Omega 41 (2013) 195–206

Contents lists available at SciVerse ScienceDirect

Omega

journal homepage: www.elsevier.com/locate/omega

Does the market value corporate response to climate change?

Audrey Wen-hsin Hsu [a,*], Tawei Wang [b]

[a] Department of Accounting, National Taiwan University, No. 1, Sec. 4, Roosevelt Rd., Taipei City 106, Taiwan
[b] School of Accountancy, University of Hawaii at Manoa, USA

ARTICLE INFO

Available online 3 February 2012

Keywords:
Environmental studies
Climate change
Tone

ABSTRACT

Motivated by the controversial debate on mandatory reductions of greenhouse gases in the U.S., this study explores whether the market values corporate response to tackle carbon dioxide emissions. We measure corporate responses using the measure of media tone based on the positive and negative words in each news article. Our results show that the market reacts favorably to the negative media exposure of corporate response to climate change over the announcement period and the one-year period, which implies that the socially responsible action to tackle climate change is costly. We further find that the positive response is less pronounced for firms from polluting industries and firms with poor environmental performance.

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1. Introduction

The purpose of our study is to examine how the media exposure of corporate responses to tackle "climate change" affects investor behavior and security prices. Our focus on climate change is motivated by the recent debates in the business press whether governments across the globe should establish the binding constraints on CO2 emissions. For example, on August 8, 2009, a group of Democrats sent a letter to President Obama opposing the climate change legislation that sets a greenhouse emissions target in the United States Senate [1]. They warned that strong actions to limit emissions of carbon dioxide and other greenhouse gases will add costs to companies and reduce the competitive advantage of American industries. Despite the expected surmounting costs for the implementation, on the other side of the Atlantic, Scottish parliament passed the landmark climate change law in the same year and argued that it is the Scots' "ethical duty" to make the commitments in the law [2]. The two contrasting examples raise an interesting question whether and how corporate response to tackle climate change is valued in the U.S.A.

On one hand, combating climate change can decrease shareholders' wealth because a commitment to environmental protection, a type of corporate social responsibility (CSR), can crowd out other more productive investments, detract the firm from the earnings power of the physical assets of the firm or putting companies at an economic disadvantage [3]. For instance, the U.S. government refused to ratify the Kyoto Protocol in fear of the reduction in GDP or the damage to the U.S. business.[1] However, some studies [4–7] assert that CSR can increase shareholders' wealth because it allows firms to earn profits above the return on its tangible assets. Tackling carbon emissions allows firms to lower the costs of complying with future environmental regulations, drive down operating costs, improve their firm image, enhance the loyalty of key stakeholders and enhance the firm's performance.

To investigate this issue, our first analysis tests whether investors value corporate response to tackle climate change. Following prior studies [8–11], we measure corporate responses using textual analysis of media reports.[2] One main reason is that corporate disclosures in the filings (e.g., 10-Ks in the U.S.) regarding the corporate response to global warming are rather limited. Prior studies [8–11] assert that news plays an important role in providing forward-looking information for investors. Some studies [12] argue that media attention to a firm's policy allows investors to call into question whether companies make decisions at their best interests. As the attitude is a leading indicator of

[1] The Kyoto Protocol is the first international agreement to fight global warming. It was signed by 141 countries, excluding the U.S. The pact went into effect in 2005 and expires in 2012. The protocol sets legally binding targets for developed countries to reduce greenhouse emissions within 7 years, to about 5% below 1990 level. To reach this goal, countries must put greenhouse emissions controls on its largest polluters.

[2] While Tetlock [10] and Tetlock et al. [11] do not try to capture tone on a very specific issue, many studies use tone to measure context-based issues. For example, Core et al. [8] examined more than 11,000 press articles about CEO compensation from 1994 to 2002. They use the negative tone of media exposure to capture the firms whose CEO receive high total annual pay. Kothari et al. [9] also use tone measure to proxy for favorable and unfavorable reports from business press in six types of risks (industry risk, firm risk, organizational risk, performance risk, reputation risk and regulatory risk). They find that negative disclosures from news result in increased cost of capital and return volatility.

* Corresponding author. Tel.: +886 2 33661131.
E-mail address: audrey.hsu@management.ntu.edu.tw (A.-h. Hsu).

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doi:10.1016/j.omega.2011.07.009

future behaviors, investors can use corporate attitudes to predict a firm's actions and assess whether these actions can respond to the expectations of the shareholders [13–16].

We examine a sample of firms with news coverage in the *Wall Street Journal* (WSJ) during the period 1989–2008. All the news should relate to corporate response to global warming/climate change, and carbon dioxide/gas/CO2/emission/ carbon neutral/ carbon footprint. We use the extent of "negative" word classification in each piece of news to proxy for corporate response as this tone measure can be effective in measuring tone.[3] For each article, we analyze the content at the article level and paragraph level. In our context, firms with large value of negative tone can be those that do not believe that CO_2 is the main cause of global warming, those that oppose reducing emissions or those that refuse to join Kyoto accord. For some firms, although they might promise to become carbon neutral, the negative tone means that the high-profile statements are symbolic.[4]

Using an event study approach, we first investigate whether equity prices reacted to the public exposure on the target firms' climate change attitudes (short-window period). We calculate cumulative abnormal stock returns (CAR) around each news announcement date and employ a cross-sectional regression with the CARs regressed on the extent of negative media exposure. Investors would react to the publication of the media coverage if it can change investors' expectation on future cash flows. Further, following Forbes [17], we use the Ohlson's price model [18] to examine the association between stock prices and corporate response, incremental to net income and equity book value. If investors think that tackling climate change may crowd out other more productive investments, investors may view corporate resistance to tackle climate change as providing information about an unbooked intangible asset.

Our results show that firms with more negative words on climate change have significantly positive wealth effects. Further, many studies suggest that economic performance for each firm can vary with its current environmental performance as poor environmental performance face greater political pressure from regulators and environmentalists [19–22]. Thus, we analyze whether the market reactions to negative tones depend on the extent of regulatory scrutiny or current environmental performance. We partition the sample into polluting and non-polluting industries and firms with good (bad) environmental performance using the ratings provided by KLD Research and Analytics, Inc.[5] We find that the market reaction to media pessimism is less positive for environmentally sensitive industries and for firms with poor environmental performance.

The remainder of the paper is organized as follows. We review relevant literature and develop our hypotheses in Section 2. In Section 3, the research methodology is elaborated. Our results are given in Section 4. We provide additional analyses in Section 5 and conclude with discussions in Section 6.

[3] According to Tetlock [10], calculating the fraction of positive words in each news story can provide much weaker results because positive words are more frequently used in combination with negations, such as "not good", which obscures the relationship between positive words counts and the intended meaning of the phrase.

[4] Prior studies exploring any dimension of CSR tend to carry out content analysis with human coders or questionnaires and have small sample size. Our approach can solve the small sample problem and include the language usages in disclosures.

[5] Since 1994 KLD divide CSR criteria analyzed for inclusion in the Domini 400 index into eight broad categories, one of which is environment. For each of them, KLD identifies the strength and weakness and indicates a series of corporate actions falling under these two categories. Our study only focuses on environmental performance.

2. Literature review and hypothesis development

2.1. Prior studies

Two streams of literature relate to our study. The first stream relates to the empirical studies on the relationship between corporate social responsibilities (CSR) and firm performance. One view is that firms face a trade-off between social responsibility and financial performance, proposing that firms incurring costs for socially responsible actions will put themselves at an economic disadvantage compared to other firms [23–25]. However, the contrasting view is that the explicit costs of corporate social responsibility are minimal and that firms may actually benefit from socially responsible actions in terms of reputation, employee morale and productivity [26–28]. For instance, Freedman and Jaggi [29] do not find any association between pollution disclosures and economic performance. One reason for the mixed results [30–33] is that the methodologies used to evaluate and screen corporations are not yet standardized and are often kept confidential by the rating organizations. Metrics that are not comparable could actually lead to outcomes that harm corporate social performance [33–34]. Hawken [35] argues that the screening methodologies for some corporate ratings might allow practically any publicly held firms to be considered as a firm with good CSR.

Another stream of literature relates to the environmental management literature on the trade-off between ecology and the economy [4–7]. Porter and van der Linde [36] argues that how a firm and industry's action to environmental challenge can be a leading indicator of its overall competitiveness. Some researchers claim that being proactive on environmental policy might actually lower the costs of complying with future environmental regulations because poor environmental performance is a sign of inefficiency within manufacturing processes and waste is a non-recoverable cost [37]. However, not all environmental policies can lead inevitably to competitiveness or to higher productivity for all companies. Many do not seriously implement those environmental policies. If firms are determined to tackle environmental problems, they will incorporate these policies into existing total quality management program, and engage cooperation through different departments, and the use of employee involvement [38]. Most importantly, companies need to design a continuous improvement method focused on environmental objectives [39].

2.2. Hypothesis development

Our study would like to examine whether investors are influenced by the textual content of the corporate climate change attitude reported in news media. Many firms are concerned that mandatorily reducing greenhouse gas emissions in the U.S. can impose extra costs on U.S. industries and end up with a price disadvantage over other countries without mandatory carbon restrictions [1]. However, there are still some studies arguing that combating climate change is beneficial [40].

We use the degree of media pessimism as a proxy for corporate resistance and investigate whether media pessimism on corporate response to climate change creates or destroys shareholders' value. A growing body of finance research uses textual analysis to examine the tone of newspaper articles and find that negative word classification can be effective in measuring tone. Media attention on a firm's policy also allows investors to call into question whether firms make decision at their best interests [12]. The tone of a news report can be affected by the choice of words. The appendix illustrates the textual analyses.

We hypothesize that if investors perceive that fighting off climate change is a costly (value-added) strategy, we expect positive (negative) market reactions to the negative words in the news coverage. A firm's valuation is based on future profitability. A firm's

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