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Signaling through corporate accountability reporting

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ABSTRACT

We document that corporate social responsibility ("CSR") expenditures are not a form of corporate charity nor do they improve future financial performance. Rather, firms undertake CSR expenditures in the current period when they anticipate stronger future financial performance. We show that the causality of the positive association between CSR expenditures and future firm performance differs from what is claimed in the vast majority of the literature and that corporate accountability reporting is another channel through which outsiders may infer insiders' private information about firms' future financial prospects.

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1. Introduction

We examine the relation between corporate social responsibility ("CSR") expenditures and firm performance.[1] The motivation for our approach is based on two observations. First, there is a significant debate as to the merits of CSR activities (Margolis et al., 2007). While some researchers find support for what is commonly referred to as "doing well by doing good" (e.g., Servaes and Tamayo, 2013; Fombrun, 2005), others suggest that CSR activities are an irresponsible use of corporate resources (e.g., Friedman, 1970). Second, researchers have addressed this debate through studies that investigate whether there is a positive association between CSR initiatives and different aspects of economic performance. The underlying assumption in these studies is that evidence of a positive association implies that CSR expenditures lead to improvements in a firm's performance. We hypothesize that the causality does not necessarily go from CSR expenditures to financial performance. Rather, we posit that a firm may undertake a CSR initiative because the firm expects strong future financial performance.

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[1] Some specific examples of CSR initiatives can be found in the Corporate Social Responsibility in Practice Handbook, available online at http://www.pathfinder.org/publications-tools/pdfs/CATALYST-Corporate-Social-Responsibility-in-Practice-Casebook.pdf.

This latter point can be illustrated by a simple example. Assume that a firm has a breakthrough in its operations that will result in substantially increased profitability in the future. In addition, suppose that this firm started a new CSR initiative in the current year. Based on these facts, a researcher examining this firm might conclude that increased CSR expenditures led to improved financial performance by looking at the relation between current CSR expenditures and future financial performance. However, it could be that the firm began to invest in CSR in anticipation of its strong future performance. The omitted variable in this example, management's private information about the future prospects of the firm, impacts not only whether there is an association between CSR expenditures and future firm performance, but also the direction of the causality.

Based on this motivation, we examine three possible explanations for CSR expenditures. First, firms undertake CSR activities not because they increase firm value but because they are beneficial for society – we refer to this as the charity hypothesis.[2] Second, firms undertake CSR activities because they are investments that generate positive economic returns – we refer to this as the investment hypothesis.[3] Third, CSR expenditures are undertaken by firms who expect strong future performance, with the result that CSR expenditures "signal" information about firms' future prospects – we refer to this as the signaling hypothesis. The key distinction between the charity hypothesis and the investment and signaling hypotheses is that the former is not associated with improved financial performance. The key distinction between the signaling and investment hypotheses is that, in the case of signaling, the firm's financial performance is not the result of CSR expenditures; rather the firm's decision to undertake CSR activities is a result of managements' expectations of future financial performance.

We begin our analysis by first establishing whether a positive association exists between current CSR expenditures and future firm performance. Consistent with prior studies, we document a positive relation between CSR expenditures and future performance, as measured by changes in both return on assets and operating cash flow, but only an insignificant association when future performance is measured with size adjusted stock return. These results are inconsistent with the charity hypothesis, which implies that CSR expenditures should not impact the firm's future performance, but are consistent with both the investment and signaling hypotheses.

Next, we examine the direction of the causality between CSR expenditures and future performance to identify whether the relation is consistent with either the signaling or investment hypothesis. The methodological innovation of our analysis that allows us to examine the direction of the causality is the use of a two-stage approach, in which we first split CSR expenditures into two components: (a) the component that can be explained by economic-based factors (i.e., the "optimal" CSR expenditure) and (b) the component that is unrelated to economic-based factors (i.e., the deviation from the optimum).[4] We split CSR expenditures using a first stage regression that includes economic drivers of CSR expenditures documented in prior research; the fitted value from this regression is the optimal and the residual is the deviation.

We then examine whether different proxies for future financial performance are associated with these two components of CSR expenditures. This approach allows us to identify whether future performance is associated with either the optimal level of CSR expenditure or the deviation from that optimum, which in turn allows us to discriminate between the investment and signaling hypotheses. If CSR spending is a good economic investment, then there will be a positive association between optimal CSR expenditure and future firm performance. On the other hand, if CSR expenditures convey information about a firm's future prospects, then there will be a positive association between the deviation from the optimum and future firm performance.[5] We find that, on average, the improvement in firms' future performance is associated with the deviation rather than the optimal CSR expenditure. Based on these results, we conclude that the positive association between future performance and CSR expenditures is more likely due to the signaling value of CSR expenditures rather than positive economic returns on those expenditures.

Our identification strategy relies on the assumption that the residual from the first stage model is exogenous with respect to the financial performance variables in the second stage model. This assumption is reasonable to the extent that the first stage model is complete, an assumption that we believe is reasonable given the high explanatory power of the first-stage model. To provide additional assurance that our results are not partially attributable to an incomplete first stage model, we augment our first stage model by including lagged values for CSR expenditures. Under this approach, we are including all information available to the market, not just information that determines optimal CSR expenditures. The results from this approach provide further support for the signaling hypothesis. We also use a single-stage model in which each determinant of the optimal CSR expenditure has a direct and unconstrained relation with firm performance. As some of the variables in our first-stage model are associated with both financial performance and CSR expenditures,

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[2] Finding empirical support for the charity hypothesis does not rely on a firm making charitable contributions. Rather, this hypothesis is supported when CSR expenditures, regardless of type, are not associated with future financial performance. Under this formulation, there are several possible explanations for a finding that supports the charity hypothesis. We discuss this point in detail in Section 2.

[3] For example, CSR expenditures might improve a firm's reputation, increase employee morale and productivity, mitigate political costs and enhance the firm's ability to negotiate with regulators, thereby resulting in better product market outcomes, such as allowing the firm to charge higher prices.

[4] This methodological approach is new to the CSR literature. However, it has been used in other areas of research, such as executive compensation (e.g., Bebchuk and Grinstein, 2005). The optimal and deviation terminology we employ is consistent with this literature.

[5] Of course, these effects are not mutually exclusive – it is possible for both the optimal CSR expenditure and deviation to have positive associations with future firm performance.

using a single-stage model alleviates concerns that constraining the coefficients on these variables affects our results. The results from this approach also support the signaling hypothesis.

Our primary contribution is to show that CSR expenditures reveal information about the future financial prospects of the firm. While the extant literature has focused extensively on the relation between CSR expenditures and firm performance, it has assumed that the direction of the causality is from CSR expenditures to firm performance, ignoring the idea that CSR expenditures may be undertaken by firms who expect strong future performance. Our analysis indicates that prior research has provided an incomplete assessment on the association between CSR expenditures and financial performance.

We proceed as follows. In Section 2, we provide background on the charity, investment and signaling hypotheses. In Sections 3 and 4, we describe the data and our research design. We summarize our results in Section 5 and conclude in Section 6.

2. Literature review and hypothesis development

Proponents of CSR initiatives believe that financial performance will improve as a direct consequence of strong CSR performance – a view typically captured by the phrase "doing well by doing good." In contrast, opponents argue that CSR activities undertaken by for-profit enterprises are inconsistent with their purpose and hence are by definition irresponsible.[6] This latter view is supported, in part, by research which argues that CSR activities are a waste of corporate resources. For example, Campbell (2007) builds a theory in which he argues that only firms with excess current resources will be asked to expend some of those resources to undertake social investments. Similarly, Hong et al. (2012) find that firms with excess current period financial slack undertake CSR initiatives. The implicit assumption in both of these papers is that CSR initiatives use corporate resources, which implies that CSR expenditures are akin to a form of corporate charity. That is, CSR initiatives are undertaken without any expectation that those expenditures will improve the future financial performance of the firm. This leads to our first hypothesis:

H1. Current CSR expenditures are not associated with future firm performance (Charity Hypothesis).

Finding empirical support for the charity hypothesis does not rely on a firm making charitable contributions. Rather, this hypothesis is supported when CSR expenditures, regardless of type, are not associated with future financial performance. Under this formulation, there are several possible explanations for a finding that supports the charity hypothesis. For example, a firm may have invested in ineffective CSR projects. Alternatively, CSR expenditures may reflect perquisite consumption by firm executives in the form of spending on their own pet projects that have a CSR component.[7] In addition, CSR expenditures may represent a form of delegated philanthropy (Bénabou and Tirole, 2010), in which the firm acts on behalf of stakeholders by making approved charitable contributions.[8] In each case, the ex ante driver of the CSR expenditure is different, but the ex post result is still consistent with the charity hypothesis – CSR expenditures are not associated with future financial performance.[9]

In contrast to the charity hypothesis, several studies highlight specific channels that link CSR expenditures and future financial performance. For example, a commitment to CSR activities may help firms attract and retain high quality employees (Greening and Turban, 2000), improve the effectiveness of the marketing of products and services (Fombrun, 2005), increase demand for products and services (Navarro, 1988), and provide superior access to valuable resources (Cochran and Wood, 1984). Additionally, indirect channels exist through which CSR expenditures may improve a firm's financial prospects. For example, CSR expenditures may act as a form of reputation insurance (Peloza, 2006) and mitigate the likelihood of negative regulatory or legislative action (Hillman and Keim, 2001). In addition, the benefits of CSR expenditures extend beyond traditional measures of financial performance. For example, Dhaliwal et al. (2011) find that the voluntary disclosure of CSR activities leads to a reduction in a firm's cost of capital, higher institutional investor ownership, and broader analyst coverage. Collectively, these studies suggest that CSR expenditures are associated with enhanced economic performance.

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[6] Consider the following excerpt from Business Week (2005): "It's 8:30 am on a Friday in July, and Carol B. Tomé is starting to sweat. The chief financial officer of Home Depot Inc. isn't getting ready to face a firing squad of investors or unveil troubled accounting at the home improvement giant. Instead, she and 200 other Home Depot employees are helping to build a playground replete with swings, slides, and a jungle gym at a local girls' club in hardscrabble Marietta, Ga. … Is this any way to build shareholder value at Home Depot, where the stock has been stuck near $43, down 35% from its all-time high?"

[7] Consider the following excerpt from the Wall Street Journal, dated August 7 (2002): "Mr. Kozlowski was known for spending his own time and money on worthy causes. But he was also very generous with Tyco's money, donating tens of millions of corporate dollars to charities he favored – often getting credit in his own name rather than Tyco's. A Maine private school attended by his daughters got $1.7 million in Tyco money for its Kozlowski Athletic Center, while his alma mater, New Jersey's Seton Hall University, received a $5 million Tyco pledge for Kozlowski Hall."

[8] Bénabou and Tirole (2010) introduced the concept of delegated philanthropy as a potential reason for CSR activities. Under this view, some stakeholders (investors, customers, employees) are willing to sacrifice money to further social goals; the firm acts as a channel that allocates this sacrifice to the stakeholders' preferred recipients. Under delegated philanthropy, CSR expenditures represent money that would otherwise have been paid to stakeholders.

[9] The lack of an association between CSR expenditures and firm value does not imply that CSR expenditures are irrational. For example, under the delegated philanthropy view, stakeholders may want the firm to engage in charitable activities because it can do so more efficiently than individual stakeholders. If this is the case, then delegated philanthropy represents rational and efficient economic behavior, as opposed to a symptom of ineffective management (in the case of a bad investment) or an agency problem (in the case of perquisite consumption), even though it does not increase firm value.

While these studies provide a link between current CSR expenditures and future financial performance, the evidence from the empirical tests does not necessarily imply that CSR expenditures lead to improvements in a firm's financial performance. In a review of the literature on the association between corporate financial performance and CSR activities, Margolis et al. (2007) noted that the existing body of research focuses on how a strong commitment to CSR initiatives improves firm performance, but does not consider the reverse – namely, that the expectation of strong performance leads to CSR expenditures. Anecdotally, the latter explanation seems reasonable. Ceteris paribus, a firm that expects to have more operational slack in future periods is more likely to undertake special projects (Fazzari et al., 1988) and such projects can include CSR-related activities (Hong et al., 2012).

We seek to distinguish between these competing causal interpretations for CSR expenditures and future financial performance. We label the situation in which CSR expenditures lead to improvements in the financial performance of the firm as the investment hypothesis, and the situation in which CSR expenditures convey information about future financial performance as the signaling hypothesis.

H2. Current CSR expenditures lead to improvements in future firm performance (Investment Hypothesis).

H3. Private information regarding future firm performance leads firms to undertake current CSR expenditures (Signaling Hypothesis).

The signaling hypothesis does not require that the firm actively wishes to convey its future prospects when it commits to the investment in and disclosure of a certain CSR initiative. Rather, it only requires that CSR expenditures "signal" information about the future financial prospects of the firm. This definition of signaling is consistent with several studies on dividends, in which the dividend changes have implications for the future cash flows of the firm even if there is no intent on the part of the firm to convey information about future performance (Miller and Rock, 1985; John and Williams, 1985). This approach is also practical because, like the dividend literature, our empirical tests cannot distinguish between active and passive signals (Allen and Michaely, 2003). In other words, our empirical tests cannot distinguish between the choice to convey 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).

Even though each of our three hypotheses predicts a specific and distinct relation between the CSR expenditure and the firm's future financial performance, this does not imply that the underlying activities are also distinct. For example, the firm could be engaging in behavior that is consistent with the charity hypothesis (i.e., making CSR expenditure decisions that produce no actual financial benefit) when it is engaging in behavior that is consistent with the signaling hypothesis (i.e., making CSR expenditure decisions that produce no actual financial benefit in anticipation of the firm's future performance). We do not differentiate between our three hypotheses based on the performance of the specific CSR expenditure or the type of CSR expenditure.[10] Rather, we differentiate based on the relation between the CSR expenditure and the firm's overall future financial performance.

3. Data

We collect information on CSR activities from the Thomson Reuters ASSET4 database,[11] which provides comprehensive CSR data for firms in the Russell 1000 beginning in 2002. Our primary measure of CSR expenditures is the CSR score produced by ASSET4 that only includes social and environmental factors[12] and does not reflect financial performance or corporate governance factors. We exclude financial and governance factors because those are less connected with the notion of social investments, which benefit society in general rather than the firm's stakeholders. Consistent with other studies, we assume that a firm's CSR score is directly related to a scaled measure of the firm's actual CSR expenditures (e.g., Margolis et al., 2007; Servaes and Tamayo, 2013). This assumption is reasonable, after we control for industry, as the level of disclosure and the types of CSR expenditures are relatively comparable within industries. In addition, the reliance of ASSET4 on publicly available CSR information is suitable for our setting since disclosure is a necessary element of signaling.

For each firm-year observation, we collect financial data from Compustat, stock return information from CRSP, and management guidance data from I/B/E/S. We collect information on whether a firm issues a standalone CSR report and

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[10] In fact, it is possible for the same type of CSR expenditure to result in findings that are consistent with any one of our three hypotheses. For example, consider a firm that makes a charitable contribution. This expenditure would be consistent with the charity hypothesis if it is uncorrelated with the future financial performance of the firm. In contrast, this expenditure would be consistent with the investment hypothesis if it improves the financial performance of the firm (e.g., by making the firm's products more attractive to customers). Lastly, this expenditure would be consistent with the signaling hypothesis if it was made in anticipation of strong future financial performance.

[11] Founded in 2003, ASSET4 was a privately held Swiss-based firm until it was acquired by Thomson Reuters in 2009. ASSET4 has collected data and scored firms on financial, governance, environmental and social dimensions since 2002. Research analysts at ASSET4 collect more than 900 evaluation points per firm, and all of the primary data used must be objective and publicly available. Typical sources include stock exchange filings, annual financial and sustainability reports, nongovernmental organizations' websites, and various news sources. Subsequently, these 900 data points are used as inputs to a default equal-weighted framework to calculate 250 key performance indicators (KPIs) that are further organized into 18 categories within four pillars: (a) economic performance score, (b) environmental performance score, (c) social performance score, and (d) corporate governance performance score. Every year, a firm receives a *z*-score for each of the pillars, benchmarking its performance with the rest of the firms in the database. Each firm takes one analyst approximately one week to evaluate.

[12] Appendix B contains a description of the social and environmental factors, as outlined in the ASSET4 documentation.

whether the report is audited from ASSET4. We identify whether the firm's CSR report uses the Global Reporting Initiative (GRI) framework[13] using data purchased from CorporateRegister.com. We truncate all continuous variables at the first and 99th percentiles. Appendix A provides definitions for key variables in the analysis.

Tables 1 and 2 provide additional granularity on our sample composition and descriptive statistics for the main variables used in the regression analyses. Table 1 Panel A shows that our sample size increases over the sample period of 2002–2010, consistent with increased demand for CSR related measures. Table 1 Panel B indicates that our sample encompasses a broad cross-section of industries. Table 2 shows that the CSR scores have a broad range and relatively high variability. For example, the environmental score ranges from 0.09 to 0.97, with a standard deviation of 0.30. In addition, the firms in our sample are generally large and profitable. Only firms in the lowest quartile of profitability have negative income or negative operating cash flows.

In our main tests, we use the entire sample, although we run robustness tests to confirm that our results are similar for a group of firms that are in the sample for the entire period. We also compare the distributions of the non-CSR variables (i.e., financial and performance attributes of the firms provided in Panel C of Appendix A) for the firms covered by ASSET4 to the remaining firms in the Russell 1000. Over our entire sample period, there are no significant differences, although during the initial years of our sample ASSET4 tended to cover larger firms.

4. Research design

We examine whether CSR expenditures are related to future financial performance using the following specifications:

$$\Delta ROA_{t+1} = \alpha_{0a} + \alpha_{1a}CSR_t + \alpha_{2a}\Delta ROA_t + \alpha_{3a}ROA_{t-1} + Controls + \epsilon_{1a} \tag{1a}$$

$$\Delta CFO_{t+1} = \alpha_{0b} + \alpha_{1b}CSR_t + \alpha_{2b}\Delta CFO_t + \alpha_{3b}CFO_{t-1} + Controls + \epsilon_{1b} \tag{1b}$$

$$SAR_{t+1} = \alpha_{0c} + \alpha_{1c}CSR_t + Controls + \epsilon_{1c} \tag{1c}$$

We measure firm performance using future changes in return on assets, denoted ΔROA_{t+1} (i.e., $ROA_{t+1}–ROA_t$), future changes in operating cash flow scaled by total assets, denoted ΔCFO_{t+1} (i.e., $CFO_{t+1}–CFO_t$), and size-adjusted stock returns for the 12 month period beginning on the first day of fiscal year $t+1$, denoted SAR_{t+1}. For each specification, the charity hypothesis implies that $\alpha_1 = 0$, while the investment and the signaling hypotheses both imply $\alpha_1 > 0$. We include variables to control for mean reversion of the dependent variable in each specification. For example, Eq. (1a) includes lagged ROA (ROA_{t-1}) and the change in current ROA ($ROA_t–ROA_{t-1}$).[14] In supplementary analysis, we also separate CSR expenditures into social and environmental components. We control for the scope of a firm's CSR disclosures using three variables – (1) whether they contain an official standalone corporate accountability report, (2) whether the report follows the GRI sustainability reporting framework, and (3) whether the report is subject to a voluntary audit. Each variable is described in more detail in Appendix A.

The first two specifications use accounting-based measures of performance. We use ROA as it is the most commonly used measure of accounting performance, and CFO as operating cash flows are more persistent and more difficult to manipulate than reported earnings (Sloan, 1996). Finally, we use SAR because, in a semi-strong-form efficient market, returns provide a more complete picture of firm performance. In particular, the stock market takes into account all publicly available information and all possible channels through which CSR expenditures can impact firm value, even if that impact is only through the creation of an intangible asset. This approach allows us to capture long term improvements from beneficial CSR expenditures, which may impact stock returns without impacting the subsequent year's ROA or CFO.

To distinguish whether CSR is an investment or a signal, we first split CSR expenditures into two components: (1) the component that can be explained by economic-based factors, and (2) the component that is unrelated to economic-based factors. We refer to the first component as the "optimal CSR" and the latter as the "deviation". Specifically, we determine the optimal CSR and deviation for each firm by estimating:

$$CSR = \beta_0 + \beta_1 \, Firm \, Factors + \beta_2 \, Industry \, Factors + \varepsilon_2 \tag{2}$$

We use the fitted value of CSR expenditures from Eq. (2) as a proxy for the optimal level of CSR expenditures, and the residual from Eq. (2) as a proxy for the deviation. Under the investment (signaling) hypothesis, the optimal CSR (deviation) should be positively correlated with future firm performance.

To ensure that our firm and industry factors explain as much of the variation in CSR expenditures as possible, we conduct a comprehensive search for factors identified by the extant literature as relevant in the study of CSR expenditures. Specifically, we include advertising and R&D expenses as firms with higher expenditures in these areas invest more heavily

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[13] The GRI framework is a comprehensive structure that enables greater transparency on environmental and social performance. Details are available at: https://www.globalreporting.org/information/about-gri/what-is-GRI/Pages/default.aspx.

[14] Without controls for lagged measures of performance, there would be a positive mechanical association between future changes in accounting performance and CSR_t to the extent that the returns to CSR_t do not materialize until future periods. For example, a charitable contribution in period t will reduce current period income and, hence, reduce ROA_t. To the extent that there is a negative correlation between ROA_t and CSR_t, there will be a positive correlation between ΔROA_{t+1} (i.e., $ROA_{t+1}–ROA_t$) and CSR_t (under the assumption that the CSR expenditure does not persist in period $t+1$). The inclusion of ROA_{t-1} and ΔROA_t as control variables means that any of the mechanical aspects of the positive relation between ΔROA_{t+1} and CSR_t are not captured by the coefficient on CSR_t, our variable of interest.

Table 1
Sample composition.

Panel A: Breakdown by year

Year	Firms	Percent (%)
2002	408	6.9
2003	414	7.0
2004	567	9.6
2005	640	10.8
2006	636	10.7
2007	649	11.0
2008	804	13.6
2009	913	15.4
2010	897	15.1
Total	5928	100.0

Panel B: Breakdown by industry

1-digit SIC	Description	Firm-Years	Percent (%)
0	Agriculture, forestry, and fisheries	11	0.2
1	Mineral and construction	365	6.2
2	Manufacturing	1066	18.0
3	Manufacturing	1317	22.2
4	Transportation, communications, and utilities	752	12.7
5	Whole trade and retail trade	577	9.7
6	Finance, insurance and real estate	1130	19.1
7	Service industries	524	8.8
8	Service industries	156	2.6
9	Public administration	30	0.5
Total		5928	100.0

Table 2
Descriptive statistics of the variables used in the regression analyses. All variables are defined in Appendix A.

	N	Mean	Std. Dev.	P1	P25	Median	P75	P99
Dependent variables								
ROA	5833	4.9%	6.7%	−19.0%	1.5%	4.6%	8.6%	20.8%
ΔROA_{t+1}	5568	0.1%	4.0%	−13.6%	−1.1%	0.1%	1.5%	13.2%
CFO	4619	9.2%	8.4%	−17.3%	5.2%	9.0%	13.6%	31.1%
ΔCFO_{t+1}	4413	0.0%	8.1%	−22.9%	−3.7%	0.0%	3.5%	24.4%
SAR	5805	5.1%	33.7%	−55.3%	−15.8%	0.8%	20.3%	127.2%
CSR variables								
CSR	5928	0.417	0.273	0.087	0.180	0.328	0.641	0.957
ENV_COMP	5928	0.393	0.302	0.095	0.152	0.215	0.685	0.964
SOC_COMP	5928	0.441	0.285	0.059	0.183	0.380	0.693	0.970
CSRREPORT (Indicator)	5928	0.186	0.389					
CSRAUDIT (Indicator)	5928	0.035	0.184					
CSRGRI (Indicator)	5928	0.054	0.226					
Other variables								
ATO	5833	0.796	0.634	0.054	0.343	0.661	1.058	3.049
PM	5850	0.070	0.147	−0.567	0.034	0.075	0.131	0.353
CASH	5729	0.087	0.089	0.001	0.021	0.055	0.125	0.378
LEVERAGE	5880	0.244	0.173	0.000	0.112	0.228	0.354	0.703
MTB	4967	1.633	1.104	0.254	0.933	1.300	1.956	5.779
SIZE	5840	8.999	1.297	6.497	8.035	8.872	9.854	12.397
R&D	5899	0.033	0.072	0.000	0.000	0.000	0.025	0.325
ADVERTISING	5868	0.010	0.021	0.000	0.000	0.000	0.011	0.106
LITIGATION	5789	0.000	0.002	0.000	0.000	0.000	0.000	0.009
CORPGOV	5928	0.734	0.168	0.138	0.659	0.771	0.851	0.962
MGMT_GUIDANCE (Indicator)	5928	0.433	0.495					
GUIDANCE_DIRECTION	5928	0.017	0.419	−1.000	−1.000	0.000	0.000	1.000
DDPS	5856	0.052	0.293	−0.982	0.000	0.000	0.099	1.000

in CSR-related activities (Shane and Spicer, 1983; Wieser, 2005; McWilliams and Siegel, 2000). We include litigation expenses as CSR expenditures can act as reputation insurance (Peloza, 2006). We include the natural log of total assets to proxy for firm size as larger firms may have greater resources for CSR expenditures and, therefore, may attract greater

pressure to engage in CSR-related activities (Wu, 2006; Teoh et al., 1999). We include a measure of the firm's overall corporate governance score because of the suggestion that corporate governance is associated with the scope and effectiveness of CSR expenditures (Johnson and Greening, 1999). We include book leverage and market-to-book as stable firms with lower risk generally appear more likely to make CSR expenditures (Cochran and Wood, 1984; Orlitzky and Benjamin, 2001). We include the level of cash, cash flow from operations, and return on assets to proxy for firm performance, which some suggest enables or gives rise to the external demand for CSR expenditures (Preston and O'Bannon, 1997; Campbell, 2007). Lastly, we include industry fixed effects due to the variation in environmental impact, growth prospects, disclosure requirements, and regulatory oversight in different industries, all of which are expected to affect the level of CSR expenditures (Karpoff et al., 2005; Griffin and Mahon, 1997; Spencer and Taylor, 1987).

We take the fitted and residual values from Eq. (2) and test the association between future firm performance and these two components of CSR expenditures using the following specifications:

$$\Delta ROA_{t+1} = \gamma_{0a} + \gamma_{1a}\widehat{CSR} + \gamma_{2a}\widehat{\varepsilon_2} + \gamma_{3a}\Delta ROA_t + \gamma_{4a}ROA_{t-1} + Controls + \epsilon_{3a} \tag{3a}$$

$$\Delta CFO_{t+1} = \gamma_{0b} + \gamma_{1b}\widehat{CSR} + \gamma_{2b}\widehat{\varepsilon_2} + \gamma_{3b}\Delta CFO_t + \gamma_{4b}CFO_{t-1} + Controls + \epsilon_{3b} \tag{3b}$$

$$SAR_{t+1} = \gamma_{0c} + \gamma_{1c}\widehat{CSR} + \gamma_{2c}\widehat{\varepsilon_2} + Controls + \epsilon_{3c} \tag{3c}$$

In addition to the lagged performance and CSR disclosure measures used in Eq. (1), we include in these regressions a set of variables that control for other ways in which investors could infer management's private information about the future prospects of the firm. More specifically, we include the change in the dividend payment per share, an indicator for whether the firm provided EPS guidance, and a variable for whether guidance was positive or negative relative to the analyst consensus forecast. We use changes in dividends because dividends represent a common form of signaling in the accounting and finance literatures. We include management forecasts because, even though they are not costly in the same way as CSR expenditures or dividends, investors could also use management forecasts to make inferences about firms' future prospects.

The investment hypothesis implies that future firm performance is positively correlated with optimal CSR and that there is no association between the deviation and future firm performance. As a result, the investment hypothesis implies that $\gamma_1 > 0$ and $\gamma_2 = 0$. In contrast, under the signaling hypothesis there should be no association between optimal CSR and future firm performance. However, there should be a positive association between the deviation and future firm performance. Therefore, the signaling hypothesis implies that $\gamma_1 = 0$ and $\gamma_2 > 0$.

Our approach of identifying associations using the fitted and residual values of a first stage regression is commonly used in the compensation literature (Bebchuk and Grinstein, 2005), where executive compensation is divided into the portion that is explained by firm-specific economic determinants and the portion that is unexplained by such determinants. In this way, the researcher can tie the variable of interest (e.g., accounting fraud) to the unexplained or excess portion of compensation. For example, Core et al. (1999) estimate the deviation from optimal compensation as the residual from a regression of total compensation on a set of economic characteristics, including sales, ROA, and stock returns; they then test whether the deviation is associated with weaker governance structures and poor future operational performance.

The empirical approach used in our paper differs from traditional causal inference studies in that we do not directly rely on a source of exogenous variation in the endogenous variable of interest. In the context of our study, such a research design would test the investment hypothesis by identifying an exogenous source of variation in CSR expenditures and then testing whether increases in CSR expenditures driven by that exogenous shock are positively related to future firm performance. Similarly, a research design to test the signaling hypothesis would identify an exogenous source of variation in managers' expectations of future firm performance and then test whether changes in managers' expectations driven by the exogenous shock are positively related to current CSR expenditures. We do not use this approach largely because it is not feasible to identify exogenous variation in CSR expenditures or managers' expectations of future profitability in our setting. Rather, we rely on the assumption that the residuals from the first stage model are exogenous with respect to the variable of interest in the second stage model.

In other words, our approach relies on the assumption that the first stage model in Eq. (2) is *complete*. If there is an omitted variable in Eq. (2) that predicts the optimal level of CSR expenditure, then omitting that variable will result in the residual containing the information from that variable that is orthogonal to the other explanatory variables in Eq. (2). While in theory this is a valid concern, we believe that we have mitigated this concern to the extent possible for two reasons. First, our exhaustive review of the literature makes it unlikely that we have missed a critical explanatory variable. In addition, the range and scope of the explanatory variables we have included in Eq. (2) make it unlikely that another variable would substantially impact our fitted and residual values. Second, our results are unaffected by variations in our model specification and by including information on past CSR expenditures. This will become evident when we discuss our results in the next section.

5. Results

We present our results in five subsections. First, we summarize the results of our main specification and discuss some cross-sectional analyses. Next, we present two alternative specifications: one that conducts our analysis using

Table 3

Subsequent firm performance and total CSR expenditures.

Results from an OLS estimation in which the dependent variables are proxies for subsequent firm performance and the independent variables are the various CSR expenditure, corporate accountability reporting and control variables. All variables are defined in Appendix A. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, using two-tailed tests and standard errors clustered at the firm-level.

	(1) ΔROA_{t+1}	(2) ΔCFO_{t+1}	(3) SAR_{t+1}	(4) ΔROA_{t+1}	(5) ΔCFO_{t+1}	(6) SAR_{t+1}
CSR expenditures						
CSR	0.004* (1.90)	0.009** (2.51)	0.008 (0.50)			
ENV_COMP				−0.001 (−0.46)	−0.004 (−0.85)	0.004 (0.19)
SOC_COMP				0.005** (2.01)	0.015*** (2.85)	0.017 (0.77)
CORPGOV				−0.000 (−0.06)	−0.005 (−0.66)	−0.019 (−0.60)
Corporate accountability reporting						
CSRREPORT				−0.000 (−0.04)	−0.002 (−0.76)	−0.003 (−0.21)
CSRAUDIT				0.006** (2.08)	0.009* (1.75)	−0.005 (−0.25)
CSRGRI				−0.003 (−1.26)	0.002 (0.37)	−0.016 (−0.84)
Control variables						
ROA_{t-1}	−0.234*** (−15.11)			−0.234*** (−15.14)		
ΔROA_t	−0.351*** (−16.99)			−0.351*** (−17.01)		
CFO_{t-1}		−0.475*** (−21.20)			−0.478*** (−21.22)	
ΔCFO_t		−0.646*** (−36.20)			−0.648*** (−36.02)	
Industry- and year-fixed effects	Included	Included	Included	Included	Included	Included
R^2	18.1%	30.9%	2.8%	18.2%	31.0%	2.8%
N	5379	4229	5683	5379	4229	5683

a single- rather than two-stage model and a second that uses a recursive approach for the first stage model. We conclude with some additional analyses and robustness tests.

5.1. Main specification

We report the regression results for Eq.(1) in Table 3. The coefficient on CSR expenditure, α_1, is positive and significant in both the ΔROA (column 1) and ΔCFO (column 2) regressions. A positive value for α_1 indicates that there is a positive association between current CSR expenditures and future firm performance. This is contrary to the charity hypothesis (i.e., $\alpha_1 = 0$), but is consistent with both the investment and signaling hypotheses, which imply that $\alpha_1 > 0$. As expected, the coefficients on our control variables for lagged and current performance are negative and highly significant due to the documented mean reversion in both ROA and CFO. The regression results for Eq. (1c) are reported in column 3. Unlike the results in columns 1 and 2, the coefficient on CSR expenditure for the SAR regression is not significant, although the coefficient is positive. Overall, we conclude that a positive association exists between CSR expenditure and future firm accounting performance; hence, CSR expenditures are not well characterized by the charity hypothesis.

We include several different CSR-related variables in the specifications in Table 3 columns 4–6 to identify whether there is a specific type of CSR activity that is driving the results in columns 1–3. The environmental component (ENV_COMP) and the social component (SOC_COMP) are the two principal components of CSR, our primary measure of CSR expenditures. We also include the corporate governance score ($CORPGOV$) as it is sometimes included as part of broader measures of CSR expenditures. We include three measures of the scope of a firm's CSR disclosures – (1) whether there is an official standalone corporate accountability report ($CSRREPORT$), (2) whether the report follows the GRI sustainability reporting framework ($CSRGRI$), and (3) whether the report is subject to a voluntary audit ($CSRAUDIT$). Including these measures has virtually no effect on the other regression coefficients. Of the variables of interest, only the SOC_COMP and $CSRAUDIT$ variables have coefficients that are positive and statistically significant in the ΔROA (column 4) and ΔCFO (column 5) regressions. No variables are significant in the SAR (column 6) specification.

While the results in Table 3 rule out the charity hypothesis, they do not allow us to distinguish between the investment and signaling hypotheses. Our first step in identifying whether CSR expenditures fit the signaling or investment hypothesis

Table 4
Economic and institutional determinants of firm's CSR expenditures.

Results from the first-stage estimation in which the dependent variable is the level of firm's CSR expenditures and the independent variables are various economic and institutional characteristics of the firm. All variables are defined in Appendix A. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, using two-tailed tests and standard errors clustered at the firm-level.

	(1) CSR	(2) CSR	(3) CSR	(4) CSR	(5) CSR
ATO	0.056***	0.046***	0.073***	0.053***	0.049***
	(4.68)	(3.18)	(5.13)	(5.28)	(4.83)
PM	0.013	0.190***	0.040	0.033	0.033
	(0.26)	(2.89)	(0.71)	(0.62)	(0.63)
CASH	0.030	−0.229***	0.029	0.045	0.142**
	(0.46)	(−2.80)	(0.37)	(0.66)	(2.10)
CFO	0.117*	0.074	0.163**	0.091	0.096
	(1.92)	(1.01)	(2.41)	(1.42)	(1.50)
LEVERAGE	−0.050	−0.038	−0.057	−0.033	−0.022
	(−1.25)	(−0.80)	(−1.27)	(−0.79)	(−0.52)
MTB	0.021***	−0.015**	0.018**	0.019***	0.011*
	(3.49)	(−2.16)	(2.51)	(3.09)	(1.82)
SIZE	0.124***		0.146***	0.122***	0.118***
	(22.70)		(24.37)	(21.72)	(21.47)
R&D	0.190**	0.179	0.295***	0.432***	0.381***
	(2.02)	(1.45)	(2.88)	(4.63)	(4.12)
ADVERTISING	0.368	1.069***	0.326	0.471*	0.450*
	(1.47)	(3.39)	(1.06)	(1.79)	(1.72)
LITIGATION	−0.542	4.124	−0.463	−0.701	−0.200
	(−0.23)	(1.58)	(−0.18)	(−0.27)	(−0.07)
CORPGOV	0.586***	0.778***		0.629***	0.652***
	(17.30)	(19.05)		(18.39)	(19.44)
Constant	−1.264***	−0.253**	−1.069***	−1.266***	−1.183***
	(−21.27)	(−2.30)	(−12.64)	(−23.10)	(−22.80)
Industry- and year-fixed effects	Included	Included	Included	Year	None
R^2	52.6%	33.6%	42.2%	48.5%	46.9%
N	3900	3900	3900	3900	3900

is to estimate an investment-based model that separates CSR expenditures into the portions that can and cannot be explained by firm and industry economic factors. We report the results from this analysis using Eq. (2) in Table 4. Rather than including contemporaneous *ROA*, we split *ROA* into its constituent components: Asset Turnover (*ATO*) and Profit Margin (*PM*). Not only does this improve the fit of our model, but it also allows us to investigate what portion of firm performance is associated with higher levels of CSR expenditures, as profit margin and asset turnover measure different aspects of profitability and have different levels of persistence (Nissim and Penman, 2001). Consistent with our expectations, we find that the positive association between *ROA* and CSR expenditure is driven by asset turnover, the more persistent component of *ROA*, rather than profit margin.

The coefficients on the remaining independent variables are also consistent with our expectations. The results in Table 4 indicate that higher levels of CSR expenditures are associated with higher levels of cash (the coefficients on *CASH* and *CFO* are positive, and the coefficient on *CFO* is also statistically significant); lower levels of book leverage (the coefficient is negative, although not statistically significant); higher market-to-book ratios (the coefficient is positive and statistically significant); larger firm sizes (the coefficient is positive and statistically significant); higher R&D and advertising expenses (the coefficients on R&D and advertising are positive, and the coefficient on R&D is also statistically significant); better corporate governance (the coefficient is positive and statistically significant).

Our models in Table 4 have relatively high explanatory power. For example, our main specification in column (1) has an adjusted R-squared of 53%. As noted earlier, the fitted and residual values for CSR expenditures that we derive in Table 4 are critically important in our remaining tests. Therefore, we conduct a series of robustness tests on our model to ensure that our later results are not impacted by a research design choice. Specifically, we generate fitted and residual values for CSR expenditures by dropping each of the independent variables one at a time from our model and by excluding fixed effects from our model.

The most significant change in our model occurs when we drop either the size variable or the corporate governance score. As such, we provide results omitting those variables in columns 2 and 3 of Table 4, correspondingly. Dropping size (corporate governance) has a significant impact on the adjusted R-squared, which drops about 19 (11) percentage points from 53% to 34% (42%). However, the remaining explanatory variables are largely unaffected. The coefficients generally retain the same sign and significance level across specifications, although there are exceptions. For example, in column 2 the coefficient on *MTB* becomes negative and statistically significant. The specifications in columns 4 and 5 exclude industry fixed effects and industry and year fixed effects, respectively. Once again, the fit of the model is weakened, but the coefficients on each explanatory variable are generally consistent with those in column 1. For each of the specifications in

Table 5
Subsequent firm performance on optimal and deviation from CSR expenditures.

Results from the second-stage regression in which the dependent variables are proxies for subsequent firm performance and the independent variables are the optimal and deviation components of CSR expenditures and control variables. OPTIMAL_CSR and DEVIATION are the fitted values and residual values from the determinants model presented in column (1) of Table 4. All other variables are defined in Appendix A. Standard errors are clustered at the firm-level and are calculated by bootstrapping the two-step process to correct for first-stage estimation error. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, using two-tailed tests.

	(1) ΔROA_{t+1}	(2) ΔCFO_{t+1}	(3) SAR_{t+1}
CSR expenditures			
OPTIMAL_CSR	0.004	0.012	−0.060
	(0.81)	(1.49)	(−1.60)
DEVIATION	0.006*	0.010*	0.111***
	(1.81)	(1.65)	(3.24)
Corporate accountability reporting			
CSRREPORT	−0.001	−0.005	−0.005
	(−0.43)	(−1.26)	(−0.35)
CSRAUDIT	0.007**	0.010*	0.013
	(2.01)	(1.74)	(0.67)
CSRGRI	−0.003	0.001	−0.013
	(−1.00)	(0.20)	(−0.72)
Control variables			
MGMT_GUIDANCE$_t$	−0.000	−0.000	−0.012
	(−0.31)	(−0.09)	(−1.22)
GUIDANCE_DIRECTION$_t$	0.002	−0.001	0.004
	(1.33)	(−0.31)	(0.32)
DDPS$_t$	0.005**	0.016***	−0.060***
	(2.05)	(3.70)	(−2.55)
ROA$_{t-1}$	−0.260***		
	(−15.82)		
ΔROA_t	−0.364***		
	(−15.32)		
CFO$_{t-1}$		−0.496***	
		(−19.94)	
ΔCFO_t		−0.650***	
		(−30.34)	
Industry- and year-fixed effects	Included	Included	Included
R^2	19.4%	31.0%	3.1%
N	3595	3560	3689

Table 4, we generate fitted and residual values for CSR expenditures to use in the next stage of our analysis. Each specification produces equivalent results. Therefore, for brevity, we only tabulate later results using the fitted and residual values for CSR expenditures based on our main specification in column 1.

We take the fitted and residual values produced by the specification in column 1 of Table 4 and use them as independent variables in Eqs. (3a)–(3c). The fitted value is the optimal CSR expenditure, and the residual is the deviation from the optimal CSR expenditure. The results are presented in Table 5. In columns 1 and 2, we find that the deviation is positively associated with future changes in performance measured using either ΔROA or ΔCFO ($\gamma_2 > 0$). In addition, we find that the optimal CSR is uncorrelated with ΔROA and ΔCFO ($\gamma_1 = 0$). These results are inconsistent with the investment hypothesis, which requires that the coefficient on optimal CSR be positive ($\gamma_1 > 0$). However, both the ΔROA and ΔCFO results are consistent with the signaling hypothesis, which implies that $\gamma_2 > 0$.

Column 3 reports the results of Eq. (3c), which uses *SAR* as the measure of firm performance. This measure has two principal advantages relative to both ΔROA and ΔCFO. First, market-based measures do not have finite horizons. Therefore, they can capture improvements associated with CSR expenditures that may occur in future years, while accounting measures only capture improvements that flow through the financials in a given fiscal year. Second, lagged values for firm performance need not be included in the model as market-based measures, unlike accounting-based measures, do not exhibit mean reversion.

The coefficient on deviation from optimal CSR expenditures in column 3 of Table 5 is positive and highly significant ($\gamma_2 > 0$). This result is consistent with the signaling hypothesis (the investment hypothesis implies that $\gamma_2 = 0$). Unlike the results in columns 1 and 2, the coefficient on optimal CSR is negative and marginally statistically significant ($\gamma_1 < 0$). This is contrary to our expectation, as it implies that the market reacts negatively to optimal CSR. However, this negative coefficient does not necessarily imply that the *SAR* specification results are inconsistent with either the ΔROA or ΔCFO specifications. In particular, it could be the case that CSR expenditures generate positive returns, but those returns are less than the cost of capital. This type of CSR expenditure would increase accounting-based measures of performance but could result in lower

stock returns. We test the robustness of this result by including future period *ROA* as a control in both Eqs. (1c) and (3c). This specification allows us to separate the returns that are due to improvements in the current period from returns that are attributable to improvements that will materialize in later periods. Our conclusions are unchanged.

The coefficient on the change in dividends per share, *DDPS*, is positive and significant in the ΔROA and ΔCFO specifications. In untabulated analysis, we find that the magnitude and statistical significance of the coefficients on *DDPS* are unchanged if we exclude the CSR expenditure variables. This result suggests that the positive association between CSR expenditures (changes in dividends) and future firm performance is not subsumed by the information in changes in dividends (CSR expenditures). Therefore, the signaling role of CSR expenditures is a complement to the signaling role of dividends. We cannot make similar inferences for the signaling role of management forecasts, as the coefficients on the management forecast variables are insignificant in each specification.[15]

In summary, consistent with other studies, we find a positive association between CSR expenditures and future firm performance. However, when we separate CSR expenditures into optimal and deviation components, we find results that are generally inconsistent with the vast majority of the literature that examines the relation between financial performance and CSR expenditures (Margolis et al., 2007). We find that the optimal level of CSR expenditure is unrelated to changes in *ROA*, positively correlated with changes in *CFO*, and negatively correlated with size-adjusted returns. Taken together, these results provide only mixed support for the investment hypothesis. In contrast, we document a consistent positive association between the deviation from optimal CSR expenditures and both accounting and market-based performance measures. This evidence suggests that the association between CSR expenditures and future firm performance is primarily derived from the signaling value of CSR expenditures.

5.2. Cross-sectional analysis

The results in Table 5 suggest that CSR expenditures may have different attributes for different firms. In other words, it is possible that there is a subset of firms for whom the coefficient on the optimal CSR is positive (i.e., that the investment hypothesis holds) and a subset for whom the coefficient on deviation is insignificant (i.e., the signaling hypothesis does not hold). We test for this possibility by identifying and separately testing those firms in our sample that are most likely to have investment-based CSR expenditures and those that are most likely to have signaling-based CSR expenditures. More specifically, we split our sample as shown in Fig. 1.

Our intuition is as follows. Firms with high levels of CSR expenditures and whose expenditures can be explained by investment-based factors (i.e., HL firms) are more likely to undertake CSR expenditures that are consistent with the investment hypothesis. In contrast, firms with high levels of CSR expenditures and whose expenditures cannot be explained by investment-based factors (i.e., LH firms) are more likely to undertake CSR expenditures that are consistent with the signaling hypothesis.

The results for the investment and signaling subsamples are shown in Panels A and B of Table 6, respectively. The specification used in Table 6 is the same as that used in Table 5, namely the use of Eqs. (3a)–(3c). The results for the accounting performance measures in the investment subsample support the investment hypothesis. The coefficient on the optimal CSR expenditure is positive and highly significant. In contrast, the results for the stock returns measure in the signaling subsample supports the signaling hypothesis. The coefficient on the deviation variable for the signaling subset in column 3 is positive and significant. Taken together, these results suggest that both hypotheses are supported by the data. Therefore, while we find the strongest support in the full sample for the signaling hypothesis, we cannot conclude that the investment hypothesis does not hold for a subset of the firms in our sample.

5.3. Single-stage specification

We test whether our results are sensitive to the use of a two-stage approach by re-estimating the results from Tables 4 and 5 using a single-stage model. This approach allows each determinant of CSR expenditures to have a direct and unconstrained relation with firm performance. Prior literature shows that this is important for some of the variables in our first-stage model. For example, McWilliams and Siegel (2000) found that the relation between measures of CSR expenditures and firm performance may be sensitive to the inclusion of control variables for both R&D and advertising. By using a two-stage approach, our main results only allow R&D and advertising to have an indirect relation with firm performance through predicted (or "optimal") CSR expenditures.[16] The disadvantage of a single-stage approach is that it only provides inferences on the signaling hypothesis, as the optimal level of CSR expenditures is subsumed by the control

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[15] In untabulated analysis, we also examine whether the signaling role of CSR expenditures is a complement or a substitute to another costly signal, stock repurchases. We follow Skinner (2008) and measure stock repurchases using either (a) increases in Common Treasury Stock if the firm uses the treasury method, or (b) the difference between Stock Purchases and Stock Issuance from the cash flow statement if the firm uses the retirement method. Including stock repurchases in Table 5 does not change the statistical significance of any of the coefficients on optimal CSR or deviation. In addition, our results indicate that the signaling role of CSR expenditures is also a complement to stock repurchases. However, because the stock repurchase variable is only significant in the ΔCFO specification, the empirical support for this conclusion is not as strong as it is with dividends.

[16] R&D and advertising are also components of ROA, which is included as a control in certain specifications. However, the coefficients are implicitly constrained to be identical to the other components of ROA.

Optimal CSR Expenditure

		High	Low
Deviation from Optimal CSR Expenditure	**High**		(LH) Signaling Firms
	Low	(HL) Investment Firms	

Fig. 1. Identification of signaling and investment firm subsamples.

Table 6
CSR expenditures and subsequent firm performance using single-stage model.

Results from an OLS estimation in which the dependent variables are proxies for subsequent firm performance and the independent variables are the level of CSR expenditures and various economic and institutional characteristics of the firm. The determinants of CSR expenditures are taken from the first stage model in Table 4: ATO, PM, CASH, CFO, LEVERAGE, MTB, SIZE, R&D, ADVERTISING, LITIGATION and CORPGOV. All variables are defined in Appendix A. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, using two-tailed tests and standard errors clustered at the firm-level.

	(1) ΔROA_{t+1}	(2) ΔCFO_{t+1}	(3) SAR_{t+1}
CSR	0.006*	0.010	0.114***
	(1.66)	(1.63)	(3.48)
Corporate accountability reporting:			
CSRREPORT	0.001	−0.003	−0.009
	(0.26)	(−0.87)	(−0.52)
CSRAUDIT	0.003	0.008	0.015
	(1.00)	(1.58)	(0.64)
CSRGRI	−0.003	0.000	−0.012
	(−0.95)	(0.02)	(−0.59)
Control variables:			
MGMT_GUIDANCE$_t$	0.001	−0.002	−0.010
	(0.61)	(−0.87)	(−0.90)
GUIDANCE_DIRECTION$_t$	0.001	−0.001	0.005
	(0.90)	(−0.58)	(0.41)
DDPS$_t$	0.006***	0.012***	−0.048**
	(2.83)	(3.21)	(−2.22)
ROA$_{t-1}$	−0.416***		
	(−11.35)		
ΔROA_t	−0.463***		
	(−12.27)		
ΔCFO_t		−0.103***	
		(−4.99)	
Determinants of CSR expenditures (from Table 4)	Included	Included	Included
Industry- and year-fixed effects	Included	Included	Included
R^2	26.3%	35.8%	4.2%
N	3595	3570	3710

variables. The results, provided in Table 7, are consistent with the signaling hypothesis. The coefficients on CSR expenditures are generally positive and significant, indicating that there is a positive association between future financial performance and CSR expenditures that is not explained by economic factors. In addition, the coefficients and level of significance are approximately the same on the CSR variable in Table 6 and the deviation in Table 5, indicating that our use of a two-stage approach is not driving our results.

5.4. Alternative model specification

We provide additional assurance that our results are not due to an incomplete first-stage model by estimating an alternative first-stage model that includes all public information – past values of each of the variables in Table 4 as well as information on past CSR expenditures. We estimate this recursive model by including lagged values of the deviations estimated in Table 4 as additional explanatory variables in Eq. (2). We follow this approach because information about CSR expenditures that is not reflected in the explanatory variables in Table 4 will be reflected in the lagged values of the

Table 7
Prevalence of signaling versus investment explanations for CSR expenditures.

   Results from an OLS estimation in which the dependent variables are proxies for subsequent firm performance and the independent variables are the optimal and deviation components of CSR expenditures and control variables. OPTIMAL_CSR and DEVIATION are the fitted values and residual values from the determinants model presented in column (1) of Table 4. In this table, Column (1) includes the full sample. Column (2) only includes investment firms, which are those firms with both OPTIMAL_CSR above the median and DEVIATION below the median of all firms in our sample. Column (3) only includes signaling firms, which are those firms with both OPTIMAL_CSR below the median and DEVIATION above the median of all the firms in our sample. The control variables (not shown for brevity) are the same variables used in Table 5. All variables are defined in Appendix A. Standard errors are clustered at the firm-level and are calculated by bootstrapping the two-step process to correct for first-stage estimation error. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, using two-tailed tests.

Panel A: Investment subsample

	(1) ΔROA_{t+1}	(2) ΔCFO_{t+1}	(3) SAR_{t+1}
OPTIMAL_CSR	0.025**	0.069***	−0.115
	(1.99)	(3.38)	(−1.41)
DEVIATION	−0.005	0.022	0.161
	(−0.30)	(0.69)	(1.13)
Control variables	Included	Included	Included
Industry- and year-fixed effects	Included	Included	Included
R^2	22.0%	30.5%	4.0%
N	782	779	794
Panel B: Signaling subsample			
OPTIMAL_CSR	−0.013	−0.015	0.137
	(−0.89)	(−0.65)	(1.09)
DEVIATION	0.004	0.013	0.196**
	(0.61)	(0.94)	(2.47)
Control variables	Included	Included	Included
Industry- and year-fixed effects	Included	Included	Included
R^2	24.5%	38.8%	5.8%
N	752	731	785

deviation. The model is as follows:

$$CSR_t = \beta_0 + \beta_1 \, Firm \, Factors_t + \beta_2 \, Industry \, Factors_t + \sum_{t=1}^{n} \varepsilon_{2,t-1} + \varepsilon_4 \qquad (4)$$

We refer to the fitted value from this model as the expected CSR and the residual ε_4 as the unexpected CSR. Untabulated results show that the coefficient on the lagged deviation variable in this model is highly significant and is equal to 0.74, indicating that approximately 74% of the lagged residual persists in current year CSR expenditures.

   The explanatory power of the recursive first-stage model is substantially higher than our main specification in Table 4, with an R-squared of 76% versus 53% in column 1 of Table 4. The advantage of the recursive approach is that it allows us to incorporate the relatively sticky nature of CSR expenditures as well as unobservable firm characteristics in our estimation model. In addition, this specification relies more on time-series rather than cross-sectional variation in CSR expenditures. The disadvantage of such an approach is that the expected CSR is no longer constrained by economic factors. As a result, the residual will only contain innovations that are not expected given a firm's past expenditures. In other words, if a firm made non-economic CSR expenditures in prior years, then similar expenditures would be expected in the current year despite the fact that those expenditures are not justified from an economic perspective. As a result, the expected and unexpected components of CSR expenditures are biased toward (against) a finding consistent with the investment (signaling) hypothesis.

   We re-estimate Table 5 using the expected and unexpected CSR expenditures determined using Eq. (4). The results, provided in Table 8, are mixed. For the size-adjusted returns specification in column 3, we find no association with the expected CSR expenditure and a positive coefficient on the unexpected CSR expenditure, exactly in line with our predictions for the signaling hypothesis. For the accounting-based measures of performance, the results are consistent with the investment hypothesis. In column 1, the coefficient on the expected CSR expenditure is positive but insignificant. In column 2, the coefficient on the expected CSR expenditure is positive and significant. The coefficient on the unexpected CSR expenditure is insignificant in both columns 1 and 2. Overall, these results suggest that expected CSR expenditures generate positive accounting performance, but not positive stock returns. This result could be driven by the market anticipating the firm's performance or could be because the accounting returns do not exceed the firm's cost of capital. More importantly, unexpected CSR expenditures do not generate positive accounting performance, but are associated with positive stock return. Overall, this

Table 8
Subsequent firm performance on expected and unexpected CSR expenditures.

Results from an OLS estimation in which the dependent variables are proxies for subsequent firm performance and the independent variables are the components of CSR expenditures and control variables. EXPECTED_CSR and UNEXPECTED_CSR are the fitted and residual values from a recursive estimation model that uses lagged values for all variables, including lagged CSR expenditures. All other variables are defined in Appendix A. Standard errors are clustered at the firm-level and are calculated by bootstrapping the two-step process to correct for first-stage estimation error. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively, using two-tailed tests.

	(1) ΔROA_{t+1}	(2) ΔCFO_{t+1}	(3) SAR_{t+1}
CSR expenditures			
EXPECTED_CSR	0.006	0.016**	0.027
	(1.44)	(2.47)	(1.01)
UNEXPECTED_CSR	0.004	0.004	0.155***
	(0.76)	(0.29)	(2.94)
Corporate accountability reporting			
CSRREPORT	−0.001	−0.006	−0.025
	(−0.33)	(−1.20)	(−1.35)
CSRAUDIT	0.005	0.012**	−0.005
	(1.39)	(2.33)	(−0.22)
CSRGRI	−0.002	−0.002	−0.016
	(−0.75)	(−0.38)	(−0.67)
Control variables			
MGMT_GUIDANCE$_t$	−0.001	−0.000	−0.012
	(−0.51)	(−0.05)	(−0.97)
GUIDANCE_DIRECTION$_t$	0.002	−0.000	0.002
	(1.18)	(−0.13)	(0.13)
DDPS$_t$	0.005*	0.014***	−0.023
	(1.84)	(3.40)	(−0.92)
ROA$_{t-1}$	−0.254***		
	(−13.97)		
ΔROA_t	−0.372***		
	(−12.91)		
CFO$_{t-1}$		−0.482***	
		(−15.16)	
ΔCFO_t		−0.669***	
		(−26.32)	
Industry- and year-fixed effects	Included	Included	Included
R^2	20.0%	31.4%	2.9%
N	2564	2576	2571

is consistent with the signaling hypothesis because it implies that excess CSR expenditures improve stock price performance, even though they do not seem to improve accounting performance.

5.5. Robustness tests

We conduct several robustness tests. First, we consider the effect of the return window on our results. Specifically, the market reaction to the announcement of CSR expenditures can occur at a different rate depending on the nature of the expenditure. In particular, CSR expenditures that are investments may not be impounded in prices until the cash flows from the investments are realized or at least anticipated by the market. However, under the signaling hypothesis, all of the information is contained in the signal itself, suggesting that the market reaction should manifest during a relatively short window surrounding the period in which the market observes the signal.

Return window tests in our setting are complicated by the fact that CSR expenditures generally occur throughout the year. Therefore, unlike other signals such as dividends, a single announcement date for all the firm-years in our sample does not exist. However, for a small subset of the firms in our sample that produce a standalone CSR report, we have the specific month in which the report is made publicly available. Therefore, for the 305 firm-years for which the data is available, we can test whether the announcement of CSR initiatives coincides with short-term returns (consistent with signaling) or long-term returns (consistent with investment). In untabulated results, we do not find support for either hypothesis. The coefficient on returns for the three months following the release of a corporate accountability report is not significant.

Second, we use three other measures of accounting performance – Return on Equity (*ROE*), Profit Margin (*PM*), and Asset Turnover (*ATO*), and three other measures of stock returns – raw returns, returns calculated using the Fama-French Three Factor Model (1993), and returns calculated using the Carhart Four-Factor Model (1997). We use *ROE* as it is the second most commonly used accounting performance measure after *ROA* in the extant literature that examines the relation between CSR

expenditures and financial performance (Margolis et al., 2007). We use *PM* and *ATO* as they are the constituent components of *ROA*. Furthermore, some papers that examine the relation between CSR expenditures and financial performance use *PM*. We use alternative measures of risk-adjusted returns to confirm that our results are not driven by a correlated omitted risk factor. These tests do not provide any additional insights. The coefficient on the deviation from CSR expenditures in Eq. (3) using ROE as the measure of firm performance is positive and significant. In addition, similar to (3b), the coefficient on the optimal value of CSR expenditure is positive and significant. Overall, these results are consistent with the signaling hypothesis, although the positive coefficient on the fitted value suggests that the conclusion is not as clear as it is with our other specifications. We find no significant results using *PM* or *ATO* as the measure of firm performance, nor do any of our conclusions change when we use alternative measures of stock returns.

Third, we ensure that the positive coefficient on deviation from optimal CSR expenditures in Table 5 is not attributable to negative values of deviation. We do this because an alternative interpretation of the investment hypothesis might suggest that positive (negative) values of the deviation could be associated with negative (negative) future performance. In other words, when firms over- or under-invest, performance declines. Since the signaling hypothesis predicts that positive (negative) values of the deviation are associated with positive (negative) future performance, it is only for positive values of deviation that the investment and signaling hypotheses have different predictions. In untabulated analysis, we re-estimate Table 5 by replacing deviation with its negative and positive components. We find that the coefficient on each component is positive and significant. This provides additional evidence in favor of (against) the signaling (investment) hypothesis.

Lastly, we split our sample based on the level of deviation from CSR expenditures to test whether firms with higher deviations also have changes in financial performance that are disproportionately greater. We re-estimate Eqs. (3a)–(3c) after including interaction terms for firms in the highest versus the lowest deciles (and, separately, the highest versus the lowest quartiles) of the residual. We are unable to reject the hypothesis that the coefficients in these models are any different than those in the base groups in Eqs. (3a)–(3c). In other words, we do not find any support for the hypothesis that firms with the largest residuals experience greater rates of increase in firm performance. Rather, the change in firm financial performance for a given level of deviation from the optimal CSR expenditure is the same for these firms as it is for firms with lower levels of deviation.

6. Summary and conclusion

The extensive literature on CSR expenditures has focused on whether those expenditures increase shareholder value. We add to this literature by showing that the positive association between CSR expenditures and financial performance is more likely due to the signaling value of CSR expenditures rather than positive returns on those investments. This novel explanation suggests that prior research provides an incomplete assessment on the association between CSR expenditures and financial performance. Our finding that CSR performance is correlated with financial performance is also relevant to the ongoing debate on potential disclosure regulation for the content and creditability of corporate accountability reporting.

Acknowledgment

Appendix A. Variable description and data sources

Variable	Description	Data source
Panel A: CSR expenditure variables		
CSR	ASSET4 2-Factor CSR score; includes social and environment components	ASSET4
ENV_COMP	Environmental score	ASSET4
SOC_COMP	Social score	ASSET4
OPTIMAL_CSR	Optimal total CSR expenditure; defined as the predicted value from a regression of total CSR expenditures on various economic determinants described in Panel C (below) and industry- and year-fixed-effects	Constructed
DEVIATION	Deviation from the optimal total CSR expenditure; defined as the difference between CSR and OPTIMAL_CSR	Constructed
EXPECTED_CSR	Expected total CSR expenditure; defined as the predicted value from a recursive regression of total CSR expenditures on lagged values for various economic determinants described in Panel C (below), industry- and year-fixed-effects, and lagged total CSR expenditures.	Constructed

UNEXPECTED_CSR	Unexpected total CSR expenditure; defined as the difference between CSR and EXPECTED _CSR	Constructed
Panel B: Corporate accountability reporting variables		
CSRAUDIT	Binary variable taking the value of 1 if the firm produces an audited standalone CSR report and 0 otherwise	ASSET4
CSRGRI	Binary variable taking the value of 1 if the firm's CSR report follows GRI guidelines and 0 otherwise	Corporate Register.com
CSRREPORT	Binary variable taking the value of 1 if the firm produces a standalone CSR report and 0 otherwise	ASSET4
Panel C: Firm-level economic determinants of CSR expenditures		
ADVERTISING	Advertising expense scaled by net sales for fiscal year t	Compustat
ATO	Net sales divided by total assets, measured at the end of fiscal year t	Compustat
CASH	Cash scaled by total assets, measured at the end of fiscal year t	Compustat
CFO	Cash flow from operations (calculated using the indirect method) divided by total assets, measured at the end of fiscal year t	Compustat
CORPGOV	Corporate governance score	ASSET4
LEVERAGE	Sum of long-term debt and debt in current liabilities divided by total assets, measured at the end of fiscal year t	Compustat
LITIGATION	Litigation expense scaled by net sales for fiscal year t	ASSET4 & Compustat
MTB	Sum of market value of equity, long-term debt, debt in current liabilities, liquidation value of preferred stock, and deferred taxes and investment credit divided by total assets, measured at the end of fiscal year t	Compustat
PM	Income before extraordinary items divided by net sales for fiscal year t	Compustat
R&D	Research and development expense scaled by net sales for fiscal year t	Compustat
SIZE	Natural logarithm of total assets, measured at the end of fiscal year t	Compustat
Panel D: Other variables		
DDPS	Percent change in dividend per share for fiscal year t	Compustat
GUIDANCE_DIRECTION	-1, 0 or 1 for management guidance below, at, or above the analyst consensus, respectively	I/B/E/S
MGMT_ GUIDANCE	Binary variable taking the value of 1 if management met their own EPS guidance and 0 otherwise	I/B/E/S
ROA	Income before extraordinary items divided by total assets, measured at the end of fiscal year t	Compustat
SAR	Raw return minus the return of the corresponding size-decile index, measured over fiscal year t	CRSP

Appendix B. Description of ASSET4 categories (from ASSET4 documents)

Environmental component

- **Resource reduction**: The resource reduction category measures a company's management commitment and effectiveness toward achieving an efficient use of natural resources in the production process. It reflects a company's capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management.
- **Emission reduction**: The emission reduction category measures a company's management commitment and effectiveness toward reducing environmental emission in the production and operational processes. It reflects a company's capacity to reduce air emissions (greenhouse gases, F-gases, ozone-depleting substances, NOx and SOx, etc.), waste, hazardous waste, water discharges, spills or its impacts on biodiversity and to partner with environmental organizations to reduce the environmental impact of the company in the local or broader community.
- **Product innovation**: The product innovation category measures a company's management commitment and effectiveness toward supporting the research and development of eco-efficient products or services. It reflects a company's capacity to reduce the environmental costs and burdens for its customers, and thereby creating new market opportunities through new environmental technologies and processes or eco-designed, dematerialized products with extended durability.

Social component

- **Employment quality**: The workforce/employment quality category measures a company's management commitment and effectiveness toward providing high-quality employment benefits and job conditions. It reflects a company's capacity to increase its workforce loyalty and productivity by distributing rewarding and fair employment benefits, and by focusing on long-term employment growth and stability by promoting from within, avoiding lay-offs and maintaining relations with trade unions.
- **Health and safety**: The workforce/health & safety category measures a company's management commitment and effectiveness toward providing a healthy and safe workplace. It reflects a company's capacity to increase its workforce loyalty and productivity by integrating into its day-to-day operations a concern for the physical and mental health, well-being and stress level of all employees.
- **Training and development**: The workforce/training and development category measures a company's management commitment and effectiveness toward providing training and development (education) for its workforce. It reflects a

company's capacity to increase its intellectual capital, workforce loyalty and productivity by developing the workforce's skills, competences, employability and careers in an entrepreneurial environment.

- **Diversity and opportunity**: The workforce/diversity and opportunity category measures a company's management commitment and effectiveness toward maintaining diversity and equal opportunities in its workforce. It reflects a company's capacity to increase its workforce loyalty and productivity by promoting an effective life–work balance, a family friendly environment and equal opportunities regardless of gender, age, ethnicity, religion or sexual orientation.
- **Human rights**: The society/human rights category measures a company's management commitment and effectiveness toward respecting the fundamental human rights conventions. It reflects a company's capacity to maintain its license to operate by guaranteeing the freedom of association and excluding child, forced or compulsory labor.
- **Community**: The society/community category measures a company's management commitment and effectiveness toward maintaining the company's reputation within the general community (local, national and global). It reflects a company's capacity to maintain its license to operate by being a good citizen (donations of cash, goods or staff time, etc.), protecting public health (avoidance of industrial accidents, etc.) and respecting business ethics (avoiding bribery and corruption, etc.).
- **Customer/product responsibility**: The customer/product responsibility category measures a company's management commitment and effectiveness toward creating value-added products and services upholding the customer's security. It reflects a company's capacity to maintain its license to operate by producing quality goods and services integrating the customer's health and safety, and preserving its integrity and privacy also through accurate product information and labeling.

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