

Linking Corporate Carbon and Financial Performance: A Portfolio Analysis

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(1) Overview

A number of studies examine the relationship between the financial performance of firms and corporate sustainability (e.g., Bansal, 2005; Hart & Ahuja, 1996; King & Lenox, 2001; Klassen & McLaughlin, 1996; Stanwick & Stanwick, 1998; Waddock & Graves, 1997). A few authors attempt to generalize the findings of these studies (e.g., Murphy, 2002; Orlitzky, Schmidt, & Rynes, 2003). Their outcomes indicate that research yielded mixed results regarding the link between sustainability and financial performance. Beyond the in literature discussed shortcomings, we point out the relevance of the underlying data as a potential source for the prevailing inconclusiveness. Before an in-depth investigation of the relationship between sustainability and financial performance, research faces the challenge to shed light on the studied phenomenon. We consider the phenomenon to be material in the case there is a reasonable assumption for a certain sustainability issue (Steger, 2004) that it constitutes business relevant circumstances (Vogel, 2005) and, thus, can have a systematic and significant effect on a firm's profitability.

Considering scientific proof, the IPCC (2007) report calls the evidence of climate warming "unequivocal". Climate change and the increasing intensification through carbon-based emissions seem to be most tangible as a financial issue for the global economy. Stern (2006) estimates that the damage cost from climate change could rise to 20% of the global GDP. These economic losses are directly linked to profitability on the firm level (UNEP FI, 2006). Therefore, climate change has become a relevant business topic (Duncan, 2007) and it is reasonable to investigate its materiality for firms. However, to our knowledge, no academic study investigates explicitly climate change as a measure for environmental performance.

(2) Methods

This study analyses the relationship between corporate carbon and financial performance for European and U.S. corporations. We exclusively examine the investor perspective: In other words, we do not focus on the causal effect of corporate carbon performance on financial performance within an econometric analysis, but conduct a portfolio analysis. Such approaches typically compare the risk-adjusted stock returns of portfolios that consist of corporations with a higher environmental or social performance and portfolios that consist of stock corporations with a lower environmental or social performance. Our hypothesis is that the average stock return of a virtually constructed portfolio, which is restricted to companies with superior carbon performance, is not lower than the average stock return of a portfolio which contains companies with inferior carbon performance and also not lower than the average stock return of a benchmark portfolio.

Methodologically, we examine, in accordance with recent studies (e.g., Bauer et al., 2005, 2006, Derwall et al., 2005, Kempf and Osthoff, 2006), the estimation of Jensen's α within modern asset pricing models such as the multifactor models according to Fama and French (1993) or Carhart (1997). While the size, book-to-market equity, and momentum factors, which are necessary for the estimation of these models, are publicly available for the U.S. stock market over a long time, we have calculated them for the entire European stock market

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based on the Thomson Financial Datastream dataset. Regarding the measure of carbon performance to construct the portfolios, we use panel data regarding CO₂-emissions. Based on this CO₂ data and a firm's sales we construct the item 'carbon intensity'.

(3) First Results

Currently we are conducting statistical analyses in order to derive evidence for our hypothesis. First results show neither a positive nor a negative relationship between a firm's contribution to climate change, measured as carbon intensity, and financial performance. However, we presently check the robustness of our results with better datasets.

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