

Financial Analysts, Firm Quality, and Social Responsibility

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We suggest that financial analysts have an incentive to follow the stocks of socially responsible companies, because such stocks meet the growing demands and psychology of the investment community, who want to combine the usual investment goals with social responsibility. Socially responsible investors prefer to hold stocks of companies they perceive as socially responsible or of high quality. Financial analysts then help brokers' marketing efforts by supplying investors with more analysis for stocks of socially responsible or high-quality companies. Using scores from Fortune surveys on perceptions of community and environmental responsibility as a measure of social responsibility and Fortune survey measures of quality as a measure of company quality, we find evidence that stocks of socially responsible and high-quality companies are indeed followed by more financial analysts. The positive relationship among social responsibility, company quality, and analyst following remains significant even after controlling for the effects on analyst following of firm size, share price, the volatility of stock returns, and market-to-book value of equity.

Recent accounting scandals at renowned companies like AOL Time Warner, Enron, Merck, Qwest Communications, WorldCom, and Xerox have raised serious concerns among investors about social responsibility and ethical issues in corporate America. This article suggests that investors prefer to put their money into stocks of companies they perceive as socially responsible and higher-quality than those they perceive as socially irresponsible or lower-quality. In return, brokerage firms respond to these preferences by steering their analysts and brokers toward socially responsible and high-quality companies.

Friedman [1970] was the first to define corporate social responsibility. He stated that "Corporate social responsibility is to conduct the business in accordance with shareholders' desires, which generally will be to make as much money as possible while conforming to the basic rules of society, both those embodied in law and those embodied in ethical custom."¹ We define high-quality firms as those that maintain their company reputation by making things like investor relations, environmental sensitivity, and social responsibility as their priorities.

Larson [1999] reports that as of November 1999, about \$2.2 trillion was invested in the United States in a socially responsible manner, an 82% increase from \$1.2 trillion in 1997. Socially responsible investing accounts for roughly 13% of the \$16.3 trillion under pro-

fessional management in the U.S.² According to the Social Investment Forum's (SIF) [2001] report on socially responsible investment trends, assets in socially screened portfolios rose from \$40 billion in 1984 to \$639 billion in 1995, and \$2.34 trillion in 2001. This makes the growth rate for socially responsible investing more than 1.5 times that of all professionally managed assets in the U.S.,³ which indicates an increasing trend toward conscious awareness of social responsibility in the investment community.

We ask whether financial analysts consider investor psychology when they evaluate and analyze corporate activities involving social responsibility or company quality issues. Existing literature provides little information. To answer this question, we examine the relationship among company quality, social responsibility, and analyst following.

For a behavioral finance perspective, we take the view that analysts are working alongside brokers as part of the brokerage firm's marketing team. In this way, we believe that additional insight into security analysis activities can be gained. We define "marketing" as the process by which companies identify the preferences of customers, design products to satisfy those preferences, and promote their products.

Companies allocate considerable resources to marketing their products. It is apparent from recent literature that the process of marketing financial products, with the goal of increasing firm visibility, is similar to marketing other products (see Merton [1987], Ross [1989], Brennan [1995], Chung, Jo, and Statman [1995], Chung and Jo [1996], Chung [2000], and Spiller [2000]).

Previous studies have discussed what factors determine the cross-sectional distribution of analyst services.

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Moyer, Chatfield, and Sisneros [1989] suggest that security analysts act as monitors of managerial performance, and that the number of analysts following a particular company is determined by the complexity of the company's agency problems. Bhushan [1989] considers various firm characteristics that can influence either the aggregate demand or supply of analyst services. He notes that, all else being equal, the demand for analyst services increases with firm size, but the cost of acquiring information does not vary with firm size. Thus, analyst following should be greater for larger companies.

Brennan and Hughes [1991] develop a model in which the dependence of brokerage commission rate on share price provides an incentive for brokers to produce research reports on companies with low share prices. That is, brokers receive higher commissions on lower-priced stocks. Brennan and Hughes [1991] find that the number of analysts following a company is inversely related to its share price. Chung and Jo [1996] and Chung [2000] present evidence that a greater number of analysts tend to follow high-quality companies.

Fortune magazine conducts annual surveys on perceptions of community and environmental responsibility and company quality. Using these surveys as a measure of social responsibility and quality, we find evidence that socially responsible or high-quality companies are followed by more analysts than socially irresponsible or low-quality companies. The positive correlation among social responsibility, company quality, and analyst following remains significant even after controlling for firm size, share price, stock return volatility, and market-to-book value of equity. The positive relationship between social responsibility (or company quality) and analyst following remains robust regardless of regressions based on levels or changes of variables.

Additionally, mean *Fortune* scores of social responsibility and company quality for companies included in the Institutional Brokers Estimate System (I/B/E/S) tape are significantly higher than those for companies not included in I/B/E/S. In general, companies with no analyst following are absent from I/B/E/S, so this provides additional support for the idea that financial analysts value social responsibility and company quality.

Based on these results, we conclude that financial analysts have an incentive to analyze stocks of socially responsible or high-quality companies because such stocks meet the growing demands of the investment community, which wants to combine traditional investment goals with social responsibility.

Investor Preference and the Role of Financial Analysts

A brokerage firm does not follow all stocks, just as a department store does not carry all brands of, say, wristwatches. However, some stocks are followed by

more analysts than others. The difference may lie in the marketing of a stock by a brokerage firm, which becomes more effective when more security analysts are following it.

We suggest that brokerage firms cater to investor preferences by concentrating their marketing efforts, including analyst following, on stocks of socially responsible and/or high-quality companies. The pivotal distinction in our framework is between socially responsible (high-quality) and socially irresponsible (low-quality) companies. First, socially responsible investing is a powerful concept, as socially responsible investors often use screening and shareholder advocacy to encourage corporate responsibility. Giacobbe and Segal [2000] and Spiller [2000] suggest that the creation and implementation of socially responsible codes of conduct have significant implications for marketing and finance professionals.

Second, our use of the term "corporate quality" is borrowed from the survey conducted by *Fortune* on the efficacy of a company's quality assurance, brand management, human resource evaluations, corporate communications, strategic planning, investor relations, environmental sensitivity, and R&D. Based on this annual survey, *Fortune* reports on America's most admired corporations and constructs America's Most Admired DataBook (AMAC).

This is different from the term as used by Arbel and Strebel [1983]. Arbel and Strebel discuss "neglected" companies, and argue that the distinction between high- and low-quality companies does not matter as much as that between companies with known (but possibly low) and unknown quality.

In our framework, the analyst's role is that of a marketing aid to brokers. Analysts provide tools, such as forecasts and recommendations that help brokers maximize transaction profits. There is a sharp contrast between this framework and that of Moyer, Chatfield, and Sisneros [1989], in which analysts act as monitors of management performance to control agency problems.

Our framework is similar to that of Brennan and Hughes [1991], though, who suggest that analysts help broker efforts to generate more transactions on lower-priced stocks by supplying more analysis for such stocks. Our framework differs from Brennan and Hughes in that our analysts also help brokers by addressing the preferences of brokerage clients (individuals as well as institutional investors). Brennan and Hughes' analysts do not consider such preferences. An implicit assumption in the Brennan and Hughes model is that investors are indifferent between high- and low-priced shares, although they are expected to pay higher trading commissions for lower-priced shares.

We argue that investors prefer stocks of socially responsible or high-quality companies to stocks of socially irresponsible or low-quality companies for at least three reasons. The first relates to moral views.

Some investors feel they are called, from a moral standpoint, to invest in socially responsible companies, regardless of financial returns. As an analogous example, consider vegetarians. Vegan vegetarians will not eat meat or purchase leather items. These views are not based on utility, but on their belief that it is unethical to harm living creatures even for sustenance. Many vegetarians also believe that organic foods are superior to traditionally raised crops because they have not been irradiated or exposed to pesticides. Again, views of this kind are largely based on the idea that "natural is better," rather than on a utilitarian view that organic foods may be healthier. Much of the ecology movement is based on views of this sort.

We claim that many investors purchase socially responsible stocks for similar reasons. Their personal ethical standards do not allow them to invest in companies that might be responsible for damaging the environment, maintaining sweatshops, breaking child labor laws, or other behaviors they deem irresponsible. These investors make a conscience trade-off between social responsibility and financial returns. In essence, they are willing to sacrifice returns for a clear conscience.

The second reason relates to the cognitive error of investors. Investors sometimes confuse the quality of a company with the profitability of investment in the company, i.e., they neglect the implications of the efficient markets hypothesis. Evidence suggests that investors tend to perceive stocks of high-quality companies as stocks that will have high expected returns. Early observers of this tendency include Graham and Dodd [1934] and Bernstein [1956]. More recent observers include Dreman [1977] and Shefrin and Statman [1995, p. 31], who attribute this proclivity to "representativeness," a common cognitive error described by Kahneman and Tversky [1973].

The third reason for investor attraction to socially responsible or high-quality stocks relates to the fiduciary responsibility of institutional investors. O'Brien and Bhushan [1990] argue that institutions require information not only to make decisions, but also to satisfy standards of fiduciary responsibility, such as the "prudent man" standard. O'Brien and Bhushan [1990] note that institutions seek stocks they perceive as "winners" to protect their trust officers from legal liability. They argue that large size could be a proxy for winners. In our study, we interpret the term "winners" to mean socially responsible or high-quality companies and believe it provides a closer proxy for quality than firm size.

The effect of prudent man rules on socially responsible stock preference is important because it increases the clientele for such stocks beyond those who only believe they will provide higher returns. Actually, not everyone believes that stocks of socially responsible or high-quality companies provide higher returns. Hamilton, Jo, and Statman [1993] find that the risk-adjusted

return for socially responsible funds is not significantly different from conventional mutual funds. Statman [2000] also reports that the risk-adjusted returns of the Domini Social Index, an index of socially responsible firms, and the S&P 500 Index over 1990 to 1998 are not statistically different.

In fact, there is considerable evidence that these stocks may yield lower returns. Shefrin and Statman [1995] find that high-quality companies generally have a high market value of equity and a low ratio of book-to-market value of equity. These are characteristics that Fama and French [1992, 1995] and others have associated with inferior returns. The effect of prudent man rules is significant because it induces brokers and money managers to act as if they prefer the stocks of socially responsible companies even if they realize that such a preference is unwise. Evidence shows that money managers are selecting stocks that minimize violations of the prudent man rule. Badrinath, Gay, and Kale [1989] and Del Guercio [1996] find that institutions, which are subject to the prudent man rule, shun stocks of low-quality companies. Similarly, Gross [1982, p. 176] advises brokers to avoid recommending stocks of low-quality companies because they are unlikely to provide adequate defense against claims of imprudence.

In short, investors prefer stocks of socially responsible or high-quality companies that meet their moral views and/or their fiduciary responsibility, and they believe that such stocks will provide high returns. This, in turn, makes it easier for brokers to pitch these stocks. Hence, we expect that the stocks of socially responsible or high-quality companies are followed by more analysts than those of socially irresponsible or low-quality companies. Similarly, we predict that more analysts are attracted to a company when there is an upward revision in the perceived social responsibility or quality of the company.

In the following sections, we examine the cross-sectional association between the number of analysts following a company and the *Fortune* scores on social responsibility and company quality to test our marketing assertion of analyst following. We also perform an empirical investigation based on year-to-year changes in these and other control variables.

Data and Descriptive Statistics

We use data from the *Fortune* magazine surveys as proxies for perceptions of company quality. We obtain the survey results from Occam Research, Inc., which manages the data for *Fortune*. *Fortune* has published the results from its survey of company quality annually since 1983, when the survey included 200 companies—the ten largest companies in America's twenty largest industries (Makin [1983]). Nearly 6,000 execu-

tives, outside directors, and financial analysts rate the companies on eight attributes on a scale of zero (poor) to ten (excellent). The attributes are quality of management; quality of products or services; innovativeness; value as a long-term investment; financial soundness; ability to attract, develop, and keep talented people; responsibility to the community and environment; and wise use of corporate assets.

Fortune surveys are distributed after Labor Day, administered from September through December, and published early in the following calendar year (usually February). We pooled the data from the nine *Fortune* surveys from 1990 through 1998. Table 1 reports descriptive statistics of the *Fortune* variables together with other characteristics for our final sample of companies.

While *Fortune* ranks the quality of a company by its average score based on the eight attributes, 82% of the survey respondents consider quality of management the most important. Only one attribute, community and environmental responsibility, relates to expectations of social responsibility. The remaining attributes, including quality of management, relate to the perception of quality of companies. The correlations among these eight attributes are reported in Table 2.

Note that there is a significant positive correlation between the *Fortune* score on community and environmental responsibility and the other scores on company quality, such as quality of management, innovativeness, ability to attract, develop, and keep talented people, and wise use of corporate assets. Thus, respon-

dents to *Fortune* surveys also appear to identify stocks of high-quality companies as stocks with social responsibility or good investment value. This result echoes previous studies that imply that market participants believe stocks of high-quality companies will outperform stocks of low-quality companies (see, e.g., Dreman [1977] and Shefrin and Statman [1995]).

High correlations between *Fortune* variables and social responsibility are also related to the "affect heuristic" of Finucane et al. [2000] and Slovic et al. [2002], who argue that people consult their affective feelings when they make decisions. Both studies suggest that people base their decisions not only on what they think, but also on what they feel. For example, if people like an activity, they tend to judge the risks of that activity as low and the benefits as high. Those who dislike the activity will tend to judge its risks as high and its benefits as low. From these studies, we can infer that affect is positively correlated with social responsibility, because investors will have positive feelings about doing good by investing in socially responsible securities.

A high correlation between the quality of management and community and environmental responsibility supports the notion of Sundman [2000] as well, who claims that a good manager should be a moral manager. Because the *Fortune* scores are highly correlated with each other, we focus on three measures: 1) quality of management as a measure of firm quality; 2) community and environmental responsibility as a measure of social responsibility; and 3) the composite score of

Table 1. Summary Statistics

	M	SD	Mdn	Percentile			
				5	25	75	95
Number of analysts following the firm (NAF)	21.8	8.5	22.0	8.0	16.0	27.0	37.0
<i>Fortune</i> Scores							
Quality of management	6.7	1.0	6.7	5.0	6.1	7.4	8.2
Quality of products or services	7.0	0.8	7.0	5.9	6.4	7.6	8.4
Innovativeness	6.2	0.9	6.1	4.8	5.5	6.8	7.6
Value as a long-term investment	6.3	1.0	6.3	4.8	5.6	6.9	7.8
Financial soundness	6.6	1.2	6.7	4.6	5.9	7.4	8.5
Ability to attract, develop, and keep talented people	6.3	0.9	6.3	4.9	5.7	6.9	7.9
Community and environmental responsibility (social responsibility)	6.3	0.7	6.2	5.3	5.8	6.8	7.6
Wise use of corporate assets	6.3	0.9	6.3	4.6	5.7	6.9	7.7
Composite score	6.5	0.8	6.4	5.1	5.9	7.0	7.8
Control Variables							
Market value of equity ^a	6,527	9,993	3,074	681	1,736	6,535	24,525
Book value of equity ^a	3,536	5,000	2,018	270	907	3,887	13,626
Market-to-book value of equity	2.8	7.1	1.6	0.7	1.1	2.7	7.2
Share price (\$)	48.0	35.2	41.7	16.4	28.9	57.6	94.7
Return variance (%)	4.2	7.9	3.0	2.1	4.4	9.7	

Note: NAF is the number of analysts making annual earnings forecasts (reported in *I/B/E/S*). Social responsibility and company quality scores are from the *Fortune* surveys on community and environmental responsibility and company quality. We pool the data from the nine *Fortune* surveys published from 1990 through 1998. Our pooled dataset consists of 1,320 time series and cross-sectional observations. The market value of equity, book value of equity, and share price data are obtained from Standard & Poor's Compustat tape. The variance of returns is calculated using data from the CRSP daily return file.

^aIn millions of dollars.

Table 2. *Correlations Among the Fortune Social Responsibility and Quality Measures*

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Quality of management (Q1)	1.00	0.80	0.83	0.88	0.76	0.90	0.57	0.93
Quality of products or services (Q2)		1.00	0.75	0.78	0.71	0.84	0.70	0.77
Innovativeness (Q3)			1.00	0.76	0.59	0.84	0.54	0.78
Value as a long-term investment (Q4)				1.00	0.90	0.92	0.69	0.91
Financial soundness (Q5)					1.00	0.85	0.70	0.84
Ability to attract, develop, and keep talented people (Q6)						1.00	0.72	0.89
Community and environmental responsibility (social responsibility) (Q7)	0.60							1.00
Wise use of corporate assets (Q8)								1.00

Note: Social responsibility and company quality scores are from the *Fortune* surveys on community and environmental responsibility and company quality. We pooled the data in the nine *Fortune* surveys published from 1990 through 1998. Our pooled dataset consists of 1,320 time series and cross-sectional observations.

the eight attributes as a measure of combined firm quality and social responsibility. The results based on the other *Fortune* quality scores are qualitatively identical to those presented below.

Using the *Fortune* scores as proxies for perceived quality has advantages and disadvantages. One advantage is that the surveys provide direct measures of perceptions of quality, while alternatives such as the S&P quality rankings are computed from accounting data. The *Fortune* surveys also provide a direct measure of perceptions of social responsibility, while S&P's ratings do not. As a disadvantage, the *Fortune* surveys include only a subset of all companies, and analysts are included among survey respondents along with executives and outside directors. However, the survey data are compiled separately for analysts and non-analysts for most survey years. Shefrin and Statman [1995] find that the correlation between perception of quality by analysts and non-analysts is very high, and there are no significant differences between the two.

We obtained the number of analysts following each company from I/B/E/S. The I/B/E/S database contains analysts' earnings forecasts from approximately 400 brokerage firms. We match the *Fortune* and I/B/E/S data by locating the number of analysts who had one-year-ahead earnings forecasts as of September of the appropriate year for each company in the *Fortune* sample. We obtained the market and book values of equity and the share price from Standard and Poor's Compustat tape. We calculate the variance of stock returns using data from the CRSP daily return file. Our pooled dataset consists of 1,320 time series and cross-sectional observations.

Empirical Results

Our first step is to regress the number of analysts following a company against each *Fortune* measure of social responsibility or company quality. Since we use data pooled from *Fortune* surveys over nine years, we

include dummy variables representing the annual surveys in our regression. The results reported in Table 3 show that the number of analysts following a company is positively and significantly related to its *Fortune* score on quality of management. There is also a positive and even more statistically significant relationship between the number of analysts following a company and the company's *Fortune* score on community and environmental responsibility.

We observe a similar relationship between analyst following and the *Fortune* combined score on company quality and social responsibility. Overall, the results are consistent with our hypothesis that it is easier for brokers to pitch stocks of socially responsible or high-quality companies, and analysts support broker marketing efforts by following such high-quality companies.

Analysts usually specialize in particular industries, probably because of the cost structure of analyst following. We expect to find that more analysts follow industries in which the mean social responsibility and/or mean quality of companies is high. We also expect that within an industry, socially responsible or high-quality companies will attract more analysts.

To clarify our argument, consider two extreme cases. In the first, the cost of following two companies in two different industries is identical to the cost of following two companies in the same industry. In this situation, to attract analysts, the only relevant score is the social responsibility or quality score of a company. There is no role for the mean social responsibility or mean quality score of companies in the industry.

Now consider the other extreme. When an analyst follows one company in a given industry, the marginal cost of following another company in the same industry is zero. To attract analysts in this situation, the only relevant social responsibility or quality score is the mean social responsibility or the mean quality score of the industry. There is no role here for the social responsibility or the quality score of a company.

In the intermediate case, there would be some (imperfect) economies of information in following compa-

Table 3. *Analyst Following as a Function of Social Responsibility or Company Quality*

	Results with Company Score			Results with Company and Industry Score		
Intercept	10.331 (5.60**)	12.045 (1.13)	0.313 (0.16)	24.768 (5.33**)	2.508 (0.66)	2.753 (0.64)
Quality of management (company score)	1.345 (5.47**)			1.657 (6.34**)		
Community and environmental responsibility (company score)		2.798 (10.66**)			2.816 (9.62**)	
Composite score (company score)			2.992 (10.26**)			3.085 (9.42**)
Quality of management (industry mean score)				0.835 (1.21)		
Community and environmental responsibility (industry mean score)					2.725 (4.59**)	
Composite score (industry mean score)						2.611 (3.97**)
Dummy variable for the 1991 survey	0.986 (0.86)	0.719 (0.65)	0.704 (0.63)	1.086 (0.95)	0.720 (0.65)	0.720 (0.64)
Dummy variable for the 1992 survey	0.284 (0.25)	-0.258 (-0.23)	-0.221 (-0.20)	0.405 (0.36)	-0.257 (-0.23)	-0.206 (-0.19)
Dummy variable for the 1993 survey	3.088 (2.75**)	2.681 (2.47**)	2.752 (2.53**)	3.286 (2.94**)	2.685 (2.47**)	2.786 (2.56**)
Dummy variable for the 1994 survey	3.276 (2.94**)	3.034 (2.82**)	3.035 (2.81**)	3.450 (3.11**)	3.037 (2.82**)	3.062 (2.83**)
Dummy variable for the 1995 survey	2.982 (2.64**)	2.600 (2.38**)	2.563 (2.34**)	3.161 (2.81**)	2.604 (2.39**)	2.588 (2.36**)
Dummy variable for the 1996 survey	3.645 (3.25**)	3.183 (2.93**)	3.231 (2.97**)	3.839 (3.43**)	3.186 (2.93**)	3.253 (2.99**)
Dummy variable for the 1997 survey	3.550 (3.14**)	3.010 (2.75**)	3.115 (2.84**)	3.689 (3.28**)	3.010 (2.75**)	3.127 (2.85**)
Dummy variable for the 1998 survey	3.681 (3.39**)	3.213 (3.06**)	3.560 (3.38**)	3.743 (3.46**)	3.213 (3.06**)	3.573 (3.40**)
F-value	6.42**	15.94**	14.99**	6.98**	14.33*	13.53**
Adjusted R ²	0.152	0.147	0.148	0.162	0.156	0.219

Note: Regressions are based on the levels of variables. Analyst following is the number of analysts making annual earnings forecasts (reported in I/B/E/S). Social responsibility and company quality scores are from the *Fortune* surveys on community and environmental responsibility and company quality. We pooled the data in the nine *Fortune* surveys published from 1990 through 1998. Our pooled dataset consists of 1,320 time series and cross-sectional observations (t-values are in parentheses).

**Significant at the 1% level. *Significant at the 5% level.

nies. So in this case, the social responsibility or quality score of a company and the mean social responsibility or mean quality score of the companies in an industry would both play a role in attracting analysts.

To examine these issues, we run regressions using both the *Fortune* score of quality of a company and the mean *Fortune* score of quality of companies in the same industry. As Table 3 shows, there is a positive and statistically significant relationship between analyst following and social responsibility or company quality. We also find a positive and statistically significant relationship between analyst following and the mean *Fortune* scores of social responsibility or quality of the company's industry. These results suggest that the intermediate case describes the economies of information that affect analyst following.

Although we do not distinguish between buy and sell side analysts here, we believe that social responsi-

bility should be more relevant on the buy side than the sell side, for at least two reasons. First is Odean's [1999] attention hypothesis. He argues that stock purchases are in part the result of an attention effect. Investors typically buy only a few stocks that have caught their attention, whether good or bad. Odean [1999] further argues that attention is less likely to matter for stock sales because of the fundamental difference between selling and buying. When individuals are looking for a stock to sell, they obviously limit their search to those stocks they currently own. But when buying stocks, there is a much wider range of possibilities to choose from, and factors more related to attention thus enter the decision.

The second reason is that brokers earn more commissions from buy side recommendations than sell side recommendations (Brennan and Chordia [1993]). Casual observation suggests that analysts do not issue sell

recommendations very often, because they would rather drop coverage of a stock altogether than issue a negative report. It seems that brokers are involved in their own type of agency problem by simply not commenting on stocks instead of issuing a sell recommendation. Clearly, brokers sometimes act more in their own best interest than in the interest of their customers. Consequently, we expect that the relationship between social responsibility and analyst following will be more prevalent on the buy side than on the sell side.

Regression Results with Control Variables

We examine four variables that are prominent in the literature on what determines analyst following: size, share price, volatility, and market-to-book value of equity. Bhushan [1989] argues that the number of analysts following a given company should be greater for larger companies, because the demand for analyst services increases with firm size but the cost of acquiring information does not vary with firm size. Brennan and Hughes [1991] predict a positive relationship between the reciprocal of share price and the level of analyst following based on the observation that broker commissions are higher for lower-priced stocks.

Bhushan [1989] hypothesizes that the relationship between return volatility and analyst following is positive because the value of private information increases with volatility. He finds a positive relationship between the two, as do Brennan and Hughes [1991]. However, O'Brien and Bhushan [1990] find a negative relationship between changes in analyst following and volatility, while Pearson [1991] finds a negative relationship between analyst following and the standard deviation of market model residuals.

Chung and Jo [1996] find a positive relationship between analyst following and Tobin's q , which typically measures growth opportunities. We measure growth opportunities with market-to-book value of equity, because it is highly correlated with Tobin's q .

Since the levels of many economic variables are cross-sectionally correlated without any direct causal link, regressions using the levels of variables are likely to show spurious associations between variables (see O'Brien and Bhushan [1990]). We use a regression model with year-to-year changes in analyst following, *Fortune* scores, firm size (measured by the natural log of market value of equity), variance of stock returns, reciprocal of share price, and market-to-book value of equity ratio to perform a stronger test of causal relations:

$$\Delta \text{Analyst Following}_{i,t} = \alpha_0 + \alpha_1 \Delta \text{Fortune Score}_{i,t} + \alpha_2 \Delta \ln(\text{Market Value of Equity}_{i,t}) + \alpha_3 \Delta \text{Variance of Returns}_{i,t} + \alpha_4 \Delta (1/\text{Share Price}_{i,t}) + \alpha_5 \Delta (\text{Market-to-Book Value of Equity}_{i,t}) + \epsilon_{i,t}$$

where Δ denotes the change in variable from year $t-1$ to year t , subscript i denotes company i , and $\epsilon_{i,t}$ is an error term. While the presence of a significant relationship between the changes in variables does not necessarily imply causality, the lack of such a relationship is definitely an indicator of no causality between the variables.

Table 4 presents the regression results. Even after we control for the effects of other variables on analyst following, we find a significant and positive relationship between changes in company social responsibility, company quality scores, and changes in analyst following. The results, however, reveal that changes in analyst following are insignificantly related to changes in industry mean *Fortune* scores. Our stronger test results suggest that, to attract analysts, the only social responsibility or quality score that matters is the social responsibility or quality score of a company. This result suggests that the cost of following two companies in two different industries may not be significantly higher than the cost of following two companies in the same industry.

Empirical results also show that changes in analyst following are significantly and positively associated with changes in the reciprocal of share price. This result supports Brennan and Hughes' [1991] conjecture that low-priced stocks are attractive to brokers because they bring higher commissions.

Our results further suggest that changes in analyst following are positively related to changes in market-to-book value of equity. If market-to-book value of equity captures growth opportunities, it is plausible that more analysts follow growth stocks than value stocks because growth stocks are easier to sell. However, over the past several decades, value stocks have earned a premium over growth stocks. De Bondt and Thaler [1985] were the first to note this, but many subsequent studies, such as Haugen [1997] and Bauman and Miller [1997], report that growth stocks are persistently overvalued and value stocks are persistently undervalued.

The positive relationship between the changes in analyst following and the changes in market-to-book value of equity supports the notion that security analysts tend to overestimate the return potential of growth stocks and underestimate the return potential of value stocks. They simply overweight salient information, such as growth opportunities, and underweight data like long-term stock returns. As Kahneman and Tversky [1973] find, people tend to make intuitive forecasts. Financial analysts are professionals who make earnings forecasts, but they are also human. Following more growth stocks than value stocks might be an overreaction to growth opportunities, which supports the "overreaction hypothesis" of De Bondt and Thaler [1990]. However, our results show that the correlation between changes in return variability and changes in analyst following is not statistically significant.

Table 4. *Analyst Following as a Function of Social Responsibility, Company Quality, Size, Risk, Share Price, and Market-to-Book*

	Results with Company Score			Results with Company and Industry Score		
Intercept	0.422 (3.72**)	0.375 (3.26**)	0.403 (3.35**)	0.421 (3.70**)	0.368 (3.23**)	0.401 (3.37**)
Quality of management (company score)	0.532 (2.49**)			0.526 (2.44**)		
Community and environmental responsibility (company score)		0.715 (2.45**)			0.665 (2.43**)	
Composite score (company score)			0.554 (2.02*)			0.551 (2.01*)
Quality of management (industry mean score)				0.236 (0.94)		
Community and environmental responsibility (industry mean score)					0.145 (0.50)	
Composite score (industry mean score)						0.078 (0.24)
ln (market value of equity)	2.180 (7.01**)	2.175 (6.25**)	2.194 (6.18**)	2.280 (6.32**)	2.264 (6.76**)	2.183 (6.05**)
Variance of daily stock returns	-0.005 (-0.52)	-0.006 (-0.55)	-0.004 (-0.41)	-0.005 (-0.51)	-0.005 (-0.47)	-0.004 (-0.41)
1/share price	33.075 (4.29**)	32.010 (4.25**)	32.812 (4.32**)	32.123 (4.37**)	32.011 (4.23**)	32.138 (4.22**)
Market-to-book value of equity	1.537 (3.85**)	1.441 (3.49**)	1.429 (3.27**)	1.486 (3.79**)	1.421 (3.54**)	1.448 (3.48**)
F-value	19.24**	18.78**	18.59**	16.37**	16.41*	15.92**
Adjusted R ²	0.113	0.108	0.105	0.104	0.106	0.098

Note: Regressions are based on changes in variables. Analyst following is the number of analysts making annual earnings forecasts. Social responsibility and company quality scores are from the *Fortune* surveys on community and environmental responsibility and company quality. We pool the data in the nine *Fortune* surveys published from 1990 through 1998. Our pooled dataset consists of 1,320 time series and cross-sectional observations. The market value of equity, book value of equity, and share price data are obtained from Standard & Poor's Compustat tape. The variance of returns is calculated using data from the CRSP daily return file (t-values are in parentheses).

**Significant at the 1% level. *Significant at the 5% level.

Consistent with previous studies, we also find that analyst following and size, i.e., market value of equity, are strongly and positively correlated (see, e.g., Bhushan [1989], O'Brien and Bhushan [1990], and Brennan and Hughes [1991]). However, the rationale offered for the relationship between size and analyst following is incomplete, which suggests that size may proxy for other variables. Bhushan [1989] suggests that size proxies for liquidity. He notes that a trade, which might be considered liquidity-motivated if it consists of shares of a large company, could be identified as information-motivated if it consists of an equal dollar amount of shares of a small company. However, size is hardly the best proxy for liquidity; the bid-ask spread, the volume of trades, or the volume of trades relative to shares outstanding are all better choices.

We clearly do not have a complete understanding of the positive relationship between analyst following and firm size. We propose that the market value of equity (MVE) could be related to analyst following because it serves as a joint proxy for perceived company quality

and breadth of investor attention. For example, note that the natural log of MVE can be decomposed into the natural log of book value of equity (BVE) and the natural log of the market-to-book value of equity ratio (MBR):

$$\ln(\text{MVE}) = \ln(\text{BVE}) + \ln(\text{MBR})$$

Table 5 shows the regression results with both $\ln(\text{BVE})$ and $\ln(\text{MBR})$ in lieu of $\ln(\text{MVE})$. The results show that analyst following is positively and significantly related to MBR. Since the *Fortune* measures of social responsibility or quality and MBR are significantly and positively correlated, this suggests that MBR proxies for perceptions of company quality. The correlation between the composite *Fortune* score and the log of market-to-book value of equity is 0.40 for our sample of companies. We also find a positive and significant correlation between analyst following and BVE.

Although previous studies offer the "cost of information acquisition" or "liquidity issues" as possible

Table 5. *Impact of Social Responsibility, Company Quality, Firm Size, Risk, and Share Price on the Number of Analysts Following the Company*

	(1)	(2)	(3)
Intercept	0.471 (4.19**)	0.452 (4.03**)	0.460 (4.10**)
Quality of management (company score)	0.530 (2.38*)		
Community and environmental responsibility (company score)		0.671 (2.53**)	
Composite score (company score)			0.512 (1.98*)
ln (book value of equity)	2.434 (8.23**)	2.419 (8.19**)	2.419 (8.18**)
ln (market to book value of equity)	1.679 (4.39**)	1.687 (4.41**)	1.669 (4.35**)
Variance of daily stock returns	-0.006 (-0.51)	-0.005 (-0.49)	-0.004 (-0.41)
1/share price	27.537 (3.61**)	27.164 (3.57**)	27.236 (3.57**)
F-value	15.45**	15.60**	14.99**
Adjusted R ²	0.080	0.082	0.088

Note: Regressions are based on the changes in variables. Analyst following is the number of analysts making annual earnings forecasts. Social responsibility and company quality scores are from the *Fortune* surveys on community and environmental responsibility and company quality. We pooled the data in the nine *Fortune* surveys published from 1990 through 1998. Our pooled dataset consists of 1,320 time series and cross-sectional observations. The market value of equity, book value of equity, and share price data are obtained from Standard & Poor's Compustat tape. The variance of returns is calculated using data from the CRSP daily return file (t-values are in parentheses).

**Significant at the 1% level.

*Significant at the 5% level.

explanations for high correlations between analyst following and firm size, we offer an alternative behavioral interpretation. Consider a capital market in which information is neither costless nor spontaneously available to all market participants. Merton [1987] suggests that, in such a market, an investor constructing an optimal portfolio can only use a certain security if that investor is aware of the security. Merton noted that actual portfolios held by individual and institutional investors contain only a small fraction of the thousands of traded securities available.

In a similar line of reasoning, Barber and Odean [2002] examine the idea that the buying decisions of individual investors are driven by attention more than selling decisions are, because investors typically buy only a few stocks that have caught their attention. They create portfolios of these attention-grabbing stocks using many criteria, e.g., stocks with abnormally high trading volume, stocks with abnormally high or low returns, or stocks with news announcements. Barber and Odean [2002] find that, regardless of criteria, individual investors are more likely to be buyers of these high-attention stocks than sellers.⁴

Given such investor behavior, it is probably easier for brokers to promote stocks with broader investor cognizance or familiarity. Since the magnitude of attention and familiarity are likely to be greater for stocks of larger companies, we would expect that analysts assist the marketing efforts of brokers by follow-

ing large companies. Viewed from this perspective, the positive correlation between analyst following and firm size can be understood in the context of our behavioral argument.

Results Using Companies Not Included in I/B/E/S

Our analysis only uses companies whose data are available from both I/B/E/S and the *Fortune* survey. Note the difference between the *Fortune* social responsibility or quality scores of the companies in I/B/E/S versus those that are not. We believe that when a firm is not reported in I/B/E/S, it does not necessarily indicate that the firm is completely neglected by financial analysts. Empirical evidence based on this sample would help assess the robustness of our results. If the number of analysts following a company increases with the company's social responsibility or quality score, we should find that *Fortune* survey companies included in I/B/E/S have higher social responsibility or quality scores than those not included in I/B/E/S.

Table 6 shows the results of t-tests comparing the mean *Fortune* score of companies included in I/B/E/S with those of companies not in I/B/E/S. For all three measures of social responsibility or quality, we find that the mean *Fortune* score of companies in I/B/E/S is significantly greater than that of the other group as a whole. This result provides additional evidence of the

Table 6. Comparison of Social Responsibility and Quality Scores of Companies Included in the I/B/E/S Database and Companies Missing from the Database

	Companies in the I/B/E/S Database			Companies Not in the I/B/E/S Database			t-Statistics of the Difference Between Means
	Mean Score	Standard Deviation	Number of Observations	Mean Score	Standard Deviation	Number of Observations	
Quality of management	6.59	1.053	1369	6.400	1.050	1100	4.472**
Community and environmental responsibility	6.186	0.994	1369	5.953	1.023	1100	5.693**
Composite score	6.344	0.902	1369	6.162	0.930	1100	4.904**

Note: This table presents the results of t-tests that compare the mean *Fortune* community and environmental responsibility and company quality score of companies included in I/B/E/S with that of companies not included in I/B/E/S.

**Significant at the 1% level.

positive relationship between analyst following and social responsibility or company quality.

Test of Causal Effect

An implicit assumption of our analysis is that the interaction between analyst following and social responsibility is uni-directional and contemporaneous. It is conceivable, however, that there is a certain lag between the effect of analyst following and social responsibility. To examine this question empirically, we regress the number of analysts following a firm (NAF) on both the lagged values of the same variable and the contemporaneous and lagged values of social responsibility (RESPONSBLTY) using our pooled time series and cross-sectional data. Similarly, we also regress

Fortune combined averages of social responsibility and company quality on both the lagged values of the same variable and the contemporaneous and lagged values of NAF.

If the regression coefficients for NAF in the social responsibility equation are positive and significant, a higher NAF is said to *cause* greater social responsibility (see Geweke, Meese, and Dent [1983]). The regression results, reported in Table 7, show that the one-year lagged value of the dependent variable is a very strong predictor variable in both equations. The one-period lagged value of NAF in the NAF equation is highly significant (t-statistic = 26.34). Similarly, the one-period lagged value of RESPONSBLTY in the social responsibility equation is also highly significant (t-statistic = 22.87). In the NAF equation, the lagged value of RESPONSBLTY shows no signs of statistical signifi-

Table 7. Test of Causal Effects

	Analyst Following $\ln(\text{NAF}_{i,t})$	Community and Environmental Responsibility (RESPONSBLTY)	Analyst Following $\ln(\text{NAF}_{i,t})$	Fortune Combined Ratings of RESPONSBLTY and Quality
Intercept	0.189 (2.00**)	0.205 (5.33**)	0.084 (0.80)	0.198 (5.66**)
$\ln(\text{NAF}_{i,t})$		0.026 (1.89*)		0.022 (1.96*)
$\ln(\text{NAF}_{i,t-1})$	0.657 (26.34**)	-0.023 (-1.46)	0.648 (25.65**)	-0.013 (-1.16)
$\ln(\text{NAF}_{i,t-2})$	0.240 (7.43**)		0.242 (7.51**)	
$\ln(\text{RESPONSBLTY}_{i,t})$	0.192 (2.46**)		0.269 (2.64**)	
$\ln(\text{RESPONSBLTY}_{i,t-1})$	-0.112 (-1.25)	0.964 (22.87**)	-0.121 (-1.12)	0.912 (23.64**)
$\ln(\text{RESPONSBLTY}_{i,t-2})$		-0.081 (1.89**)		-0.035 (-0.91)
F-Value	748.181**	669.931**	753.373**	643.998**
Adjusted R ²	0.788	0.769	0.789	0.762

Note: Number of analysts following the firm (NAF) is the number of analysts (reported in I/B/E/S) making annual earnings forecasts. T-values are in parentheses.

**Significant at the 5% level.

*Significant at the 10% level.

cance. Similarly, only the contemporaneous term of NAF is significant in the RESPONSBLTY equation. So it appears that the relationship between NAF and social responsibility is strictly contemporaneous. In addition, it seems that the direction of greater social responsibility and company quality, causing greater NAF, is *stronger* than the direction of greater NAF causing greater social responsibility and company quality.

Conclusions

We examine whether financial analysts consider the psychology of investors when they analyze corporate activities. Specifically, we argue that the roles of analysts and brokers can be understood in an alternative fashion when they are seen as marketing agents of their brokerage firms. We suggest that investors prefer companies they perceive as socially responsible, and analysts are instruments that help brokers sell stocks. Empirical results based on *Fortune* magazine surveys on social responsibility and company quality are consistent with our arguments.

Previous studies have speculated on the factors determining the cross-sectional distribution of analyst services. Some suggest the brokerage commission schedule is the main determinant. Others argue that financial analysts act as monitors of managerial performance, and that the number of analysts following a company is determined by the complexity of the company's agency problems.

A behavioral finance perspective may provide insight into the various aspects of social responsibility and security design. It may also shed light on the product line choices of mutual fund companies (e.g., why are there "socially responsible" mutual funds?), and the world of advisory services from venture capital and private equity to pension fund management. More research is needed in this area.

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Notes

1. The definition of social responsibility varies, and the term "ethical" may also be used instead. Ethicists use the term "ethical,"

while social investment professionals use "socially responsible." In this paper, we use the term "socially responsible." Although the discussion of social responsibility is difficult, there are strategies to screen socially responsible firms based on social and/or environmental criteria, and it is now the most common screening method. More than 50% of socially responsible investors (SRI) exclude tobacco, gambling, alcohol, and weapons companies. Less than 30% use special screenings that include a firm's executive compensation criteria. There are many stocks and mutual funds devoted to socially responsible investments, including the Calvert Social Investment Fund, the Parnassus Fund, and the Pax World Fund. Moreover, many investors, such as pension funds, exclude securities of socially irresponsible companies.

2. Social Investment Forum President Steve Schueth says, "The clear message from this data is that socially responsible investing is now firmly on a path of steady growth thanks to the nearly universal acceptance of social investment as a viable and value-added approach to asset management. Clearly, a growing number of American individuals and institutions are insisting that their money be invested in a fashion that is aligned with their values."
3. Ip [1999] reports that Social Security plans under discussion call for stock investments of \$650 billion to \$1.2 trillion over the next fifteen years. This may increase socially responsible investment substantially if those funds are invested in the securities markets and screened for social responsibility.
4. In addition, there is substantial behavioral literature on familiarity that seems highly germane to cognizance. For instance, Laroche, Kim, and Zhou [1996] report that familiarity with a brand influences a consumer's confidence, which in turn affects her intention to buy the same brand. Similarly, Ye and Raaij [1997] argue that a high level of familiarity inhibits the primary affective reaction.

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