



## Analysis

# Environmental corporate social responsibility and financial performance: Disentangling direct and indirect effects

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## ABSTRACT

This paper assesses the impact of environmental corporate social responsibility (ECSR) on Corporate Financial Performance (CFP) measured by ROA and Tobin's Q. We show that the relationship between firms' return on assets (ROA) and ECSR, strengths and concerns, is negative and statistically significant. We also show that firms' Tobin Q and ECSR, strengths and concerns, are negatively correlated in a statistically significant way. However, accounting for the interaction between firms' environmental efforts and R&D yields a different perspective: while the direct impact of ECSR on CFP is still negative, the interaction of ECSR and R&D has a positive and significant impact on it. ECSR *strengths* and *concerns* harm CFP since they are perceived as a potential cost. However, this CSR activity fosters R & D efforts of firms which generates additional value (indirect effect).

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## 1. Introduction

In recent years, firms' activities related to corporate social responsibility (CSR) in general, and environmental CSR (ECSR) in particular, have come under increased scrutiny by the academic community. Until now the main objective for firms has been to maximize shareholders' wealth. However, this approach can be too restrictive and may even be dangerous if, in order to maximize shareholders' wealth, firms end up harming their other stakeholders (by polluting, exploiting the environment or discriminating amongst employees, etc.). Thus, CSR, *a priori*, should not necessarily be incompatible with corporate financial performance (CFP). The empirical literature, however, has not converged towards a stylized fact that CSR has a positive and statistically significant impact on CFP. In a meta-analysis of 167 studies covering the period 1972–2007, Margolis et al. (2007) conclude that, while positive, the overall effect of CSR on firm performance is trivial at best.

The existing empirical evidence on the impact of ECSR on CFP, although also inconclusive, has mostly been negative. For example, Bird et al. (2007) find a negative relationship between firms' excess return and one year lagged ECSR activity.<sup>1</sup> Horvathova's (2010) meta-analysis shows that, using the findings from 37 studies, the empirical evidence is still inconclusive as to the sign of the relation between ECSR and CFP: half of studies find that the impact is positive while the rest document either a negative or an insignificant impact. Marsat and Williams

(2011) use the MSCI ESG rating relative to the environment and recently document a negative impact on firms' Tobin's Q ratios.

That concerns are likely to harm CFP seems intuitive and is widely documented (e.g. Konar and Cohen (2001)). Thus, firms under potential threat of regulation, broadly speaking, are likely to incur a cost which will naturally reduce CFP. Hence, typical studies investigating the relationship between ECSR concerns and CFP focus on the direct effects. Specifically, they regress a measure of firms' CFP (i.e. Tobin's Q or return on assets) on a dummy variable capturing ECSR concern. This approach is of course well suited to capturing the direct effects of firms' related ECSR concerns. Yet, in several contributions, Porter and co-authors<sup>2</sup> suggest that complying with environmental regulation *ex ante* or *ex post* may have positive spillover effects for firms, which may improve their production processes and make them more efficient. This is the *induced innovation* idea widely investigated in the literature. Jaffe and Palmer (1997), for example, show that lagged environmental compliance expenditure has a positive impact on firms' future R&D.<sup>3</sup> Heyes and Kapur (2011) provide the conditions for a regulator to sustain such an effect.

Since R&D and innovation are likely to be positively correlated with firm value, any impact of ECSR concerns on R&D is an indirect (positive) impact on CFP. As a consequence, a better design of the empirical

<sup>2</sup> See Porter and van der Linde (1995a, 1995b). See also subsection 2.3 of Pizer and Kopp (2005).

<sup>3</sup> Padgett and Galan (2010) showed that, in recent data, R&D can also have a substantial impact on CSR. We address the endogeneity issue that this raises below.

<sup>4</sup> It is true that Golec et al. (2010) showed that regulation may harm firms' investments in R&D based on data from a natural experience from 1993. Nevertheless, a broader investigation by Jaffe et al. (1995) tends to conclude that such an impact is likely to be small if inexistent.

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<sup>1</sup> See Bird et al. (2007), page 199, Table V.

investigation of the relationship between firms' CFP and ECSR concerns should allow room for both direct and indirect effects to capture the global impact of ECSR concerns.

It is also often reported that even ECSR strengths have a negative impact on CFP. Fisher-Vanden and Thorburn (2011) document a substantial negative abnormal stock return for firms announcing voluntary membership to the EPA's Climate Leaders program. Using similar data to the current paper, Bird et al. (2007) also document a negative impact and their interpretation of such a finding is that, while the market understands the need to spend corporate resources on complying or pre-empting public regulation to avoid future litigation, it does not reward for expenses that go beyond this objective. However, CSR/ECSR strengths may also have some impact on another variable, which is known to affect CFP. For example, Verwijmeren and Derwall (2010) and Bae et al. (2011) both conclude that firms with a good track record of employee well-being have lower leverage. This is because lower leverage implies lower probability of default, *ceteris paribus*, which in turn reduces the expected costs for the employees from a liquidation of the firm. If firm value is negatively related to leverage (as often documented), ignoring the impact of CSR related to employees' well-being on leverage will lead to an underestimation of the impact of CSR on CFP. Hence, for ECSR strengths as well as for ECSR concerns, it is important to account for potential indirect effects.

All in all, ECSR strengths and concerns are thus expected at the same time to have both positive and negative impact on CFP. This could be one source of the conflicting results encountered in the literature. To quantify direct and indirect effects *simultaneously* we proceed as follows.

We collect information on firms' environmental strengths and concerns from KLD database. Environmental strength is a dummy variable that equals one if a firm received score 1 in the KLD defined criteria of five to seven strength variables (e.g. beneficial products, clean energy, etc.). Similarly, environmental concern is a dummy variable that equals one if a firm received score 1 in the KLD criteria of five to seven concern variables (e.g. hazardous waste, agricultural chemicals etc.). Using a data set of close to 17,000 firms/years observations for period the 1993–2007, we show that both environmental strengths and concerns have a negative impact on firms' ROA as well as Tobin's Q. The direct impact of ECSR seems to be a strong negative impact thus lending support to potential costs hypotheses. The negative impact persists even when we separately look at each of the criteria within environmental strengths as reported in the KLD database. We find that the direct relationship with firm CFP (ROA or Tobin's Q) is still negative most of the time.

Next, based on the previous discussion, we treat R&D investment as a potential variable through which ECSR impacts CFP indirectly. We thus include an interaction term between ECSR and R&D in our original estimation equation. We then show that the direct impact of ECSR on CFP as captured by the ECSR dummy variable is still negative, while the interaction between ECSR and R&D turns out to have a positive impact on CFP. We still find direct support for the perceived cost hypotheses. Nevertheless, we find that there is an extra compensation by the market for R&D activities for firms' undertaking ECSR, thus, lending support to the indirect value-creation hypothesis. To substantiate this finding, we investigate the impact of ECSR on R & D, controlling for endogeneity issues. We show that ECSR strengths and concerns have a strong positive impact on firms' R & D effort which translates into additional CFP.

While we focus on environment in this study, other studies have also found that not all CSR activities may have a positive effect on CFP. Bird et al. (2007) interpret the negative effect of community strengths on CFP as a market sanction for excessive spending on philanthropic activities. The results in this paper suggest that some effort must be devoted to investigating potential indirect channels through which investment in Community strengths may increase CFP. The simple empirical exercise carried out in this paper does not pretend that the whole story is captured by the interaction variable added. The only purpose is to suggest that some effort needs to be made to identify variables that are likely to

help better capture the potential benefit from ECSR and/or CSR. Controlling for the indirect impact of CSR on these variables may give a better picture as to the impact of CSR on CFP.

The findings of this paper are complementary to those of studies that suggest some explanations for contradictory results obtained in the empirical literature. Margolis et al. (2007) raise the problem of aggregation as a potential source of heterogeneity in empirical findings: while a broad indicator of CSR delivers a small to in-existent impact of CSR on firm performance, the association between financial performance and CSR is stronger for specific dimensions of CSR, such as employees, community, etc. Recent results in Bird et al. (2007) and Drusch and Lioui (2010) do confirm this notion. Horvathova (2010) points out that the heterogeneity in empirical methods is an important determinant of the difference in results. King and Lenox (2001) argue that empirical tests of environmental performance to financial performance fail to distinguish whether the firms operate in cleaner industries or whether they adopt cleaner technologies. Finally, Chatterji et al. (2009) suggest that the problem may lie with the data. They assess the extent to which the KLD database, extensively used in the literature, really measures what it is supposed to measure. While Sharfman (1996) validates the data but for the small sample available at that time, Chatterji et al. (2009) were unable to validate all the data, although they validated a substantial fraction of it.<sup>5</sup> In this paper, we use KLD data which makes our findings directly comparable to the existing literature. It thus adds another potential explanation for the mixed empirical findings.

The remainder of the paper is organized as follows. In Section 2 we develop our hypothesis and in Section 3 we describe our data as well as the methodology we follow. Section 4 presents the results. Section 5 concludes.

## 2. Hypothesis Development

After decades of extensive research, no consensus has been reached so far as to why firms enroll in CSR activities. Several theories have been put forward and they have been reviewed recently by Benabou and Tirole (2010), Jo and Harjojo (2011) and Kitzmueller and Shimshak (2012). Empirical research provided only mixed results (Horvathova (2010)) and hence was unable to help discriminate amongst existing theories. Since there was no obvious benefit from doing CSR, Friedman (1970) suggested that "*the social responsibility of business is to increase its profits*" putting in simple words the neo classical view on CSR. Without adhering to this perspective on CSR, one can fairly recognize that CSR activities in general and ECSR activities in particular are time and resource consuming. There is thus a direct cost for doing CSR although it is clear that firms expect if not explicitly at least implicitly some positive reward out of doing beyond what is expected from them.

The preliminary step of any empirical investigation is to construct a quantifiable measure of CSR strength or CSR concern. Thus it is important to pay attention to the measurement of CSR. Usually, studies build an index of firms' CSR. Waddock and Graves (1997), for example, measure first an index for each CSR category covered by KLD (sum of strengths (positive) and concerns (negative)) and then a CSR index is obtained using a weighting scheme obtained out of the opinion of three experts. Hull and Rothenberg (2008) proceed similarly using a different weighting scheme. Such an approach for measuring CSR may lead to wrong conclusions. Assume a firm having one CSR strength and one CSR concern. Summing up the two, the firm CSR index will be 0. When using the CSR variable as an independent variable, one will conclude that CSR has no impact on the dependent variable (firm financial performance

<sup>5</sup> The Authors validated the KLD measures of environmental concerns. As to strengths, they had some reservations as to KLD "others" dimension of environmental strengths mainly. They stress the difficulty in assessing the environmental management systems put in place. Since this is one dimension amongst many others, we personally concluded that a substantial part of the data has been validated.

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