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# Buy-Side vs. Sell-Side Analysts' Earnings Forecasts

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*The study reported here is a comparison of the earnings-forecasting performance of analysts at a large buy-side firm with the performance of sell-side analysts in the 1997–2004 period. The tests show that the buy-side analysts made more optimistic and less accurate forecasts than their counterparts on the sell side. The performance differences appear to be partially explained by the buy-side firm's greater retention of poorly performing analysts and by differences in the performance benchmarks used to evaluate buy-side and sell-side analysts.*

The 2003 Global Settlement of Conflicts of Interest between Research and Investment Banking raised fundamental questions about the integrity and quality of sell-side research. Regulators had alleged that investment banking fees used to support research induced sell-side analysts to be overly optimistic about the stocks they covered.[1] Funding research through trading commissions (see Cowen, Groysberg, and Healy 2006) and the desire to preserve access to management at companies covered might also induce sell-side analysts to be optimistic about the stocks they cover.

By limiting the investment banking benefits from sell-side research, an (unintended) consequence of the Global Settlement has been to reduce sell-side research budgets at leading investment banks and to encourage the growth of buy-side research. Buy-side research, which is privately produced and funded, is used only by fund managers at the producing investment firm. As a result, buy-side analysts do not face the potential conflicts of working for investment banking firms and the need to generate commissions encountered by the sell side. Yet, to our knowledge, because of a lack of data on buy-side research, no public investigation of the performance of buy-side analysts has been carried out.

In the study that we report here, we used earnings forecast data for U.S. companies from buy-side analysts at a top U.S. investment firm and publicly available data and information on U.S. sell-side analysts to compare the performance of buy-side and sell-side analysts' earnings forecasts.

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## Differences between Buy-Side and Sell-Side Research

At a fundamental level, buy-side and sell-side research analysts perform similar functions.[2] Both study companies in order to make recommendations about whether to buy, sell, or hold specific securities. Buy-side research and sell-side research differ fundamentally, however, in a variety of ways: the scale and scope of their coverage, the sources of information used, the private versus public dissemination of reports, their target audiences, and the ways in which analyst performance is measured and analysts are compensated.

**Scale and Scope of Coverage.** Research departments at money management firms are typically considerably smaller than those at sell-side firms. For example, on average during the 1997–2004 period, the research department at the buy-side firm we studied, one of the ten largest firms in assets under management, employed 20–30 analysts, whereas 186 senior analysts were employed by the average large investment bank in this period.

Analysts at buy-side firms are often responsible for covering an entire sector, such as technology. Of the 50–100 stocks in a sector that a buy-side analyst follows, the analyst writes reports on roughly 15 stocks at any given time. In contrast, a sell-side analyst usually covers only one segment of an industry, such as semiconductors or biotech. Sell-side analysts also write reports on only 10–15 stocks at a given time, but this number usually represents a much larger fraction of the total stocks that the analyst follows than it does for the buy-side analyst.

Perhaps as a result of these differences in scope, reports by analysts at the sample buy-side firm that we studied were shorter—typically only two pages—than those provided by the leading sell-side analysts, who also included detailed industry analyses and bottom-up, company-level analyses.

**Information Sources.** The sell-side analysts that we interviewed commented that their research improves significantly through interactions with sales representatives and traders at their firms and with many of their clients. Buy-side analysts do not have the opportunity to receive such diverse feedback and new insights. They pitch their recommendations to their own portfolio managers and their staff.

**Private vs. Public Report Dissemination.** Sell-side research is widely disseminated to institutional and retail clients, whereas buy-side research is private and available only to a buy-side firm's portfolio managers. Prior to enactment in 2000 of Regulation Fair Disclosure (Reg FD), the U.S. SEC alleged that corporate managers could limit access to information provided to sell-side analysts who issued negative public forecasts and ratings of their companies; thus, sell-side analysts had incentives to issue only positive reports. In contrast, because buy-side analysts' research is private, buy-side analysts have been less likely to face such pressure and more likely to provide impartial research.

**Target Audience.** Buy-side analysts make recommendations to their firms' portfolio managers, who have ultimate authority for deciding whether to buy or sell stocks. Buy-side analysts add value for portfolio managers in two ways. First, they filter the large amount of sell-side research and company news to distill the information into a short monthly report that can be easily used by portfolio managers and their staff. Second, buy-side analysts provide the firm's portfolio managers with a perspective on companies that is different from the perspective they receive from sell-side analysts. Buy-side analysts are expected to reach their own conclusions independent of the conclusions of sell-side analysts.

Sell-side research is distributed to buy-side analysts and portfolio managers at a wide range of firms and to retail investors. Clients reward sell-side firms for providing these services by directing trading activity to their firms, which allows the costs of research to be recovered through commissions. Sell-side analysts also provide value for companies issuing stock by lowering the information costs of investors who are considering a stock and by helping create a liquid market for stocks. The cost of providing these services is recovered indirectly through investment banking fees.

The different target audiences of buy-side and sell-side analysts lead to fundamental differences in analyst incentives. Sell-side analysts create value for their firms by (1) providing clients with research and services that generate trading volume in stocks covered or (2) increasing demand for a new issue that their firms are underwriting or distributing. Prior research indicates that these incentives can also create conflicts of interest for sell-side analysts.[3] In addition, public rankings by *Institutional Investor* magazine and the public dissemination of analyst research are likely to provide sell-side analysts with an incentive to "follow the crowd," which would be consistent with theories of herd behavior (see Scharfstein and Stein 1990; Healy and Palepu 2003).

In contrast, buy-side analysts are encouraged to present portfolio managers with fresh perspectives on stocks that are currently owned, stocks that are not owned but might be attractive buys, and at some firms, candidates for short selling. As a result, these analysts are likely to be willing to make recommendations and forecasts that differ from the Street's consensus and to issue sell as well as buy recommendations.

**Compensation.** The buy-side analysts at our sample firm received a salary (approximately $300,000 in 2004) and a bonus that was effectively capped at roughly twice their salary. The top analysts at the firm made roughly $1 million in salary and bonus. Annual bonuses were based on two factors—the performance of the analyst's buy recommendations (measured by quarterly returns adjusted for returns on the S&P 500 Index) and the impact of research on the portfolio managers (measured by portfolio managers' quarterly ratings of whether the analyst provided good stock ideas, communicated those ideas effectively, made good judgment calls, etc.).

Promotions in our sample buy-side firm are primarily to higher analyst levels within the research department, with accompanying increases in compensation. The firm intends successful analysts to have lengthy careers as analysts and provides opportunities for growth and development within the department. Some other firms in the industry, in contrast, view analysts as "portfolio managers in training." The analyst function is considered to be an entry-level position, and analysts rotate among industries to receive broad industry exposure. The most successful analysts at these firms are eventually promoted to portfolio manager, which is typically a more highly paid position than that of analyst.[4]

Compensation for sell-side analysts is typically tied to such metrics as commissions and soft-dollar revenues in the stocks that the analysts cover, their *Institutional Investor* magazine ranking, and (prior to the Global Settlement) their ability to create demand for a new issue that their firm is underwriting or distributing. In 2002, the Institutional Investor Research Group (2002) reported that, on average, outstanding U.S. sell-side analysts earned $1.6 million and second-tier analysts earned $900,000.

These forms of compensation generally reinforce the differences in roles and incentives of buy-side versus sell-side analysts. Specifically, buy-side analysts are rewarded for providing support to portfolio managers and new ideas that differ from the Street consensus. Sell-side analysts are rewarded for creating new business for the firm by generating trading volume in the stocks they cover (and, before the Global Settlement, by generating demand for new issues their firm underwrites or distributes).

## Sample and Data

We examined how differences between the roles/incentives of buy-side analysts and those of sell-side analysts affect one component of their research, namely, earnings forecasts. The conflicts of interest that we noted imply that the quality of buy-side research will exceed that of the sell side. Other institutional differences, however, could lead sell-side analysts to outperform their buy-side counterparts. Sell-side analysts cover more narrowly defined industries, which permits specialization in a few stocks. Also, sell-side analysts have access to feedback and market information from clients, sales representatives, traders, and managers of companies that they cover that is likely to be valuable in testing and improving their research ideas, whereas buy-side analysts primarily relate to the portfolio managers at their own firms.

The sample buy-side firm is a top 10–rated money management firm for which fundamental research is an essential part of the stock selection process and short selling is forbidden. From analyst reports provided by the firm for the period July 1997 through December 2004, we collected annual earnings forecasts and stock recommendations for each company covered.

For sell-side analysts, earnings forecasts are from Thomson Financial's I/B/E/S database. The sell-side sample was dominated by analysts at the large, bulge-bracket firms.

For each company covered by the buy-side analysts, we constructed an earnings forecast database that included the company's name, CUSIP, and industry, the buy-side and sell-side analysts' annual earnings forecasts for that company, the dates that the forecasts were issued, a code for the analyst and the sell-side analyst's firm name, I/B/E/S values for actual earnings, and the date that each analyst first appeared in the I/B/E/S database or was hired by the buy-side firm. We adjusted forecasts for stock splits and stock dividends to ensure comparability of actual earnings per share. Finally, we confirmed with the buy-side firm and from the buy-side firm analyst reports that the earnings metric forecasted by its analysts was identical to that forecasted by sell-side analysts.[5]

To examine results for various forecast horizons, we separated earnings forecasts into the following seven horizons prior to a company's annual earnings announcement date: less than 3 months, 4–6 months, 7–9 months, 10–12 months, 13–15 months, 16–18 months, and more than 18 months. The forecasts were approximately evenly distributed across these horizons. To reduce the risk of nonindependence of observations, we report only results from using the first forecast made by an analyst for each company within each three-month forecast horizon.[6]

Panel A of **Table 1** shows how the sample of usable earnings forecasts was constructed. The final sample consisted of 3,526 buy-side forecasts and 58,562 sell-side forecasts.[7] Observations were excluded primarily because analysts made multiple forecasts for the same company within a three-month period or because observations for a particular company-period were covered by sell-side analysts but not a buy-side analyst or vice versa.

Descriptive data for the final number of analysts, number of analyst firms, and number of stocks covered are reported in Panel B of Table 1. The final sample was made up of 37 buy-side analysts (at the single buy-side firm) and 3,184 sell-side analysts at 298 sell-side firms. Because of the matched research design, both buy-side and sell-side analysts covered the same 337 stocks.

## Whose Forecasts Are More Optimistic?

To compute the relative optimism of analysts' earnings forecasts, we adopted an approach similar to that in Cowen et al. (2006), who constructed a measure of relative optimism, *ROPT*, of each analyst's earnings forecast that controls for any company- and time-specific factors that affect forecast performance. The measure is as follows:

$$ROPT_{itj}^{t+k} = \frac{Forecast_{itj}^{t+k} - \overline{Forecast_{it}^{t+k}}}{StdDev(Forecast_{it}^{t+k})}. \qquad (1)$$

**Table 1. Buy-Side and Sell-Side Earnings Forecast Samples, July 1997–December 2004**

*A. Sample construction*

| Number in Sample | Number of Forecasts: Buy-Side Analysts | Number of Forecasts: Sell-Side Analysts |
|---|---|---|
| Full sample of earnings forecasts of U.S. companies in period | 14,641 | 2,623,650 |
| Less: Duplicate forecasts by analyst in forecast period | 5,958 | 1,149,483 |
| Less: Forecasts for companies covered by only one side or all forecasts for company/horizon identical | 3,742 | 1,390,570 |
| Less: Forecasts with missing (negative) horizon data | 347 | 1,857 |
| Less: Forecasts with missing actual earnings data | 1,068 | 23,178 |
| Final sample for earnings forecast tests | 3,526 | 58,562 |

*B. Sample composition*

| Side | No. of Analyst Firms | No. of Analysts | No. of Stocks Covered | No. of Forecasts or Recommendations |
|---|---|---|---|---|
| Buy side | 1 | 37 | 337 | 3,526 |
| Sell side | 298 | 3,184 | 337 | 58,562 |
| Total | 299 | 3,218+ | 337+ | 62,088 |

*Note*: Columns indicated by "+" do not sum because of an overlap between the buy side and the sell side during the sample period as some analysts transferred from the sell side to the buy side.

$Forecast_{itj}^{t+k}$ is analyst $j$'s forecast made at time $t$ of company $i$'s earnings for year $t+k$. We compared this forecast with the average forecast for all analysts (buy side and sell side) making earnings forecasts for company $i$ in year $t+k$ within the same forecast horizon—that is, $Forecast_{it}^{t+k}$. We standardized the relative forecast by deflating it by the standard deviation of forecasts of all analysts who were forecasting earnings for the same company-year and forecast horizon—that is, $StdDev\left(Forecast_{it}^{t+k}\right)$.[8]

The distributions of relative optimism in buy- and sell-side analysts' earnings forecasts (without controlling for horizon) are shown in **Figure 1**. The difference between the two distributions is striking. Sell-side analysts' relative earnings forecast optimism is tightly clustered around zero, with little evidence of skewness. In contrast, relative optimism for buy-side analysts is highly positively skewed, which produces a higher mean and variance than those of the sell-side analysts' forecasts.

To test whether relative optimism differs for buy-side and sell-side analysts, we estimated the following model:

$$ROPT_{ijt}^{t+k} = \alpha + \beta_1 Buyside_{jt} + \beta_2 Horizon_{ijt}^{t+k} + \beta_3 AEXP_{jt} + \varepsilon_{ijt}. \quad (2)$$

$Buyside_{jt}$ is a dummy variable equal to 1 if analyst $j$ worked for the buy-side firm at time $t$ and 0 otherwise. If buy-side analysts make less optimistic forecasts than their sell-side counterparts, the coefficient will be negative.

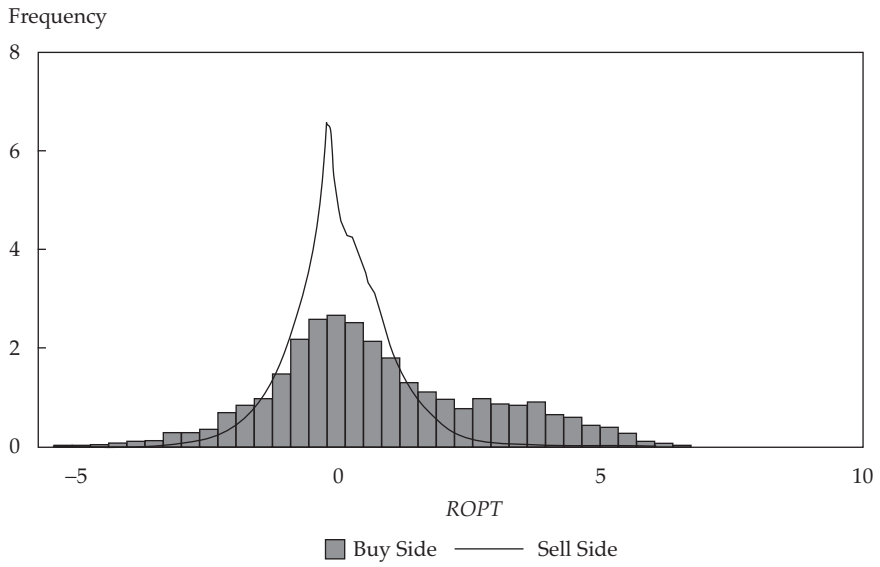
Equation 2 includes two control variables found by earlier studies to be important in explaining relative optimism—namely, forecast horizon and analyst experience. Forecast horizon was partially controlled for by benchmarking analysts' performance to the mean of all analysts forecasting for the same company, time period, and three-month horizon. This design controlled for forecasts made during the same three-month period but did not allow for differences in horizon within the three months. Therefore, we also included a finer measure of forecast horizon, the number of days between the forecast issue date and the subsequent fiscal year-end, $Horizon_{ijt}^{t+k}$. We expected the estimated coefficient to be positive, implying that forecast optimism increased with a lengthening horizon.

The second control variable that we used is analyst experience, measured by the natural logarithm of the number of quarters analyst $j$ had worked as an analyst at either a sell-side firm or with the sample buy-side firm, denoted $AEXP_{jt}$.[9] The coefficient was expected to be negative if experience led to lower optimism.

**Table 2** reports summary statistics on relative earnings optimism, forecast horizon, and analyst experience. On average, the buy-side firm analysts are more optimistic and less experienced than their sell-side counterparts, as shown by the mean relative forecast optimism, *ROPT*, of 0.78 for buy-side analysts versus –0.05 for sell-side analysts. Buy-side analysts had an average of 14.9 quarters of experience (shown in Table 2 as log experience of

**Figure 1. Distribution of Relative Earnings Forecast Optimism, *ROPT*, for Buy-Side and Sell-Side Analysts, July 1997–December 2004**




2.7), compared with 20.1 quarters for the average sell-side analyst. Table 2 shows no significant difference in average forecast horizon for buy-side and sell-side analysts.

The results of tests for earnings forecast optimism are presented in **Table 3.** To judge the statistical reliability of the coefficients, we used Huber–White adjusted standard errors, which allow for any lack of independence between forecasts made by the same analyst.[10] We found that, after controlling for forecast horizon and analyst experience, earnings forecasts by the analysts at the buy-side firm are considerably more optimistic than forecasts made by analysts at the sell-side firms. These differences persisted across all forecast horizons studied. The estimated relative forecast optimism coefficients for the buy-side firm are all highly statistically significant. The estimates imply

**Table 2. Descriptive Statistics for Relative Earnings Forecast Optimism and Accuracy and the Control Variables, July 1997–December 2004**

| | Buy-Side Analysts | | Sell-Side Analysts | |
|---|---|---|---|---|
| Summary Statistics | Mean | Std. Dev. | Mean | Std. Dev. |
| *ROPT* | 0.78 | 1.98 | –0.05 | 0.85 |
| *RAERR* | 0.85 | 1.93 | –0.05 | 0.85 |
| *Horizon* (days) | 322 | 199 | 335 | 221 |
| *AEXP* | 2.7 | 1.1 | 3.0 | 1.1 |
| *ACOYS* | 9.2 | 4.5 | 14.3 | 11.0 |
| *ASPEC* (%) | 35.8 | 28.8 | 48.9 | 33.5 |
| *FSIZE* | 19.3 | 5.6 | 26.6 | 41.2 |
| *FSPEC* (%) | 6.0 | 9.0 | 10.4 | 14.2 |

*Notes*: *ROPT* is the analyst's forecast minus the average forecast for all analysts forecasting for the same company-year and forecast horizon, deflated by the standard deviation of all analysts' forecasts for the company-year and forecast horizon. *RAERR* is the absolute value of the analyst's forecast error minus the average absolute forecast error for all analysts forecasting for the same company-year and forecast horizon, deflated by the standard deviation of all analysts' absolute forecast errors for the company-year and forecast horizon. *Horizon* is the number of days between the issue of a forecast and the fiscal year-end relating to the forecast. *AEXP* is the log of the number of quarters that an analyst had been publishing forecasts. *ACOYS* is the number of companies for which the analyst published forecasts in a given calendar year. *ASPEC* is the percentage of companies that the analyst covered in the same industry as the forecast company. *FSIZE* is the number of analysts working for the firm in a given calendar year. *FSPEC* is the percentage of other analysts at the firm covering other stocks in the forecasted stock's industry during the forecast year.

**Table 3. Relative Earnings Forecast Optimism by Forecast Horizon, July 1997–December 2004**
(*t*-statistics in parentheses)

| Variable | 1–3 Months | 4–6 Months | 7–9 Months | 10–12 Months | 13–15 Months | 16–18 Months | 18+ Months |
|---|---|---|---|---|---|---|---|
| Constant | –0.19 | –0.54 | –0.84 | –1.30 | –2.55 | –2.57 | –0.78 |
| | (–3.2)** | (–5.3)** | (–6.2)** | (–6.2)** | (–10.7)** | (–9.0)** | (–5.4)** |
| *Buyside* | 1.07 | 0.88 | 0.79 | 0.78 | 0.69 | 0.69 | 0.85 |
| | (4.3)** | (4.1)** | (2.7)** | (2.6) ** | (3.4)** | (4.2)** | (3.8)** |
| *Horizon* | 0.0035 | 0.0036 | 0.0036 | 0.0039 | 0.0060 | 0.0051 | 0.0011 |
| | (6.6)** | (6.7)** | (6.5)** | (6.3)** | (11.4)** | (9.4)** | (5.3)** |
| *AEXP* | –0.031 | –0.022 | –0.027 | –0.014 | –0.003 | –0.028 | –0.018 |
| | (–2.1) | (–1.5) | (–1.7) | (–0.8) | (–0.2) | (–1.7) | (–1.3) |
| $R^2$ | 6.9% | 4.8% | 4.2% | 4.3% | 4.8% | 4.6% | 5.9% |
| No. of observations | 11,121 | 9,692 | 8,157 | 8,094 | 8,480 | 6,867 | 9,677 |

*Notes*: The dependent variable is relative earnings forecast optimism. Independent variables are a dummy variable for working at a buy-side firm (*Buyside*), the number of days between the issue of a forecast and the fiscal year-end relating to the forecast (*Horizon*), and the log of the number of quarters that an analyst had been publishing forecasts (*AEXP*). The model was estimated by using robust cluster analysis and the Huber–White standard error adjustment.

**Significant at the 1 percent level in a two-tailed test.

that for a typical company with actual earnings per share of $2.00, the mean (median) difference between buy-side and sell-side forecasts is $0.15 ($0.08) for the 0–3 month horizon, $0.17 ($0.10) for the 10–12 month horizon, and $0.33 ($0.24) per share for the 18+ month horizon. The mean differences range from 8 percent to 16 percent of actual earnings, and the median values range from 3 percent to 12 percent.

Consistent with earlier findings, the coefficients on forecast horizon (*Horizon*) are positive and highly significant, implying that within each of the three-month horizons, the less-timely forecasts tended to be the relatively more optimistic.

Finally, analyst experience (*AEXP*) is unrelated to forecast optimism except for forecasts with the shortest horizon.

To judge how the buy-side firm performed relative to sell-side firms, we estimated the earnings optimism tests with analyst-firm fixed effects and the *Buyside* variable dropped. We then ranked the coefficients for the analyst-firm fixed effects among all the firms. Depending on the forecast horizon, the buy-side firm ranked between 13th and 25th most optimistic of the 299 sample firms.

## Whose Forecasts Are More Accurate?

Our measure of earnings forecast accuracy is similar to that used by Jacob, Lys, and Neale (1999), Clement (1999), Hong, Kubik, and Solomon (2000), and Hong and Kubik (2003), who controlled for company- and time-specific factors that have been shown to affect accuracy. We estimated the relative absolute error, *RAERR*, for each analyst's earnings forecast as follows:

$$RAERR_{itj}^{t+k} = \frac{AERR_{itj}^{t+k} - \overline{AERR_{it}^{t+k}}}{StdDev(AERR_{it}^{t+k})}. \quad (3)$$

$AERR_{itj}^{t+k}$ is the absolute forecast error for analyst $j$'s forecast at time $t$ of company $i$'s earnings for year $t+k$. The absolute forecast error was compared with the mean absolute forecast error for all analysts making earnings forecasts for the same company-year within the same forecast horizon, $\left(\overline{AERR_{it}^{t+k}}\right)$, and deflated by the standard deviation of the absolute forecast errors for all analysts forecasting earnings for the company-year with the same forecast horizon, $StdDev\left(AERR_{it}^{t+k}\right)$.

The distributions of *RAERR*s for buy-side and sell-side analysts (without controlling for the horizon) are shown in **Figure 2**. The distributions are similar to those for forecast optimism in Figure 1 and indicate that absolute forecast errors for buy-side analysts have a higher mean and variance than those for the sell-side analysts and are positively skewed relative to the sell-side distribution.

**Figure 2. Distribution of Relative Absolute Earnings Forecast Error, *RAERR*, for Buy-Side and Sell-Side Analysts, July 1997–December 2004**


To test whether relative absolute forecast errors differ for buy- and sell-side analysts, we estimated the following model:

$$RAERR_{ijt}^{t+k} = \alpha + \beta_1 Buyside_{jt} + \beta_2 Horizon_{ijt}^{t+k} + \beta_3 AEXP_{jt} + \beta_4 ACOYS_{jt} + \beta_5 ASPEC_{jt} + \beta_6 FSIZE_{jt} + \beta_7 FSPEC_{jt} + \nu_{ijt}. \quad (4)$$

The estimated *Buyside* coefficient represents the mean difference in relative forecast accuracy for buy-side analysts versus all sell-side analysts after controlling for forecast horizon and analyst experience (as defined previously). Other control variables are the number of companies for which analyst *j* published forecasts in calendar year *t*, $ACOYS_{jt}$; the percentage of other companies followed by analyst *j* within the forecast firm's I/B/E/S industry classification in calendar year *t*, $ASPEC_{jt}$; the number of analysts working at analyst *j*'s firm in calendar year *t*, $FSIZE_{jt}$; and the percentage of the other analysts at analyst *j*'s firm covering other stocks in the forecast company's industry in calendar year *t*, $FSPEC_{jt}$.[11]

Earlier studies found that absolute forecast errors are an increasing function of forecast horizon and the number of companies that an analyst covers and are a decreasing function of analyst industry specialization, firm size, and firm specialization.[12] Findings for analyst experience have varied. For example, Clement (1999) and Mikhail, Walther, and Willis (1997) found that forecast accuracy improves with experience, whereas Jacob et al. (1999) found no relationship.

Table 2 reports summary statistics for the control variables as well as the relative absolute forecast errors. The estimates indicate that, on average, the buy-side analysts had higher relative absolute forecast errors (0.85) than the sell-side analysts (–0.05), issued reports on fewer firms, and were less specialized by industry (about 36 percent of the companies they covered were in the same industry versus about 49 percent for the sell side). Thus, the buy-side analysts covered roughly three industries for every two covered by the sell side. The buy-side analysts were less experienced than their sell-side counterparts, as noted previously, and they had fewer in-house analyst colleagues and a smaller percentage of colleagues who covered other companies in the same industries. The multivariate tests helped us to judge whether differences in the relative absolute forecast errors of buy-side analysts are related to differences in these factors or to other factors specific to buy-side firms.

Results of the tests for absolute earnings forecast error are reported in **Table 4**. They show that even after we controlled for differences in forecast timing, analyst characteristics, and analyst-firm effects, the buy-side analysts had markedly higher relative absolute forecast errors for all forecast horizons than did their sell-side counterparts. The estimated coefficients are 1.53 for the short-term horizon (0–3 months), 0.93 for horizons of 10–12 months, and 0.89 for forecasts with horizons of 18 months or more, all highly statistically significant. For a typical firm with earnings per share of $2.00, these estimates imply that the mean (median) difference between buy- and sell-side absolute forecast

**Table 4. Relative Absolute Earnings Forecast Errors by Forecast Horizon, July 1997–December 2004**
(*t*-statistics in parentheses)

| Variable | 1–3 Months | 4–6 Months | 7–9 Months | 10–12 Months | 13–15 Months | 16–18 Months | 18+ Months |
|---|---|---|---|---|---|---|---|
| Constant | –0.40 | –1.12 | –1.32 | –2.36 | –2.05 | –2.51 | –0.85 |
| | (–7.0)** | (–12.1)** | (–10.0)** | (–11.7)** | (–8.7)** | (–9.1)** | (–7.7)** |
| *Buyside* | 1.53 | 1.36 | 1.18 | 0.93 | 0.77 | 0.76 | 0.89 |
| | (10.2)** | (9.8)** | (6.1)** | (4.6)** | (4.7)** | (5.1)** | (3.7)** |
| *Horizon* | 0.0071 | 0.0076 | 0.0058 | 0.0074 | 0.0050 | 0.0052 | 0.0012 |
| | (14.2)** | (15.3)** | (10.8)** | (12.4)** | (9.7)** | (9.7)** | (8.4)** |
| *AEXP* | –0.043 | –0.029 | –0.050 | –0.023 | –0.013 | –0.027 | –0.016 |
| | (–3.2)** | (–2.0)* | (–3.4)** | (–1.5) | (–0.8) | (–1.6) | (–1.1) |
| *ACOYS* | 0.0020 | 0.0026 | 0.0030 | 0.0015 | 0.0013 | –0.0003 | –0.0003 |
| | (2.1)* | (2.8)** | (2.3)* | (1.3) | (1.3) | (–0.3) | (–0.4) |
| *ASPEC* | –0.0003 | –0.0002 | –0.0004 | –0.0002 | –0.0003 | –0.0004 | –0.0003 |
| | (–1.1) | (–0.8) | (–1.2) | (–0.7) | (–0.7) | (–0.9) | (–0.8) |
| *FSIZE* | –0.0002 | –0.0004 | –0.0003 | –0.0006 | –0.0006 | –0.0005 | –0.0001 |
| | (–1.7) | (–3.0)** | (–2.3)* | (–4.3)** | (–3.3)** | (–3.6)** | (–0.7) |
| *FSPEC* | –0.0013 | –0.0021 | –0.0017 | –0.0002 | –0.0016 | –0.0013 | 0.0004 |
| | (–1.9) | (–3.0)** | (–1.8) | (–0.3) | (–1.9) | (–1.5) | (0.4) |
| $R^2$ | 12.8% | 10.5% | 8.3% | 7.2% | 5.1% | 5.6% | 6.5% |
| No. of observations | 10,783 | 9,307 | 7,811 | 7,826 | 8,257 | 6,622 | 9,334 |

*Significant at the 5 percent level in a two-tailed test.
**Significant at the 1 percent level in a two-tailed test.

errors is $0.21 ($0.08) for the 0–3 month horizon, $0.18 ($0.11) for the 10–12 month horizon, and $0.30 ($0.22) per share for the 18+ month horizon. The mean differences range from 11 percent to 15 percent of actual earnings, and the median values range from 4 percent to 11 percent of actual earnings.

Estimates for many of the other coefficients are consistent with findings of prior studies. The forecast horizon coefficient is positive and significant, implying that less-timely forecasts within each three-month horizon had higher absolute errors. For short-term to medium-term forecast horizons, the coefficients are positive for number of companies covered and negative for analyst experience, analyst specialization in the industry, and analyst-firm size. These results imply that analysts' absolute forecast errors were lower if they covered fewer stocks, had more experience as an analyst, specialized in the forecast company's industry, and were employed by a relatively large firm (which presumably had more resources).

To assess whether buy-side inaccuracy was solely the result of forecast bias in our tests, we reestimated our tests with a control for forecast bias. We found that absolute forecast errors for buy-side analysts declined by roughly 30 percent after controlling for forecast bias. However, buy-side analysts' forecast errors continued to be larger than those of their sell-side counterparts.

Finally, to judge how the buy-side *firm* performed relative to sell-side firms, we reestimated the absolute forecast error tests with firm fixed effects and dropped the *Buyside* variable. We found that, depending on the forecast horizon, the buy-side firm had between the 7th and the 20th highest mean absolute forecast errors of the 299 sample firms.

## Why Do Buy-Side Analysts Underperform?

We examined seven potential explanations for the more optimistic and less accurate earnings forecasts of the buy-side analysts.

**Analyst Retention.** One explanation is that the buy-side firm retained fewer high-quality analysts or more low-quality analysts than the sell-side firms. To test this hypothesis, we estimated the relationship between analyst retention and analyst forecast performance for the buy-side firm and the aggregate sell side.

The average annual retention rate for the buy-side analysts was 71 percent, which is significantly higher than the 64 percent retention rate for the sell side. For sell-side analysts, retention rates were below average for both the best and worst performers. The lower retention rate for high performers could have been caused by recognized

"stars" voluntarily exiting the industry to manage money themselves. The lower retention rate among poor performers is likely to have come from their involuntarily exiting the industry.

The buy-side firm also had a lower-than-average retention rate for its high-performing analysts, but we found no relationship between retention and performance for the worst performers. Relative to its average retention rate, the buy-side firm was 2 percent *more* likely to retain analysts in its lowest-performing quartile. In contrast, relative to their own average retention rates, sell-side firms were 6 percent *less* likely to retain analysts in the lowest-performing quartile. This difference is statistically reliable and implies that poorly performing analysts are more likely to continue working at the buy-side firm than on the sell side.[13]

To assess how much of our earnings forecast findings can be explained by the higher buy-side retention of low-accuracy analysts, we estimated the probability that an analyst was retained by the firm by using the following model:

$$\text{prob}\left(Retention_{jt}\right) = \alpha + \beta_1 Buyside_{jt} + \beta_2 AEXP_{jt} + \sum_{k=1}^{3}\left[\gamma_k (Rank_{jt})^k + \lambda_k (Buyside_{jt} * Rank_{jt})^k\right] + \mu_{jt}. \quad (5)$$

$Rank_{jt}$ is the analyst's absolute forecast error rank measured by using average relative absolute forecast errors across all forecasts made in a given year. The ranks of average absolute errors for analyst-years are scaled from 0 to 1, with 0 being the most accurate analyst in the year and 1 being the least accurate.

The model estimates imply that a sell-side analyst whose average absolute forecast error was more than 1 standard deviation above that of the average sell-side analyst had a less than 50 percent chance of being retained by the analyst's current firm in the following year. These data generated an attrition rate associated with poor forecast performance of 5 percent. Applying these sell-side standards of forecast performance to analysts at the buy-side firm, we found that the bottom 15 percent would be expected to exit the firm in any given year.

We used these results to assess how our findings would change if the sell-side forecast performance standard was applied to the buy-side analysts. To do so, we created a dummy variable for buy-side analysts whose prior year's mean absolute forecast errors were 1 standard deviation or more above that for the average sell-side analyst covering the same stocks but who continued to be retained by the buy-side firm. We included this dummy variable in our original earnings forecast bias and accuracy models. If lower retention rates for poor forecasters on the sell side fully explain buy-side optimism and absolute forecast error, we expected the estimates for the dummy variable to subsume the effect of the *Buyside* variable.

We found that the dummy variable explained little of buy-side forecast bias and absolute error for short horizons. For the longest horizons, however, it explained as much as 40–45 percent. On average, across all horizons, the dummy variable explained roughly one-third of the buy-side analysts' forecast bias and one-fifth of their absolute forecast errors.

**Differences in Analyst Benchmarks.** A second explanation for the findings is that buy-side and sell-side analysts have different incentives. Throughout our sample period, the buy-side firm made no attempt to benchmark its analysts to their sell-side peers.[14] In contrast, sell-side analysts have long been benchmarked to other sell-side analysts. *Institutional Investor* magazine's analyst ratings, which rank analysts within industry covered on the basis of a survey of institutional investors, are published each year and affect sell-side analysts' standings and compensation.

**Sell-Side Information Advantage.** Our findings could also reflect an information advantage for sell-side analysts from one or more potential sources. One source is the sell-side firms' sales forces and traders (who may have deep knowledge about current market conditions). A second source (particularly prior to Reg FD) is managers of the companies covered. Finally, sell-side analysts may develop an information advantage through feedback on their ideas from their own institutional clients. The value of most of these information sources is difficult to assess, but the adoption of Reg FD in 2000 enabled us to test, indirectly, whether sell-side analysts had superior access to management information prior to the regulatory changes.

We carried out a supplemental test to estimate the buy-side analysts' relative earnings forecast optimism and absolute error by year for the one- to three-month forecast horizon. The results reported in **Table 5** provide evidence of a decline in buy-side analysts' *relative* earnings forecast optimism and absolute errors after Reg FD. The buy-side optimism estimates for 1997–99 are all highly statistically significant. In contrast, the estimates for 2001–04 are insignificant at the 5 percent level. The average buy-side absolute error estimates before Reg FD are largest for 1997–98 and decline beginning in 1999. These changes in relative performance are largely attributable to changes in *sell-side* optimism and accuracy, which deteriorated after the new regulation, rather than to changes in buy-side performance.

**Table 5. Relative Earnings Forecast Optimism and Absolute Errors by Year: Coefficient on *Buyside* for One- to Three-Month Forecast Horizon, July 1997–December 2004**
(*t*-statistics in parentheses)

| Forecast Year | Forecast Optimism | Absolute Forecast Error |
|---|---|---|
| 1997 | 2.93 | 2.97 |
| | (12.01)** | (8.84)** |
| 1998 | 3.07 | 3.28 |
| | (10.01)** | (13.20)** |
| 1999 | 1.06 | 0.62 |
| | (6.32)** | (2.70)** |
| 2000 | 0.49 | 0.64 |
| | (2.57)* | (3.17)** |
| 2001 | 0.03 | 0.57 |
| | (0.14) | (3.58)** |
| 2002 | 0.23 | 0.69 |
| | (1.71) | (4.54)** |
| 2003 | 0.01 | 0.41 |
| | (0.23) | (2.96)** |
| 2004 | 1.01 | 1.85 |
| | (1.71) | (3.93)** |

*Notes*: The sample is the full sample of 3,526 buy-side forecasts and 58,562 sell-side forecasts. The forecast optimism model is Equation 2. The absolute forecast error model is Equation 4.

*Significant at the 5 percent level in a two-tailed test.
**Significant at the 1 percent level in a two-tailed test.

Although these findings are consistent with the bias in sell-side analysts' forecasts and absolute errors being driven partially by an information advantage before Reg FD, this explanation is questionable for several reasons. First, the change in buy-side estimates appears to begin in 1999, prior to adoption of Reg FD. Second, the years following Reg FD were particularly turbulent ones for the U.S. equity market. Key events included the conclusion of the bull market in technology stocks of the late 1990s, the financial scandals of Enron Corporation and WorldCom, enactment of the Sarbanes–Oxley Act of 2002, and the Global Settlement. Whether the observed changes in sell-side behavior were driven by Reg FD or by some of these other events is unclear. Finally, Table 5 indicates that in 2004, buy-side relative forecast optimism and inaccuracy reverted to pre–Reg FD levels. We are cautious, therefore, about interpreting the time-series findings.

**Scope of Analyst Coverage.** Even though the buy-side analysts wrote reports at any given time on roughly the same number of companies as the typical sell-side analyst, the buy-side analysts that we studied followed many more companies. The average analyst at the buy-side firm followed 50–100 companies in a broadly defined sector and wrote reports on about 9 of them at any time. Analysts at the bulge-bracket firms that dominated the sell-side sample covered and wrote reports on 15 stocks from a more narrowly defined industrial sector. Thus, one explanation for the poor performance of the buy-side firm analysts is that the scope of their coverage prevented them from spending much time on any one stock, which produced shallow analyses. Consistent with this explanation is the fact that typical buy-side reports at the sample firm were only two pages long and were far less comprehensive than those of typical sell-side analysts.

To examine this explanation, we compared the performance of the buy-side analysts with that of sell-side analysts at firms of comparable size and scope of coverage. For this comparison, we eliminated all sell-side firms with more than 50 analysts. Some of the remaining firms focused on a narrow set of industries (e.g., technology stocks), so we eliminated firms that covered fewer than 75 industries.[15] The remaining firms were comparable to the buy-side firm in number of analysts and breadth of industry coverage.

We used the revised sample of sell-side firms to reestimate our earnings forecast tests. The findings are similar to those reported, indicating that differences in coverage scope probably do not explain the earnings forecast optimism and absolute errors of the buy-side analysts.

**Truncation Bias.** Another potential explanation for the poor buy-side performance is that buy-side analysts are more likely than sell-side analysts to write reports on stocks for which they have positive views (i.e., are optimistic about) and to stop writing reports on stocks when they find themselves having pessimistic views about the companies. This truncation is especially plausible in light of the large number of stocks that the buy-side analysts must screen and the fact that the money management firm was not permitted to short stocks.

To assess the impact of this bias on our findings, we compared the buy-side and sell-side analysts' relative earnings forecast optimism and absolute errors for newly covered stocks, a subsample that should not be subject to truncation bias. The findings were even stronger than those reported in the tables, particularly in the initiation quarter, and showed that the buy-side firm's analysts made more optimistic and less accurate earnings forecasts than their sell-side counterparts even for newly covered stocks. We conclude that truncation bias alone is unlikely to explain the relative optimism of the buy-side analysts.

**Quality of Analysts Hired.** Sell-side firms often argue that the quality of the sell-side analysts themselves is higher than that of analysts hired by the buy side. To test whether this hypothesis explains the poor performance of these buy-side firm analysts, we examined the time-series performance of 27 buy-side analysts who were hired from the sell side. We extended the sell-side earnings forecast dataset to begin in 1983 and tracked the relative performance of these analysts when they worked on the sell side and after they joined the buy side.

**Figure 3** and **Figure 4** present the distributions of, respectively, relative earnings forecast optimism and absolute errors for the switching analysts before and after they moved to the buy side. Panel A of Figures 3 and 4 show that prior to the switch, there was little difference in optimism or absolute errors between the sell-side analysts who were later

**Figure 3. Distribution of Relative Earnings Forecast Optimism, *ROPT*, for Switching Analysts before and after the Switch, January 1984–December 2004**

**Figure 4. Distribution of Absolute Earnings Forecast Error, *RAERR*, for Switching Analysts before and after the Switch, January 1984–December 2004**


hired by the buy-side firm and those who continued working on the sell side. After the change, however, as the B panels show, a pronounced shift to the right occurs in the distributions of forecasts and errors for switching sell-side analysts versus nonswitching sell-side peers; thus, both forecast optimism and absolute error increased for these analysts after their move to the buy-side firm.

Multivariate tests confirmed these conclusions. For earnings forecast optimism, the pre-hire estimates for sell-side analysts subsequently hired by the buy-side firm ranged from –0.17 to 0.01 (across the various forecast horizons) and were statistically insignificant for all but two horizons. The implication is that prior to being hired by the buy-side firm, the sell-side analysts were no more optimistic than their sell-side competitors. More than 90 percent of the sell-side analysts became more optimistic, however, once they were hired by the buy-side firm (the estimates ranged from 0.46 to 1.03 and were all statistically significant). Finally, the estimates for buy-side analysts who were not hired from the sell side ranged from 0.72 to 1.02 and were statistically significant, indicating that these analysts were also highly optimistic relative to the sell side.

The findings for absolute forecast errors provide a similar picture. In the pre-hire period, sell-side analysts subsequently hired by the buy-side firm were as accurate as their sell-side counterparts. This finding was reflected in the insignificant coefficients on *RAERR*. After being hired, however, more than 90 percent of the analysts became less accurate than their sell-side peers (with significant and positive estimates from 0.52 to 1.33 across the forecast horizons).

A potential explanation for the change in an analyst's performance in forecasting earnings after joining the buy-side firm is that the new analysts are assigned to stocks that they had not previously covered.[16] Consistent with this explanation is that during their first two years as buy-side analysts, former sell-side analysts had an average company-coverage turnover of 64 percent relative to the number of stocks that they covered during their final year as sell-side analysts. In contrast, during their last two years as sell-side analysts, average company-coverage turnover for these same analysts was only 28 percent.

To examine the effect of this turnover on the performance of buy-side analysts hired from the sell side, we separately estimated optimism and accuracy for stocks that the analyst covered both before and after moving to the buy-side firm and for stocks that the analyst covered only following the hiring change. The results (unreported) indicated no significant difference in forecast optimism or accuracy for the analysts' earnings predictions for the two types of stocks: Forecast optimism and absolute errors increased comparably for both types after the sell-side analysts switched to the buy side.

Overall, we conclude that prior to being hired by the buy-side firm, sell-side analysts had earnings forecast performance comparable to that of other sell-side analysts. After the switch, however, these analysts' performance deteriorated. These findings are inconsistent with the earlier results being driven by the buy-side firm hiring low-quality analysts.

**Poor Investment Firm Performance.** The final explanation that we examined is that the buy-side firm is simply a poorly performing firm, perhaps because of its poor research performance. To test this hypothesis, we collected data on the performance of the buy-side firm's portfolio managers from the Reuters Group and *Institutional Investor* magazine ratings of top U.S. fund management groups from 1997 through 2003. The ratings were based on responses of U.S. corporations to an annual questionnaire that requested ratings of the leading institutional investors. The sample firm was consistently ranked among the top 10 firms during the sample period.

We also collected Morningstar ratings for equity funds at the sample firm and the other money management firms ranked in the top 10 by *Institutional Investor* in 2003. For each firm, we estimated the average Morningstar 1-, 3-, 5-, and 10-year ratings by fund type (e.g., Foreign Small/Mid-Growth, Large Blend, Large Growth, etc.). The sample firm's relative performance ranked in the top 30 percent for four of the seven categories in one-year performance and three of the six categories for three- and five-year horizons.[17] When we computed firm average Morningstar ratings for all equity funds that the firm offered (with no control for fund type), the sample firm's average rating exceeded the average ratings for other top 10 firms for the 1-, 3-, and 5-year horizons but not for the 10-year horizon.

Finally, we computed the annual market-adjusted performance of the firm's large-capitalization equity funds (because most of the analyst reports were written on large-cap stocks). The mean annualized market-adjusted return for these portfolios during the sample period was 2.7 percent. Performance varied considerably over time; the weakest returns were generated during the 1998–99 tech boom (–21.5 percent and –8.2 percent), and the strongest performance, in 1997, 2000, 2001, and 2003 (respectively, 9.2 percent, 12.7 percent, 9.2 percent, and 19.5 percent). The relationship between the firm's annual mutual fund performance and its research performance (measured by the annual market-adjusted returns of its analysts' strong buy/buy recommendations) was found to be positive but insignificant.

## Conclusion

We examined analyst earnings forecast optimism and accuracy for buy-side analysts at a large, reputable money management firm relative to the optimism and accuracy of sell-side analysts in the 1997–2004 period. Our findings indicate that analysts at the buy-side firm made more optimistic and less accurate forecasts than their counterparts on the sell side. As a percentage of actual earnings, the mean (median) buy-side forecasts are 8–16 percent (3–12 percent) higher than those for the sell side, and the buy-side mean (median) absolute forecast errors are 11–15 percent (4–11 percent) higher than those of their sell-side peers.

We conclude that roughly one-third of the buy-side analysts' forecast optimism and one-fifth of their absolute forecast error is attributable to the buy-side firm's higher retention rate for low-quality analysts. The performance differences also appear to have arisen because the buy-side firm did not measure its own analysts against the sell side, whereas

sell-side analysts are regularly measured against each other. Time-series tests showed that after Reg FD, a decline in sell-side performance occurred that was not matched by a decline on the buy side, which is consistent with the sell-side analysts' having had an information advantage relative to the buy side that was removed by Reg FD. We interpret this finding with caution, however, because the sample-period years coincided with several other significant economic events that could have affected buy- and sell-side performance. Finally, the findings do not appear to be the result of differences between the buy side and sell side in scope of coverage, differences in a truncation bias, the quality of analysts hired, or the quality of the sample buy-side firm (as measured by its funds' performance).

Our findings raise several questions for researchers and practitioners. First, although we have no reason to believe that the sample firm is anything but a strong performer within the industry, a replication of the tests on a broader sample would be interesting. We have been unsuccessful, however, in our efforts to gather more data on buy-side firms to attempt such tests. Second, our findings raise questions about the quality of other buy-side research metrics, such as stock recommendations (see Groysberg, Healy, Shanthikumar, and Gui 2008). Finally, it will be interesting to assess whether (and how) such services as StarMine Corporation, which benchmarks buy-side analysts' research performance to that of analysts at other buy-side firms and to the sell side, affect the quality of buy-side research.

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*This article qualifies for 1 CE credit.*

## Notes

1. For evidence of the conflict between research and investment banking, see Lin and McNichols (1998), Michaely and Womack (1999), Dechow, Hutton, and Sloan (2000), and O'Brien, McNichols, and Lin (2005).
2. The description of buy-side analysts in this section draws on discussions with buy-side analysts, portfolio managers, research directors, and chief investment officers at several leading money management firms. See also Metropolitan Club (2004).
3. Lin and McNichols (1998); Michaely and Womack (1999); Dechow et al. (2000); O'Brien et al. (2005); Cowen et al. (2006).
4. At our sample firm, at the end of 2004, fewer than 10 percent of the portfolio managers had been hired from the firm's research department. Many of the portfolio managers promoted from within had been with the company for 20–30 years.
5. As additional confirmation that buy-side analysts were forecasting the same earnings number as sell-side analysts, we note that the sample firm recently began submitting its earnings forecasts to StarMine Corporation, a firm that compares buy- and sell-side analysts' forecasting and recommendation performance for investment firms and institutional investors.
6. Results were similar if we used either a randomly selected forecast or the last forecast made by an analyst for each company during the three-month forecast horizon.
7. To assess whether differences in the sample sizes of buy-side and sell-side forecasts affected our findings, we also estimated our analysis by using matched samples of sell-side analyst forecasts. The findings were similar to those reported for the full sell-side sample.
8. We considered deflating relative forecast optimism by stock price. As noted by Jacob, Lys, and Neale (1999), for earnings, however, doing so effectively weights optimism by the P/E, which implies that changes in P/Es over time and across companies affect price-deflated relative optimism. Consequently, we opted for deflating our optimism measures by the standard deviation of the forecasts.
9. This approach underestimates the experience of analysts who started work at a buy-side firm other than the sample firm.
10. See Huber (1967); White (1980); Froot (1989); Williams (2000).
11. We included these additional variables as controls in the model, even though no economic link necessarily exists between them and relative forecast optimism, because they have been included in other studies. Not surprisingly, most of the additional estimates were insignificant. More importantly, our findings for the buy-side variable were unchanged.
12. For example, O'Brien (1990); Clement (1999); Jacob et al. (1999).
13. Average absolute forecast errors for poorly performing analysts retained by the buy-side firm continued to be abnormally high for one more year before improving, suggesting that these analysts either learned how to make more accurate forecasts over several years or were replaced.
14. The sample firm signed up for StarMine after our sample period.
15. We used a number of different cutoffs to define the sample of sell-side firms with scope of coverage comparable to that of the buy-side firm. The findings were insensitive to different cutoffs.
16. Mikhail et al. (1997) found that analysts' forecast accuracy increased with the length of time that they had covered a stock.
17. Data were insufficient to estimate meaningful ratings for all the categories for the 10-year period.

 

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