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Is there Informational Value in Corporate Giving?

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Abstract In this article, we propose that giving in cash and non-cash (in-kind) differ in their relation with the giving firm's future corporate financial performance (CFP) and only cash giving is associated with future CFP. Using a novel dataset from ASSET4 that differentiates corporate giving over a sample period of 2002–2012, we examine three competing hypotheses: (1) *agency cost hypothesis* that cash giving reflects agency cost and destroys value for shareholders, (2) *investment hypothesis* that cash giving is an investment by management that aims for better future return, and (3) *information hypothesis* that cash giving has informational value to shareholders as cash is a critical resource at a firm and giving is a decision by managers who are insiders. We find that indeed, only cash giving is positively associated with future CFP and firm value, measured by Fama–French five-factor abnormal risk-adjusted stock returns, future return on assets, and Tobin's Q. In addition, we find that the positive association exists only between excess, i.e., unexpected, but not expected cash giving and future CFP. Our empirical findings support the information hypothesis, but neither the agency hypothesis nor the investment hypothesis, and are robust to a number of endogeneity tests, including orthogonalized cash giving, instrumental variable regression using geography-based instruments, and propensity score matching. Furthermore, we show that the positive association between future CFP and unexpected cash giving is only pronounced at firms with good governance and relatively higher sales growth where agency problems are less likely, and at firms with no alternative mechanisms to demonstrate the strength of cash flow. Additionally, we do not find evidence that suggests in-kind giving to possess any informational value.

Keywords Corporate philanthropy · Cash giving · Information hypothesis · Agency hypothesis · Investment hypothesis · Corporate financial performance

Introduction

Despite the global financial crisis, corporate giving persists, and has continued to grow in economic importance (Brammer and Millington 2008).[1] However, the drivers and outcomes of corporate giving are difficult to measure, as it is a complex, multifaceted, multi-stakeholder phenomenon that is hard to clearly define (Gautier and Pache 2015). Consequently, the effects of corporate giving remain contestable, and the research on the relation between corporate giving and corporate financial performance (CFP) remains largely inconclusive. For instance, while some critics

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[1] For instance, many companies allocate significant portions of their expense budgets to corporate philanthropy, with large U.S. firms spending US$20 billion and US$18.5 billion on corporate philanthropy in 2012 and 2014, respectively (Giving in Numbers 2013, 2015). In addition to presenting a profile of corporate philanthropy in 2012, the Giving in Numbers (2013) report pinpoints how corporate giving has continued to evolve and become more focused since the onset of the global financial crisis. Giving in Numbers (2015) suggests that corporate giving grew for 56 % of companies between 2012 and 2014, and it increased by more than 10 % for 42 % of companies.

maintain that corporate giving is a drain on shareholder wealth (Friedman 1970; *agency cost hypothesis*), others claim that strategic corporate giving can raise a company's image and reputation (Porter and Kramer 2002; *investment hypothesis*). Most recently, Lys et al. (2015) suggest that corporate social responsibility (CSR) expenditures passively "signal" information about firms' future prospects (*information hypothesis*).

In this article, we investigate the relation between corporate giving and CFP and examine the above three hypotheses, especially the validity of the information hypotheses. For that task, we first postulate that the acts of giving in cash and non-cash (in-kind[2]) differ in their relation with the giving firm's future CFP. Second, we attempt to show that cash giving is positively associated with future CFP, suggesting potential evidence that supports either the investment or information hypothesis. Furthermore, we differentiate between expected cash giving and unexpected cash giving to investigate whether only unexpected cash giving is positively associated with future CFP. If so, such evidence is consistent with the information hypothesis, but not the investment hypothesis. Finally, we suggest that the informational value of cash giving is more pronounced at well-governed firms that otherwise lack alternative mechanisms to demonstrate their financial strength.

Most prior studies that relate corporate giving to CFP treat corporate giving as a homogeneous construct and do not differentiate between cash and non-cash (in-kind) types of corporate giving. One study related to ours is that of Seifert et al. (2003) that discusses the differential relation between cash flow as well as free cash flow and corporate philanthropy. By classifying big versus small givers, they examine the association between (free) cash flow and corporate philanthropy and find a positive association between a firm's cash flow and cash donations. Their study, however, leaves the distinction between cash giving and in-kind giving unexplored. It also leaves the distinction between expected and unexpected cash giving unquestioned. Seifert et al. (2003) also do not deal with the inherent endogeneity issue. Consequently, they fail to distinguish the differential prediction between the investment and information hypotheses.

[2] A donation may take various forms, including cash giving and in-kind donations. In-kind donations are those donations that are done in goods and services rather than money (or cash). An in-kind donation could be donating goods, such as a store donating trash bags to a cleanup project, a restaurant donating food for a community event, and an individual donating their used clothes to the local thrift store. An in-kind donation could also be donating the time or professional services. This could include regular volunteers at museums, an accountant doing the taxes for a non-profit, and company staff helping to plant trees on company time. All of these things benefit the non-profit but are not financial donations.

Previous poverty-fighting literature has demonstrated that there is a drastic difference between wealth transferred in cash and that delivered in-kind (Thurow 1974). In the context of corporate giving, while there is no ambiguity in the face value of giving in cash to the firm, the difference between the cost of in-kind versus cash giving to the firm and the value to the beneficiary could vary dramatically. For example, despite a great social value, the value of unsold inventory for in-kind giving fails to provide additional information about the giver's financial health. From an informational perspective, cash giving is more likely to be associated with the giver's future financial performance than in-kind giving. We therefore hypothesize that (1) corporate giving in cash has different implications for CFP from in-kind giving and (2) only cash giving is associated with a firm's future financial performance.

Past studies have suggested multiple hypotheses that could explain the observed relation between corporate giving and CFP. *Agency cost hypothesis* states that the goal of a corporation should be to generate profits and that corporate philanthropy programs take away value from shareholders and have negative long-term effects on firms' financial performance (Friedman 1970; Jensen and Meckling 1976; Masulis and Reza 2015). The principal-agent theory of Jensen and Meckling (1976), in particular, argues that managers have an interest in overinvesting in corporate philanthropy for their own personal private benefits at a cost to shareholders. In support of the agency theory, Galaskiewicz and Burt (1991) and Haley (1991) suggest that managers tend to exploit corporate philanthropy for their own private benefit, either to boost up their personal reputation or to advance their careers. Recently, Masulis and Reza (2015) further maintain that relative to other firms, cash-giving firms deviate more from shareholder value maximization and as firms give more, their corporate cash holdings become less valuable to outside shareholders.

The *investment hypothesis* states that as a particular type of CSR expenditure, corporate giving is a kind of investment that creates value through various channels, for example, better corporate image and reputation (Porter and Kramer 2002; Peloza 2006), long-term focus (Benabou and Tirole 2010), competitive advantage (Ramchander et al. 2012), and capabilities for filling institutional voids (Su et al. 2014). Under the investment hypothesis, firms treat corporate giving as investments which lead to positive future CFP.

The *information hypothesis* also predicts a positive association between corporate giving and future CFP, but with the causality going from management information about positive future prospects to giving. The information hypothesis suggests that corporate philanthropy programs convey information about the giving firm's future financial

prospects because such decisions are made by managers with inside information (Shapira 2012; Lys et al. 2015). Lys et al. (2015), in particular, maintain that managers commit to CSR expenditures in the current period when they foresee positive future CFP, and claim that CSR expenditures serve as a "passive" signal[3] for the firm's future CFP. Following the arguments of Lys et al. (2015), we hypothesize that corporate philanthropy through cash giving could serve as a passive signal for positive future CFP.

We examine the above three hypotheses using all U.S. firms in the ASSET4 database that reports annual corporate giving information over the sample period of 2002–2012 and find that cash giving is positively associated with future CFP and firm value, measured by return on assets (ROA), abnormal risk-adjusted stock return, and Tobin's Q, respectively. Using a panel firm-fixed effects model that controls for time-fixed effects and includes cash and in-kind giving in the same regressions, we find that the positive association between giving and future CFP only exists for giving in cash. On the other hand, there is no empirical association between in-kind giving and future CFP. By comparing the association between the two forms of corporate giving and CFP/firm value for the same firm, we are able to achieve identification and infer that our findings on the differential impact of cash versus in-kind giving to future CFP are not spurious. In addition, our findings yield little support for the agency cost hypothesis.

Cash giving, however, is highly endogenous. Earlier studies show that corporate philanthropy is a function of firm size, industry, and the availability of financial resources (Navarro 1988; Brammer and Millington 2008) and using cash giving as an independent variable might bias the results. Similar to Lys et al. (2015), our other identification strategy uses *unexpected cash giving*, which is the residual term from a first-stage modeling of cash giving and is likely exogenous to CFP, to examine the informational value of cash giving. We find a positive association between unexpected cash giving and future ROA along with abnormal risk-adjusted stock returns, but not contemporaneous ROA. Furthermore, we do not find a positive association between *expected cash giving* and future CFP. Together, while our findings yield little support for the investment hypothesis, they strongly suggest the informational value of cash giving.

We also address the endogeneity concerns by using an instrumental variable regression where a firm's giving in cash is instrumented by cash giving at *other* firms in the same state and find that the positive association between future CFP and cash giving still remains, further supporting the *information hypothesis*. Taken together, our results are consistent with the information hypothesis, but inconsistent with the agency cost hypothesis or the investment hypothesis.

Further analyses suggest that the positive association between cash giving and CFP is only salient at firms with more uncertain cash flows and without strong alternative mechanisms for investors to uncover the cash flow-related information, for example, no- or low-dividend-paying firms with high growth. We also show that the positive association between cash giving and CFP is only prominent at firms with strong governance, where cash giving is unlikely to be interpreted as a mere reflection of agency problems.

Our study extends existing literature in two important ways. First, we contribute to the research on corporate philanthropy by revealing that different types of corporate giving are related to CFP in different ways. Second, we contribute to the cash management literature and show how cash giving, another way of dispensing cash, could provide additional information on cash flow for no or low-dividend-paying firms that have relatively high growth and strong governance. To the best of our knowledge, we are the first to propose an informational value from cash giving and empirically find supportive evidence of the differential impact of cash versus in-kind giving on CFP.

Literature and Hypotheses

The existing literature on the drivers and outcomes of corporate giving, both theoretical and empirical, is abundant, but it remains largely inconclusive. For example, corporate giving is argued to enhance CFP by boosting sales, employee morale, and productivity (Navarro 1988; Turban and Greening 1997; Greening and Turvan 2000), by promoting products and enhancing brand image (Waddock and Graves 1997; File and Prince 1998; Gardberg and Formbrun 2006; Lev et al. 2010), by protecting shareholder value through reputation and the acquisition of moral capital (Fombrun 1996; Godfrey 2005), and by providing access to valuable resources (Cochran and Wood 1984; Waddock and Graves 1997; Wang and Qian 2011). Some empirical studies show that corporate giving leads to improved future revenue and revenue growth in firms in more consumer sensitive industries (Hillman and Keim 2001; Lev et al. 2010; Servaes and Tamayo 2013).

In addition, both CSR and corporate giving have been suggested to be costly observables that can signal unobservable attributes such as a firm's concern over social issues (McWilliams and Siege 2000), aversion to sacrificing quality (Fisman et al. 2008), long-term focus

[3] Lys et al. (2015) distinguish the active signal, i.e., the signal of the firm's future CFP through CSR expenditures from the passive signal, i.e., the informational implications of CSR expenditures for the firm's future CFP.

(Benabou and Tirole 2010), and competitive advantage (Ramchander et al. 2012). As mentioned earlier, in their studies of CSR, Lys et al. (2015) further argue that the CSR expenditures can serve as a passive signal for future CFP.

Although these studies have enhanced our understanding of the interactions between corporate giving and various corporate benefits, they assume corporate giving as a homogeneous construct. Corporate giving could be in the form of cash or in-kind. Whereas both demand resources from the firm, what are used to fulfill such demands can be vastly different. The resources that support in-kind giving can be a firm's products, services, use of facilities, or managerial expertise, or employees' time, which are not necessarily associated with CFP (Seifert et al. 2003). Furthermore, in-kind giving is often designed to cut costs or enhance revenue and some common purposes for in-kind giving aim to get rid of excess inventory, maintain profit margin, or obtain tax credits. In addition, volunteering service is more likely to be driven by ethics, human capital, or social interaction motivations (Wilson and Musick 1997) rather than by CFP-driving incentive. For example, a pharmaceutical company can donate expensive cancer drugs to poor countries so that it continues to maintain its high price level. Public announcements of drug donations to poor countries are often welcome, but sometimes the details reveal murkier intentions; some of the drugs are close to, or even past, their expiry date (Green 2013). Poorer countries encourage their drug companies to make cheaper generic alternatives to expensive branded ones or use other tools available at their disposal to help bring the price of medicines down to more affordable levels. But they face immense pressure from multinational pharmaceutical corporations, even when generics and other options pursued are legitimate under international rules. For these multinationals, they have poured billions into some of these drugs and therefore want a patent system that will protect their investments as long as possible. In addition, it is not just a government failure to get existing medicines to those who need it, but a more global failure that pharmaceutical companies are a key part of an intellectual property rights (IPR) regime that actually makes it harder for poor countries to use cheaper (and affordable) generic versions. Many pharmaceutical companies, in fact, are at the forefront of opposing governmental attempt to make medicines cheaper, widely available, or generic.[4] Indeed, according to Giving in Numbers (2013 and 2015), the largest in-kind donation occurs with pharmaceutical industry. For another example, cash giving decreases after the recent global financial crisis as many firms had poor financial performance under the tight economic conditions. The value of in-kind giving during the same period, however, increases. Cash giving becomes more unusual during periods of crisis, as it is one of the most important resources that serve many purposes at corporations: companies need cash for investments (projects), working capital, wages and salaries, dividend payment, buybacks, advertising, and the list goes on. Indeed, surplus cash indicates that a firm has enough cash exceeding the level that is needed to operate, pay creditors, and invest in the projected asset growth. These all suggest that the form of corporate giving greatly matters with respect to the relation between corporate giving and CFP, and that cash giving should be more associated with CFP than in-kind giving.

Furthermore, possession of excess cash implies that the firm does not need to disclose prominent information to obtain additional external financing on favorable terms (Bettis 1983), which is an important relative advantage, especially for firms that may have such needs. As one way of dispensing cash, cash giving could convey cash flow-related information since the decision to give cash comes from managers who possess inside information (Miller and Rock 1985). Therefore, cash giving is associated with improved expected financial performance as investors read cash flow information from such behavior (the information hypothesis).

In the corporate finance literature, various ways of dispensing cash have been argued to serve as a signal of a firm's financial performance since a decision that comes from managers who are insiders and involves cash flow has informational value (Bhattacharya 1979; Miller and Rock 1985 among others). Dividends and share repurchases, the two main methods corporations use to distribute cash to shareholders, convey positive information about the value of the firm from better-informed managers (Dann et al. 1991; Guay and Harford 2000).

We propose that cash giving is likely to possess informational value and claim that cash giving is a good experiment vehicle to directly examine passive signal, i.e., informational content of cash giving about future prospects. Allen and Michaely (2003) distinguish between an active and a passive signal. Lys et al. (2015) further differentiate the choice between the signal of the firm's future performance through CSR expenditures (i.e., active signal) and the implications of CSR expenditures for the firm's future performance (i.e., passive signal). Using this definition of passive signal, we maintain that cash giving rather than overall giving expenditure is more starkly related to the informational implications for future cash flows of the firm, given that not all the giving expenditure requires cash outlay (i.e., in-kind donation).

[4] The problem is that for developing countries, research into these first world problems may seem beneficial, but the benefit can only be reaped by the developing world if it is in the context of good IPR programs that make the medication available and affordable to those who need it (Green 2013).

In particular, even though cash giving does not directly benefit shareholders, the decision to give in cash involves positive assessment of managers on a firm's critical resource—cash. In-kind giving, despite its social value, is less likely to be directly related to future CFP, as resources involved in in-kind giving could range from unsold inventory to community service. We therefore hypothesize that:

Hypothesis 1 Cash giving and in-kind giving are associated with future CFP in a different way.

Hypothesis 2 (*The information hypothesis*) Cash giving is positively associated with future CFP due to its informational value to shareholders.

A competing explanation is the *agency cost hypothesis*. At firms with no good investment opportunities but flush with cash, agency problems of free cash flow are likely (Jensen 1986). Corporate giving provides a context where agency problems are likely to arise and the concern has been exacerbated by the ambiguities over the benefits of charitable contribution (Wang and Coffey 1992). Researchers also find supporting evidence for agency cost involved in corporate giving. For example, Brown et al. (2006) show that agency costs play a prominent role in explaining corporate giving as firms with larger boards are associated with significantly more cash giving and the establishment of corporate foundations.

Dissimilar to dividends or repurchases which pay shareholders, cash flow can also go to other stakeholders in addition to shareholders. So, it is possible that cash giving may merely reflect agency cost as entrenched managers give for their own personal reputation as good social citizen at the expense of the firm, especially at firms with free cash flow (Jensen 1986). Recently, Masulis and Reza (2015) suggest that as firms give more, their corporate cash holdings become less valuable to outside shareholders. Therefore, cash giving lowers firm value and is not associated with improved financial performance due to agency problems. We thus hypothesize:

Hypothesis 3 (*The agency cost hypothesis*) Cash giving is negatively associated with future CFP due to its agency costs to shareholders.

Another competing explanation is the *investment hypothesis*. Proponents of the investment hypothesis believe that when the company commits to the investment in and disclosure of corporate-giving initiative, corporate philanthropy programs have the potential to contribute to its future CFP. These programs also attract socially responsible consumers and improve a firm's overall reputations (Porter and Kramer 2002). The investment explanation thus predicts that corporate giving will positively affect future financial performance and lead to an increase in shareholder wealth. In support of this theory, a number of scholars have documented evidence of a relation between corporate-giving initiatives and favorable CFP (e.g., Peloza 2006; Benabou and Tirole 2010; Ramchander et al. 2012; Su et al. 2014).

As the investment hypothesis also predicts, the same positive giving-CFP association like the information hypothesis, following Lys et al. (2015), we distinguish the information hypotheses from the investment hypothesis by differentiating the impact of expected versus unexpected, i.e., excess cash donation on future CFP. If the investment hypothesis is more valid, then we would expect to observe a positive association between expected cash giving and CFP in the future, as the firm invests in giving today in hope of better future CFP. If the information hypothesis is more valid, then we expect to find a positive association between unexpected excess cash donation and CFP in the subsequent period, as the manager with information on strong future prospect at the firm gives cash. Consequently, we hypothesize the following:

Hypothesis 4(a) Expected cash giving is positively associated with future CFP (the investment hypothesis).

Hypothesis 4(b) Unexpected cash giving is positively associated with future CFP (the information hypothesis).

Next, we examine moderating effects on the relation between cash giving and CFP. Since the agency cost of free cash flow is less likely at well-governed firms (Shleifer and Vishny 1997) and at firms with an abundance of investment opportunities (Chen and Chuang 2009), we expect that the informational value of cash giving will be prominent at well-governed firms and firms with good investment opportunities. In addition, because dividends, or the cash that firms pay out on a regular basis to their investors, dwarf the amount of corporate cash giving[5] and there is much less uncertainty on cash flow at dividend-paying firms, especially those that pay relatively high dividends, the cash giving by dividend-paying firms may not provide additional informational value to shareholders. Similarly, cash giving may lose its informational value at firms with alternative existing mechanisms that demonstrate strength of cash flow. We therefore have

Hypothesis 5(a) The positive association between unexpected cash giving and future CFP is more pronounced at firms with strong governance or high growth.

Hypothesis 5(b) The positive association between unexpected cash giving and future CFP is more pronounced

[5] We only consider cash dividends, not stock dividends. The mean amount of annual cash giving is US$26.2 million and the annual mean dividend commitment is US$342.3 million, respectively, for firms with a total asset size of greater than US$1 billion.

at firms with no alternatives that demonstrate strength of cash flow.

Data and Sample

The sample for this study comprises all U.S. public companies in the Thomson Reuters ASSET4 database over the period of 2002–2012. ASSET4 is a data vendor that provides objective, relevant, auditable, and systematic environmental, social, and governance (ESG) performance scores to professional investors (Cheng et al. 2014), and the data coverage started in 2002. As of the second quarter of 2013, ASSET4 had covered 3898 global companies with numeric scores on four pillars: Environmental, Social, Corporate Governance, and Economic. Corporate giving belongs to the social pillar, and ASSET4 reports the exact dollar amounts for total, cash, and in-kind giving for each year under review.[6]

The form of the final sample was dictated by the need to identify the dollar amounts of firms' total donations and cash donations, and for a sufficient time series data. The corporate-giving data are more sporadic for foreign firms as ASSET4 has continually added more firms over time starting from 2002. Of the 1035 U.S. firms in the ASSET4 universe as of the end of June 2013, there were 1813 firm-year observations with information on corporate giving (388 unique firms) and 701 firm-year observations with cash giving (218 unique firms) over the sample period of 2002–2012. Our analyses of the difference between cash and in-kind giving start with all of the available observations within corporate-giving information from ASSET4.

Because we use various accounting and financial information, we require that sufficient observations from the Compustat database are available for our tests. We also employ the Center for Research on Security Prices (CRSP) database to measure 1-year-ahead abnormal risk-adjusted holding period returns using the Fama–French five-factor model. This combined sample procedure produces a total of 1722 firm-year observations of *total giving ratio* (total donations divided by sales revenue), 700 firm-year observations of *cash giving ratio* (cash donation divided by sales revenue), and 553 firm-year observations of *in-kind donation ratio* (in-kind donation divided by sales revenue) from 2002 to 2012. Actual samples used in the analyses are slightly different because the data availability is different for each regression analysis.

Table 1 presents the descriptive statistics for the sample of U.S. firms with any corporate giving and the group of firms with cash giving. First, we observe large variations in all variables, which suit the need for regression analysis well. For instance, the mean log of total assets (*Log(TA)*) is 9.743 with a range of 5.578–11.378 (unreported), suggesting an average of US$17.034 billion with a range of US$0.265 to 87.378 billion. The mean *Log cash donation* is 15.76, suggesting US$6.98 million in cash donations on average. Second, we observe lower giving ratios and higher measures of *ROA*, *CF return*, and *FF5 1 yr return* for the subsample of firms that give in cash, supporting our argument that cash giving is subject to more corporate scrutiny and likely to be related to corporate health. For example, of the 1722 firm-year observations that have information on total donations, the mean donation-to-sale ratio is 0.256 %; of the 700 firm-year observations with information on cash donations, the mean ratio is 0.137 %; while of the 553 firm-year observations with information on in-kind donations, the mean ratio is 0.352 %. Furthermore, the mean and median financial performance figures of the firms that donate cash are both higher than those of the firms that donate in any other form (7.8 and 7.3 % for ROA, 17.2 and 16.5 % for cash flow return, 3.9 and 0.5 % for excess Fama–French (FF) five-factor 1-year stock return for cash donations, and 6.4 and 5.6 % for ROA, 15 and 14.3 % for cash flow return, and 2.8 and −0.4 % for excess FF 1 year stock return for total donations, respectively). Third, the firms that donate cash have higher mean R&D strength and advertising intensity while they have lower mean leverage ratio, capital expenditure, and net fixed assets ratio. Interestingly, we notice that the mean of the non-dividend dummy for the firms that donate cash is 0.195, which is higher than that of the firms that give all types of donations (0.161). Both groups have a median of zero. Also, the group of firms that donate cash has higher corporate governance scores than the overall group.

Table 2 presents the Pearson correlation matrices for the various charitable giving measures and firm characteristics for firms with cash donations. We notice that all of the donation measures– *total giving ratio*, *cash giving ratio*, and *Log in-kind donation*—are all significantly and positively correlated with ROA, and the firm size measured by the natural log of total assets (*Log*(*TA*)), suggesting that large and profitable firms tend to donate more in terms of both cash and non-cash giving. Most notably, *Log cash donation* is positively correlated with ROA (0.16) while *cash giving ratio* is positively correlated with ROA (0.13). However, neither type of unexpected cash donation is correlated with firm size, consistent with our conjecture that once orthogonalized, unexpected cash donation is not subject to size effect that is known to bias CSR research (Udayasankar 2008).

[6] According to Thompson Reuters, only corporate giving is included for total giving, employee donated or raised money is not. All donations by the company and its foundations and trusts are also included. Cash giving only includes the amount that the company classifies as such. Some companies only conduct cash or in-kind giving, and do not have total giving information. Thompson Reuters leaves the entry blank if no public information is available.

Table 1 Sample composition and descriptive statistics

Variable	All donation				Cash donation			
	N	Mean	Median	SD	*N*	Mean	Median	SD
ROA	1813	0.064	0.056	0.069	701	0.078	0.073	0.073
CF return	1786	0.150	0.143	0.092	693	0.172	0.165	0.093
FF5 1 yr return	1548	0.028	−0.004	0.321	601	0.039	0.005	0.329
Log(TA)	1813	9.743	9.811	1.166	701	9.646	9.655	1.196
Leverage	1812	0.246	0.236	0.150	700	0.232	0.215	0.142
Cash/TA	1813	0.113	0.072	0.118	701	0.140	0.101	0.129
R&D/TA	1813	0.022	0.000	0.042	701	0.031	0.007	0.045
Advertising/TA	1813	0.013	0.000	0.027	701	0.020	0.001	0.035
CAPX/TA	1796	0.046	0.036	0.043	695	0.043	0.035	0.037
Net FA/TA	1758	0.302	0.233	0.243	686	0.260	0.215	0.211
Nondiv dummy	1804	0.161	0.000	0.368	697	0.195	0.000	0.397
Sales growth	1696	0.067	0.058	0.180	699	0.083	0.064	0.186
CGOV	1665	82.187	86.170	13.423	644	84.288	87.495	11.438
Total giving ratio %	1722	0.256 %	0.102 %	0.528 %	649	0.398 %	0.173 %	0.690 %
Cash giving ratio %	700	0.137 %	0.084 %	0.162 %	700	0.137 %	0.084 %	0.162 %
In-kind giving ratio %	553	0.352 %	0.073 %	0.841 %	479	0.360 %	0.080 %	0.856 %
Log cash donation	701	15.759	16.061	2.492	701	15.759	16.061	2.492
Expected cash donation					637	0.138 %	0.114 %	0.106 %
Expected cash donation2					637	15.737	15.831	1.741
Unexpected cash donation					637	0.000 %	−0.010 %	0.126 %
Unexpected cash donation2					637	0.000	0.132	1.840

Our sample includes the universe of U.S. firms with corporate-giving information in the Asset 4 database over the period of 2002–2012. See variable definition and data source in "Appendix"

Dependent Variable: Future Corporate Financial Performance

Because ASSET4 reports the amount of corporate giving as a lump sum for a given calendar year, we cannot apply an event study method to this sample. Instead, we use three measures for corporate financial performance, including ROA, Tobin's Q,[7] and Fama–French five-factor[8] adjusted excess return (*FF5* hereafter) for future corporate financial performance.

We follow three steps to calculate the abnormal risk-adjusted 1-year holding period return: (1) We regress the past 24 months of stock returns from the CRSP database before the fiscal year in which cash giving occurs on the contemporaneous risk factor returns to estimate the firm's risk exposure (betas) to each of the five factors. (2) We calculate the expected holding period return on the stock over the next 12 months after the end of the fiscal year in which cash giving occurs using the estimated betas. (3) The abnormal risk-adjusted holding period return is the difference between the actual return over the next 12 months after the end of fiscal year in which cash giving occurs and the expected return is calculated from step (2). The market-based dependent variable is the return difference calculated from step (3)

$$\begin{aligned}&\text{Abnormal One-year Return}\\&\quad=\text{Actual Future One-year Return}\\&\qquad-\text{Expected Future One-year Risk-Adjusted Return}\end{aligned}$$

where Expected One-year Return $=\alpha+\sum_{j=1}^{5}\beta_j$ * Return on factor j $+\varepsilon$.

[7] Consistent with past research in strategic management (see Kor and Mahoney 2005; Jayachandran et al. 2013), we use Tobin's Q as a measure of firm performance. Compared to accounting-based measures, Tobin's Q is a forward-looking measure and reflects future profitability. Furthermore, Tobin's Q has several desirable characteristics such as scale independence and robustness to accounting manipulations. Tobin's Q is also widely used as a measure of firm value in finance (Chung and Jo 1996; Servaes and Tamayo 2013). We use the formula proposed by Chung and Pruitt (1994) to compute Tobin's Q.

[8] The five risk factors are the three Fama–French factors (return on market index minus risk-free interest rate (market), return on small-firm stocks less return on large-firm stocks (SMB), and return on high book-to-market–ratio stocks less return on low book-to-market-ratio stocks (HML), Fama and French (1993), the Carhart (1997) momentum factor, and the Pastor and Stambaugh (2003) liquidity factor.

Table 2 Pearson correlation (for firms with cash donation information)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) *ROA*	1.00																		
(2) *CF return*	**0.83**	1.00																	
(3) *FF5 1 yr return*	0.01	**0.09**	1.00																
(4) *Log(TA)*	**−0.12**	**−0.25**	**−0.10**	1.00															
(5) *Leverage*	**−0.26**	**−0.10**	0.04	−0.04	1.00														
(6) *Cash/TA*	**0.27**	**0.16**	**−0.10**	0.00	**−0.45**	1.00													
(7) *R&D/TA*	**0.21**	**0.24**	−0.03	0.03	**−0.33**	**0.49**	1.00												
(8) *Advertising/TA*	**0.23**	**0.29**	0.06	**−0.19**	0.07	0.02	−0.04	1.00											
(9) *CAPX/TA*	**0.12**	**0.31**	**0.12**	**−0.07**	0.05	**−0.27**	−0.04	−0.01	1.00										
(10) *Net FA/TA*	−0.07	0.07	0.07	−0.02	**0.29**	**−0.44**	**−0.25**	−0.12	0.69	1.00									
(11) *Nondiv dummy*	**−0.17**	**−0.09**	0.01	**−0.30**	**−0.12**	**0.23**	**0.22**	−0.06	−0.04	**−0.16**	1.00								
(12) *Sales growth*	**0.15**	**0.22**	**0.08**	−0.07	−0.06	0.02	0.02	−0.04	**0.10**	−0.02	**0.19**	1.00							
(13) *CGOV*	**0.09**	**0.12**	−0.03	0.14	−0.08	0.05	**0.13**	**0.10**	0.04	0.02	**−0.11**	**−0.15**	1.00						
(14) *Total giving ratio*	**0.26**	**0.23**	0.07	**0.15**	**−0.14**	**0.17**	**0.33**	0.02	−0.01	**−0.14**	−0.04	0.04	−0.02	1.00					
(15) *Cash giving ratio*	**0.12**	**0.10**	**0.10**	**0.10**	**−0.11**	**0.10**	**0.14**	−0.01	−0.02	**−0.10**	**−0.09**	0.07	−0.07	**0.61**	1.00				
(16) *In-kind giving ratio*	**0.24**	**0.22**	0.06	**0.10**	**−0.12**	**0.17**	**0.35**	−0.04	−0.05	**−0.13**	0.06	0.04	**−0.10**	**0.88**	**0.17**	1.00			
(17) *Log cash donation*	**0.16**	**0.11**	0.05	**0.53**	**−0.14**	0.00	**0.09**	0.08	0.02	**−0.09**	**−0.25**	0.00	**0.17**	**0.36**	**0.39**	**0.16**	1.00		
(18) *Unexpected cash donation*	0.01	0.06	**0.09**	0.00	0.00	0.00	0.00	0.00	0.04	−0.02	0.00	0.00	0.00	0.38	**0.77**	0.04	**0.29**	1.00	
(19) *Unexpected cash donation2*	0.00	0.06	**0.08**	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	**0.19**	**0.30**	0.05	**0.73**	**0.40**	1.00

This table presents a bivariate correlation matrix of the main variables of interest from our sample firms. See variable definition and data source in "Appendix." Significance <5 % has bold character

Main Independent Variables

Cash/total/in-kind giving: We use the amount of dollars of various forms of corporate giving as reported in ASSET4. We also use the ratio of corporate-giving dollars to sales revenue (*total giving ratio, cash giving ratio, and in-kind giving ratio*) for this study. Since ASSET4 relies on reported information and does not extrapolate, it is common to have more firm-year observations with information on total giving than on cash or in-kind giving. We use the raw giving amounts in a panel firm-fixed effects regression to estimate the relation between corporate giving and future CFP.

Unexpected Cash Giving: Earlier studies show that corporate philanthropy is a function of firm size, labor intensity, industry, and the availability of financial resources (Navarro 1988; Brammer and Millington 2008). Indeed, because cash donation is an endogenous variable and is influenced by various firm and industry-level characteristics, a regression using the raw amount of cash donation on CFP will generate inconsistent estimates that cannot be used to make inferences. Therefore, we use a two-stage approach to mitigate the endogeneity of cash giving following the extant literature.

Similar to the argument for CSR expenditure as in Lys et al. (2015), corporate giving could be decomposed into two components: (1) the component that can be explained by firm characteristics (expected giving) and (2) the component that is unrelated to firm characteristics (unexpected giving). The informational value, therefore, should reside in the unexpected portion of corporate giving. We measure unexpected cash giving by *Unexpected Cash Donation* which is the residual from a cash-giving determination model as our main independent variable.

In the first stage, we implement the following cash-giving determination model in Eq. (1), which is similar to the corporate philanthropy determination model in Brammer and Millington (2008) and consistent with the cash-holding determination literature (Almeida et al. 2004), to calculate the expected cash giving. We also use it to get a rough measure of expected total and in-kind giving. We acknowledge that using Eq. (1) can be less convincing for in-kind giving, since in-kind giving may involve many other social and psychological factors.

$$\begin{aligned} \textit{Cash Giving} = {} & \alpha_0 + \alpha_1 \textit{Firm size} \\ & + \alpha_2 \textit{Leverage} + \alpha_3 \textit{Cash Ratio} \\ & + \alpha_4 \textit{ROA} + \alpha_5 \textit{R\&D Ratio} + \alpha_6 \textit{Advertising Intensity} \\ & + \alpha_7 \textit{Nondiv Dummy} + \alpha_8 \textit{Corporate Governance} \\ & + \alpha_9 \textit{Industry Fixed Effects} \\ & + \alpha_{10} \textit{Year Fixed Effects} + \varepsilon. \end{aligned} \quad (1)$$

In the second stage, we use the residual, which represents excess (and therefore unexpected) cash giving, as a proxy of the passive, but credible signal. In addition, our unexpected cash-giving measure has less endogeneity concerns because it is orthogonal to firm and industry characteristics by construct (Elton et al. 1993).

Other Control Variables

We control for levels of variables that measure firm characteristics and changes in variables that describe firm characteristics in the second stage. These control variables are documented in the literature to influence the association between CSR and CFP, as corporate philanthropy is a crucial subset of CSR. For example, McWilliams and Siegel (2000) suggest that an appropriate econometric model linking CSR to CFP should control for firm size, R&D intensity, advertising intensity, industry fixed effects, and risk factors. In fact, any firm-level characteristics that may be related to CSR and CFP should be controlled to gage the exact effect of unexpected giving on CFP. Because one of our main dependent variables is future incremental CFP, we include the following control variables to capture the changes in firm size, leverage, R&D, advertising, capital expenditure, fixed assets spending intensity, corporate governance, industry, and year-fixed effects in relation to unexpected cash donations.

Firm size

We control for (change in) firm size because as firms grow in size and become more mature and less risky, their returns tend to be lower. Change in firm size is measured as the difference between 1-year-ahead and the log of the firm's total asset value as of the fiscal year end when the cash giving amount is reported ($log(TA)_{t+1} - log(TA)_t$). These data come from Compustat.

Leverage

When a firm's leverage changes, the firm's financial risk changes and the change in leverage may be related to future performance, either positively or negatively, due to the multiplier effect. Thus, we control for change in leverage to capture this effect on incremental CFP (Cochran and Wood 1984; Orlitzky and Benjamin 2001). The leverage ratio data come from Compustat and are calculated as interest-bearing debt/total assets.

R&D intensity

R&D activities have been documented to have long-term effects on the financial performance of firms (Griliches 1979). Scholars have also called for the intensity of R&D to be used in relating CSR to CFP (McWilliams and Siegel 2000). Accordingly, we use change in R&D intensity to

capture the effect of such a change on a firm's future performance. The R&D intensity data come from Compustat and are calculated as R&D expenditure/total assets. Following the literature, if R&D is missing for a firm, we set it to zero to preserve our sample size (McWilliams and Siegel 2000; Jo and Harjoto 2011, 2012).

Advertising intensity

Advertising is also related to CSR and CFP (McWilliams and Siegel 2000; Servaes and Tamayo 2013) and the change in a firm's advertising intensity may be due to the change in its CFP. The advertising intensity data come from Compustat and are calculated as XAD/total assets.

Capital expenditure ratio

Capital expenditure is also positively related to CFP and should be included in our model to mitigate possible model misspecification. The capital expenditure ratio data come from Compustat and are calculated as CAPX/total assets.

Net fixed assets ratio

Net fixed assets, including plant and equipment, may also be associated with CSR and CFP. We use the change in the net fixed assets ratio to capture the effect of such a change on future CFP. The net fixed assets ratio data come from Compustat and are calculated as PPENT/total assets.

Corporate governance

Because a firm's cash reserves may be subject to the agency problems associated with free cash flow (Jensen 1986), a change in the strength of a firm's corporate governance may be related to how cash is expensed and whether this expenditure helps improve CFP. We use the change in corporate governance strength to capture the effect of such change on future CFP. The corporate governance measure (*CGOV*) is a numerical rating (zero to 100 %) collected from ASSET4.[9]

Sales growth rate

Because firms with high sales growth rate suggest that they have abundant investment opportunities and these firms are less likely to incur agency cost of free cash flow (Chen and Chuang 2009), we expect sales growth moderates the relation between cash giving and CFP. We include sales growth as a control variable to capture the effect of growth on future CFP. The sales growth rate (*Growth*) is calculated using annual sales figures from Compustat.

Non-Dividend Dummy

Nondiv Dummy is a dummy variable that takes the value of one if a firm does not pay a dividend to its shareholders, and zero otherwise.

Year-fixed effects

We include a dummy variable for each year of our sample period, 2002–2012, with 2002 as the omitted base year.

Industry fixed effects: We follow the Fama and French (1997) twelve industry categorization and use the categorization to capture industry effects.[10]

In sum, we follow Eq. (2) to estimate the relation between corporate giving and firm value and future ROA. We follow Eq. (3) to estimate the relation between unexpected giving, especially unexpected cash giving, and future CFP:

$$\begin{aligned} CFP_{t+1} &= \alpha_0 + \alpha_1 \times Log(TA)_t + \alpha_2 \times Leverage_t \\ &+ \alpha_3 \times RD_t + \alpha_4 \times Adv_t + \alpha_5 \times CAPX_t + \alpha_6 \times NetFA_t + \\ &\alpha_7 \times CGOV_t + \alpha_8 \times Nondiv_t + \alpha_9 \times Giving_t \\ &+ \alpha_{10} Industry_i + \alpha_{11} Year_t + \varepsilon_t \end{aligned} \quad (2)$$

$$\begin{aligned} CFP_{t+1} - CFP_t &= \gamma_0 + \gamma_1 (Log(TA)_t - Log(TA)_{t-1}) \\ &+ \gamma_2 (Leverage_t - Leverage_{t-1}) \\ &+ \gamma_3 (RD_t - RD_{t-1}) + \gamma_4 (Adv_t - Adv_{t-1}) \\ &+ \gamma_5 (CAPX_t - CAPX_{t-1}) + \gamma_6 (NetFA_t - NetFA_{t-1}) \\ &+ \gamma_7 (CGOV_t - CGOV_{t-1}) \\ &+ \gamma_8 Nondiv_{t-1} + \gamma_9 Excess\ Donation_t + \gamma_{10} Industry_i \\ &+ \gamma_{11} Year_t + \omega_t. \end{aligned} \quad (3)$$

[9] The ASSET4 corporate governance performance scores are composite scores on (i) board structure, such as the percentage of independent board members, CEO-chair separation, board size, and board diversity; (ii) board function, such as the degree of audit committee independence, degree of compensation committee independence, degree of nomination committee independence, number of board meetings, and the average board meeting attendance; (iii) compensation policy, such as remuneration packages, stock option programs, vesting of stock options, and total board member compensation; (iv) shareholder rights, such as voting rights, ownership, classified board structure, and staggered board structure; and (v) vision and strategy, such as a CSR sustainability committee, Global Reporting Initiative (GRI) report guidelines, CSR sustainability report global activities, and CSR sustainability external audits.

[10] We use the Fama–French 48 industry classification (FF48) in Eq. (1) and the Fama–French 12 industry classification (FF12) in Eq. (2) to capture the industry fixed effects. In Eq. (2), when FF48 is used, due to the substantial multicollinearity problem between the variables, statistical inferences become inaccurate. Because we use Eq. (1) to estimate excess donations using the residuals only, multicollinearity is less of a concern as it only contaminates the standard errors.

Table 3 Univariate analysis

	FF5 1-yr return			ΔROA_{t+1}		
	Low	High	Difference	Low	High	Difference
Cash/TA	0.082	0.008	0.074***	0.004	−0.001	0.006
CGOV	0.051	0.027	0.024	−0.003	0.006	−0.009*
Sales growth	0.009	0.055	−0.045*	0.003	−0.003	0.005

This table presents univariate tests of firm performance by the levels of *CASH/TA*, *CGOV*, and *Sales growth* $\Delta ROA_{t+1} = ROA_{t+1} - ROA_t$. *FF5 1-yr return* is excess 1 year holding period return over year t to $t + 1$ using Fama–French five-factor model. The five factors are market factor, small minus large factor, high minus low book-to-market–ratio factor, momentum factor, as well as Pastor and Stambaugh (2003) liquidity factor. See variable definition and data source in "Appendix." ***, **, and *stand for statistical significance at the 1, 5, and 10 % level, respectively

Empirical Results

Univariate Analysis

To insure that our results are not driven by endogenous relation between future CFP and a firm's cash holdings ratio, corporate governance, or growth, we first report results from a univariate analysis in Table 3 where we compare the mean measures for future CFP, including *FF5* and incremental ROA for firms with above- and below-median cash holding, corporate governance, and sales growth levels, respectively. The subsamples of firms with below-median cash holding or above-median sales growth have higher average *FF5*, while the subsample of firms with above-median corporate governance has higher average incremental ROA. Because higher cash holdings ratio is actually associated with lower future *FF5*, it is unlikely that a positive relation between cash giving and future *FF5* is driven by a large cash holding, alleviating the concern for endogeneity.

Multivariate Regression Analysis

We then use multivariate regressions to estimate the relation between future corporate financial performance, including Tobin's Q and ROA, and corporate-giving measures, including ratios of total, cash, and in-kind giving to sales, respectively, using a panel firm-fixed effects model that also controls for year-fixed effects. We report the results in Panel A of Table 4. The relation between future Tobin's Q and cash-giving ratio is positive and significant, while that between Tobin's Q and in-kind giving ratio is negative and marginally significant in a regression using a firm-fixed effects model. There is a similarly differential association between future ROA and cash and in-kind giving measures. These results suggest that for the same firm, only cash giving is positively associated with future financial performance, while in-kind giving is not associated with future CFP. In Panel B of Table 4, we present consistent results when we use *FF5* as the alternative measure for future CFP. In Columns (1)–(4), we use a stock response model with the independent variable being changed of giving variables and other control variables. In Columns (5)–(6), we regress *FF5* on levels of giving variables. Only coefficient estimates on cash giving are positive and significant for both models. These findings lend support to Hypothesis 1 and 2 that (1) cash and in-kind giving have a differential association with future CFP and that (2) cash giving is positively associated with future CFP.

Addressing Endogeneity Concerns

We employ three methods: (1) orthogonalized endogenous variable, (2) instrumental variable regression with a valid instrument, and (3) propensity score matching, respectively, to address the endogeneity concern of our main explanatory variable and cash giving.

Orthogonalization: Unexpected Giving and Future CFP

Tables 5 and 6 present the results using measures of unexpected giving, with Table 5 showing the procedure for determining unexpected giving and Table 6 relating unexpected giving to CFP. Table 5 reports the results from the corporate-giving determinant models with the same independent and control variables used in Eq. (1) using both Tobit and OLS models with clustered standard errors. We use Tobit regression to estimate the residuals from the giving determinant model for the giving ratios, including the *total giving ratio*, *cash giving ratio*, and *in-kind giving ratio* and we report the results in Columns (1)–(3). Because all three ratios are censored variables and are bounded by 0 and 1, a Tobit regression that can generate consistent and unbiased parameter estimates is necessary (Brammer and Millington 2008). However, the alternative corporate-giving measure, the log of the dollar amount in donations, is not subject to the critique concerning the use of OLS for a censored sample. Therefore, we use OLS with clustered

Table 4 Corporate philanthropy and firm value, future financial performance

Variables	(1) *Tobin's* Q_{t+1}	(2) *Tobin's* Q_{t+1}	(3) *ROA* $_{t+1}$	(4) *ROA* $_{t+1}$
Panel A: Panel firm-fixed effect models of future *Tobin's Q* and *ROA*				
$Log(TA)_t$	−0.707***	−0.832***	−0.066***	−0.056
	(−5.757)	(−4.730)	(−4.338)	(−1.612)
$Leverage_t$	−2.075**	−0.316	0.007	−0.075
	(−2.483)	(−0.525)	(0.177)	(−0.748)
ROA_t	−0.282	−0.034		
	(−0.911)	(−0.096)		
$R\&D/TA_t$	1.731	−0.757	0.326*	0.361*
	(0.906)	(−0.476)	(1.949)	(1.703)
Adv/TA_t	4.513**	1.514	0.380	0.475
	(2.071)	(0.363)	(1.062)	(0.487)
$CAPX/TA_t$	−1.420	−4.510*	−0.142	0.058
	(−1.192)	(−1.723)	(−0.936)	(0.230)
Net FA/TA_t	0.082	0.413	−0.017	0.038
	(0.134)	(0.342)	(−0.166)	(0.299)
Nondiv dummy$_t$	0.031	−0.424	0.004	0.004
	(0.200)	(−1.620)	(0.486)	(0.190)
Sales growth$_t$	0.048	0.287**	0.009	0.034
	(0.560)	(2.093)	(0.595)	(1.373)
$CGOV_t$	−0.002	0.002	0.000	0.000
	(−1.085)	(0.690)	(1.474)	(0.867)
Cash giving ratio %$_t$		1.448*		0.095**
		(1.755)		(2.025)
In-kind giving ratio %$_t$		−0.770*		0.005
		(−1.767)		(0.161)
Total giving ratio %$_t$	−0.048		0.016	
	(−0.253)		(1.099)	
Constant	9.722***	10.862***	0.658***	0.528*
	(7.817)	(6.446)	(4.645)	(1.701)
Year fixed	Yes	Yes	Yes	Yes
Firm fixed	Yes	Yes	Yes	Yes
Clustered at a firm level	Yes	Yes	Yes	Yes
Observations	1313	388	1313	388
R^2	0.345	0.502	0.147	0.160
Adjusted R^2	0.335	0.473	0.135	0.114

Variables	(1) *FF5*	(2) *FF5*	(3) *FF5*	(4) *FF5*	(5) *FF5*	(6) *FF5*
Panel B: OLS difference and level regressions						
$\Delta Log(TA)_t$	0.005	−0.059	−0.069	−0.052		
	(0.046)	(−0.472)	(−0.974)	(−0.428)		
$\Delta Leverage_t$	0.413	0.214	0.046	0.335		
	(1.003)	(0.492)	(0.201)	(0.743)		
ΔROA_t	−0.126	−0.299	−0.020	−0.279		
	(−0.411)	(−1.416)	(−0.090)	(−1.232)		
$\Delta R\&D/TA_t$	−0.260	−0.393	0.126	−0.242		
	(−0.239)	(−0.353)	(0.096)	(−0.220)		
$\Delta Adv/TA_t$	1.661	0.260	2.615	0.693		

Table 4 continued

Variables	(1) *FF5*	(2) *FF5*	(3) *FF5*	(4) *FF5*	(5) *FF5*	(6) *FF5*
	(0.766)	(0.124)	(1.397)	(0.298)		
$\Delta CAPX/TA_t$	2.352	1.872	−0.039	1.621		
	(1.433)	(0.842)	(−0.045)	(0.617)		
$\Delta Net\ FA/TA_t$	−0.370	−0.170	0.447	−0.276		
	(−0.533)	(−0.291)	(0.735)	(−0.410)		
$\Delta Nondiv\ dummy_t$	−0.077	−0.092	−0.046	0.030		
	(−1.064)	(−1.253)	(−0.764)	(0.460)		
$\Delta Sales\ growth_t$	−0.083	0.022	−0.121	0.002		
	(−0.918)	(0.246)	(−1.551)	(0.020)		
$\Delta CGOV_t$	0.001	0.002	0.002	0.001		
	(0.951)	(0.771)	(1.469)	(0.401)		
$\Delta Cash\ giving\ ratio\ \%_t$	0.433*			0.766*		
	(1.865)			(1.779)		
$\Delta In\text{-}kind\ giving\ ratio\ \%_t$		−0.135		0.341		
		(−0.834)		(1.597)		
$\Delta Total\ giving\ ratio\ \%_t$			0.117			
			(1.350)			
$Log(TA)_t$					−0.021**	−0.048***
					(−2.277)	(−2.962)
$Leverage_t$					0.077	0.012
					(1.172)	(0.069)
ROA_t					−0.108	−0.295
					(−0.519)	(−0.912)
$R\&D/TA_t$					0.266	−0.433
					(0.968)	(−1.030)
Adv/TA_t					0.358	0.106
					(1.238)	(0.266)
$CAPX/TA_t$					−0.184	−1.089
					(−0.489)	(−1.305)
$Net\ FA/TA_t$					−0.001	0.204
					(−0.009)	(1.277)
$Nondiv\ dummy_t$					0.020	−0.032
					(0.617)	(−0.569)
$Sales\ growth_t$					−0.123**	0.155*
					(−2.286)	(1.848)
$CGOV_t$					0.000	0.002
					(0.598)	(1.293)
$Cash\ giving\ ratio\ \%_t$						0.259***
						(3.470)
$In\text{-}kind\ giving\ ratio\ \%_t$						0.090
						(1.446)
$Total\ giving\ ratio\ \%_t$					0.017	
					(0.489)	
Constant	0.175*	0.078	0.135**	0.107	0.404***	0.694**
	(1.813)	(0.825)	(2.478)	(1.071)	(3.251)	(2.005)
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes
Clustered at a firm level	Yes	Yes	Yes	Yes	Yes	Yes

Table 4 continued

Variables	(1) *FF5*	(2) *FF5*	(3) *FF5*	(4) *FF5*	(5) *FF5*	(6) *FF5*
Observations	353	289	974	263	1399	396
R^2	0.141	0.161	0.077	0.190	0.056	0.141
Adjusted R^2	0.061	0.064	0.047	0.082	0.034	0.066

In Panel A, dependent variables are future Tobin's Q (*Tobin's* Q_{t+1}) in Column (1)–(2) and future ROA (ROA_{t+1}) in Column (3)–(4). In Panel B, dependent variables are Fama–French 1-year risk-adjusted excess holding period stock returns (*FF5*). *FF5 1 yr return* is excess 1 year holding period return over year t to $t + 1$ using Fama–French five-factor model. The five factors are market factor, small minus large factor, high minus low book-to-market–ratio factor, momentum factor, as well as Pastor and Stambaugh (2003) liquidity factor. All models of this table use standard errors clustered at firm levels. Robust t statistics are reported in parentheses. See variable definition and data source in "Appendix." ***, **, and * stand for statistical significance at the 1, 5, and 10 % level, respectively

standard errors that adjust for heteroskedasticity to estimate the amount of unexpected giving and report results in Columns (4)–(6). The results in Table 5 show that consistent with our bivariate correlation results, larger and more profitable firms are likely to donate more, regardless of the donation type. R&D and advertising intensive firms are likely to give more in total donations. The non-dividend dummy and corporate governance strength scores are both positive and significant for the log of the amount of total donations. We also conduct multicollinearity diagnostics using a linear regression model and find that the variance inflation factor (VIF) values for the individual variables are all well below five (the mean VIF is below three for all models), suggesting that multicollinearity does not significantly influence our results. By construction, unexpected corporate giving is not correlated with the firm-level characteristics that are included in the giving determinant models, thereby mitigating the endogeneity concern potentially driven by firm-size effects.

Table 6 reports the results of regressions on the relation between unexpected donations (cash and in-kind) and future incremental CFP following Eq. (2). The CFP return measure is the abnormal risk-adjusted return based on the Fama–French five-factor (FF5) model in Columns (1)–(4). The accounting measure of CFP is the change of ROA in Columns (5)–(6). In Column (1), we observe that when FF5 is regressed on incremental financial variables only, the explanatory power measured by adjusted-R^2 is 0.010. When we include an additional explanatory variable, *unexpected cash giving* in Column (2) to the same regression model, the adjusted-R^2 increases to 0.073, a more than 600 % jump. When we add expected cash giving in Column (3), there is barely any change in the adjusted-R^2. These results suggest that *unexpected cash giving* contains information that can explain the giving firms' future CFP.

We also notice that none of the coefficient estimates on expected or unexpected in-kind donations is significant for the incremental CFP measures, suggesting that in-kind donations are not associated with future CFP, confirming H1. The coefficient estimates on unexpected cash giving, however, is positive and highly significant in all models. The coefficient estimate on expected cash donations in Column (3) is insignificant, suggesting no relation between expected cash giving and FF5. This finding suggests that H4(a), i.e., *investment hypothesis* is not supported by our data. Interestingly, the coefficient estimate on expected cash giving in Column (5) is negative and significant, suggesting a negative relation between future ROA and expected cash giving. In contrast, the coefficient estimates on unexpected cash donations are positive and significant for all of the CFP measures, supporting our Hypothesis 4(b), i.e., the *information hypothesis*. Furthermore, the coefficients on advertising expenditure are insignificant. The results reported in Columns (3) and (5) suggest that (positive) unexpected cash donations that predict positive CFP change beyond and above advertising expenditure. In summary, the results in Table 6 are consistent with Hypothesis 1, that while various types of corporate philanthropy have different effects on future CFP, only unexpected cash donations are associated with improved future CFP. Our Table 6 results are also supportive of the information hypothesis 4(b), but not the investment hypothesis 4(a).

Instrumental Variable (IV) Regression

Next, we use an instrumental variable (IV) regression to address the endogeneity concern. We introduce two instruments similar to Jiraporn et al. (2014). These instruments are both related to *cash giving ratio* and not driven by firm-specific characteristics:

(1) Mean annual *cash giving ratio* of all other firms that are in the same state (*State mean cash giving ratio*), and
(2) Mean *cash giving ratio* of all other firms that are in the same industry (*SIC2 mean cash giving ratio*) measured by 2-digit SIC code

Table 5 Results of estimating Tobit and OLS models of the determinants of corporate giving

Variables	(1) *Cash Giving ratio* Tobit	(2) *In-kind Giving ratio* Tobit	(3) *Total Giving ratio* Tobit	(4) *Log cash Donation* OLS	(5) *Log in-kind Donation* OLS	(6) *Log total Donation* OLS
$Log(TA)_t$	0.002	0.055**	0.033***	1.318***	1.109***	1.234***
	(0.241)	(2.085)	(2.767)	(9.046)	(7.685)	(19.724)
$Leverage_t$	−0.023	−0.085	0.007	−1.997	0.365	−0.117
	(−0.295)	(−0.594)	(0.097)	(−1.203)	(0.318)	(−0.256)
ROA_t	0.046	0.363*	0.161	−1.625	1.576	0.700
	(0.623)	(1.854)	(1.366)	(−1.304)	(1.244)	(1.175)
$R\&D/TA_t$	0.263**	0.355	0.457***	3.884**	3.896**	2.340***
	(2.172)	(1.397)	(3.045)	(2.257)	(2.357)	(3.123)
Adv/TA_t	0.651**	1.808	1.512***	2.369	4.658	7.201***
	(2.045)	(1.407)	(2.891)	(0.375)	(0.770)	(3.555)
$CAPX/TA_t$	−0.188	−0.027	0.168	3.372	6.998*	5.051**
	(−0.612)	(−0.048)	(0.458)	(1.138)	(1.853)	(2.173)
$Net\ FA/TA_t$	−0.022	0.116	0.036	−0.098	0.250	0.149
	(−1.076)	(1.457)	(1.063)	(−0.222)	(0.560)	(0.841)
$Sales\ growth_t$	0.035	−0.086	−0.072*	0.297	−0.511	−0.161
	(0.742)	(−1.048)	(−1.778)	(0.492)	(−0.692)	(−0.740)
$CGOV_t$	−0.002**	−0.001	−0.000	0.003	0.022*	0.018***
	(−1.996)	(−0.287)	(−0.430)	(0.470)	(1.884)	(3.223)
Constant	0.367**	−0.372	−0.248**	3.944**	3.061*	2.094***
	(2.328)	(−1.425)	(−1.968)	(2.284)	(1.844)	(2.803)
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Clustered	Yes	Yes	Yes	Yes	Yes	Yes
At a firm level						
Observations	637	500	1546	637	500	1546
R^2				0.472	0.627	0.616
Psuedo R^2	−0.689	0.830	1.691			
Log likelihood	417.3	−39.54	185.5			
Adjusted R^2				0.420	0.581	0.600

Columns (1)–(3) of this table are based on Tobit models with (0, 1) boundary. Columns (4)–(6) are based on OLS. Dependent variables are cash (In-kind, total) giving ratios in Columns (1)–(3) and dependent variables are log cash (In-kind, total) donations in Columns (4)–(6). All models use standard errors clustered at firm levels. Robust *t* statistics are reported in parentheses. Industry is measured by using Fama and French (1997) 48 industry classification. See variable definition and data source in "Appendix." ***, **, and * stand for statistical significance at the 1, 5, and 10 % level, respectively

A valid instrumental variable requires meeting two criteria: It should affect the level of *cash giving ratio*, and it should not affect firm performance through other channels except for its direct effect on *cash giving ratio*. Because certain shared location-related influence, *State mean cash giving ratio* of all other firms in the same state should be positively correlated with that of a specific firm.[11,12] If *cash giving ratio* is industry-related, *FF48 mean cash giving ratio* should be positively correlated with *cash giving ratio*.

[11] Jiraporn et al. (2014) show that a firm's CSR policy is significantly influenced by the CSR policies of firms in the same area, either due to investor clientele, local competition, and/or social interactions.

[12] We use the mean cash giving at all *other* firms in the same state or in the same industry as our instrumental variables because a firm's cash giving policies and practices are likely affected by other firms' giving practices in the same state or in the same industry. Thus, these instruments satisfy the first condition for a valid instrument, i.e., they are highly correlated with firm-level cash giving. Other firms' cash giving practices, however, should not affect the own firm's individual financial performance. Regarding the second-stage exclusion restriction, we consider that other firms' cash giving practices should not affect the own firm's CFP directly because other firms' cash giving alone does not necessarily drive own firm's CFP. Thus, our instruments also satisfy the second-stage exclusion restriction.

Table 6 Corporate giving and corporate financial performance

Variables	(1) *FF5*	(2) *FF5*	(3) *FF5*	(4) *FF5*	(5) ΔROA_{t+1}	(6) ΔROA_{t+1}
$\Delta Log(TA)_t$	−0.049	0.207*	0.193	−0.052	−0.026	−0.041
	(−1.387)	(1.752)	(1.583)	(−0.525)	(−1.078)	(−1.154)
$\Delta Leverage_t$	0.033	−0.078	−0.063	0.311	0.010	0.037
	(0.393)	(−0.243)	(−0.197)	(1.010)	(0.173)	(0.467)
ΔROA_t	0.137	−0.269	−0.294	−0.236		
	(1.193)	(−1.054)	(−1.216)	(−1.071)		
$\Delta R\&D/TA_t$	−0.006	−0.114	−0.091	−0.857	0.554**	0.589***
	(−0.020)	(−0.089)	(−0.070)	(−0.914)	(2.497)	(2.802)
$\Delta Adv/TA_t$	1.289	2.777	2.818	2.563	−0.037	−0.030
	(1.376)	(1.455)	(1.464)	(1.118)	(−0.096)	(−0.066)
$\Delta CAPX/TA_t$	−0.169	2.005	1.965	0.456	−0.166	−0.003
	(−0.555)	(1.495)	(1.465)	(0.248)	(−0.821)	(−0.015)
$\Delta Net\ FA/TA_t$	−0.040	0.600	0.573	0.147	0.127	0.104
	(−0.167)	(1.251)	(1.176)	(0.368)	(1.276)	(1.004)
$\Delta Nondiv\ dummy_t$	0.015	−0.039	−0.039	−0.033	−0.012	−0.005
	(0.512)	(−0.500)	(−0.509)	(−0.441)	(−0.763)	(−0.275)
$\Delta Sales\ growth_t$	−0.046	−0.098	−0.100	0.144*	0.009	0.028
	(−1.331)	(−1.175)	(−1.211)	(1.933)	(0.602)	(1.554)
$\Delta CGOV_t$	0.000	0.001	0.001	0.001	0.000	0.000
	(0.684)	(0.417)	(0.494)	(0.664)	(0.111)	(0.096)
$Expected\ cash\ donation_t$			0.200		−0.087**	
			(0.858)		(−1.984)	
$Unexpected\ cash\ donation_t$		0.257***	0.256***		0.034**	
		(3.483)	(3.424)		(1.991)	
$Expected\ In\text{-}kind\ donation_t$				0.134		−0.002
				(1.612)		(−0.111)
$Unexpected\ In\text{-}kind\ donation_t$				0.002		0.007
				(0.040)		(0.855)
Constant	0.050**	0.208***	0.181**	0.148	0.025**	0.018
	(2.199)	(2.700)	(2.113)	(1.489)	(2.467)	(1.189)
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Clustered at a firm level	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5016	529	529	416	502	406
R^2	0.016	0.126	0.128	0.108	0.094	0.090
Adjusted R^2	0.010	0.073	0.074	0.036	0.036	0.017

In this table, corporate financial performance (CFP) is measured by two variables: future ROA changes (ΔROA_{t+1}, that is, $ROA_{t+1} - ROA_t$) and Fama–French 1 year excess risk-adjusted holding period stock returns. *Predicted cash donation* is the expected cash giving ratio from Column (1) in Table 5 and *Unexpected cash donation* is the residual from Column (1) in Table 5. *Predicted In-kind donation* is the expected In-kind giving ratio from the Column (2) in Table 5 and *Unexpected In-kind donation* is the residual from the Column (2) in Table 5. Industry effects are captured by Fama–French 12 industry classification. Standard errors for all models are clustered at firm levels. *FF5 1 yr return* is excess 1 year holding period return over year t to $t + 1$ using Fama–French five-factor model. The five factors are market factor, small minus large factor, high minus low book-to-market–ratio factor, momentum factor, as well as Pastor and Stambaugh (2003) liquidity factor. ROA is calculated as income before extraordinary items (IB)/total assets (AT). Robust t statistics are reported in parentheses. See variable definition and data source in "Appendix." ***, **, and * stand for statistical significance at the 1, 5, and 10 % level, respectively

Table 7 Instrumental variable regression

Variables	First stage	Second stage	
	(1) *Cash Giving ratio*	(2) *FF5* All sample	(3) *FF5* High CGOV sample
Cash giving ratio$_t$ (predicted)		0.453**	0.677**
		(2.042)	(2.052)
Log(TA)$_t$	0.001	−0.030**	−0.072***
	(0.07)	(−2.310)	(−2.857)
Leverage$_t$	−0.063	0.091	0.417**
	(−0.77)	(0.576)	(2.290)
ROA$_t$	0.157	−0.141	0.030
	(1.46)	(−0.495)	(0.077)
R&D/TA$_t$	0.288	−0.382	−1.067**
	(1.30)	(−0.986)	(−2.248)
Adv/TA$_t$	0.081	0.240	0.209
	(0.50)	(0.768)	(0.554)
CAPX/TA$_t$	0.195	0.111	−1.585*
	(0.85)	(0.150)	(−1.696)
Net FA/TA$_t$	−0.000	0.036	0.243
	(−0.01)	(0.248)	(1.288)
Nondiv dummy$_t$	−0.023	0.006	−0.012
	(−1.23)	(0.143)	(−0.207)
Sales growth$_t$	0.039	0.073	0.210
	(1.39)	(1.009)	(1.162)
CGOV$_t$	−0.000	0.001	0.008
	(−0.62)	(0.914)	(1.356)
Instruments			
Annual state mean cash giving ratio$_t$	0.810***		
	(9.92)		
SIC2 mean Log(cash giving)$_t$	0.031***		
	(4.16)		
Industry fixed	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes
Clustered at a firm level	Yes	Yes	Yes
Kleibergen–Paap rk LM statistic (underidentification test)	14.664*** ($p = 0.00$)		
Kleibergen–Paap rk Wald F statistic (weak identification test)	52.148*** ($p = 0.00$)		
Hansen J statistics (overidentification test)	0.054 ($p = 0.817$)		
Endogenous Chi-square test	1.706 ($p = 0.191$)		
Observations		578	294
R^2		0.094	0.177
Adjusted R^2		0.043	0.079

In the first stage, a dependent variable is cash giving ratio and in the second stage, a dependent variable is Fama–French 1-year risk-adjusted excess holding period stock returns (*FF5*). *FF5 1 yr return* is excess 1 year holding period return over year t to $t + 1$ using Fama–French five-factor model. The five factors are market factor, small minus large factor, high minus low book-to-market–ratio factor, momentum factor, as well as Pastor and Stambaugh (2003) liquidity factor. Robust t statistics are reported in parentheses. See variable definition and data source in "Appendix." ***, **, and * stand for statistical significance at the 1, 5, and 10 % level, respectively

The first-stage IV regression shows that our two instruments are not weak ones with an F statistic of 52.148 (p value = 0.000) (Stock and Yogo 2005). Interestingly, the endogenous test suggests that the *cash giving ratio* is not endogenous (p value = 0.191) in a regression on *FF5* and Hansen's J test shows that at least one of the

Table 8 Propensity matching tests

Variable	Sample	Treated	Controls	Difference	SE	*T* stat
FF5	Unmatched	0.0600	0.0265	0.0353	0.0301	1.11
	ATT	0.0874	−0.0203	0.1077	0.0451	2.39

Variable	Sample	Mean		Bias %	*t*	*p* value
		Treated	Control	reduction		
$Log(TA)_t$	Unmatched	9.901	9.515		3.55	0.00
	Matched	9.672	9.481	50.5	1.39	0.17
$Leverage_t$	Unmatched	0.174	0.224		−4.50	0.00
	Matched	0.179	0.196	67.1	−1.12	0.27
ROA_t	Unmatched	0.053	0.027		6.10	0.00
	Matched	0.053	0.052	96.2	0.14	0.89
$R\&D/TA_t$	Unmatched	0.024	0.022		0.47	0.64
	Matched	0.027	0.023	−133.5	0.77	0.44
Adv/TA_t	Unmatched	0.100	0.077		3.35	0.00
	Matched	0.106	0.094	45.0	1.48	0.14
$Net\ FA/TA_t$	Unmatched	0.209	0.272		−3.50	0.00
	Matched	0.229	0.213	75.1	0.71	0.48
$Nondiv\ dummy_t$	Unmatched	0.197	0.221		−0.65	0.52
	Matched	0.232	0.282	−103.6	−0.95	0.34
$Sales\ growth_t$	Unmatched	0.096	0.092		0.22	0.83
	Matched	0.100	0.127	−612.1	−1.07	0.28
$CGOV_t$	Unmatched	84.755	84.121		0.61	0.54
	Matched	85.383	84.802	8.4	0.45	0.66

High cash donation = 1 if the *cash giving ratio* > mean, 0 if the *cash-giving ratio* ≤ mean 0.137 % or (cash donation and total donation information is missing). With Caliper 0.01 restriction, one-to-one nearest matching. See variable definition and data source in "Appendix"

instruments for the IV regression is valid (p value = 0.817). In the second stage, the instrumented values of the *cash giving ratio* are used to estimate the impact of cash giving on *FF5*. The estimated coefficient of the *cash giving ratio* is positive and significant for the overall sample (0.453 with t stat = 2.042), especially for the subsample of firms with above-median corporate governance (0.677 with t stat = 2.052). The results from the two stages of the IV regression are reported in Table 7. From the results in the second stage, we confirm the positive association between the *cash giving ratio* and *FF5*, which is both statistically and economically significant, supporting the information hypothesis.

Propensity Score-Matching Tests

We also use the propensity score-matching technique to further address potential endogeneity concerns. The method of propensity score matching has been receiving more attention in social studies mainly for dealing with the endogeneity issues since the seminal work of Rosenbaum and Rubin (1983). We also follow Heckman et al. (1997, 1998), Bae et al. (2011), and DeFond et al. (2016) in using the propensity score-matching approach of three steps to find optimal matching firms. The first step is to use a probit model to estimate propensity scores and match firms with a *cash giving ratio* higher than the sample mean (0.137 %) with other firms in the sample which are similar in size, profitability (ROA), R&D intensity, fixed assets, dividend-paying or not, corporate governance, sales growth, in the same Fama–French 48 industry, as well as in the same year. The second step is to estimate the conditional probability or the propensity score for each observation from the probit model. The third step is to use various matching techniques and compare the difference in *FF5* between the group of firms with *cash giving ratio* higher than 0.137 % and the matched group. The results from the propensity score matching from the third step show that we are able to match a resembling group of firms having non-distinguishable differences with an allowed error margin (caliper) of 0.01. The two groups of firms with and without high *cash giving ratio* are very different in characteristics before the match. The t statistics for their differences in size, ROA, R&D intensity, advertising

Table 9 Unexpected cash donation and CFP with corporate governance

Variables	(1) *FF5* High CGOV	(2) *FF5* Low CGOV	(3) ΔROA_{t+1} High CGOV	(4) ΔROA_{t+1} Low CGOV	(5) *FF5* High Growth	(6) *FF5* Low Growth	(7) ΔROA_{t+1} High Growth	(8) ΔROA_{t+1} Low Growth
$\Delta Log(TA)_t$	−0.026	0.633***	−0.049	−0.022	0.116	0.048	−0.026	−0.032
	(−0.258)	(2.821)	(−1.281)	(−0.766)	(0.810)	(0.382)	(−0.758)	(−1.198)
$\Delta Leverage_t$	0.229	0.242	0.120	−0.152***	0.556	−0.105	0.134	−0.073
	(0.554)	(0.956)	(1.347)	(−3.074)	(1.157)	(−0.727)	(1.601)	(−1.495)
ΔROA_t	−0.404**	0.463			−0.295	0.047		
	(−2.051)	(0.765)			(−0.664)	(0.214)		
$\Delta R\&D/TA_t$	−0.951	0.676	0.553***	0.318	−1.292	−0.116	0.896***	−1.122***
	(−0.950)	(0.268)	(2.701)	(1.122)	(−1.019)	(−0.056)	(4.185)	(−2.981)
$\Delta Adv/TA_t$	1.928	4.528	−0.051	0.052	13.253*	0.033	0.639	0.091
	(0.949)	(1.240)	(−0.118)	(0.135)	(1.898)	(0.019)	(0.524)	(0.270)
$\Delta CAPX/TA_t$	3.112*	1.439	−0.059	−0.239	2.844*	−2.072*	−0.269	−0.133
	(1.817)	(0.919)	(−0.240)	(−0.912)	(1.732)	(−1.738)	(−0.884)	(−0.635)
$\Delta Net\ FA/TA_t$	−0.235	2.521*	0.076	0.148	1.405	−0.204	0.405**	−0.048
	(−0.515)	(1.923)	(0.659)	(0.560)	(1.597)	(−0.337)	(2.441)	(−0.468)
$\Delta Nondiv\ dummy_t$	−0.090	0.171	0.001	−0.067*	−0.067	−0.123	−0.014	−0.020
	(−1.068)	(1.448)	(0.060)	(−1.694)	(−0.435)	(−1.439)	(−0.306)	(−1.592)
$\Delta Sales\ growth_t$	−0.063	−0.239	0.008	0.016	0.007	0.025	0.029	0.004
	(−0.721)	(−1.096)	(0.488)	(0.701)	(0.058)	(0.240)	(1.178)	(0.169)
$\Delta CGOV_t$	0.003	−0.005**	0.000	−0.000	0.002	−0.001	−0.000	−0.000
	(1.385)	(−2.214)	(0.340)	(−0.245)	(0.993)	(−0.463)	(−0.651)	(−0.085)
Expected cash donation$_t$	0.167	0.358	−0.080	−0.019	0.262	0.252	−0.061	−0.169**
	(0.690)	(0.645)	(−1.545)	(−0.386)	(0.833)	(0.909)	(−1.264)	(−2.333)
Unexpected cash donation$_t$	0.283***	0.094	0.033*	−0.019	0.221**	0.191	0.042*	0.045
	(2.852)	(0.383)	(1.808)	(−0.439)	(2.172)	(1.124)	(1.754)	(1.396)
Constant	0.142	0.105	0.022**	0.013	0.125	0.049	0.046***	0.017
	(1.400)	(0.657)	(2.287)	(0.673)	(1.337)	(0.569)	(3.572)	(1.427)
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered at a firm level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	435	94	419	83	249	233	228	228
R^2	0.129	0.531	0.117	0.462	0.204	0.149	0.171	0.211
Adjusted R^2	0.0620	0.307	0.0488	0.168	0.0944	0.0232	0.0490	0.0952

In this table, dependent variables are Fama–French 1-year risk-adjusted excess holding period stock returns (*FF5*) and future ROA changes (ΔROA_{t+1}, that is, $ROA_{t+1} - ROA_t$). *FF5 1 yr return* is excess 1 year holding period return over year t to $t + 1$ using Fama–French five-factor model. The five factors are market factor, small minus large factor, high minus low book-to-market–ratio factor, momentum factor, as well as Pastor and Stambaugh (2003) liquidity factor. Expe*cted cash donation* is the expected cash-giving ratio from Column (1) in Table 5 and *Unexpected cash donation* is the residual from Column (1) in Table 5. Robust t statistics are reported in parentheses. See variable definition and data source in "Appendix." ***, **, and * stand for statistical significance at the 1, 5, and 10 % level, respectively

intensity, and corporate governance, however, are all significant with p values of 0.00. The t statistics for differences in characteristics of the two groups after match are all insignificant with p values ranging between 0.14 and 0.89, suggesting that our matching process is successful. After match, the difference for 1 year *FF5* between the groups with higher than mean *cash-giving ratio* becomes more statistically significant with a t value of 2.39. Our results reported in Table 8 suggest that the *cash-giving ratio* is an important driving factor for future stock performance measured by *FF5*, again supporting the information hypothesis, but not the agency cost hypothesis.

Table 10 Expected and unexpected cash donation and CFP using Lys et al. (2015) model

	(1)	(2)
VARIABLES	*FF5*	*FF5*
$\Delta Log(TA)_t$		0.205*
		(1.673)
$\Delta Leverage_t$		−0.071
		(−0.221)
ΔROA_t		−0.274
		(−1.105)
$\Delta R\&D/TA_t$		−0.106
		(−0.083)
$\Delta Adv/TA_t$		2.843
		(1.486)
$\Delta CAPX/TA_t$		1.970
		(1.466)
$\Delta Net\ FA/TA_t$		0.625
		(1.284)
$\Delta Nondiv\ dummy_t$		−0.040
		(−0.516)
$\Delta Sales\ growth_t$		−0.101
		(−1.222)
$\Delta CGOV_t$		0.001
		(0.362)
Expected cash donation	0.133	0.072
	(0.649)	(0.325)
Unexpected cash donation	0.265**	0.333***
	(2.547)	(3.258)
Constant	0.210*	0.200**
	(1.670)	(2.267)
Industry fixed	Yes	Yes
Year fixed	Yes	Yes
Clustered at a firm level	Yes	Yes
Observations	595	529
R^2	0.084	0.132
Adjusted R^2	0.0483	0.0774

In this table, dependent variables are Fama–French 1-year risk-adjusted excess holding period stock returns (FF5). FF5 is excess 1 year holding period return over year t to $t + 1$ using Fama–French five-factor model. Robust t statistics in parentheses. *Expected cash donation* is the expected cash giving ratio from Column (1) in Table 5 and *Unexpected cash donation* is the residual from Column (1) in Table 5. ***, **, and * stand for statistical significance at the 1, 5, and 10 % level, respectively

Firm Characteristics and the Informational Value of Cash Giving

Table 9 reports how corporate governance could influence the informational value of cash giving. We split the full sample into subsamples with above- and below-median governance scores and report the relation between *FF5* and change in ROA in Columns (1)–(4) for the two subsamples, respectively. *Unexpected cash giving* is only positively associated with future CFP at firms with strong corporate governance (t stats = 2.852 and 1.808, respectively), suggesting that the informational value of cash giving is more pronounced when giving is unlikely to be agency problem-related. Similarly, for subsamples of firms with and without high sales growth, unexpected cash giving is only positively associated with future CFP at firms with high growth (t stats = 2.172 and 1.754, respectively). The association between expected cash giving and future CFP, however, is never positive and significant. Our findings again support the *information hypothesis*, but not the *investment hypothesis*.

Our results for the expected and unexpected cash giving and future CFP continue to hold when we use the model of Lys et al. (2015) to estimate the expected and unexpected cash giving. These results are reported below in Table 10. The coefficient estimates on expected cash giving are insignificant in both models (1) and (2) while those on unexpected cash giving are positive and highly significant in both models (1) and (2). Again, our findings are supportive of the *information hypothesis*, but not the *investment hypothesis*.

Table 11 explores how alternative mechanisms that help investors uncover cash flow-related information influence the informational value of cash giving. We use *unexpected cash giving* as the measure of giving and investigate three alternative mechanisms: dividends, advertising, and repurchases. Models (1)–(2) examine the effects of high- or low-dividend payout ratios on the relation between *unexpected cash giving* and *FF5* returns. The *excess cash giving* is only positively associated with *FF5* for firms with below-median dividend payout ratios (0.561 for coefficient estimate with t stat = 2.835). Models (3)–(4) examine the effects of high and low advertising intensity, and Models (5)–(6) explore the effects of high and low repurchase ratios on the relation between *unexpected cash giving* and *FF5*, respectively. Again, *unexpected cash giving* is only positively associated with *FF5* for firms with below-median advertising intensity and repurchase ratio (t stats of 2.580 and 3.134, respectively). Thus, the findings in Models (1)–(6) are consistent with Hypothesis 5(b), that the informational value cash giving is only pronounced at firms with no convincing alternative mechanisms that demonstrate strength of cash flow.

Conclusion

We differentiate corporate giving into cash and in-kind giving and examine three possible hypotheses that could explain the relation between corporate giving and future

Table 11 The effect of corporate giving and alternative signaling mechanisms

Variables	(1) *FF5* Low Dividends	(2) *FF5* High Dividends	(3) *FF5* Low Advertising	(4) *FF5* High Advertising	(5) *FF5* Low Repurchase	(6) *FF5* High Repurchase
$\Delta Log(TA)_t$	−0.010	−0.252	−0.068	0.173	0.129	−0.242
	(−0.078)	(−1.361)	(−0.497)	(0.522)	(1.051)	(−1.267)
$\Delta Leverage_t$	−−0.071	1.037	−0.229	1.097	0.163	0.886
	(−0.097)	(1.090)	(−0.653)	(1.191)	(0.333)	(0.943)
ΔROA_t	−0.142	0.757	0.261	−0.160	−0.120	−0.197
	(−0.506)	(1.083)	(0.428)	(−0.545)	(−0.228)	(−0.979)
$\Delta R\&D/TA_t$	2.313	0.342	0.371	−1.248	−0.925	1.828
	(0.626)	(0.331)	(0.286)	(−0.325)	(−0.722)	(0.618)
$\Delta Adv/TA_t$	−3.545	2.031	−1.401	5.313	4.876	−0.735
	(−0.630)	(0.871)	(−0.606)	(1.217)	(1.024)	(−0.446)
$\Delta CAPX/TA_t$	2.918	0.496	0.582	5.613	5.292**	−0.301
	(1.279)	(0.418)	(0.544)	(1.401)	(2.005)	(−0.247)
$\Delta Net\ FA/TA_t$	0.839	−1.133*	−1.360	−0.051	−0.086	0.512
	(0.793)	(−1.961)	(−1.394)	(−0.048)	(−0.088)	(0.384)
$\Delta Nondiv\ dummy_t$	−0.069		−0.111	0.015	−0.066	−0.087
	(−0.802)		(−0.886)	(0.111)	(−0.597)	(−1.025)
$\Delta Sales\ growth_t$	−0.171	0.106	−0.108	−0.048	−0.163	0.408
	(−1.388)	(0.786)	(−1.042)	(−0.175)	(−1.620)	(1.410)
$\Delta CGOV_t$	0.000	−0.002	0.000	−0.001	0.001	−0.002
	(0.040)	(−1.470)	(0.108)	(−0.319)	(0.648)	(−0.800)
$Expected\ cash\ donation_t$	−0.080	−0.523	−0.002	−0.596	0.004	−0.047
	(−0.440)	(−1.170)	(−0.013)	(−0.540)	(0.026)	(−0.093)
$Unexpected\ cash\ donation_t$	0.561***	0.067	0.197**	0.225	0.233***	0.153
	(2.835)	(0.774)	(2.580)	(0.780)	(3.134)	(0.676)
Constant	0.283*	0.185	0.125	0.268	0.200	0.097
	(1.680)	(1.231)	(0.633)	(1.323)	(1.246)	(0.614)
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Clustered at a firm level	Yes	Yes	Yes	Yes	Yes	Yes
Observations	189	164	237	116	199	146
R^2	0.231	0.198	0.182	0.265	0.228	0.237
Adjusted R^2	0.079	0.032	0.058	0.051	0.085	0.047

In this table, dependent variables are Fama–French 1-year risk-adjusted excess holding period stock returns (*FF5*). *FF5 1-yr return* is excess 1 year holding period return over year t to $t + 1$ using Fama–French five-factor model. The five factors are market factor, small minus large factor, high minus low book-to-market–ratio factor, momentum factor, as well as Pastor and Stambaugh (2003) liquidity factor. *Expected cash donation* is the expected cash giving ratio from Column (1) in Table 5 and *Unexpected cash donation* is the residual from Column (1) in Table 5. Robust t statistics in parentheses. See variable definition and data source in "Appendix." ***, **, and * stand for statistical significance at the 1, 5, and 10 % level, respectively

CFP: agency cost hypothesis, investment hypothesis, and information hypothesis. We use robust methodologies that carefully address the endogeneity concerns which make the interpretation difficult on the relation between corporate giving and CFP. Overall, our empirical results support the *information hypothesis*, but neither the agency explanation nor the investment hypothesis.

We also show that unexpected cash giving is more likely to possess informational value and the informational value is pronounced when the firm is well governed, has high growth, and when investors lack alternative information channel about cash flows at the firm.

This article contributes to the corporate philanthropy literature in a few dimensions. First, our finding that

unexpected cash giving, but not unexpected in-kind or total giving, is associated with improved CFP, suggests that different types of corporate philanthropy have heterogeneous effects, most likely through alternative channels, as they rely on different resources. We therefore add to the literature on the diverse effects of CSR activities (Godfrey et al. 2009; Chang et al. 2014). Second, we contribute to the literature on cash management, as our findings show that cash giving stands out as a passive signaling tool. Finally, we demonstrate that the informational value of cash giving is more pronounced at firms which lack alternative signaling mechanisms.

Future studies could expand the study beyond U.S. and investigate whether a different legal and cultural environment influences the information value of corporate giving. Future studies could also explore how to combine cash- and in-kind giving that suits the need for a particular firm.

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Appendix

See Table 12.

Table 12 Variable definitions and data sources

Variable Name	Definition	Calculation	Data Source
Financial variables			
Log(TA)	Log (Total Assets)	Log(at)	Compustat
Leverage	Debt ratio	Total Debt/Total Assets	Compustat
ROA	Return on Assets	Income before extraordinary items/Total Assets at the beginning of the period	Compustat
CF return	EBITDA/Total assets	Total assets at the beginning of the period	Compustat
Tobin's Q	Tobin's Q	(Total assets − book value of common equity + market value of common equity)/total assets	Calculated from Compustat
FF5 1 yr risk-adjusted abnormal return (*FF5*)	Future 1-year abnormal risk-adjusted holding period stock return starting from fiscal year end of corporate-giving activity.	Actual future 1-year holding period stock return − benchmark (expected future 1-year stock returns. The future 1-year period starts from the fiscal year end for the corporate-giving activity and ends in 12 months in the future. The benchmark (expected 1-year return) is calculated using Fama and French five-factor models. The five factors are market, SMB (small minus big), HML (high minus low), momentum, and Pastor–Stambaugh liquidity factors. The respective betas are calculated using 24 months of return data before the fiscal year end of corporate-giving activity	CRSP
Cash/TA	Cash/Total assets	Cash and short-term investments/Total Assets	Compustat
R&D/TA	R&D/Total assets	R&D Expenses/Total assets, missing R&D expenses are treated as zero	Compustat
Adv/TA	Advertising/Total Assets	Advertising expenses/Total assets, missing advertising expenses are treated as zero	Compustat
CAPX/TA	Capital expenditure/TA	Capital expenditure/Total Assets	Compustat
Net FA/TA	Net Plant and equipment/TA	Total Property, plant, and equipment/Total assets	Compustat
Non-Dividend dummy	Dummy variable	Takes 1 if firms does not pay dividends, else 0	Compustat
Div/TA	Dividends/Total Assets		Compustat
Sales growth	Sales growth	[Sales(t)/Sales($t-1$)] − 1	Compustat
CSR related variables			
Log cash donation	Log(cash donation in dollars)		ASSET4

Table 12 continued

Variable Name	Definition	Calculation	Data Source
Total giving ratio %	Total donation/Sale * 100		ASSET4
Cash giving ratio %	Cash donation/Sale * 100		ASSET4
In-kind giving ratio %	In-kind donation/Sale * 100		ASSET4
CGOV	Numerical corporate governance rating		ASSET4
Expected cash donation	Expected number from a Tobit Model (Model 2 in Table 3)		Calculated using ASSET4 and Compustat
Expected cash donation2	Expected number from an OLS model (Model 5 in Table 3)		Calculated using ASSET4 and Compustat
Unexpected cash donation	Residual from a Tobit Model (Model 2 in Table 3)	Actual (Cashdon/Sale) – Expected (Cashdon/Sale)	Calculated using ASSET4 and Compustat
Unexpected cash donation2	Residual from an OLS model (Model 5 in Table 3)	Actual (Log (Cashdon)) – Expected (Log (Cashdon))	Calculated using ASSET4 and Compustat

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