



Environmental and Financial Performance of Fossil Fuel Firms: A Closer Inspection of their Interaction



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ABSTRACT

We investigate the relationship between environmental and financial performance of fossil fuel firms. To this extent, we analyze a large international sample of firms in chemicals, oil, gas, and coal with respect to several environmental indicators in relation to financial performance for the period 2002–2013. We find that these firms have significantly higher scores on environmental performance efforts than other firms. We use a simultaneous equations system to identify the direction of the relationship between environmental and financial performance of the firms. We find that environmental outperformance has no impact on financial performance for chemical firms, reduces returns and risks for coal companies, has a mixed impact on returns in oil and gas, and reduces financial risks for oil and gas firms. Financial outperformance reduces environmental performance in all fossil fuel (sub)industries investigated. Our findings mainly support the opportunistic view regarding the impact of financial returns, which holds that financial performance negatively impacts social performance. Regarding financial risk, we find support for the stakeholder perspective where good environmental performance is beneficial from a finance perspective. We conclude to substantial differences in the environmental-financial performance relationship along fossil fuel firms in different subindustries.

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1. Introduction

Given the impact of fossil fuels on climate change, it seems very relevant to investigate how the environmental performance of fossil fuel firms (firms in oil and gas, coal, and chemicals) relates to their financial performance. More specifically, is good financial performance associated with sound environmental performance, or is there a trade-off? Further, is this relationship the same along different performance measures and (sub)industries? Answering these questions is important to assess the potential for changes in operations by fossil fuel firms to transform the energy system. Several studies find that energy-intense companies are punished by the stock market for poor environmental performance (see Patten, 1992; Kolk et al., 2001; Kollias et al., 2012). These studies usually focus on the impact of events on company reputation (see, e.g., Spence, 2011), but not on company operations and related cash flows. Scholtens (2008) and Lioui and Sharma (2012) investigate the potential reasons why there would be a link between environmental and financial performance. The former study finds that it is highly dependent on the way in which these performances are being measured.

The latter finds a negative direct impact of environmental on financial performance but a positive indirect impact.

Our study specifically investigates environmental and financial performance of fossil fuel firms. As such, it tries to focus on a much more homogeneous category than understood by the concept 'social performance' and its equivalents, which also relates to governance, ethical, and social issues with firms. To be precise, we investigate environmental and financial performance in three subindustries: chemicals, coal, and oil and gas. We rely on both qualitative and quantitative environmental performance indicators that are much more fine-grained than those used in the literature thus far. Further, we rely on different financial performance measures to avoid biases and to account for the underlying value structure of firms. We also address endogeneity and try to detect structural relations between environmental and financial performance. We find that fossil fuel firms have significantly higher scores for their environmental performance efforts relative to firms in other industries, but it shows that this is highly sensitive to (sub)industry classification. It will not come as a surprise that we also find that fossil fuel firms produce more waste and emissions than firms in other industries. Further, we find that environmental outperformance does not impact the financial performance of chemical firms, reduces returns and risks for coal companies, and has a mixed impact on returns in oil and gas, and reduces financial risks for firms in oil and gas. Financial

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outperformance reduces environmental performance in all the types of fossil fuel firms investigated. This shows that there are substantial differences in the relationships studied for the different subindustries. These findings suggest that any policy approach should account for the value chain at the subindustry level, since a 'one size fits all' policy is likely to have very distorting effects and, hence, is doomed to be ineffective.

The remainder of this paper proceeds as follows. We first discuss the background of the relationship between financial and environmental performance of the fossil fuel firms (i.e. firms in oil and gas, coal, chemicals). Then, we introduce the data and methods employed in our analysis. Next, we report the results from the univariate analysis and show the estimation results of the regression models. Finally, we discuss our conclusions.

2. Background and Hypotheses

Bénabou and Tirole (2006, 2010) argue that there are basically three reasons as to why firms and institutions would want to behave in a responsible manner (please note that these responsibilities pertain to environmental, ethical, social and governance characteristics). The first is altruism, that is, 'doing the right thing'. Here, the firm does incur costs to avoid or reduce externalities, but does not necessarily get something in return, such as lower expenses or higher revenues. The second reason is greenwashing, where the firm claims to behave in a responsible manner to gain benefits, but does not actually change the way it operates nor internalize externalities. The third reason is strategic behavior. Here, the firm makes an effort and incurs real costs to reduce externalities. However, it also succeeds in increasing its revenues from behaving in a responsible manner. Firms act on the basis of all three reasons, but may place different weightings on each of them, resulting in differing outcomes regarding social responsibility.

Views regarding the social (in a broad encompassing sense) responsibilities of companies mainly hold that their responsibilities go beyond maximizing shareholder returns, including a focus on the environment, ethical conduct of business operations, and responsibility to stakeholders (Campbell, 2007). From this perspective, companies should adopt policies and practices that align with the wider societal good (Matten and Moon, 2008). This approach aims at stakeholders like employees, customers, suppliers, communities, regulators, and the environment. The social policies and practices of firms reflect a behavioral standard regarding their social responsibilities (Campbell, 2007). It appears that the results of company policies and practices may vary widely and bear no straightforward relationship with financial performance (Dam and Scholtens, 2015). Furthermore, policies and practices regarding corporate responsibility often are not clearly defined and go beyond what is written into laws and regulations (Heal, 2008; Chatterji et al., 2009).

Two meta-studies that investigate the literature on the financial and responsibility performance of firms are Wu (2006) and Margolis et al. (2009). Wu (2006) researches the relationships between the financial and responsibility performance of firms (the latter relates to the environmental, social and governance performance of firms in general within the context of his research). This author arrives at several results: (1) there is a positive relationship between responsibility and financial performance indicators; (2) market-based measures are weaker predictors of responsibility than other financial measures, such as accounting indicators; and (3) perception-based measures report a stronger responsibility–financial performance relationship than performance-based measures. Margolis et al. (2009) find a small but statistically significant positive correlation between financial and social performance. One problem with such meta-analyses is that a lot of information gets lost and that studies are equally weighted despite huge differences in research design and quality.

Apart from methodological problems, indicators of social responsibility as well as those of financial performance widely differ among

the studies included. Margolis et al. (2009) and Schultze and Trommer (2012) specifically mention this problem and the challenge of defining the responsibility construct. Indicators and measures of responsibility tend to capture either a single specific dimension, such as philanthropic donations or pollution control, or are broad appraisals of responsibility as a whole, like ratings. The issue of multi-dimensionality also plays a role with financial indicators (see Dam and Scholtens, 2015). For example, Gregory et al. (2014) mention that accounting measures are backward looking, and their objectivity and informational value is questionable. Stock market measures, by contrast, are much more forward-looking, with expectations of future cash flows and timing of these flows as well as risk embedded within the stock price (Gregory et al., 2014).

Based on Preston and O'Bannon (1997), Scholtens (2008) provides a brief overview as to why there might be a particular causal relationship between financial and environmental or social performance. There can be a negative link as the latter involves costs and therefore weakens the firm's competitive position, suggesting there is a trade-off between the two. As such, environmental and social issues may conflict with value maximizing behavior. In addition, managers may engage with social and environmental issues from an opportunistic perspective which may conflict with stakeholder and shareholder objectives. The managerial opportunism theory. This approach states that 'when financial performance is strong, managers may attempt to cash in by reducing social expenditure in order to take advantage of the opportunity to increase their own short-term private gains' (Allouche and Laroche, 2005). This is a form of agency costs. It also works the other way around: when financial performance weakens, managers might engage in social programs to offset or justify their disappointing results. The opportunism approach follows agency theory. Here, one believes a manager, when possible, has an incentive to put private gains first. When financial performance is strong, managerial opportunism expects less social performance. Thus, the opportunism approach assumes that financial performance precedes social performance. Please note that there can also be a positive association. For example, satisfying stakeholders' non-financial interests may result in improving the firm's financial performance due to increased loyalty. Firms do have a social impact and there is a demand from stakeholders for responsible conduct of the firm and in equilibrium the costs and benefits of servicing this demand would cancel out.

As to the direction of the causality, there is the financial resources-based view where financial means are essential in order to invest in responsible conduct and performance (the availability of funds, hereafter 'resources'). According to Orlitzky et al. (2003), the resource perspective suggests that investments in social performance may help firms develop new competencies, resources, and capabilities which are manifested in a firm's culture, technology, structure, and human resources (see also Russo and Fouts, 1997). Orlitzky et al. (2003) argue that social performance may help build managerial competencies because preventive efforts necessitate significant employee involvement, organization-wide coordination, and a forward thinking managerial style. They conclude that social performance can help management develop better scanning skills, processes, and information systems, which increase the organization's preparedness for external changes, turbulence, and crises. The same type of causality does occur in the more classical view of production which does occur to the detriment of social welfare (i.e. the classical externalities).

The causality can also run from environmental to financial performance. This is the case with stakeholder theory (which assumes a positive relationship) and the trade-off perspective (which assumes a negative relationship). Stakeholder theory suggests that social performance is positively associated with financial performance because it enhances the satisfaction of various stakeholders – and consequently the firm's external reputation – and leads to better financial performance (Allouche and Laroche, 2005). According to Preston and O'Bannon (1997), there is a lead-lag relationship between social and financial

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