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ARE ANALYSTS ALL ALIKE? IDENTIFYING EARNINGS FORECASTING ABILITY

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Investors and the financial media apparently believe that some Wall Street equity analysts' research is superior to others'. We examine whether such quality differentials exist, in terms of analysts' ability to forecast earnings accurately, and whether these differentials are identifiable on an ex ante *basis. The results suggest that there is some persistence in analysts' forecast accuracy. In particular, forecast accuracy is associated with analyst experience, breadth of coverage, timeliness, and brokerage firm size. Analysts selected for All-Star status by industry publications also tend to have higher forecast accuracy. However, the differences in forecast accuracy do not produce material differences in the dollar magnitudes of forecast errors.*

0 Introduction

Few groups of capital market participants rival equity research analysts for influence. Investors and portfolio managers select stocks in part by scrutinizing analysts' opinions of companies. Financial news organizations disseminate widely analysts' opinions and discuss them so frequently that some analysts have become media celebrities. As a result, these individuals' pronouncements can send stock prices rocketing or plummeting.

Not all research analysts appear to be created equal, however. Rather there is a widespread perception that stark differences exist in the quality of analysts' research. For instance Opdyke (2000), writing about the annual *Wall Street Journal* survey of analysts, says "the sports world has its Michael Jordan, its Cal Ripken, its Wayne Gretzky—players who, surrounded by greatness, still stand above the rest. Wall Street, too, has its luminaries." Investment

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managers can subscribe to services that evaluate analysts, with the aim of singling out individuals who provide more accurate forecasts of earnings or investment performance. The opinions of these supposedly more talented analysts can then be given more weight.[1] Similarly the financial press periodically polls investment managers to rate the performance of individual analysts. For example, *Institutional Investor* each year selects analysts for its All-American Research Team based on institutional clients' evaluation of the quality of their investment recommendations and research, among other things. The *Wall Street Journal* provides another annual ranking of analyst performance.

The belief that some analysts are better than others carries over into equity prices. Gleason and Lee (2003), Park and Stice (2000) find systematic differences across analysts with respect to the price impact of changes in their estimates: revisions by more prestigious analysts tend to be associated with larger immediate price changes. As well, differences across analysts in their perceived ability show up in the form of differences in compensation and prestige. Analyst salaries are closely tied to their ratings in the *Institutional Investor* survey. Those included in the lists are handsomely rewarded, and brokerage firms take out advertisements trumpeting their analysts' achievements.

Implicit in the singling out of analysts for "star" status and the industry's overall reliance on analyst rankings is the assumption that it is possible to detect on an *ex ante* basis individuals who consistently provide better results. This paper evaluates carefully whether this presumption has any basis in fact. Specifically we identify whether consistent differences in analyst performance exist, and the economic materiality of these differences. Since analysts serve a variety of clienteles (Hong and Kubik, 2003; Chan *et al.*, 2007), however, they play a number of roles. As a result not all aspects of their performance are easily quantifiable, at least based on publicly available data. For example, analysts' investment advice, in the form of stock recommendations, forecasts of long-term growth and target stock price levels, are difficult to evaluate because they apply over an unspecified horizon. With respect to analysts' stock picks, Jegadeesh *et al.* (2004) even question whether the level of recommendations is informative about future stock returns, given the characteristics of the stocks that are recommended. In any case, the noisiness in stock returns makes it hard to tease out analysts' talent in stock selection or price prediction.

To circumvent these issues we focus on the central function that analysts have traditionally filled, namely the provision of annual earnings forecasts. The financial media lavish a great deal of attention on analysts' estimates, and revisions in these estimates can induce large movements in the stock price (see Landsman and Maydew, 2002; Chan *et al.*, 2007). For our purposes, the advantage of working with earnings forecasts is that they apply to a specific calendar period (the fiscal year), and the actual realization is observed at the end of the period. As a result, it should be less difficult to pick out those analysts who do a better job in terms of providing more accurate forecasts of earnings.

Previous academic research confirms that the consensus estimate of analysts out-performs statistical models in forecasting earnings. At the level of individual analysts, however, the evidence on consistency in performance is a little cloudier. Brown and Rozeff (1980), O'Brien (1990) fail to detect differences in analyst performance over time. Sinha *et al.* (1997) report that individuals providing more accurate forecasts of a firm's earnings in one year tend to be accurate as well in the following year. In a related vein, Stickel (1992) documents that analysts voted onto the All-American research team subsequently provide more accurate earnings forecasts. The short sample periods used in these studies, however, calls into question the reliability of their results. For

instance, Sinha *et al.* (1997) use only seven years of data (1984–1990) to evaluate the accuracy of annual earnings forecasts. Another source of controversy is whether analyst forecast accuracy reflects skill or more mechanical differences. For instance analysts may vary in their accuracy because some individuals' forecasts are more stale than others'. Some analysts may be affiliated with brokerage firms that have different levels of data-collection and processing resources, thereby confounding our understanding of the sources of forecasting skill. In short, while we know that analysts as a group exert a strong influence on stock price behavior, we are less confident about whether some individuals' forecasts are more credible than others'.

We assess consistency in analyst forecasting performance from several standpoints: at the level of each stock covered, at the level of an individual analyst, as well as at the level of a brokerage firm. The comparisons of forecast accuracy control for variables such as forecast age, analyst experience, breadth of coverage, and the size of the brokerage firm. We also zero in on two groups where consistently superior forecasting ability might be concentrated: analysts affiliated with large high-status brokerage firms, and analysts selected for star status by influential media outlets such as *Institutional Investor* or *The Wall Street Journal*.

Arguably, unbiased research may not be an analyst's sole objective, since analysts in the past were expected to facilitate investment banking deals, or stimulate clients' trades and thereby generate brokerage commission fees. As a result, it may be the case that analysts have an incentive to paint a flattering picture of a firm's prospects. One way they can accomplish this is by setting the forecast immediately before the earnings announcement date to be lower than what earnings are likely to be, so investors receive a pleasant surprise when the actual numbers are released. Accordingly, to judge whether analysts' forecast accuracy is compromised by conflicts of interest, we also examine the performance of a set of independent analysts who do not have direct ties to investment banking business.

Our results provide statistical evidence in favor of consistency in analyst accuracy in earnings forecasts. For example, an analyst who is ranked in the top quartile by past accuracy is 1.3 times more likely to remain in the top group than to fall to the bottom group. Similarly, an analyst who falls in the bottom quartile by past accuracy is 1.4 times more likely to stay in the bottom quartile than to rise to the top. The consistency in accuracy persists after controlling for a variety of characteristics of the forecast, the stock being covered, the analyst and the brokerage firm. Large brokerage firms and All-Star analysts tend to be associated with more accurate forecasts. However, the economic magnitude of the differences in forecast accuracy is generally small.

Clement (1999), Brown (2001) also find that several analyst attributes such as experience, breadth of coverage and past accuracy help to predict future accuracy. This paper extends their evidence in several respects. By aggregating an analyst's forecasts over all the firms covered by the individual in a year, we reduce the noisiness in forecast errors and improve the reliability of our results. Our analysis also provides a bridge to related work on the performance of All-American analysts (Stickel, 1992). Specifically we examine whether, holding other variables constant, star status based on industry polls predicts accuracy and whether the performance of star analysts persists. Finally, the main result in Clement (1999) is that the size of the brokerage firm employing the analyst is the key predictor of accuracy. We flesh out this finding by aggregating over the forecasts of analysts affiliated with a brokerage firm and examining whether there is consistency at this level, controlling for brokerage firm characteristics. Notably, our examination of independent brokerage firms' accuracy lets us address

recent controversies about whether some brokerage firms' ties to investment banking business compromise their ability to provide impartial estimates of earnings.

The rest of the paper is organized as follows. Section 1 describes our empirical approach. Section 2 applies multiple tests to determine whether there is persistence in forecast accuracy. Section 3 evaluates whether large brokerage firms, and All-Star analysts, have an edge in forecast accuracy over their competitors. A final section concludes.

1 Data and methodology

We assess analyst performance in terms of their accuracy in forecasting annual earnings per share. Data on actual earnings and individual analyst forecasts are from the Institutional Brokers' Estimate System (I/B/E/S) Detail History file. We consider analysts' forecasts of current fiscal-year (FY1) earnings for domestic US equity issues. Each estimate in the file is associated with codes that identify the analyst issuing the forecast, as well as the affiliated brokerage firm. Our sample period is 1984–2002. Prior to 1984, there is some question as to whether the forecasts reported on I/B/E/S are comparable with the earnings that companies were reporting.

To see which analysts consistently do better than others we require a metric that allows direct comparisons across analysts who cover different stocks, and also across time. Forecast errors, either in dollar amounts or percentage terms, do not facilitate such comparisons, since the distribution of errors varies across stocks and time. Instead we develop the following forecast accuracy measure. For each stock in each year, we assign to every analyst a score that reflects how closely the analyst's forecast matches actual earnings. In particular, we track each analyst's most recent outstanding forecast as of six months before the end of the stock's fiscal year. Our choice of forecast horizon is based on the idea that six months before the fiscal year-end, there is sufficient uncertainty about future earnings to generate dispersion across analysts. Hence, any evidence of analyst talent should come through more clearly. As the end of the fiscal year approaches, forecasts tend to converge and analysts appear more homogeneous. Given the length of time until the release of annual earnings there is also less of a tendency for analysts to manipulate strategically their estimates in order to curry favor with potential investment banking clients. Additionally it is less likely that, six months before the fiscal year-end, managers are leaking information to selected analysts in order to guide their forecasts. To mitigate the influence of inactive forecasters, we discard any estimate that has been outstanding for longer than 100 days as of six months prior to the fiscal year-end.

The score assigned to an analyst is calculated as follows. For all stocks with at least three outstanding forecasts, we calculate the absolute value of the difference between each analyst's forecast and actual earnings per share.[2] The absolute errors are ordered from highest to lowest, and each forecaster's percentile ranking is used as the score.[3] The end result is that every analyst is assigned an indicator of forecast accuracy that lies between zero (the least accurate forecaster) and one (the most accurate forecaster). By construction the average score is 0.5.

Note that our scoring procedure is fully predictive in nature. In particular, our ranking of analysts who cover a stock in a given year is irrespective of whether they continue their coverage in the future. In the subsequent year some of these individuals may discontinue their forecasts for the stock, while others may initiate coverage. The ranking in the subsequent year applies to the reconstituted set of analysts (survivors plus new entrants). Of course, in evaluating whether there is consistency in forecast accuracy we can compare scores across adjacent years for the survivors only.

2 Persistence in analyst forecast accuracy

We check whether good forecasters repeat using a variety of test designs, including rank correlations in forecast accuracy between successive years and contingency table tests. We also estimate regression models that control for other attributes.

2.1 Rank correlation tests

Table 1 tests whether an analyst's past forecasting performance is informative about future forecast accuracy. We consider past forecasting performance measured in the most recent year t, or the scores from up to the preceding three years averaged and then re-scaled between zero and one. Averaging over the past three years helps to give a clearer indication of which analyst has a better track record in forecasting.[4]

We correlate analyst i's past accuracy score for stock j as of year t to the same analyst's score for the same stock in the subsequent year $t+1$. The rank correlation is calculated over all analyst-firm estimates across two adjacent years. Average correlations over all years in the sample period are reported in Panel A, along with the proportion of years where the correlation is significant at the 5 percent level.

The results for the past one-year score or past-three year average score are similar. The average correlation is positive but low (4 percent for the whole sample period), suggesting that past performance has only slight information about performance over the next year. The correlation is statistically significant in about 72 percent of the years for past one-year scores, and in about 78 percent of the years for past three-year average scores.

Estimates on a stock-by-stock basis are noisy and may obscure judgments about which analysts are better forecasters. We can refine our accuracy measure by evaluating forecast performance across all the stocks covered by an individual analyst. Taking this broader perspective helps to reduce the idiosyncratic component of the forecast error and may sharpen our ability to distinguish between luck and skill. Accordingly in Panel B of Table 1, we use a composite accuracy score for analyst i by averaging scores across all the stocks the individual covers in a given period. This average is then re-scaled so that the least accurate forecaster each year has a score of zero and the most accurate forecaster has a score of one. In each year over the sample period we compute a cross-sectional correlation between an analyst's past composite score (either over the past year or past three years) and the next year's composite score; the result is then averaged over years. The average correlations, as well as the percent of yearly correlations (relative to the total sample period) that are significant at the 5 percent level, are provided in Panel B of Table 1.

As expected, aggregating an analyst's scores across stocks lowers measurement error. As a result we now see stronger evidence of consistency in forecast accuracy. Average correlations at the analyst level are higher in Panel B. Over the entire sample period, the rank correlation between an analyst's score in the current year and next year's score averages 7.9 percent (compared to 4 percent in Panel A), and the correlation is significant in 15 out of 18 years (or 83 percent of the time). Measuring past performance over a longer horizon (three years) helps as well. The correlation between the average past three-year score and next year's score rises to 9 percent with significant correlations in 78 percent of the years.

2.2 Contingency table tests

Brown *et al.* (1992) argue that nonparametric procedures based on contingency tables are less susceptible to survivorship bias in tests for persistence in mutual fund performance. We follow their lead and use the same general approach to

Table 1 Correlation in forecast performance.

		Correlation between next-year score and			
		Current 1-year score		Past average 3-year score	
Sample period	No. of cases	Correlation	Percentage significant	Correlation	Percentage significant
Panel A: Firm-level forecast accuracy					
1984–1992	53039	0.048	77.8	0.043	66.7
1993–2001	67111	0.032	66.7	0.036	88.9
1984–2001	120150	0.040	72.2	0.039	77.8
Panel B: Analyst-level forecast accuracy					
1984–1992	13535	0.098	88.9	0.107	88.9
1993–2001	19317	0.059	77.8	0.073	66.7
1984–2001	32852	0.079	83.3	0.090	77.8

The sample comprises all analysts with current fiscal-year (FY1) earnings estimates for domestic U.S. common stocks from January 1984 to October 2002 on the I/B/E/S Daily Detail Earnings Estimate History file. For each firm covered by at least three analysts in the current year, analysts with valid outstanding estimates as of six months before the fiscal year-end are ranked on the basis of absolute forecast error and assigned a score between zero (the least accurate forecaster for the firm in that year) to one (the most accurate forecaster for the firm in that year). Rank correlations between scores in the current year, or scores averaged over the preceding three years and re-scaled, and scores in the next year are computed in Panel A pooled over all analyst-firm estimates. The average correlation over years in the sample period, as well as the percent of yearly correlations that are significant at the five percent level, are reported. In Panel B, accuracy scores are averaged over all stocks covered by an individual analyst and rescaled between zero and one each year. Rank correlations between analysts' current yearly scores, or prior three-year average score, and next-year scores are computed each year. The results are averaged over years and reported, along with the percentage of years with correlations that are significant at the five percent level.

see whether good forecasters repeat. The results are reported in Table 2 at the level of individual stocks (Panel A), analysts (Panel B), and brokerage firms (Panel C).

Table 1 shows that averaging over past performance helps single out superior forecasters. Accordingly in Table 2 we measure past performance over a three-year horizon and see whether this predicts performance in the next year. If the analyst's past forecast history does not cover three full years, we use as many observations as are available up to that time. In each case the procedure follows the same steps. Each year we rank analysts by the relevant score on past performance: in Panel A the score refers to each analyst's accuracy for a particular stock; in Panel B the score is an analyst's rescaled average performance indicator across all stocks covered; in Panel C the scores are averaged over all analysts employed at a given brokerage firm and rescaled. The ranked analysts or brokerage firms are then placed into one of four equally sized categories (from category 1 which comprises cases with the lowest score to category 4 with the highest score). To ensure that every category in the ranking is populated, we limit the analysis in Panel A to stocks that are covered by at least four analysts. Separate categories are created for non-surviving analysts (who provide forecasts in the first period but not in the following year), and new analysts (with forecasts in the second year but no prior estimates). The intersection of these two sorts gives us a contingency table that reports the proportion of cases in each joint classification. We obtain

Table 2 Contingency table tests for consistency in forecast performance.

Past score rank	Next year score rank					Absolute forecast error	
	1 (Worst)	2	3	4 (Best)	Non-survivors	Past	Next year
Panel A: Firm-level forecast accuracy							
1 (Worst)	2.20	1.95	1.89	1.91	8.87	0.2241	0.1652
2	2.36	2.35	2.37	2.36	7.39	0.1797	0.1642
3	2.19	2.44	2.47	2.49	7.24	0.1428	0.1603
4 (Best)	2.09	2.20	2.27	2.37	7.89	0.0947	0.1582
New	8.30	8.21	8.14	8.02			0.1379
Past error	0.1618	0.1606	0.1600	0.1588	0.1391		
Next year error	0.2637	0.1827	0.1317	0.0699			
Panel B: Analyst-level forecast accuracy							
1 (Worst)	4.10	3.54	3.01	2.84	6.43	0.2014	0.1487
2	3.66	4.64	4.60	3.31	3.73	0.1612	0.1477
3	3.09	4.72	5.20	3.89	3.04	0.1422	0.1422
4 (Best)	3.22	3.64	4.13	4.17	4.79	0.1266	0.1451
New	6.41	3.98	3.57	6.29			0.1485
Past error	0.1682	0.1507	0.1520	0.1605	0.1785		
Next year error	0.2030	0.1473	0.1269	0.1065			
Panel C: Brokerage house-level forecast accuracy							
1 (Worst)	6.03	4.68	2.67	3.84	4.40	0.2021	0.1641
2	4.77	6.13	5.13	4.29	1.68	0.1648	0.1553
3	2.48	5.39	7.42	4.96	1.65	0.1442	0.1550
4 (Best)	3.73	4.16	5.59	6.14	2.09	0.1421	0.1579
New	5.33	2.35	1.84	3.24			0.1807
Past error	0.1773	0.1495	0.1556	0.1708	0.2039		
Next year error	0.1987	0.1564	0.1414	0.1358			

The sample comprises all analysts with current fiscal-year (FY1) earnings estimates for domestic U.S. common stocks from January 1984 to October 2002 on the I/B/E/S Daily Detail Earnings Estimate History file. In each year over the sample period and for each firm covered by at least four analysts in the current year, analysts with valid outstanding estimates as of six months before the fiscal year-end are ranked on the basis of absolute forecast error for the current year and assigned a score from zero (the least accurate forecaster for the firm in that year) to one (the most accurate forecaster for the firm in that year). In Panel A, analysts are ranked by their average scores over the prior three years and placed in one of four groups from worst (lowest score) to best (highest score). Analysts are also ranked by their score over the following year and placed in one of four groups. Analysts with no forecast for the stock in the following year are placed in a separate category (non-survivors); analysts with a forecast for the stock in the following year but no forecasts over the prior three years are also placed in a separate category (new). The proportion of analysts falling in each of the categories from the intersection of the two classifications, along with the median absolute forecast error (forecast minus actual earnings per share) in each category, is calculated for each stock. The averages over years are reported in the table. In Panel B, each analyst's score is averaged across all stocks covered by the individual and the above classification procedure is applied to analysts' overall scores. In Panel C, the scores of all analysts affiliated with a given brokerage firm are averaged and the above classification procedure is applied to brokerage firms' overall scores.

a contingency table for each year in the sample period, and then the results are averaged across years. Finally, to gauge the economic difference between good and bad forecasters, we report the average over years of the median absolute forecast error for each classification.

To mitigate problems with survivorship bias, Table 2 keeps track of non-surviving analysts and new analysts as well. Accordingly, the frequencies in the table are expressed each year relative to all the analysts who are considered over the two adjacent periods: survivors, non-survivors, and new analysts. As a result, even though the classifications by accuracy are based on quartile breakpoints from then-existing analysts, the percentage of cases in each accuracy quartile is generally less than 25 percent. Even if past and future forecast performance are independent, therefore, the proportion of cases in each cell will not equal 6.25 percent ($\frac{1}{16}$). As it turns out, there is high turnover in analyst coverage, so as a result the frequencies in the body of the table are on the whole much lower than 6.25 percent. In Panel A, for example, about 33 percent of the estimates are from new forecasters in the second year, while about 31 percent are issued by non-survivors.[5]

At the level of a firm (Panel A), there is some tendency for forecast accuracy to persist but the evidence is not eye-catching. For example, on average 2.37 percent of all forecasters fall in the top accuracy quartile in the past as well as in the next year. The proportion of forecasters who are ranked in the top quartile in the past, but who fall in the bottom quartile in the next year, is somewhat lower (2.09 percent). Alternatively, conditional on falling in the highest quartile over the past, 14 percent of the cases remain in the top quartile in the following year compared to 12 percent who drop to the bottom quartile subsequently.[6] Similarly, forecasters who are lowest-ranked based on their past score and who continue to have the lowest accuracy next year make up 2.20 percent of all cases (or 13 percent of the bottom quartile by past score), compared to a smaller proportion (1.91 percent of all cases, or 11 percent of the bottom quartile) who are lowest-ranked based on past accuracy, but are highest-ranked in the following year.

There is somewhat stronger evidence of persistence when forecasting performance is evaluated across all the stocks an analyst covers (Panel B). For example, the highest-ranked analysts in the past who are also highest-ranked in the following year represent 4.17 percent of all eligible analysts, or 21 percent of the prior top quartile. A smaller percentage, 3.22 percent of all cases (16 percent of the prior top quartile), denotes analysts who are ranked highest in the past but are then ranked lowest in the future. In other words, an analyst in the top quartile is 1.3 times more likely to stay in the top group than to fall to the bottom group.

Similarly the proportion of repeat inferior forecasters (who are lowest-ranked in both years) indicates that there is consistency in forecast performance. Of the least accurate forecasters over the prior period, 30 percent repeat their poor performance in the next year while only 21 percent improve and reach the top quartile, so they are 1.4 times more likely to stay in the bottom group than to rise to the top.

Panel B also highlights the amount of turnover in the analyst community. The proportion of non-survivors out of all eligible analysts averages about 18 percent, while new entrants make up another 20 percent.[7] Forecasters who leave the sample tend to have unimpressive past forecast performance. Of the non-survivors, the largest fraction (6.43 percent of all cases, or about 36 percent of non-survivors) falls in the lowest quartile by past forecast accuracy. Our evidence that poor forecasting performance can adversely affect an analyst's career is consistent with the findings in Hong and Kubik (2003). New entrants, on the other hand, tend to be

more evenly represented in both the worst and best categories.

The statistical evidence of repeated performance in forecast accuracy does not translate into economically meaningful differences. Based on past accuracy, the highest-ranked forecasters on average generate a median absolute forecast error of 12.66 cents, compared to an absolute error of 20.14 cents for the lowestranked forecasters. In the subsequent year, however, the two groups are almost equivalent in terms of their median absolute errors (14.51 cents for the top quartile versus 14.87 cents for the bottom quartile).

Aggregating the results up to the level of brokerage firms (Panel C) yields stronger statistical evidence of persistence in forecast accuracy. Of the brokerage houses which are ranked in the top quartile by past accuracy, 28 percent maintain their ranking in the following year, while 17 percent fall to the bottom quartile in the future. Looking at brokerage firms in the bottom quartile in the previous period, 28 percent also continue to be ranked lowest, and 18 percent move to the top quartile, subsequently.

In summary, when we look at "portfolios" of earnings estimates, either for an individual analyst or for a brokerage firm, there is evidence of repeated performance in forecast accuracy. However, it is much harder to pick out discernible differences in the magnitude of the forecast errors across good and bad forecasters.

2.3 Regression results

Our comparison of analysts' forecast accuracy is based on their estimates as of six months before the end of the stock's fiscal year. These forecasts are outstanding for different amounts of time, however, so some forecasts are comparatively stale. While we exclude forecasts that are older than 100 days, differences in the timeliness of forecasts may affect judgments about forecasters' accuracy.

Beyond adjusting forecasts for their timeliness, we also use other attributes to help single out forecasts that are potentially more accurate. In this section, we collect these variables into a regression model to identify *ex ante* superior forecasters.

The model relates the accuracy score, either at the firm-level, analyst-level, or brokerage-level, over the subsequent year to the following variables. To see if past forecast accuracy carries over into the future, we use the average accuracy score over the previous three years (if the record of forecasts does not extend back this far we average over as many of the past years as are available). As a control for forecast timeliness we include the age (in days) of the forecast relative to six months before the fiscal year-end.

We conjecture that future forecast accuracy is also related to several other, currently observable, attributes. The first set of attributes relates to the brokerage firm that employs the analyst. Analysts with large brokerage firms may have better access to firm managers, and more resources to collect information about firms. To capture these effects we use the size of the brokerage firm that employs the analyst, as measured by the number of analysts in the current year that are affiliated with the brokerage firm. Specifically we use two dummy variables. The first dummy variable takes the value of one if the forecast is issued by a large brokerage firm (with at least 50 affiliated analysts in the current year) and zero otherwise; the second dummy variable takes the value of one if the forecast is issued by a small brokerage firm (with at most 5 affiliated analysts in the current year) and zero otherwise.

A second set of attributes is related to the analyst's expertise level and specialization. More experienced, and more specialized, analysts presumably should be able to produce more accurate forecasts.

The analyst's expertise is proxied by experience level, measured by overall business experience (the number of years the analyst appears on the I/B/E/S file) and number of years' experience forecasting the particular firm. Specialization is measured as the number of distinct firms covered by the analyst in the current year, as well as the number of distinct 2-digit SIC code industries followed by the analyst in the current year. Being chosen for All-Star status by an industry publication may also indicate that the investment community believes that the individual is an expert forecaster. To see whether this is the case we include a dummy variable that is equal to one if the forecast is issued by an All-Star analyst (based on either the *Institutional Investor* or *Wall Street Journal* surveys) in the current year and zero otherwise. Finally, recent policy reforms posit that brokerage firms with no investment banking business are more likely to be free from conflicts of interest with potential client firms.[8] As a result analysts affiliated with independent organizations may be more impartial predictors of stock performance and come up with forecasts that are less biased. Their lack of bias, however, may come at some cost because their forecasts may be less accurate. The independent firms tend to be smaller companies with fewer resources at their disposal. Hence they may not be as successful in attracting forecasting talent as the larger and more prestigious investment banks. Further they may not have the same access to firm management. To provide some evidence on these issues we include a dummy variable for forecasts issued by independent firms. We generate a list of independent firms by consulting trade publications and industry sources.

The regression model is estimated each year, and coefficient estimates are averaged over years. While each annual regression is based on all stocks with analyst coverage that year, our concern is whether differences across analysts who cover the same stock are associated with differences in accuracy. Hence, to preserve the comparability across stocks of these differences in analyst characteristics, we standardize the analyst attributes as follows. For each stock in a given year, we calculate the mean values of forecast age, firm and industry coverage, business and firm experience, across all analysts covering the stock. Each individual forecaster's attribute is then measured relative to the corresponding average for the stock in that year. The results from the regression are reported in Table 3. The *t*-statistics of the mean coefficients are calculated relative to the time-series standard deviations of the coefficients. Also reported is the time-series average of the adjusted *R*-squared values.

If there is no consistency in forecast accuracy the intercept should not be very different from the unconditional mean score (0.5) and the slope coefficient for past accuracy should be close to zero. In Panel A of Table 3 the regression of next year's score on average past three-year score (model 1) produces an intercept of 0.4806 and a small positive slope coefficient (0.0388) that is more than two standard errors from zero. Nonetheless the explanatory power of past accuracy by itself for next-year accuracy is low: the average *R*-squared is very close to zero. Forecast age is an important determinant of accuracy, with staler estimates lowering forecast accuracy. Introducing just this variable into the regression (model 2) raises the adjusted *R*-squared to 1.7 percent.

Of the remaining attributes in Panel A the dummy for large brokerage firm has a large coefficient that is significant in all the regressions. Everything else constant, the forecasts issued by large brokerage firms have a higher accuracy score (by about 4 percent) than the forecasts of small brokerage firms. On the other hand, the evidence does not indicate that independent brokers are more accurate forecasters. The indicator variable for independent brokers has a large negative, and statistically significant, coefficient. Analyst specialization and experience generally have weak effects on accuracy next year.

Table 3 Consistency in forecast performance: regression results.

Model	Intercept	Past 3-year score	Forecast age	Large brokerage	Small brokerage	No. of firms covered	No. of industries covered	Business experience	Firm experience	Independent brokerage	All-Star status	Adjusted R^2
Panel A: Firm-level forecast accuracy												
1	0.4806	0.0388										0.0019
	(201.5)	(8.21)										
2	0.4800	0.0383	−0.0018									0.0170
	(203.3)	(8.14)	(−11.24)									
3	0.4725	0.0373		0.0221	−0.0192							0.0039
	(206.4)	(7.96)		(8.61)	(−2.04)							
4	0.4746	0.0347	−0.0019	0.0207	−0.0097	−0.0002	−0.0031	0.0013	0.0017	−0.0373		0.0226
	(202.7)	(7.61)	(−11.42)	(9.07)	(−1.05)	(−1.20)	(−5.72)	(1.32)	(2.25)	(−4.59)		
5	0.4762	0.0321	−0.0022	0.0153	−0.0195	−0.0003	−0.0032	0.0008	0.0006	−0.0559	0.0104	0.0277
	(142.4)	(5.02)	(−9.13)	(5.40)	(−2.42)	(−1.45)	(−6.23)	(1.92)	(0.64)	(−6.75)	(2.52)	
6	0.4762	0.0294	−0.0022	0.0170	−0.0197	−0.0003	−0.0031	0.0007	0.0006	−0.0485	0.0115	0.0274
	(129.8)	(4.40)	(−8.45)	(6.02)	(−2.19)	(−1.55)	(−5.54)	(1.53)	(0.56)	(−8.02)	(1.69)	
7	0.4745	0.0345	−0.0019	0.0208	−0.0099	−0.0002	−0.0030	0.0013	0.0017	−0.0372	0.0014	0.0228
	(201.8)	(7.65)	(−11.42)	(9.18)	(−1.09)	(−1.14)	(−5.72)	(1.31)	(2.25)	(−4.60)	(0.27)	

Table 3 (*Continued*)

Model	Intercept	Past 3-year score	Forecast age	Large brokerage	Small brokerage	No. of firms covered	No. of industries covered	Business experience	Firm experience	Independent brokerage	All-Star status	Adjusted R^2
Panel B: Analyst-level forecast accuracy												
8	0.4559	0.0620	−0.0039	0.0319	−0.0486	−0.0006	−0.0046	0.0014		−0.0949	0.0259	0.0538
	(74.6)	(5.35)	(−12.27)	(8.94)	(−4.09)	(−1.43)	(−3.64)	(1.73)		(−12.68)	(3.53)	
9	0.4577	0.0553	−0.0038	0.0342	−0.0441	−0.0006	−0.0050	0.0015		−0.0914	0.0189	0.0503
	(71.4)	(5.26)	(−11.29)	(9.80)	(−3.62)	(−1.37)	(−3.76)	(1.52)		(−11.78)	(3.68)	
10	0.4493	0.0817	−0.0035	0.0351	−0.0375	−0.0002	−0.0038	0.0031		−0.0774	−0.0154	0.0494
	(83.8)	(7.45)	(−15.29)	(13.26)	(−2.78)	(−0.85)	(−4.09)	(1.69)		(−9.90)	(−2.17)	
Panel C: Brokerage firm-level forecast accuracy												
11	0.4550	0.1136	−0.0052	0.0736	−0.0430	−0.0005	−0.0081	0.0144		−0.0662		0.1201
	(35.0)	(4.72)	(−9.26)	(7.83)	(−2.67)	(−0.35)	(−2.15)	(4.65)		(−2.51)		

The sample comprises all analysts with current fiscal-year (FY1) earnings estimates for domestic U.S. common stocks from January 1984 to October 2002 on the I/B/E/S Daily Detail Earnings Estimate History file. In each year over the sample period and for each firm covered by at least four analysts in the current year, analysts with valid outstanding estimates as of six months before the fiscal year-end are ranked on the basis of absolute forecast error for the current year and assigned a score from zero (the least accurate forecaster for the firm in that year) to one (the most accurate forecaster). In Panel A, analyst *i*'s score for stock *j* in year *t* is regressed on: analyst *i*'s average score for stock *j* over the prior three years; the number of days analyst *i*'s forecast has been outstanding as of six months before the stock's fiscal year-end, measured relative to the average number of days all forecasts for stock *j* have been outstanding in year *t*; dummy variables representing whether analyst *i* is affiliated with a large brokerage firm (which has at least 50 analysts) or with a small brokerage firm (which has 5 or fewer analysts); the number of stocks covered by analyst *i* relative to the average number of firms covered by all analysts with outstanding forecasts for stock *j*; the number of two-digit SIC code industries covered by analyst *i* relative to the average number of industries covered by all analysts with outstanding forecasts for stock *j*; the number of prior years in which analyst *i* has outstanding I/B/E/S forecasts for any stock; the number of prior years in which analyst *i* has outstanding forecasts for stock *j*; a dummy variable representing whether analyst *i* is affiliated with an independent brokerage firm with no investment banking business; and a dummy variable representing whether in the prior year analyst *i* has been awarded All-Star status either on the *Institutional Investor* list (model 8) or *Wall Street Journal* ranking (model 9), or has been ranked in the top decile based on average score over all stocks covered (model 10). Values for forecast age are Winsorized at the 95th percentile; values for firm and industry coverage are Winsorized at the 1st and 99th percentiles. In Panel B the regression is fit to analysts' current-year scores averaged across all stocks covered by the individual with prior three-year score and forecast age averaged across all stocks covered. In Panel C the regression is fit to current-year scores averaged across all analysts affiliated with a given brokerage firm, using prior three-year score, forecast age, firm and industry coverage, business and firm experience averaged across all the brokerage firm's analysts. In each case the regression is estimated each year and the time-series average coefficient, *t*-statistic based on the time-series standard deviation of the coefficients, and average adjusted *R*-squared, are reported.

Models (5)–(7) in Panel A differ with respect to where we cull the list of All-Star analysts. In model 5, the indicator variable for All-Star status uses the list of analysts chosen by *Institutional Investor*, while model 6 uses the group of analysts chosen by *The Wall Street Journal*. For the sake of comparison in model 7, we select our own group of star analysts, comprising those who rank in the top decile by accuracy score in the current year. The results suggest that analysts selected for the *Institutional Investor* and *Wall Street Journal* lists have slightly higher average accuracy scores (by about one percent).

The results when accuracy scores are averaged over the stocks covered by an analyst (Panel B), and when they are combined over analysts at the same brokerage firm (Panel C) reinforce the above findings. At the level of individual analysts, past accuracy is reliably associated with next-year accuracy, with a coefficient between 0.06 and 0.08. Less timely estimates, analysts affiliated with smaller brokerage firms, as well as analysts who cover more industries, tend to be less accurate. On the other hand, analysts at larger brokerage firms are generally more accurate.

To illustrate the overall impact on forecast performance we apply the average coefficient estimates in model (8) to an analyst who is not a star analyst, but who ranks at the 75th percentile in terms of past three-year average score, with a relatively timely forecast (at the 25th percentile in terms of the distribution of forecast age), is affiliated with a large brokerage firm, and with a relatively narrow focus in terms of industry coverage (ranks at the 25th percentile of number of industries covered). All other values of the explanatory variables are set to their median values. This analyst has an average accuracy score of 0.57. In comparison an analyst who ranks at the 25th percentile in terms of past accuracy score, has a relatively stale forecast (at the 75th percentile of the distribution of forecast age), is affiliated with a small brokerage firm, and with a relatively broad industry coverage (at the 75th percentile of the distribution of number of industries covered) has an average accuracy score of 0.40. The difference between the fitted accuracy scores of the two hypothetical analysts is thus about 17 percent.

Another robust result is that All-Star analysts seem to bring some special talents to the task, after controlling for other attributes. The *Institutional Investor* star analysts (model 8) produce an accuracy score in the next year that averages 2.59 percent higher than other analysts, even when other attributes are taken into account. The improvement on the part of *Wall Street Journal* star analysts in model (9) is also notable (1.89 percent on average). These rankings appear to add information beyond accuracy in the current year: when we consider only analysts with current-year accuracy scores in the top decile (model 10), their score next year drops on average by 1.54 percent.[9]

When forecast performance is averaged over analysts within a brokerage firm (Panel C), the explanatory power of the regression model improves: the average R-squared rises to 12 percent. In particular, large brokers have an edge of 7.36 percent with respect to average accuracy scores, while small brokers rank lower on accuracy by 4.30 percent, yielding a difference of about 12 percent between the two groups. However, organizations that are not affiliated with investment banking business suffer with respect to accuracy. Their average scores are lower than other brokerage firms by 6.62 percent. Hence, while independent brokers' estimates are less biased (see Chan *et al.*, 2007), Table 3 indicates that their forecasts are less accurate. Independent brokers' estimates thus do not offer an unambiguous advantage over the forecasts from their competitors who have ties to investment banking. Possibly independent brokers lack the ample resources and the close contact with firm managers that investment banking firms can

command, and as a result their forecast accuracy suffers.

3 Who are the better forecasters?

The regressions from the previous section suggest that two groups may merit singling out as potentially more accurate forecasters: large brokerage firms, and All-Star analysts. In this section, we flesh out this finding, and explore further the gains in accuracy from following forecasts by each of these two groups.

3.1 Do large brokerage firms issue better forecasts?

Within the securities industry a number of firms tend to be regarded as highly prestigious and receive the bulk of attention from businesses and the media. Perhaps not coincidentally, the high-prestige brokerage firms also employ large numbers of analysts, many of whom have high profiles and high salaries.

Table 4 investigates whether brokerage firms differ with respect to their accuracy in forecasting earnings. The table provides results for brokerage firms broken out by size (number of affiliated analysts), and for independent brokerage firms. The results by brokerage firm size are reported for four groups of brokerage firms: the three largest brokerage firms in each year (denoted Top 3 in the table); all large brokers (with more than 50 affiliated analysts), small broker firms (with fewer than five analysts), and the intermediate category (mid-sized broker firms). Panel A of the table reports the count of cases (number of brokerage firms as well as the number of estimates, analysts and firms covered) in each classification. Panel B provides statistics on the forecast performance of analysts affiliated with the brokerage houses in each classification, pooled over all firm-year estimates.

Over the 1985–2002 period 46 brokerage houses are classified as large (with at least 50 affiliated analysts). These large brokerage houses are associated with 4792 distinct analysts who produce 112,927 estimates covering a total of 5847 distinct stocks. The brokerage houses that are among the three largest in any year account for a disproportionate share of the estimates. Notably, the 3 largest brokerage firms each year are highly visible financial giants. In 2002, for example, this group comprises Merrill Lynch, Salomon Smith Barney, and Goldman Sachs. They generate almost 26 percent of the forecasts made by large brokerages, and employ almost one in three of the affiliated analysts. In comparison, although there are 558 small brokerage houses (with fewer than 5 analysts) their forecasts number only 14,453 or about 13 percent of the large brokerage houses' estimates. Small brokerage houses tilt their coverage toward smaller firms with lower earnings per share.

Six months before the fiscal year-end, all categories of brokerage firms issue estimates that are on average optimistic. The median forecast errors (earnings estimates minus actual earnings per share) are all positive, ranging from 2.5 cents for large brokers to 3 cents for mid-sized brokers. Average errors are even higher at about 13 cents per share. While they all tend to err in the same direction, some brokerage firms' forecasts turn out to be more accurate. In particular, large brokers turn in higher accuracy scores than small brokerage houses. For example, the mean score for large brokers is 0.5151 compared to small brokers' mean score of 0.4623. Similarly the mean absolute percent error is 26.39 percent for large brokerage houses, which is lower than the mean absolute error for small brokers (28.39 percent). Within the group of large brokerage firms, the top three exhibit somewhat higher accuracy: their mean score is 0.5266 and their mean absolute percent error is 25.94 percent (compared to 0.5151 and 26.39 percent for all large brokers).

Table 4 Forecast accuracy results for brokerage firms.

Panel A: Characteristics of sample

Sample classification	Number of brokerages	Number of forecasts	Number of analysts	Number of firms	For firms covered	
					Average size decile rank	Median EPS ($)
Top 3 brokerage firms	8	29166	1562	3943	7.1	1.06
Large brokerage firms	46	112927	4792	5847	7.1	1.02
Mid-sized brokerage firms	314	131671	5874	6429	6.5	0.86
Small brokerage firms	558	14453	966	3454	6.2	0.97
Independent brokerage firms	9	14217	464	2133	7.9	1.20

Panel B: Forecast performance

Sample classification	Accuracy score		Absolute percent error		Percent error		Absolute error		Error	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Top 3 brokerage firms	0.5266	0.5238	25.94	10.94	16.74	2.37	0.2672	0.1334	0.1310	0.0287
Large brokerage firms	0.5151	0.5000	26.39	11.20	16.89	2.30	0.2699	0.1375	0.1316	0.0250
Mid-sized brokerage firms	0.4959	0.5000	28.29	11.90	19.28	3.23	0.2561	0.1200	0.1376	0.0300
Small brokerage firms	0.4623	0.4545	28.39	12.42	18.09	2.68	0.2667	0.1400	0.1276	0.0285
Independent brokerage firms	0.4505	0.4231	26.38	11.11	17.55	2.69	0.2881	0.1500	0.1452	0.0313

The sample comprises all analysts with current fiscal-year (FY1) earnings estimates for domestic U.S. common stocks from January 1984 to October 2002 on the I/B/E/S Daily Detail Earnings Estimate History file. In each year over the sample period and for each firm covered by at least four analysts in the current year, analysts with valid outstanding estimates as of six months before the fiscal year-end are ranked on the basis of absolute forecast error for the current year and assigned a score from zero (the least accurate forecaster for the firm in that year) to one (the most accurate forecaster for the firm in that year). Results are provided for brokerage firms classified by size (number of affiliated analysts): the top three brokerage firms in each year; large brokerage firms with more than 50 analysts; mid-sized brokerage firms with more than 5 but fewer than 50 analysts; small brokerage firms with fewer than 5 analysts. Results are also given for a sample of independent brokerage firms with no investment banking business. Panel A reports the features of each sample classification: the number of distinct brokerage firms classified, the number of firm-year estimates, the number of distinct analysts, the number of distinct firms covered, the mean size decile rank across the firms covered (from the smallest in decile 1 to the largest in decile 10), and the median realized earnings per share (EPS) across covered firms. Panel B reports mean and median statistics across all forecasts by analysts affiliated with the brokerage firms in each classification with respect to: the accuracy score; absolute value of percentage forecast error (absolute value of the difference between forecast and actual earnings per share, divided by the absolute value of actual earnings per share); percentage forecast error (difference between forecast and actual earnings per share, divided by absolute value of actual earnings per share); absolute value of forecast error in dollars (forecast less actual); and forecast error in dollars.

The verdict on the accuracy of independent brokers is not favorable. Their average accuracy score of 0.4505 falls short of the average accuracy score of large brokers (0.5151). The mean absolute forecast error for independent brokers is 28.81 cents, which is almost two cents higher than the mean absolute error of large brokers. Similarly, the average forecast error favors large brokers by 1.36 cents.[10] Hence, while large brokers' estimates may be distorted by potential conflicts of interest, they may provide an offsetting advantage by being more accurate than independent brokers.

3.2 All-Star analysts

Each year analysts are chosen for the *Institutional Investor* (*II*) All-American Research Team by polling buy-side portfolio managers. Winning analysts are chosen on the basis of research insight, client service, the performance of their stock recommendations, and the accuracy of their earnings estimates.[11] Similarly *The Wall Street Journal* (*WSJ*), in its yearly "Best on the Street" survey, singles out analysts who excel in terms of the performance of their recommendations as well as the accuracy of their earnings forecasts. The list is published in May or June each year.

The *II* survey has some features of a popularity poll tilted toward larger, high-status brokerage firms. Nonetheless an individual's appearance on the list is a sign that at least some influential investors perceive the analyst to be an accurate forecaster (among other things). At the same time, the *WSJ* list often contains analysts from smaller and less well-known firms. Both sets of rankings, therefore, may be helpful in spotlighting superior forecasters.

Table 5 looks at whether analysts who have been chosen for star status either by *Institutional Investor* or *The Wall Street Journal* live up to their billing. Every year we cull the lists of star analysts from either publication and we track their accuracy scores over a three-year window that starts from the year preceding their selection, and ends in the year following their selection. The sample period starts from 1993 for the *Institutional Investor* list, or from 1994 for *The Wall Street Journal*, and ends in 2001 for both cases. The individuals in each list are matched up with all other analysts who issue estimates for the stocks covered by the star analysts, and their forecasting performance is then compared.

Analysts on the *II* list (Panel A) have superior accuracy scores in the year prior to their selection. Their mean score in the previous year is 0.5448, compared to 0.5075 for their counterparts covering the same stocks. These select individuals continue to have a slight edge in the selection year and the subsequent year as well. The *II* analysts' scores one year after their selection averages 0.5307 compared to 0.5031 for other analysts. In terms of their prospective forecast errors, however, the *II* analysts look less stellar. In the postselection year, the median absolute percentage forecast error is 10.12 percent and the median absolute error is 16.77 cents for the star analysts, compared to 10.88 percent and 16.55 cents for their comparison group.

The results for the *WSJ* list (Panel B) are similar. They have superior forecast accuracy in the past year and in the following year relative to their selection, but there is only a slight advantage to following their forecasts in terms of the resulting forecast errors. In the year after their selection, for example, the median absolute error for both the *WSJ* stars and their counterparts is about 18 cents.

Panel C checks whether the selection criteria used by external sources such as the *II* and *WSJ* add new information. We do this by comparing the previous results to those obtained from performing the same analysis on analysts who are ranked in the top decile each year based on our one-year forecast accuracy score. In the selection year their mean score is

Table 5 Forecast accuracy results for All-Star analysts.

Classification	Year relative to selection	Number of analysts	Experience (years)	Number of firms	Accuracy Score	Absolute percent error	Percent error	Absolute error ($)	Error ($)
Panel A: Institutional Investor All-Stars, 1993–2001									
All-Stars	One year before	64	8.7	12	0.5448	9.43	1.01	0.1702	0.0210
	Selection year	64	9.6	12	0.5330	9.88	1.78	0.1686	0.0259
	One year after	63	10.6	12	0.5307	10.12	1.33	0.1677	0.0194
Others	One year before	1466	6.4	9	0.5075	10.16	1.46	0.1705	0.0234
	Selection year	1767	6.5	8	0.5005	10.69	2.12	0.1718	0.0288
	One year after	1486	7.6	8	0.5031	10.88	2.09	0.1655	0.0256
Panel B: Wall Street Journal All-Stars, 1994–2001									
All-Stars	One year before	38	7.4	9	0.5380	9.62	1.14	0.1710	0.0267
	Selection year	42	7.7	9	0.5766	10.02	0.69	0.1694	0.0164
	One year after	42	8.6	9	0.5188	11.18	2.46	0.1808	0.0371
Others	One year before	1096	6.6	9	0.5066	10.37	1.74	0.1769	0.0297
	Selection year	1294	6.8	9	0.4975	10.17	1.24	0.1732	0.0191
	One year after	1124	7.9	9	0.5004	10.91	2.40	0.1767	0.0299
Panel C: Top decile analysts based on past 1-year score, 1985–2001									
All-Stars	One year before	153	5.3	5	0.5411	13.51	5.59	0.2349	0.0898
	Selection year	267	4.5	3	0.9503	9.51	3.25	0.1423	0.0467
	One year after	172	5.5	5	0.5188	14.17	4.84	0.2086	0.0677
Others	One year before	1480	6.4	9	0.5097	12.82	4.36	0.2391	0.0835
	Selection year	1797	6.4	8	0.4591	14.14	5.44	0.2478	0.0968
	One year after	1487	7.6	8	0.4989	13.37	4.50	0.2231	0.0744

The sample comprises all analysts with current fiscal-year (FY1) earnings for domestic U.S. common stocks from January 1984 to October 2002 on the I/B/E/S Daily Detail Earnings Estimate History file. Each year all analysts on the *Institutional Investor* All-American Research Team poll (Panel A), or *The Wall Street Journal* Best on the Street list (Panel B), are selected. Alternatively in each year over the sample period and for each firm, analysts with valid outstanding estimates as of six months before the fiscal year-end are ranked on the basis of absolute forecast error for the current year and assigned a score from zero (the least accurate forecaster for the firm in that year) to one (the most accurate forecaster for the firm in that year). Each year analysts whose accuracy scores averaged across all stocks they cover fall in the top decile are selected in Panel C. Statistics are calculated for each group in the selection year, the previous year and the following year, and the results averaged over all years in the sample period are reported. Corresponding statistics are calculated for all other analysts covering the same stocks. Results are given in each category for: the number of eligible analysts; the average number of years these analysts have outstanding forecasts recorded on the I/B/E/S file; the average number of firms covered; the average accuracy score (scaled between zero and one); the median absolute percentage forecast error (the absolute value of the difference between forecast and actual earnings per share, divided by the absolute value of actual earnings per share); the median percentage forecast error (the difference between forecast and actual earnings per share, divided by the absolute value of actual earnings per share); the median absolute value of the forecast error (in dollars per share); and the median forecast error (in dollars per share).

0.95 (by construction), with an accompanying average absolute forecast error of 14 cents. The score reverts to 0.5188 in the following year, suggesting that there is a large measurement error component in year-to-year forecast accuracy. As before, statistical accuracy does not translate into measurable improvement with respect to dollar forecast errors.

4 Conclusion

Investors and the financial media seem to believe that there are well-defined quality differentials between Wall Street research analysts. During the late 1990s, for example, a selective few analysts received the bulk of attention from the media and were elevated to near-celebrity status. Investment firms tout products that weed out superior analysts from the crowd with the hope of obtaining more informative forecasts of future earnings or profitable stock recommendations. The financial press conduct polls and trumpet lists of individuals anointed to be star analysts. These lists are widely disseminated as marketing vehicles to clients and raise the prestige of the securities firms; in turn individuals on these lists are richly compensated.

This paper examines whether these perceived quality differentials have any basis in terms of analysts' ability to forecast earnings accurately. We focus on earnings forecasts because they are a central function of research analysts. Further, since actual earnings are reported at the end of the year, it is possible to evaluate objectively the accuracy of an individual's forecast, as opposed to the accuracy of a forecast of growth or target price over an unspecified future horizon.

Our results suggest that there is some persistence in forecast accuracy on the part of analysts. The results are more reliable when we aggregate across all the firms covered by an analyst, reducing the variability in earnings forecast errors. An analyst who is ranked in the top quartile by past accuracy is, in the following year, 1.3 times more likely to remain in the top quartile than to fall to the bottom quartile. In the case of the least accurate forecasters (in the bottom quartile) by past accuracy, it is 1.4 times more likely that they will be ranked lowest in the next year compared to rising to the top quartile.

In particular, three *ex ante* observable attributes help to identify accurate forecasts. Timely estimates tend to be more accurate. Analysts affiliated with large brokerage firms tend to be more accurate than analysts associated with small brokerage firms. Further, analysts selected for All-Star status by either *Institutional Investor* or *The Wall Street Journal* provide, on average, more accurate estimates of earnings. On the other hand, analysts affiliated with independent brokerage firms that have no investment banking business suffer from low accuracy. Independent brokers are less susceptible to conflicts of interest from investment banking ties. However, they may lack the access to firm managers, and the level of resources that come with the lucrative investment banking ties to those firms.

Our sample of earnings estimates over many stocks, analysts and years provides evidence of persistence in forecast accuracy. The statistical evidence of persistence is not accompanied by material economic differences, however. The improvement in accuracy when measured in terms of the dollar difference between actual and forecasted earnings is quite small.

Notes

[1] See, for example, http://www.starmine.com and http://www.marketperform.com

[2] Random variation in forecast accuracy will induce fluctuations in analyst scores from one period to the next. In cases where only two persons follow a stock, an individual's score may thus move from one extreme to the other, exacerbating the noise and clouding further our ability to detect forecasting talent. To mitigate variation on this account, we restrict the sample to stocks that are followed by at

least three analysts. The median I/B/E/S firm is covered by about 5 analysts.

[3] Suppose stock i at date t (six months before the end of the current fiscal year) is followed by N_{it} analysts with outstanding forecasts of earnings per share for the current fiscal year. Given actual earnings per share, each analyst is associated with a forecast error, and the absolute errors are ranked from highest to lowest. If analyst j's rank on absolute forecast error for the stock at that date is $R_{ijt} = 1, \ldots, N_{it}$, the analyst's score is $\rho_{ijt} = \frac{R_{ijt}-1}{N_{ijt}-1}$.

[4] The average past score uses up to three previous years. If an analyst has fewer than three years of prior forecasts, we average over as many years as are available.

[5] The data indicate that there are few veteran analysts in the industry. The median business experience of an analyst (measured as the length of time an analyst appears in the I/B/E/S file) is about 4 years. The median length of time an analyst covers a particular stock is only two years.

[6] These percentages are calculated as $\frac{2.37}{2.09+2.20+2.27+2.37+7.89}$, and $\frac{2.09}{2.09+2.20+2.27+2.37+7.89}$, respectively.

[7] Note that the percentages reported in the text are expressed relative to the total number of surviving, non-surviving, and new analysts. Moreover, given the growth of the securities industry over most of the sample period, the number of new entrants, at least in the aggregate, has generally increased over time. As a result the stated percentages tend to understate the rate of entry relative to currently existing analysts, and the rate of exit relative to previously existing analysts.

[8] See, for example, Simon (2004), Simon and Story (2004).

[9] Note our definition of a "star" analyst in model (10) is based on accuracy in the current year only. In contrast the past accuracy score that also appears in the regressions is an average over the preceding three years. The negative coefficient on the star analyst dummy variable in model (10) may thus be picking up the effect of transitory forecast errors unrelated to analyst skill.

[10] Comparing the percentage errors, either absolute or raw, paints a somewhat more flattering picture for independent brokers. However, this reflects the generally higher level of earnings per share for the stocks covered by independent brokers.

[11] The rankings are published in the October issue of *Institutional Investor*, and further details are provided in *Institutional Investor* US Equities Market Report (2003).

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