Environmental Disclosure:

Evidence from Newsweek's Green Companies Rankings

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ABSTRACT

Corporate-level environmental information disclosure is increasingly common. We study the impact of a prominent media-generated sustainability ratings program, Newsweek's 2009 ranking of the 500 largest US firms. Using an event study methodology, we find the rankings had a significant impact on shareholder value. Firms in the top 100 experienced abnormal returns after the information release that were 0.6 – 1.0 percent higher than returns of firms in the bottom 400. The form of the information released had significant effects as well. Nuanced environmental score variables had no independent impact on market outcomes; only the final ranking mattered. We also explore possible channels through which the rankings may have had their impact. We find suggestive evidence that private and public politics mechanisms were the most important.

Key words: Disclosure, environmental information, sustainability rankings, event study
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1. Introduction

Since the U.S. Toxics Release Inventory began reporting data in 1988, environmental disclosure schemes have proliferated rapidly. Information programs now include pollution inventories such as state-level carbon reporting rules; firm-level environmental performance ratings such as Greenpeace's company scorecards and India's Green Ratings Program; and ecolabels like the USDA Organic certification and the DOE's EnergyStar label. Despite their significant expansion, the effects of environmental transparency programs on business, public policy, and society remain controversial (Tietenberg 1998; Fung et al. 2007). A recent review of the relatively mature product quality literature even concluded that optimal disclosure schemes remain poorly understood in that arena (Dranove and Jin 2010).[1] If the knowledge base for understanding product quality disclosure is incomplete, the knowledge base for understanding environmental disclosure is surely extremely uncertain.

This paper helps address these gaps by examining the impact of *Newsweek* magazine's 2009 Greenest Companies ratings on financial market outcomes. The specific setting is of interest for at least two reasons. First, the 2009 *Newsweek* rankings were the first large-scale environmental assessment created by a media organization in the United States. All of the 500 largest U.S. companies were evaluated, *Newsweek* is a household name, and the findings were disseminated widely. Second, while the data underlying the performance ratings were high-quality, they were already widely available to investors with an interest in corporate environmental responsibility. So, even with significant publicity, it was not clear *a priori* whether the rankings would constitute news to the stock market itself.

[1] Dranove and Jin (2010) conclude that despite the existence of a large literature, "Much additional research is required to help certifiers design optimal quality disclosure schemes." Gaps in the literature include how consumers respond to particular report formats and how suppliers may "game" ratings schemes.

We make three contributions. First, we use a financial event analysis to examine the stock market impacts of *Newsweek's* corporate environmental rankings. While concerns about self-selection and self-reporting arise in many related studies, the rated firms in our context did not have the choice to opt in or opt out of the strictly external evaluation. Our event also had a sharply defined starting time, so we have an unusually clean setting for a capital market event study. Second, we go beyond the direct impact of the ratings to explore how the specific information format affected market outcomes. Unlike many studies that evaluated single metric information releases, our setting allows us to investigate which specific environmental ratings impacted markets and which specific environmental ratings did not. Third, we explore the possible channels linking corporate-level environmental information to financial outcomes. These underlying mechanisms are very poorly understood in the existing literature, and we know of no other empirical study that systematically evaluates all of the major possible channels for a single setting.

We find that the 2009 *Newsweek* rankings had a substantial impact. Highly-rated firms had abnormal returns following the disclosure event that were 0.6 – 1.0 percent higher than the returns of firms rated poorly. We also find that the form of the information disclosed mattered a great deal. Only the aggregate 1-500 rankings mattered; more nuanced individual metrics like overall green score, environmental impact score, or environmental policy score had no independent market impact. Finally, we find suggestive, but not definitive, evidence that private and public politics channels are the most compelling link between the *Newsweek* rankings and observed financial market outcomes. While our channel explorations do not necessarily shed light on mechanisms driving other information settings, our analysis does provide a roadmap for future research in the area.

The remainder of the paper is organized as follows. Section 2 provides necessary background and Section 3 describes the data used. We lay out our empirical approach in Section 4. Section 5 presents our basic market impact results, Section 6 presents results from our information format and channels explorations, and Section 7 concludes.

2. Background

In this section, we provide context for our study. We first describe the nature of the Newsweek rankings and the publicity the rankings received. We then discuss the novelty of the information and the implications for our research strategy. We close with a discussion of the closely related literature.

2.1 The *Newsweek* rankings

On Monday, September 21, 2009, *Newsweek* magazine released an issue with a distinctive green cover and the headline "The Greenest Big Companies in America: An Exclusive Ranking."[2] The cover story evaluated the environmental performance of the 500 largest US companies by revenue, market capitalization, and number of employees. According to the magazine, "this is the first time a media organization ranked companies in this way. Most green lists are anecdotal---ours is the result of a massive database research project."

An independent advisory panel of academics, environmental NGO representatives, and media partners oversaw a rankings process. Each company's ranking was based on a 0-100 overall green score composed of three separate factors: (1) environmental impact, which was computed using data provided by the private environmental accounting firm Trucost; (2) a green policies score, which was based on 'environmental strength' measures developed by the social

[2] The date printed on the magazine's cover is September 28, 2009. This date, however, indicates the newsstand 'pull' date and not the publication date.

investment firm KLD Research and Analytics; and (3) a reputation score, which was calculated from CorporateRegister.com surveys of corporate social responsibility professionals, academics, environmental experts, and industry executives. Environmental impact scores were meant to measure factors like greenhouse gas emissions, water use, solid waste disposal, conventional air pollution, and toxic releases, all calculated per dollar of revenue. Green policy scores were designed to capture proactive environmental management, climate change policies and performance, pollution policies and performance, and product impacts relative to others within the same industry. Reputation scores were developed to reflect perceptions about whether the firm was a leader or laggard within its sector on environmental performance, commitment, and communications. The three component scores were standardized and averaged into an overall green score using weights of 45% environmental impact, 45% green policies, and 10% reputation. Sector-neutral scores based on reputation and internal policies were deliberately given greater total weight than environmental impact in order to help facilitate meaningful comparisons across industries. The final weighted average overall green score determined the 1-500 performance ranking.

- Table 1 about here -

Table 1 replicates rankings and scores for the top 10 and the bottom 10 firms. For the top 100 firms, the print edition reported ranking, overall green score, impact score, policies score, and reputation score. For these firms, the ranking itself received the most prominent attention. For firms ranked 101-500, the print edition reported ranking and overall green score. The online edition reported all ratings for all firms, including impact score, policies score, and reputation score. However, even online, rankings were highlighted relative to other metrics. The importance of rank was reinforced in the text, as the article referred to ‘No. 4 Intel’, ‘No. 59 Walmart’, etc.

The article implied that the top 100 firms were particularly notable performers. As noted, the print edition provided greater score detail for the top 100. Further, the article stated that "many of the companies that finished in our top 100 are recognized leaders in sustainability."

2.2 Publication, coverage, and publicity

Newsweek's "Greenest Big Companies in America" issue arrived on newsstands and was published online on Monday, September 21, 2009. At this time, the magazine's circulation was approximately 1.97 million. We are unable to obtain the exact number of page views for the internet version of the story. However, we are able to use Google Trends to approximate the frequency of internet searches related to the *Newsweek* rankings around the time of the story. During the week of September 20 - 26 (the event week), Google searches for "Newsweek and green" were 122 times the average volume from January 2004 to December 2009. For the week of September 27 to October 3 (the week after the event), searches were 119 times the average volume. For the week of October 4 to 10 (2 weeks after the event), searches were 86 times average volume. Google Trends uncovered no abnormal search volume for any other week. These results suggest that the public responded to the *Newsweek* story by seeking more information about the rankings online.

In addition to *Newsweek*'s own print and online circulation, the story received substantial follow-up coverage in other media outlets. Blogs and trade outlets gave the story considerable attention beginning late Monday, September 21 and lasting through Friday, September 25. Larger media outlets, including the Wall Street Journal, CNN, and MSN, carried the story throughout the week as well. However, most of the large media outlet coverage appeared later in the week, beginning on Wednesday. Local media continued to carry the story into the following week.

While the *Newsweek* article itself suggested that the Top 100 firms in its ranking were environmental leaders, the broader media took many different approaches to covering the story. A particularly common form of coverage listed the overall top 5 to 20 companies by name. Another common strategy was to choose an industry and discuss best and worst performers from that industry. A small number of stories listed the overall worst performers. Like *Newsweek*'s own treatment, nearly all external coverage focused on performance rank only.

2.3 The novelty of the information

Searches on Lexis-Nexis, Google News, Google, and Factiva found no web or media coverage of *Newsweek* rankings prior to the September 21, 2009 publication date. Google Trends identified no significant internet search volume spikes for "Newsweek and green" or "Newsweek and environment" prior to September 21. This suggests that it is very unlikely that our event was significantly anticipated. Lack of public discussion prior to the story is perhaps not surprising, as the magazine had strong incentives to maximize impact by preventing leakage.

Nevertheless, it is surely true that at least some, and perhaps much, of the information underpinning the ratings was known to select market participants ahead of time. At least a subset of highly motivated investors formed their own expectations about individual companies' environmental performance prior to September 21, 2009. This is especially likely because *Newsweek*'s scores mostly reflected Trucost and KLD data that could have been obtained prior to publication. Of course, overall corporate environmental performance is extremely complex, and even well-informed investors may have updated their own beliefs after seeing this prominent new aggregation.

More importantly, environmental performance rankings would be potentially novel to markets even if every individual investor was already fully aware of the information. As long as investors believed that the environmental information would be considered novel to *some* stakeholders, the information release would cause investors to revise their expectations about individual companies' environmental opportunities and challenges. For example, if some investors believed that consumers would respond to the highly public *Newsweek* rankings, those investors would adjust their beliefs about the present value of the firm's profitability. In short, stock prices may be expected to change even if investors themselves were fully informed about the information content.

2.4 Related Literature

Our analysis of the impact of the 2009 *Newsweek* sustainability ratings builds on existing empirical studies that explore environmental transparency. One strand of related research broadly links environmental information disclosure to changes in environmental outcomes and risks (Blackman et al. 2004; Garcia et al. 2007; Shimshack et al. 2007; Bennear and Olmstead 2008; Garcia et al. 2009; Delmas et al. 2010). Our more specific point of departure is the environmental event study literature. Here, evidence suggests that stock markets respond to environmental transparency by punishing firms with poor environmental records (Laplante and Lanoie 1994; Hamilton 1995; Konar and Cohen 1996; Khanna et al. 1998; Gupta and Goldar 2005; Beatty and Shimshack 2010). Evidence on the market response to positive environmental news is less readily available, and generally more ambiguous. In some cases, stock markets reward exemplary performance (Klassen and McLaughlin 1996; Dasgupta, Laplante, and Mamingi 2001; King and Lenox 2001). In others cases, good performers seem to receive no

abnormal returns (Beatty and Shimshack 2010) or even experience negative returns (Lyon et al. 2011).

We also contribute to the emerging literature on how the form of disclosure affects its impact. The existing research suggests that environmental information has more impact when it is processed into a readily interpreted form (Bae et al. 2010). Some studies suggest that disclosure is most effective when it uses ratings categories that appropriately reflect underlying performance differences (Heinzle and Wustenhagen 2010). However, the state of knowledge regarding the relationship between the structure of disclosure and outcomes remains sparse.

The literature exploring the channels through which disclosure has its effects is particularly unsettled. Building on the work of Tietenberg (1998), Powers et al. (2011) identify several channels through which disclosure might work. All identified mechanisms have found at least tentative empirical support in the literature: output market pressures (Teisl et al. 2002); input market pressures, especially from capital markets (Hamilton 1995; Konar and Cohen 1996; Klassen and McLaughlin 1996; Khanna et al. 1998; King and Lenox 2001; Gupta and Goldar 2005; Beatty and Shimshack 2010); judicial and regulatory pressures (Muoghalu et al. 1990; Blacconiere and Patton 1994; Decker 2003; Garcia et al. 2009); community pressures (Powers et al. 2010); and managerial information (Blackman et al. 2004; Powers et al. 2011). All of the papers cited here make important contributions, yet none systematically evaluated which of these many possible channels is the most important for the particular setting.

3. Data

Our goal is to estimate market responses to *Newsweek*'s green ratings and to understand the determinants of those responses. Consequently, we match environmental ranking and score

data with financial market data at the company level. We use performance rankings and scores from *Newsweek* and Newsweek.com's 2009 "Greenest Big Companies in America" story. We use historical New York Stock Exchange (NYSE) and National Association of Securities Dealers Automated Quotations (NASDAQ) daily stock data obtained from Google Finance. We use firm characteristics data from the CompuStat financial database. S&P500 index returns data comes from Google Finance and Wilshire4500 index returns data comes from Wilshire.com.

Our final sample includes 492 of the 500 originally rated firms. We omit one firm because its score was incorrectly reported in print but corrected online. We omit seven other firms because of incomplete or potentially inaccurate stock market data, most often because the company was acquired during our sample period.[3] The remaining 492 firms have complete market returns data for the entire sample period.

Adjusted daily closing prices for each security and our two market indices are directly observed. To control for firm scale across securities, we follow convention and use daily returns as the basic unit of analysis. Logarithmic returns represent gains (losses) of the current day's adjusted close price relative to the previous adjusted close prices. Returns are expressed as percentages and are calculated as $\log (close_t / close_{t-1})$.[4]

Our sample period begins one full year before the September 21, 2009 *Newsweek* story. Our "estimation window," or the pre-event calibration time frame, spans the 251 trading days between Monday, September 22, 2008 and Friday, September 18, 2009. We chose one full year to maintain day-of-week, week-of-month, and month-of-year balance throughout the estimation window. The "event window," or the period of expected information impact, begins following the information release and continues for several trading days. In our main analysis, the event

[3] The 8 omitted firms are Schering Plough, ConAgra, Wyeth, Affiliated Computer Services, Lorillard, Virgin Media, McCormick, and Hewitt Associates.

[4] Results are also robust to the use of simple arithmetic returns calculated as $(close_t - close_{t-1}) / close_{t-1}$.

window begins the first possible trading day after publication and dissemination of the *Newsweek* story (Tuesday, September 22, 2009) and continues through the end of the trading week (Friday, September 24, 2009).[5]

3.1 Industry-specific summary statistics

Table 2 presents summary statistics for the full sample and by industry. We use *Newsweek* and Newsweek.com's exact sector designations, which are based on the Dow Jones Industry Classification Benchmark. As expected, the mean rank for the full sample is 250 and 20 percent of firms in the full sample are ranked in the top 100. The mean overall green score is 70.5 points out of a possible 100. Mean company characteristics for fiscal year 2008 were: $19.2 billion in sales; $1.69 in earnings per share; and $0.03 in advertising expenditures per dollar of sales. The average Tobin's Q, a common measure of market value to book value, was 1.57.[6]

- Table 2 about here -

The combined results of Tables 1 and 2 suggest that final rankings do not appear to be sector-neutral, even though overall green scores were designed with disproportionate weight attached to sector-neutral metrics. Firms in the retail, financial services, pharmaceuticals, banks and insurance, technology, and consumer product sectors received favorable performance ratings on average. Technology companies were overrepresented in the top 10. Firms in the utilities, health care, basic materials, and oil and gas sectors received unfavorable performance ratings on average. Utilities were overrepresented in the bottom 10.

[5] Results are also robust to different estimation and event windows. For example, our results are robust to significantly shorter estimation window lengths and event windows beginning Monday, September 21 and/or ending Thursday, September 24.

[6] We calculated Tobin's Q as: [(price of common stock × common stock outstanding) + (the liquidating value of preferred stock) + (total liabilities)] / total assets. Since total liabilities were not reported for several firms in the Compustat database, we followed the literature and calculated liabilities as total assets – total common equity. Using Compustat variable names, our complete Tobin Q calculation is: [(prcc_f*csho)+pstkl+(at-ceq)]/at.

Table 2 also demonstrates that firm characteristics differed substantially by industry. On average, oil/gas and retail companies were large and financial services, industrial goods, and utility companies were comparatively small. Transportation and oil/gas firms had high earnings per share while banks/insurance and media/travel/leisure firms experienced net losses, on average. Pharmaceutical and food/beverage companies had relatively high Tobin's Q measures, and consumer products/car companies had relatively high advertising expenditures per dollar of sales.

3.2 Performance rating correlations

As noted in Section 2, environmental rankings were based on overall green scores that were calculated as the weighted average of environmental impact scores, green policy scores, and reputation scores. The final rankings received the vast majority of attention in the *Newsweek* text and in the broader media coverage, and the print edition only presented rankings and overall green scores for firms ranked outside of the top 100. However, component metrics were presented online for all firms. Table 3 presents a performance rating correlation matrix for all metrics.

- Table 3 about here -

We note several features of Table 3. As expected, overall rank is very strongly negatively correlated with the overall green score and top 100 rank is very strongly positively correlated with the overall green score. Similarly, many of the individual metrics determining the overall green score are highly collinear. The overall green score, the green policies score, and the reputation survey score are strongly positively correlated with one another. However, the environmental impact score is negatively, albeit weakly, correlated with other metrics. A

potential implication is that the environmental impact score may be expected to contain somewhat different information than the other metrics, and therefore this score may be the most likely to influence returns independently of overall rank or overall green score.

4. Basic empirical approach

Our methodological point of departure is the financial event study literature as originally developed in Ball and Brown (1968) and Fama et al. (1969) and summarized in MacKinlay (1997). To abstract away from general market influences, we use a market model to compute abnormal returns. Abnormal returns reflect the difference between observed returns for a given security on a given day and predicted returns for the same security on the same day. Predicted returns are based on the performance of the overall market. Our main analysis then examines the determinants of these abnormal returns during the event window. Most notably, we explore the relationship between *Newsweek* environmental performance ratings and abnormal returns for a several-day period following the information release.

4.1 The market model

Our first empirical step is to relate individual companies' returns to overall market returns. For each firm, we regress the company's daily stock returns on daily returns for the market as a whole. We perform this analysis for the pre-event estimation window only, since we wish to identify co-movement between the individual stock's returns and market returns absent the impact of the event. For each rated company i and day t of the 251 trading day pre-event estimation window, we relate return $R_{i,t}$ on day t to overall market return $R_{m,t}$:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + u_{i,t}, \qquad (1)$$

where $u_{i,t}$ is a mean zero, finite error term with $E\left(u_{i,t}\right)=0$ and $\text{var}(u_{i,t})=\sigma^2_{u_{i,t}}$.

Our main analysis uses the Standard & Poor's (S&P) 500 index as our market returns measure $R_{m,t}$. This index contains large cap stocks traded on both NYSE and NASDAQ markets. Our 492 rated companies are the largest firms by revenue, so they overlap significantly with S&P500 firms. The advantage of the S&P500 index for market model purposes is that index returns have high predictive power for the returns of individual securities in our sample.[7]

- Figure 1 about here -

Figure 1 summarizes each of the firm-specific market model results in more detail. If a given stock tracked the S&P500 market index perfectly, its intercept coefficient would be zero and its slope coefficient would be one. Across all sample companies, the average regression intercept was 0.0002 and the average regression slope coefficient was 1.11. The mean intercept was statistically indistinguishable from zero, and all 492 individually estimated intercepts were statistically indistinguishable from zero as well. In other words, if the market index experienced zero returns on a given day, our sample firms experienced zero returns on that same day on average. The mean slope coefficient was statistically different from zero, and all 492 individually estimated slope coefficients were statistically different from zero as well. If the market index closed up (down) 1 percent on a given day, on average our sample firms closed up (down) 1.11 percent on that same day. The 274 firms with slope coefficients above one had magnified movements relative to the market as a whole, and the 218 firms with slope coefficients below one had dampened movements relative to the market as a whole. Our four greatest outliers were financial firms: XL Group, Lincoln National Corporation, CB Richard Ellis Group, and Principal

[7] We know of no obvious disadvantage of this index for calibration during the estimation window. The index may be endogenous, but this poses no problems when the regression is used for prediction rather than causal inference. We discuss the implications of an endogenous index for other aspects of our overall research design in Section 4.3.

Financial Group. If the market closed up (down) one percent on a given day during our estimation window, these four firms closed up (down) more than 2.5 percent that same day.

4.2 Abnormal returns and cumulative abnormal returns

Our second empirical step is to use the market model results to generate abnormal returns for individual securities. The market models represented by equation (1) and summarized in Figure 1 describe the typical relationship between a given security and the market as a whole during the pre-event estimation window. Predictions from these models can be used to calculate expected daily returns for a given security on a given day based upon the performance of the S&P500 index on that same day. For any rated firm *i* during the entire sample period (including both the estimation and event windows), *expected* returns $E\left(R_{i,t} \mid R_{m,t}\right)$ on day *t* are:

$$E\left(R_{i,t} \mid R_{m,t}\right) = \hat{\alpha}_i + \hat{\beta}_i R_{m,t} . \qquad (2)$$

Given expected returns, abnormal returns are the difference between the observed return, $R_{i,t}$, and the predicted return for that day, $E\left(R_{i,t} \mid R_{m,t}\right)$. More formally, for any rated firm *i*, *abnormal* returns $AR_{i,t}$ on day *t* are:

$$AR_{i,t} = R_{i,t} - E\left(R_{i,t} \mid R_{m,t}\right) = R_{i,t} - \hat{\alpha}_i - \hat{\beta}_i R_{m,t} . \qquad (3)$$

For example, suppose the S&P500 was up one percent on a given day. Our market model results suggest that we would predict Apple, Inc. to be up 0.90 percent that same day. If Apple were actually up 0.95 percent, its abnormal return for that day would be 0.05 percent (0.95 – 0.90).

The standard approach to explaining abnormal returns over multiple days in an event window is to aggregate abnormal returns across days to obtain *cumulative* abnormal returns. For example, cumulative abnormal returns might represent the total abnormal returns over an event

period spanning the first day following the information release to the last day of the trading week. For a given security, cumulative abnormal returns across days are calculated by simple summation. For an event occurring on day *t*, cumulative abnormal returns calculated over *d* subsequent event window days can be expressed as:

$$CAR_{i,d} = \sum_{k=t+1}^{t+d} AR_{i,k} \ . \qquad (4)$$

4.3 Statistical concerns: Event date clustering and cross-sectional dependence

A natural concern with the traditional event study methodology in our context is event date clustering. Event time and calendar time exactly coincide for all analyzed firms. In other words, the information event potentially affected all of the 492 largest companies on the same days. This poses two potential problems. First, our market measure $R_{m,t}$ may be endogenously influenced by the information event. The 492 large firms in our sample significantly overlap with the 500 large firms in the S&P500 index, so the market index used to predict returns during the event window is not strictly exogenous on these days.[8] One might mitigate the endogenous index difficulty by using a market index that contains none of the rated firms (like the Wilshire4500 small and mid cap index). However, the cross-sectional independence assumptions necessary to accurately calculate traditional event study test statistics will still be violated with significant event date clustering. This is a particularly important concern when the sample contains nearly all of the market's large firms, as our sample does. Collins and Dent (1984) and Sefcik and Thompson (1986) demonstrated with analytical and simulation exercises that magnitudes of errors in inference can be large even when sample size is large.

[8] High and low ratings should have opposing effects, so perhaps this concern is not important in practice. Nevertheless, it is inappropriate to simply assume that the middle of the pack received zero abnormal returns.

It is therefore not possible to infer whether a given firm, or a given set of firms, experienced statistically and practically significant net positive or negative abnormal returns in response to the *Newsweek* ratings event. Thus, our empirical analysis explores the determinants of abnormal returns rather than the simple presence of positive or negative abnormal returns (the simplest event study approach). Estimation details are presented in the next subsection, but the key point here is that *our empirical results are appropriately interpreted in a relative sense*. We will test, for example, if highly rated firms experienced significantly higher cumulative abnormal returns during the event window than poorly rated firms. We will not test if this difference represents rewards to good performers or penalties to poor performers (or both).[9]

4.4 Determinants of cumulative abnormal returns

In order to investigate the determinants of abnormal returns during the event window, we regress cumulative abnormal returns during the event window (calculated as described in sections 4.1 and 4.2) on *Newsweek*'s environmental performance ratings. Our simplest regression specification, for all rated firms *i,* can be written:

$$CAR_i = \alpha + \beta RATING_i + \varepsilon_i \ , \qquad (5)$$

where *CAR* are cumulative abnormal returns, α and β are coefficients, and ε are the usual idiosyncratic error terms. *RATING* may refer to the firm's 1-500 overall environmental performance ranking or may represent a 0/1 dummy variable indicating if the firm is ranked among the top 100 performers. Recall that the *Newsweek* article singles out the top 100 firms as leaders in sustainability. β is the coefficient of most direct interest, and it represents the average

[9] The existing literature offers suggestive results. The evidence consistently finds that firms with publicly disclosed poor environmental records are punished (Hamilton 1995; Klassen and McLaughlin 1996; Konar and Cohen 1996; Khanna et al. 1998; Gupta and Goldar 2005; Beatty and Shimshack 2010). Evidence definitively demonstrating that firms with publicly disclosed positive environmental records are rewarded is comparatively rare (Klassen and McLaughlin 1996; King and Lenox 2001).

impact of a one unit increase in the rating on cumulative abnormal returns during the event window.

Tables 1 and 2 demonstrated that ratings may be strongly correlated with industrial sector. We therefore augment regressions of the form (5) with additional specifications that include industry fixed effects. For firm *i* in industry *j*, the extended specifications can be written:

$$CAR_{ij} = \alpha + \theta_j + \beta RATING_{ij} + \varepsilon_{ij} \ , \qquad (6)$$

where θ_j are *j*-1 industry fixed effects.

Environmental performance ratings may also be correlated with firm-level characteristics beyond industrial sector. We therefore estimate specifications of the form (6) that also include firm size as measured by sales revenue, profitability as measured by earnings per share, and market value relative to book value as measured by Tobin's Q.[10] For covariate and parameter vectors X and Γ, these specifications are:

$$CAR_{ij} = \alpha + \theta_j + \beta RATING_{ij} + X_{ij}\Gamma + \varepsilon_{ij} \ . \qquad (7)$$

Finally, we supplement regressions of the form (7) with specifications that group *Newsweek* rankings into five categories: (1) ranking in the top 100, (2) ranking between 101 and 200, (3) ranking between 201 and 300, (4) ranking between 301 and 400, and (5) ranking between 401 and 500. In regressions with categorical ranking variables, category (3) is omitted and all coefficients are interpreted relative to this middle-of-the-pack group. We test null hypotheses of no difference between categories against alternative hypotheses that good performers exhibit higher cumulative abnormal returns than middle of the pack performers and that poor performers exhibit lower cumulative abnormal returns than middle of the pack performers.

[10] We are unable to obtain firm-level characteristics for 2 of our 492 firms, so relevant analyses omit these companies.

5. Basic results

In this section, we report our main empirical findings. We start with a discussion of the relationships between *Newsweek* green ratings and cumulative abnormal returns. We also examine whether the results are driven by industrial sector heterogeneity or firm-level characteristics. We then conduct a number of sensitivity analyses to establish the robustness of our main findings.

5.1 The relationship between performance ratings and cumulative abnormal returns

Table 4 presents our main regression results, with findings presented for two different event window lengths per specification. Standard errors are presented in parentheses below coefficient estimates. For presentation purposes, all coefficients and standard errors are scaled by a factor of 100, such that a coefficient of 1.00 represents a one percent increase in cumulative abnormal returns over the event window. Before turning to our main results, we note that F statistics suggest our independent variables explain significant portions of the variability in cumulative abnormal returns during the event window.

Results from specifications (1a) and (1b) indicate that rank coefficients are significantly negative. Cumulative abnormal returns after the information release are a decreasing function of *Newsweek* ranking. Results from specifications (2a), (2b), (3a), and (3b) demonstrate that significant negative coefficients are highly robust to conditioning on industry and other covariates. Point estimates and standard errors remain largely unchanged. Most firm-level control variables are not statistically significant, suggesting that cumulative abnormal returns during the event window are not correlated with most firm-level characteristics after controlling

for industry. Profitability, as measured by earnings per share, is positively related to cumulative abnormal returns during the event window.

- Table 4 about here -

Key results are readily interpretable. Three days after the event, cumulative abnormal returns were approximately two one-thousandths of a percent lower for each one unit increase in rank. Four days after the event, cumulative abnormal returns remained approximately two one-thousandths of a percent lower for each one unit increase in rank. In other words, after conditioning on industry and firm covariates, a ranking that was 100 places more favorable (i.e. rank 50 vs. 150) was associated with a 0.2 percent increase in cumulative abnormal returns over the four days following the information release.

Table 4's results for specifications (4a) and (4b) reinforce the above findings. Coefficients on Top 100 dummy variables are significantly positive. Cumulative abnormal returns after the information release are an increasing function of being named a top 100 performer. After conditioning on industry and firm covariates, firms ranked in the top 100 experienced cumulative abnormal returns over a three day event window that were 0.73 percent higher than returns for firms ranked 101-500, on average. Four days after the event, cumulative abnormal returns for firms in the top 100 remained a full 0.62 percent higher than returns for firms ranked outside of the top 100.

Categorical specification results in Table 4 are also consistent. After conditioning on industry and firm covariates, firms ranked in the top 100 experienced cumulative abnormal returns during the event week that were 0.79 - 0.99 percent higher than cumulative abnormal returns for firms ranked 201-300, on average. We also find suggestive evidence that firms ranked 101-200 experienced cumulative abnormal returns that were somewhat higher than returns for

firms ranked 201-300. In contrast, differences in cumulative abnormal returns between firms receiving middle of the pack rankings and firms receiving poor rankings were generally small in magnitude and not statistically significant. More precisely, firms ranking 301-400 and 401-500 experienced cumulative abnormal returns that were not statistically different than cumulative abnormal returns for firms ranking 201-300.

5.2 Robustness

Our results are consistent across several specifications, but possible concerns remain. Findings may be driven by omitted factors or events unrelated to the *Newsweek* story event. Perhaps the event itself was largely anticipated. Alternatively, an endogenous market index might have influenced our results. In this section, we present results from a number of sensitivity analyses designed to address these concerns.

Our first sensitivity check involves falsification tests which replicate all previous analyses for the weeks preceding the event window. Table 5 presents a summary of falsification tests results. In marked contrast to the results in Table 4, we find no evidence for a negative relationship between *Newsweek* ranking and cumulative abnormal returns for any of the six weeks prior to the event. Nearly all estimated coefficients are statistically insignificant at conventional levels. The sole statistically significant coefficient is positive rather than negative. Two implications follow. First, we find no evidence supporting the hypothesis that the *Newsweek* information was significantly anticipated or leaked. Second, the lack of a systematic relationship between environmental performance rankings and cumulative abnormal returns during other weeks suggests that our key results in Table 4 are unlikely to be driven by omitted unobserved factors. Firms with good rankings did not *typically* receive unexpectedly high returns relative to

firms with poor rankings during the estimation window; these firms *only* received unexpectedly high relative returns during the week of the information release.

- Table 5 about here -

It remains possible that an event unrelated to the *Newsweek* rankings might drive our key results if: (a) that event occurred during our event week and (b) that event differentially impacted highly rated firms and poorly rated firms after controlling for industry and observable firm characteristics. We searched the Wall Street Journal and the business and financial section of the New York Times for our event week. The only potentially significant large-scale shock to business during the event week was a Fed Open Market committee announcement of a reduction in mortgage assistance programs. It is difficult to imagine that this Fed announcement favored good environmental performers relative to poor environmental performers, after controlling for industry, size, profitability, and Tobin's Q. However, to ensure that our results are not driven by a handful of firms experiencing unusually high or unusually low returns due to the Fed announcement or another confounding event, we replicated the analyses in Table 4 omitting potential outliers. Specifically, we repeated the analysis omitting all firms in the top ten percent and all firms in the bottom ten percent of the cumulative abnormal returns distribution during the event week. Reassuringly, results are qualitatively similar to those presented in Table 4. Point estimates are smaller, as expected, but cumulative abnormal returns remain related to rank in a statistically significant negative manner and cumulative abnormal returns remain related to the top 100 dummy variable in a statistically significant positive manner (even though sample size shrunk 20 percent).

As discussed in Section 4.3, it is possible that the S&P market index is endogenously influenced by the event itself. Therefore, as a sensitivity test, we replicated all analyses reflected

in Table 4 using the Wilshire4500 index as the regressor in our market model. The Whilshire4500 index measures the average performance of every traded firm with regularly available price data, save for the 500 largest firms making up the S&P500 index. The Whilshire4500 index is unlikely to be endogenously affected by the rankings themselves during the event week, since ratings only applied to the largest firms. Reassuringly, results are quantitatively and qualitatively similar to those presented in Table 4. Point estimates are similar in magnitude. Cumulative abnormal returns remain related to rank in a statistically significant negative manner and cumulative abnormal returns remain related to the top 100 dummy variable in a statistically significant positive manner.

A final possible concern is that our pre-event estimation window, September 2008 to September 2009, was a tumultuous period for US markets. In particular, overall markets fell precipitously between mid-September 2008 and mid-March 2009. We therefore replicated all analyses reflected in Table 4 using a shorter estimation window spanning Monday, March 23, 2009 to Friday, September 18, 2009. This period was characterized by few very large market swings and a steady increase in overall market returns. Reassuringly, results are quantitatively and qualitatively similar to those present in Table 4. Point estimates are nearly identical (very slightly smaller) in magnitude. Cumulative abnormal returns are related to rank in a statistically significant negative manner and to the Top 100 dummy variable in a statistically significant positive manner.

6. Further explorations

The above results demonstrate that the *Newsweek* information release affected market outcomes, and that the good performers received significantly higher cumulative abnormal

returns than poor performers. In this section, we explore these results in more detail. We first examine how market outcomes were affected by the information format. We then turn to the more complex, and more speculative, question of the relative importance of the alternative channels through which the disclosure had its effects.

6.1 The effects of information format

Which environmental metrics influenced outcomes? Which environmental metrics did not? Here, we first examine the impact of *Newsweek* rankings versus the impact of the *Newsweek* overall green scores used to calculate the rankings. We then explore the impacts of aggregate measures like rank versus component scores. All regressions take the general form of equation (7), but *RATING* is no longer restricted to ranking or a top 100 performer dummy. Additionally, multiple metrics may be included simultaneously.

Table 6 presents our information format results, with findings again presented for two different window lengths per specification. Standard errors are presented in parentheses below coefficient estimates. For presentation purposes and comparability to earlier results, all coefficients and standard errors are scaled by a factor of 100, such that a coefficient of 1.00 represents a one percent increase in cumulative abnormal returns over the event window.

- Table 6 about here -

Results from specifications (1a) and (1b) indicate that overall green score coefficients are significantly positive when included alone. After conditioning on industry and firm-level covariates, a ten point increase in overall green score is associated with a 0.28 percent increase in cumulative abnormal returns over the event week. However, the results from specifications (2a) and (2b) suggest that the impacts of green score are driven by a very strong correlation with the

more prominent rank metric. Coefficients on overall green score become small with standard errors approximately three to 20 times greater than estimated coefficients when both rank and score are included as explanatory variables. In contrast, rank coefficients are roughly similar in magnitude to those in Table 4. As plausibly expected with strong multicollinearity, rank is no longer statistically significant at conventional levels. Nevertheless, these results suggest that the prominent and easy-to-interpret Newsweek ranking affected abnormal returns while the less prominent and more difficult-to-interpret green score did not do so independently.

Results from specifications (3a) and (3b) indicate that coefficients on a disaggregated measure, policy score, are significantly positive when included alone. After conditioning on industry and firm characteristics, a ten point increase in policy score is associated with a 0.15 percent increase in cumulative abnormal returns over the event week. However, as with the overall green score, the results from specifications (4a) and (4b) suggest that the impact of policy score is driven by a very strong correlation with the more prominent rank metric. Coefficients on policy score become small with large standard errors, while coefficients on rank remain similar to originally estimated coefficients in Table 4.

Of course, Table 3 highlighted that rank, overall green score, policy score, and reputation score are highly collinear. Perhaps the best test, then, of the impact of disaggregated score metrics is the relatively uncorrelated environmental impact score. However, results from specifications (5a), (5b), (6a), and (6b) suggest that environmental impact has no significant influence on cumulative abnormal returns during the event window. Environmental impact score coefficients are not statistically significant, even when included alone. Collectively, the results of this subsection indicate that only the prominent and easy-to-interpret aggregate measure rank

affected abnormal returns; more subtle and less prominently displayed disaggregated measures had no impact, even when they may have contained novel information.[11]

6.2 Channels of Influence

How does environmental information disclosure work in our context? Which theoretical mechanisms drive observed market outcomes? The existing information disclosure literature suggests several possibilities, but provides few observational insights from the real world. Here, we systematically explore each of the major channels that may link Newsweek's performance ratings to market outcomes. Figure 2 summarizes theoretically possible mechanisms, including: (1) output market pressures, (2) input market pressures, (3) public and private politics pressures; and (4) managerial information.

- Figure 2 about here -

Our disclosure channel investigations combine educated judgments with empirical explorations. Educated judgments are based upon a qualitative synthesis of diverse literatures spanning business and society, economics, and public policy. Quantitative explorations generally take the form of:

$$CAR_{ij} = \alpha + \theta_j + \beta RATING_{ij} + \lambda Z_{ij} + \delta RATING_{ij} \times Z_{ij} + \varepsilon_{ij}, \qquad (8)$$

where *CAR* are cumulative abnormal returns; α, β, λ, and δ are coefficients; θ_j are j-1 industry fixed effects; Z are firm-level characteristics; and ε are the usual idiosyncratic error terms. Our key interest in this section is the interaction term $RATING \times Z$ and its coefficient δ. A statistically significant δ indicates that the impact of the *Newsweek* rating on cumulative abnormal returns

[11] Specifications that simultaneously include rank, overall green score, and the three disaggregated score metrics generate no statistically significant coefficients due to significant multicollinearity. Nevertheless, point estimates on rank remain reasonably robust. Signs remain negative and rank coefficient magnitudes are 40-70 percent of Table 4 rank coefficient magnitudes.

varies with the value of the firm-level characteristic *Z*. Full interaction results are presented in Table 7 and interpretation is discussed in the text below.

This subsection is exploratory. As with other papers in this literature, we are unable to precisely determine the mechanism(s) linking our information event and subsequent market outcomes. We are not claiming that the channels driving the market impacts of the *Newsweek* rankings necessarily apply to all environmental information events. Nevertheless, we believe the analysis that follows sheds light on the likely relative importance of alternative channels in one large-scale context and provides a starting point for future environmental disclosure research.

Input Markets

Scholars and policy makers often interpret event studies showing that stock markets respond to environmental news as evidence that investors have preferences for positive environmental performance. This is not necessarily true. Investor preferences may influence investment decisions, but an alternative argument is that wealth-maximizing investors update their beliefs about how *other* channels respond to disclosed environmental information.

We believe this latter argument is more important in our context. First, nearly all of the data in the *Newsweek* story was already available to investors. KLD, the source of the policy scores, has been providing data on corporate environmental performance since 1988. Indeed, KLD is the most widely used source of information for socially responsible investment funds. The correlation between policy scores and rank is -0.87 and the correlation between policy scores and overall green scores is 0.77. We also detect no statistical relationship between TruCost environmental impact score, the only metric with substantially distinct information, and cumulative abnormal returns during the event week. Second, the related literature detects no

significant financial market impact when small groups of investors publicly announce stock divestitures for social purposes. Other investors appear immediately willing to buy divested stocks (Davidson et al. 1995). While investor preference channels may be important in some contexts, we believe they are unlikely to systematically explain the significant link between *Newsweek* ratings and market outcomes.

Another possible input market channel is employee preferences. Business ethics researchers find positive associations between companies' social responsibility ratings and students' self-reported opinions of employment attractiveness (Turban and Greening 1996, Backhaus et al. 2002, and Albinger and Freeman 2000). However, if employee preferences for social responsibility drive financial outcomes on a large scale, socially oriented firms should be able to hire and retain employees at lower wages than less socially oriented firms. The empirical labor economics literature finds little evidence in support of this "donated labor" hypothesis (Frye et al. 2006, Goddeeris 1988, Leete 2001, Ruhm and Borkowski 2003). Employees at socially responsible firms are indeed paid lower observable wages on average, but the evidence to date suggests that wage differences disappear once worker, job, and workplace characteristics are included in empirical models. While employee preference channels may be important in some contexts, we believe they are unlikely to systematically explain the significant link between *Newsweek* ratings and market outcomes.

Output Markets

Emerging empirical evidence indicates that environmental performance is increasingly important to firms' institutional and business customers (Vandenbergh 2006-2007). Business-to-business or business-to-institution output market pressures may therefore help explain the

observed link between *Newsweek* ratings and market outcomes. When a major retailer like Wal-mart decides it can reduce waste, help the environment, and improve profitability simultaneously, the pursuit of such "win/win" outcomes can be a powerful driver of business behavior. Investors may have taken the *Newsweek* ratings to provide valuable insight into which firms in particular industries were well prepared to face pressure from large retailers for further environmental improvements. We discuss this possibility further below in the context of managerial information.

Final consumers may also be an exogenous source of output market pressure. Indeed, large marketing and environmental economics literatures find that social performance influences consumers' product perceptions, consumers' product responses, and consumers' willingness to pay. The rapidly growing number of "green claims" made on product packaging suggests that companies believe at least some final consumers prefer green products.[12]

Nevertheless, it is not clear that *Newsweek's* environmental ratings disclosure should have significantly impacted expected firm profitability through consumer channels. First, many of the 500 rated companies are not household names. Even in the consumer products sector, companies like Johnson Controls, Mohawk Industries, and D.R. Horton are difficult to associate with specific products. Second, many rated firms produce goods not sold directly to final consumers (e.g. U.S. Steel, United Technologies, Newmont Mining). Third, many of even the most familiar ranked firms make a wide variety of products not marketed under the parent company's name (e.g. Dow Chemical, Dupont, Proctor and Gamble).

We also empirically explored the consumer preference channel. Researchers commonly assume that advertising proxies for a company's consumer orientation (Arora and Cason 1995;

[12] See Terrachoice Group Inc.'s http://sinsofgreenwashing.org/ for more information on changes in the extent of 'green' labeling over time.

Khanna and Damon 1999; Beatty and Shimshack 2010). We therefore explored the interaction of advertising per dollar of sales and *Newsweek* environmental performance ratings. A large and statistically significant negative coefficient on the interaction between rank and advertising – and/or a large and statistically significant positive coefficient on the interaction between top 100 rank and advertising – would suggest that disclosed performance had a greater market impact for firms with greater consumer orientation. Results in specifications (1a), (1b), (1c), and (1d) of Table 7, however, reveal no such statistical relationship. Interaction coefficients are not statistically significant. Coefficient signs suggest that, if anything, the impact of environmental performance on cumulative abnormal returns is greater for firms with lower advertising (all else equal). While final consumer preference channels may be important in some contexts, we believe they are unlikely to systematically explain the significant link between *Newsweek* ratings and market outcomes.

Public and Private Politics

Firm-level environmental ratings information may affect expected firm profitability through public and private politics channels. Firms with disclosed good (poor) environmental performance may experience reduced (intensified) "public politics" pressures from regulators. A growing literature finds that firms respond strongly to current government oversight and to the perceived threat of future government actions (Gray and Shimshack 2011). Innes and Sam (2008) find that facilities with good environmental performance in any given period are rewarded with fewer inspections in future periods, and Decker (2003) finds that facilities with good environmental performance may receive environmental permits for new facilities more quickly. Similarly, firms with disclosed good (poor) environmental performance may experience

reduced (intensified) “private politics” pressures from activists. A growing literature indicates that environmental NGOs have significant impacts on corporate environmental behavior (Baron and Diermeier 2007; Eesley and Lenox 2006; Feddersen and Gilligan 2001; Innes 2006). Protests, boycotts, letter writing campaigns, proxy votes, or even citizen suits may become more legitimate and urgent in the presence of disclosed poor environmental performance.

We empirically tested two hypotheses related to politics channels. First, researchers frequently claim that bigger firms are more likely to become targets of environmental boycotts and environmentally oriented proxy votes (Gupta and Innes 2009; Lenox and Eesley 2009). Larger firms may also be more frequent targets of regulator actions. So, we explored the interaction of size and *Newsweek* environmental performance ratings. A large and statistically significant negative coefficient on the interaction between rank and size – and/or a large and statistically significant positive coefficient on the interaction between top 100 rank and size – would suggest that disclosed performance had a greater market impact for bigger firms. Results in specifications (2a) and (2b) of Table 7 provide suggestive, but not definitive, evidence that bigger firms are indeed more sensitive to environmental performance disclosure. The negative interaction of size and rank is statistically significant at the five percent level for an event window lasting three days and nearly significant at the ten percent level for an event window lasting four days.

Second, business strategy scholars increasingly posit that firms with powerful brands are more likely to become targets of NGO actions, because activist campaigns may reduce both sales and value embodied in the brand (Baron 2002; Conroy 2007). Firms with high brand asset values may be especially favorable targets for public regulators as well, as public penalties may indirectly leverage private politics pressures for high visibility firms. Thus, we explored the

interaction of Tobin's Q and *Newsweek* environmental performance ratings.[13] Recall that Tobin's Q is the ratio of the firm's market value to its book value, and values of Q above one indicate substantial intangible firm value that may be attributable to brand value.[14] A large and statistically significant negative coefficient on the interaction between rank and Tobin's Q – and/or a large and statistically significant positive coefficient on the interaction between top 100 rank and Tobin's Q – would suggest that disclosed performance had a greater market impact for firms with higher Tobin's Q. Results in specifications (3c) and (3d) of Table 7 provide suggestive, but not definitive, evidence that firms with higher Tobin's Q are more sensitive to environmental performance disclosure. The positive interaction of Tobin's Q and top 100 rank is statistically significant at the ten percent level for an event window lasting four days.

Educated judgments and empirical tests seem to support the role of politics channels. Public and private politics channels remain credible candidates to systematically explain the significant link between *Newsweek* ratings and market outcomes.

Managerial Information

A final possible mechanism is that environmental ratings provide information about managerial ability. Environmental disclosure may inform firm managers themselves about areas for improvement. Blackman et al. (2004) and Powers et al. (2011) find evidence to support this notion in Indonesia and India, respectively. The testable implication in our context is that poor environmental performers should experience positive abnormal returns relative to good

[13] An alternative approach would be to examine the interaction of brand value measures and environmental performance ratings. However, common brand valuation tools (Interbrand, Young and Rubicam, and Millward-Brown) are only appropriate measures of firms' consumer orientation for mono-brand and business-to-consumer companies. These restrictions exclude most of the 500 largest US firms included in the *Newsweek* rankings.

[14] Other factors, like managerial ability, human capital, or intellectual property may also contribute to intangible value and therefore Tobin's Q. However, if Tobin's Q is capturing human capital or intellectual property, we see no reason to expect a significant interaction effect between Q and Newsweek ratings. We discuss the managerial ability interpretation of Tobin's Q in the next subsection.

environmental performers, because poor rankings indicate the present of low-cost opportunities for improvement. However, our main results in Table 4 directly contradict this hypothesis.

A related possibility is that environmental disclosure may inform investors about managerial ability in general, as environmental performance may proxy for overall managerial ability. This might be especially important in industries targeted by Wal-mart or other major retailers for efficiency improvements. A testable implication is that firms where management was already believed to be good would be rewarded less by positive environmental news than firms where management was believed to be poor. Thus, we revisited the interaction of Tobin's Q and *Newsweek* environmental performance ratings. Recall again that Tobin's Q is the ratio of the firm's market value to its book value, and values above one indicate substantial intangible firm value that may be attributable to beliefs about overall managerial ability. A large and statistically significant positive coefficient on the interaction between rank and Tobin's Q – and/or a large and statistically significant negative coefficient on the interaction between top 100 rank and Tobin's Q – would suggest that disclosed performance had a greater impact for firms with lower Tobin's Q. However, as noted above, results in specifications (3a), (3b), (3c), and (3d) of Table 7 provide no support for this hypothesis. Firms with low Tobin's Q are less sensitive to ratings. While managerial information channels may be important in some contexts, we believe they are unlikely to systematically explain the significant link between *Newsweek* ratings and market outcomes.

7. Discussion and Conclusion

This paper analyzes the impact of a prominent, media-generated environmental rankings scheme for the largest companies in the U.S. We find strong evidence that *Newsweek*'s 2009

Green Rankings had a significant impact on rated firms' capital market performance, with firms in the Top 100 obtaining abnormal returns that were 0.6 – 1.0 percent greater than those of the Bottom 400. These are meaningful differences. A back of the envelope calculation suggests that the top 100 firms experienced a change in market value during the event week that was approximately $10.8 billion higher than the change in market value during the event week for 100 average firms ranked outside of the top 100, all else equal.[15]

Our detected market response, while broadly consistent with a growing empirical literature on environmental information disclosure, was not necessarily expected *a priori*. First, this was an unusual event. The 2009 *Newsweek* rankings were administered on a much larger scale than previous media-generated environmental ratings, and the information release reached an unusually diverse immediate audience. Second, the social influence of traditional newsweeklies was thought to be waning. Third, and perhaps most noteworthy, the data underpinning the ratings were already largely available to investors concerned about environmental issues.

One implication of the strong detected response is that market participants continue to believe environmental performance is important to at least some stakeholders. Investors also appear to believe that traditional media sources remain influential. Finally, markets evidently remain highly uncertain as to which firms are good environmental performers and which firms are poor environmental performers. If investors believed that all stakeholders had complete and accurate information, it is unlikely that the *Newsweek* ratings could have any effect at all.

This paper goes beyond characterizing market impacts alone; we also analyze how the format of the information disclosure affected market responses. Few existing studies address this

[15] The average firm in our sample had a 2009 market value of approximately $18 billion, so the market value of 100 average firms was $1800 billion. 0.6 percent of $1800 billion is $10.8 billion.

issue in detail. We find strong evidence that only the aggregate ranking had any impact on share prices. The underlying metrics, including the more novel environmental impact score, had no direct effect. Apparently, market response was a function of the ultimate horse race of the rankings themselves, rather than a nuanced assessment of the details lying beneath the rankings.

We also contribute early evidence on the channels through which disclosure operates. This is the most glaring gap in the disclosure literature, and without this knowledge it will be impossible for governments, third-party organization, and firms themselves to design environmental disclosure schemes for maximum impact. The fact that investors responded to the event, even though much of the information was available to motivated parties ahead of time, suggests that investors were unlikely to be aligning their money with their own preferences. Rather, investors appear to have their money follow those channels where they *think* media-generated environmental rankings might matter. Practical arguments and empirical tests fail to support employee preferences, output market pressures, and managerial information as influential channels linking the disclosure event with market beliefs. Both anecdotal and empirical evidence, however, provide suggestive evidence that private and public politics channels best explain the link between *Newsweek* rankings and market response. While we make no claim about which channels apply in other settings, our analysis provides provocative results for one prominent setting and suggests a roadmap for future mechanism research. And future study that makes progress on understanding disclosure channels will be valuable indeed.

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Figure 1. Market model results summary

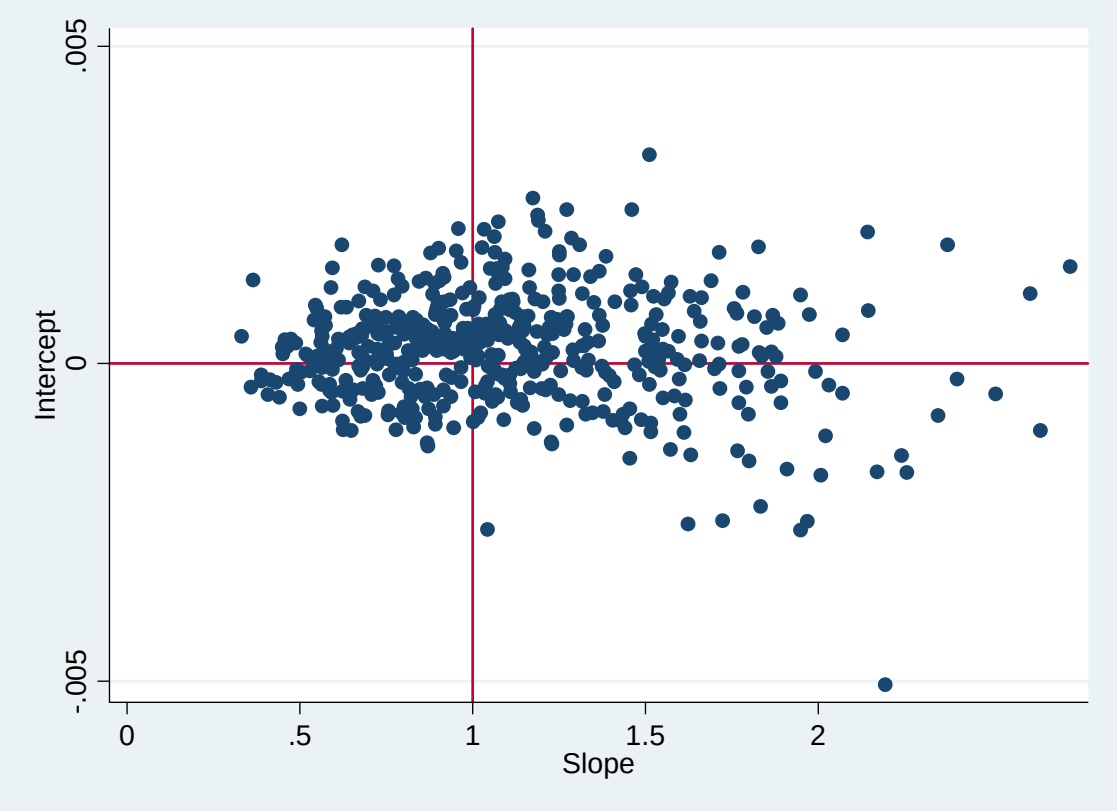

Figure 2. Environmental Information: Channels of Influence

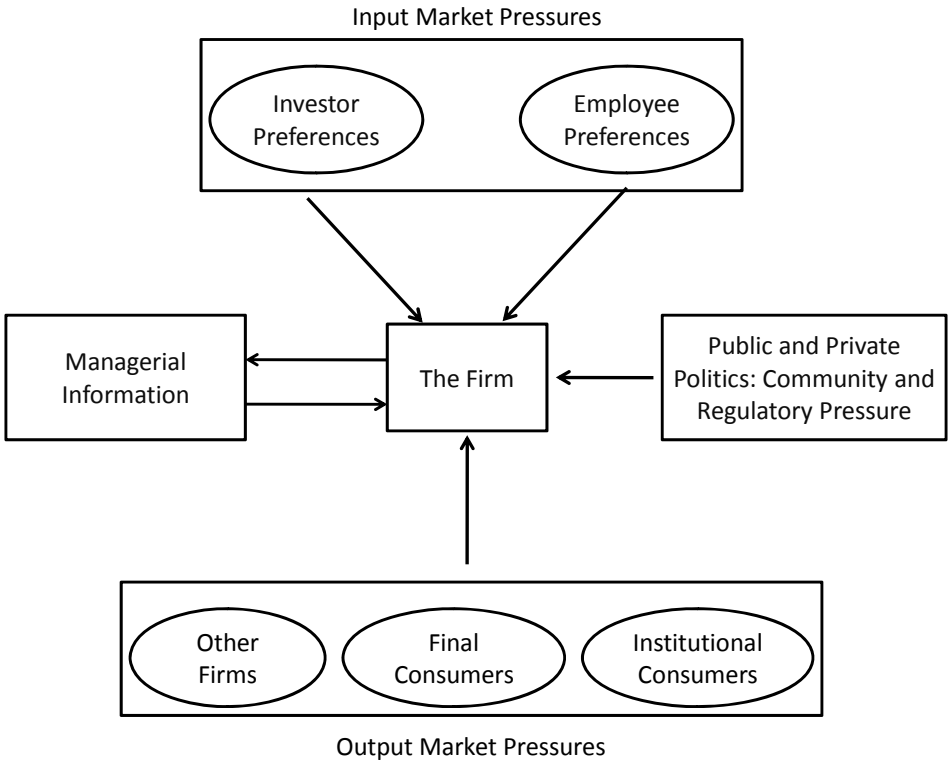

Table 1. Sample *Newsweek* rankings: Top 10 and bottom 10

Rank	Company	Industry Sector	Overall Green Score	Enviro. Impact Score	Green Policies Score	Reputation Survey Score
1	Hewlett-Packard	Technology	100.00	64.80	97.90	88.44
2	Dell	Technology	98.87	67.70	100.00	70.80
3	Johnson & Johnson	Pharmaceuticals	98.56	56.70	98.17	75.88
4	Intel	Technology	95.12	46.70	87.87	81.86
5	IBM	Technology	94.08	76.90	84.20	77.56
6	State Street	Financial Services	93.62	95.00	84.39	70.69
7	Nike	Consumer Products, Cars	93.28	77.10	78.31	89.90
8	Bristol Meyers Squibb	Pharmaceuticals	92.62	27.80	88.52	64.73
9	Applied Materials	Technology	91.79	50.90	89.51	44.51
10	Starbucks	Media, Travel, Leisure	91.63	30.50	82.01	75.42
490	Duke Energy	Utilities	44.91	1.60	48.32	58.59
491	First Energy	Utilities	43.15	2.40	16.89	32.46
492	Southern	Utilities	36.54	1.40	43.06	23.76
493	Bunge	Food and Beverage	33.96	2.20	3.95	21.11
494	American Elec. Power	Utilities	33.17	1.00	29.48	47.68
495	Ameren	Utilities	31.63	1.20	28.05	31.34
496	Consol Energy	Basic Materials	28.65	1.80	4.59	44.71
498	Allegheny Energy	Utilities	25.04	0.60	42.11	24.23
499	NRG Energy	Utilities	22.75	0.80	15.49	29.72
500	Peabody Energy	Basic Materials	1.00	0.20	16.12	42.26

NOTES: ConAgra was originally ranked 497 in the print edition, but this was due to a calculation error. The rank was subsequently changed online. We omit this firm from all analyses.

Table 2. Industry-specific summary statistics

Industry Sector	# of Firms	Mean Rank	% in Top 100	Score	Sales ($B)	Earnings Per Share ($)	Tobin Q	Advert. Expense per Dollar of Sales
FULL SAMPLE	492	250.4	20	70.5	19.209	1.69	1.57	0.03
Banks and Insurance	36	211.0	22	73.2	21.198	-0.47	1.06	0.01
Basic Materials	28	295.4	07	65.3	12.599	2.08	1.47	n/a
Consumer Products, Cars	29	223.8	28	73.0	16.651	0.65	1.73	0.06
Financial Services	29	195.9	24	73.8	9.851	1.64	1.55	0.03
Food and Beverages	26	274.0	23	67.6	18.147	2.17	1.87	0.04
General Industrials	28	227.7	25	71.8	15.563	1.77	1.41	n/a
Health Care	27	331.6	11	67.2	16.068	2.79	1.81	0.00
Industrial Goods	45	246.6	20	71.1	10.313	2.33	1.65	0.01
Media, Travel, Leisure	35	235.1	23	71.5	12.570	-0.45	1.47	0.03
Oil and Gas	31	294.6	03	69.0	47.399	3.86	1.30	n/a
Pharmaceuticals	16	197.5	38	74.8	16.022	1.63	2.48	0.04
Retail	52	186.4	23	73.8	32.140	1.16	1.60	0.03
Technology	52	216.0	35	74.6	20.370	1.44	1.77	0.02
Transportation, Aerospace	21	284.0	14	69.5	22.082	3.91	1.84	n/a
Utilities	37	383.9	03	58.1	10.837	2.48	1.12	n/a

Table 3. Performance Rating Correlation Matrix

	Rank	Top 100 Rank	Overall Green Score	Enviro. Impact Score	Green Policies Score	Reputation Survey Score
Rank	1.00		-	-	-	-
Top 100 Rank	-0.70**	1.00				
Overall Green Score	-0.88**	0.62**	1.00	-	-	-
Enviro. Impact Score	-0.19**	0.09*	0.28**	1.00	-	-
Green Policies Score	-0.87**	0.69**	0.77**	-0.10**	1.00	-
Reputation Survey Score	-0.48**	0.51**	0.43**	-0.09*	0.46**	1.00

NOTES: ** and * indicate statistically significant pairwise comparisons at the five and ten percent significant levels.

Table 4. Basic Results: Regressions of Cumulative Abnormal Returns on Performance Ratings

	(1a) 3-day CAR	(1b) 4-day CAR	(2a) 3-day CAR	(2b) 4-day CAR	(3a) 3-day CAR	(3b) 4-day CAR	(4a) 3-day CAR	(4b) 4-day CAR	(5a) 3-day CAR	(5b) 4-day CAR
Rank	-0.0021**	-0.0017**	-0.0023**	-0.0020**	-0.0022**	-0.0020**	-	-	-	-
	(0.0007)	(0.0008)	(0.0007)	(0.0009)	(0.0007)	(0.0009)				
Rank<= 100	-	-	-	-	-	-	0.739**	0.622**	0.789**	0.990**
							(0.255)	(0.300)	(0.322)	(0.378)
Ranking 101-200	-	-	-	-	-	-	-	-	0.348	0.823**
									(0.314)	(0.369)
Ranking 301-400	-	-	-	-	-	-	-	-	-0.267	0.056
									(0.319)	(0.374)
Ranking 401-500	-	-	-	-	-	-	-	-	0.048	0.503
									(0.333)	(0.391)
Industry Fixed Effects	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES
Sales	-	-	-	-	0.004	0.002	0.003	0.002	0.003	0.001
					(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Earnings Per Share	-	-	-	-	0.054**	0.047*	0.051**	0.044	0.052**	0.044
					(0.024)	(0.028)	(0.024)	(0.028)	(0.24)	(0.028)
Tobin's Q	-	-	-	-	-0.087	-0.026	-0.086	-0.024	-0.100	-0.042
					(0.133)	(0.157)	(0.134)	(0.157)	(0.134)	(0.157)
Constant	-0.090	-0.144	0.842*	0.849	0.743	0.750	-0.128	-0.028	-0.119	-0.366
	(0.201)	(0.237)	(0.454)	(0.532)	(0.487)	(0.574)	(0.388)	(0.457)	(0.458)	(0.535)
Observations	492	492	492	492	490	490	490	490	490	490
F-statistic	9.04**	4.54**	3.25**	3.30**	3.16**	2.92**	2.86**	3.12**	2.85**	2.79**
Prob > F	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTES: Standard errors in parentheses. *,** indicate statistical significance at the 10 and 5 percent levels. In specifications (5a) and (5b), the category "Rank 201-300" is omitted.

Table 5. Falsification Test Results:
Regressions of Cumulative Abnormal Returns on Performance Ratings for the First through Sixth Weeks Preceding the Event

	(1a) 3-day CAR	(1b) 4-day CAR	(2a) 3-day CAR	(2b) 4-day CAR	(3a) 3-day CAR	(3b) 4-day CAR	(4a) 3-day CAR	(4b) 4-day CAR	(5a) 3-day CAR	(5b) 4-day CAR	(6a) 3-day CAR	(6b) 4-day CAR
Rank	-0.0001	-0.0003	-0.0003	-0.0004	0.0013	0.0023**	-0.0023	-0.0015	-0.0004	-0.0007	-0.0007	-0.0007
	(0.0011)	(0.0012)	(0.0011)	(0.0012)	(.0010)	(0.0011)	(0.0018)	(0.0021)	(0.0009)	(0.0011)	(0.0008)	(0.0010)
Firm Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	490	490	490	490	490	490	490	490	490	490	490	490
F-statistic	3.01**	2.88**	2.98**	2.76**	3.06**	2.89**	2.98**	2.76**	2.61**	2.60**	2.99**	2.76**
Prob > F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTES: Standard errors in parentheses. *,** indicate statistical significance at the 10 and 5 percent levels. Specification number refers to the number of weeks preceding the event, so that specifications (3a) and (3b) are regressions of cumulative abnormal returns on environmental ranking for three week preceding the actual information event.

Table 6. Information Format Results: Regressions of Cumulative Abnormal Returns on Various Performance Ratings

	(1a) 3-day CAR	(1b) 4-day CAR	(2a) 3-day CAR	(2b) 4-day CAR	(3a) 3-day CAR	(3b) 4-day CAR	(4a) 3-day CAR	(4b) 4-day CAR	(5a) 3-day CAR	(5b) 4-day CAR	(6a) 3-day CAR	(6b) 4-day CAR
Rank	-	-	-0.0023	-0.0015	-	-	-0.0023	-0.0015	-	-	-0.0022**	-0.0020**
			(0.0015)	(0.0017)			(0.0018)	(0.0021)			(0.0007)	(0.0009)
Overall Score	0.028**	0.028**	-0.001	0.008	-	-	-	-	-	-	-	-
	(0.011)	(0.013)	(0.022)	(0.025)								
Policy Score	-	-	-	-	0.015**	0.014**	0.001	0.004	-	-	-	-
					(0.006)	(0.007)	(0.014)	(0.016)				
Impact Score	-	-	-	-	-	-	-	-	-0.002	0.000	-0.001	0.000
									(0.006)	(0.007)	(0.006)	(0.007)
Firm Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	490	490	490	490	490	490	490	490	490	490	490	490
F-statistic	3.01**	2.88**	2.98**	2.76**	3.06**	2.89**	2.98**	2.76**	2.61**	2.60**	2.99**	2.76**
Prob > F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTES: Standard errors in parentheses. *,** indicate statistical significance at the 10 and 5 percent levels.

Table 7. Channel Explorations: Regressions of Cumulative Abnormal Returns on Ratings Interactions

	(1a) 3-day CAR	(1b) 4-day CAR	(1c) 3-day CAR	(1d) 4-day CAR	(2a) 3-day CAR	(2b) 4-day CAR	(2c) 3-day CAR	(2d) 4-day CAR	(3a) 3-day CAR	(3b) 4-day CAR	(3c) 3-day CAR	(3d) 4-day CAR
Rank	-0.005**	-0.005**	-	-	-0.001	-0.001*	-	-	-0.004**	-0.003*	-	-
	(0.0018)	(0.0021)			(0.0008)	(0.0010)			(0.0016)	(0.0018)		
Top 100	-	-	0.802	0.493	-	-	0.678**	0.666**	-	-	0.551	-0.499
			(0.554)	(0.637)			(0.291)	(0.342)			(0.582)	(0.680)
ADV	-2.784	0.505	9.416	9.321	-	-	-	-	-	-	-	-
	(7.958)	(9.161)	(7.126)	(8.186)								
ADV × Rank	0.060	0.046	-	-	-	-	-	-	-	-	-	-
	(0.041)	(0.047)										
ADV × Top100	-	-	-5.10	-0.858	-	-	-	-	-	-	-	-
			(10.08)	(11.58)								
SIZE	-	-	-	-	0.0133**	0.0088	0.003	0.002	-	-	-	-
					(0.0049)	(0.0057)	(0.004)	(0.004)				
SIZE × Rank	-	-	-	-	-.00004**	-0.00003	-	-	-	-	-	-
					(0.00002)	(0.00002)						
SIZE × Top100	-	-	-	-	-	-	0.003	-0.001	-	-	-	-
							(0.006)	(0.007)				
TOBIN	-	-	-	-	-	-	-	-	-0.285	-0.160	-0.089	-0.139
									(0.253)	(0.297)	(0.148)	(0.173)
TOBIN × Rank	-	-	-	-	-	-	-	-	0.001	0.001	-	-
									(0.001)	(0.001)		
TOBIN × Top100	-	-	-	-	-	-	-	-	-	-	0.160	0.698*
											(0.312)	(0.365)
Industry FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	201	201	201	201	490	490	490	490	490	490	490	490
F-statistic	2.33**	1.65*	1.83**	1.24	3.34**	3.06**	3.01**	2.90**	2.96**	2.92**	2.91**	3.09**
Prob > F	0.01	0.08	0.05	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTES: Standard errors in parentheses. *,** indicate statistical significance at the 10 and 5 percent levels. ADV – advertising per dollar of sales. SIZE – firm size as measured by sales revenue. TOBIN – book to market value as measured by Tobin's Q.