.0514***	0.0515***
	(45.2106)	(45.3085)	(−3.2361)	(−3.1658)	(43.3888)	(43.5319)	(45.5080)	(45.5891)	(46.1293)	(46.2109)
$\_CONS$	0.0561***	0.0584***	0.0536***	0.0547***	0.0602***	0.0634***	0.0494***	0.0520***	0.0542***	0.0568***
	(4.8725)	(5.1016)	(8.4398)	(8.6209)	(4.2319)	(4.4560)	(3.1965)	(3.3886)	(3.5006)	(3.6939)
$IndustryFE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$YearFE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	12612	12612	12612	12612	12612	12612	12612	12612	12612	12612
R^2(Within)	0.5300	0.5311	0.5962	0.5969	0.5012	0.5021	0.4904	0.4915	0.4986	0.4996

Notes: The equations are estimated based on the fixed-effects model and standard errors are clustered at the firm level (t-statistics are in parentheses). *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

4.2.3. SOEs vs. NSOEs

In the context of the Chinese capital market, one of the most significant features is the existence of SOEs. Because the government remains in control of pivotal resources and persistently intervenes with the operations of SOEs, SOEs and NSOEs differ in terms of their characteristics, strategies, and performance (Liu, 2006; Zhang et al., 2009; Li et al., 2015). SOEs

cannot concentrate on profit maximization as they have to fulfill political and social objectives such as full employment and social stability (Zhang et al., 2009; Chen et al., 2011b; Xu et al., 2015). Hence, the motives and economic consequences of CPG may also vary between SOEs and NSOEs. Thus, we divide the sample into SOEs and NSOEs. The results of the univariate test are reported in Table 8.

TABLE 8.

Comparison tests: SOEs vs. NSOEs.

	Mean (SOEs) $N = 5064$	Mean (NSOEs) $N = 7548$	Difference	Median (SOEs) $N = 5064$	Median (NSOEs) $N = 7548$	Difference
R_{AVE}	0.0890	0.0852	0.0037^{***}	0.0852	0.0825	0.0027^{***}
PHI_M	11.5273	11.3778	0.1495^{**}	12.6492	12.4244	0.2248^{***}
$ADVERT$	0.0020	0.0028	-0.0008^{**}	0.0000	0.0002	-0.0002^{***}
MVE	15.8979	15.6534	0.2445^{***}	15.8470	15.6257	0.2213^{***}
BTM	0.6729	0.5694	0.1035^{***}	0.6942	0.5719	0.1223^{***}
LEV	0.5057	0.3688	0.1369^{***}	0.5246	0.3522	0.1724^{***}
$MTUM$	0.2629	0.2078	0.0551^{***}	0.0611	0.0000	0.0611^{***}
$LIQUID$	3.0809	3.1160	-0.0351	2.4949	2.6228	-0.1279^{***}
LTG	0.3914	0.4279	-0.0365^{***}	0.2706	0.3366	-0.0660^{***}

Notes: *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

Table 8 shows that both the mean and median of $RAVE$ of SOEs are higher than those of NSOEs. Because of ambiguous property rights, less effective corporate governance mechanisms, and the existence of non-economic objectives in SOEs, they are more likely to suffer higher levels of business risk and cost of equity capital (Qiang, 2003; Zhang et al., 2009; Xu et al., 2015). Table 8 also demonstrates that both the mean and median of PHI_M for the SOE group are significantly higher, which indicates that SOEs tend to make larger donations than NSOEs. On average, SOEs have a higher market value of equity (MVE), book-to-market ratio (BTM), leverage (LEV), and momentum ($MTUM$). Meanwhile, they have lower advertising intensity ($ADVERT$), liquidity ($LIQUID$), and long-term growth rate (LTG).

We present the regression results of model (6) and (7) in Table 9. The results in columns (1)-(4) show that the effect of CPG on the cost of equity capital is positive and significant for both SOEs and NSOEs, which is consistent with hypothesis 1a. In columns (5)-(8), all the coefficients on the interaction terms ($PHI\_D{*}HighAwareness$ and $PHI\_M{*}HighAwareness$) have negative signs, but only the coefficients in columns (7) and (8) are significant. These results indicate that the role of public awareness in mit-

TABLE 9.
The effect of public awareness on the CPG — cost of equity capital relation: SOEs vs. NSOEs.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	SOEs		NSOEs		SOEs		NSOEs	
PHI_D	0.0033***		0.0020***		0.0035***		0.0025***	
	(3.1080)		(2.6386)		(2.9290)		(3.0643)	
PHI_M		0.0003***		0.0003***		0.0003***		0.0003***
		(3.6952)		(4.8919)		(3.3465)		(5.2343)
$HighAwareness$					0.0058**	0.0047*	0.0022	0.0027
					(2.3551)	(1.8482)	(1.1117)	(1.3898)
PHI_D*					−0.0017		−0.0033*	
$HighAwareness$					(−0.6907)		(−1.6873)	
PHI_M*						−0.0000		−0.0003**
$HighAwareness$						(−0.2193)		(−2.0325)
MVE	−0.0004	−0.0006	0.0001	−0.0001	−0.0004	−0.0005	0.0001	−0.0001
	(−0.3522)	(−0.5272)	(0.1344)	(−0.0990)	(−0.3336)	(−0.5017)	(0.1097)	(−0.1195)
BTM	0.0182***	0.0181***	0.0174***	0.0171***	0.0186***	0.0185***	0.0173***	0.0169***
	(5.8372)	(5.8148)	(6.6286)	(6.5436)	(5.9313)	(5.9069)	(6.5613)	(6.4705)
LEV	0.0023	0.0022	0.0167***	0.0165***	0.0024	0.0023	0.0168***	0.0166***
	(0.5747)	(0.5425)	(6.1520)	(6.0905)	(0.6061)	(0.5678)	(6.1835)	(6.1224)
$MTUM$	−0.0060***	−0.0060***	−0.0077***	−0.0077***	−0.0059***	−0.0059***	−0.0077***	−0.0077***
	(−7.5488)	(−7.5279)	(−12.8680)	(−12.8484)	(−7.4538)	(−7.4415)	(−12.8662)	(−12.8477)
$LIQUID$	−0.0000	−0.0000	−0.0005***	−0.0005***	−0.0000	−0.0000	−0.0005***	−0.0005***
	(−0.1155)	(−0.1403)	(−2.5985)	(−2.6534)	(−0.0370)	(−0.0531)	(−2.5807)	(−2.6404)
LTG	0.0380***	0.0381***	0.0399***	0.0399***	0.0380***	0.0381***	0.0399***	0.0399***
	(29.0107)	(29.1400)	(34.0080)	(34.0156)	(29.1421)	(29.2667)	(33.9849)	(33.9954)
$\_CONS$	0.0659***	0.0685***	0.0496***	0.0517***	0.0643***	0.0670***	0.0489***	0.0508***
	(3.5105)	(3.6630)	(3.4850)	(3.6302)	(3.4186)	(3.5772)	(3.4374)	(3.5679)
$IndustryFE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$YearFE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5064	5064	7548	7548	5064	5064	7548	7548
R^2(Within)	0.4879	0.4885	0.5760	0.5772	0.4896	0.4902	0.5762	0.5776

Notes: The equations are estimated based on the fixed-effects model and standard errors are clustered at the firm level (t-statistics are in parentheses). *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

igating the effect of CPG on the cost of equity capital is not effective for SOEs. The CPG decisions in SOEs are usually made based on political and social objectives rather than shareholder welfare maximization (Long et al., 2020). In contrast to NSOEs, SOEs are less likely to use CPG as a strategic mechanism to attain legitimacy or build political connections for their long-term development (Li et al., 2015). Therefore, SOEs have a

higher probability of misappropriating money on CPG and damaging the interests of investors compared with NSOEs (Chen et al., 2020). Although advertising raises stakeholder's awareness of a firm's CPG involvement, investors of SOEs might not regard CPG as a favorable signal, and thus the perceived risk of SOEs will not decrease.

TABLE 10.

The effect of public awareness on the CPG — cost of equity capital relation: Eastern region vs. non-eastern region.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Eastern region		Non-eastern region		Eastern region		Non-eastern region	
PHI_D	0.0028^{***}		0.0016		0.0033^{***}		0.0016	
	(3.9331)		(1.2080)		(4.3703)		(1.0744)	
PHI_M		0.0003^{***}		0.0002^{**}		0.0004^{***}		0.0002^{*}
		(5.8493)		(2.0794)		(6.0608)		(1.8886)
$HighAwareness$					0.0041^{**}	0.0035^{*}	0.0041	0.0045
					(2.1770)	(1.9347)	(1.3571)	(1.4512)
PHI_D*					-0.0042^{**}		−0.0005	
$HighAwareness$					(−2.2483)		(−0.1657)	
PHI_M*						-0.0003^{*}		−0.0001
$HighAwareness$						(−1.9531)		(−0.3121)
MVE	−0.0007	−0.0009	0.0016	0.0014	−0.0007	−0.0009	0.0017	0.0015
	(−0.8986)	(−1.1521)	(1.3474)	(1.1785)	(−0.9173)	(−1.1642)	(1.4409)	(1.2740)
BTM	0.0160^{***}	0.0158^{***}	0.0148^{***}	0.0146^{***}	0.0160^{***}	0.0158^{***}	0.0154^{***}	0.0151^{***}
	(6.7076)	(6.6472)	(4.2148)	(4.1645)	(6.7025)	(6.6407)	(4.3110)	(4.2550)
LEV	0.0124^{***}	0.0123^{***}	0.0102^{**}	0.0101^{**}	0.0124^{***}	0.0123^{***}	0.0105^{**}	0.0104^{**}
	(4.8511)	(4.8015)	(2.4144)	(2.3953)	(4.8547)	(4.7872)	(2.4603)	(2.4437)
$MTUM$	-0.0077^{***}	-0.0077^{***}	-0.0070^{***}	-0.0070^{***}	-0.0077^{***}	-0.0077^{***}	-0.0070^{***}	-0.0070^{***}
	(−14.3361)	(−14.3093)	(−7.3153)	(−7.2943)	(−14.3009)	(−14.2792)	(−7.2971)	(−7.2817)
$LIQUID$	−0.0003	−0.0003	−0.0002	−0.0002	−0.0003	−0.0003	−0.0002	−0.0002
	(−1.5386)	(−1.5805)	(−0.6181)	(−0.6397)	(−1.5124)	(−1.5506)	(−0.6502)	(−0.6780)
LTG	0.0393^{***}	0.0393^{***}	0.0385^{***}	0.0386^{***}	0.0393^{***}	0.0393^{***}	0.0386^{***}	0.0387^{***}
	(36.0374)	(36.1113)	(27.0575)	(27.1076)	(36.0458)	(36.1134)	(27.1253)	(27.1733)
$\_CONS$	0.0716^{***}	0.0735^{***}	0.0324	0.0347^{*}	0.0711^{***}	0.0730^{***}	0.0304	0.0326
	(3.7919)	(3.9254)	(1.6143)	(1.7335)	(3.7756)	(3.9029)	(1.5126)	(1.6270)
$IndustryFE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$YearFE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	8754	8754	3858	3858	8754	8754	3858	3858
R^2(Within)	0.5531	0.5544	0.4919	0.4925	0.5534	0.5547	0.4933	0.4938

Notes: The equations are estimated based on the fixed-effects model and standard errors are clustered at the firm level (t-statistics are in parentheses). *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

4.2.4. Eastern region vs. non-eastern region

Although China's economy has made great progress over the past forty years, substantial imbalances still exist among different regions. Compared with the central and western regions, the eastern region is relatively well-developed in terms of its institutional environment and has a higher level of marketization (Wang and Qian, 2011). The non-eastern region with weak institutional environments is confronted with more severe government resource control and poorer enforcement of laws and regulations (Huang and Rice, 2012; Chen et al., 2018b). These institutional deficiencies in the non-eastern region can be exploited by opportunistic firms for their own benefits. Hence, the motives of CPG are more complicated for firms located in the non-eastern region. We divide our sample into eastern region and non-eastern region groups based on the region where the firm's headquarter is located. We then rerun the regressions based on models (6) and (7).

The results are reported in Table 10. For the eastern region group, the coefficients of the CPG proxies remain significantly positive, and the coefficients of interaction terms remain significantly negative, which are consistent with our main findings. However, for the non-eastern region, the coefficients of PHI_D and the interaction terms are not significant. The coefficient on PHI_M for the non-eastern region group is significantly positive, but its magnitude and t-statistics are smaller than those of the PHI_M for the eastern region group. Because of the poor institutional environment and high government intervention, firms located in the non-eastern region are more likely to engage in CPG activities to trade for some essential resources or hide misbehavior (Chen et al., 2018b). Hence, firms located in the non-eastern region suffer less business risk and enjoy more economic benefits when they donate, such that the positive effect of CPG on the cost of equity capital is not as obvious as with firms in the eastern region.

4.2.5. High market competition vs. low market competition

Market competition is considered as an important factor that influences a firm's CPG initiatives. However, the effects of market competition are still controversial. Zhang et al. (2010) find that firms in highly competitive industries are more likely to use CPG to differentiate themselves from their rivals. On the contrary, Bagnoli and Watts (2003) suggest that high market competition prevents firms from investing in CSR because engaging in CSR increases the marginal cost of producing private goods. Hence, it

is necessary to examine the effects of CPG and public awareness on the firm's cost of equity capital under different market competition conditions.

TABLE 11.

The effect of public awareness on the CPG — cost of equity capital relation: High market competition vs. low market competition.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	High market competition		Low market competition		High market competition		Low market competition	
PHI_D	0.0031^{***}		0.0009		0.0032^{***}		0.0019	
	(3.9422)		(0.8736)		(3.7580)		(1.6220)	
PHI_M		0.0004^{***}		0.0002^{**}		0.0004^{***}		0.0002^{***}
		(5.5895)		(2.0535)		(5.3259)		(2.6039)
$HighAwareness$					0.0030	0.0035^{*}	0.0066^{**}	0.0055^{**}
					(1.5432)	(1.8258)	(2.4374)	(2.0820)
PHI_D*					-0.0011		-0.0064^{**}	
$HighAwareness$					(-0.5781)		(-2.4113)	
PHI_M*						-0.0001		-0.0004^{**}
$HighAwareness$						(-0.8910)		(-1.9995)
MVE	0.0004	0.0002	-0.0010	-0.0012	0.0004	0.0002	-0.0010	-0.0012
	(0.4536)	(0.2110)	(-0.9756)	(-1.1311)	(0.5044)	(0.2642)	(-0.9747)	(-1.1526)
BTM	0.0162^{***}	0.0159^{***}	0.0176^{***}	0.0175^{***}	0.0165^{***}	0.0162^{***}	0.0175^{***}	0.0174^{***}
	(6.7333)	(6.6516)	(4.9091)	(4.8860)	(6.8007)	(6.7198)	(4.8706)	(4.8446)
LEV	0.0076^{***}	0.0074^{***}	0.0176^{***}	0.0176^{***}	0.0076^{***}	0.0073^{***}	0.0177^{***}	0.0177^{***}
	(2.8694)	(2.7884)	(4.2201)	(4.2199)	(2.8633)	(2.7744)	(4.2362)	(4.2411)
$MTUM$	-0.0072^{***}	-0.0072^{***}	-0.0075^{***}	-0.0075^{***}	-0.0072^{***}	-0.0072^{***}	-0.0075^{***}	-0.0075^{***}
	(-12.3513)	(-12.3569)	(-9.1447)	(-9.1093)	(-12.3191)	(-12.3200)	(-9.1073)	(-9.0766)
$LIQUID$	-0.0001	-0.0001	-0.0004^{*}	-0.0004^{*}	-0.0001	-0.0001	-0.0004^{*}	-0.0004^{*}
	(-0.5678)	(-0.5867)	(-1.6620)	(-1.7101)	(-0.5219)	(-0.5456)	(-1.6622)	(-1.7125)
LTG	0.0387^{***}	0.0388^{***}	0.0393^{***}	0.0394^{***}	0.0388^{***}	0.0388^{***}	0.0393^{***}	0.0394^{***}
	(36.4932)	(36.5819)	(26.9173)	(26.9638)	(36.5783)	(36.6677)	(26.9016)	(26.9322)
$\_CONS$	0.0509^{***}	0.0534^{***}	0.0739^{***}	0.0755^{***}	0.0499^{***}	0.0523^{***}	0.0730^{***}	0.0751^{***}
	(3.7493)	(3.9458)	(3.9208)	(4.0306)	(3.6536)	(3.8430)	(3.8741)	(4.0126)
$IndustryFE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$YearFE$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	8236	8236	4376	4376	8236	8236	4376	4376
R^2(Within)	0.5462	0.5475	0.5137	0.5143	0.5466	0.5479	0.5145	0.5149

Notes: The equations are estimated based on the fixed-effects model and standard errors are clustered at the firm level (t-statistics are in parentheses). *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

We use the Herfindahl-Hirschman Index (HHI) to measure the level of market competition as follows:

$$HHI_{j,t} = \sum_{i=1}^{N_j} S_{i,j,t}^2 \tag{8}$$

where $S_{i,j,t}$ is the market share of firm i in industry j in year t, and the industry classification is based on the codes provided by CSRC. A high HHI represents low market competition, and vice versa. An industry is regarded as having strong market competition if its HHI is under the sample median for a specific fiscal year. Following the prior studies (e.g., Zhang et al., 2010; Chen et al., 2018a; Khan et al., 2020), we calculate HHI based on the sales revenue of all listed firms for each industry. The sales revenue data used to construct HHI is provided by the CSMAR database and covers 34,466 firm-year observations.

Table 11 provides the regression results for the two groups. In columns (1)-(4), the coefficients on both CPG proxies in the high-market-competition group are significantly positive. In the low-market-competition group, the coefficient on PHI_M remains significantly positive, whereas the coefficient on PHI_D is not significant. These results indicate that the positive effect of CPG on the cost of equity capital is more pronounced in highly competitive industries. Furthermore, in columns (5)-(8), we find that the coefficients on the interaction terms of CPG and public awareness are significantly negative in the low-market-competition group, but not significant in the high-market-competition group. This means that the moderating effect of public awareness only exists in low-competition industries. In high-competition industries, firms' CPG involvement may result in higher "opportunity costs" and business risk because CPG would lower firms' free cash flow and make firms miss good investment opportunities, which are more likely to disappear quickly in high-competition industries (Chen et al., 2018b). Hence, firms in high-competition industries suffer a higher cost of equity capital when engaging in CPG activities compared with those in low-competition industries. In addition, the advertising activities of rivals of homogenous products are more intense in high-competition industries, such that the attention of stakeholders is distracted. As a result, the moderating effect of public awareness is less obvious in high-competition group.

5. ROBUSTNESS TESTS

Our main analysis suggests that CPG positively affects a firm's cost of equity capital, and the effect is mitigated by public awareness. However, the results might suffer from endogeneity problems caused by measurement error or omitted variables that can affect both CPG and the cost of equity capital. We conduct the following robustness tests to confirm the reliability of our results.

TABLE 12.

Robustness tests: High advertising intensity vs. low advertising intensity.

	(1)	(2)	(3)	(4)
	High advertising intensity		Low advertising intensity	
PHI_D	-0.0002		0.0034^{***}	
	(-0.1419)		(3.1557)	
PHI_M		0.0001		0.0004^{***}
		(0.7008)		(4.5546)
MVE	-0.0000	-0.0001	-0.0015	-0.0018^{*}
	(-0.0307)	(-0.0668)	(-1.5914)	(-1.8831)
BTM	0.0073^{*}	0.0074^{*}	0.0165^{***}	0.0162^{***}
	(1.7249)	(1.7450)	(5.5681)	(5.4814)
LEV	0.0041	0.0040	0.0107^{***}	0.0106^{***}
	(0.9119)	(0.8824)	(2.8894)	(2.8568)
$MTUM$	-0.0130^{***}	-0.0130^{***}	-0.0052^{***}	-0.0052^{***}
	(-11.4937)	(-11.5194)	(-7.6314)	(-7.5999)
$LIQUID$	-0.0009^{***}	-0.0009^{***}	-0.0004^{*}	-0.0004^{*}
	(-3.0570)	(-3.0531)	(-1.8418)	(-1.9122)
LTG	0.0379^{***}	0.0379^{***}	0.0404^{***}	0.0405^{***}
	(15.8609)	(15.8373)	(32.6031)	(32.7339)
$\_CONS$	0.0367	0.0363	0.0899^{***}	0.0934^{***}
	(1.4541)	(1.4456)	(5.3125)	(5.5188)
$IndustryFE$	Yes	Yes	Yes	Yes
$YearFE$	Yes	Yes	Yes	Yes
N	2565	2565	6052	6052
R^2(Within)	0.5756	0.5757	0.5481	0.5493

Notes: The equations are estimated based on the fixed-effects model and standard errors are clustered at the firm level (t-statistics are in parentheses). *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

5.1. High advertising intensity vs. low advertising intensity

To further examine the mitigating effects of public awareness on the CPG's effect on the cost of equity capital, we divide our sample of firms

into four quartiles based on the advertising intensity measure $ADVERT$ and rerun our regressions on the top and bottom quartile groups. Firms in the top (bottom) quartile have a high (low) level of advertising intensity. Table 12 reports the estimates of model (6). The coefficients on PHI_D and PHI_M for the low-advertising-intensity group are both significantly positive at the 1% level, while the coefficients on these two CPG measures are not significant for the high-advertising-intensity group. These results imply that firms with low public awareness suffer a higher cost of equity capital when they engage in CPG activities, which is consistent with our aforementioned arguments.

TABLE 13.

Robustness tests: Large firms vs. small firms.

	(1)	(2)	(3)	(4)
	Large firms		Small firms	
PHI_D	0.0016		0.0023^{**}	
	(0.7984)		(2.1896)	
PHI_M		0.0002		0.0002^{***}
		(1.6180)		(2.7896)
MVE	0.0006	0.0004	-0.0063^{***}	-0.0064^{***}
	(0.4186)	(0.2856)	(-3.9446)	(-3.9633)
BTM	0.0153^{***}	0.0152^{***}	0.0160^{***}	0.0161^{***}
	(3.0501)	(3.0331)	(3.5456)	(3.5768)
LEV	-0.0002	-0.0006	0.0216^{***}	0.0217^{***}
	(-0.0380)	(-0.0930)	(3.7936)	(3.7997)
$MTUM$	-0.0092^{***}	-0.0091^{***}	-0.0042^{***}	-0.0042^{***}
	(-8.1564)	(-8.1328)	(-4.0604)	(-4.0767)
$LIQUID$	0.0001	0.0001	-0.0007^{**}	-0.0007^{**}
	(0.3751)	(0.3420)	(-2.4861)	(-2.5223)
LTG	0.0355^{***}	0.0356^{***}	0.0439^{***}	0.0439^{***}
	(19.8889)	(19.9615)	(26.1861)	(26.1598)
$\_CONS$	0.0485^{*}	0.0507^{*}	0.1613^{***}	0.1612^{***}
	(1.8393)	(1.9255)	(6.2673)	(6.2826)
$IndustryFE$	Yes	Yes	Yes	Yes
$YearFE$	Yes	Yes	Yes	Yes
N	3075	3075	3237	3237
R^2(Within)	0.4795	0.4801	0.6237	0.6244

Notes: The equations are estimated based on the fixed-effects model and standard errors are clustered at the firm level (t-statistics are in parentheses). *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

5.2. Large firms vs. small firms

The prior research suggests that large firms have better visibility, which can attract greater public attention (Seifert et al., 2004; Amato and Amato, 2007; Baldini et al., 2018). Therefore, we divide our sample into four quartiles based on the firms' assets and rerun our regressions on the top and bottom quartile groups. Firms in the top (bottom) quartile have a large (small) size. The regression results of model (6) reported in Table 13 show that CPG can significantly increase the cost of equity capital of small firms, but has no effects on the cost of equity capital of large firms. These results imply that small firms with a low degree of visibility (public awareness) suffer a higher cost of equity capital when they engage in CPG activities. Hence, public awareness can mitigate the positive effect of CPG on the cost of equity capital.

TABLE 14.

Robustness tests: An alternative measure of public awareness.

	(1)	(2)	(3)	(4)
PHI_D	0.0025^{***}		0.0024^{***}	
	(3.8991)		(3.8831)	
PHI_M		0.0003^{***}		0.0003^{***}
		(5.9825)		(5.9312)
$PublicAwareness$			0.0617^{**}	0.0583^{**}
			(2.2984)	(2.1773)
$PHI\_D * PublicAwareness$			-0.0000^{***}	
			(-2.8504)	
$PHI\_M * PublicAwareness$				-0.0000^{***}
				(-2.9082)
MVE	-0.0001	-0.0003	-0.0001	-0.0003
	(-0.0787)	(-0.4025)	(-0.1221)	(-0.4385)
BTM	0.0164^{***}	0.0162^{***}	0.0167^{***}	0.0165^{***}
	(8.3809)	(8.2940)	(8.4829)	(8.3920)
LEV	0.0110^{***}	0.0109^{***}	0.0108^{***}	0.0107^{***}
	(5.0342)	(4.9863)	(4.9427)	(4.9011)
$MTUM$	-0.0074^{***}	-0.0074^{***}	-0.0074^{***}	-0.0073^{***}
	(-15.6940)	(-15.6599)	(-15.6113)	(-15.5808)
$LIQUID$	-0.0002	-0.0002	-0.0002	-0.0002
	(-1.5349)	(-1.5855)	(-1.5326)	(-1.5829)
LTG	0.0390^{***}	0.0391^{***}	0.0390^{***}	0.0391^{***}
	(45.1495)	(45.2488)	(45.1867)	(45.2824)
$\_CONS$	0.0567^{***}	0.0591^{***}	0.0570^{***}	0.0593^{***}
	(4.9225)	(5.1548)	(4.9443)	(5.1730)
$IndustryFE$	Yes	Yes	Yes	Yes
$YearFE$	Yes	Yes	Yes	Yes
N	12612	12612	12612	12612
R^2(Within)	0.5297	0.5308	0.5300	0.5310

Notes: The equations are estimated based on the fixed-effects model and standard errors are clustered at the firm level (t-statistics are in parentheses). *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

5.3. An alternative measure of public awareness

In this section, we use a more size-free measurement of public awareness to check the robustness of the results. Specifically, we define $PublicAwareness$ as the ratio of advertising expenditures to lagged total revenue and set $PublicAwareness$ equal to the industry median if missing. As shown in Table 14, the coefficients on the interaction terms of CPG and public awareness are still significantly negative, while the absolute values of the inter-

action terms become smaller. These findings indicate that our results do not depend on the specific measurement of public awareness.

5.4. Control for operating performance

The control variables used in our main regressions are mostly measurements of firms' financial performance. However, the level of business risk and the cost of equity capital are also related to a firm's operating performance. To alleviate the concerns of omitted variable bias, we add the return on assets (ROA) and total factor productivity (TFP) into our regressions to control for firms' operating performance.

ROA is calculated as the earnings before interest and tax divided by total assets. TFP represents the transformation efficiency of total inputs into total outputs. To estimate TFP, we refer to prior literature (e.g., Faleye et al., 2006; Dai et al., 2017) and assume that the firm's production function follows the Cobb-Douglas form:

$$Y_{i,t} = AL_{i,t}^{\alpha} K_{i,t}^{\beta} \tag{9}$$

where $Y_{i,t}$ is the sales of firm i in year t; $L_{i,t}$ is the number of employees of firm i in year t; and $K_{i,t}$ is the net property, plant, and equipment of firm i in year t. We implement the natural logarithm of both sides of equation (9), and then calculate the TFP of the firm as the residual using the following regression equation:

$$y_{i,t} = a_{i,t} + \alpha l_{i,t} + \beta k_{i,t} + \varepsilon_{i,t} \tag{10}$$

where $y_{i,t}$, $l_{i,t}$, and $k_{i,t}$ are the logarithmic forms of $Y_{i,t}$, $L_{i,t}$, and $K_{i,t}$, respectively. We estimate equation (10) by industry and year, and exclude regressions with less than 20 observations.

We re-estimate our main regressions after including both ROA and TFP. The results reported in Table 15 show that our main regression results remain robust.

TABLE 15.

Robustness tests: Controlling for operating performance.

	(1)	(2)	(3)	(4)
PHI_D	0.0020^{***}		0.0024^{***}	
	(3.1566)		(3.4448)	
PHI_M		0.0003^{***}		0.0003^{***}
		(4.9992)		(5.1512)
$HighAwareness$			0.0042^{**}	0.0042^{**}
			(2.5514)	(2.5727)
$PHI\_D * HighAwareness$			-0.0029^{*}	
			(-1.7899)	
$PHI\_M * HighAwareness$				-0.0002^{*}
				(-1.8021)
MVE	-0.0025^{***}	-0.0027^{***}	-0.0025^{***}	-0.0027^{***}
	(-3.5279)	(-3.7776)	(-3.4761)	(-3.7232)
BTM	0.0245^{***}	0.0243^{***}	0.0247^{***}	0.0244^{***}
	(11.4757)	(11.3792)	(11.5261)	(11.4244)
LEV	0.0173^{***}	0.0171^{***}	0.0172^{***}	0.0171^{***}
	(7.1275)	(7.0741)	(7.1172)	(7.0553)
$MTUM$	-0.0082^{***}	-0.0082^{***}	-0.0082^{***}	-0.0081^{***}
	(-17.6699)	(-17.6185)	(-17.6021)	(-17.5620)
$LIQUID$	0.0001	0.0001	0.0001	0.0001
	(0.4136)	(0.3723)	(0.4336)	(0.3899)
LTG	0.0442^{***}	0.0442^{***}	0.0442^{***}	0.0442^{***}
	(45.1564)	(45.2296)	(45.2279)	(45.2972)
TFP	0.0017^{**}	0.0017^{**}	0.0018^{**}	0.0018^{**}
	(2.4514)	(2.4373)	(2.4939)	(2.4778)
ROA	0.1310^{***}	0.1304^{***}	0.1306^{***}	0.1300^{***}
	(9.5294)	(9.4923)	(9.5099)	(9.4718)
$\_CONS$	0.0698^{***}	0.0718^{***}	0.0690^{***}	0.0710^{***}
	(4.5145)	(4.6655)	(4.4650)	(4.6114)
$IndustryFE$	Yes	Yes	Yes	Yes
$YearFE$	Yes	Yes	Yes	Yes
N	11584	11584	11584	11584
R^2(Within)	0.5695	0.5704	0.5699	0.5708

Notes: The equations are estimated based on the fixed-effects model and standard errors are clustered at the firm level (t-statistics are in parentheses). *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

5.5. Propensity score matching

We implement a propensity score matching method to address the endogeneity concerns arising from selection bias. First, we divide our sam-

TABLE 16.

Robustness tests: Propensity score matching.

	(1)	(2)
$PHI\_BIGGIVER$	0.0027^{***}	0.0033^{***}
	(3.7419)	(4.1550)
$HighAwareness$		0.0027^{*}
		(1.7715)
$PHI\_BIGGIVER * HighAwareness$		-0.0033^{**}
		(-2.1068)
MVE	0.0004	0.0005
	(0.4070)	(0.4418)
BTM	0.0220^{***}	0.0220^{***}
	(6.9852)	(7.0047)
LEV	0.0105^{***}	0.0102^{***}
	(2.9831)	(2.9109)
$MTUM$	-0.0061^{***}	-0.0060^{***}
	(-7.2502)	(-7.2279)
$LIQUID$	-0.0005^{**}	-0.0005^{**}
	(-2.0319)	(-2.0583)
LTG	0.0390^{***}	0.0390^{***}
	(26.8018)	(26.8063)
$\_CONS$	0.0644^{***}	0.0632^{***}
	(3.6889)	(3.6345)
$IndustryFE$	Yes	Yes
$YearFE$	Yes	Yes
N	5086	5086
R^2(Within)	0.5501	0.5507

Notes: The equations are estimated based on the fixed-effects model and standard errors are clustered at the firm level (t-statistics are in parentheses). *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

ple into two subsamples based on the sample mean of the firms' donation expenditures. We construct a new CPG measure $PHI\_BIGGIVER$ that equals 1 if the amount of a firm's donation expenditures is above the sample mean in a specific fiscal year and 0 otherwise. Second, we run a probit regression on our full sample to predict the possibility of donating a larger amount than the sample mean. All the control variables in model (6) are included in the prediction model. We then match each $PHI\_BIGGIVER = 1$ observation with a $PHI\_BIGGIVER = 0$ observation that has the closest propensity score. Finally, we examine the effects of CPG and public awareness on the cost of equity capital using this

matched sample. The results presented in Table 16 are consistent with our main findings.

TABLE 17.

Robustness tests: 2SLS method.

	Estimates of model (6)		Estimates of model (7)	
	(1)	(2)	(3)	(4)
	First stage	Second stage	First stage	Second stage
$IndustryAveragePHI\_M$	0.8635^{***}		0.8860^{***}	
	(20.8264)		(20.1255)	
$IndustryAveragePHI\_M * HighAwareness$			-0.1731	
			(-1.6410)	
PHI_M		0.0011^{***}		0.0014^{***}
		(4.7251)		(5.7120)
$HighAwareness$			2.1410^{*}	0.0426^{***}
			(1.7141)	(4.1518)
$PHI\_M * HighAwareness$				-0.0033^{***}
				(-3.7892)
MVE	0.6065^{***}	-0.0074^{***}	0.5979^{***}	-0.0074^{***}
	(7.7379)	(-14.1810)	(7.6164)	(-14.0101)
BTM	1.0398^{***}	0.0232^{***}	1.0482^{***}	0.0234^{***}
	(3.0707)	(11.4484)	(3.0960)	(11.2973)
LEV	0.2410	0.0115^{***}	0.2383	0.0113^{***}
	(0.5684)	(4.8529)	(0.5621)	(4.7283)
$MTUM$	-0.0750	-0.0088^{***}	-0.0600	-0.0086^{***}
	(-1.0716)	(-23.0240)	(-0.8514)	(-21.9444)
$LIQUID$	-0.0165	-0.0016^{***}	-0.0181	-0.0017^{***}
	(-0.6875)	(-11.9864)	(-0.7520)	(-11.9823)
LTG	-0.2433^{*}	0.0381^{***}	-0.2377^{*}	0.0383^{***}
	(-1.7427)	(41.3476)	(-1.7035)	(41.1382)
The p-value of the instrument's partial F test	0.0000		0.0000	
Underidentification test: Kleibergen-Paap rk LM statistic	235.74^{***}		33.39^{***}	
Weak identification test: Cragg-Donald Wald F statistic	516.38^{***}		123.77^{***}	
N	12113	12113	12113	12113

Notes: The equations are estimated based on the fixed-effects model and standard errors are clustered at the firm level (t-statistics are in parentheses). *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively.

5.6. Two-stage least squares regression

Because it is possible that CPG and the cost of equity capital are simultaneously affected by some omitted variables, we perform a two-stage least squares (2SLS) regression to deal with the omitted variable concerns. Following Xu et al. (2015) and Judd and Lusch (2018), we use the CPG behavior of industry peers as our instrumental variable measure. Specifically, we define $IndustryAveragePHI\_M$ as the industry average of PHI_M in a specific fiscal year. In the first stage, we estimate CPG using the instrument variable and the other control variables included in our main regressions. In the second stage, we use the predicted CPG measure as the independent variable to estimate models (6) and (7). The procedure is performed using a Stata external command xtivreg2, and 499 observations are deleted automatically due to the singleton group problem. The results are presented in Table 17, which are consistent with those in the main tests. Following Xie and Zhang (2020), we conduct several tests to check the validity of the instrument variable. The p-values of the instrument's partial F-test for the first stage are equal to 0.0000, which indicates that the instrument variable is highly correlated with the endogenous variable. In addition, the instrument also passes both the Kleibergen-Paap and the Cragg-Donald relevance tests. Thus, our results are robust after controlling for endogeneity using the 2SLS method.

6. CONCLUSION

This study examines the influence of CPG on the cost of equity capital and investigates whether public awareness affects the effect of CPG on the cost of equity capital. Using a sample of Chinese listed companies, this study shows that CPG positively affects the cost of equity capital. We also find that this positive effect is mitigated for firms with high public awareness. Our findings are consistent with the prior work suggesting that firms are unable to benefit from CSR involvement without public awareness (Servaes and Tamayo, 2013). However, the moderating effect of public awareness only applies to NSOEs when the sample is divided into SOEs and NSOEs. Furthermore, we find that for firms in the eastern region or those in less competitive industries, the positive effect of corporate philanthropy on the cost of equity capital can be moderated as the firms' public awareness increases.

Our findings provide evidence that CPG activities can increase firm's equity costs and harm stockholders' value in China. Hence, strengthen-

ing corporate governance mechanisms would be beneficial to firms in terms of alleviating agency concerns and costs arising from CPG activities, and enabling firms to protect the interest of shareholders when fulfilling their social responsibilities. Moreover, this study suggests that high public awareness through advertising could help spread good news about firms' CPG activities and mitigate the passive impact of CPG on firms' equity cost, as this can help firms build beneficial and long-term relationships with stakeholders. Furthermore, the findings of this study suggest that the Chinese government's control over market resources may distort the motivations for CPG at the cost of the firms' value and increase the probability of market failure as firms may trade CPG for resources that are necessary for their development. Lastly, this study benefits investors as it serves as a reminder that a firm's CPG activities should be taken into consideration when making investment decisions. Investors need to pay attention to the trade-offs between the costs of CPG and its potential benefits.

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