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Halo effect or fallen angel effect? Firm value consequences of greenhouse gas emissions and reputation for corporate social responsibility

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ABSTRACT

Greenhouse gas (GHG) emissions are perceived to have negative consequences for society at large by contributing to potential climate change and represent a potential cash drain from firms from exposure to future regulatory, abatement, and compliance costs. Beginning in 2010, US companies are required to report their GHG emissions to the Environmental Protection Agency (EPA). We utilize these data for 2010–2014 to examine whether the possible adverse firm value impact of these GHG emissions is alleviated or exacerbated by the firm's reputation for corporate social responsibility. Our findings suggest that there is *no* halo effect, i.e., a firm's reputation for social responsibility (as reflected in its CSR score) does *not* protect the firm from the adverse firm value effects of GHG emissions. Rather, our findings suggest a fallen angel effect, i.e., for any given level of GHG emissions, the higher the firm's CSR score, the greater the adverse impact on firm value. In other words, the decline in firm value due to the adverse impact of GHG emissions is compounded by the hit to the firm's reputation for corporate social performance. Our paper contributes to the sparse prior US literature on the firm value effects of GHG emissions. Further, by providing scholarly evidence on the existence of a fallen angel effect, our findings suggest that boards and managers of firms that provide voluntary CSR disclosures cannot afford to be complacent about their GHG emissions.

1. Introduction

Although corporate social responsibility (CSR) appears to deviate from maximizing shareholder wealth (Friedman, 1970), prior research (e.g., Elliott et al., 2014; Gregory et al., 2016) suggests that a reputation for responsible social performance can endow a firm with a competitive advantage that is reflected in a *higher* firm value. Relatedly, because of their potential adverse impact on the environment (e.g., climate change), corporate greenhouse gas (GHG) emissions may be viewed as an element of negative, if not *irresponsible*, social performance (Huang and Watson, 2015). In recent research, Griffin et al. (2017) and Matsumura et al. (2014) use data obtained from US firms' *voluntary* disclosures of GHG emissions to the Carbon Disclosure Project (CDP) as well as estimates of GHG emissions for non-disclosers to suggest that investors in US equity markets penalize GHG emitters.¹ Separately, beginning in

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¹ The Carbon Disclosure Project (CDP) is supported by institutional investors and offers self-reported but standardized high quality environmental information for use by investors and academics. The CDP (www.cdp.net) is widely recognized as a source of reliable albeit voluntarily supplied environmental data for academic research.

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2010, the US Environmental Protection Agency's (or EPA's) Greenhouse Gas Reporting Program (GHGRP) *requires* US fossil fuel suppliers, direct GHG emitters and industrial gas suppliers, to report their GHG emissions to the EPA.

In this study, the research question we address is whether the adverse impact of EPA-mandated GHG emission data on firm value is attenuated or exacerbated by the firm's reputation for corporate social responsibility. Relative to prior US-based GHG research (e.g., Griffin et al., 2017; Matsumura et al., 2014), our use of the standardized and uniformly reported mandatory EPA GHG emissions data allows us to examine *actual* (rather than estimated) GHG emissions and firm value effects for larger firms as well as for smaller firms that do not voluntarily report GHG emissions to the CDP. As discussed later in the paper, our findings with respect to the valuation effects of mandatory GHG emission disclosures are consistent with prior findings in the literature with respect to such voluntary disclosures. Hence, rather than focus on the main effect, i.e., the valuation effect of mandatory GHG emission disclosures alone, we focus on the interaction effect between firms' GHG emissions and their reputation for social responsibility. In effect, the research question we examine is whether a firm's reputation for social responsibility (as reflected in the firm's CSR score) has a cushioning (or "halo") effect that protects the firm against the adverse market effects of GHG emissions. Alternatively, for firms with a reputation for social responsibility, the GHG emissions could have a disillusioning (or "fallen angel") effect that exacerbates the adverse market effects associated with the EPA-mandated GHG data.

The fundamental notion underlining the halo effect or fallen angel effect is a potential error in expectations. Prior research (e.g., Chiu and Sharfman, 2011) suggests that responsible social performance increases the firm's legitimacy and builds reputation which in turn can attract better employees and loyal customers.² Potentially, the firm's corporate social responsibility (CSR) score could create a "halo effect" by which the firm gains broader social legitimacy and causes investors to attribute positive outcomes to the firm in other areas as well (Lyon and Montgomery, 2015).³ Put differently, responsible social performance, as a form of stakeholder engagement, can build goodwill which can have an insulating effect, i.e., can lower, if not prevent, the harm from negative events such as product safety issues or an environmental accident (Chakravarthy et al., 2014; Godfrey et al., 2009). From this perspective, to the extent that GHG emissions are viewed as impairing firm value (as suggested by Griffin et al., 2017; Matsumura et al., 2014), the insulating properties of responsible social performance may be expected to have a "halo effect," i.e., dampen the potential negative consequence for firm value of GHG emissions.

On the other hand, the firm's CSR scores could have increased social performance expectations which are then lowered when the GHG data become available. Underpinning this lowering of expectations is "greenwashing," an umbrella term for a range of corporate behaviors that induce investors and others to hold an overly positive view of the firm's performance (Lyon and Montgomery, 2015).⁴ Along the same lines, Flammer (2015) suggests that the minimum requirements for what is perceived to be responsible social performance have been increasing. What may have once been perceived as exceptional practice may now be perceived as no more than the new normal. Relatedly, there has been rising awareness of climate change in recent years and the potential harmful effects of GHG emissions. Further, although climate change is a component of responsible social performance as measured by the CSR score, GHG emissions data were not specifically identified as a social performance indicator due to lack of data for US companies. Consequently, the new EPA-mandated GHG emissions data could potentially have a disillusioning ("fallen angel") effect, i.e., exacerbate the negative effect of GHG emissions on the value of a firm with a previous reputation for corporate social performance. In other words, firms previously perceived as socially responsible may now be perceived as less so on account of their GHG emissions. Put differently, the greater the firm's CSR score, the greater the original perception of the firm as an angel (i.e., a socially responsible firm), and the greater the reversal (or fall) in terms of how the firm is perceived following the disclosure of the new EPA-mandated GHG emission data. For these reasons, whether the adverse impact of GHG emissions on firm value is alleviated or exacerbated by the firm's reputation for social performance (as reflected in the firm's CSR score) remains an open empirical question.

Our analysis is based on a sample of companies with EPA-mandated GHG data as well as CSR data during the first five years (2010–2014) of the EPA's Greenhouse Gas Reporting Program (GHGRP). We first establish that the EPA-mandated GHG emission data are value relevant (consistent with prior research) by examining whether they have a negative impact on firm market value. Then, we examine whether the negative impact of GHG emissions on a firm's market value is alleviated or exacerbated by its CSR score. We also examine whether the alleviating or exacerbating effect of CSR scores on the market value impact of GHG emissions holds for more profitable vs. less profitable firms, for larger vs. smaller firms, for older vs. younger firms, and for later vs. earlier years of the EPA's GHGRP. Finally, although climate change is a component of responsible social performance as measured by the CSR score, GHG emissions data are not specifically identified as a social performance indicator (MSCI ESG Research, 2015). Still, to eliminate the possibility of a mechanical relation between our dependent and independent variables, in alternative analyses we also utilize a modified CSR score without its environmental component.

We find evidence consistent with EPA-mandated GHG emissions having a negative effect on equity value, i.e., lowering firm value. We also find evidence consistent with CSR score having a positive effect on equity value, i.e., raising firm value. Further, consistent with the fallen angel effect, we find the negative impact of GHG emissions on firm value to be increasing in the level of the CSR score, i.e., the higher the firm's CSR score, the greater the negative impact of GHG emissions on firm value. These findings

² Reputation may be defined as how a firm is perceived with respect to some characteristic or performance. Karpoff (2012) views a good reputation as an intangible asset that allows a company to obtain higher fees for its services or sell the same merchandise at prices higher than that of other suppliers.

³ Lyon and Montgomery (2015, p. 227) define halo effect as the "inability to evaluate individual attributes apart from an overall impression." As an example, investors may learn that a company's products are organic and so also assume that the firm uses renewable energy and avoids GHG emissions.

⁴ We thank an anonymous reviewer for pointing us in the direction of "greenwashing," i.e., a form of cheap talk whereby firms create the impression of responsible performance but fail to make the necessary effort or engage in only symbolic efforts potentially resulting in an error of expectations and a subsequent correction (Lyon and Montgomery, 2015).

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