Marketing of Stocks by Brokerage Firms: The Role of Financial Analysts

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This paper examines the role of financial analysts as a marketing aid to brokerage firms. This study suggests that investors prefer to hold stocks of high-quality companies and that financial analysts help the marketing efforts of brokerage companies by focusing their analysis on such stocks. This paper uses S&P's common stock rankings as empirical proxies for firm quality and finds that stocks rated by S&P are followed by more analysts than those not rated. Furthermore, among those stocks rated by S&P, more analysts follow highly rated stocks than poorly rated ones. This study also finds a significant increase (decrease) in analyst following when S&P upgrades (downgrades) quality rankings. Overall, empirical evidence supports the marketing hypothesis of analyst following.

What determines the number of analysts that follow a firm? Researchers have offered various conjectures about the factors influencing analysts' decision to follow a firm. Moyer, Chatfield, and Sisneros (1989) suggest that security 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. Bhushan (1989) considers various firm characteristics that can influence the aggregate demand and supply of analyst services. Notably, Bhushan argues that, everything else being equal, the demand for analyst services increases with firm size, but the cost of acquiring information does not vary proportionately with firm size. Consequently, analyst following should be greater for larger firms. Brennan and Hughes (1991) develop a model in which the dependence of the brokerage commission rate on share price provides an incentive for brokers to produce research reports on companies with low share prices. Consistent with the prediction of their model, Brennan and Hughes find that the number of analysts following a company is inversely related to its share price.

This paper presents an alternative explanation of analyst following. This study suggests that additional insight on analyst following can be obtained by viewing analysts as working alongside brokers as part of a brokerage firm's marketing

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This work was supported in part by a grant from The University of Memphis Faculty Research Grant Fund. This support does not necessarily imply endorsement by the university of research conclusions. The author thanks Hoje Jo and Meir Statman for their contributions to earlier versions of this paper, two anonymous referees for many valuable suggestions, and Xin Zhao for her research assistance. The author also thanks the Editors, Melanie Austin, Arvind Bhandari, Pinaki Bose, Keith Brown, Joel Hasbrouck, Roger Huang, Joe Kendrick, Michele Laplante, Thomas McInish, Shelby McIntyre, Edward McQuarrie, Michael Munson, Stephen Pruitt, Jay Ritter, Atulya Sarin, and Brett Trueman for helpful comments.

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team.[1] Companies allocate considerable resources to market their products. They strive to identify customer preferences and design products to satisfy these preferences, and they employ personnel to sell these products. As Merton (1987), Ross (1989), and Brennan (1995) suggest, the marketing of financial products has many of the same features as the marketing of other products.

The marketing of financial products is a major enterprise, as indicated by the size of brokerage firms' payrolls. Stoll (1993) reports that in 1989, compensation to registered representatives (i.e., brokers) exceeded $9 billion. Clerical and administrative employee expenses added another $10 billion. The market for stocks, however, is hardly saturated. Mankiw and Zeldes (1991) report that only 27% of households own stocks (including mutual funds), and even among households with liquid assets of $100,000 or more, the proportion is only 48%.

This study suggests that investors prefer stocks of high-quality companies over stocks of low-quality companies, and that brokerage firms respond to this preference by directing their analysts and brokers toward high-quality companies.[2] This study holds that investors prefer stocks of high-quality companies for two reasons: 1) investors tend to identify stocks of high-quality companies as stocks with high expected returns; and 2) institutional investors prefer high-quality companies to comply with their fiduciary responsibility for prudent investing.

Chung and Jo (1996) find that analyst following is positively related to Tobin's q ratio, R&D expenditure, and advertising expenditure. Chung and Jo interpret this result to indicate that high-quality companies attract more analysts.[3] While a company's q ratio and R&D and advertising expenditures may influence investors' perception of its quality, these variables are likely to be imperfect proxies of company quality. Further, it is unlikely that institutional investors can claim fiduciary prudence based on such variables if beneficiaries sue them. The present study uses a much more direct and explicit measure of company quality and reexamines the marketing hypothesis of analyst following.

This study defines high-quality companies as those companies that are ranked by a well-publicized and independent rating agency: Standard and Poor's Corporation (S&P). According to Compustat's User's Guide, S&P does not rank a company's stock when "it does not meet the ranking criteria or the data is insufficient to perform the ranking."

[1] Several recent studies consider marketing perspectives in the analysis of corporate decisions. For example, Angel (1997) holds that companies split their stock to entice more dealers and limit-order traders and thereby to increase liquidity for their shares. Baker, Powell, and Weaver (1999) examine whether the listing on the NYSE improves liquidity and marketability. McLaughlin, Safieddine, and Vasudevan (2000) find that stock returns on seasoned equity offerings are significantly related to the reputation and marketing skills of investment bankers. The study finds that equity offerings by high-prestige investment bankers with marketing skills have less underpricing.

[2] Indeed, brokers are taught early in their careers that investors prefer stocks of high-quality companies over stocks of low-quality companies. For example, in his sales manual, Gross (1982) advises brokers that it is easier to generate transactions by selling stocks of high-quality companies. He writes: "When selecting a stock to attempt to merchandise in a big way to many people, one of my essential requirements is that the stock be rated A-, A, or A+ by Standard & Poor's. These ratings are based on an assessment of a company's financial strength. The quality rating has no bearing whatsoever on the direction the price may take in the future. There is great misunderstanding in the financial selling community about the S&P ratings. This misunderstanding tends to reassure the under-informed and uninitiated about the security of the current price or the potential for price recovery of a particular stock."

[3] Chung and Jo (1996) suggest that while financial analysts are likely to prefer high-quality companies, it is also possible that analyst following itself enhances firm quality through their indirect monitoring of corporate managers. In a similar vein, D'Mello and Ferris (2000) find that analyst following exerts a significant impact on stock returns surrounding the announcement of new equity issue. Specifically, D'Mello and Ferris show that announcement period returns are significantly more negative for firms followed by fewer analysts.

Hence, the very fact that a company's stock is rated by S&P may indicate that it meets the minimum quality standard. Consequently, this study hypothesizes that more analysts follow stocks rated by S&P than those that are not rated. Among those stocks rated by S&P, we expect that more analysts follow high-ranked stocks than low-ranked stocks.

Empirical results are generally consistent with the marketing theory of analyst following. This paper finds that, after controlling for the effects of firm size, share price, trading volume, and the volatility of stock returns, indeed more financial analysts follow high-quality companies than low-quality companies. This paper finds that stocks rated by S&P (even when they are ranked "below average") attract more analysts than stocks that are not rated. Among those stocks included in the S&P rating, more analysts follow high-ranked stocks than low-ranked stocks. This paper also finds a significant increase in analyst following when common stock rankings are upgraded by S&P and a significant decrease when downgraded. Similarly, this paper finds an increase in analyst following when a stock is added to the S&P rating.

The remainder of the paper is organized as follows. Section I discusses the role of financial analysts in brokerage firms and the implications regarding the relationship between perceived company quality and analyst following. Section II describes the data and sample selection procedures. Sections III and IV present the empirical findings. Section V provides a brief summary and concluding remarks.

I. Role of Financial Analysts in Brokerage Firms

Effective marketing of a stock by a brokerage firm requires that at least one of the firm's analysts follow the stock. A brokerage firm does not follow all stocks, however, any more than a department store carries all clothing labels. Some clothing labels are carried by more department stores than others, and some stocks are followed by more analysts than others. What differentiates the stocks followed by many analysts from the stocks followed by few analysts?

This paper suggests that brokerage firms cater to investor preferences by concentrating their marketing efforts, including analyst following, on stocks of high-quality firms. The distinction that matters in the present framework is the distinction between high- and low-quality firms. This is different from the use of the term by Arbel and Strebel (1983). When Arbel and Strebel discuss "neglected" firms, they argue that the distinction that matters is not the distinction between high- and low-quality companies, but the distinction between companies with known, but possibly low quality, and companies with unknown quality. The use of the term "quality" in this study is closer to that made by O'Brien and Bhushan (1990).

In the present framework, the analysts' role is that of a marketing aid to brokers. Analysts provide tools, such as forecasts and recommendations, that help brokers maximize transaction profits.[4] 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 so as to control agency problems. This study's framework is similar to that of Brennan and Hughes (1991) in that analysts help brokers' sales efforts. Brennan and Hughes suggest that analysts help brokers' efforts to generate more transactions on low-price stocks by supplying more analysis for such stocks. The present framework, however, is different from Brennan and Hughes', because our analysts help

[4]In a related study, Carleton, Chen, and Steiner (1998) find evidence that analysts make recommendations that help their brokers receive underwriting contracts.

brokers' *marketing* efforts by addressing the *preferences* of brokerage clients (i.e., individual as well as institutional investors), while Brennan and Hughes' analysts do not consider such preferences.[5]

This study suggests that investors prefer stocks of high-quality companies to stocks of low-quality companies for at least two reasons. One reason relates to the cognitive error of investors. Evidence suggests that investors tend to identify stocks of high-quality companies as stocks with high-expected returns. Early observers of this proclivity include Graham and Dodd (1934) and Bernstein (1956). More recent observers include Dreman (1977) and Shefrin and Statman (1986, 1995). Shefrin and Statman (1995) attribute this proclivity to "representativeness," a common cognitive error described by Kahneman and Tversky (1973). Thus, in spirit, investors in the present framework are closer to "the individual investor," than to "the representative investor," according to the distinction made in Brennan (1995).[6]

The second reason for investors' attraction to stocks of high-quality companies relates to the fiduciary responsibility of institutional investors. O'Brien and Bhushan (1990) argue that institutions require information not only to make investment decisions, but also to satisfy standards of fiduciary responsibility. Fiduciaries are expected to exercise prudence as they invest. They must demonstrate that they have met the "prudent-person" standard, if sued by beneficiaries.[7] O'Brien and Bhushan note that institutions look for "winners" among stocks to protect their trust officers from legal liability, and argue that large size could be a proxy for winners. This study interprets the term "winners" as high-quality companies and provides a closer proxy for quality than firm size.

The effect of prudent-person laws on the preference for stocks of high-quality companies is important, because it increases the clientele for such stocks beyond those who believe that these stocks provide high expected returns. Not everyone believes that stocks of high-quality companies provide high returns. In fact, there is considerable evidence that these stocks provide low, rather than high, returns. Shefrin and Statman (1995) find that high-quality companies generally have 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-person laws is significant, because it induces brokers and money managers to act as if they prefer stocks of high-quality companies, even if they realize that such preference is unwise, so as to avoid violations of prudent-person laws.[8]

In short, investors prefer stocks of high-quality companies to meet their fiduciary responsibility, as well as due to their belief that such stocks are expected to provide high returns. This in turn makes brokers' marketing jobs easier when they pitch stocks

[5]An implicit assumption in Brennan and Hughes' model is that investors are indifferent between high- and low-price shares, although they are expected to pay higher trading commissions for low-price shares.

[6]Brennan (1995) writes: "The representative investor is assumed to understand the economy and the process determining asset prices; the individual investor frequently does not. For example, the representative investor is assumed to hold a well-diversified portfolio; yet, individual investors often hold few or no stocks."

[7]Gross (1982) goes on to describe analysts as both facilitator of sales and scapegoats when things go wrong: "When you choose a stock for mass merchandising and big position building, *restrict your choice solely to issues positively recommended as current buys on a fundamental basis by your firm*. Should the stock perform badly after purchase, it's the firm's fault! It is the research department's error. It was the analyst who judged incorrectly! You can legitimately direct the customer's ire away from you toward several other sources. You and the client can jointly deplore the bad outcome and still retain a decent relationship, and perhaps the hope of recovery by means of a different analyst's suggestion."

[8]There is evidence that fund managers prefer stocks that minimize their exposure to prudent-person law violations. Badrinath, Gay, and Kale (1989) and Del Guercio (1994) find that institutions that are subject to prudent-person laws shun stocks of low-quality companies.

of high-quality companies.[9] This study conjectures that financial analysts support the marketing efforts of brokers by focusing their analysis on the stocks of high-quality companies. Hence, this paper predicts that more analysts follow the stocks of high-quality companies than stocks of low-quality companies. In the following sections, this study examines the cross-sectional association between the number of analysts following a company and S&P's common stock rankings to test the marketing hypothesis of analyst following. This paper also examines whether changes in S&P's stock rankings are accompanied by corresponding changes in analyst following.

II. Data and Descriptive Statistics

This study uses S&P's common stock rankings as empirical proxies for company quality. S&P provides investors with independent ratings of firm quality derived from a proprietary computerized scoring system. S&P employs both the growth and stability of earnings and dividends as key elements in determining its common stock rankings. S&P uses a computerized scoring system to calculate quality scores for earnings and dividends, and then adjusts the scores by a set of predetermined modifiers for growth, stability within long-term trend, and cyclicality. Adjusted scores for earnings and dividends are combined to yield a final score. The final score for each stock is measured against a scoring matrix determined by analyzing the scores of a large representative sample of stocks.[10]

S&P's stock ranking data are obtained from Compustat annual industrial files. I use data from the *Primary, Supplementary, and Tertiary (PST) File* and the *Full-Coverage File*. The *PST File* contains the largest companies on the New York and American Stock exchanges, as well as utility subsidiaries that were once S&P 500 constituents, and companies listed on major exchanges. For simplicity, this paper categorizes these companies as the NYSE/Amex sample. The *Full-Coverage File* contains the largest Nasdaq National Market System Companies, companies listed on regional exchanges, publicly held companies trading common stock, and wholly owned subsidiaries trading preferred stock or debt. This paper labels these companies as the Nasdaq sample. Because S&P's stock ranking data are not available prior to 1985, this study uses data over a 12-year period from 1985 to 1996. The number of shares outstanding and share price are obtained from Compustat files. The market value of equity is obtained by multiplying the number of shares outstanding by share price at the end of each year. For each stock in the Compustat sample, I calculate the standard deviation of daily returns and the average daily dollar trading volume during each year of the study period using the CRSP file.

The number of analysts following each company is obtained from Institutional Brokers Estimate System (I/B/E/S). The I/B/E/S database contains analysts' forecasts of

[9]A factor that likely reinforces investors' preference towards stocks of high-quality companies is that analysts themselves have a stronger incentive to follow high-quality companies and make positive recommendations for these stocks than to follow low-quality companies and make negative recommendations. This is because sell recommendations generate transactions only by those who already hold the stock or those who are willing to take short positions. In contrast, buy recommendations can appeal to all investors. Indeed, empirical evidence shows that analysts issue more buy than sell recommendations. For example, Stickel (1995) shows that the ratio of buy recommendations to sell recommendations exceeds 4.5. Similar results are reported in Lin (1994).

[10]The use of S&P's common stock rankings as proxies for company quality has advantages and disadvantages. Advantages include the fact that the S&P common stock ranking covers a large number of companies, whereas alternatives, such as the Fortune Surveys of company quality include only a small subset of all companies. S&P's quality rankings, however, are computed from accounting data, whereas the surveys provide direct measures of perceived company quality.

Table I. Distribution of Stocks by S&P and I/B/E/S Coverage

This table shows the number of stocks for each group according to S&P and I/B/E/S coverage during 1996.

	NYSE/Amex	Nasdaq
Number of Stocks in Compustat files	3,097	4,042
Number of Stocks Rated by S&P	1,584	1,072
Number of Stocks Covered by I/B/E/S	1,947	1,782
Number of Stocks Both Rated by S&P and Covered by I/B/E/S	1,183	566
Number of Stocks Not Rated by S&P but Covered by I/B/E/S	764	1,216
Number of Stocks Rated by S&P but Not Covered by I/B/E/S	401	506
Number of Stocks Neither Rated by S&P Nor Covered by I/B/E/S	749	1,754

corporate earnings collected from approximately 400 leading brokerage firms. This study matches S&P's stock rankings with the I/B/E/S data by identifying, for each company in COMPUSTAT files, the number of analysts who made one-year-ahead earnings forecasts in June of each year. S&P includes common stock rankings in its monthly publication, *Security Owner's Stock Guide*, as well as in quarterly Compustat files. Hence, the stock ranking information contained in the annual Compustat files is likely to be known to the public throughout the year. Consequently, this paper examines the contemporaneous empirical association between analyst following and S&P's common stock rankings using yearly data.

While there are 3,097 firms in the 1996 *PST File* with non-missing share price and shares outstanding, slightly over half (1,584 firms) of these firms are rated by S&P (see Table I). The table shows that about 63% (1,947 firms) of them are covered by I/B/E/S and only 38% (1,183 firms) are covered by both S&P stock rankings and I/B/E/S. The table shows that 764 firms are covered by I/B/E/S but not rated by S&P, 401 firms are rated by S&P but not covered by I/B/E/S, and 749 firms are neither rated by S&P nor covered by I/B/E/S. The median market value of equity for the last group of 749 firms is $108 million.[11] The table also shows that even smaller percentages of Nasdaq firms are rated by S&P or covered by I/B/E/S. Only 14% (566 firms) of 4,042 firms in the *Full-Coverage File* with non-missing share price and shares outstanding are both rated by S&P and covered by I/B/E/S and more than 43% (1,754 firms) are neither rated by S&P nor covered by I/B/E/S. The median market value of these 1,754 firms is $20 million and more than three-fourths of them have market values less than $64 million.

Table II presents descriptive statistics for companies included in both Compustat files and the I/B/E/S database. The table shows for each S&P ranking, the average number of analysts, the average market value of equity, the average standard deviation of daily returns, the average share price, and the average daily trading volume. The table shows these figures for the NYSE/Amex sample and, separately, for the Nasdaq sample. According to the results from the 1996 data, the average number of analysts for the group of highest-ranked (A+) companies is 18.49 for the NYSE/Amex sample and 12.5 for the Nasdaq sample (see also Figure I). In contrast, the corresponding figures are 4.37 and 3.15, respectively, for the group of lowest-ranked (D) companies. Similar results are obtained from the 1985-1996 aggregate data.

[11]Many large foreign companies are included in this group.

Table II. Descriptive Statistics

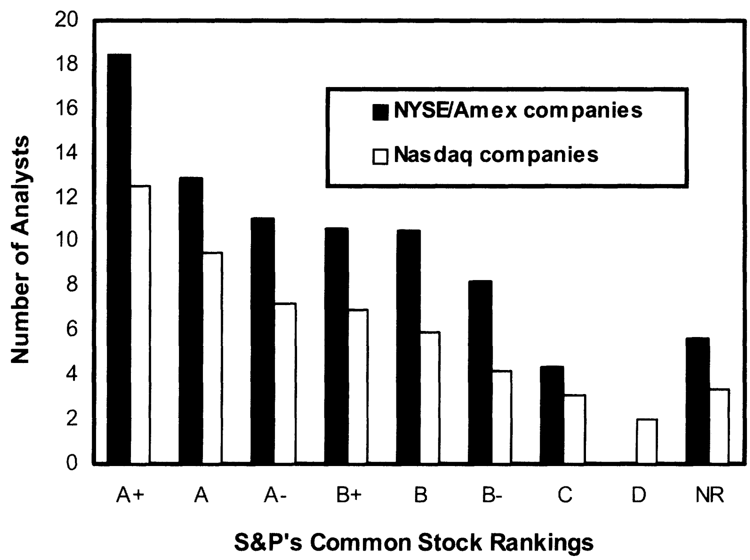
This table presents descriptive statistics of the variables. For each S&P ranking, the table shows the number of stocks, the average number of analysts following the company, the average market value of equity, the average standard deviation of daily returns, the average share price, and the average daily dollar trading volume. The number of analysts is measured by the number of analysts who made one-year-ahead earnings forecasts in June of each year. The market value of equity is obtained by multiplying the number of shares outstanding by share price at the end of each year. Return volatility is measured by the standard deviation of daily returns during each year.

S&P's Common Stock Rankings (Description)		NYSE/Amex Stocks # of Stocks	# of Analysts	Market[a] Equity	Return Volatility	Share Price	Trading[b] Volume	Nasdaq Stocks # of Stocks	# of Analysts	Market Equity[a]	Return Volatility	Share Price	Trading Volume[b]
Panel A. Results from 1996 Data													
A+	(Highest)	67	18.49	16,489	0.0148	50.41	30,770	2	12.50	2,979	0.0150	60.59	8,272
A	(High)	112	12.88	7,506	0.0154	43.43	14,146	17	9.47	1,466	0.0193	34.61	5,501
A-	(Above Average)	144	11.01	4,625	0.0157	37.18	8,161	23	7.26	1,210	0.0229	25.20	3,368
B+	(Average)	295	10.58	4,386	0.0176	37.32	14,646	94	6.96	2,847	0.0269	25.60	20,069
B	(Below Average)	298	10.52	3,369	0.0197	32.59	15,459	164	5.95	1,367	0.0351	21.37	15,736
B-	(Lower)	215	8.26	2,085	0.0238	24.09	10,243	159	4.16	481	0.0392	12.79	5,518
C	(Lowest)	52	4.37	450	0.0340	13.04	5,600	105	3.15	225	0.0478	9.76	2,479
D	(In Reorganization)	0	n/a	n/a	n/a	n/a	n/a	2	2.00	22	0.0832	3.81	133
NR	(Not Rated)	764	5.69	2,771	0.0222	26.66	3,936	1,216	3.38	770	0.0446	15.96	2,868
Whole Sample		1,947	8.67	3,851	0.0205	31.10	9,904	1,782	3.98	891	0.0419	16.80	5,203
Panel B. Results from 1985 to 1996 Data													
A+	(Highest)	964	19.32	7,783	0.0163	42.76	14,873	54	15.44	1,819	0.0211	32.74	6,488
A	(High)	1,424	15.06	4,008	0.0162	38.87	7,430	163	9.69	1,140	0.0201	28.14	2,649
A-	(Above Average)	1,779	13.05	3,318	0.0165	33.97	6,038	224	6.79	652	0.0210	27.56	1,674
B+	(Average)	2,521	11.07	2,307	0.0185	32.22	6,703	804	6.32	808	0.0280	20.01	5,786
B	(Below Average)	2,325	10.67	1,872	0.0211	27.25	7,667	1,033	5.63	694	0.0331	18.36	7,021
B-	(Lower)	1,583	8.65	1,425	0.0246	22.62	6,929	985	3.91	311	0.0390	12.79	3,534
C	(Lowest)	582	6.63	456	0.0342	11.27	2,487	507	3.39	178	0.0480	9.51	1,791
D	(In Reorganization)	16	8.81	863	0.0516	10.42	4,758	7	3.14	24	0.0717	2.41	690
NR	(Not Rated)	4,674	5.99	2,029	0.0246	23.30	2,857	5,562	3.65	701	0.0410	15.54	2,028
Whole Sample		15,868	10.23	2,603	0.0213	28.55	6,091	9,339	4.36	653	0.0382	16.22	3,081

[a]In millions of dollars.

[b]In thousands of dollars.

Figure I. Average Number of Analysts for Each S&P Stock Ranking



Clearly, these results are consistent with the conjecture that high-quality companies attract more analysts than low-quality companies. The positive relation between analyst following and company quality may be spurious, however, because the market value of equity increases almost monotonically with S&P's quality rankings. To the extent that larger companies attract more analysts and they are also ranked higher by S&P, the positive association between analyst following and S&P's stock rankings can be driven by their respective correlations with size. One needs to control for the effect of size on analyst following to see the net effect of quality.

III. Empirical Results

The following subsections relate the empirical findings of this study.

A. Analyst Following as a Function of S&P's Common Stock Rankings

To examine the effect of S&P's common stock rankings on analyst following, this study employs the following regression model:

$$NAF_i = \alpha_0 + \alpha_1 DH_i + \alpha_2 DR_i + \alpha_3 \ln(MVE_i) + \alpha_4 Volatility_i + \alpha_5(1/Price_i) + \alpha_6 \ln(Volume_i) + \varepsilon_i \quad (1)$$

where NAF_i is the number of analysts reporting a one-year-ahead earnings forecast for firm i, DH_i equals one if S&P's common stock ranking is higher than B and zero otherwise, DR_i equals one if the stock is rated by S&P and zero otherwise, MVE_i is the market value of equity for firm i, $Volatility_i$ is the standard deviation of firm i's daily stock returns, $Price_i$ is year-end share price of firm i, and $Volume_i$ is the average daily trading volume of firm i.[12]

This study includes the high-ranking dummy variable, DH_i, in the regression to

[12]The regression results using the log of NAF are similar to those presented here.

Table III. Effect of S&P's Common Stock Rankings on Analyst Following

This table reports the results of the regression model:

$$NAF_i = \alpha_0 + \alpha_1 DH_i + \alpha_2 DR_i + \alpha_3 \ln(MVE_i) + \alpha_4 Volatility_i + \alpha_5 (1/Price_i) + \alpha_6 \ln(Volume_i) + \varepsilon_i$$

where NAF_i is the number of analysts reporting a one-year-ahead earnings forecast for firm i in June of each year, DH_i equals one if S&P's common stock ranking is higher than B and zero otherwise, DR_i equals one if the stock is rated by S&P and zero otherwise, MVE_i is the market value of equity for firm i, $Volatility_i$ is the standard deviation of firm i's daily stock returns, $Price_i$ is year-end share price of firm i, and $Volume_i$ is the daily average dollar trading volume of firm i. For each variable, the table shows the average coefficient value from 12 cross-sectional regressions, the percentage of positive coefficients, the aggregated p-value from the chi-square test using the procedure outlined in Gibbons and Shanken (1987), Z-statistic, and p-value from Z-statistic. The table also reports the average adjusted-R^2 from 12 cross-sectional regressions.

		α_0	α_1	α_2	α_3	α_4	α_5	α_6
NYSE/ Amex	Average Coefficient	-38.832	0.682	2.036	1.567	34.846	13.426	2.702
	Positive Coefficients (%)	0%	100%	100%	100%	83%	100%	100%
	Aggregated p-Value (χ^2 Test)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Z-Statistic	-77.605	6.102	18.098	21.699	5.476	11.871	43.759
	p-Value from Z-Statistic	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Average Adjusted-R^2 = 0.686							
Nasdaq	Average Coefficient	-22.172	0.967	0.999	0.556	22.698	1.793	1.787
	Positive Coefficients (%)	0%	92%	100%	92%	83%	100%	100%
	Aggregated p-Value (χ^2 Test)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Z-Statistic	-34.048	6.150	10.797	11.399	4.520	7.221	39.738
	p-Value from Z-Statistic	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Average Adjusted-R^2 = 0.504							

examine whether stocks rated above average (i.e., those ranked above B) attract more analysts than stocks rated below average. To the extent that stocks with higher S&P rankings attract more analysts than stocks with lower S&P rankings, we expect the estimated coefficient for DH_i to be greater than zero. If stocks rated below average attract more analysts than those not rated at all, we expect the estimated coefficient for DR_i to be positive.

This study includes four control variables in the regression that are prominent in the literature on the determinants of analyst following: size, share price, volatility, and trading volume. Bhushan (1989) holds that analyst following is greater for larger firms, because the demand for analyst services increases with size, but the cost of acquiring information does not vary proportionately with it. Brennan and Hughes (1991) predict a positive relation between the reciprocal of share price and analyst following because broker commissions are higher for lower-price stocks. Bhushan (1989) predicts a greater analyst following for riskier firms as the value of private information increases with uncertainty. Bhushan finds a positive relation between analyst following and return volatility, and so do Brennan and Hughes (1991) and Brennan and Subrahmanyam (1995). However, O'Brien and Bhushan (1990) find a negative relation between the change in analyst following and the change in return volatility, and Pearson (1991) finds a negative relation between analyst following and the standard deviation of the market model residuals. Chung and Jo (1996) find that more analysts follow high-volume stocks than low-volume stocks.[13]

To the extent that analyst following is correlated over time, estimating Equation (1) simultaneously for all years (by exploiting autocorrelations in the error terms) would produce more efficient estimates. We are unable to estimate Equation (1) as a multivariate system across all years, however, due to year-to-year variations in the number and composition of companies included in S&P's stock rankings.[14] Hence, this study estimates Equation (1) using cross-sectional data for each year.

The regression results are reported in Table III. For each variable, the table shows the average coefficient estimate from 12 cross-sectional regressions and the percentage of years with positive coefficients. To test whether each coefficient is significantly greater than zero,[15] I calculate the aggregated p-value from the chi-square test using the procedure outlined in Gibbons and Shanken (1987). For any continuous random variable, the product of negative two and the natural logarithm of the p-value is distributed as chi-square with two degrees of freedom. To obtain the aggregated p-value, I first calculate the p-value for each coefficient estimate using the t-statistic from the individual year regression.[16] I then sum the $-2\log_e$ of each coefficient's p-value across the study period (i.e., 12 years). The sum of these transformed p-values follows a chi-square distribution with twice the number of years as its degrees of freedom, and I calculate an aggregated p-value from this statistic.

To assess the sensitivity of the results to different aggregation methods, this study also employs the alternative approach outlined in Meulbroek (1992) (see Dodd and Warner, 1983, and Warner, Watts, and Wruck, 1988, for a detailed discussion of the methodology). Specifically, I calculate the Z-statistic and its p-value for each coefficient to test whether the mean regression coefficient for each variable differs from zero. The Z-

[13]As pointed out by the referee, a higher trading volume may trigger a greater analyst following to the extent that volume is correlated with perceived stock quality. Analysts may be more likely to promote stocks with higher trading volumes if a higher trading volume is a signal that the stock is interesting.

[14]For the same reason, we are unable to use the panel data procedure to estimate Equation (1).

[15]This study performs one-sided tests because we have priors on the sign of the coefficients.

[16]T-statistics are calculated using White (1980)'s heteroskedasticity-consistent covariance matrix.

Table IV. Regression Results using Industry-Adjusted Analyst Following

This table reports the results of the regression model:

$$ADJNAF_i = \alpha_0 + \alpha_1 DH_i + \alpha_2 DR_i + \alpha_3 \ln(MVE_i) + \alpha_4 Volatility_i + \alpha_5 (1/Price_i) + \alpha_6 \ln(Volume_i) + \varepsilon_i$$

where $ADJNAF_i$ is the industry-mean-adjusted number of analysts following firm i, DH_i equals one if S&P's common stock ranking is higher than B and zero otherwise, DR_i equals one if the stock is rated by S&P and zero otherwise, MVE_i is the market value of equity for firm i, $Volatility_i$ is the standard deviation of firm i's daily stock returns, $Price_i$ is year-end share price of firm i, and $Volume_i$ is the daily average dollar trading volume of firm i. $ADJNAF_i$ is the difference between the number of analysts following firm i and the industry mean analyst following for each three-digit SIC code. For each variable, the table shows the average coefficient value from 12 cross-sectional regressions, the percentage of positive coefficients, the aggregated p-value from the chi-square test using the procedure outlined in Gibbons and Shanken (1987), Z-statistic, and p-value from Z-statistic. The table also reports the average adjusted-R^2 from 12 cross-sectional regressions.

		α_0	α_1	α_2	α_3	α_4	α_5	α_6
NYSE/ Amex	Average Coefficient	-33.542	0.700	0.996	0.425	69.378	8.458	2.219
	Positive Coefficients (%)	0%	92%	100%	100%	92%	100%	100%
	Aggregated p-Value (χ^2 Test)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Z-Statistic	-65.662	5.931	7.679	6.140	8.997	8.952	35.817
	p-Value from Z-Statistic	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Average Adjusted-R^2 = 0.480							
Nasdaq	Average Coefficient	-19.484	0.7220	0.813	0.458	5.529	1.826	1.300
	Positive Coefficients (%)	0%	83%	100%	92%	67%	100%	100%
	Aggregated p-Value (χ^2 Test)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Z-Statistic	-32.554	4.823	9.203	10.464	1.332	7.874	30.691
	p-Value from Z-Statistic	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Average Adjusted-R^2 = 0.374							

Table V. Distribution of Companies by S&P's Common Stock Rankings

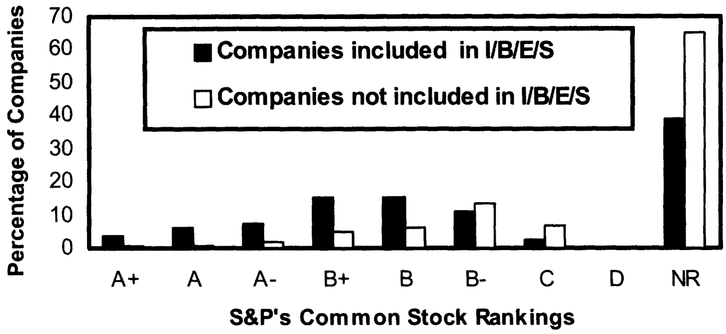
This table shows the difference in the distribution of S&P's stock rankings between the group of companies included in the I/B/E/S database and the group of companies not included in the database.

S&P's Common Stock Rankings	NYSE/Amex Stocks Included in I/B/E/S	NYSE/Amex Stocks Not Included in I/B/E/S	Nasdaq Stocks Included in I/B/E/S	Nasdaq Stocks Not Included in I/B/E/S
Panel A. Results from 1996 Data				
A+	67 (3.4%)	6 (0.5%)	2 (0.1)%	0 (0.0%)
A	112 (5.8%)	9 (0.8%)	17 (1.0%)	4 (0.2%)
A-	144 (7.4%)	22 (1.9%)	23 (1.3%)	4 (0.2%)
B+	295 (15.2%)	58 (5.0%)	94 (5.3%)	42 (1.9%)
B	298 (15.3%)	72 (6.3%)	164 (9.2%)	61 (2.7%)
B-	215 (11.0%)	153 (13.3%)	159 (8.9%)	186 (8.2%)
C	52 (2.7%)	78 (6.8%)	105 (5.9%)	207 (9.2%)
D	0 (0.0%)	3 (0.3%)	2 (0.1%)	2 (0.1%)
NR	764 (39.2%)	749 (65.1%)	1,216 (68.2%)	1,754 (77.6%)
Whole Sample	1,947 (100.0%)	1,150 (100.0%)	1,782 (100.0%)	2,260 (100.0%)
Panel B. Results from 1985 to 1996 Data				
A+	964 (6.1%)	128 (1.4%)	54 (0.6%)	5 (0.0%)
A	1,424 (9.0%)	258 (2.9%)	163 (1.7%)	47 (0.3%)
A-	1,779 (11.2%)	340 (3.8%)	224 (2.4%)	87 (0.5%)
B+	2,521 (15.9%)	613 (6.8%)	804 (8.6%)	368 (2.3%)
B	2,325 (14.7%)	690 (7.7%)	1,033 (11.1%)	587 (3.6%)
B-	1,583 (10.0%)	1,152 (12.8%)	985 (10.5%)	1,294 (8.0%)
C	582 (3.7%)	750 (8.3%)	507 (5.4%)	1,365 (8.4%)
D	16 (0.1%)	18 (0.2%)	7 (0.1%)	14 (0.1%)
NR	4,674 (29.5%)	5,055 (56.1%)	5,562 (59.6%)	12,457 (76.8%)
Whole Sample	15,868 (100.0%)	9,004 (100.0%)	9,339 (100.0%)	16,224 (100.0%)

statistic is obtained by adding the individual regression t-statistics across years and dividing the sum by the square root of the number of regression coefficients. This procedure assumes that the individual regression t-statistics asymptotically follow a unit normal distribution. Finally, the table shows the average adjusted-R^2 from 12 cross-sectional regressions.

The results show that the mean value of the coefficient for DR_i is greater than zero for both the NYSE/Amex and Nasdaq samples, indicating that stocks rated by S&P (even when they are ranked "below average") attract more analysts than stocks that are not rated. The p-values from both the chi-square test and Z-statistics suggest that the results are statistically significant. The results also show that the coefficient for the dummy variable representing higher S&P rankings (DH_i) is significantly greater than zero for both the NYSE/Amex and Nasdaq samples. Hence, high-ranked companies attract more analysts than low-ranked companies, irrespective of the location of listing. These results are consistent with the conjecture that the task of brokers is easier when they pitch stocks of high-quality companies, and that analysts support the marketing efforts of brokers by following high-quality companies.

Figure II. Distribution of NYSE/Amex Companies by S&P's Common Stock Rankings



than zero for both the NYSE/Amex and Nasdaq samples. Hence, high-ranked companies attract more analysts than low-ranked companies, irrespective of the location of listing. These results are consistent with the conjecture that the task of brokers is easier when they pitch stocks of high-quality companies, and that analysts support the marketing efforts of brokers by following high-quality companies.

Consistent with the findings of previous studies, this study finds that analyst following and the market value of equity are strongly and positively correlated.[17] Empirical results also show that analyst following is significantly and positively associated with the reciprocal of share price. This result supports Brennan and Hughes' (1991) conjecture that low-price stocks are attractive to brokers, because they bring higher commissions for a transaction of a given dollar amount. Consistent with the result of previous studies, this study also finds a significant, positive relation between analyst following and both return volatility and trading volume. On average, the empirical model explains about 50% to 69% of the cross-sectional variation in analyst following.

Aggregating individual test-statistics across year relies on the assumption of independence across the tests being aggregated. To the extent this assumption does not hold, the econometric specification employed in this study remains imperfect. To examine the sensitivity of the results to different econometric specifications, this paper estimates one set of coefficients for Equation (1) using OLS from the panel data of time-series and cross-sectional observations. The results of this regression are similar to those from year-to-year regressions. Hence, it appears that the results are quite robust to different econometric specifications.

If both analyst following and S&P's stock rankings are highly dependent on the firm's industry, then the observed empirical association between the two variables can be spurious. For example, firms in certain industries may attract more analysts and also feature higher S&P stock rankings, while firms in other industries are neglected by financial analysts and exhibit lower stock rankings. To examine whether the positive association between analyst following and stock quality ranking is driven by their respective linkage to industry affiliations, I repeat the regression analysis after each firm's analyst following is normalized by its industry average. For this, I first calculate the industry mean analyst following for each three-digit SIC code. Then, the industry mean is subtracted from the number of analysts following each company. Table IV shows

[17]See, e.g., Bhushan (1989), O'Brien and Bhushan (1990), Brennan and Hughes (1991), and Pearson (1991).

Table VI. Regression Results using Companies not Included in the I/B/E/S Database

This table reports the results of the regression model:

$$NAF_i = \alpha_0 + \alpha_1 DH_i + \alpha_2 DR_i + \alpha_3 \ln(MVE_i) + \alpha_4 Volatility_i + \alpha_5 (1/Price_i) + \alpha_6 \ln(Volume_i) + \varepsilon_i$$

where NAF_i is the number of analysts reporting a one-year-ahead earnings forecast for firm i in June of each year, DH_i equals one if S&P's common stock ranking is higher than B and zero otherwise, DR_i equals one if the stock is rated by S&P and zero otherwise, MVE_i is the market value of equity for firm i, $Volatility_i$ is the standard deviation of firm i's daily stock returns, $Price_i$ is year-end share price of firm i, and $Volume_i$ is the average daily dollar trading volume of firm i. This study assumes that NAF = 0 for companies not included in the I/B/E/S database. For each variable, the table shows the average coefficient value from 12 cross-sectional regressions, the percentage of positive coefficients, the aggregated p-value from the chi-square test using the procedure outlined in Gibbons and Shanken (1987), Z-statistic, and p-value from Z-statistic. The table also reports the average adjusted-R^2 from 12 cross-sectional regressions.

		α_0	α_1	α_2	α_3	α_4	α_5	α_6
NYSE/ Amex	Average Coefficient	-26.682	1.008	2.485	1.478	34.796	2.126	1.718
	Positive Coefficients (%)	0%	100%	100%	100%	92%	100%	100%
	Aggregated p-Value (χ^2 Test)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Z-Statistic	-77.465	9.291	28.925	30.390	10.099	15.269	42.930
	p-Value from Z-Statistic	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Average Adjusted-R^2 = 0.590							
Nasdaq	Average Coefficient	-7.801	1.488	0.669	0.531	0.739	0.093	0.649
	Positive Coefficients (%)	0%	100%	100%	100%	42%	92%	100%
	Aggregated p-Value (χ^2 Test)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Z-Statistic	-35.514	9.974	13.571	21.458	1.172	13.218	42.930
	p-Value from Z-Statistic	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Average Adjusted-R^2 = 0.376							

Table VII. Changes in Analyst Following around Changes in S&P Stock Rankings

This table shows changes in analyst following (ΔNAF) associated with revisions in S&P rankings. The table shows the mean value of the change in the number of analysts when S&P either upgraded a firm's quality ranking (e.g., from B- to A) or initiates its quality ranking (e.g., from NR to B). Similarly, the table shows the mean value of the change in the number of analysts when S&P either downgrades a firm's quality ranking (e.g., from A to C) or stops ranking its quality (e.g., from B- to NR).

	Results Using Only Stocks Included in the I/B/E/S Database				Results Using All Stocks in the Compustat Database Assuming NAF = 0 for Those Stocks Not Included in the I/B/E/S Database			
	NYSE/Amex Stocks		Nasdaq Stocks		NYSE/Amex Stocks		Nasdaq Stocks	
Upgrades	ΔNAF(t-value)	# of Obs.	ΔNAF(t-value)	# of Obs.	ΔNAF(t-value)	# of Obs.	ΔNAF(t-value)	# of Obs.
From NR to A+	1.56 (2.45)*	16	4.00 (2.00)	2	1.37 (2.50)*	19	2.67 (1.51)	3
From NR to A	1.00 (2.54)*	33	0.17 (0.23)	6	0.89 (2.94)**	46	0.33 (0.66)	9
From NR to A-	0.56 (1.60)	34	0.60 (1.07)	10	0.60 (2.31)*	50	0.50 (1.07)	12
From NR to B+	0.17 (0.92)	123	0.31 (1.28)	88	0.27 (1.74)	162	0.28 (1.50)	119
From NR to B	0.64 (3.37)**	164	0.12 (0.70)	133	0.55 (3.65)**	211	0.18 (1.40)	202
From NR to B-	0.53 (2.65)**	86	0.08 (0.60)	145	0.42 (3.17)**	176	0.12 (1.84)	313
From NR to C	-0.13 (-0.42)	48	-0.24 (-1.45)	110	-0.01 (-0.06)	115	-0.12 (1.96)	342
One-Rank Upgrade	0.34 (4.85)**	928	0.39 (3.50)**	298	0.33 (5.32)**	1,262	0.23 (3.81)**	584
Two-Ranks Upgrade	1.25 (1.09)	8	0.00 (n/a)	2	1.43 (1.09)	7	n/a	0
Downgrades	ΔNAF(t-value)	# of Obs.	ΔNAF(t-value)	# of Obs.	ΔNAF(t-value)	# of Obs.	ΔNAF(t-value)	# of Obs.
From A+ to NR	n/a[a]	0	n/a	0	n/a	0	n/a	0
From A to NR	-3.50 (-1.46)	4	n/a	0	-2.44 (-1.83)	9	n/a	0
From A- to NR	-0.71 (-0.38)	7	n/a	0	1.00 (0.65)	15	-0.50 (-1.00)	2
From B+ to NR	-1.50 (-1.12)	6	n/a	0	0.13 (0.17)	23	-0.66 (0.87)	12
From B to NR	-0.56 (-0.76)	9	n/a	0	-0.38 (-0.57)	21	0.08 (0.32)	12
From B- to NR	-0.29 (-0.67)	7	-0.10 (-0.19)	10	0.00 (0.00)	21	-0.10 (-0.62)	41
From C to NR	-0.67 (-2.00)	3	-0.20 (-0.53)	5	-0.21 (-1.14)	14	-0.02 (-0.57)	56
One-Rank Downgrade	-0.60 (-8.69)**	1,237	-0.71 (7.87)**	345	-0.36 (-5.83)**	1,707	-0.36 (-6.98)**	740
Two-Ranks Downgrade	-1.23 (-4.42)**	57	-0.50 (-1.20)	14	-0.94 (-3.80)**	66	-0.26 (-1.06)	23

[a]Not applicable.

**Significant at the 0.01 level.

*Significant at the 0.05 level.

B. Results Using Companies not Included in the I/B/E/S Database

This study uses only those companies included in both the I/B/E/S database and Compustat files. Generally, a company is likely to be absent from the I/B/E/S database when no analysts follow it. If the number of analysts following a company increases with company quality, we should find that COMPUSTAT companies included in the I/B/E/S database have higher S&P stock rankings than Compustat companies not included the I/B/E/S database. Table V shows the difference in the distribution of S&P's stock rankings between the two groups of companies using the NYSE/Amex sample (see also Figure II). Of those companies included in the I/B/E/S database, about 39% are absent from the 1996 S&P common stock rankings. In contrast, the corresponding figure is 65% among those companies not included in the I/B/E/S database. Similarly, about 17% of I/B/E/S-listed companies receive S&P's rankings higher than "average" (B+), while the corresponding figure is only about 3% among those companies not included in the I/B/E/S database. I find similar results from the Nasdaq sample. These results provide additional evidence on the positive relation between analyst following and company quality.

To examine the issue further, this study invokes the working assumption that NAF = 0 for companies not included in the I/B/E/S database and estimates the regression model (1). Although not being included in the I/B/E/S database does not necessarily indicate that a firm is completely neglected by financial analysts, empirical evidence based on this expanded sample shall help assess the robustness of the results. The regression results, reported in Table VI, are qualitatively similar to those in Table III. Hence, the positive effect of company quality on analyst following seems to be quite robust.

C. Results Using Additional Control Variables

Chung and Jo (1996) show that analyst following is positively correlated with the firm's Tobin's q ratio, R&D expenditure, and advertising expenditure. To the extent that these variables reflect certain dimensions of firm quality, it is unclear whether S&P stock rankings can explain cross-sectional variation in analyst following beyond that explained by these variables. To examine this issue, I include these variables in the regression as additional control variables.[18] This paper measures Tobin's q ratio using the procedure suggested in Chung and Pruitt (1994). The firm's R&D activity is measured by the ratio of its annual R&D expense to sales. Similarly, the firm's advertising activity is measured by the ratio of its annual advertising expense to sales.[19] The regression results for the NYSE/Amex sample and the Nasdaq sample, respectively, are as follows:

$$NAF_i = \underset{(6.327)}{1.356}\, DH_i + \underset{(13.827)}{2.902}\, DR_i + \text{Control variables;}$$
Average adjusted-R^2 = 0.682

$$NAF_i = \underset{(4.773)}{1.374}\, DH_i + \underset{(6.120)}{0.565}\, DR_i + \text{Control variables;}$$
Average adjusted-R^2 = 0.442

[18]Hence, this study's control variables include ln(MVE), Volatility, 1/Price, ln(Volume), Tobin's q, and advertising and R&D expenditure ratios. This study assumes that NAF = 0 for firms not covered by I/B/E/S.

[19]Due to the high rate of missing values (-0.001) for R&D and advertising variables, the total number of cross-sectional and time-series observations used in the regressions is 6,086 for the NYSE/Amex sample and 7,535 for the Nasdaq sample, respectively, while the corresponding figures are 24,872 and 25,563 in the regressions for Table VI. To maintain a reasonable sample size, however, R&D and advertising expenditures are assumed to be zero for those companies with -0.008 code for these variables. (S&P uses -0.008 code if data has been reported by the company as "insignificant.")

For each dummy variable, I report the average coefficient value from 12 cross-sectional regressions and Z-statistic (in parenthesis). I also report the average adjusted-R^2 value from 12 cross-sectional regressions for each study sample. Note that the coefficient for DR_i is positive and significant in both the NYSE/Amex and Nasdaq samples. In addition, the coefficient for high-quality rankings is significantly greater than zero in both regressions. These results indicate that analyst following is significantly related to the S&P stock ranking and the relation between the two variables is quite robust and not sensitive to different model specifications.

IV. Changes in Analyst Following around Changes in S&P's Quality Rankings

Since the level variables can be cross-sectionally correlated without any direct causal link, regressions that use the levels of variables may show spurious associations between variables. To further examine the empirical linkage between analyst following and company quality, this study measures changes in analyst following when there are revisions in S&P's stock rankings during the 12-year study period. I calculate the mean value of the change in the number of analysts when S&P either upgrades a firm's quality ranking (e.g., from B- to A) or initiates its quality ranking (e.g., from NR to B). Similarly, I calculate the mean value of the change in the number of analysts when S&P either downgrades a firm's quality ranking or stops ranking its quality.

The results are reported in Table VII. The results suggest that analyst following increases when S&P initiates a company's stock ranking, although the increase is statistically significant for only NYSE/Amex-listed stocks. I find a significant increase in analyst following for both NYSE/Amex and Nasdaq stocks when S&P upgrades the rankings. The results suggest that an upgrade of one rank in S&P's common stock rankings results in an increase of 0.34 analysts for NYSE/Amex companies and an increase of 0.39 analysts for Nasdaq companies. I obtain similar results when I include companies not covered in the I/B/E/S database in the study sample.

In contrast, the table shows a significant decrease in analyst following for both NYSE/Amex and Nasdaq firms when S&P downgrades their quality rankings. When S&P downgrades a NYSE/Amex-listed company by two ranks (one rank), the number of analysts following the company declines by 1.2 (0.6). Similarly, the number of analysts following a Nasdaq company declines by 0.7 when its S&P quality ranking drops by one rank. Because of the scarcity of cases, the impact of the cessation of S&P rankings on analyst following cannot be meaningfully established.

V. Conclusions

Previous studies have offered various conjectures regarding the factors that determine the cross-sectional variation in analyst following. Some suggest that it is the brokerage commission schedule that determines the cross-sectional difference in analyst following. 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.

This paper presents an alternative explanation of analyst following. This study suggests that the roles of analysts and brokers can be best understood when they are seen as marketing agents of their brokerage firms. This study defines "marketing" as the process by which companies identify the preferences of customers, design products to satisfy these preferences, and sell their products. This study predicts that investors prefer stocks of high-quality companies over stocks of low-quality companies, and that brokerage firms respond to this preference by directing their analysts and brokers toward high-quality companies. The empirical results are generally consistent with these predictions.

The results of the present study underscore a possible conflict of interest between investors and analysts/brokers. While the ultimate goal of investors is the maximization of their investment returns, the securities analysis activities and resulting stock recommendations by analysts/brokers can be driven by their own private interest, which may not coincide with the interest of investors. To the extent that stocks of high-quality companies offer inferior returns to those of low-quality companies, it is important for investors to guard against the analysts/brokers' tendency to promote/recommend stocks of high-quality companies.

The marketing perspective may provide insights into phenomena beyond brokerage firms and analyst following. For example, the marketing perspective may provide an understanding of the choice of product lines of mutual fund companies (e.g., why are there "socially responsible" mutual funds?); the choice of an exchange's marketing niche (e.g., Nasdaq as "The stock market for the next 100 years"); and the world of advisory services, from investment magazines to pension fund management. Further investigation of these issues would be a fruitful area for future research. ■

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