Does analyst stock ownership affect reporting behavior?

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**Abstract**

An analyst who owns stock in the company she covers may be tempted to protect or enhance her personal interests. I examine how this conflict of interest affects the reporting of sell-side analysts. I identify and collect two samples, the first from SEC Form 144 filings, and the second from voluntary ownership disclosures.  Ordered probit analyses show that owning-analyst recommendations are slightly more cautious than those of the control analysts.  I find little robust evidence that stock ownership leads to optimistic analyst reporting, however I do find that analysts who are consistently optimistic are owners. The results are consistent with a conclusion that analyst stock ownership, unlike other potential incentives, may not be a significant concern since in many cases multiple non-owning analysts also provide reports. Being an outlier potentially reduces any benefit to the owning analyst and risks their personal reputation.

**1. Introduction**

In this paper, I provide empirical evidence of the influence of sell-side analyst stock ownership on their recommendations and earnings forecasts. Although an extensive literature documents the existence of an optimistic bias in analyst forecasts, providing an explanation for the bias continues to be an ongoing source of academic debate. Some research hypothesizes and supports an incentive explanation for the bias, whereas other research posits econometric or other rationales for the presence of the forecast bias.[[1]](#footnote-1) Prior studies link analyst recommendation optimism and personal financial incentives based on employer compensation but lack compensation data (Lin and McNichols, 1998; Michaely and Womack, 1999). A study of the effect of analyst stock ownership on analyst reporting provides an opportunity to examine a direct incentive for reporting bias, thereby allowing for stronger conclusions on the causal link between incentives and reporting bias.

Understanding the effect of incentives on analyst reporting behavior is important for at least three reasons. First, analysts play a significant role as information intermediaries in the public markets. If incentives affect their reports, markets and market participants could be adversely affected. Second, analyst forecasts are a common proxy for the market’s earnings expectations in academic research. Results and conclusions of studies could be altered by biases in this proxy. Last, analyst stock ownership provides a setting to study the broader question of the effect of incentives on reporting.

Historically, disclosure of analyst stock ownership has been boilerplate and nonspecific. Therefore, there is little evidence of the extent of analyst stock ownership. Popular press interviews suggest that analyst ownership was pervasive prior to various reforms undertaken in 2001. For example, a Merrill Lynch spokesman states that slightly more than one-half of their analysts own stock in the companies that they cover (Cowan 2002, Schack 2001). A 2001 Securities and Exchange Commission (SEC) inquiry found that some analysts held restricted stock in the companies that they covered. Restricted stock is an unregistered security that is issued by companies in non-public transactions, such as prior to an initial public offering (IPO). The SEC found that the analyst’s restricted stock holdings generated individual profits ranging from $100,000 to $3.5 million (Unger 2001). Therefore, stock ownership appears to be a common, and potentially major, financial incentive for sell-side analysts.

Popular press anecdotes and the SEC investigation suggest analysts typically become stock owners by purchasing restricted stock prior to an IPO, or by investing at the time of the IPO as an employee of one of the underwriting investment banks, or by making an open market purchase. One venture capitalist explained the potential benefit of allowing a pre-IPO investment by an analyst as follows, “You’re hoping to get them to cover you if you go public.”[[2]](#footnote-2) The SEC found that analysts were regularly involved with start-up companies well before an investment banking relationship had been established. The analyst established the relationship and often reviewed the company operations and provided informal strategic advice. The desire for, and importance of, analyst coverage to companies going public in recent times is documented by Loughran and Ritter (2004) and Bradley, Jordan and Ritter (2003). Developing relationships with pre-IPO companies and owning stock offer potential benefits to the analyst as well. Evaluating emerging competitors enhances the analyst’s industry knowledge and understanding of competitive threats to existing industry participants. Identifying potential IPO clients is also valuable to the analyst’s employer and, perhaps ultimately, the analyst themselves. Investing in the companies that the analyst covers, or will cover, as part of their employment allows investment without any additional effort. Analyst stock ownership offers potential benefits to companies and the analyst, but there is legitimate concern about the potential effect on users of analyst reports if those reports are biased due to personal incentives.

An analyst’s financial interest in the stock of a company on which she reports could have a detrimental effect since an analyst might report with an optimistic bias. For example, an owning analyst might fail to report bad news prior to selling their stock. A personal financial incentive would result in strategic bias. However, the long-term value, and hence importance, of an analyst’s reputation provides a potential counter-force against any strategic reporting bias. In addition, behavioral theory suggests that analyst ownership could create an inside view which results in a lack of reporting objectivity. Such an outcome would be a nonstrategic bias.

Government and regulatory authorities desire a fair and well functioning capital market. Therefore they are sensitive to investors or potential investors receiving biased advice. The SEC is currently pursuing a legal case against one analyst, alleging that he failed to tell investors that he owned stock in two public companies for which he issued a buy recommendation (Solomon, 2005). Recent regulatory changes now prohibit analysts from obtaining restricted shares. Clear and explicit disclosure of ownership is now required (NYSE Rule 472) and many brokerage firms have adopted policies prohibiting analysts from owning the stocks that they cover. This paper explores the influence of analyst stock ownership on their primary report outputs in the period prior to these reforms.

I employ two samples of analysts who provide research coverage on stocks they own. Each sample has its advantages. The Form 144 sample results from matching analyst names to SEC Form 144 filings. A Form 144 is required for the sale of restricted stock if the stock is sold within a specified timeframe. (See 3.1.1 for details.) These restricted-stock-owning analysts may not have otherwise disclosed their stock ownership, therefore market participants may not have been aware of the potential conflict of interest. Theory suggests that the analyst is likely to report optimistically under these circumstances (Morgan and Stocken, 2003). This sample also provides a cross-section of owning analysts from different brokerage firms, however, the firms represented are generally large. The 144 sample is all IPO companies, as the analyst sells her restricted shares shortly after the IPO. I obtain the second sample (disclosing sample) through analyst ownership disclosures in the published reports of one of the few brokerage firms that historically required such disclosure.[[3]](#footnote-3) The disclosing firm is also in the largest decile of brokerage firms. This sample has the advantage of identifying all of the ownership positions of the disclosing analysts. The majority of the disclosing sample companies are also IPOs, although a substantial portion is older, well established companies. To isolate the effect of stock ownership from an underwriting incentive, all underwriting relations are identified and controlled for in the empirical tests. The research design also includes tests to differentiate between an optimistic analyst who chooses to own (self-selection) and an owner who reports with bias. A summary of results follows.

Both stock-owning and non-stock-owning control analysts issue “Buy” recommendations, on average, during the sample period. The results of the ordered probit analyses for both samples show that stock-owning analysts are more likely to issue a less favorable recommendation, relative to non-stock-owning analysts. Announcement returns around the analysts’ recommendations suggest that in most cases the market does not assess owner recommendations differently. Where optimism might be expected due to a lack of objectivity or a financial incentive this cautious behavior is surprising.

Univariate analysis of earnings forecast errors shows owning-analysts are more optimistic than control analysts in both samples. For the 144 sample, the multivariate test fails to support an association between ownership and optimism. Additional testing around the sale of their stock is suggestive of strategic behavior in the 144 sample but the results are limited to sub-samples and are sensitive to the specification applied. In the disclosing sample, the multivariate analysis provides some evidence of an association between stock ownership and earnings forecast optimism however, additional testing reveals that disclosing analysts issue similarly optimistic forecasts even when they are not an owner. Therefore it is difficult to conclude that ownership is the cause of the optimism. Such behavior may reflect analyst efforts to please company management in an effort to obtain information (Lim, 2001).

Although common, not all analysts own every stock for which they publish research. Therefore, any owning-analyst reporting bias is subject to user skepticism since in many cases multiple non-owning analysts also provide reports. Being an outlier potentially reduces any benefit to the analyst and risks their personal reputation. This scenario is similar to Gu and Xue’s (2008) setting where independent analysts provide implicit monitoring which counters investment banking and brokerage incentives. Stock ownership therefore differs from other incentives, like underwriting and management access where many, if not all, analysts are attempting to curry favor with company management through optimistic reporting, in that non-owning analysts act as implicit monitors. In the absence of a detrimental effect, ownership offers a potential benefit as a credible signal of an analyst’s conviction in a company’s prospects.

This study makes several contributions to the literature. First, it explores a new incentive which has received regulatory and government interest but heretofore has been absent from the academic literature. Second, the results support the countervailing role of reputation on personal incentives where there are multiple reporting parties, some of whom are free of the potential conflict of interest. This study complements the theory work of Morgan and Stocken (2003), who model an analyst stock ownership setting but with only one analyst, as well as the empirical evidence of Gu and Xue (2008) who explore the beneficial role of independent analysts. Last, the results suggest that brokerage firms and regulatory bodies may have overreacted to concerns about the detrimental effects of analyst stock ownership, on average.

The paper is organized as follows. Section 2 outlines the hypothesis. Section 3 contains the sample selection, some descriptive statistics and outlines the research design. Section 4 details the results. Section 5 concludes.

1. **Hypothesis Development**

Researchers and investors are uncertain about the objective function of analysts. There is some evidence that analyst compensation may be tied to brokerage firm revenues, including trading commissions and investment banking revenues (Michaely and Womack, 1999). Thus, one element of an analyst’s objective function is her compensation. In addition, an analyst’s personal stock portfolio would also affect her objective function. These personal financial considerations could affect an analyst’s objectivity and misalign her interests from those of investors. Prior research finds support for a relation between investment banking affiliation and analyst reporting optimism. In particular, the recommendations of analysts associated with the lead underwriter, of both IPOs and Seasoned Equity Offerings (SEOs), are, on average, more optimistic than the recommendations of other analysts (Lin and McNichols, 1998; Michaely and Womack, 1999). Because there is anecdotal evidence that analyst compensation is significantly influenced by their helpfulness to the investment banking group and its financing efforts, one interpretation of these results is that personal financial incentives motivate underwriter analyst optimism.

Morgan and Stocken (2003) model the recommendations of one analyst where investors are uncertain about the analyst’s incentives. They find that a misaligned analyst, one that prefers to induce a higher stock price than is warranted by their information, issues favorable reports more frequently. A stock-holding analyst might personally benefit from attempts to boost the stock price prior to selling, or by selling prior to downgrading a recommendation or reducing an earnings forecast.[[4]](#footnote-4) Such actions constitute a strategic bias. Morgan and Stocken’s result suggests that opportunistic behavior is expected where incentives are not clearly disclosed, i.e. where the analyst’s stock ownership is not revealed in her report.

However, analyst reputation concerns help to align investor and analyst interests, acting as a potential counter force to personal financial incentives. Perceived external reputation is also a major contributing factor to analyst compensation. Industry polls and analyst rankings, such as those found in *Institutional Investor* and the *Wall Street Journal,* affect an analyst's reputation and hence her compensation. Stock-picking ability and forecast accuracy are two of the cited determinants of external analyst rankings.[[5]](#footnote-5)

Cognitive research suggests a potential nonstrategic bias arising from analyst stock ownership. Boni and Womack (2002), citing the work of Kahneman and Lovallo, suggest that stock-owning analysts may be subject to an inside view in the sense that it is more difficult for them to be objective and think statistically about companies with which they are emotionally involved. Thinking situations are unique, rather than a member of a class of probabilistic events, owning-analysts are likely to think in terms of potentially achievable outcomes rather than most likely outcomes. Facing uncertainty, good decision-making requires an “outside view”, which is not possible if the analyst is an owner of the stock.

Given the uncertainty of whether the incentive effect dominates the reputation effect and whether an inside view effect exists, I offer my hypothesis in the null; analyst report outputs are unaffected by stock ownership.

3. Sample Selection, Descriptive Statistics, and Research Design

* 1. *Sample Selection*

I identify two samples of analysts that held stock in a company and published research on that company.

*3.1.1. Form 144 sample*

The Form 144 sample is based on name matches between Form 144 filings and the IBES database of analysts.Form 144 is filed with the SEC under Rule 144. An analyst must file a Form 144 if she sells restricted stock during the first year following the required holding period. Prior to April 29, 1997, SEC Rule 144 required a two year holding period for restricted stock owners; after April 29, 1997 the required holding period is one year. Non-insiders,such as analysts*,* who sell after the mandated reporting period, have no obligation to file a Form 144 with the SEC.

These filings offer an ex-post indication of the incentives that existed when the analyst reported on the company and about which, in many cases, the market was unaware. From a research perspective the filings also allow a cross-section of owning-analysts, the majority of whom would not have otherwise disclosed their stock ownership.

Figure 1 depicts the timeline of critical events: the purchase and sale of restricted stock, the company IPO, and the required holding and Form 144 filing periods for a non-insider. The figure also shows the sample period which encompasses any report issued after the IPO through to the date of the owning-analyst’s final disclosed stock sale.

I obtain a complete database of Form 144 filings from Thomson Financial. Based on the Form 144 filings for the period 1987 to 2001, 51 instances in which an analyst owns restricted stock and appears in the IBES database as an analyst for that company arise. This sample represents 49 different companies and 43 analysts from 30 brokerage firms.

The median (mean) declared market value of the restricted stock sold is $65,000 ($388,000). The total investment may be greater, as the shares sold may represent only a fraction of the analyst’s holdings. Given that pre-IPO shares are generally purchased at prices well below the IPO price, analysts’ profits could be a substantial percentage of the proceeds. Moreover, these amounts are significant relative to the average analyst’s compensation, which in 2002 was estimated to be $189,250 per year.[[6]](#footnote-6)

Since a Form 144 filing can only be observed if a sale occurs in the first year after the mandatory holding period and meets the other reporting requirements, it is possible that analystrestricted stock ownership is not fully identified. Because there might be a misclassification between treatment and control groups, this possibility could weaken any cross-sectional tests that rely on comparisons to other analysts. However, given that most stocks are covered by multiple analysts, it is highly improbable that all, or even many, control analysts will also be stock owners, albeit undisclosed.

*3.1.2. Disclosing Sample*

I collect the second sample (the disclosing sample) from ownership disclosures in analyst reports. Prior to recent regulatory changes, and in contrast to much of the industry practice at the time, one of the larger brokerage firms required explicit ownership disclosure.[[7]](#footnote-7) IBES does not allow the revelation of the disclosing brokerage firm’s name. I identify the 41 equity analysts in the employ of this disclosing firm during 1998 as those who issue earnings forecasts during the year, as reported on IBES.

I review all the written reports of these analysts to identify instances and the period of ownership by the disclosing analyst. Investext is the source of analyst reports. The review covers approximately 8,000 reports spanning 1993 through 2001. There are 103 companies for which an analyst discloses ownership or a long position. These 103 analyst/company pairs comprise the disclosing sample. The 103 companies represent approximately 15% of the stocks that the analysts cover. Almost all of the analysts at the disclosing firm own at least one of the stocks that they cover. Although the ownership period is identified through the Investext reports, all earnings forecasts and recommendations for the sample come from IBES.

* 1. *Descriptive Statistics*

Table 1 PANEL A compares the market value of equity of the 49 companies in the Form 144 sample to the Schrand and Verrecchia (2002) IPO sample.[[8]](#footnote-8) The stock-owning analyst sample companies are bigger, on average, than typical IPO companies. In untabulated results I also perform a similar comparison of excess returns in the first year after going public[[9]](#footnote-9). On average, the owning sample excess returns are relatively high (0.56), but the range is quite large. The mean and median excess returns of the sample companies (0.56 and 0.245, respectively, relative to CRSP value weighted) are greater than the comparable returns for the more comprehensive IPO sample (0.144 and -0.062, respectively). At face value, the returns difference suggests that the owning-analysts have significant stock picking ability.

Although the IPOs of the sample companies are spread over many years, 55% of the companies went public in the years 1999 and 2000. In addition, the 49 companies represent 21 different four-digit SIC industry codes but are primarily concentrated in technology, Internet, or telecommunication companies.[[10]](#footnote-10)

Table 1PANEL B compares the yearly market value of equity of the disclosing sample companies to the entire Compustat database. In general, based on the medians and means of both groups, it is clear that the stock-owning analyst sample companies are larger than the average Compustat company. However, the size difference may not be unusual, in that previous research has shown that analyst coverage is generally concentrated in larger firms.

Eighty of the 103 companies undertake an IPO during the sample period, suggesting that analyst ownership is frequently associated with IPOs. The sample companies are also quite active in the SEO market; so controlling for SEO underwriting incentives is appropriate. Most industry groups, based on one-digit SIC code, are present in the sample. However, approximately 40% of the sample is computer programming or software firms.[[11]](#footnote-11) Sample analyst characteristics are discussed in the results section (Section 4.2 and Table 3).

*3.3. Research design*

I test for the presence of bias in stock-owning analyst reporting by comparing their primary report outputs to those of non-stock-owning analysts employed by other investment or research firms who cover the same company. These comparisons eliminate any idiosyncratic reporting differences across industries and companies, but fail to control for analyst characteristics. I use control variables to address possible reporting differences across analysts.

An alternative research design is to compare within-analyst. A within-analyst approach uses only owning-analyst reports and compares the outputs across two groups, those she owns versus those that she does not own. Comparing within-analyst controls for individual analyst characteristics but ignores reporting differences across industry or company. Since analyst forecast bias, either optimistic or pessimistic, varies widely across stocks and given that there is little research to explain this cross-sectional variation, identifying appropriate control variables for a within-analyst approach is problematic. Subject to that caveat, I use the within-analyst approach for robustness testing in the disclosing sample because all the disclosing analysts’ ownership interests are identified.

*3.3.1. Variables*

Since the objective is to test for the existence and significance of bias in stock-owning analyst reports, the tests focus on earnings forecasts and recommendations, the primary outputs of a research report.[[12]](#footnote-12) The two dependent variables are forecast errors and the recommendation level.

Forecast errors (FE) are company actual quarterly earnings less individual analyst earnings forecasts. Since analysts forecast the results from continuing operations before extraordinary items, actual earnings often require adjustment to be comparable to analyst forecasts. I obtain actual earnings from IBES, because IBES performs the earnings adjustment. To reduce heteroskedasticity, I deflate forecast errors by the stock price one year prior to the forecast period ending date. For the first year of forecasts after an IPO I deflate the forecasts by the first price quoted on CRSP. To avoid FE measurement problems that could arise from small deflators, consistent with prior research, I delete the observations with price deflators that are less than $5. To reduce the effect of outliers, I winsorize the top and bottom percentile of forecast errors.

IBES converts analyst recommendations into an ordinal variable, one through five. A strong buy recommendation appears as a one in the database, a two is a buy, a three is a hold, a four is a sell, and a five is a strong sell. To enhance recommendation comparability, I match each stock-owning analyst report with all non-stock-owning analyst recommendations issued in the 60 days before and after the stock-owning analyst report.

To test for stock ownership bias, I include an ownership dummy variable (OWN) in all test specifications. Ideally, the economic significance of the stock relative to an analyst’s wealth would be the incentive measure. However, given that personal financial data is unavailable, the incentive proxy is the existence of ownership. Negative forecast errors indicate optimism. For the recommendation specification, optimism also results in a negative coefficient because IBES assigns a lower number to more favorable recommendations. Section 3.3.3 discusses how the research design addresses the fact that ownership is a choice variable.

Control variables address known determinants of bias or error. These factors are: other incentives that could affect analyst reporting; analyst and company characteristics that previous research has shown to affect forecast errors and which may affect analyst reporting in general; and forecast age. Because information arrives over time, forecast error should decline as the actual earnings announcement approaches.

I specify underwriting dummy variables to differentiate an underwriting incentive from a stock ownership effect (see Michaely and Womack, 1999; and Lin and McNichols, 1998). The lead underwriter dummy variable represents lead and co-lead underwriting firms and, following Bradley, Jordan, and Ritter (2003), an additional variable is added for co-managers as well. To control for lower average forecast error in companies with greater analyst coverage, the regressions contain the analyst following variable (Follow), which is the number of analysts who provide forecasts on a company during the quarter (See Lys and Soo, 1995).

Specific to the Form 144 sample I add the Disclose variable, because some stock-owning analysts in this sample clearly and explicitly disclose their ownership in their report. This disclosure could limit opportunistic behavior of a disclosing-owner analyst relative to those that do not disclose. Since only owning analysts disclose, the Disclose variable captures the interactive effect of disclosure and ownership.

Three variables - experience, broker decile, and complexity - control for the effect of individual analyst characteristics on their reports (Clement, 1999; Lim, 2001). Experience measures the analyst’s tenure as a sell-side analyst, in years; a proxy for which is the number of years they appear in the IBES database. A learning hypothesis would imply that analyst performance improves with experience. Further, greater experience could indicate a better quality analyst, since she has retained her job longer in a competitive field. Both theories predict that forecast errors will decline with experience(Mikhail, Walther, and Willis, 1997; Jacob and Lys, 1999). Broker decile differentiates brokerage firms based on size. Analysts at larger brokerage firms may have greater resources available to assist with their duties, resulting in better outputs. I assign all brokerage firms to deciles each year, based on the number of analysts at each firm. Complexity represents the number of companies an analyst covers. As an analyst covers more companies, I expect a decline in relative performance, due to work demands.

Another consideration for control variables is company-specific variables. In both samples, most companies are recent IPO companies. Therefore, earnings predictability is likely to be comparable. However, in the disclosing sample there is a mix of new and seasoned companies, so I include the volatility variable as my proxy for forecast difficulty (Das, Levine, and Sivaramakrishnan, 1998). Volatility is the standard deviation of the previous year’s daily stock returns. Brown (1999) finds that forecast errors differ between loss and profit companies, therefore a dummy variable, Loss, controls for forecast differences between profitable and non-profitable quarters.

Forecast age is the difference in days from the analyst forecast date to the company’s earnings announcement date (O’Brien, 1988).

To the extent that cross-sectional variation in analyst bias by company is related to the firm’s industry, industry dummy variables control for the average effect. Although the Form 144 sample companies represent 21 different four-digit SIC code industry groups, many are technology or Internet-related companies and the sample is small. Therefore, using Loughran and Ritter’s (2002) definition of Technology Stocks, I use one industry control variable, labeled Internet. Thirty-four sample companies fall into this Internet category. For the somewhat larger disclosing sample, I define an industry based on one-digit SIC codes.

I would like to include a proxy for analyst reputation in the regression testing. However, in the Form 144 sample only 5 of the 43 analysts are ranked by Institutional Investor. Including a dummy variable for being ranked does not alter the results. Of the 41 analysts in the disclosing sample, only 3 are ranked by Institutional Investor.

*3.3.2. Exploiting the institutional setting – Form 144 Sample*

The cross-sectional testing assumes that the stock-owning analyst’s incentive is to be optimistic throughout her entire period of ownership. A stock-owning analyst’s reporting may only be affected by her stock ownership during the period(s) when any effect on stock price is beneficial to the analyst, i.e., prior to the sale of her stock.

Since Rule 144 requires a holding period (See Figure 1), I employ an alternative approach to investigate the effect of stock ownership on analyst reporting, and perhaps increase the power of the test with the Form 144 sample. The test compares stock-owner analyst reporting during the required holding period, a period in which the analyst may not be able to extract a personal financial benefit, relative to the eligible sale period reporting. Moreover, by comparing a change in reporting over time many of the self-selection issues of the cross-sectional testing are eliminated.

*3.3.3. Self-selection bias*

Both samples are of analysts that choose to own stock. Therefore, where possible, I incorporate a selection model and differences-in-differences in the testing. My selection model is one in which I explicitly model the choice to own stock in one or more equations. The final equation uses the outcome of the prior equations’ estimation to instrument for the fact that the variable of interest, ownership, is a choice variable.

Tests of differences-in-differences exploit time series data pre- and post-treatment of both a sample and a control group. This design compares subject outputs to their previous outputs, thus eliminating many sources of non-comparability between the sample and the control group.

**4. Results**

I obtain Form 144 filings from Thomson Financial; analyst forecasts and recommendations from IBES; stock prices from CRSP; IPO and SEO information from SDC; and analyst reports from Investext, Multex, and First Call.

* 1. *Analyst recommendations*

Table 2 presents the univariate and ordered probit analyses of the owning and control analyst recommendations. I reduce the sample by eliminating instances in which there are no recommendations issued by control analysts in the 120-day period centered on the date of the owning analyst’s recommendation.

The univariate results of PANEL A show that, on average, both stock-owning and non-stock-owning control analysts issue “Buy” recommendations ( 2=Buy) during the sample period. In the Form 144 sample, owning analysts have a mean recommendation of 1.87. The control sample mean recommendation is 1.62 and is statistically different from the stock-owning sample mean. The higher average recommendation level among stock-owning analysts suggests less favorable recommendations. The disclosing stock-owning analyst sample has a mean recommendation of 2.24 compared to the control sample mean of 2.14 but they are not statistically different at the conventional level. Fisher’s exact test, however, rejects that the two samples have the same distribution. The stock-owning analysts do not issue a sell or strong sell recommendation in either sample, nor do the control analysts in the Form 144 sample. During the sample periods, sell and strong sell recommendations were rare in general and a buy recommendation was common for many stocks.

PANELBof Table 2 presents the multivariate analyses of the samples’ recommendations. Analyst recommendations are a polychotomous variable that has a natural order. Therefore, I use an ordered probit to perform the analyses. A z-statistic indicates the significance of the probit coefficients. The Form 144 sample ownership variable (OWN) is positive and weakly significant at the 10% level. In the larger disclosing sample, the coefficient on the ownership variable is 0.32 and significant. These positive coefficients provide evidence that a stock-owning analyst has a greater probability of issuing a less favorable recommendation than does a non-stock-owning control analyst.

However, for the ordered probit, the marginal effects of the regressors on the probabilities of each recommendation level are not equal to the coefficients. Only the signs of the changes in the two extreme outcomes are unambiguous; the effect on the middle cells is ambiguous (See Greene, 2000). In PANEL C, Table 2, I present the marginal effects of the ownership dummy variables on the probabilities of each recommendation. The magnitude of the marginal effects differs across samples, perhaps due to sample size differences. However, the result is the same, a rightward shift in the distribution toward less favorable recommendations. Note, in the larger disclosing sample, the marginal effect is relatively small.

These results provide preliminary evidence that an analyst’s reputation concerns may provide an effective check on the incentive effect of stock ownership. The results also suggest there is little evidence to support an inside view effect. This evidence of cautious reporting by stock-owning analysts also reduces concerns of a self-selection bias inducing a finding of greater optimism. Final conclusions are subject to the forecast error testing.

Although the main result is consistent across samples, the sign and significance of the control variables differs by sample. The IPO underwriter variable is positive and significant in the Form 144 sample, but not in the disclosing sample. This finding contradicts the existing literature, but it is based on a small sample of IPO firms. The disclosing sample results show that three of the four underwriting coefficients are negative, including the IPO co-manager variable, which is also the only one of the four that is statistically significant. This finding is consistent with an underwriting incentive, as in Michaely and Womack (1999), but it suggests that the co-managers, not the lead underwriters, of IPOs provide optimistic recommendations. The lack of significance of the SEO underwriting variables is inconsistent with Lin and McNichols (1998). However, Lin and McNichols explore a much larger sample of SEOs, which could explain the different results.

For the Form 144 sample, the internet and broker decile variables are the only other statistically significant control variables. The coefficient on the Internet variable is positive, but the broker decile variable coefficient is negative. I do not calculate the marginal effects for the control variables, since they are not the focus of the paper. However, the general implications are that recommendations for Internet companies are less optimistic and recommendations issued by larger brokerage firms have a higher probability of being a strong buy.

The analyst following variable is the only other statistically significant control variable in the disclosing sample. The coefficient is positive, suggesting that greater competition limits analyst optimism.

*4.2. Recommendation Announcement Returns*

To capture the market’s assessment of owning analyst recommendations, I analyze 3-day cumulative abnormal returns (CAR) around the disclosing sample recommendations (results not tabulated).[[13]](#footnote-13) Following Lin and McNichols (1998), I estimate the following regression without an intercept:[[14]](#footnote-14)

**CAR = α1 Owner Strong Buy + α2 Owner Buy + α3 Owner Hold + α4 Strong Buy + α5 Buy +**

**α6 Hold + α7 Sell + α8 Strong Sell + α9 UW Strong Buy + α10 UW Buy + α11 UW Hold (1)**

I use two samples; across analysts (similar to Table 2 without the time restriction) and; within-analyst (using only owning-analyst recommendations, both for stocks they own and those that they do not own). I control for underwriting incentive effects by including the UW variables.

The owner and underwriting variables capture the incremental return. All the owner variables are statistically insignificant except for the owner Hold variable in the within-analyst sample. In that case, the coefficient on the owner Hold variable is -0.07 and is statistically significant at the five percent level. This result suggests that, relative to hold recommendations on stocks she does not own, the market reacts more negatively when an owner issues a hold recommendation on a stock she does own. For both samples the Hold coefficient is negative and significant at the one percent level, suggesting that the market interprets a hold recommendation from any analyst as a sell.

In general, the market results are supportive of the previous results; owning-analyst recommendations are comparable to both other analyst recommendations and the recommendations on stocks for which an owning-analyst is not an owner.

*4.3. Univariate results – forecast errors*

Table 3 presents some univariate statistics. In both samples, the average forecast error is negative, suggesting overall optimism. The analyses of the two samples’ forecast errors by stock-owning analysts relative to non-stock-owning analysts show statistically significant mean differences. Stock-owning analysts are more optimistic, with a mean forecast error of -0.003 compared to the control sample mean of -0.001, as shown in both PANEL A and B.[[15]](#footnote-15)

The average forecast age (all greater than 149 days) for the stock-owning and control groups is relatively high, considering that they represent quarterly forecasts, but the high average occurs because many analysts initially forecast all four quarters at the beginning of the year. On average, stock-owning analysts forecast earlier than do control analysts. Therefore, forecast age may, in part, explain their excess optimism.

It is also more common for a stock-owning analyst to be affiliated with the lead underwriter and/or underwriting co-manager than it is for a control analyst, confirming a relationship between underwriting and analyst stock ownership. On average, stock-owning analysts are also from slightly larger brokerage firms. In the Form 144 sample, owning-analysts have more years of experience as sell-side analysts, but in the disclosing sample the opposite is true. In both samples, the number of companies for which a stock-owning analyst provides research coverage is greater than the control analyst group, on average. Ownership is disclosed for approximately 20% of owning-analyst observations in the Form 144 sample.

I measure the loss, following, and volatility variables at the company level and therefore do not include them in either panel of Table 3*.* In the Form 144 sample, a loss occurs in approximately 71% of the quarterly observations. For the disclosing sample, a loss occurs in approximately 35% of the quarterly observations. The difference in loss frequency between the two samples is likely a function of the non-IPO companies in the disclosing sample. The mean (median) analyst following is 14.2 (11) and 13.3 (9) for the Form 144 sample and the disclosing sample, respectively. The mean and median volatility in the disclosing sample is 0.04.

* 1. *Cross-sectional forecast error regression*

Table 4 presents the results of the cross-sectional forecast error regressions, before incorporating a selection model. The pooled OLS results of the Form 144 sample show no evidence of analyst optimism attributable to stock ownership, as analyst ownership (OWN), the primary variable of interest, is positive but not significant. In the disclosing sample, OWN is negative and significant, but requires additional tests to be conclusive; for example, to address the ownership choice (See Sections 4.7 and 4.8).

In the larger disclosing sample, to address problems arising from cross-sectional dependence in a pooled regression, I run separate quarterly regressions using ordinary least squares for the entire sample period and present the mean of those quarterly regression coefficients. To test the hypothesis that the mean coefficients are statistically different from zero, I calculate adjusted t-statistics following the Fama and Macbeth (1973) procedure. Although not tabulated, the Fama-Macbeth results for the Form 144 sample are qualitatively similar to the pooled OLS results of Table 4.

The regression results for many of the control variables are consistent across the two samples. The underwriter variables are not statistically significant in the Form 144 sample. In the disclosing sample, the IPO co-manager variable is not statistically significant, but the three other underwriter variables are all positive and statistically significant. These findings suggest that, with the exception of the IPO co-manager, underwriter forecasts are less optimistic, on average. The IPO co-manager recommendation optimism in Table 2, and the forecast findings above, show that IPO co-managers are optimistic, and more so than other underwriting participants.

In both samples the negative and significant coefficient on the forecast age variable supports greater optimism in early forecasts. Similarly, the negative coefficient on the loss variable suggests that analysts are poor at predicting losses and, in particular, that they are overly optimistic.

The coefficients for analyst following are positive and statistically significant, which suggests that greater analyst following reduces analyst optimistic bias. In addition, in the larger disclosing sample, I interact the owner and the follow variable to determine if owner optimism is incrementally affected by the level of analyst following. The coefficient on the interaction term is positive and statistically significant, which indicates that analyst following not only has a general effect on optimism, but also results in an incremental reduction in owner optimism.

The Internet industry dummy is positive and significant in the Form 144 sample. The remaining control variables are only significant in the disclosing sample. The experience variable is negative and significant, which suggests that, on average, analysts with more experience have higher forecast optimism. Volatility is positive and significant, which is surprising. Perhaps lagged volatility is a poor proxy for predictability, or perhaps companies with volatile returns in the previous year provide analysts with greater forecast guidance.

Optimism in quarterly forecasts by analysts who disclose their ownership seems odd since one might expect that users would discount subsequent forecasts potentially reducing any personal economic benefit to the analyst. Moreover, given the preliminary but conflicting multivariate earnings forecast results, the next four sections explore alternative research designs and tests to address the self-selection issue.

* 1. *Selling period incentive – Form 144 sample*

As outlined in Section 3.3.2, to compare the change in reporting behavior between the required holding period and the eligible sale period, I obtain a subsample of all stock-owning analysts who provide earnings forecasts in both periods, as well as the corresponding control analyst forecasts from the cross-sectional testing in Section 4.4. The sample is slightly more than one half of the full sample. I report results only for earnings forecasts, as the existence of multiple period observations allows comparison across time. The sample does not provide sufficient recommendations from both periods to draw any reasonable conclusions.

Since the date of the analyst’s stock purchase is unknown, I estimate the end of each analyst’s required holding period as the earlier of 60 days before the first disclosed sale (Form 144 filing) or the appropriate holding period (one or two years) after the IPO date. Any reports published before this date are considered holding-period reports and any issued after this date are considered selling-period or post-holding-period reports.

I supplement the regression specification of Table 4 with two additional variables. The first is a dummy variable, Post Holding Period, which takes on the value of one for forecasts issued after the end of the holding period, and zero otherwise. The second variable is an interactive variable, Post Holding \* Own, which is the interaction of the analyst ownership variable and the Post Holding Period variable. This interactive variable measures the incremental change in stock-owning analyst forecast behavior after the required holding period (i.e. when the analyst is free to sell), relative to the holding period forecasts. A strategic bias would predict a negative coefficient on the interactive variable.

Table 5 presents the results of this analysis. Similar to the Table 4 Form 144 sample results, the coefficient on the OWN variable is positive, but not statistically significant. The Post Holding dummy variable and the interactive Post Holding \* Own variable are both statistically significant. The Post Holding variable is positive, which supports an average decline in overall forecast optimism by all analysts in the post-holding period. This reduced optimism could be consistent with a general decline in optimism in the years following the IPO. The interactive variable Post Holding \* Own is negative, which supports incremental owning-analyst forecast optimism during the period that analysts are free to sell their stock. This owner optimism is suggestive of strategic reporting behavior. To explore the robustness of this strategic owner optimism, I expand the test above to include the forecasts issued after the analysts’stock sale. In untabulated testing, the results show no change in forecast behavior by the stock-owning analysts after the sale of stock, relative to the selling period, and the incremental optimism during the post holding period is no longer statistically significant. Therefore the pre-sale optimism result is not robust.

I contrast the regression results for the control variables presented in Table 5 with those of Table 4. The forecast age and loss variables are negative and significant, similar to the previous analysis. The Internet and following variables are positive, but are no longer statistically significant. The other significant change, relative to the Table 4 results, is that the complexity variable is now statistically significant. The signs of the coefficients on the Co-Manager and Disclose variables change relative to the prior analysis, but both are still not statistically significant.

To further address the self-selection issue, I revisit the forecast error cross-sectional results in the next three sections.

* 1. *Differences-in-differences – Form 144 sample*

Since the analyst’s stock sale date is known for the Form 144 sample I apply a differences-in-differences test. Table 6 presents the results. Contrasting forecasts for the same quarter, made at different times, eliminates many other sources of forecast variability. The sample does not provide sufficient recommendations from both periods to draw any reasonable conclusions, therefore only the earnings forecast results are presented.

To obtain the most powerful test, I focus on the last disclosed sale for each stock-owning analyst. To allow only one forecast revision per owning-analyst/company pair, I select the last forecast period. One drawback of the differences-in-differences test is that not every stock-owning analyst forecasts earnings for the same forecast period, both before and after the stock sale. Missing time-series data reduces the sample size, including control observations, to 73. The inclusion of control observations ameliorates other potential explanations for forecast revisions.

PANEL A of Table 6 presents the univariate analysis. Although the stock-owning analyst revisions are positive and much larger than the non-stock-owning analyst revisions, a test of means shows no statistical difference between the two groups. The change in forecast age is significantly greater for stock-owning analysts compared to the control group, which suggests less timely revisions by the stock-owning group. Stock-owning analysts provide coverage on a significantly greater number of companies (Complexity). The other two control variables do not show any statistically significant difference in means, although the relations are similar to those shown in Table 3.

PANEL B of Table 6 presents the multivariate analysis. The dependent variable is the change in forecast error. The regression coefficient on the OWNvariable is positive and statistically significant. The decline in stock-owning analysts’ forecast optimism after the sale of their stock holdings is statistically greater than other analysts’ decline in optimism for the same forecast periods. However, robustness tests of these results, using either the earliest forecast period for each owning analyst/company pair or all owning-analyst forecast revisions, are not statistically significant.

The change in forecast age is the only control variable that is weakly significant. The sign of the coefficient is positive.In the cross-sectional results, the forecast age is negative and significant. The two results are consistent, forecast optimism declines as the actual earnings report date approaches.

The cross-sectional regression results for the 144 sample provide no evidence of an effect of ownership on analyst earnings forecasts. In addition, although the tests after the holding period and around the actual sale raise some concerns about strategic reporting, the evidence is not robust. The two sections that follow further explore the disclosing sample cross-sectional evidence of optimistic owner forecasts.

*4.7. Incorporating a selection model*

The results of the forecast error treatment regression for the disclosing sample are presented in Table 7. I model the ownership decision using the experience variable and the underwriting variables. Early in a sell-side analyst’s career, her personal risk appetite and wealth could limit investment activity. I include the underwriting variables because an analyst’s early investment in a pre-IPO company may lead to that analyst’s brokerage firm being chosen as an underwriter. Alternatively, an analyst employed by an underwriter may be more likely to have preferential access to stock, either prior to or at the IPO, due to their significant relationship with the company as the underwriter. For an SEO, an analyst’s stock ownership could signal to the company management the commitment and belief the analyst has in the company which, in turn, may influence the SEO underwriting assignment. To facilitate the implementation of the two-stage model, it is run on a pooled basis. The first stage model is solved by maximum likelihood. A Wald test rejects the independence of the two equation’s error terms, at a 10% significance level, thereby providing some support for the need to control for the fact that ownership is a choice variable.

In the first stage probit (PANEL A), the four underwriter variables and the experience variable are all statistically significant. Experience and ownership are negatively related, which suggests that the less experienced analysts are more likely to own the stock that they cover. The underwriter results also strongly suggest that there is some association between stock ownership and underwriting involvement.

In the second stage regression (PANEL B), consistent with results shown in Table 4, the ownership variable is negative and significant. The significance of the coefficient, however, is likely overstated due to cross-sectional dependence, since there are multiple quarterly observations by the same analyst. The support for this conjecture is the Table 7 control variable results which are similar in sign to those of Table 4 but the z-statistics are of greater magnitude in Table 7. The only exception is Complexity, the coefficient changes sign from Table 4 to Table 7; but it is not significant in Table 7. The greater statistical significance of most of the control variables is likely a function of cross-sectional dependence. Note that the experience variable is excluded from the second stage regression to ensure identification.

The results of implementing a bivariate selection model on the forecast error equation for the Form 144 sample are inconclusive and untabulated. Although the significance of the owner variable is unchanged after applying the selection model, the results indicate that the first stage of the selection model is a poor predictor of owning-analysts.

The evidence to support an association between analyst forecast optimism and stock ownership in both samples appears to be weak. The results of the next section provide more conclusive results.

*4.8. Comparing forecasts - ownership and non-ownership periods – disclosing sample*

To complement the selection model results, holding the sample of companies constant, I explore owner reporting during periods of non-ownership, either before or after the stock ownership period, relative to periods of ownership. Using this expanded sample I supplement the Table 4 regression specification with two additional dummy variables. The first, Non-Owning Period, is an intercept term that controls for all forecasts during the non-stock-ownership period. The second, Owning-analyst-non-owning period, measures the owning analysts’ average forecast bias during the non-treatment period (periods during which they do not own). By comparing the sign, magnitude and significance of the two owner dummy variables (ownership and non-ownership), I assess whether stock ownership is an explanation for analyst optimism.

Table 8 presents the results. Relative to Table 4, it is clear that the magnitude and significance of all the variables are similar across the two tables. Moreover, although it is positive, the new intercept term that captures the incremental difference in bias during the non-stock-ownership period is not statistically significant.

The primary variables of interest are the two owner variables. As in Table 4, stock-owning analyst forecasts during the period that they own the stock are optimistic. The coefficient on the OWN variable is -0.0008 and is statistically significant. The contrast of interest is the forecast error for the period during which the analysts do not own the stock. The results show that the owning-analysts are optimistic even during the period of non-ownership. The coefficient on the Owning-analyst–non-owning period variable is -0.0007, and is statistically significant. An F-test rejects that both coefficients are zero. However, a second F-test cannot reject that the two owner coefficients are equal.

Finally, I also perform a within-analyst analysis (See Section 3.3) on the earnings forecasts of disclosing owning-analysts using themselves as control observations. In untabulated results, I find that analyst forecast optimism is greater in the stocks that they own, versus those that they do not own. However, the difference is not statistically significant.

The results suggest that the cross-sectional forecast optimism found in the initial regression on Table 4 for the disclosing sample is the norm for this group of analysts and is not associated with their ownership status. Analyst attempts to curry favor with company management by issuing optimistic earnings forecasts to obtain inside information is supported by ex-ante research (Francis and Philbrick, 1993; Das, Levine and Sivaramakrishnan, 1998; Lim, 2001 and Ke and Yu, 2006). Overall, I find no robust evidence of an effect of stock ownership on analyst earnings forecasts.

**5. Conclusion**

In this paper I take the first step toward investigating the effect of stock ownership, a direct and known incentive to the analyst, on analyst reporting. Although the existence and extent of analyst ownership has been opaque to researchers and the market, the study exploits two different data sources.

Anecdotal evidence, the SEC investigation results and the data for this study all suggest that analyst ownership is not infrequent and the investment amounts are in many cases sizable. For example, in the disclosing sample most analysts own at least one stock they cover and they own 15% of all the stocks they cover. The Form 144 sample reveals that the average market value of the stock sold by an analyst is significant, $388,000, and the total ownership interest could be larger.

Based on the two samples of sell-side analysts who have a stock-ownership position and provide research coverage, I find that analysts who own stock are slightly more cautious in their recommendations. Tests of market reactions to the recommendations generally provide support for the lack of bias. This lack of support for the Morgan and Stocken (2003) model results may be due to two reasons. First, their model considers only one analyst. In this paper, the average number of analysts reporting on the sample companies is at least thirteen. The least conflicted analyst(s) provide(s) a check on the others, as users are able to compare outputs across analysts and may underweight the extremes reducing the potential benefit of bias. Such comparisons also put the analyst’s reputation at risk. The results show that optimism is decreasing in analyst following. Second, at least in the disclosing sample, a user of the analyst’s report is aware of the analyst’s stock ownership, which may reduce or eliminate the benefit of bias, as a user may rationally anticipate and adjust for any potential conflict of interest.

Although there is some concern about optimistic forecasts by analysts around the time of their stock sale, the weight of evidence suggests that stock ownership does not affect earnings forecasts. Disclosing-analyst forecasts are optimistic whether they are an owner or not. Such behavior may arise from an incentive to curry favor with the company’s management in an effort to extract private information in a pre-Regulation Fair Disclosure environment.

I conclude that analyst stock ownership, on average, has little effect on analyst recommendations or earnings forecasts. I find no evidence to support an inside view effect. Unlike other incentives, such as underwriting and management access, the fact that all analysts are not owners may limit opportunistic behavior as users are able to compare report outputs across analysts. In contrast, underwriters want to maintain management’s support and brokerage firms which are not currently underwriters are attempting to curry favor to become underwriters. Similarly, for many companies most, if not all, analysts benefit from management access and inside information and so, to the extent that these two incentives affect many or all analysts, the risk of being an outlier and, hence, damaging their reputations is lessened. Interestingly, Khorana, Servaes and Wedge, in their investigation of mutual fund manager’s ownership effect on future fund performance, find a positive relation despite the fact that the absolute investment is modest (median $0, mean $96,663). They conclude that “managerial ownership has desirable incentive alignment attributes for mutual fund investors.” Whether regulators and brokerage firms acted appropriately in dealing with analyst stock ownership remains open to future research.

Some caveats are in order. The tests applied have attempted to address the fact that ownership is a choice. To the extent that the tests do so imperfectly, then the results and interpretations could be affected. Moreover, since analyst stock ownership is not fully identified in the 144 sample, the results could be weakened due to the misclassification of control observations.

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**Figure 1**

**Form 144 time line for non-insiders**

Cross-Sectional Testing

IPO Date

Restricted Stock Purchase

Sale Date

Required Holding Period

Form 144 required

Time

Restricted stock is an unregistered security issued by a company in a non-public transaction. SEC Rule 144 requires filing Form 144 for non-insiders who sell their restricted stock in a public market during the 1st year after the required holding period.

Required Holding Period:

Pre April 29, 1997 – 2 years.

After April 29, 1997 – 1 year.

Table 1

**Descriptive Statistics**

**PANEL A: Market Value of Equity at IPO – Form 144 Sample vs. Broad IPO sample**

I construct the Form 144 sample by matching analyst names from IBES to SEC Form 144 filings from 1987 to 2001. The SEC requires Form 144 for the sale of restricted stock if the stock is sold within a specified timeframe. There are 51 instances in which an analyst owns restricted stock and appears as an analyst for that company in the IBES database. The sample represents 49 different companies and 43 analysts from 30 brokerage firms.

This panel compares market value of equity at the time of the IPO for the 49 companies versus a broad IPO sample, obtained from Schrand and Verrecchia (2002). Market value of equity is the product of the offering price and the number of shares outstanding immediately following the offering. Schrand and Verrecchia, 2002 (S&V) include firm commitment IPOs from 1990 to 1999 on SDC excluding non-ordinary shares, closed-end mutual funds, “penny stocks”, financial firms, spin-offs and firms with data discrepancies. Owning analyst sample companies are also excluded from the S&V group. Respectively, superscripts a and b denote statistical significance between sample and comparison firms at the 5% and 1% level.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **$ million** | **N** | **Mean** | **25th Percentile** | **Median** | **75th Percentile** | **Std. Dev.** |
| Sample Companies | 49 | 718a | 149 | 312b | 477 | 1,761 |
| S&V Sample | 2,490 | 191 | 65 | 112 | 203 | 273 |

**PANEL B: Market Value of Equity: Compustat versus Disclosing sample companies**

I obtain the Disclosing sample from analyst ownership disclosures in the written reports of one of the few brokerage firms that historically required such disclosures. I identify the 41 equity analysts employed at this disclosing firm as those that issued earnings forecasts during 1998, as reported on IBES. I review all reports written by these analysts, which are compiled by Investext and span 1993 through 2001, for ownership disclosures. There is analyst ownership for 103 companies included the sample.

This table compares the yearly market value of equity of the 103 companies (where appropriate) to the entire Compustat database. Superscript a denotes statistical significance between sample and comparison firms at the 5% level.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Compustat** | | **Sample companies** | |
|  | **Mean** | **Median** | **Mean** | **Median** |
| 1993 | 865a | 83a | 4,724 | 428 |
| 1994 | 855a | 78a | 4,426 | 240 |
| 1995 | 1,034a | 89a | 6,158 | 406 |
| 1996 | 1,190a | 100a | 8,087 | 579 |
| 1997 | 1,533a | 116a | 10,215 | 467 |
| 1998 | 1,867a | 98a | 14,464 | 529 |
| 1999 | 2,615a | 104a | 21,036 | 1,117 |
| 2000 | 2,466a | 84 a | 23,118 | 651 |
| 2001 | 2,186a | 93a | 18,147 | 470 |

Table 2

**Analyst Recommendations**

This table compares owning-analyst recommendation levels to non-owning analyst recommendations. For the Form 144 sample, the owner sample represents all recommendations issued by owning analysts prior to the sale of their restricted stock and on IBES. The disclosing sample represents recommendations issued during the period of ownership and for which owning analyst reports are available on Investext and IBES. These disclosing analysts are employed by one of the few brokerage firms that historically required such disclosures. The control samples are all other analyst recommendations for the same company issued within 60 days of the owning analyst recommendation. A strong buy recommendation appears as a one, a two is a buy recommendation, a three is a hold, a four is a sell, and a five is a strong sell. Superscript a denotes statistical significance between sample and control observations at the 5% level.

PANEL A: Univariate Comparison

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Sample Group | | | Control Group | | |
| ***Form 144 Sample*** |  | Mean |  | **Std. Dev.** | Mean |  | **Std. Dev.** |
| Recommendation Level |  | 1.87 |  | 0.53 | 1.62a |  | 0.58 |
| Number of observations |  | 38 |  |  | 101 |  |  |
| ***Disclosing Sample*** | | | | | | | |
| Recommendation Level |  | 2.24 |  | 0.49 | 2.14 |  | 0.83 |
| Number of observations |  | 103 |  |  | 453 |  |  |

Table 2, Analyst Recommendations - continued

**PANEL B: Ordered Probit Results**

This panel presents the ordered probit analysis of the owning and control analyst recommendations. **Recommendation** is an ordinal variable representing the analyst’s stock recommendation (1 Strong Buy, 5 Strong sell). **Own** is a dummy variable indicating whether the analyst owns the stock on which she issues a report. **IPO Underwriter** is adummy variable indicating whether the analyst's brokerage firm is the IPO lead underwriter and the analyst report is issued within one year after the IPO. **IPO Co-manager** is defined in the same way. **SEO Underwriter** is a dummy variable indicating whether the analyst's brokerage firm is the SEO lead underwriter and the analyst report is issued within six months before and one year after the SEO. **SEO Co-manager** is defined the same way. **Broker Decile** is a decile size ranking ofthe analyst’sbrokerage firm, computed annually, based on the number of analysts at each brokerage firm, as reported by IBES. **Experience** is a measure of analyst tenure as a sell-side analyst, as of the current year (years in the IBES database is the proxy). **Complexity** is the number of companies the analyst covers during the year. **Disclose** is adummy variable indicating whether the analyst is a restricted stock owner and whether their ownership was disclosed to the public, prior to the Form 144. **Internet** is a dummy variable indicating whether the company is in the group of four digit SICs as specified by Loughran and Ritter (2002) for technology stocks. **Follow** isthe number of analysts reporting earnings forecasts on the company during the quarter. **Industry** dummies are based on one digit SIC codes. \* Statistically significant at the 5% level or better.

*Dependent variable: Recommendation*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | ***Form 144 Sample*** | | |  | ***Disclosing Sample*** | | |
|  |  | **Coefficient** |  | **z-Statistic** |  | **Coefficient** |  | **z-Statistic** |
| Analyst Owner Dummy (OWN) |  | 0.53 |  | 1.9 |  | 0.32 | \* | 3.1 |
| IPO Underwriter |  | 0.65 | \* | 2.0 |  | -0.26 |  | -1.4 |
| IPO Underwriting Co-manager |  | 0.13 |  | 0.5 |  | -0.55 | \* | -3.3 |
| SEO Underwriter |  | n/a |  | n/a |  | -0.32 |  | -1.4 |
| SEO Underwriting Co-manager |  | n/a |  | n/a |  | 0.02 |  | 0.1 |
| Broker Decile |  | -0.22 | \* | -2.5 |  | 0.04 |  | 1.0 |
| Experience |  | 0.00 |  | 0.0 |  | 0.01 |  | 1.3 |
| Complexity |  | 0.02 |  | 1.4 |  | 0.00 |  | 0.9 |
| Disclose Ownership |  | -0.44 |  | -1.0 |  | n/a |  | n/a |
| Internet (Industry Dummy) |  | 0.50 | \* | 2.0 |  | n/a |  | n/a |
| Follow |  |  |  |  |  | 0.02 | \* | 2.6 |
| Industry Dummies (not reported) |  |  |  |  |  | YES |  |  |
| Year Dummies (not reported**)** |  |  |  |  |  | YES |  |  |
| **Pseudo R square =** |  |  |  | **9.2 %** |  |  |  | **2.5%** |
| Number of Observations |  | 139 |  |  |  | 556 |  |  |

PANEL C: Marginal Effect of Analyst Ownership on the probability of each recommendation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Form 144 Sample*** | **Prob(Rec=1)** | **Prob(Rec=2)** | **Prob(Rec=3)** | **Prob(Rec=4)** | **Prob(Rec=5)** |
| Change | -19 | +13 | +6 | n/a | n/a |
| ***Disclosing Sample*** | | | | | |
| Change | 0 | 0 | -0.1 | -1.4 | +1.5 |

**Table 3**

**Earnings forecasts – univariate statistics**

**PANEL A – Form 144 Sample**

An owning analyst is a sell-side analyst that provides research coverage on a company and files a Form 144 with the SEC upon the sale of their restricted stock in that same company. The owner sample represents owning analyst quarterly earnings forecasts issued prior to the sale of their restricted stock. The control sample is non-owning-analyst earnings forecasts for the same companies and forecast periods as owning analyst forecasts. Respectively, superscripts a and b denote statistical significance between the sample and control group at the 5% and 1% level.

**Forecast error** is actual earnings for the quarter less the analyst’s earnings forecast all deflated by lagged stock price. **Forecast age** is the difference, in days, between the date of the analyst’s forecast and the company’s actual earnings announcement. **IPO Underwriter** is adummy variable indicating whether the analyst's brokerage firm is the IPO lead underwriter and the analyst report is issued within one year after the IPO. **IPO Co-manager** is defined in the same way. **Broker Decile** is a decile size ranking ofthe analyst’sbrokerage firm, computed annually, and based on the number of analysts at each brokerage firm as reported by IBES. **Experience** is a measure of analyst tenure as a sell-side analyst, as of the current year (years in the IBES database is the proxy). **Complexity** is the number of companies the analyst covers during the year. **Disclose** is adummy variable indicating whether the analyst is a restricted stock owner and whether their ownership was disclosed to the public, prior to the Form 144.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Owner Sample** | | | **Control Sample** | | |
|  | **Mean** | **Median** | **Std. Dev.** | **Mean** | **Median** | **Std. Dev.** |
| Forecast Error | -0.003 | 0.0001 | 0.016 | -0.001a | 0.0002a | 0.014 |
| Forecast Age (days) | 173 | 175 | 103 | 150b | 126b | 97.0 |
| IPO Underwriter | 0.354 | 0.00 | 0.479 | 0.101b | 0.00b | 0.301 |
| IPO Co-manager | 0.512 | 1.00 | 0.501 | 0.216b | 0.00b | 0.411 |
| Broker Decile | 9.62 | 10.0 | 1.02 | 9.20b | 10.0b | 1.44 |
| Experience | 7.83 | 7.00 | 4.65 | 6.33b | 5.00b | 4.73 |
| Complexity | 21.9 | 19.0 | 11.7 | 15.1b | 14b | 8.10 |
| Disclose Ownership | 0.195 | 0.00 | 0.397 | 0.000b | 0.00b | 0.000 |
| Number of observations | 359 |  |  | 2,812 |  |  |

**Table 3 - continued**

**Earnings forecasts – univariate statistics**

**PANEL B– Disclosing Sample**

Owning analysts are identified as sell-side analysts that provide research coverage on a company and disclose ownership in that same company. These disclosing analysts are employed by of one of the few brokerage firms that historically required such disclosures. The sample represents forecasts issued and on IBES, during the period of ownership and for which owning-analyst reports are available on Investext. The control sample is all other analyst forecasts for the same companies and forecast periods as owning-analyst forecasts. **Forecast error** is actual earnings for the quarter less the analyst’s earnings forecast all deflated by lagged stock price. **Forecast age** is the difference, in days, between the date of the analyst’s forecast and the company’s actual earnings announcement. **IPO Underwriter** is adummy variable indicating whether the analyst's brokerage firm is the IPO lead underwriter and the analyst report is issued within one year after the IPO. **IPO Co-manager** is defined in the same way. **SEO Underwriter** is a dummy variable indicating whether the analyst's brokerage firm is the SEO lead underwriter and the analyst report is issued within six months before and one year after the SEO. **SEO Co-manager** is defined the same way. **Broker Decile** is a decile size ranking ofthe analyst’sbrokerage firm, computed annually, and based on the number of analysts at each brokerage firm as reported by IBES. **Experience** is a measure of analyst tenure as a sell-side analyst, as of the current year (years in the IBES database is the proxy). **Complexity** is the number of companies the analyst covers during the year.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Owner Sample** | | | **Control Sample** | | |
|  | **Mean** | **Median** | **Std Dev.** | **Mean** | **Median** | **Std Dev.** |
| Forecast Error | -0.003 | 0.000 | 0.008 | -0.001b | 0.000a | 0.005 |
| Forecast Age (days) | 187 | 181 | 103 | 173b | 175b | 104 |
| IPO Underwriter | 0.061 | 0.000 | 0.240 | 0.010b | 0.000b | 0.103 |
| IPO Co-manager | 0.102 | 0.000 | 0.302 | 0.022b | 0.000b | 0.146 |
| SEO Underwriter | 0.061 | 0.000 | 0.240 | 0.013b | 0.000b | 0.113 |
| SEO Co-manager | 0.108 | 0.000 | 0.311 | 0.034b | 0.000b | 0.183 |
| Broker Decile | 10 | 10 | n/a | 9.32b | 10b | 1.38 |
| Experience | 6.66 | 5.00 | 4.20 | 7.19b | 5.00 | 5.11 |
| Complexity | 18.0 | 18.0 | 6.39 | 14.7b | 13.0b | 7.13 |
| Number of obs. | 1,253 |  |  | 12,085 |  |  |

**Table 4**

**Cross-sectional Forecast Error Regression**

The Form 144 Sample are sell-side analysts that provide research coverage on a company and file a Form 144 with the SEC upon the sale of their restricted stock in that same company. The Disclosing Sample represents sell-side analysts that provide research coverage on a company and disclose ownership in that same company. **Forecast error** is actual earnings for the quarter less the analyst’s earnings forecast all deflated by lagged stock price. **Own** is a dummy variable indicating whether the analyst owns the stock on which she issues a report. **IPO Underwriter** is adummy variable indicating whether the analyst's brokerage firm is the IPO lead underwriter and the analyst report is issued within one year after the IPO. **IPO Co-manager** is defined in the same way. **SEO Underwriter** is a dummy variable indicating whether the analyst's brokerage firm is the SEO lead underwriter and the analyst report is issued within six months before and one year after the SEO. **SEO Co-manager** is defined the same way. **Forecast age** is the difference, in days, between the date of the analyst’s forecast and the company’s actual earnings announcement. **Loss** is a dummy variable indicating whether the current quarter’s income is a loss or not. **Follow** is the number of analysts reporting earnings forecasts on the company during the quarter. **Broker Decile** is a decile size ranking ofthe analyst’sbrokerage firm, computed annually, and based on the number of analysts at each brokerage firm as reported by IBES. **Experience** is a measure of analyst tenure as a sell-side analyst, as of the current year (years in the IBES database is the proxy). **Complexity** is the number of companies the analyst covers during the year. **Disclose** is adummy variable indicating whether the analyst is a restricted stockowner and whether their ownership was disclosed to the public, prior to the Form 144. **Internet** isadummy variable indicating whether the sample company belongs to one of the four digit SIC groups specified by Loughran and Ritter (2002) for Technology stocks. **Volatility (lagged)** is the standard deviation of daily stock returns for the preceding year. **Industry** is a dummy variable, one for each one digit SIC code. \* Statistically significant at the 5% level or better.

*Dependent variable: Forecast Error (FE).*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | ***Form 144 Sample*** | | |  | ***Disclosing Sample*** | | |
|  |  | **Coefficient**  **(OLS)** |  | **T-Statistic (OLS)** |  | **Coefficient**  **(1)** |  | **T-Statistic**  **(1)** |
| Intercept |  | 0.0031 |  | 1.93 |  | -0.0048 | \* | -2.26 |
| Analyst Owner Dummy (OWN) |  | 0.0003 |  | 0.36 |  | -0.0013 | \* | -2.34 |
| IPO Underwriter |  | 0.0006 |  | 0.69 |  | 0.0018 | \* | 1.96 |
| IPO Co-manager |  | -0.0008 |  | -1.15 |  | 0.0009 |  | 1.19 |
| SEO Underwriter |  | n/a |  | n/a |  | 0.0019 | \* | 4.13 |
| SEO Co-manager |  | n/a |  | n/a |  | 0.0021 | \* | 3.30 |
| Forecast Age |  | -0.0000 | \* | -11.0 |  | -0.0000 | \* | -8.74 |
| Loss |  | -0.0051 | \* | -8.14 |  | -0.0080 | \* | -5.90 |
| Analyst Following (Follow) |  | 0.0001 | \* | 4.97 |  | 0.0001 | \* | 6.13 |
| Own x Follow |  | n/a |  | n/a |  | 0.0000 | \* | 2.06 |
| Broker Decile |  | 0.0000 |  | 0.46 |  | 0.0001 |  | 1.95 |
| Experience |  | -0.0000 |  | -0.39 |  | -0.0001 | \* | -3.94 |
| Complexity |  | -0.0000 |  | -1.37 |  | 0.0000 |  | 1.24 |
| Disclose Ownership |  | -0.0025 |  | -1.34 |  | n/a |  | n/a |
| Internet |  | 0.0023 | \* | 3.50 |  | n/a |  | n/a |
| Volatility (lagged) |  |  |  |  |  | 0.0756 | \* | 3.22 |
| Industry Dummies (not reported) |  |  |  |  |  | Yes |  |  |
| **Adj. R square =** |  |  |  | **6.3 %** |  |  |  |  |
| Number of observations |  | 3,171 |  |  |  | 11,695 |  |  |

(1) Fama-MacBeth Average Coefficients () and T-Statistics 

**Table 5**

**Forecast Error Regression – Holding Period / Free to Sell Period – Form 144 Sample**

This analysis tests the subsample of all Form 144 owning analysts that provide earnings forecasts during both the SEC mandated holding period and the post-holding period. An owning analyst is a sell-side analyst that provides research coverage on a company and files a Form 144 with the SEC upon the sale of their restricted stock in that same company. SEC Rule 144 requires a restricted stock owner to hold the stock for at least one year (See Figure 1). **Forecast error** is actual earnings for the quarter less the analyst’s earnings forecast all deflated by lagged stock price. **Post Holding Period** is a dummy variable indicating whether the earnings forecast is issued after the Rule 144 required holding period. **Internet** isadummy variable indicating whether the sample company belongs to one of the four digit SIC groups specified by Loughran and Ritter (2002) for Technology stocks. **Own** is a dummy variable indicating whether the analyst owns the stock on which she issues a report. **Forecast age** is the difference, in days, between the date of the analyst’s forecast and the company’s actual earnings announcement. **IPO Underwriter** is adummy variable indicating whether the analyst's brokerage firm is the IPO lead underwriter and the analyst report is issued within one year after the IPO. **IPO Co-manager** is defined in the same way. **Loss** is a dummy variable indicating whether the current quarter’s income is a loss or not. **Follow** is the number of analysts reporting earnings forecasts on the company during the quarter. **Broker Decile** is a decile size ranking ofthe analyst’sbrokerage firm, computed annually, and based on the number of analysts at each brokerage firm as reported by IBES. **Experience** is a measure of analyst tenure as a sell-side analyst, as of the current year (years in the IBES database is the proxy). **Complexity** is the number of companies the analyst covers during the year. **Disclose** is adummy variable indicating whether the analyst is a restricted stockowner and whether their ownership was disclosed to the public, prior to the Form 144. \* Statistically significant at the 5% level or better.

*Dependent variable: Forecast Error (FE).*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Coefficient** |  | **T-Statistic** |
|  |  |  |  |  |
| Intercept |  | 0.0007 |  | 0.38 |
| Post Holding Period |  | 0.0016 | \* | 2.40 |
| Internet |  | 0.0011 |  | 1.63 |
| Analyst Owner Dummy (OWN) |  | 0.0009 |  | 0.77 |
| Forecast Age |  | -0.0000 | \* | -6.97 |
| IPO Underwriter |  | 0.0012 |  | 1.32 |
| IPO Co-manager |  | 0.0014 |  | 1.93 |
| Loss |  | -0.0045 | \* | -8.04 |
| Analyst Following (Follow) |  | 0.0000 |  | 0.05 |
| Broker Decile |  | 0.0004 |  | 1.80 |
| Experience |  | 0.0001 |  | 0.97 |
| Complexity |  | -0.0001 | \* | -3.24 |
| Disclose Ownership |  | 0.0002 |  | 0.06 |
| Post Holding \* Own |  | -0.0040 | \* | -2.18 |
| **Adj. R square = 7.3 %** |  |  |  |  |
| Number of observations |  | 1,771 |  |  |

**Table 6**

**Differences-in-Differences – Form 144 Sample**

This test compares owning-analyst forecast bias after the sale of their stock to the level of bias prior to the sale, where both forecasts are for the same fiscal quarter. An owning analyst is a sell-side analyst that provides research coverage on a company and files a Form 144 with the SEC upon the sale of their restricted stock in that same company. **ΔFE** is the difference between the forecast error (FE) from the earnings forecast issued after the sale of restricted stock and the FE of the forecast issued prior to the sale of the stock. (**FE** is actual earnings for the quarter less the analyst’s earnings forecast all deflated by lagged stock price.) **Own** is a dummy variable indicating whether the analyst owns (or owned) the stock on which she issues a report. **Change Forecast Age** is the number of days between the post sale forecast and the pre-sale forecast. **Loss** is a dummy variable indicating whether the current quarter’s income is a loss or not. **Broker Decile** is a decile size ranking ofthe analyst’sbrokerage firm, computed annually, and based on the number of analysts at each brokerage firm as reported by IBES. **Experience** is a measure of analyst tenure as a sell-side analyst, as of the current year (years in the IBES database is the proxy). **Complexity** is the number of companies the analyst covers during the year. Superscript b denotes statistical significance between owner sample and control sample at the 1% level. \* Statistically significant at the 5% level or better.

**PANEL A: Univariate Results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Owner Sample** | | **Control Sample** | |
|  | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** |
| Change FE (**ΔFE)** | 0.0158 | 0.0339 | -0.0000 | 0.0026 |
| Change: Forecast Age | 177 | 85.9 | 118b | 53.4 |
| Broker Decile | 9.31 | 1.54 | 9.23 | 1.36 |
| Experience | 9.06 | 5.37 | 7.35 | 5.07 |
| Complexity | 20.4 | 9.67 | 15.0b | 7.52 |
| Number of observations | 16 |  | 57 |  |

**PANEL B: Regression Results**

*Dependent variable: Change in Forecast Error (ΔFE).*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | |  | **Coefficient** |  | **T-Statistic** |
|  | |  |  |  |  |
| Intercept | |  | -0.0113 |  | -0.88 |
| Analyst Stock Owner (OWN) | |  | 0.0111 | \* | 2.24 |
| Change: Forecast Age | |  | 0.0000 |  | 1.77 |
| Loss | |  | 0.0044 |  | 0.92 |
| Broker Decile | |  | -0.0006 |  | -0.40 |
| Experience | |  | 0.0000 |  | 0.23 |
| Complexity | |  | 0.0003 |  | 1.29 |
| Number of observations | 73 |  |  |  |  |
| **Adj. R square** | 17.3 % |  |  |  |  |

**Table 7**

**Forecast Error Pooled Treatment Regression – Disclosing Sample**

This table analyzes the effect of analyst stock ownership on analyst forecast bias, controlling for the fact that stock ownership is a choice variable; by the use of a treatment regression (Table 4 ignores the self-selection issue). Owning analysts are identified as sell-side analysts that provide research coverage on a company and disclose ownership in that same company. **Forecast error (FE)** is actual earnings for the quarter less the analyst’s earnings forecast all deflated by lagged stock price. **Own** is a dummy variable indicating whether the analyst owns the stock on which she issues a report. **IPO Underwriter** is adummy variable indicating whether the analyst's brokerage firm is the IPO lead underwriter and the analyst report is issued within one year after the IPO. **IPO Co-manager** is defined in the same way. **SEO Underwriter** is a dummy variable indicating whether the analyst's brokerage firm is the SEO lead underwriter and the analyst report is issued within six months before and one year after the SEO. **SEO Co-manager** is defined the same way. **Forecast age** is the difference, in days, between the date of the analyst’s forecast and the company’s actual earnings announcement. **Loss** is a dummy variable indicating whether the current quarter’s income is a loss or not. **Follow** is the number of analysts reporting earnings forecasts on the company during the quarter. **Broker Decile** is a decile size ranking ofthe analyst’sbrokerage firm, computed annually, and based on the number of analysts at each brokerage firm as reported by IBES. **Experience** is a measure of analyst tenure as a sell-side analyst, as of the current year (years in the IBES database is the proxy). **Complexity** is the number of companies the analyst covers during the year. **Volatility (lagged)** is the standard deviation of daily stock returns for the preceding year. **Industry** is a dummy variable, one for each one digit SIC code. The z-statistics are based on Huber/White robust standard errors. \* Statistically significant at the 5% level or better.

**Own\*=γ0 + γi Industryi + γi Yeari + γ1 Experience +γ2 IPO Underwriter +γ3 IPO Co-Manager +γ4 SEO Underwriter +γ5 SEO Underwriter Co-Manager + µ**

**PANEL A - 1st Stage Probit**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | | |
|  |  | **Coefficient** |  | **Z-Statistic** |
| Intercept |  | -1.19 | \* | -15.1 |
| IPO Underwriter |  | 0.460 | \* | 2.54 |
| IPO Co-manager |  | 0.690 | \* | 6.88 |
| SEO Underwriter |  | 0.759 | \* | 6.58 |
| SEO Co-manager |  | 0.510 | \* | 6.31 |
| Experience |  | -0.007 | \* | -2.45 |
| Year Dummies |  | Yes |  |  |
| Industry Dummies |  | Yes |  |  |
| **Wald Χ2=3.38** |  | Prob. (**Χ2)=.066** |  |  |

**Table 7, continued**

**Forecast Error Pooled Treatment Regression – Disclosing Sample**

This table analyzes the effect of analyst stock ownership on analyst forecast bias, controlling for the fact that stock ownership is endogenous; by the use of a treatment regression (Table 4 ignores the self-selection issue). Owning analysts are identified as sell-side analysts that provide research coverage on a company and disclose ownership in that same company. **Forecast error** is actual earnings for the quarter less the analyst’s earnings forecast all deflated by lagged stock price. **Own** is a dummy variable indicating whether the analyst owns the stock on which she issues a report. **IPO Underwriter** is adummy variable indicating whether the analyst's brokerage firm is the IPO lead underwriter and the analyst report is issued within one year after the IPO. **IPO Co-manager** is defined in the same way. **SEO Underwriter** is a dummy variable indicating whether the analyst's brokerage firm is the SEO lead underwriter and the analyst report is issued within six months before and one year after the SEO. **SEO Co-manager** is defined the same way. **Forecast age** is the difference, in days, between the date of the analyst’s forecast and the company’s actual earnings announcement. **Loss** is a dummy variable indicating whether the current quarter’s income is a loss or not. **Follow** is the number of analysts reporting earnings forecasts on the company during the quarter. **Broker Decile** is a decile size ranking ofthe analyst’sbrokerage firm, computed annually, and based on the number of analysts at each brokerage firm as reported by IBES. **Experience** is a measure of analyst tenure as a sell-side analyst, as of the current year (years in the IBES database is the proxy). **Complexity** is the number of companies the analyst covers during the year. **Volatility (lagged)** is the standard deviation of daily stock returns for the preceding year. **Industry** is a dummy variable, one for each one digit SIC code. The z-statistics are based on Huber/White robust standard errors.

**FE=α0 + αi Industry +αi Year+ β1 Own + β2 IPO Underwriter + β3 IPO Co-manager**

**+ β4 SEO Underwriter + β5 SEO Co-manager + β6 Forecast Age + β7 Loss + β8 Follow**

**+ β9 Broker Decile + β10 Complexity + β11 Volatility (lagged) + ε**

**[**where Own=1 if Own\*>0 and Own=0 otherwise]

**PANEL B - 2nd Stage Regression**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | | |
|  |  | **Coefficient** |  | **Z-Statistic** |
| Intercept |  | -0.0080 | \* | -16.4 |
| Analyst Owner Dummy (OWN) |  | -0.0004 | \* | -1.96 |
| IPO Underwriter |  | 0.0012 |  | 1.70 |
| IPO Co-manager |  | 0.0007 |  | 1.54 |
| SEO Underwriter |  | 0.0018 | \* | 4.19 |
| SEO Co-manager |  | 0.0015 | \* | 4.38 |
| Forecast Age |  | -0.0000 | \* | -22.9 |
| Loss |  | -0.0069 | \* | -30.2 |
| Analyst Following (Follow) |  | 0.0001 | \* | 18.1 |
| Broker Decile |  | 0.0001 | \* | 4.10 |
| Complexity |  | -0.0000 |  | -1.56 |
| Volatility (lagged) |  | 0.0755 | \* | 14.6 |
| Year Dummies (not reported) |  | Yes |  |  |
| Industry Dummies (not reported) |  | Yes |  |  |
| Number of observations |  | 12,819 |  |  |

**Table 8**

**Forecast Error Regression – Owning Period / Non-Owning Period – Disclosing Sample**

This table analyzes an expanded sample, by adding any forecasts related to stock owned by an analyst but issued before or after the ownership period for both owning and control analysts to the Table 3, Panel B sample. The purpose is to compare reporting behavior during the ownership period to behavior during a non-ownership period. Owning analysts are identified as sell-side analysts that provide research coverage on a company and disclose ownership in that same company. **Forecast error (FE)** is actual earnings for the quarter less the analyst’s earnings forecast all deflated by lagged stock price. **Non-Owning period** is a dummy variable indicating that no analyst owns the stock during the forecast period. **Own** is a dummy variable indicating whether the analyst owns the stock on which she issues a report. **Owning-analyst – non-owning period** is a dummy variable indicating whether an analyst owns the stock during another quarter but does not own during the current quarter. **IPO Underwriter** is adummy variable indicating whether the analyst's brokerage firm is the IPO lead underwriter and the analyst report is issued within one year after the IPO. **IPO Co-manager** is defined in the same way. **SEO Underwriter** is a dummy variable indicating whether the analyst's brokerage firm is the SEO lead underwriter and the analyst report is issued within six months before and one year after the SEO. **SEO Co-manager** is defined the same way. **Forecast age** is the difference, in days, between the date of the analyst’s forecast and the company’s actual earnings announcement. **Loss** is a dummy variable indicating whether the current quarter’s income is a loss or not. **Follow** is the number of analysts reporting earnings forecasts on the company during the quarter. **Broker Decile** is a decile size ranking ofthe analyst’sbrokerage firm, computed annually, and based on the number of analysts at each brokerage firm as reported by IBES. **Experience** is a measure of analyst tenure as a sell-side analyst, as of the current year (years in the IBES database is the proxy). **Complexity** is the number of companies the analyst covers during the year. **Volatility (lagged)** is the standard deviation of daily stock returns for the preceding year. **Industry** is a dummy variable, one for each one digit SIC code. \* Statistically significant at the 5% level or better.

*Dependent variable: Forecast Error (FE).*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | | |
|  |  | **Coefficient** |  | **T-Statistic(1)** |
| Intercept |  | -0.0071 | \* | -6.07 |
| Non Owning Period dummy variable |  | 0.0001 |  | 0.27 |
| Analyst Owner Dummy (OWN) |  | -0.0008 | \* | -2.59 |
| Owning analyst – non-owning periods |  | -0.0007 | \* | -1.97 |
| IPO Underwriter |  | 0.0016 | \* | 2.54 |
| IPO Co-manager |  | 0.0011 | \* | 1.96 |
| SEO Underwriter |  | 0.0008 | \* | 2.23 |
| SEO Co-manager |  | 0.0010 | \* | 2.23 |
| Forecast Age |  | -0.0000 | \* | -6.45 |
| Loss |  | -0.0066 | \* | -7.65 |
| Analyst Following (Follow) |  | 0.0001 | \* | 5.20 |
| Broker Decile |  | 0.0001 | \* | 5.69 |
| Experience |  | -0.0000 | \* | -3.36 |
| Complexity |  | 0.0000 |  | 1.24 |
| Volatility (lagged) |  | 0.0720 | \* | 6.16 |
| Industry Dummies (not reported) |  | Yes |  |  |
| Number of observations |  | 30,998 |  |  |

(1) Fama-Macbeth Average Coefficients () and T-Statistics 

1. For incentive support see, Lim (2001), Lin and McNichols, (1998), McNichols and O’Brien (1997); for alternative explanations see, Keane and Runkle, (1998), Gu and Wu (2000),Abarbanell and Lehavy, (2003). [↑](#footnote-ref-1)
2. Doug Carlisle, Partner, Menlo Ventures. As reported by Thurm, WSJ, December 10, 2001. [↑](#footnote-ref-2)
3. Since this investment bank was on public record for requiring disclosure of ownership, unlike most of their competitors, it seems reasonable that their disclosures would be truthful and complete due to litigation concerns. [↑](#footnote-ref-3)
4. Repeated quarters of optimistic earnings forecasts are unlikely to be beneficial as the bias would be revealed in the early quarters. [↑](#footnote-ref-4)
5. One might expect that brokerage firms also may impose control mechanisms to reduce stock ownership induced biases since the brokerage firm bears the potential losses from such biases (reputation effects, litigation risks) but may not reap the benefits. The SEC inquiry and press stories suggest, however, that the compliance departments at brokerage firms during this period were not very effective in policing conflicts of interest. In the case of analyst restricted stock ownership for example, the SEC found that the compliance departments were generally not even aware of its existence. [↑](#footnote-ref-5)
6. Regulation Analyst Certification, Proposed Rule, SEC, August 2002. Of course, analysts covering technology stocks during the 1990s may have been earning well above the industry average. [↑](#footnote-ref-6)
7. A typical brokerage firm disclosure was as follows: “The firm and/or affiliates and employees have or may have a long or short position or holding in the securities, options on securities, or other related investments of issuers mentioned herein.” (“Analyzing Analyst Recommendations”, Securities and Exchange Commission, 7/13/2001.) [↑](#footnote-ref-7)
8. Market value of equity is the product of the IPO offering price and the number of shares outstanding immediately after the IPO. [↑](#footnote-ref-8)
9. Excess returns are based on the IPO price and are relative to both the CRSP value-weighted index and the NASDAQ. Results are similar regardless of the benchmark. [↑](#footnote-ref-9)
10. Details available upon request. [↑](#footnote-ref-10)
11. Details available upon request. [↑](#footnote-ref-11)
12. Price targets are not available for many IBES firms. [↑](#footnote-ref-12)
13. Results are qualitatively similar using Value weighted or Equal Weighted market returns and a 5 day CAR. [↑](#footnote-ref-13)
14. Where there are insufficient observations a variable may be excluded; for example, owner strong sell. [↑](#footnote-ref-14)
15. In the Form 144 sample, four stock-owning analysts do not issue quarterly forecasts. These analysts are absent from the analysis. Also, Average forecast errors are likely smaller, in general, than most other studies, because other studies have larger, more general sample populations. Also, studies that use annual forecasts have larger forecast errors, on average. [↑](#footnote-ref-15)