

# **The missing link between CSR awards and financial performance: And the winner is...**

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## **Abstract**

The aim of this paper is to investigate whether corporate responsibility (CR hereafter) awards enhance financial performance, after controlling for investor attention. Using a balanced panel of 879 firms from 25 countries over the 2005-2014 period, linear OLS regression first suggested that there is no relationship between CR awards and market value. We go beyond this result and implement a panel-threshold regression (PTR) analysis to study whether there is an optimal investor attention level which may result in threshold effect and asymmetrical responses of the financial performance to CR awards. Interestingly, empirical results show that returns on CR awards are either not significant or negative below the threshold and then become significantly positive above it. Our results remain robust under several different proxies, estimation methods and sample compositions. Overall, this study indicates that CR awards indirectly enhance financial performance through improved firm visibility, but only from a point at which investor attention is optimal.

**Keywords:** *Corporate responsibility awards, Financial performance, Firm visibility, Investor attention, Panel threshold regression.*

**JEL Classification:** C58, G14, G15, G32.

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## **1. Introduction**

Despite the well-documented shareholder wealth effects, there is little consensus about the underlying dynamics associated with additional benefits of corporate social responsibility (CSR hereafter). For example, it remains unanswered whether stock market reactions to favorable social performance are solely attributable to the positive information content or to additional effects.

The first motivation of this research is to investigate the relative effectiveness of investor attention as a channel through which corporate responsibility (CR hereafter) awards may affect corporate financial performance (CFP hereafter). This intuition is derived from studies that analyze investors' delayed and biased reactions to information (Grossman & Stiglitz, 1980). An assumption often made by these studies is that, if investors have limited resources and ability to collect, interpret, and finally trade on value-relevant information, we would expect asset prices to incorporate information only gradually, and as investor attention intensifies.

We therefore echo the intuition of Madsen and Rodgers (2015) suggesting that firms will benefit from effective stakeholder management when stakeholders are paying attention to firm activities. As firms engage in community-centric responses, they attract positive attention from stakeholders that can, in turn, benefit the firm. CR awards are defined as prizes awarded to the company for its social, ethical, community, or environmental activities or performance. Our aim is to test threshold and interaction effects in the relationship between CR awards, Tobin's Q (Jiao, 2010, Servaes & Tamayo, 2013), and investor attention.

From an instrumental standpoint, CSR commitment is a form of investment, entailing initial costs for future financial benefits (Branco & Rodrigues, 2006). The environmental dimension has been one of the greatest interests in terms of the market's attitude toward CSR (Bird, Hall, Momentè, & Reggiani, 2007, Flammer, 2013, Krüger, 2015). For example, Klassen and McLaughlin (1996) suggest that improved financial performance is a result of environmental performance as proxied by environmental awards. Similarly, Kassinis and Vafeas (2006) and Welford, Chan, and Man (2008) find the environment to be one of the most important concerns for stakeholders in a company's CSR efforts. Recently, a growing stream of literature focuses on the social dimension of CSR policies. Edmans (2011, 2012) provides evidence that there are benefits to being in the top level of employee satisfaction. He constructs a value-weighted portfolio of the "100 Best Companies to Work For in America" and shows that this portfolio significantly outperforms industry benchmarks.

Regarding research design, some scholars have used cross-sectional data to study the relationship between socially responsible activities and financial performance, but have recognized the limitations of using such procedure to establish causal effects, especially in an international context (McWilliams & Siegel, 2000, Rodriguez, Siegel, Hillman, & Eden, 2006). Recent studies rather suggest that the relationship between CSP and CFP may not be linear depending on other underlying factors and mechanisms. For example, Wang, Choi, and Li (2008) show that benefits of corporate philanthropy will increase more slowly with each additional rise in philanthropic contributions.. More recently, relying on the regression discontinuity design, Flammer (2015) find evidence that CSR has decreasing marginal returns. Similarly, using the path analysis, Harjoto, Jo, and Kim (2015) show that higher CSR commitment reduces firm risk at a decreasing rate indirectly through its effect on institutional ownership.

These studies strongly suggest a non-linear relationship between CSR commitment and financial benefits. The empirical approaches are various but one common premise of these studies suggest that CSR improves financial performance, which is consistent with the view that CSR is a valuable resource for firms (Aragon-Correa & Sharma, 2003, Branco & Rodrigues, 2006, Hart, 1995, Russo & Fouts, 1997). That being said, the “stock” of CSR resources that is already in place may influence the benefits having a CR award which in turn enhances financial performance. In the present paper, we propose the use of threshold regression techniques to examine whether any relationship between CSR and financial performance may depend upon a third conditioning threshold variable. We moved away from evidencing a non-linear CSP-CFP relationship (Barnett & Salomon, 2012) and attempted to respond to a call for the use of new empirical settings in CSR research who noted the premise of using alternative methodologies (Flammer, 2015, Rupp, Ganapathi, Aguilera, & Williams, 2006, Rupp, Shao, Thornton, & Skarlicki, 2013).

The general approach of comparing outcomes just above and below a threshold is known as “Panel threshold regression” (PTR) in the economic literature. In our setting, the discontinuity arises because, around a particular threshold in investor attention, high values lead to a discrete change (i.e., a discontinuity) in the impact of CSR awards on corporate value. This paper explores if there exists an optimal level of investor attention, which may result in threshold effect and asymmetrical responses of the firm value to CR awards. It also could be assumed that CR awards only affects financial performance once a “critical value” of investor attention is reached, in which case the relationship is positive.

Relying on a sample of 8,790 firm-year observations from 25 countries and from a range of industries from 2005 to 2014, we assume that such sample would be helpful in demonstrating CSR outcomes in a worldwide context. This is important to account for different regulatory frameworks since CSR has not yet been adequately addressed and literature yields confounding results. Elsewhere, we use the setting of Hansen (1999) to support the non-linear relationship between CR awards and financial performance. As previously mentioned, investor attention is defined as the threshold variable, and is used to split the sample into two groups, which we may call regimes. Indeed, the presence of thresholds is found to be determined by two regimes of investor attention. In particular, the threshold approach allows for the conclusion that the effect of CR awards on financial performance is stronger for firms with relatively higher levels of investor attention.

Empirical results argue that firms can “*do well by doing good*”, in line with a number of empirical studies documenting a positive relationship between CSR activities and financial performance (Barnett & Salomon, 2006, Barnett & Salomon, 2012, Choi & Varian, 2009, Eccles, Ioannou, & Serafeim, 2014, Flammer, 2015, Kacperczyk, 2009, Margolis, Elfenbein, & Walsh, 2009, Margolis & Walsh, 2003, Minor & Morgan, 2011, Orlitzky, Schmidt, & Rynes, 2003, Waddock & Graves, 1997). In particular, we add to this literature by highlighting the role of investor attention in shaping the positive impact of CR awards on financial performance. Therefore, this study echo the view of CSR as a valuable resource, in line with the resource-based view of the firm (Hart, 1995, Russo & Fouts, 1997), the instrumental stakeholder theory (Jones, 1995) and the shared value argument (Porter and Kramer 2006, 2011). Additionally, this reasoning bears on stakeholder-theory research suggesting that firms’ ability to buttress stakeholder’s support through CSR depends on stakeholder perceptions of the social benefits of such behavior (Godfrey et al. 2009). Since we emphasize that the relationship between CR awards and financial performance is not linear, we argue that CSR pays off only after a certain threshold of investor attention. Before this point is reached, additional CSP is either decreasing financial performance or is not significant. Finally, our findings would partially constitute a counter-point to a long-standing contention that corporate pro-social behavior reduces both corporate and societal welfare (Friedman, 1970).

This paper contributes to previous literature in distinctive aspects. First, we deviate from the classical debate on the CSP-CFP relationship and move towards elucidating the mechanisms through which CR awards can influence financial performance (Flammer, 2013, Servaes & Tamayo, 2013). We also contribute to an emerging literature which has made strides in

applying empirical techniques to better control for factors potentially endogenous to social responsibility when examining the valuation effects of CSR (Flammer, 2015, Flammer, 2015, Flammer & Luo, 2014, Wang, Choi, & Li, 2008, Wang, Qiu, & Kong, 2011). In contrast with the traditional linear model, the non-linear threshold model can describe the “trade-off” between the reputational benefits of CR awards and the disadvantages of costs from additional CSR expenditure that may damage the corporate value. Second, to the best of our knowledge, this paper provides the first evidence that positive returns to CR awards start from an optimal level of investor attention. However, it is also worth noting that under the threshold CR awards are negatively related to corporate value, in line with the agency cost theory (Aupperle, Carroll, & Hatfield, 1985, Boyle, Higgins, & Rhee, 1997, Jensen & Meckling, 1976, Marsat & Williams, 2013) as well as in support to the limited investor attention evidence (Da, Gurun, & Warachka, 2014, Tetlock, 2011). Third, instead of operationalizing social responsibility as an aggregated construct, we isolate the effects of distinct types of CSR (Chen & Delmas, 2011, Mattingly & Berman, 2006, Rowley & Berman, 2000) such as environmental awards and social labels. This paper’s evidence is mixed and reveals that corporate value is positively connected to social labels above an optimal level of investor attention, while environmental awards are not relevant for financial performance in both attention regimes. Finally, we maintain that there are positive financial payoffs to CSP that are associated with the acquisition of critical resources controlled by shareholders such as their attention. These benefits are, however, subject to gradual level off because obviously, CSR benefits cannot increase indefinitely but most importantly, investor attention is a scarce and valuable resource (Kahneman, 1973). Given that firms with higher levels of investor attention benefit from CR awards, as opposed to low-attention firms, CSR commitment may influence corporate value at certain levels of investor attention. Regardless of today’s information dissemination technology, news fail to grab everyone’s attention at the same time. Instead, it diffuses gradually across networks of investors. An important reason for such gradual diffusion is limited investor attention. To the best of our knowledge, the potential existence of an attention threshold effect in financial literature has not yet been empirically studied. So far, only one paper focuses on the impact of investor attention on the valuation of CSP. Madsen and Rodgers (2015) show, among other pieces of evidence, that CSR benefits increase as the attention devoted to social activities among stakeholders is higher.

The remainder of the paper is organized as follows. Section 2 discusses prior literature and develops relevant hypothesis. Section 3 briefly presents the sample selection and the regression variables used in the study, whereas section 4 explains the econometric

methodology and reports empirical results. Section 5 tests the validity of results which are discussed in Section 6. Section 7 sets forth concluding remarks.

## **2. Literature review and hypotheses development**

Although stakeholders' theory (Freeman 1984) provides enough good reasons why CSR adds value, empirical evidence is rather divergent in this regard (Margolis et al. 2009) Before we propose the main hypotheses, some discussion of prior literature needs to be addressed first. We began by highlighting the previous literature on the CSP-CFP relationship and discuss the channels through which such link may be plausible. Then, we specifically focus on the relevance of investor attention as a key mediator of the CSP-CFP relationship.

### ***2.1. CSP does not matter***

The first impression drawn from the CSR literature is that there are mixed results regarding the CSP-CFP relationship. Earlier literature found a neutral relationship (Abbott & Monsen, 1979, Aupperle, Carroll, & Hatfield, 1985, McWilliams & Siegel, 2000). For example, Cohen, Fenn, and Naimon (1995) and Fogler and Nutt (1975) do not find any significant relation between environmental policies and financial performance. Similarly, Seifert, Morris, and Bartkus (2004) investigate the relationship between corporate philanthropy and profitability while controlling for ownership concentration, differentiation, and industry and find no significant evidence. More recently, Cheung (2011) investigated the stock market reaction to announcements of index additions (deletions) to (from) the Dow Jones Sustainability World Index (DJSWI) from 2002 to 2008. Empirical results do not find any significant impact on the stock returns of U.S. firms that are included or excluded from the DJSWI. Thus, the first hypothesis is as follows:

***Hypothesis 1.*** Corporate responsibility awards are not linked to financial performance.

### ***2.2. CSP as a cost***

Another strand of literature argues that there is a cost involved by CSR practices which may be reflected in firm financial performance. For example, Friedman (1970) and Jaffe, Peterson, Portney, and Stavins (1995) posit that CSR presumes higher direct and indirect costs, which would further burden a firm's financial performance and competitiveness. Gray and Shadbegian (1993) also show that stringent environmental practices can have a negative effect on a firm's productivity. Similarly, Lioui and Sharma (2012) find a negative direct

relationship between a firm's market value and environmental KLD scores and suggest that investors perceive environmental strengths as an additional cost or penalties. In a related vein, Oberndorfer, Schmidt, Wagner, and Ziegler (2013) show that inclusion of German corporations in Dow Jones STOXX sustainability index as well as the Dow Jones sustainability world index leads to negative stock returns. This leads to the following hypothesis:

***Hypothesis 2.*** Corporate responsibility awards are negatively and directly linked to financial performance.

### ***2.3. CSP as a valuable resource***

One of the oldest and important questions in CSR literature is whether “*doing good*” pays off. As previously discussed, earlier literature has first supported a negative relationship between social responsibility and financial performance (Aupperle, Carroll, & Hatfield, 1985, Friedman, 1970) However, subsequent research emphasizes the potential value of CSR. Sustainability practices can, for example, improve financial performance as a result of market gains and cost savings in the firm's operations (Klassen & McLaughlin, 1996). Accordingly, because of confounding results, investigating the relationship between CSR and CFP becomes an active area of research.

Changes in CSP lead to subsequent changes in value, and firms are seen to be acting in the best interests of shareholders when improving the level of engagement with CSR (Gregory & Whittaker, 2013, Kim, Park, & Wier, 2012). In the spirit of Freeman's (1984) stakeholder theory, CSR can be defined as the set of practices that firms adopt towards the interests of everyone who can substantially affect, or be affected by the welfare of the company (Agle, Donaldson, Freeman, Jensen, Mitchell, & Wood, 2008). In particular, the instrumental view of stakeholder theory argues that CSR efforts are initiatives taken to benefit stakeholders with the ultimate goal of benefiting shareholders (Jones, 1995). Furthermore, the conflict-resolution view of CSR argues that firms with high CSP allow managers to gain greater stakeholder commitment and loyalty, leading to a more efficient use of financial resources (Harjoto & Jo, 2011, Jiraporn & Chintrakarn, 2013, Jo & Harjoto, 2012, Jo & Harjoto, 2011) and thus to increase shareholders' wealth. Indeed, high levels of CSP may mitigate the tension between managers and stakeholders, and decrease opportunistic behaviors in firms (Jones, 1995). For example, investors could consider that managers of socially responsible firms use financial resources more efficiently because they can more easily focus on maximizing firm

value. Furthermore, for high CSR firms, decision-making is facilitated because CSR policies reduce the likelihood of lawsuits, media campaigns, or boycotts. However, Barnett (2007) suggests that effective stakeholder relationships are not built instantaneously, arguing that only those firms with a real commitment to CSR activity are likely to realize the long term benefits of such investment.

Elsewhere, even though the agency-view theory (Jensen & Meckling, 1976) argues that entrenched managers in a firm with strong corporate governance may use CSR activities to get higher managerial discretion and extract private benefits, the corporate governance role of CSR was also found to be effective in reducing the agency problems associated with many decisions namely, the cash holdings decision (Arouri & Pijourlet, 2015). This justifies studies such as Verwijmeren and Derwall (2010), Bae, Kang, and Wang (2011) and Girerd-Potin, Jimenez-Garcès, and Louvet (2011), which suggest that firms should pay particular attention to relationships with their stakeholders in their financial decisions in order to exploit the financial benefits related to the implementation of CSR policies.

Among others, a seminal meta-analysis of Margolis et al. (2009) report that 167 studies have focused on the CSR-CFP link between 1972 and 2007. Typically, this literature often regresses measures of CFP (e.g., Tobin's Q, operating performance, etc.) on proxies of CSR (e.g., the CSP scores) and the majority of these studies conclude that the correlation between CSR and CFP is positive but small. Beyond traditional measures of financial performance, Dhaliwal, Li, Tsang, and Yang (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. Most prior studies in the CSR literature deal exclusively with environmental performance and its financial consequences (Al-Tuwaijri, Christensen, & Hughes II, 2004, Barth & McNichols, 1994, Capelle-Blancard & Laguna, 2010, Clarkson, Li, & Richardson, 2004, Flammer, 2013, Moneva & Cuellar, 2009). Corporate environmental performance could be defined as the firm ability, relative to its peers, in reducing its impact on the environment (Klassen & McLaughlin, 1996). Based on a sample of 140 events between 1987 and 1991, Klassen and McLaughlin (1996) find a positive market reaction to the announcements of environmental awards. Specifically, the authors find significantly positive (negative) associations between CAR and strong (weak) environmental management, indicating that better environmental performance improves future stock market performance (CAR). The authors find abnormal returns of 0.82% around the announcement of environmental awards. Similarly, Flammer (2013) finds abnormal returns of 0.84% around the announcement of eco-friendly news. Eccles, Ioannou, and Serafeim (2014) also show a positive link between a



firm's financial and sustainability performance and Derwall, Guenster, Bauer, and Koedijk (2005) suggest that portfolios of companies with strong environmental responsibility generate risk-adjusted excess returns. Elsewhere, Edmans (2011) finds risk-adjusted excess returns for portfolios with high CSR levels, but as measured by high employee satisfaction. In a very close setting, Edmans (2012) shows that firms listed in the "100 Best Companies to Work For in America" experience 2.3% to 3.8% higher abnormal returns per year from 1984 to 2011.

Another important area of corporate social performance that draws significant stakeholder attention is corporate philanthropy. Philanthropy is a part of CSR initiatives that differs in kind and degree from the mandatory conformance with economic, legal, or ethical dimensions of CSR (Carroll, 1979). This discretionary manifestation of CSR has progressively gained greater legitimacy (Margolis & Walsh, 2003, Sharfman, 1994) and investors are more willing to invest in firms that are known for their corporate philanthropy (Barnett & Salomon, 2006, Graves & Waddock, 1994, Johnson & Greening, 1999).

Finally, it may be worth noting that short run cash flows are somehow adversely affected while the impact on the long run future cash flows is positive. For instance, Russo and Fouts (1997) draw attention to the short run financial risk of investing in pollution prevention technology when the company expects long run rewards. Barnett and Salomon (2012) support this assumption by providing similar evidence. However, although there may be a short term negative impact on profitability, investors will reward firms with serious commitment to a CSR agenda and value those firms accordingly. This reward represents higher valuations despite negative short term profits. This leads to our first hypothesis:

***Hypothesis 3.*** Corporate responsibility awards are positively and directly associated with financial performance (signaling hypothesis).

#### ***2.4. How CSP pays off: The channels***

As can be noticed, although most studies conclude to a positive correlation, the CSP-CFP relationship appears complex and results are inconclusive. It may be that this is due to the omission of intervening (mediators and moderators) variables in prior literature.

CSR commitment has a number of non-financial outcomes which in turn enhance financial performance. For example, it may help firms improve the effectiveness of the marketing policies (Fombrun, 2005), attract and retain high quality employees (Greening & Turban, 2000), gain greater employee satisfaction (Albinger & Freeman, 2000, Greening & Turban, 2000, Peterson, 2004, Pfeffer, 1994, Turban & Greening, 1997, Vogel, 2005), increase

demand for products and services (Navarro, 1988), provide superior access to valuable resources (Cochran & Wood, 1984) and foster the use of more efficient technologies or processes (e.g., environment-friendly technologies). A common premise of these studies is that CSR allows firms to have stronger social capital because they tend to have better relationships with stakeholders, providing insurance like protection that can mitigate harm from negative events (Flammer, 2013) and negative regulatory or legislative action (Hillman & Keim, 2001).

In light of the resource-based view (RBV) of the firm, companies may engage in CSR in order to increase their efficiency through improved reputation and greater legitimacy and trust (Barney, 1991, Hart, 1995, Pelozo, 2006, Porter, 1991, Porter & Kramer, 2011, Porter & Kramer, 2006, Russo & Fouts, 1997, Varadarajan & Menon, 1988). Such actions may thus attract new “green” customers, increase the companies’ financial performance, and enhance their competitive advantage (Porter & Kramer, 2011, Porter & Kramer, 2006). Evidence has also revealed that improved reputation and competitive advantage induce higher levels of customer satisfaction (Anderson & Sullivan, 1993, Matzler & Hinterhuber, 1998, Walsh, Dinnie, & Wiedmann, 2006), a finding confirmed by Galbreath and Shum (2012) who agree that reputation is an outcome of customer satisfaction. Furthermore, Dowling (2004) argues that reputational capital associated with favorable CSR policies can help insulate and protect firms in tough economic times.

In line with economic intuition, recent developments in microeconomic theory suggest a non-linear relationship between CSP and CFP (García-Gallego & Georgantzís, 2009, Manasakis, Mitrokostas, & Petrakis, 2013, Manasakis, Mitrokostas, & Petrakis, 2014), which has thinly been tested. Recently, Flammer (2015) argues that CSR has decreasing marginal returns; i.e., the CSR–CFP relationship is concave. In other words, as companies keep increasing their social performance, the returns from an additional CSR initiative may decrease. They further examine the channels through which CSR increases shareholder value and find that shareholders CSR proposals improve job satisfaction and help companies cater to customers that are responsive to sustainable practices.

Considering reputational benefits as well agency costs simultaneously, Wang, Choi, and Li (2008) propose an inverted U-shaped relationship between corporate philanthropy and financial performance. Similarly, Barnett (2007) suggests that only firms with high levels of investment in CSR make net benefits, with a lower degree of commitment failing to generate benefits greater than costs, resulting in a U-shaped relationship between CSP and financial performance. Fisman, Heal, and Nair (2008) also suggest that there is a non-linear

relationship between CSR and financial performance through product differentiation and advertising. Building on this evidence, we propose the following hypothesis.

***Hypothesis 4.*** Corporate responsibility awards are positively and indirectly related to financial performance.

### ***2.5. Investor attention as a mediator***

As mentioned above, it could be that the returns to socially responsible behavior are captured through the reputation of the firm (Fombrun, Gardberg, & Barnett, 2000). Underlying the positive returns of CR awards is the idea that the firm's various stakeholders will further reward it for behaving responsibly, so that a firm that receives a CR award may enjoy stronger and lasting relationships with these stakeholders inducing lower costs and higher quality inputs (Barnett, 2007, Freeman, 1984, Godfrey, 2005, Hart, 1995, Jones, 1995, Porter & Kramer, 2006, Porter & Van der Linde, 1995, Wang & Bansal, 2012). Empirical work has provided consistent evidence with this, given the benefits of a strong relationship between the firm and its stakeholders such as consumers (Casadesus-Masanell, Crooke, Reinhardt, & Vasishth, 2009, Fosfuri, Giarratana, & Roca, 2015), employees (Turban & Greening, 1997), suppliers (Hillman & Keim, 2001), investors (Cheng, Ioannou, & Serafeim, 2014, Mackey, Mackey, & Barney, 2007), analysts (Ioannou & Serafeim, 2015, Luo, Wang, Raithel, & Zheng, 2015), activists and communities (Baron, 2001, Baron & Diermeier, 2007, Henisz, Dorobantu, & Nartey, 2014), and regulators (Koh, Qian, & Wang, 2014), with these benefits being stronger, the greater the attention to and salience of social activities among stakeholders (Aouadi & Marsat, 2016, Flammer, 2013, Lev, Petrovits, & Radhakrishnan, 2010, Madsen & Rodgers, 2015, Servaes & Tamayo, 2013).

A substantive implication of this evidence is that firms should not only consider CSR as an element of corporate strategy policies but investigate the channel through which CSR efforts are willing to be more visible. Most importantly, firms will benefit from effective stakeholder management only when stakeholders are paying attention to firm activities (Madsen & Rodgers, 2015). This finding dates back to Copeland and Galai (1983) which reveal that investors intensify their engagement and liquidity increases as more information about the firm is publically available. Barber and Odean (2008) also show that investors are more likely to buy a stock that previously caught their attention. They develop a model of decision making and suppose that agents face many different investment alternatives and demonstrate that investors consider primarily those alternatives that first caught their attention. Similarly, a

vivid example is given in Huberman and Regev (2001), who conducted a case study on the price discovery of Entremed, a biotech company. The authors document that stock returns more than tripled in May 1998 as a consequence of seemingly breaking news made public on a front-page article in the New York Times. Anecdotally, this article was based on stale news and the substance of the story had already been released months earlier - in a less attention-grabbing manner in the less widely read scientific magazine "*Nature*". Therefore, attention-based stock demand through increased media presence could push stock prices, affect buying behavior and generate additional trading volume. Another argument which can be cited to relate CSR policies with investor attention is the impact of CSR on brand preference and brand loyalty (Holt, Quelch, & Taylor, 2004, Rust & Oliver, 2000). Du, Bhattacharya, and Sen (2007) report that favorable CSR policies lead to stronger brand recognition, brand loyalty, and brand advocacy. Therefore, we argue that CSR commitment translates into increased loyalty from customers and even other stakeholders towards a firm.

Although shareholders' perceptions of a firm's corporate philanthropy are not directly observable, evidence (Flammer, 2013, Godfrey, Merrill, & Hansen, 2009, Madsen & Rodgers, 2015, Muller & Kräussl, 2011) reveals that financial markets incorporate the impact of socially responsible activities on a broad set of stakeholders' attitudes and behavior and, thus, on the future cash flows and value of the firm (see Mackey et al. 2007 for a further discussion). As firms receive CR awards, they attract positive attention from stakeholders that can benefit the firm (Aouadi & Marsat, 2016, Madsen & Rodgers, 2015, Muller & Kräussl, 2011).

Considering an indirect relation between CR awards and market value, a non-linear association through investor attention is quite plausible. However, while investor attention is expected to be a necessary condition for perceptions of CR awards to arise, it is not likely to be sufficient. Although theories related to the threshold effect of shareholder attention on the CSP-CFP relationship are inexistent, limited investor attention has been widely documented in the context of financial information (Da, Gurn, & Warachka, 2014, Tetlock, 2011), earnings announcements (DellaVigna & Pollet, 2009, Engelberg, 2008, Hirshleifer, Lim, & Teoh, 2009), economic shocks (Cohen & Frazzini, 2008), and investment choices (Barber & Odean, 2008, Solomon, Soltes, & Sosyura, 2014). Furthermore, Sims (2006) emphasizes that attention constraints may be nonlinear. A number of papers have applied the Sims' (2006) view of rational inattention to a variety of different decision problems, not only to price setting problems (Luo, 2008, Maćkowiak & Wiederholt, 2015).

Because investors are limited in their ability to attend to the various actions of organizations (Kahneman, 1973, Madsen & Rodgers, 2015), we should thus expect that returns on CR awards would be greater for firms whose actions do not only attract greater investor attention or that operate under greater stakeholder scrutiny, but above the required threshold. In the following section, we build on these ideas by presenting the following hypotheses:

***Hypothesis 5.*** Corporate responsibility awards are indirectly related to financial performance through investor attention.

***Hypothesis 5a.*** Corporate responsibility awards are negatively or insignificantly related to financial performance when investor attention is under the threshold.

***Hypothesis 5b.*** Corporate responsibility awards are positively related to financial performance when investor attention is above the threshold.

### **3. Regression variables and sample**

#### ***3.1. Corporate social performance***

We collect information on corporate responsibility awards (CR awards) as well as CSP scores from the Thomson Reuters-ASSET4. The database provides comprehensive environmental, social, and governance (ESG hereafter) data on over 3,400 firms worldwide as of 2002. Asset4 data are updated biweekly and collected from publicly available sources (e.g., annual reports, NGO websites, and media outlets) which are relevant for the purpose of this paper since publicity is a prerequisite of human attention.

In this study, the main measure of CSP is CR awards. As defined by Asset4, CR awards is a dummy variable which takes one if the company received an award for its social, ethical, community, or environmental activities or performance and 0 otherwise. When investigating the value effect of CR awards, we control for the CSP score<sup>2</sup>. However, we retain only social and environmental factor<sup>3</sup> since CR awards relate specifically to social and environmental

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<sup>2</sup> Asset4 provides the “Equal Weighted Rating”, which captures a balanced view of the firm’s performance in four areas, environmental, social, governance and economic. In this paper, we do not use the “Equal Weighted Rating” as denoted “14IR” by Asset4 but rather purge the economic and governance dimensions from this score. The remaining factors are described in detail in Appendix B, as presented by the ASSET4 documentation.

<sup>3</sup> In untabulated robustness tests, we include governance score and find similar results. Findings are available upon requests from the authors.

commitment (El Ghoul, Guedhami, & Kim, 2016, Lys, Naughton, & Wang, 2015). Further details of the ESG sub-factors are provided in Appendix B.

### **3.2. Corporate value**

We follow Campbell (1996) and Harjoto and Jo (2015) and measure firm value based on the Fama–French 48 industry-adjusted Tobin’s Q (*Adj\_Q*, hereafter). Tobin’s Q was first introduced by Brainard and Tobin (1968) and constitutes a forward-looking measure of firm performance, widely used as a proxy of corporate value in empirical finance and economics (Servaes & Tamayo, 2013). It is the ratio between the market and replacement value of the same physical asset. A value below one indicates poor use of resources while, a value greater than one indicates that the forward-looking market value is higher than the current value of total assets. *Adj\_Q* is actually the firm’s Tobin’s Q minus the industry-median Tobin’s Q. Firms are first classified into different industries using Fama–French 48 industry classification and then we subtract the median of firms’ Tobin’s Q for each industry.

Using this proxy is appealing because stakeholders’ rewards may occur in response to favorable social performance without immediately materializing for some types of financial performance proxies. For example, even though CSP accrue reputational insurance (Gardberg & Fombrun, 2006, Godfrey, 2005), leniency from regulators (Godfrey, Merrill, & Hansen, 2009), or decreased public activism (Hiatt, Sine, & Tolbert, 2009, King & Whetten, 2008, Lounsbury, Ventresca, & Hirsch, 2003), costs may exceed benefits in the short run. Yet the expected value of CFP over the long term may still be positive (Madsen & Rodgers, 2015). As Godfrey, Merrill, and Hansen (2009) assert, “*CSR activities can provide an insurance mechanism to preserve—rather than to generate—CFP*”. Expected benefits are thus more visible in market measures of firm performance such as stock price than in short-term accounting measures of firm performance (Orlitzky & Benjamin, 2001).

### **3.3. Investor attention**

In contrast to laboratory experiments in psychological research, attention in stock markets can hardly be proxied directly. When testing theories of attention, empiricists face a substantial challenge since investor attention is difficult to measure. Many indirect proxies were employed such as extreme returns (Barber & Odean, 2008), trading volume (Barber & Odean, 2008, Gervais, Kaniel, & Mingelgrin, 2001, Hou, Xiong, & Peng, 2009), news and headlines (Barber & Odean, 2008, Yuan, 2008), advertising expense (Chemmanur & Yan, 2010, Grullon, Kanatas, & Weston, 2004, Lou, 2014), and price limits (Seasholes & Wu, 2007).

Attention could be defined as an individual taking notice of a piece of information (Pashler, Johnston, & Ruthruff, 2001). Da, Engelberg, and Gao (2011) propose Google search volume (GSV hereafter) of stock tickers as a proxy for investor attention and find that weekly GSV is positively associated with market capitalization, turnover, analyst following and media attention. The authors conclude that GSV is a more direct and timely proxy for attention than prior proxies. As in Da, Engelberg, and Gao (2011) and Drake, Roulstone, and Thornock (2012), we employ GSV as provided by Google Trends<sup>4</sup> as a proxy of investor attention given that it measures the stock popularity as evidenced by internet activity. We simply choose to identify a stock using its ticker. Since a firm's ticker<sup>5</sup> is always uniquely assigned, identifying a stock using its ticker avoids the problem of multiple reference names. We assume that as market participants search the internet for firm-specific information, they are paying attention to that stock.

### **3.4. Control variables**

To determine the value effect of CR awards, we must control for other factors with predictable influences on the current market value of the firm. The choice of control variables is based on prior research findings. For instance, prior studies report that firm size and risk affect both financial performance and CSR (Aras, Aybars, & Kutlu, 2010, Moore, 2001, Waddock & Graves, 1997). Appendix A gives summary information about all the variables used in this study.

In the current study, we attempt to ensure that the model is correctly specified and control for:

- ***Firm size***

A number of empirical papers assume that firm size influences the relationship between CSP and financial performance (Moore, 2001, Stanwick & Stanwick, 1998). For example, Burke, Logsdon, Mitchell, Reiner, and Vogel (1986) suggest that smaller firms are less likely to

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<sup>4</sup>Google Trends is a free tool provided by Google that can be used to monitor trends in public keyword search queries. The application provides the popularity of a term over a given time period or geographical location. Search term queries can be filtered by search type (i.e., image, news), geography (i.e., country, city), time range, and category (e.g., automotive, finance, travel). One caveat of this application is that Google Trends data do not reflect the actual search volume and are presented as a relative scale. Historical data are available from Google Trends starting January 1, 2004.

<sup>5</sup> We are cautious about using tickers with a generic meaning such as “GPS” and “ALL”. Such issue induces that GSV of these tickers would usually be inflated that may have nothing to do with attention paid to the stocks with these ticker identifiers. While we report the results using all tickers to avoid sample selection bias, we confirm that our results are insensitive to the exclusion of the “noisy” tickers we identified (about 3% of all the stocks under analysis).

openly engage CSR expenditure than larger firms which attract greater stakeholders' attention and benefit from higher information intermediaries (Gode & Mohanram, 2003). Trotman and Bradley (1981) also find some evidence that companies which disclose CSR information are larger than firms that do not disclose and that the amount of information disclosed is also positively correlated with the firm size. It follows that size will alleviate information asymmetry, leading to less uncertainty and cheaper equity financing since larger firms are better known to investors. Elsewhere, Ullmann (1985) suggest that there is a significant relationship between firms size and CSR activities given that larger companies are subject to more public scrutiny and are more likely to have the required financial, managerial, and technical expertise to engage in CSR activities, like reducing emissions for example, than are their smaller peers (Barnett, 2014).

The increased visibility increases the likelihood that stakeholders will notice and attend to corporate initiatives. Different proxies for firm size were employed such as sales volume, total assets (Trotman & Bradley, 1981) and turnover (Moore, 2001). In this research, we use the log of total assets (Aras, Aybars, & Kutlu, 2010, Tsoutsoura, 2004).

- ***Risk***

To measure risk, literature has proposed the level of debt (Tsoutsoura, 2004, Waddock & Graves, 1997) and the debt to equity ratio (Roberts, 1992). It appears important to control for firm risk which we specify as long-term debt scaled by total assets (Aras, Aybars, & Kutlu, 2010, Waddock & Graves, 1997). Several studies (Aras, Aybars, & Kutlu, 2010, Kapopoulos & Lazaretou, 2007, Perrini, Rossi, & Rovetta, 2008) suggest a significant negative correlation between the level of risk and financial performance. Another strand of literature finds a negative relationship between CSR and firm risk (Roberts, 1992). The negative link can be attributed to the fact that firms with lower levels of risk are expected to be more able to participate in social responsible activities as a result of a stable pattern of stock market returns due to the low level of risk.

- ***Dividend***

Dividend is the ratio of dividends to net assets. Jiao (2010) pinpoints the role of dividend yield as determinant of corporate value.

- ***Capital expenditures***

Erhemjamts, Li, and Venkateswaran (2013) investigate the relationship between CSR commitment and a firm's investment policy and explain that the level of CSP impacts firms' investment decisions. For example, they show that high CSR firms invest more in capital expenditures given that high CSP induces additional investments such as "*equipment and*



*facility to reduce pollution, waste, energy, and water usage, as well as additional office space, and computers necessary for CSR-implementation.”* We control for capital expenditures which is calculated by the ratio of capital expenditures to total assets.

- ***Return on assets***

According to Jayachandran, Kalaignanam, and Eilert (2013), more profitable firms are expected to have higher valuations. Profitability is proxied on the basis of return on assets, that is, the ratio of net income before extraordinary items to total assets (ROA).

- ***Sales growth***

Sales growth is the growth in sales compared to the previous fiscal year. Growth opportunities constitute a greater fraction of firm value rather than total assets since they induce sales growth. We thus expect a positive relationship between sales growth and firm value.

- ***R&D***

McWilliams and Siegel (2000) argue that some studies investigating the CSP-CFP relationship suffer from several important theoretical and empirical limitations due to the omission of R&D intensity as a control variable. R&D expenditure is seen as major contributor to information asymmetry (McWilliams & Siegel, 2000). However, R&D may yield a positive return in the long run which in turn improves financial performance. We measure a firm's R&D by its R&D expenses scaled by assets. Consistent with prior studies, we set R&D expenses to zero if they are missing (Barnett & Salomon, 2012).

- ***Advertising expenditure***

It is calculated as advertising expenditure to net sales and is set to zero if missing. We also control for the presence of data by a dummy variable (Barnett & Salomon, 2012). Servaes and Tamayo (2013) use advertising expenditure as a proxy of consumer awareness and find that it explains the positive valuation effect of CSR. The argument behind this evidence is that advertising expenditure provides insights into a firm's information environment (Nelson 1974).

- ***Industry effects***

We suppose that investors may consider social performance as a waste if a firm is much more involved in CSR than its peers. Moreover, it is well-known that the level of CSR commitment may vary according to industry characteristics (Cottrill, 1990, El Ghouli, Guedhami, Kwok, & Mishra, 2011, Holder-Webb, Cohen, Nath, & Wood, 2009, McWilliams & Siegel, 2001, Waddock & Graves, 1997). For instance, Balabanis, Phillips, and Lyall (1998) suggest that industries with a significant and more visible impact on the environment are less able to avoid public attention. Therefore, those firms receive more pressures to increase their CSR

commitment and thereby improve their reputation. Besides, according to Balabanis, Phillips, and Lyall (1998), the industry in which a company is operating could also affect its financial performance. In particular, they state that the visibility of the “damage” to the environment of a firm, with significant more impact on the environment, could negatively affect the behavior of stakeholders to the firm which in turn may decrease the financial performance. Similarly, Cai, Jo, and Pan (2012) suggest that the level of CSR may vary considerably across industries due to differences in the nature of the products produced, regulatory environment and shifts in social norms.

Some studies that controlled for industry used either the 4-digit Standard Industrial Classification (SIC) code (Holder-Webb, Cohen, Nath, & Wood, 2009, Waddock & Graves, 1997) and the KLD’s industry categorization (Ruf, Muralidhar, Brown, Janney, & Paul, 2001). In this paper, different industries are defined according to the Fama and French (1997) classification as in (Ghoul, Guedhami, & Kim, 2016).

- *Geographic effects*

The impact of CSP is region-specific. Wang and Pirinsky (2010) show that the geographic location plays an important role in financial decision-making. The authors conclude that this segmentation “*exposes the firm to a wide variety of individual and institutional characteristics from the region*”. Jiraporn, Jiraporn, Boeprasert, and Chang (2014) also review the literature on the connection between geography and social responsibility.

- *Year effects*

We include year dummies in all estimations. Indeed, the relationship between CSP and financial performance has evolved over time (Flammer, 2013) and such procedure allows to control for shifting macroeconomic conditions that affect stock prices, which, in turn, may influence corporate value and to reduce cross-individual correlation.

### **3.5. Sample**

We investigate an international panel of 3,468 firms collected from the Thomson Reuters-DataStream database. We collected company data from 2000 to 2015 and constructed an unbalanced panel of nearly 55,488 firm-year observations. Then, we applied a number of standard data restrictions. First, in order to use the panel threshold regression that requires a balanced panel, firms with missing data were removed, so that the resulting dataset includes a total of 9,910 firm-year observations about 991 firms. Second, firms operating in financial sectors (banks, insurance and life assurance companies and investment trusts) were excluded since they are subject to different accounting considerations and do not have the same

regulatory frameworks (Antoniou, Guney, & Paudyal, 2008, Dang, 2011, Dang, Kim, & Shin, 2012, El Ghouli, Guedhami, Kwok, & Mishra, 2011, Ozkan, 2001). This may also allow us to avoid unnecessary confounding effects. Our final sample consists of 879 companies: 8,790 firm-year observations, with the longest time series of 10 years over the period 2005–2014.

*<Insert Table 1 here>*

Table 1 reports the industry (48 industry classification as in Fama and French (1997)) and country distributions. As it appears from Panel A, there is wide variation in the number of firm-years across countries. As expected, the United States and Japan are the most representative countries while Brazil and Luxembourg are the least representative countries, with only one firm-year observation each. According to Table 1, we can assume that the sample is fairly dispersed across industries, with no single industry group representing more than 10% of the sample observations. Although some clustering is evident in the sample, the firm-year observations are fairly evenly spread across industries and countries.

#### **4. Methodology and empirical results**

The objective of this paper is to investigate the role of investor attention on the CSP-CFP relationship. We first apply a multivariate regression and then complement the analysis by the panel threshold regression (PTR). The intuition behind this research approach is that investor attention does not only play a role in connecting CSP to CFP, but above a particular threshold. From a purely econometric point of view, as a benchmark for the PTR results, we first estimate the panel linear case. Moreover, since a panel data approach has some drawbacks such as the assumption of parameter homogeneity over cross-section units, PTR seems to be an alternative to alleviate such a pitfall.

##### ***4.1. Descriptive statistics and correlations***

Table 2 reports summary statistics. The mean corporate value as measured by *Adj\_Q* is about 0.018. The CSP scores vary from 7.9% to 95.8 % with a mean of 64.4%, while the average of investor attention in our sample is about 3.036. Our sample includes large as well as small firms in terms of total assets. Sales growth (mean 1.133) varies from 0.070 to 6.810. Average return on assets is 6.6 % with a maximum of 26.9 % and a minimum of -11.9 %.

*<Insert Table 2 here>*

The correlation results are reported in Table 3. Most of the correlation coefficients among control variables are no more than 50%, mitigating concerns for multicollinearity. It appears that investor attention is correlated with a number of firm attributes such as *Adj\_Q*, size and return on assets. Otherwise, CSP scores appear to be highly correlated to CR awards (47.6%) and firm (46.7%) which would constitute a concern. To alleviate this pitfall, we test for multicollinearity using VIFs which are widely used as reliable indicators of multicollinearity. To avoid the VIF to be inflated, we re-estimate a transformed model using the OLS method, which removes the fixed effects from the estimation but still produces the same estimated coefficients as in the fixed effect model (Gormley & Matsa, 2014). Reassuringly, as can be seen in Table 2, VIFs do not exceed 2 for all the variables under analysis, confirming the absence of multicollinearity. Furthermore, as is common practice, we winsorize extreme values of all variables of interest prior to estimating a regression model in order to alleviate the effect of outliers. Thus, all variables are winsorized at the 1 and 99 % level.

*<Insert Table 3 here>*

#### **4.2. Preliminary analysis**

Given differences in the corporate visibility across firms, the relationship between CSP and corporate value may vary across firms as a result of differences in investor attention. We start with a two-sample t-test in order to gather some insights on the role of investor attention. For that purpose, the sample is split into two sub-samples using the Google search volume proxying for investor attention as discriminating variable. Particularly, we conducted a series of two-sample t-tests comparing firm attributes across the high-investor attention and low-investor attention subsamples. The results are reported in Table 4.

*<Insert Table 4 here>*

At first sight, the sub-sample of high-attention firms exhibits a higher average *Adj\_Q* (0.045 vs. -0.008) but a lower average advertising expenditure. These tests lend some insights to the idea that attention mediates the relationship between CSR and CFP. Indeed, the test for differences in means, shown in Table 4 highlights interesting varieties in firm characteristics. For example, high attention firms are those which are larger, more performing and more closely followed by analysts. Hence, the attention hypothesis has to be taken into account in the analysis. This assumption is further supported by the significant correlation coefficient between investor attention and firm attributes, as previously discussed. Yet, correlation

analysis as well as the test for difference of means may still serve as a benchmark and a first look at the nexus between different variables. In the next section, the role of investor attention will be analyzed in a more rigorous framework, namely multivariate regression.

### 4.3. The mediating effect of investor attention on the CR-CFP relationship

#### 4.3.1. Model specification and estimation

Before investigating the threshold effect of investor attention on the CSP-CFP relationship, we first test its mediating effect through an interaction term. The model we estimate is as follows:

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 CR_{AWARDSi,t} + \beta_2 Attention_{i,t} + \beta_3 CR_{AWARDSi,t} * Attention_{i,t} + \alpha Controls_{i,t} + \mu_i + \varepsilon_{i,t} \quad (1)$$

Where  $CR_{AWARDSi,t}$  and  $Attention_{i,t}$  denote CR awards and investor attention respectively, for firm  $i=1, \dots, N$  at time  $t=1, \dots, T$ .  $Controls_{i,t}$  is the set of performance determinants as previously documented in the literature. If  $\beta_3 > 0$ , no matter whether  $\beta_1 > 0$  or  $\beta_1 < 0$ , then investor attention is beneficial to the value effect of CSP. If  $\beta_1 > 0$ , CSP benefits the corporate value and investor attention improves this positive impact; whereas if  $\beta_1 < 0$ , CSP is negatively related to the corporate value, in line with the agency cost theory (Jensen & Meckling, 1976), but this negative effect is tempered by greater firm visibility through greater investor attention. Thus, the influence of investor attention is positive. All regression analyses include Fama and French (1997) 48 industry dummies, country dummies and year dummies. The t-statistics are estimated based on standard errors clustered by the firm level<sup>6</sup>.

We present the results from estimating the direct and indirect effects of CR awards on market value in Table 5. The findings provide some valuable insights. As Table 5 shows, the coefficient on CR awards is positive but not significant. Similarly, the coefficient on the interaction term is not significant but negative, meaning the mediating effect of investor attention is not significant and hypothesis 1 is supported. We further investigate the effect of particular CR awards on  $Adj\_Q$ , namely environmental awards and social labels as defined in Appendix A. The pattern is qualitatively similar when we look at more specific dimensions of CR awards. In contrast, the coefficient on investor attention is positive and highly significant for all types of awards. Elsewhere, most coefficient estimates of control variables are statistically significant and corroborate with their expected signs.

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<sup>6</sup> We have also lagged all explanatory variables to mitigate simultaneity concerns, the results remain the same.

*<Insert Table 5 here>*

Given the high correlation between CR awards, the interaction term and the CSP score, we transform these variables by subtracting their mean value from each value to mitigate the structural multicollinearity problem in our regressions. In addition to the VIF's, this method is known as centering the predictor and is commonly used to reduce multicollinearity (Harjoto, Jo, & Kim, 2015, Ruppert, 2004). The results remain the same suggesting that multicollinearity is not concern in our setting.

From the analysis of the interaction effect above, we cannot achieve definitive remarks. The only definitive observation is that the coefficients on all interaction terms are not significant, supporting the CR awards are not valued by the market. Nonetheless, the interaction term only allows us to roughly examine the mediating effect of the investor attention on the main variables of interest and does not allow us to have more observations. In the threshold model analysis below, we can differentiate distinct regimes of investor attention as well as their potential effects on the relation between CR awards and financial performance.

#### **4.3.2. Evidence from sample splits**

There may be concerns that the results reported in Table 5 are confined to certain stocks. For instance, larger firms have more visibility in the market. As a result, it is very much possible that CSR practices get noticed in these firms more than less visible firms for which CSR commitment may remain unnoticed. In order to address these concerns, we divide our sample into two groups – first group containing firms with above average investor attention and second group containing firms with below average investor attention– and re-estimate the base linear model for both groups. In addition, we test for the significance of difference of means between the two subsamples. The results are reported in Table 6.

*<Insert Table 6 here>*

Remarkably, there are differences between the two subsamples. Furthermore, the coefficients on the level as well as interaction term of the different CR awards proxies are not consistent across different categories of awards. Specifically, for high-attention firms, the direct effect of CR awards is significantly negative at 95% confidence level; however its interaction with investor attention is positive and significant. This suggests that investor attention is beneficial to the valuation effect of CR awards. These effects are similar for environmental awards and social labels but not significant. In contrast, for low attention firms, the interaction between

investor attention and CR awards is negatively significant suggesting that investor attention exert an unfavorable impact on the valuation effect of CR awards.

This analysis provides evidence that investor attention may play a relevant role as a determinant of the CSP-CFP relationship. However, the evidence is mixed: CR awards are negatively related to  $Adj\_Q$  for low attention firms while they are positively assessed by the market for high attention firms. Therefore, this emphasizes the possible existence of a threshold level, from which investor attention may operate.

#### ***4.4. The threshold effect of investor attention***

##### **4.4.1. General specification**

As seen above, we cannot draw definitive conclusions from the analysis of the interaction effect. Most importantly, this approach does not allow to test whether the valuation effect of CR awards differs under different investor attention regimes. Specifically, in the threshold model analysis below, we can differentiate distinct effects of CR awards on  $Adj\_Q$  across different regimes of investor attention.

As a special case of regime switching models (RSM), the panel threshold regression model describes a simple form of nonlinear regression with piecewise linear specifications and regime switching that occurs when an observed variable crosses unknown thresholds. PTR specifications are quite popular as they are easy to estimate and interpret, and able to produce interesting nonlinearities and rich dynamics. First introduced into a univariate time series context (Tong, 1983), the appropriate econometric techniques for threshold regressions with panel data were initially outlined by Hansen (1999).

Threshold models are widely used in economic literature. The general intuition is that a process may behave differently when the values of a variable exceed a particular threshold. This means that a different model may apply when values are greater than the threshold value than when they are below it.

The general specification of threshold models takes the following form:

$$\dot{y}_{i,t} = \mu_i + \sum \beta_{k+1} x_{i,t} I(\gamma_k < q_{i,t} \leq \gamma_{k+1}) + \beta_{k+1} x_{i,t} I(\gamma_k < q_{i,t} \leq \gamma_{k+1}) + \varepsilon_{i,t} \quad (2)$$

$\mu_i$  is the firm specific fixed effect and  $\varepsilon_{i,t}$  is the error term assumed to be independent and identically distributed (iid) with mean zero and finite variance  $\sigma^2$ . The subscripts  $i$  and  $t$  refer to cross-section and period, respectively.  $I(\cdot)$  is an indicator function indicating the regime defined by the threshold variable  $q_{i,t}$ , and the threshold parameter  $\gamma$ .  $y_{i,t}$  is the dependent

variable and the vector of explanatory variables. Equation (2) allows for (k) threshold values and thus (k+1) regimes. In each regime, the marginal effect of  $x_{i,t}$  may be different.

As previously mentioned, threshold regression models allow individual observations to be divided into regimes based on the value of an observed variable. Allowing for fixed individual effects, the panel threshold regressions (PTR) model divides observations into two or more regimes, depending on whether a threshold variable is smaller or larger than the threshold value. These regimes are then distinguished by producing different regression slopes.

The PTR approach can be summarized into three steps. First, the threshold value estimate is obtained by a grid search selection over its possible values, choosing that value which minimizes the sum of squared errors (SSE) from least squares (LS) estimates of the model structural equation. Second, inference about the statistical significance of the threshold effect is made by using a bootstrapping procedure to simulate the asymptotic distribution of a likelihood ratio test for the null hypothesis that the parameters estimated for the different regimes are equal. Finally, to check for the consistency of the estimated threshold value, confidence intervals are constructed using a likelihood ratio statistic.

#### 4.4.2. Testing for a threshold

Before estimating the threshold regression model, we should test if there exist threshold effects. If we cannot reject the null hypothesis, the threshold effect doesn't exist. Hansen (1999) suggested a "bootstrap" method to compute the asymptotic distribution of testing statistics in order to test the significance of threshold effect. Furthermore, when the null hypothesis doesn't hold, which means, the threshold effect does exist, Chan (1993) proved that OLS estimation of threshold is super consistent, the asymptotic distribution is derived. Hansen (1999) used simulation likelihood ratio test to derive the asymptotic distribution of testing statistic for a threshold and proposed to use two-stage OLS method to estimate the panel threshold model.

Inspired from the Hansen's (1999) model, we set up single threshold model as follows:

$$v_{it} = \begin{cases} \mu_i + \theta' h_{it} + \alpha_1 d_{it} + \varepsilon_{it} & \text{if } d_{it} \leq \gamma \\ \mu_i + \theta' h_{it} + \alpha_2 d_{it} + \varepsilon_{it} & \text{if } d_{it} > \gamma \end{cases} \quad (3)$$

The threshold regression model of (3) can also be set as follows:

$$v_{it} = \mu_i + \theta' h_{it} + \alpha_1 d_{it} I(d_{it} \leq \gamma) + \alpha_2 d_{it} I(d_{it} > \gamma) + \varepsilon_{it} \quad (4)$$

Where  $I(\cdot)$  represents an indicator function. The dependent variable  $v_{it}$  represents firm value



as proxied by  $Adj\_Q$ . The independent variable  $d_{it}$  represents investor attention, which is the threshold variable.  $h_{it}$  is the set of control variable as previously defined. Besides  $\mu_i$ , the fixed effect, represents the heterogeneity of companies under different operating conditions. The error term  $\varepsilon_{it}$  is assumed to be independent and identically distributed with mean zero and finite variance  $\sigma^2(\varepsilon_{it} \sim iid(0, \sigma^2))$ .  $i$  and  $t$  are symbols for cross section and time periods.

As can be noticed, the observations are divided into two investor attention regimes depending on whether the threshold variable  $d_{it}$  is smaller or larger than the threshold value ( $\gamma$ ). The regimes are distinguished by differing regression slopes,  $\alpha_1$  and  $\alpha_2$ . We will use known  $v_{it}$  and  $d_{it}$  to estimate the parameters ( $\gamma$ ,  $\alpha$ ,  $\theta$  and,  $\sigma^2$ ).

This paper follows the bootstrap method to get the approximation of F statistic and then calculate the p-value.

#### **4.4.3. The threshold regression results**

If the relation between CR awards and market value is non-linear and the indirect effect of CSR on value is mediated by investor attention, the threshold will be significant at least under the single threshold test. In unreported results, we find that the test for a double threshold and a triple threshold are insignificant for all CR awards categories. We thus conclude that there exists a single threshold effect of the investor attention on the valuation effect of CR awards. This suggests that there are only two regimes in investor attention. Therefore, for the remainder of this paper, we continue with the single threshold model.

According to the results above, there exists an optimal level of investor attention. When investor attention increases, the effect of CR awards on financial performance is intuitively expected to increase. However, on the other side, CSR costs may increase which offset the positive effect of investor attention. Furthermore, greater public exposure means higher firm accountability towards different stakeholders. Thus, this paper aims at examining not only whether a threshold effect exists, but how corporate value responds to CR awards under different investor attention's regimes.

*<Insert Table 7 here>*

As shown in Table 7, more interesting results are observed as compared to the linear regression analysis. The effect of CR awards on corporate value differs across different regimes. The threshold variable – investor attention – divided the sample into two regimes, where the switching regime value is 3.738 (>75th percentile), where the border values: 3.701 and 3.745. The estimated coefficient for CR awards indicates that firms with low investor attention levels have stronger effects of awards on value. In particular, the coefficient on the CR awards proxy under the threshold estimate is significantly negative at the 1% significance level, while the effect above the threshold is positive and significant as well. Moreover, the magnitude is larger (in absolute value) in the high regime than in the high regime.

In other words, CR awards decrease firm value up to a point at which investor attention reach an optimal level. This finds support from the agency cost theory (Jensen & Meckling, 1976) and empirical studies such as (Friedman, 1970, Lioui & Sharma, 2012, Oberndorfer, Schmidt, Wagner, & Ziegler, 2013). This result can also be related to diminishing returns to CSR. However, above the threshold estimate, the relationship between CR awards and *Adj\_Q* becomes positive in line with Servaes and Tamayo (2013) and Madsen and Rodgers (2015).

Most prominent within our results is the fact that when we disaggregate CR awards into its two sub-components, the results are not the same. In particular, while the evidence is mixed for CR awards, the results are more clear and uniform for social labels. The coefficient on social labels is significantly positive in the high attention regime, supporting the hypotheses 4 and 5b, but is negative but insignificant in the regime with low investor attention, leading support to the hypotheses 2 and 5a, respectively. Moreover, the estimated coefficient for social labels in this transitional regime indicates a stronger effect of CSP on value of about 2 times the effect for the low regime.

In contrast, regarding the environmental awards, the relationship between awards and firm value is not significant regardless the two regimes of investor attention in line with hypotheses 1 and 5a but in contrast to Klassen and McLaughlin (1996). Elsewhere, the effects of other control variables on corporate value are generally consistent with the findings in financial literature for all components of CR awards.

Overall, this evidence reveals that the influence of investor attention on the valuation effect of CSP varies across different CR awards categories. That result can be reasoned based on the sample split analysis and therefore, linked to the hypothesis 5b assuming that the relationship between corporate responsibility awards and financial performance is significantly positive when investor attention is above the threshold. However, the soundness of social commitment appears to be more important to corporate value than that of environmental responsibility, in

contrast to Klassen and McLaughlin (1996), Flammer (2013) and Krüger (2015) but as an extension to Edmans (2011, 2012).

## **5. Robustness checks**

In this section, we first check the validity of the results obtained from OLS linear regression and then control for the robustness of the PTR framework.

### ***5.1. Addressing endogeneity***

The aim of this paper is to complement and extend prior literature on the determinants of the CSP-CFP link. A limitation frequently raised by prior literature is that CSP is endogenous with respect to financial performance (McWilliams & Siegel, 2000, Rodriguez, Siegel, Hillman, & Eden, 2006). CSP likely correlates with unobservable firm characteristics that may also affect financial performance. For example, it is more likely that companies engage in CSR because they are more profitable or they have favorable expectations with respect to profitability.

In this section, we employ alternative estimation methodologies in order to address these concerns. Since a randomized controlled experiment is challenging to implement, we rather implement alternative research design choices (e.g., firm fixed effects and instrumental variables approaches) which attempt to approximate randomization (El Ghouli, Guedhami, Nash, & Patel, 2016, Reeb, Sakakibara, & Mahmood, 2012).

Fixed effects can partly mitigate endogeneity concerns due to omitted variable bias (Wooldridge 2003). That is, we use both ordinary least square (OLS) regressions and two stage least square (2SLS) regressions with panel data, both with robust standard errors to correct the problem of heteroscedasticity. Particularly, we analyze and address the concern of endogeneity that occurs due to firm characteristic omitted variables, unobserved variables and the issue of reverse causality. The issues were resolved primarily using time and firm fixed effects, lagged variables and Instrumental Variables (IV).

First, we control for firm fixed effects even though it may remove the theoretical and cross-sectional variation when the changes are sticky over time (Zhou, 2001). Linear fixed effects models provide a primary workhorse for causal inference with panel data in the social sciences (Angrist, Pischke, & Pischke, 2009). We base our analysis on firm fixed effect model and obtain similar results as in Table 5. Indeed, as can be evidenced by Table 8, the results are similar to those obtained without controlling for firm fixed effects given that the interaction

between investor attention and CR awards remain negative and not significant. Furthermore, unreported results provided evidence that even when we lagged explanatory variables, the results remain the same.

*<Insert Table 8 here>*

Elsewhere, OLS regression analysis implicitly assumes that CSP is an exogenous variable. We follow the common approach and construct a simultaneous equation system in order to account for the potentially reciprocal dependence between CSP and firm performance as previously noticed by literature (Attig, El Ghouli, Guedhami, & Suh, 2013, Ioannou & Serafeim, 2015, Jo & Harjoto, 2012, Jo & Harjoto, 2011).

We employ a two stage least square (2SLS) analysis using the mean industry-year CSP score (while excluding the focal firm) as an instrument for the CSP score (El Ghouli, Guedhami, & Kim, 2016, Kim, Li, & Li, 2014). Good instrumental variables should have high correlation with the original variable and no direct correlation with the dependent variable from our main analysis.

In unreported results, the analysis from the first stage regression shows that the instrument is significantly related to the raw values of the CSP score. We then retain the predicted values of CSP scores and use them in the regressions examining the effect of CR awards on financial performance. As reported in the right-hand panel of Table 8, results from the second-stage regressions strongly support OLS regression analysis and confirm that endogeneity is not a concern in our study, regardless the inclusion of firm fixed effects.

## ***5.2. Alternative measures of financial performance***

The results above combine to provide a complex, yet interesting picture of the relationship between CR awards and corporate value. This section investigates financial performance in a broader setting, for both the long and short run respectively.

Due to the complexity and multi-dimensionality of financial performance, it remains difficult to find an ideal proxy that combines all dimensions of performance. Since there is no ideal measure able to capture all aspects, we test whether our results depend on the financial performance indicator. Literature has distinguished two main measurements. Davidson and Worrell (1990) promote the market-based measures and suggest that they relate more closely to shareholders' wealth. Otherwise, Wu (2006) rather prefers accounting-based measures as a better predictor of social performance and explains that studies using market proxies report a smaller relationship between CSP and CFP because of the choice of performance proxy.

We follow recent equity pricing research and use the industry-adjusted market-to-book (*Adj\_MB* hereafter) ratio instead of *Adj\_Q* as a corporate value indicator (Edmans, 2011, Galema, Plantinga, & Scholtens, 2008). The ratio is formally computed as the ratio of the book value of shareholders' equity plus deferred taxes and investment tax credits (if available) minus the book value of preferred stock to the market value of equity. As for *Adj\_Q*, we adjusted for industries' effect as previously performed for Tobin's Q. Vassalou and Xing (2004) show that the MB ratio is a good proxy for the organization's default risk and market value. In particular, firms with high MB ratios enjoy higher ex post returns (Fama & French, 1992).

Given that the MB ratio is closely related to Tobin's Q, we further check whether the impact of CR awards on firm value, with respect to operating performance measures as used in Servaes and Tamayo (2013). In particular, we compute three profitability measures<sup>7</sup>: operating income on assets (OIA), operating income on sales (OIS), and return on equity (ROE). ROE is computed by dividing net income by shareholders' equity, whereas OIA and OIS are calculated by dividing operating income by assets and sales, respectively. These measures reflect the internal efficiency of the firm, which is potentially influenced by the corporate social performance. Davidson and Worrell (1990) suggest that investors are concerned about accounting-based measurements only when they may affect shareholders' wealth. As before, we computed the industry-adjusted measures of OIA, OIS and ROE instead of raw values and adjusted for industry, year and country fixed effects in all specifications.

< Insert Table 9 here >

The evidence is mixed across different performance metrics. In particular, from the results of Table 9, we are able to identify two distinct sets of results. The first set consists of cases where the transition variable used is investor attention, the regime-dependent variable is CR awards and the dependent variable is a market based measure and precisely, the Market-to-book ratio. Thus, in terms of the coefficient of the long-run effects of CR awards, its sign is empirically plausible, the same as when we use *Adj\_Q* as the dependent variable. Most importantly, the coefficient on CR awards varies from -0.006 for the low regime to 0.069 for the high attention regime. It confirms that the impact of CR awards on corporate value

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<sup>7</sup> Note that ROA is dropped from the control variables in conducting this robustness check test

changes across different investor attention regimes. However, when we employ *Adj\_MB* ratio instead of *Adj\_Q*, the coefficient on CR awards is not significant in the low attention regime.

The second set consists of cases where the transition variable used is investor attention, the regime-dependent variable is CR awards and the dependent variable is an accounting-based measure and precisely, the operating income to assets, the operating income to sales and return on equity, respectively. In particular, Table 9 shows that the coefficient of CR awards to ROE is highly and significantly lower for the first regime: -0.001 versus 0.013 for the second regime (about 13 times). Moreover, under the threshold, the coefficient is not significant while it becomes significantly positive above the threshold. The results are similar for CR awards to OIS as well as to OIA. However, the threshold estimate is only significant for operating income to sales.

The common finding is that there are significant asymmetries in the effect of CR awards on financial performance. Indeed, under the threshold, the relationship between CR awards and financial performance is either insignificant or negative supporting hypothesis 1-2, while above the threshold the relationship becomes stronger and positive supporting hypothesis 3 and 5b. More importantly, the estimated coefficient for CR awards in this transitional regime indicates a stronger effect of awards on financial performance of about, at least, 9 times the effect for the low regime. Indeed, for high investor attention regime, the increase in financial performance is larger and statistically significant for all measures of financial performance.

Research shows that there is some difference in the prediction of financial performance between market-based and accounting-based measures of CFP (Orlitzky, Schmidt, & Rynes, 2003, Wu, 2006). In the present paper, employing both measurements provides a relatively full picture of financial performance and reconciles prior research streams.

### ***5.3. Additional sensitivity tests***

We also perform additional robustness checks, which are reported in Table 10. In particular, we check whether our main findings above are robust to alternative sample specifications, different proxies and other methodologies. The main dependent variable in this analysis is *Adj\_Q*, the regime-dependent variable is CR awards and the regressions, are again estimated using PTR, include the same control variables as in Table 7 and adjust for industry, country, and year fixed effects.

<Insert Table 10 here>

First, as previously discussed, we have noticed in Table 1 that the sample is predominately composed by U.S. and Japanese firms. We test whether the main findings hold when we exclude these firms, which make up 59.27% of our sample. The coefficient on CR awards remains positive and significant at the 1% level for high attention regime and negative and significant under the threshold, with the magnitude of the coefficient qualitatively the same as above. These results indicate that the relation between the CR awards and corporate value is not driven by U.S. and Japanese firms. Moreover, the coefficients on all control variables continue to have the expected sign.

Second, prior research suggests that the level of CSR may vary according to industry characteristics (El Ghouli, Guedhami, Kwok, & Mishra, 2011, McWilliams & Siegel, 2001, Waddock & Graves, 1997). Therefore, in an attempt to make our proxies for CSR more comparable across industries, we adjust CSP scores for the industry based on Fama and French (1997) 48 industry classification in each year. As shown in the second column of Table 10, the results corroborate our earlier findings, suggesting that industry effects in CSP scores are not driving our results.

Third, we assume that there is no perfect proxy for investor attention and employ the number of analysts following a firm as an alternative proxy of investor attention, as in Blankespoor, Miller, and White (2013). The intuition behind this choice is that analysts play an important role in financial markets and especially in increasing firm visibility (Bushee, Core, Guay, & Hamm, 2010, Irvine, 2003). Furthermore, security analysts play a critical role to enhance information transparency between managers and external investors. As shown in the third column of Table 10, empirical results are not sensitive to the use of an alternative attention proxy.<sup>8</sup>

Finally, the main PTR analysis uses investor attention as the threshold variable, but the latter is not included as an explanatory variable. Linear OLS regression as well as prior studies have shown that investor attention is relevant for stock market activity (Da, Engelberg, & Gao, 2011, Drake, Roulstone, & Thornock, 2012). Therefore, one could believe that the effect of CR awards will change when investor attention is controlled for. We thus include investor attention in our main specification to check the robustness of empirical findings. As can be seen, the results are qualitatively the same, with only minor changes in estimated coefficients. The evidence is thus robust to controlling for the direct effect of investor attention.

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<sup>8</sup> It is also worth noting that in untabulated analysis, all the empirical results of this paper hold after employing analyst following instead of GSV of stock tickers as a proxy of investor attention.

## 6. Discussion and implications for future research

This work argues that firms can “*do well by doing good*”, as found in empirical studies documenting a positive effects of social performance (Barnett & Salomon, 2006, Barnett & Salomon, 2012, Eccles, Ioannou, & Serafeim, 2014, Flammer, 2013, Kacperczyk, 2009, Margolis, Elfenbein, & Walsh, 2009, Margolis & Walsh, 2003, Minor & Morgan, 2011, Orlitzky, Schmidt, & Rynes, 2003, Waddock & Graves, 1997). Underlying the positive relationship between CSP and financial outcomes is the idea that effective CSR strategies can attract stakeholders, such as socially conscious consumers and investors, to increase their willingness to buy and invest, respectively. In particular, firms that undertake CSR may enjoy stronger and lasting relationships with stakeholders, resulting in lower costs and higher quality inputs, and providing a sustainable competitive advantage (Freeman, 1984).

Most importantly, this paper explores a previously unexplored premise of this argument—that investors’ rewards to CSR should only be expected to accrue if they pay attention to the firm’s CSR activities. This being the case, many of the previously hypothesized stakeholder-generated benefits to firms as a result of their CSR commitment should be contingent on the extent that these CSR activities manage to attract stakeholder attention. Our analysis finds partial support for this view, demonstrating that investor attention partially mediate the relationship between CR awards and firm financial benefits as in Madsen and Rodgers (2015) and Servaes and Tamayo (2013).

Indeed, findings suggest that CR awards are relevant for corporate value, even though the influence may be just passive. In light of the analysis of investor attention as the threshold variable, we can draw some clear patterns and discuss possible implications for several actors who might be involved in this process. First, an immediate managerial implication of our findings suggests that in order for CSR to add value in the long run, planning and considerable resources should be dedicated to the visibility of CSR commitment, given that CR awards do not pay off immediately, but only after a threshold of investor attention has been reached. All news stories are not created equal. In the best of circumstances, human attention is a fluid but scarce resource (Kahneman, 1973). Drawing to empirical results, beyond a certain threshold, the more that is asked of this resource, the better CSP performs. Higher investor attention is also correlated with the development of firm visibility, in turn impacting the value due to their linkage documented in the literature (Aouadi & Marsat, 2016, Barber & Odean, 2008, Merton, 1987). Second, a higher investor attention improves the value effect of CSP possibly through influencing the mechanisms of stock trading. The firm’s



operating performance may also improve because of increased monitoring by investors and/or by enhanced access to capital markets and due to a lower cost of information asymmetry as a result of greater consumption of information by investors and analysts.

However, under the optimal level of investor attention, the returns to CR awards are negative supporting the view of CSR as a cost as previously proposed by hypothesis 2. This result finds support from Lioui and Sharma (2012) who show a negative direct relationship between a firm's market value and environmental KLD scores, but a positive indirect effect. They suggest that environmental performance increases R&D expenditure, which enhances market value. Some authors have also posit that CSR involves higher costs without ensuring immediate benefits (Barnett, 2007) in light of the view of Friedman (1970) arguing that corporate prosocial behavior reduces both corporate and societal welfare. From such standpoint, managers are seen as inefficient and incapable of enabling social change (Friedman 1970), and CSR is argued to be a diversion of scarce firm resources by managers as agents towards unproductive activities.

The value effect of environmental awards above the threshold is not as relevant as that of social labels. The evidence thus reveals that investor attention plays a more important role for social performance. Several articles in the management literature argue that by nurturing the relationship to its employees, a company can attract, motivate, and retain the most talented employees in the industry (Albinger & Freeman, 2000, Greening & Turban, 2000, Peterson, 2004, Pfeffer, 1994, Turban & Greening, 1997, Vogel, 2005). From the stakeholder theory lens (Freeman, 1984), firms that are reported in lists of 'best companies to work for' may find it easier to recruit top quality employees, potentially resulting in improvement in productivity at relatively low cost (Moskowitz, 1972). Talented and satisfied employees allow for better productivity, improve sales and help deliver superior customer service (Korschun, Bhattacharya, & Swain, 2014), enhancing firm financial value (Edmans, 2011). Indeed, Edmans (2011, 2012) shows that companies with higher job satisfaction earn higher abnormal returns compared to their peers. Consistent with this evidence, Galema, Plantinga, and Scholtens (2008) report a positive relationship between employee relations scores derived from KLD scores and individual stock returns over the period 1992-2006, using pooled cross-sectional regressions. Our findings complement and extend this literature; however we suggest that social labels are desired, but to the limited extent that they attract and improve investor attention to a particular threshold.

Drawing on sustainability and CSR literature, there is no definitive evidence that all green investments pay off in financial terms (Ambec & Lanoie, 2008, Cordeiro & Tewari, 2015). Furthermore, these investments may be seen as agency problems. For instance, Bénabou and Tirole (2010) and Baron (2008) both propose that one explanation for environmental investment is managerial self-entrenchment. The authors argue that managers may over-invest in environmental expenditure in order to burnish their own private reputations as environmental protector or simply to serve self-interest and generate intrinsic rewards simply due to personal taste for environmental causes. Thus, environmental over-investment can be classified as agency costs that are detrimental to investors who might not systematically share such enthusiasm (Barnea & Rubin, 2010, Gillan, Hartzell, Koch, & Starks, 2010).

Finally, while the value gains from CR awards may seem small compared to other financial information (relative to earnings announcements, mergers, and other major corporate events), they appear nevertheless economically significant. Stock market participants determine a firm's stock price and consequent market value and base their decisions on perceptions of past, current, and future stock returns (Orlitzky, Schmidt, & Rynes, 2003). Within other factors, evidence has revealed that perceptions are influenced by social performance (Boyle, Higgins, & Rhee, 1997). This can also be justified by benchmarking our empirical results against the findings from other CSR studies (Hawn & Ioannou, 2016, Henisz, Dorobantu, & Nartey, 2014). For example, Servaes and Tamayo (2013) find that consumer awareness as proxied by advertising expenditure explains the positive valuation effect of CSR. This evidence is attributed to the fact that advertising expenditure provides insights into the firm's information environment (Nelson 1974). Thus, CSR signaling for improved reputation would reduce the expected legitimacy gap between the firm and its stakeholders through lower information asymmetry.

## **7. Conclusion**

While it seems intuitively clear that attention can potentially be both limited (i.e. be "*too low*") or excessive (i.e. "*too high*"), the literature so far has devoted surprisingly little effort to investigate this issue in more depth. Apart from few notable exceptions (e.g. Hou et al., 2009), studies look at one side only. They often focus on limited attention and interpret the uncovered return patterns as evidence for investor underreaction due to slow information diffusion. Alternatively, they refer to the idea of excessive attention and argue that findings are in line with investor overreaction due to uninformed demand shocks.

So far, it is not sufficiently clear from the literature which quantifiable conditions exactly cause which investor behavior and which market reaction. At least to some degree, the well-known critique of Fama (1998) comes into mind in this context. Fama argues that, according to behavioral finance research, investors appear to underreact about as often as they appear to overreact in event studies, leaving a blurry picture which eventually might also be consistent with the idea of efficient markets.

In light of the stakeholder theory (Freeman, 1984), the literature has previously documented that CSR strengths may contribute to financial performance (Donaldson & Preston, 1995, Jones, 1995, Servaes & Tamayo, 2013). Another stream of financial literature suggested that investor attention exerts a significant influence on stock market activity (Bank, Larch, & Peter, 2011, Drake, Roulstone, & Thornock, 2012, Peng & Xiong, 2006). We add to the two strands of literature and investigate how investor attention shape the relationship between CR awards and market value, i.e., whether attention plays an intermediate role and under which conditions, still awaits an investigation. We explore this issue by applying the panel threshold model inspired from Hansen (1999), that allows us to perform a deeper analysis as compared to using interaction effects.

First, we investigate whether there is any empirical association between CR awards and corporate value as proxied by industry-adjusted Tobin's Q. Although stakeholders' theory (Freeman, 1984) provides enough good reasons why such a relationship should exist, empirical evidence is rather divergent in this regard (Margolis et al. 2009). Perhaps, one potential reason is that most studies deal exclusively with the US stock market, where it seems that results are significantly affected by an endogeneity problem. This problem is due to the fact that, in the U.S., social performance seems to be mainly driven by financial performance. Evidently, in such a case financial and social performance are simultaneously determined. Trying to alleviate such a concern, the present paper relies on an international dataset which covers 879 firms from 25 countries from 2005 to 2014 and provides new evidence on the non-linear relationship between CR awards and financial performance. In particular, we establish that the main mechanism by which CSR commitment is translated into improved financial performance is when investor attention reaches a particular threshold. This evidence holds for market-based measures of financial performance as well as accounting-based measures. Furthermore, in contrast to Krüger (2015), Flammer (2013) and Klassen and McLaughlin (1996), environmental performance is found to be not relevant for  $Adj\_Q$ , regardless the investor attention regime. Conversely, social labels are positively related to  $Adj\_Q$  for firms with high attention regime, in line with Edmans (2011, 2012).

The results in this paper make a contribution to the literature for the following reasons. First, the literature on CSP has extensively focused on whether CSR adds value (Clacher & Hagendorff, 2012, Hart & Ahuja, 1996, Kumar, Tan, Quah, & Yusoff, 2002, Ramchander, Schwebach, & Staking, 2012, Servaes & Tamayo, 2013, Stanwick & Stanwick, 1998). We complement these works by showing that the positive association between CSR and financial performance is more likely due to the attention allocation hypothesis rather than positive returns on those investments. Such results indicate the relevance of attention to accelerate the resolution of information asymmetry among firms. Second, this novel explanation suggests that prior research provides an incomplete assessment of the relationship between CSR and financial performance. Therefore, the financial managers should take steps to increase firm visibility levels in the low attention regime. Third, the finding that CSP is significantly associated to financial performance is also relevant to the ongoing debate on the potential merits of CSR given the controversial results and the absence of consensus. Precisely, the paper provides new evidence on the resource-based view (RBV) of CSR based on early built panel threshold estimation techniques. Overall, the results indicate that investor attention might be an important variable explaining the value of CSR, while controlling for corporate attributes.

Our findings that “doing good” pays off has potentially far-reaching implications for corporate decision making and strategic management. In particular, companies may find it worthwhile to devote sufficient resources to developing the visibility of their CSR strategy if they want to gain returns on their investments. From a broader perspective, this insight suggests an important, and perhaps unique, feature of CSR: shareholders are undoubtedly the active players of the additional benefits of CSR. Two caveats are in order. First, as with most empirical work, unobserved firm heterogeneity could explain our findings, but the fact that our results survive a large battery of checks mitigates this concern. In addition, there may be other channels through which firms can profit from their CSR strengths. Investigating these channels and studying their relative efficacy compared to prior channels would be a fruitful avenue for further work. Finally, given the lack of a consistent theoretical framework on the role of investor attention on the CSP-CFP relationship, our preliminary analysis has to be interpreted with caution. For example, we assume that investor attention somehow, ‘magically’ or at least unproblematically, reaches firms which is an ideal framework in need of further investigation.

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## Appendix A. Description of variables

<i>Variables</i>	<i>Definition</i>	<i>Source</i>
<b><i>Dependent variables</i></b>		
<i>Adj_Q</i>	Tobin's Q is calculated as follows: $Ln((\text{market value of equity} + \text{book value of assets} - \text{book value of equity} - \text{balance sheet deferred taxes})/\text{book value of assets})$ . <i>Adj_Q</i> is the Tobin's Q minus the industry-median Tobin's Q based on the Fama–French (1997) 48 industries classification (excluding financials firms)	Authors calculations
<i>Adj_MB</i>	The Market-to-book is calculated as follows: $Ln((\text{Sum of market value of equity, long-term debt, debt in current liabilities, liquidation value of preferred stock, and deferred taxes and investment credit})/\text{total assets, measured at the end of fiscal year } t)$ . <i>Adj_MB</i> is the MB minus the industry-median MB based on the Fama–French (1997) 48 industries classification (excluding financials firms)	Thomson Reuters-Worldscope
<i>Adj_OIA</i>	OIA is calculated as the operating income by assets. <i>Adj_OIA</i> is the OIA minus the industry-median OIA based on the Fama–French (1997) 48 industries classification (excluding financials firms)	As above
<i>Adj_OIS</i>	OIS is calculated as the operating income by sales. <i>Adj_OIS</i> is the OIS minus the industry-median OIS based on the Fama–French (1997) 48 industries (excluding financials firms)	As above
<i>Adj_ROE</i>	Return on assets is the net income by shareholders' equity. <i>Adj_ROE</i> is the ROE minus the industry-adjusted ROE based on the Fama–French (1997) 48 industries classification (excluding financials firms)	As above
<b><i>Independent variables</i></b>		
<i>Corporate responsibility Awards</i>	As provided by Thomson Reuters-Asset4, equals 1 if the company received an award for its social, ethical, community, or environmental activities or performance, 0 otherwise	Thomson Reuters-Asset4
<i>Environmental Awards</i>	As provided by Thomson Reuters-Asset4, equals 1 if the company received product awards with respect to environmental responsibility?	As above
<i>Social labels</i>	As provided by Thomson Reuters-Asset4, equals 1 if the company won an award or any prize related to general employment quality or "Best Company to Work For"?	As above
<i>A4_CSPscore</i>	The CSP score is equal to the average of environmental and social performance. Environmental performance measures a firm's impact on living and non-living natural systems, including the air, land, and water, as well as complete ecosystems. Social performance measures a firm's capacity to generate trust and loyalty with its workforce, customers, and society, through its use of best management practices.	As above
<i>Investor attention</i>	$Ln(\text{mean of Google search volume of the stock ticker})$ for year t	<a href="http://www.google.com/trends/">www.google.com/trends/</a>
<i>Analyst following</i>	Analyst coverage is defined as the number of analysts providing current fiscal year earnings estimates, averaged over the previous year. Analyst following is the natural log of one plus the number of analysts.	I/B/E/S
<i>Firm size</i>	Firm size is measured as the natural logarithm of total assets in millions of \$US.	Thomson Reuters-Worldscope
<i>Research and Development</i>	Research and development expense scaled by net sales for fiscal year t	As above
<i>Advertising expenditure</i>	Advertising expenditure scaled by net sales for fiscal year t	Factset Fundamentals
<i>Firm risk</i>	The long-term debt and debt in current liabilities divided by total assets, measured at the end of fiscal year t	Thomson Reuters-Worldscope
<i>Press freedom index</i>	As provided annually by Reporters without Borders. Scores range from 0 to 100, with 0 being the best possible score and 100 the worst. We multiply this score by (-1) such that higher values indicate more press freedom.	Freedom House

This table describes the proxies for the variables considered in the paper. The data set is a panel of 879 firms collected from different sources and consists of 8,790 firm-year observations from 2005 to 2014.



## Appendix B. Description of ASSET4 ESG performance indicators

### *Environmental performance*

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**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, NO<sub>x</sub> and SO<sub>x</sub>, 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 performance*

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**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.

**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 and 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, wellbeing 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.

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## Appendix B. (Continued)

### *Social performance(Continued)*

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**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.).

### *Corporate governance performance*

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**Board Structure:** The board of directors/board structure category measures a company's management commitment and effectiveness towards following best practice corporate governance principles related to a well-balanced membership of the board. It reflects a company's capacity to ensure a critical exchange of ideas and an independent decision-making process through an experienced, diverse and independent board.

**Compensation Policy:** The integration/vision and strategy category measures a company's management commitment and effectiveness towards the creation of an overarching vision and strategy integrating financial and extra-financial aspects. It reflects a company's capacity to convincingly show and communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes.

**Board Functions:** The board of directors/board functions category measures a company's management commitment and effectiveness towards following best practice corporate governance principles related to board activities and functions. It reflects a company's capacity to have an effective board by setting up the essential board committees with allocated tasks and responsibilities.

**Vision and Strategy:** The integration/vision and strategy category measures a company's management commitment and effectiveness towards the creation of an overarching vision and strategy integrating financial and extra-financial aspects. It reflects a company's capacity to convincingly show and communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes

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**Table 1. Sample distribution**

<i>Panel A. By country</i>			<i>Panel B. By industry (Continued)</i>		
<i>Country</i>	<i>Obs.</i>	<i>Percentage(%)</i>	<i>Industry</i>	<i>Obs.</i>	<i>Percentage(%)</i>
<i>Australia</i>	100	1.14	<i>Construction</i>	340	3.87
<i>Austria</i>	70	0.80	<i>Construction materials</i>	210	2.39
<i>Belgium</i>	90	1.02	<i>Consumer goods</i>	250	2.84
<i>Brazil</i>	10	0.11	<i>Defense</i>	10	0.11
<i>Canada</i>	180	2.05	<i>Electrical equipment</i>	120	1.37
<i>China</i>	40	0.46	<i>Electronic equipment</i>	430	4.89
<i>Denmark</i>	80	0.91	<i>Entertainment</i>	50	0.57
<i>Finland</i>	90	1.02	<i>Food products</i>	250	2.84
<i>France</i>	370	4.21	<i>Healthcare</i>	40	0.46
<i>Germany</i>	330	3.75	<i>Machinery</i>	520	5.92
<i>Greece</i>	20	0.23	<i>Measuring and control equipment</i>	170	1.93
<i>Hong Kong</i>	180	2.05	<i>Medical equipment</i>	180	2.05
<i>Ireland</i>	40	0.46	<i>Non-metallic and industrial metal mining</i>	80	0.91
<i>Italy</i>	90	1.02	<i>Personal Services</i>	20	0.23
<i>Japan</i>	2,390	27.19	<i>Petroleum and natural gas</i>	520	5.92
<i>Luxembourg</i>	10	0.11	<i>Pharmaceutical products</i>	290	3.30
<i>The Netherlands</i>	130	1.48	<i>Precious Metals</i>	10	0.11
<i>Norway</i>	80	0.91	<i>Printing and publishing</i>	90	1.02
<i>Portugal</i>	20	0.23	<i>Recreation</i>	90	1.02
<i>Singapore</i>	30	0.34	<i>Restaurants, hotels, motels</i>	150	1.71
<i>Spain</i>	140	1.59	<i>Retail</i>	710	8.08
<i>Sweden</i>	220	2.50	<i>Rubber and plastic products</i>	20	0.23
<i>Switzerland</i>	230	2.62	<i>Shipbuilding and railroad equipment</i>	30	0.34
<i>The United Kingdom</i>	130	11.72	<i>Shipping containers</i>	40	0.46
<i>The United States</i>	2,820	32.08	<i>Steel works</i>	260	2.96
<b>All Countries</b>	<b>8,790</b>	<b>100</b>	<i>Textiles</i>	10	0.11
<b>Panel B. By industry</b>			<i>Tobacco products</i>	40	0.46
<i>Industry</i>	<i>Obs.</i>	<i>Percentage(%)</i>	<i>Transportation</i>	450	5.12
<i>Agriculture</i>	20	0.23	<i>Utilities</i>	540	6.14
<i>Aircraft</i>	130	1.48	<i>Wholesale</i>	230	2.62
<i>Apparel</i>	50	0.57	<i>Almost nothing</i>	20	0.23
<i>Automobiles and trucks</i>	350	3.98	<b>All industries</b>	<b>8,790</b>	<b>100</b>
<i>Beer and liquor</i>	120	1.37			
<i>Business Services</i>	740	8.42			
<i>Business suppliers</i>	150	1.71			
<i>Candy and soda</i>	30	0.34			
<i>Chemicals</i>	490	5.57			
<i>Communication</i>	350	3.98			
<i>Computers</i>	190	2.16			

**Table 2. Descriptive statistics**

	<i>Obs.</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>VIF</i>
<i>Adj_Q</i>	8,790	0.018	0.291	-1.593	1.620	--
<i>Investor attention</i>	8,790	3.036	0.817	0.360	4.369	1.37
<i>Environmental</i> <sub>Awards</sub>	8,790	0.128	0.334	0.000	1.000	1.19
<i>Social</i> <sub>Labels</sub>	8,790	0.033	0.179	0.000	1.000	1.26
<i>CR</i> <sub>Awards</sub>	8,790	0.513	0.500	0.000	1.000	1.11
<i>CSP</i> <sub>Score</sub>	8,790	0.644	0.274	0.079	0.958	1.32
<i>Capex</i>	8,790	5.577	4.818	0.040	27.460	1.55
<i>Size</i>	8,790	22.929	1.289	20.021	27.345	1.22
<i>Return on assets</i>	8,790	0.066	0.060	-0.119	0.269	1.13
<i>Sales growth</i>	8,790	1.133	0.744	0.070	6.810	1.29
<i>Dividend</i>	8,790	2.115	1.727	0.000	8.810	1.71
<i>Advertising</i>	8,790	56.137	229.030	0.000	1676.190	1.34
<i>R&amp;D</i>	8,790	2.743	4.984	0.000	26.730	1.11
<i>Press freedom</i>	8,790	-19.687	4.884	-41.000	-10.000	1.16
<i>Leverage</i>	8,790	0.236	0.157	0.000	0.693	1.23

This table reports the descriptive statistics of the dependent variable as well as all variables under analysis. In addition to the mean controlling for the distribution's central tendency, this table reports the minimum, maximum, standard deviation of the variables and variance inflation factors (VIFs). All variables are defined in Appendix A. The sample spans from 2005 to 2014.

**Table 3. Correlation matrix**

	<i>Adj_Q</i>	<i>CR<sub>Awards</sub></i>	<i>Env<sub>Awards</sub></i>	<i>Social<sub>Labels</sub></i>	<i>Investor attention</i>	<i>CSP<sub>Score</sub></i>	<i>Leverage</i>	<i>Size</i>	<i>Return on assets</i>	<i>Sales growth</i>	<i>Dividend</i>	<i>Advertising</i>	<i>Capex</i>	<i>R&amp;D</i>	<i>Press freedom</i>
<i>Adj_Q</i>	1.000														
<i>CR<sub>Awards</sub></i>	0.032***	1.000													
<i>Env<sub>Awards</sub></i>	-0.039***	0.285***	1.000												
<i>Social<sub>Labels</sub></i>	0.007	0.073***	0.003	1.000											
<i>Investor attention</i>	0.114***	0.048***	0.012	0.024**	1.000										
<i>CSP<sub>Score</sub></i>	0.010	0.476***	0.269***	0.120***	0.021*	1.000									
<i>Leverage</i>	-0.112***	0.087***	0.047***	-0.007	0.031***	0.127***	1.000								
<i>Size</i>	-0.112***	0.317***	0.189***	0.051***	0.106***	0.467***	0.315***	1.000							
<i>Return on assets</i>	0.407***	0.013	-0.088***	0.019*	0.078***	-0.068***	-0.294***	-0.185***	1.000						
<i>Sales growth</i>	0.003	0.037***	0.007	-0.001	0.031***	0.043***	0.017	0.133***	0.053***	1.000					
<i>Dividend</i>	-0.042***	0.116***	0.008	0.046***	-0.022**	0.275***	0.202***	0.192***	-0.073***	-0.036***	1.000				
<i>Advertising</i>	-0.044***	0.068***	0.064***	0.050**	-0.012	0.090***	-0.048***	0.124***	-0.055***	0.007	-0.024**	1.000			
<i>Capex</i>	0.134***	0.002	-0.007	0.027**	0.045***	-0.030***	0.076***	0.065***	0.117***	0.036***	-0.055***	-0.039***	1.000		
<i>R&amp;D</i>	0.049***	0.031***	0.023**	-0.079***	-0.020*	0.091***	-0.242***	-0.026**	0.023**	-0.019*	-0.147***	0.036***	-0.193***	1.000	
<i>Press freedom</i>	0.060***	-0.023**	0.020*	0.050***	0.170***	0.031***	-0.022**	-0.091***	0.098***	0.037***	-0.065***	-0.087***	-0.010	0.055***	1.000

This table reports correlation coefficients among variables of interest for the 8,790 firm-year observations from 2005 to 2014. All variables are defined in Appendix A. \*\*\*, \*\* and \* denote statistical significance at the 1, 5, and 10% levels, respectively

**Table 4. Difference of means test**

	<i>Full sample</i> <i>N=8,790</i>	<i>High-attention firms</i> <i>N= 4,394</i>	<i>Low-attention firms</i> <i>N=4,396</i>	<i>t-statistics</i>	<i>Sig</i>
<i>CSP<sub>Score</sub></i>	0.644	0.650	0.638	-2.062	**
<i>CR<sub>Awards</sub></i>	0.512	0.537	0.487	-4.679	***
<i>Environmental<sub>Awards</sub></i>	0.128	0.128	0.128	0.023	
<i>Social<sub>Labels</sub></i>	0.033	0.036	0.030	-1.55	
<i>Size</i>	22.929	23.046	22.812	-8.547	***
<i>R&amp;D</i>	2.743	2.551	2.935	3.614	***
<i>Advertising</i>	56.137	48.975	63.295	2.932	***
<i>Leverage</i>	0.236	0.241	0.231	-3.131	**
<i>Press freedom</i>	-19.687	-18.958	-20.415	-14.139	
<i>Return on assets</i>	0.066	0.072	0.060	-9.173	***
<i>Adj_Q</i>	0.018	0.045	-0.008	-8.748	***
<i>Dividend</i>	2.115	2.095	2.135	1.071	
<i>Sales growth</i>	1.133	1.164	1.101	-3.967	***
<i>Capex</i>	5.576	5.750	5.403	-3.381	***
<i>Analyst following</i>	2.614	2.676	2.551	-10.215	***

This table presents the means and the t-statistics for comparing the means of main variables between high-attention and low-attention firms. The sample contains 8,790 firm-year observations for 879 firms from 2005 to 2014. The variables are described in Appendix A. A firm is placed in the high-attention group if it has an above or equal to mean total Google search volume(GSV), and it is placed in the low-attention group if it has a below mean total GSV. \*, \*\*, and \*\*\* indicate whether differences are statistically significant at indicate unilateral statistical significance at 10, 5, and 1% levels, respectively.

**Table 5. The interactions between CR awards and investor attention on corporate value**

	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>	
<i>Dependent variable</i>	<i>Adj_Q</i>		<i>Adj_Q</i>		<i>Adj_Q</i>	
<i>Awards proxy</i>	<i>CR<sub>Awards</sub></i>		<i>Environmental<sub>Awards</sub></i>		<i>Social<sub>Labels</sub></i>	
<i>CSP<sub>SCORE</sub></i>	<i>CSP<sub>Score</sub></i>		<i>Environmental<sub>Score</sub></i>		<i>Social<sub>Score</sub></i>	
<i>Awards</i>	0.011	(0.018)	-0.002	(0.025)	0.020	(0.162)
<i>Investor attention</i>	0.036***	(0.007)	0.034***	(0.006)	0.034***	(0.006)
<i>Awards* Investor attention</i>	-0.005	(0.006)	-0.002	(0.008)	-0.013	(0.048)
<i>CSP<sub>Score</sub></i>	0.014	(0.021)	0.004	(0.019)	0.015	(0.017)
<i>Leverage</i>	-0.063	(0.041)	-0.063	(0.041)	-0.064	(0.042)
<i>Size</i>	-0.064***	(0.009)	-0.064***	(0.009)	-0.064***	(0.009)
<i>Sales growth</i>	1.015***	(0.090)	1.013***	(0.090)	1.014***	(0.090)
<i>ROA</i>	-0.000	(0.002)	-0.000	(0.002)	-0.000	(0.002)
<i>Dividend</i>	-0.009***	(0.002)	-0.009***	(0.002)	-0.009***	(0.002)
<i>Advertising</i>	0.000*	(0.000)	0.000*	(0.000)	0.000*	(0.000)
<i>Advertising_dummy</i>	0.032*	(0.019)	0.031*	(0.019)	0.032*	(0.019)
<i>Capex</i>	0.003***	(0.001)	0.003***	(0.001)	0.003***	(0.001)
<i>R&amp;D</i>	-0.000	(0.002)	-0.000	(0.002)	-0.001	(0.002)
<i>R&amp;D_dummy</i>	-0.021	(0.014)	-0.021	(0.014)	-0.021	(0.014)
<i>Press freedom index</i>	0.003	(0.002)	0.003	(0.002)	0.003	(0.002)
<i>Constant</i>	1.442***	(0.230)	1.445***	(0.230)	1.462***	(0.231)
<i>Year-fixed effects</i>	Yes		Yes		Yes	
<i>Country-fixed effects</i>	Yes		Yes		Yes	
<i>Industry-fixed effects</i>	Yes		Yes		Yes	
<i>R<sup>2</sup> (percentage)</i>	11.38		11.37		11.38	
<i>Number of observations</i>	8,790		8,790		8,790	

This table depicts results of fixed-effects time series regression for firm value as measured by industry-adjusted Tobin's Q (*Adj\_Q*) based on the Fama–French 48 industries (excluding financials firms), on CSR awards variables, namely CR awards, environmental awards and social labels. The estimated panel models employ clustered robust firm effects. Unreported industry controls are based on the Fama and French (1997) industry classification. The variables are defined in Appendix A. Robust standard errors are in parentheses. Our sample spans from 2005 to 2014. \*\*\*, \*\* and \* denote statistical significance at the 1, 5, and 10% levels, respectively.

**Table 6. The mediating effect of investor attention on CR awards and firm value: Evidence from sample split**

	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>		<i>Model 4</i>		<i>Model 5</i>		<i>Model 6</i>	
<i>Dependent variable</i>	<i>Adj_Q</i>		<i>Adj_Q</i>		<i>Adj_Q</i>		<i>Adj_Q</i>		<i>Adj_Q</i>		<i>Adj_Q</i>	
<i>Sample composition</i>	<i>Low-attention</i>		<i>High-attention</i>		<i>Low-attention</i>		<i>High-attention</i>		<i>Low-attention</i>		<i>High-attention</i>	
<i>Awards' type</i>	<i>CR<sub>Awards</sub></i>		<i>CR<sub>Awards</sub></i>		<i>Environmental<sub>Awards</sub></i>		<i>Environmental<sub>Awards</sub></i>		<i>Social<sub>Labels</sub></i>		<i>Social<sub>Labels</sub></i>	
<i>Awards</i>	0.044	(0.025)	-0.159**	(0.071)	0.035	(0.038)	-0.014	(0.067)	0.133	(0.261)	-0.234	(0.166)
<i>Investor attention</i>	0.045***	(0.011)	-0.001	(0.019)	0.036***	(0.010)	0.022	(0.019)	0.036***	(0.010)	0.019*	(0.019)
<i>Awards* Investor attention</i>	-0.022**	(0.010)	0.042**	(0.019)	-0.020	(0.015)	0.004	(0.018)	-0.064**	(0.095)	0.057	(0.048)
<i>CSP<sub>SCORE</sub></i>	0.030	(0.030)	0.017	(0.029)	0.021	(0.027)	-0.008	(0.027)	0.019	(0.024)	0.027	(0.023)
<i>Leverage</i>	-0.143**	(0.060)	-0.027	(0.052)	-0.144**	(0.061)	-0.026	(0.053)	-0.145**	(0.060)	-0.026	(0.053)
<i>Size</i>	-0.051***	(0.010)	-0.058***	(0.010)	-0.051***	(0.010)	-0.057***	(0.010)	-0.051***	(0.010)	-0.060***	(0.010)
<i>Return on assets</i>	0.881***	(0.139)	1.034***	(0.115)	0.879***	(0.139)	1.035***	(0.116)	0.880***	(0.139)	1.031***	(0.115)
<i>Sales growth</i>	-0.001	(0.004)	0.002	(0.003)	-0.000	(0.004)	0.002	(0.003)	-0.001	(0.004)	0.002	(0.003)
<i>Dividend</i>	-0.012***	(0.003)	-0.004*	(0.003)	-0.013***	(0.003)	-0.004	(0.003)	-0.013***	(0.003)	-0.004*	(0.003)
<i>Advertising</i>	0.000*	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)
<i>Advertising_dummy</i>	0.039*	(0.021)	0.004	(0.029)	0.038*	(0.021)	0.003	(0.029)	0.037*	(0.021)	0.004	(0.029)
<i>Capex</i>	0.003**	(0.002)	0.003**	(0.001)	0.003**	(0.002)	0.003**	(0.001)	0.003**	(0.002)	0.003**	(0.001)
<i>R&amp;D</i>	-0.000	(0.003)	0.002	(0.003)	-0.000	(0.003)	0.002	(0.003)	-0.000	(0.003)	0.002	(0.003)
<i>R&amp;D_dummy</i>	-0.024	(0.020)	-0.023	(0.018)	-0.024	(0.020)	-0.024	(0.018)	-0.024	(0.020)	-0.024	(0.018)
<i>Press freedom</i>	0.003	(0.003)	0.002	(0.004)	0.003	(0.003)	0.002	(0.004)	0.003	(0.003)	0.002	(0.004)
<i>Constant</i>	1.364***	(0.251)	1.361***	(0.276)	1.373***	(0.250)	1.266***	(0.277)	1.391***	(0.250)	1.328***	(0.278)
<i>Year-fixed effects</i>	Yes				Yes				Yes			
<i>Country-fixed effects</i>	Yes				Yes				Yes			
<i>Industry fixed effects</i>	Yes				Yes				Yes			
<i>R<sup>2</sup> (percentage)</i>	24.82		24.70		24.77		24.18		24.60		24.40	
<i>Number of observations</i>	4,396		4,394		4,396		4,394		4,396		4,394	

This table displays the results of OLS regression analysis of industry-adjusted Tobin's Q (*Adj Q*) based on the Fama–French 48 industries (excluding financials firms), on CR awards and other control variables over the period of 2005–2014. Our sample is split with respect to investor attention as measured by GSV of stock tickers. The main variables of interest are CR awards, environmental awards and social labels while controlling for other well-known determinants of market value. All variables are defined in Appendix A. Robust standard errors clustered by firms are presented in parentheses. \*\*\*, \*\* and \* denote statistical significance at the 1, 5, and 10% levels, respectively.



**Table 7. Threshold effect of investor attention on CR awards and firm value**

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
<i>Dependent variable</i>	<i>Adj_Q</i>	<i>Adj_Q</i>	<i>Adj_Q</i>
<i>Regime dependent variable</i>	<i>CR<sub>Awards</sub></i>	<i>Environmental<sub>Awards</sub></i>	<i>Social<sub>Labels</sub></i>
<b>Threshold estimates</b>			
$\hat{\gamma}$	3.738***	2.609	3.833***
C.I.	[3.701, 3.745]	[2.386, 2.791]	[3.772, 3.890]
<b>Impact of Corporate responsibility Awards</b>			
<i>Investor attention</i> < $\hat{\gamma}$	-0.013*** (0.005)	0.038 (0.032)	-0.032 (0.024)
<i>Obs.</i>	6916	3808	7295
<i>Investor attention</i> > $\hat{\gamma}$	0.016** (0.007)	-0.006 (0.007)	0.068*** (0.022)
<i>Obs.</i>	1874	4982	1495
<b>Control variables</b>			
<i>CSP<sub>score</sub></i>	-0.005 (0.015)	0.006 (0.014)	0.024* (0.014)
<i>Leverage</i>	-0.044 (0.028)	-0.181*** (0.009)	-0.176*** (0.028)
<i>Size</i>	-0.109*** (0.007)	-0.172*** (0.008)	-0.173*** (0.008)
<i>Return on assets</i>	0.905*** (0.044)	0.001 (0.003)	0.002 (0.003)
<i>Sales growth</i>	0.000 (0.002)	1.579*** (0.049)	1.577*** (0.049)
<i>Dividend yield</i>	-0.010*** (0.002)	-0.018*** (0.002)	-0.018*** (0.002)
<i>Advertising</i>	0.000** (0.000)	0.000*** (0.000)	0.000*** (0.000)
<i>Advertising<sub>dummy</sub></i>	0.027** (0.012)	0.022 (0.014)	0.022 (0.014)
<i>Capex</i>	0.002*** (0.001)	0.005*** (0.001)	0.005*** (0.001)
<i>R&amp;D</i>	-0.005*** (0.002)	-0.008*** (0.002)	-0.008*** (0.002)
<i>R&amp;D<sub>dummy</sub></i>	-0.025** (0.013)	-0.026* (0.014)	-0.026* (0.014)
<i>Press freedom</i>	0.004** (0.002)	0.003 (0.002)	0.003* (0.002)
<i>Constant</i>	2.596*** (0.168)	4.440*** (0.189)	4.462*** (0.189)
<i>Firm fixed effects</i>	Yes	Yes	Yes
<i>Year-fixed effects</i>	Yes	Yes	Yes
<i>R<sup>2</sup>(percentage)</i>	11.40	43.80	43.90
<i>Number of observations</i>	8,790	8,790	8,790

This table provides threshold regression estimation results of corporate value as measured by industry-adjusted Tobin's Q (*Adj Q*) based on the Fama–French 48 industries (excluding financials firms), on corporate responsibility awards while controlling for the presence of a threshold in investor attention as proxied by Google search volume of stock tickers. All models include time-specific dummies and firm-fixed effects. The confidence interval for the threshold parameter estimate is obtained using Hansen's (1999) approach. P-values are bootstrap-based on over 1000 replications. Robust standard errors clustered by firms are in parentheses. See Appendix A for definition of variables.

**Table 8. Robustness to endogeneity**

	<i>Model 1</i>		<i>Model2</i>		<i>Model 3</i>	
<i>Estimation method</i>	<i>OLS</i>		<i>2SLS</i>		<i>2SLS</i>	
<i>Dependent variable</i>	<i>Adj_Q</i>		<i>Adj_Q</i>		<i>Adj_Q</i>	
<i>Firm-fixed effects</i>	<i>Included</i>		<i>Not included</i>		<i>Included</i>	
<i>CR<sub>Awards</sub></i>	0.012	(0.015)	0.009	(0.060)	-0.003	(0.026)
<i>Investor attention</i>	0.037***	(0.005)	0.036***	(0.007)	0.037***	(0.005)
<i>CR<sub>Awards</sub> *Investor attention</i>	-0.006	(0.005)	-0.005	(0.005)	-0.007	(0.005)
<i>CSP<sub>score</sub></i>	-0.008	(0.015)	0.047	(0.919)	0.287	(0.389)
<i>Leverage</i>	-0.051 *	(0.028)	-0.062**	(0.029)	-0.056*	(0.030)
<i>Size</i>	-0.110***	(0.007)	-0.066	(0.070)	-0.124***	(0.021)
<i>Return on assets</i>	0.912***	(0.044)	1.025***	(0.054)	0.917***	(0.045)
<i>Sales growth</i>	0.001	(0.002)	-0.000	(0.007)	-0.001	(0.004)
<i>Dividend</i>	-0.009***	(0.002)	-0.009***	(0.003)	-0.009***	(0.002)
<i>Advertising</i>	0.000**	(0.000)	0.000*	(0.000)	0.000**	(0.000)
<i>Advertising_dummy</i>	0.031**	(0.012)	0.031**	(0.013)	0.032**	(0.013)
<i>Capex</i>	0.002***	(0.001)	0.003**	(0.001)	0.002**	(0.001)
<i>R&amp;D</i>	-0.004**	(0.002)	-0.000	(0.003)	-0.005**	(0.002)
<i>R&amp;D_dummy</i>	-0.022*	(0.012)	-0.020	(0.026)	-0.016	(0.015)
<i>Press freedom index</i>	0.002	(0.002)	0.003	(0.002)	0.003*	(0.002)
<i>Constant</i>	2.360***	(0.163)	1.460	(1.168)	2.555***	(0.309)
<i>Firm-fixed effects</i>	Yes		No		Yes	
<i>Year-fixed effects</i>	Yes		Yes		Yes	
<i>Country-fixed effects</i>	No		Yes		No	
<i>Industry-fixed effects</i>	No		Yes		No	
<i>R<sup>2</sup> (percentage)</i>	12.00		11.30		7.79	
<i>Number of observations</i>	8,790		8,760		8,760	

This table explores the relationship between industry-adjusted Tobin's Q (*Adj Q*) based on the Fama–French 48 industries (excluding financials firms), CR awards and the interaction between CR awards and investor attention as measured by Google search volume, while controlling for endogeneity concerns. The first model investigates the inclusion of firm-fixed effects. The second and third models are estimated in two stages. The first-stage regression involve regressing of the endogenous variable namely, the CSP score on all independent variables, year effects, and the instrument (mean industry-year CSP score). While, the second-stage regression results use the predicted values of the CSP score from the first-stage regressions. Only model 1 and model 3 include firm-fixed effects. All variables are defined in Appendix A. Robust standard errors adjusted for clustering by firm are in parentheses. \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

**Table 9. Robustness to financial performance measure**

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<i>Dependent variable</i>	<i>Adj_MB</i>	<i>Adj_OIA</i>	<i>Adj_OIS</i>	<i>Adj_ROE</i>
<i>Regime-dependent variable</i>	<i>CR<sub>Awards</sub></i>	<i>CR<sub>Awards</sub></i>	<i>CR<sub>Awards</sub></i>	<i>CR<sub>Awards</sub></i>
<b>Threshold estimates</b>				
$\hat{\gamma}$	3.767***	3.858	3.999***	4.012
<i>C.I.</i>	[3.719, 3.773]	[3.718, 3.867]	[3.971, 4.005]	[3.954, 4.017]
<b>Impact of Corporate responsibility Awards</b>				
<i>Investor attention &lt; <math>\hat{\gamma}</math></i>	-0.006 (0.008)	0.000 (0.001)	-0.001 (0.001)	-0.001 (0.002)
<i>Obs.</i>	7050	7385	7815	7853
<i>Investor attention &gt; <math>\hat{\gamma}</math></i>	0.069*** (0.013)	0.004*** (0.001)	0.009*** (0.002)	0.013*** (0.004)
<i>Obs.</i>	1740	1405	975	937
<b>Control variables</b>				
<i>CSP<sub>Score</sub></i>	0.032 (0.026)	-0.000 (0.003)	0.007* (0.004)	0.006 (0.007)
<i>Leverage</i>	0.797*** (0.046)	-0.030*** (0.004)	-0.001 (0.007)	0.107*** (0.012)
<i>Size</i>	-0.154*** (0.013)	-0.006*** (0.001)	0.009*** (0.002)	-0.003 (0.003)
<i>Return on assets</i>	0.797*** (0.077)	0.328*** (0.008)	0.367*** (0.011)	-0.000 (0.001)
<i>Sales growth</i>	0.005 (0.004)	0.001** (0.000)	0.000 (0.001)	1.662*** (0.019)
<i>Dividend yield</i>	-0.038*** (0.003)	0.000 (0.000)	0.000 (0.000)	0.002*** (0.001)
<i>Advertising</i>	0.000** (0.000)	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)
<i>Advertising_dummy</i>	0.051** (0.022)	0.003 (0.002)	0.002 (0.003)	0.004 (0.005)
<i>Capex</i>	0.006*** (0.001)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
<i>R&amp;D</i>	-0.004 (0.003)	-0.003*** (0.000)	-0.005*** (0.000)	0.003*** (0.001)
<i>R&amp;D_dummy</i>	-0.024 (0.022)	-0.005** (0.002)	-0.007** (0.003)	-0.009 (0.006)
<i>Press freedom</i>	0.008*** (0.003)	0.000 (0.000)	0.001** (0.000)	0.000 (0.001)
<i>Constant</i>	3.509*** (0.293)	0.150*** (0.029)	-0.196*** (0.041)	-0.062 (0.074)
<b><i>Firm-fixed effects</i></b>	Yes	Yes	Yes	Yes
<b><i>Year-fixed effects</i></b>	Yes	Yes	Yes	Yes
<b><i>R<sup>2</sup>(percentage)</i></b>	8.12	25.30	17.00	40.70

This table provides threshold regression estimation results of financial performance on CR awards while controlling for the presence of a threshold in investor attention as proxied by GSV of stock tickers. The dependent variable is proxied by the following industry-adjusted performance measures based on the Fama–French 48 industries classification (excluding financials firms), namely the MB ratio, operating income on assets, operating income on sales and return on equity. All models include time-specific dummies and firm-fixed effects. The confidence interval for the threshold parameter estimate is obtained using Hansen's (1999) approach. P-values are bootstrap-based on over 1000 replications. See Appendix A for definition of variables.

**Table 10. Additional robustness tests**

	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>		<i>Model 4</i>	
<i>Robustness test</i>	<i>US. and Japanese firms excluded</i>		<i>Industry-adjusted CSP<sub>Score</sub></i>		<i>Alternative attention proxy</i>		<i>Investor attention included</i>	
<i>Dependent variable</i>	<i>Adj_Q</i>		<i>Adj_Q</i>		<i>Adj_Q</i>		<i>Adj_Q</i>	
<i>Regime-dependent variable</i>	<i>CR<sub>Awards</sub></i>		<i>CR<sub>Awards</sub></i>		<i>CR<sub>Awards</sub></i>		<i>CR<sub>Awards</sub></i>	
<i>Threshold variable</i>	<i>GSV of stock tickers</i>		<i>GSV of stock tickers</i>		<i>Analyst following</i>		<i>GSV of stock tickers</i>	
<b>Threshold estimates</b>								
$\hat{\gamma}$	4.011**		3.738**		3.1781***		3.7381**	
C.I.	[3.996, 4.015]		[3.701, 3.745]		[3.113, 3.218]		[3.701, 3.745]	
<b>The impact of corporate responsibility awards</b>								
<i>Investor attention</i> < $\hat{\gamma}$	-0.015**	(0.007)	-0.012***	(0.005)	-0.013***	(0.004)	-0.013***	(0.005)
Obs.	3197		6916		7537		6916	
<i>Investor attention</i> > $\hat{\gamma}$	0.045***	(0.014)	0.018**	(0.007)	0.027***	(0.008)	0.017**	(0.007)
Obs.	383		1874		1253		1874	
<b>Control variables</b>								
<i>Investor attention</i>							0.034***	(0.006)
<i>CSP<sub>score</sub></i>	-0.011	(0.027)	-0.048***	(0.017)	-0.004	(0.015)	-0.008	(0.015)
<i>Leverage</i>	-0.081*	(0.044)	-0.044	(0.028)	-0.044	(0.028)	-0.034	(0.028)
<i>Size</i>	-0.085***	(0.011)	-0.108***	(0.007)	-0.111***	(0.007)	-0.117***	(0.007)
<i>Sales growth</i>	0.937***	(0.065)	0.905***	(0.044)	0.000	(0.002)	0.896***	(0.044)
<i>Return on assets</i>	0.002	(0.004)	0.000	(0.002)	0.899***	(0.044)	0.000	(0.002)
<i>Dividend yield</i>	-0.007***	(0.002)	-0.010***	(0.002)	-0.010***	(0.002)	-0.010***	(0.002)
<i>Advertising</i>	0.000***	(0.000)	0.000**	(0.000)	0.000**	(0.000)	0.000**	(0.000)
<i>Advertising_dummy</i>	0.084***	(0.020)	0.027**	(0.012)	0.028**	(0.012)	0.027**	(0.012)
<i>Capex</i>	0.002**	(0.001)	0.002***	(0.001)	0.002***	(0.001)	0.002***	(0.001)
<i>R&amp;D</i>	0.000	(0.003)	-0.005**	(0.002)	-0.005***	(0.002)	-0.005**	(0.002)
<i>R&amp;D_dummy</i>	-0.025	(0.016)	-0.025**	(0.012)	-0.026**	(0.013)	-0.024*	(0.012)
<i>Press freedom</i>	0.004**	(0.002)	0.003**	(0.002)	0.003**	(0.002)	0.003**	(0.002)
<i>Constant</i>	2.010***	(0.253)	2.566***	(0.168)	2.629***	(0.168)	2.670***	(0.168)
<i>Firm fixed effects</i>	Yes		Yes		Yes		Yes	
<i>Year fixed effects</i>	Yes		Yes		Yes		Yes	
<i>R<sup>2</sup>(percentage)</i>	12.80		11.50		11.50		11.70	
<i>Number of observations</i>	3,580		8,790		8,790		8,790	

This table provides additional robustness tests. All columns report the threshold regression estimation results of corporate value as measured by industry-adjusted Tobin's Q (*Adj\_Q*) based on the Fama and French 48 industries (excluding financials firms) on CR awards while controlling for the presence of a threshold in investor attention. All models include time-specific dummies and firm-fixed effects. The confidence interval for the threshold parameter estimate is obtained using Hansen's (1999) approach. P-values are bootstrap-based on over 1000 replications. See Appendix A for definition of variables.