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## **Information Content of Equity Analyst Reports**

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## Information Content of Equity Analyst Reports

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### Abstract

We catalog the complete contents of All-American Analyst reports and examine the market reaction to their release. Including the justifications supporting an analyst's opinion reduces, and in some models eliminates, the significance of earnings forecasts and recommendation revisions. Analysts both provide new information and interpret previously released information. The information in a report is most important for downgrades; target prices and the analyst's justifications are the only significant elements for reiterations. No correlation exists between valuation methodology and either analyst accuracy or the market's reaction to a report. Our adjusted  $R^2$ s are much larger than those of studies using only summary measures.

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## 1. Introduction

This paper investigates the association between market returns and the content of security analysts' reports. In addition, it provides the first detailed catalog of the elements in a typical analyst report. An analyst's report is the culmination of a process that includes the collection, evaluation, and dissemination of information related to a firm's future performance. The majority of these reports include three key summary measures: earnings forecasts, a stock recommendation - such as buy, sell, or hold - and a price target. In addition, many reports present extensive quantitative and qualitative analysis supporting these summary measures.

Most previous research on analyst reports examines revisions in only two summary elements: stock recommendations and earnings forecasts. We extend this research by incorporating the contents of analyst reports in their entirety rather than just the individual summary elements such as the stock recommendation. One problem in evaluating stock recommendations alone is that there are a limited number of recommendation levels. More specifically, although analysts have five distinct recommendations - strong buy, buy, hold, sell, and strong sell - at their disposal, they are generally reluctant to use the two negative ratings (see, e.g., Barber, Lehavy, McNichols, and Trueman, 2001; Mikhail, Walther, and Willis, 2004).<sup>1</sup> By also incorporating the gradations available in the analysts' price targets and the reports' contents, we overcome many of the disadvantages caused by the use of a few discrete recommendation categories. Our approach to this analysis is captured by the quote "In the end, stock ratings and target prices are just the skin and bones of analysts' research. The meat of such reports is in the analysis, detail, and tone" (see Tsao, 2002). This is especially true for reiterations, which represent almost two thirds of the analyst reports in our sample.

Using a database constructed from analyst reports issued by *Institutional Investor* All-American team members during 1997-1999, our analysis shows that changes in the summary earnings forecasts, stock recommendations, and price targets all provide independent information

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<sup>1</sup> An often-cited rationale for the lack of negative ratings is that an analyst's salary and bonus are linked to quantifiable measures such as his firm's underwriting fees or commissions generated by his recommendations, outcomes that may be facilitated by the issuance of favorable reports. In addition, analysts rely on company management for information and thus have a reason to maintain good relations with them. SEC Regulation FD, which requires firms to publicly disseminate all material information, presumably reduces this incentive.

to the capital markets. In particular, incorporating changes in analyst price targets dramatically increases the fit of our regression results over that obtained from earnings forecast revisions and discrete recommendations alone. We then show that other information in a report, such as the strength of the written arguments made to support an analyst's opinion, is also significant. The stronger the justifications provided in the report, the larger the market's reaction to the report. This holds for either aggregate strength of argument measures or several alternatives including independent measures for positive and negative arguments as well as many disaggregated justifications. However, our results show that while the market still reacts strongly to changes in price targets, the significance of earnings forecast and recommendation revisions is reduced and, in some models, eliminated.

After analyzing all the elements of an analyst report (i.e. earnings forecast, analyst recommendation, price target, and the justifications given), we next examine whether the market's reaction is affected by variations in firm specific characteristics, the release of contemporaneous information, or recommendation type (e.g., upgrade, reiteration, or downgrade). Consistent with other studies, the market's reaction to earnings revisions and recommendation downgrades, when considered separately, is significantly larger for small firms and for firms with less analyst following. We find a similar result for price target revisions. However, when all three summary measures and the proxy for the strength of an analyst's justifications are included simultaneously, only the reaction to price target revisions is still significantly affected by these factors.

To examine if an analyst report provides new information to the market or whether it merely reiterates or interprets information previously released, we identify any contemporaneous release of information concerning earnings, dividend changes, stock splits, changes in business expectations, equity issues, debt issues, mergers and divestitures, major management changes, credit rating changes, lawsuits and significant contract and/or product introductions. Approximately half of the analyst reports in our sample occur simultaneously with these other information releases. When we re-estimate our regressions on the sub-sample of observations that are free of confounding events, all our results are qualitatively similar. When, however, we

run the regressions on the sub-sample of firms for which a contemporaneous information release does exist, the only significant coefficients are the proxy for strength of an analyst's arguments and price target revisions. This suggests that for these reports, the analyst's role is to provide interpretation of information releases to the market.

Our analysis also shows that the market treats an analyst's report differently based on whether a report reiterates an old recommendation or provides an upgrade or downgrade. We find that the contents of an analyst's report receive the most scrutiny in the case of downgrades. The changes in a firm's price target and the strength of a report's arguments are both significant and positively correlated with the market's response. Conversely, the proxy for a relationship between a brokerage and the firm is significantly negative. This last result suggests that the market amplifies bad news when the brokerage is not independent of the firm. In the case of reiterations, the only significant coefficients are the strength of an analyst's arguments and price target changes. None of the examined factors are significant in the direction predicted for upgrades.

Finally, we examine the accuracy of price targets and the effects of the valuation methodology employed by an analyst. We consider a price target prediction to be accurate if the analyzed firm's stock price equals the 12-month projected price at any time during the year following the release of a report. Using this definition of accuracy, approximately 54% of analysts' price targets are achieved or exceeded. The remaining 46% of firms achieve an average of 84% of the price target within 12 months. The level of optimism exhibited by an analyst, as measured by the projected change in a firm's stock price, appears to be inversely related to the probability of achieving a particular target. We find no correlation between the valuation methodology used by analysts and either the market's reaction to a report's release or to their accuracy in predicting price targets. In fact, most analysts use a simple earnings multiple valuation model. Only a minority use Net Present Value or other discounted cash flow approaches favored by finance textbooks and MBA curriculums.

In Section 2 we summarize prior research. Section 3 describes the data and sample selection criteria as well as a typical analyst report. We discuss our empirical results in Section

4. Sections 5 and 6 provide results on price target accuracy and valuation methodologies. Section 7 concludes.

## **2. Prior Research**

Over the past two decades, security analysts' reports have been the subject of extensive empirical and experimental work. Early investigations are primarily related to either the market's reaction to revisions in analysts' earnings forecasts or recommendations. Most of this work shows positive (negative) abnormal returns for upward (downward) earnings forecast revisions or new buy (sell) recommendations. For example, Abdel-Khalik and Ajinkya (1982) find significant abnormal returns during the publication week of forecast revisions by Merrill Lynch analysts. Similarly, Lys and Sohn (1990) present evidence consistent with forecast revisions having information content (see also Stickel, 1991).

Research on revisions in analyst recommendations has also found a positive association between abnormal returns and the direction of a recommendation change. Lloyd-Davies and Canes (1978) indirectly examine the market reaction to security analyst recommendations by studying stock suggestions appearing in the *Wall Street Journal's* "Heard on the Street" column. They find an event day return of 0.93% (-2.37%) for new buy (sell) recommendations (see also Bjerring, Lakonishok, and Vermaelen, 1983; Elton, Gruber, and Grossman, 1986; Liu, Smith, and Syed, 1990; Beneish, 1991; Stickel, 1995). More recently, Womack (1996) uses First Call data to directly examine price reactions for stock recommendation changes to and from the most extreme buy and sell categories. He finds that stocks added to (removed from) strong buy lists earned size adjusted returns of 2.98% (-1.94%) while stocks added to (removed from) strong sell lists earned size adjusted returns of -4.69% (0.32%) in the 3-day event period surrounding the release of the recommendation revision. In most of these studies, reiterations of a previous forecast or recommendation are ignored. In our paper, by examining the content of an analyst report beyond the summary recommendation, we are able to draw conclusions about reiterations as well as revisions.

Our work is also related to more recent research investigating security returns conditional on examining both earnings forecast and recommendation revisions simultaneously. For example, Francis and Soffer (1997) find that neither earnings forecast revisions nor stock recommendations completely incorporate the information in the other signal. They also show that when a report is summarized by a favorable stock recommendation, investors rely on earnings forecast revisions to a greater extent. Stickel (1995), in addition to the summary recommendation and earnings forecast revisions, includes proxies for the magnitude of the recommendation revision, the analyst's reputation, the size of the analyst's brokerage house, and the analyzed firm's information environment. His results are consistent with those of Francis and Soffer indicating that earnings forecast revisions are informative even in the presence of a summary recommendation. He also finds that company size and analyst reputation affect returns for buy recommendations, while the magnitude of the recommendation revision and brokerage size affect returns for sell recommendations. Although the Francis and Soffer and Stickel studies include a broad cross-section of potential factors that contribute to the market's reaction to a new recommendation, they do not consider price targets or the content of the reports and the adjusted  $R^2$ s for their models are low. The adjusted  $R^2$  for Stickel's study is 1% for his buy regression and 2% for his sell regression, suggesting that important pieces of the puzzle are missing. Francis and Soffer get an adjusted  $R^2$  of 5% for their cross-sectional model.

Our research on analyst reports is contemporaneous with recent research incorporating price targets as a source of information. Bradshaw (2002) documents, using a sample of 103 analyst reports, that target prices are reported more frequently in favorable reports. Bradshaw and Brown (2002), using a large sample of firms, find that price targets are realized a majority of the time and that individual analysts differ in their accuracy. Brav and Lehavy (2003) reexamine Francis and Soffer's question of simultaneous information by adding price targets to earnings forecasts and recommendation levels. Using a large database of price targets, they find a significant market reaction to price targets both unconditionally and conditional on simultaneous recommendation and earnings forecast revisions. They then regress the three variables on the

market's reaction and find adjusted  $R^2$ s of almost 8%, well above the 5% found by Francis and Soffer.

Finally, our work is related to Previts, Bricker, Robinson, and Young (1994) and Hirst, Koonce, and Simko (1995) who consider the written content of a report. Previts et al use word recognition software to examine the terminology used in analyst reports, but do not perform any statistical analysis on either the content of the reports or on the market's reaction to the reports. Hirst et al use an experimental setting to investigate how potential investors assess the information contained in security analysts' reports. They assume two levels of strength of argument (strong or weak), two levels of recommendation (favorable or unfavorable) and two sources of the report (independent brokerage or analyzed firm's investment bank). They find that when a report is unfavorable the strength of the arguments contained in an analyst's report affects investors' judgments. This result conflicts with Francis and Soffer (1997) who find that investors are more likely to rely on other information in cases of good news reports. Furthermore, Hirst et al report that experimental investors react more strongly to negative reports from analysts who lack independence. The effects associated with a lack of independence are similar to those found in Michaely and Womack (1999), which documents that the mean excess returns around a buy recommendation revision are lower when the recommendation is made by an underwriter rather than by an unaffiliated brokerage.

This paper differs from other recent work, such as Brav and Lehavy (2003) and Bradshaw (2002), in that we examine the complete text of a large sample of actual analyst reports and our analysis provides information beyond earnings forecasts, recommendations, and price targets. We demonstrate that other information, such as the strength of the analyst's justifications, is also important and when considered simultaneously reduces, and in some models eliminates, the significance of the information available in earnings forecasts and recommendation revisions. By controlling for the simultaneous release of other information, we show that analyst reports do not merely repeat other firm releases of information, but also provide new and independent analysis to the market. By examining whether the market's reaction differs by report type (i.e. upgrade, reiteration, or downgrade), we demonstrate that



information in a report is more important for downgrades than for upgrades. Furthermore, the only elements that matter for reiterations are target prices and the strength of the arguments. Finally, our  $R^2$  of nearly 26% is three or four times larger than that of other studies using only partial content from analyst reports.

### **3. Sample Selection and Data Description**

#### *3.1. Sample selection*

Our analysis uses a total of 1,126 complete analysts' reports written by 56 unique sell-side analysts from 11 different investment banks covering 46 industries as provided by the Investext database. Investext features current research reports from more than 630 investment banks, brokerage houses, and research firms worldwide including, but not limited to, Credit Suisse First Boston, Lehman Brothers, Merrill Lynch, Morgan Stanley Dean Witter, and Salomon Smith Barney. Each report was read in its entirety and coded by hand for 30 separate data fields.

There are a number of financial databases that catalog and summarize earnings forecasts and analyst recommendations (e.g., Zacks Investment Research and I/B/E/S). To the best of our knowledge, however, there are currently no databases that provide similarly compiled information that includes analyst price targets and other information, such as valuation methodologies or justifications for recommendations made, typically found in an analyst report. The only way to collect this information is to read individual analyst reports and hand code the contents. To generate our sample, we select equity analyst reports that were written in 1997, 1998, or 1999 by a member of *Institutional Investor's* All-America Research Team. To qualify for inclusion in the sample, an analyst must have achieved at least one "First Team" ranking. We chose these analysts because they have been independently recognized as top analysts in their given industries. Furthermore, prior research finds that All-America Research Team members supply more accurate earnings forecasts than other analysts (e.g., Stickel, 1992) and their recommendation revisions result in a stronger stock market reaction than that observed for a typical analyst (see Stickel, 1995).

During our sample period, the number of analysts receiving top honors in the *Institutional Investor* survey each year ranged from 76 to 84. However, since many analysts were multiple year winners, only 153 unique analysts are represented in our sample. In addition to being written by a recent All-America Research Team member, the report must also be available through both the Zacks Investment Research (Zacks) and Investext Databases. When we began our initial analysis, Investext did not allow users to search reports by analyst. As a result, we used Zacks to generate a list of reports written by our sample of analysts.<sup>2</sup> Zacks identified approximately 7,100 reports that met our year and analyst criteria. These analyst reports consisted of both company and industry reports.<sup>3</sup> All of these analyst reports were then cross-referenced in the Investext database using company and brokerage identifiers as well as report dates obtained from Zacks.

In our matching, 21 analysts could not be included in our sample because the investment firms that employ them do not provide reports to Investext (e.g., Goldman Sachs). We realize that this introduces a potential bias into our sample, as only firms willing to make their reports publicly available are included within our sample. Moreover, five of the 99 industries for which Institutional Investor issues a ranking, Accounting and Tax Policy, Convertibles, Equity Derivatives, Multi-Industry, and Quantitative Research, do not require that analysts follow any specifically identified firms. We excluded these categories, which represented seven additional analysts, from our sample. In total, we omit 28 analysts from our All-America Research Team sample, leaving 125 unique analysts.

Unfortunately, the Investext database is less complete than Zacks and we were only able to find a subset of the Zacks reports.<sup>4</sup> More specifically, Investext contains fewer analysts and does not contain as many reports by the analysts it does list. Of the analyst reports listed in

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<sup>2</sup> Investext has since released a newer version that provides more search options including a category for report author.

<sup>3</sup> We omit industry reports from our sample since these reports do not usually contain new company specific information but rather serve as a summary across firms. Furthermore, if an analyst reports new information about a company and/or changes his recommendations in an industry report, he usually issues a concurrent company report as well.

<sup>4</sup> Zacks also appears to be incomplete. Investext contains some reports by particular analysts that were not identified in our search of Zacks. In both Investext and Zacks, coverage significantly improves in the latter part of our sample period.

Zacks, the percentages found in Investext were less than 13.1%, 12.4%, and 50.3% in 1997, 1998, and 1999 respectively. Our final sample includes 1,126 reports consisting of 262 upgrades, 739 reiterations, and 125 downgrades, written by 56 analysts.

Having identified our sample, the primary challenge remaining was determining the correct announcement date for each report. Firms often release key information contained in the analyst report before the actual report is dated and made available. As a consequence, the announcement dates given by many analyst databases, including Zacks, often differ from the date given on the report. In our sample, 58.6% of all report dates matched the announcement date exactly, leaving 41.4% of the analyst reports dated differently from the Zacks dates. Of the reports where dates differed, 92% of the time the report date fell after the corresponding Zacks date.

Obtaining the correct date is clearly important, given that our analysis involves examining the market reaction to information releases from the reports. We explored various sources of news releases including Dow Jones and Lexis-Nexus, as well as finance websites such as Yahoo, to determine the correct information announcement date for a random sample of 50 reports. We found that Zacks was particularly accurate in reporting recommendation release dates and thus we used its dates as our announcement dates whenever possible.

### *3.2. Typical analyst report*

Table 1, Panels A and B, presents summary statistics on average values and frequency of reporting for several of the data fields that we collect from each analyst report. All reports contain a summary stock recommendation and our table is organized by recommendation category, such as upgrade to strong buy or downgrade to hold, as well as by the combined categories all upgrades, all reiterations, or all downgrades, and a total sample column.<sup>5</sup> The majority of the reports also include summary earnings forecasts and price targets. Additional data included in each report in support of the authoring analyst's forecasts and opinions are also

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<sup>5</sup> An analyst's report generally indicates whether its recommendation is an upgrade, downgrade or reiteration. In cases where the previous recommendation is indeterminate, we use the previous recommendation as conveyed by Zacks to classify the report.

presented in Table 1. These include the prevalence of accounting statement forecasts and segment data analyses, data regarding relationships between the analyst's brokerage and the firm, data regarding the valuation methods employed, and the analyst's qualitative justifications of his or her recommendation.

Consistent with other studies and recent press reports, we find that analysts rarely issue sell or strong sell recommendations. Line 2 of Table 1, Panel A, shows that only 0.5% of the recommendations in our sample fall into these two categories. In contrast, 30.8% of the recommendations are classified as strong buy, 40.0% as buy, and 28.7% as hold. We also find that the majority of reports issued across all recommendations are reiterations. The last three columns before the Total column in Table 1, Panel A, show that upgrades, downgrades, and reiterations represent 23.3%, 11.1%, and 65.5% of our sample, respectively.

One hundred percent of our reports contain a summary stock recommendation and almost all reports also provide EPS forecasts; 99.1% for the current fiscal year and 95.3% for at least one subsequent year. Only 22.7% of our analyst reports contain forecasts beyond one year. There is no notable difference in the percentage of reports that contain one-year earnings forecasts across recommendation types. At 89.6%, the downgrade to hold recommendations are the only category of subsequent year forecasts to fall below 90%.

Price targets, which are the analyst's price forecasts, are only present in 72.6% of analysts' reports. They are given as either a point estimate or a range that the stock price is expected to achieve within the next 12 months. Price targets, while not as common as recommendations or earnings forecasts in the total sample, are even less frequent for unfavorable reports. In our sample, while over 90% of all strong buy or buy recommendations include price targets, only 11.1% of hold reiterations and 50.6% of hold downgrades include these projections. Overall, 95.8% of upgrades, 65.5% of reiterations, and 65.6% of downgrades include price forecasts. It appears that analysts' reluctance to issue negative information via downgrades extends to price targets as well, although not as strongly. In fact, 62.8% of downgrades that do not include a price target in the current report had one in the prior report. In light of recent events, some investment banks are specifically requiring their analyst to disclose price targets in

reports with a positive recommendation (e.g., Merrill Lynch). In addition, these banks are including a stock chart indicating the points at which they changed their recommendations or price targets.

The projected stock price increase, i.e. the percentage the price target is above the current price, varies systematically across recommendation categories. For example, the third line under the category Price Targets in Table 1, Panel A, shows that the average projected increase over the current stock price for an upgrade to strong buy or buy are 34.6% and 22.6%, respectively. Interestingly, reiterations have even higher stock price increases than upgrades for each recommendation category. For the entire sample, reiterations project an average 36.6% increase while upgrades project a 28.9% average increase. Price targets below current market price are fairly uncommon. Even in unfavorable reports such as a downgrade to hold, the average projected increase is a positive 5.5%.

In addition to price targets and earnings forecasts, we compile information on income statements, balance sheets, statements of cash flow, and segment forecasts. Based on our sample, financial statement forecasts are not disclosed as frequently as earnings or price forecasts. Of the reports in our sample, 28.5% contain income statement forecasts, 5.1% contain balance sheet forecasts, and 17.1% contain statement of cash flow forecasts. Although the percentages of upgrade and downgrade reports that contain income statement forecasts are similar (46.6% and 40.0%, respectively), these percentages are much higher than those of reiterated reports, which contain these forecasts only 20.1% of the time. Similar patterns exist for balance sheet and cash flow forecasts. Very few analyst reports contain geographic (3.6%), product (4.2%), or segment information (10.0%).

We also collect information on existing relationships between the company and the investment bank writing the report. Analysts are required to provide this information as a disclaimer in their report. Of the firms examined, 52.6% have an underwriting relationship with the analyst's brokerage. The underwriting relationship is similar across both upgrades and reiterations at 53%. Downgrades are only slightly less frequent with an underwriting relationship in 46.4% of the cases examined. Differences in current holdings are more varied.

Investment banks have holdings in 84.2% of the firms analyzed. Holdings of company stock exist in 68.2%, 63.2% and 93.4% of upgrades, downgrades and reiterations, respectively.

Next, we document the valuation methods used by the analysts in Table 1, Panel A, under the category Valuation Models. We find that 99.1% of analysts mention they use some sort of earnings multiple (e.g., a price to earnings ratio, EBITDA multiple, or a relative price to earnings ratio). Only 12.8% of analysts report using any variation of discounted cash flow in computing their price targets. Notably, the discounted cash flow method is much more prevalent in downgraded reports, 20.8% compared to 13.7% and 11.1% in upgrades and reiterations, respectively. Valuation models based on asset multiples are used in 25.1% of all reports and 22.9%, 27.6% and 15.2% of upgrades, reiterations and downgrades, respectively. Very few analysts use alternative valuation methodologies. Other valuation methods not falling into one of the three categories discussed above are observed in less than 3.5% of our sample. We include PEG (PE to growth) under alternative valuation methodologies since only seven of the 1126 analyst reports in our sample use them. All analysts who mention a valuation method use an earnings multiple. That is, the 0.9% that do not mention an earnings multiple do not mention any valuation method.

Finally, Table 1, Panel B, catalogs the analyst's qualitative justifications of his or her recommendation. Positive and negative remarks are recorded for fourteen specific criteria: revenue growth, earnings growth, new product introductions, new projects, cost efficiencies, expectations met, mergers and acquisitions, repurchase programs, industry climate, management, international operations, leverage, competition, and risk. Only 3% of our sample reports (i.e. 34) do not contain some justification of the recommendations.

### 3.3. *Model variables*

Our empirical analyses require us to calculate several variables not directly provided in the analyst reports we examine (see Table 1, Panel C). The first model variable we compute is the percentage change in an analyst's earnings forecast for a firm (EARN\_REV). This is the new earnings forecast divided by the old earnings forecast minus 1. Since the current report does

not usually contain the previous earnings forecast, we collect previous earnings forecasts from Investext, using the report immediately preceding the one in our sample. We obtain previous earnings forecasts for 1,029 reports, 91.4% of our sample. We find average earnings forecast changes of 4.1% and 4.0% for strong buy and buy upgrades, respectively. In contrast, unfavorable reports such as a downgrade to buy or hold generally experience reductions in forecasted earnings. Downgrades to buy result in an average reduction in earnings forecasts of 7.3%, while downgrades to hold experience a reduction of 4.5%. Overall, upgrades, downgrades, and reiterations experience earnings forecast changes of 4.1%, -3.6%, and -2.1% respectively.

The second model variable we compute is the percentage change in an analyst's price target forecast for a firm (TGT\_REV). This is the new price target divided by the old price target minus 1. Since the current report rarely contains the previous price target, we collect previous price target information, as available from Investext as described above. We obtain previous price targets for 664 reports or 59.0% of our sample.<sup>6</sup> We find an average price target change of 2.8% for the total sample. The average price target changes are 13.8% and 5.5% for strong buy and buy upgrades, respectively. In contrast, we find price target changes of only 1.0% and 2.7% for strong buy and buy reiterations. Downgrades to buy result in an average reduction in price targets of 7.0%, while downgrades to hold experience an average reduction of 7.5%. Overall, upgrades, downgrades, and reiterations experience average price target changes of 11.4%, -7.3%, and 1.9%, respectively. Except for sell reiterations and downgrades to hold and strong sell, the average price target revisions are more positive than the average earnings forecast revisions. Earnings forecast revisions and price target changes are the only model variables not computed for every report in our sample.

To measure the relationship between the firm analyzed and the analyst's employer, we construct another model variable, a proxy for underwriter affiliation and stock holdings (UND\_HLD). This indicator variable takes on a value of 0 if no relationship between the

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<sup>6</sup> We cannot be certain that the price target or earnings forecast (above) we obtain is from the report immediately prior to our sample report due to reports missing on Investext. Errors from obtaining earlier targets or earnings forecasts should weaken our results. This is discussed further in Section 4.

analyst's brokerage and the firm exists, 1 if the brokerage is an underwriter of the firm or has current holdings in the firm, and 2 if the brokerage is both an underwriter and has current holdings. The average UND\_HLD is similar for upgrades and downgrades with a value of 1.2 and 1.1, respectively. Reiterations are slightly higher with an average value of 1.5.

We model the analyst's qualitative justifications for his or her opinion by constructing a "strength of arguments" variable (STR\_ARG). This variable is computed by aggregating the number of positive remarks less the number of negative remarks from Table 1, Panel B. The analyst reports were read for any mention of the 28 recommendation categories in Table 1, Panel B. Positive comments about a category are given a value of +1 and negative comments are given a value of -1. For example, if a report mentions revenues are expected to increase, the category increasing revenues is given a value of +1; if a report mentions that revenues are expected to decrease, the category decreasing revenues is given a value of -1. The percentage of reports having comments in each category is given in Table 1, Panel B. Upgrades have an average strength value of 2.8 compared to 1.7 for reiterations and -0.2 for downgrades. It is notable that downgrades still result in an average score close to zero. This is consistent with the desire to minimize management retaliation since company management is a key source of information and future underwriting business.

This process differs from that employed by Hirst, Koonce and Simko (1995) who had subjects rate the strength of the report's comments on a scale from 1 to 15. We considered trying to code intensity but found it to be less objective than merely tabulating positive or negative. That is, an analyst may remark they expect a "large" or a "very large" improvement in revenue growth. Different observers may code these as different intensities, and indeed different analysts may have different meanings for "large" and "very large". Our approach removes subjective differences between both analysts and readers. The list of factors was initially compiled by all the authors independently and cross-checked with each other. Once the standard coding was agreed upon, the authors and RAs read all reports again. Over 75% of the reports were read by at least one author. There is no significant difference in the coding patterns between authors and



RAs. While not perfect, we believe our method is unbiased and reasonably objective.

Importantly, our measure yields statistically significant empirical results.

Next, we measure the market's reaction to the release of analyst reports with CAR, our fifth model variable. CAR is the five-day market adjusted cumulative abnormal return centered on the report release date. The average mean CAR for all firms in our sample is a negligible 0.3%. Consistent with our expectations and prior research, we find a statistically positive average mean return of 4.5% for upgrades, a statistically negative mean return of -6.6% for downgrades and an insignificant mean reaction of 0.0% for reiterations. Breaking up report types into specific summary categories yields similar results. Upgrades to strong buy and buy result in significant mean returns of 4.7% and 4.1%, respectively. Downgrades to buy and hold result in significant negative mean returns of -7.0% and -6.4%, on average. The mean CARs for upgrades and downgrades are all statistically different from zero with a two-tailed probability less than 0.01. Reiterations are generally small and insignificant with one exception: reiterations of hold recommendations have an average mean return of -1.1%. Reports representing hold upgrades, sell and strong sell downgrades or reiterations have too few observations to draw any reliable conclusions as to average market reactions. We find that a particular report's direction (e.g., upgrade, downgrade, or reiteration) tends to dominate the specific recommendation level. The differences in the observed market reaction between strong buy upgrades and buy upgrades, buy downgrades and hold downgrades, or strong buy reiterations versus buy reiterations are all insignificant. As such, although we provide descriptive statistics for reports categorized by both report type and summary recommendation, our primary empirical tests are performed on reports categorized by direction only.

Table 2 presents the Spearman and Pearson correlations for the model variables and the recommendation revisions in our sample. As expected from the last four columns in Table 1, Panel C, both the Spearman and Pearson correlations between CAR and UP\_GR are positive and highly significant, while the correlations between CAR and DOWN\_GR are negative and highly significant. The Pearson correlation is not significant between CAR and REIT although the Spearman correlation is significantly negative.

More interestingly, our model variables EARN\_REV and STR\_ARG are highly and positively correlated (Spearman = 0.40, Pearson 0.17). This relation suggests that positive (negative) earnings forecast revisions are generally supported by more optimistic (pessimistic) analyst statements. A similar result is observed between TGT\_REV and STR\_ARG. The Spearman and Pearson correlations between CAR and STR\_ARG are 0.30 and 0.33 whereas between CAR and EARN\_REV they are only 0.18 and 0.11 respectively. These results suggest that the market unconditionally reacts more to the analyst's qualitative arguments than to the actual earnings revisions that the analyst makes. The correlations between CAR and DOWN\_GR and CAR and UP\_GR are about the same as between CAR and STR\_ARG suggesting a role for the strength of an analyst's arguments at least as strong as that of a recommendation revision. Only the Pearson correlation for TGT\_REV and CAR is higher than that of the strength of arguments variable. These unconditional correlations support the view that investors use the qualitative information in an analyst's report. This conclusion is further supported by the regression results below.

### *3.4 Firm Specific Variables*

For each firm in our sample of analyst reports, we collect proxies for size (SIZE), growth versus value (MKT\_BK), and analyst coverage (ANALYSTS). SIZE is measured as the log of market value of equity from CRSP, MKT\_BK is the ratio of the firm's market value of equity to the firm's book value from COMPUSTAT, and ANALYSTS is the total number of analysts following the firm (not just All-American analysts) from Zacks. Descriptive statistics for these variables are given in the second section of Table 1, Panel C. There appear to be a few systematic differences between the various categories of reports. For example, market-to-book ratios tend to be lower for downgrades (1.67) than either reiterations or upgrades (2.33 and 2.44). These variables allow us to determine if the market's reaction to analyst reports differs for large versus small firms, growth versus value firms, or firms which are heavily followed.

### *3.5 Other Information Releases*

To investigate the confounding effects of other information that may be released simultaneously with the analyst report, we collect all announcements of the following events: earnings, dividend changes, stock splits, changes in business expectations, new equity and debt financing, mergers and divestitures, credit rating changes, lawsuits, new product introductions, new contracts, and management changes. This information was collected from multiple sources. Earnings announcements are from Zacks. Dividend changes and stock splits are from CRSP. All other information is from the Dow Jones Newswire. We define information to be simultaneous if it occurs within a nine-day window centered on the analyst report's release date.

The third section of Table 1, Panel C catalogs the number of analyst reports that occur with and without other information. As seen there in the last line, 47% of all reports do not occur contemporaneously with the above-mentioned announcements. The percentage is highest for upgrades with 60.3% and lowest for reiterations with 41.5%. The primary source of other information is earnings announcements with 31.4% of all reports having an earnings announcement within plus or minus four days of the analyst report. The next largest source of other information is announcements about changes in expectations with 11.35%.

## **4. Empirical results**

### *4.1. Report Content: Earnings, recommendations, price target revisions, and justifications*

We first document that the market reacts to earnings forecasts, recommendation revisions, and price targets contained in a security analyst report at the time of its release. Market reaction is measured by five-day market adjusted returns centered on the report's release date. This allows for possible delays by a brokerage in delivering its forecasts to Zacks or for leaks of information prior to its public release. Next, we show that the strength of the arguments used in a report is a significant factor in explaining the market's reaction. We also investigate the presence of an underwriting relationship or current stock holdings between the analyst and the firm.

Table 3 provides the results of estimating the following regression using ordinary least squares:

$$\begin{aligned}
CAR_{j,t} = & \alpha_0 + \alpha_1 EARN\_REV_{j,t} + \alpha_2 UP\_GR_{j,t} + \alpha_3 DOWN\_GR_{j,t} + \alpha_4 TGT\_REV_{j,t} \\
& + \alpha_5 STR\_ARG_{j,t} + \alpha_6 UND\_HLD_{j,t} + \varepsilon_{j,t}
\end{aligned} \tag{1}$$

where the variables are defined as follows:

- $CAR_{j,t}$  = five-day market adjusted cumulative abnormal return for firm  $j$  centered on the report release date  $t$ ;
- $EARN\_REV_{j,t}$  = Percentage change in the analyst's earnings forecast for firm  $j$  at time  $t$  computed as [(earnings forecast at time  $t$  / earnings forecast at time  $t-1$ ) - 1];
- $UP\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm  $j$  at time  $t$  that indicates the analyst's recommendation has been upgraded, 0 otherwise;
- $DOWN\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm  $j$  at time  $t$  that indicates the analyst's recommendation has been downgraded, 0 otherwise;
- $TGT\_REV_{j,t}$  = Percentage change in the analyst's projected price target for firm  $j$  at time  $t$  computed as [(price target at time  $t$  / price target at time  $t-1$ ) - 1];
- $STR\_ARG_{j,t}$  = a variable computed by aggregating the number of positive remarks less the number of negative remarks related to 14 specific criteria: revenue growth, earnings growth, new product introductions, new projects, cost efficiencies, expectations met, mergers and acquisitions, repurchase programs, industry climate, management, international operations, leverage, competition, and risk;
- $UND\_HLD_{j,t}$  = a variable taking on the value 0 if no relationship between the analyst's brokerage and the firm exists, 1 if the brokerage is an underwriter of the firm or has current holdings in the firm, and 2 if the brokerage is both an underwriter and has current holdings;
- $\varepsilon_{j,t}$  = assumed normally distributed error term with zero mean and constant variance.

The coefficients  $EARN\_REV_{j,t}$  and  $TGT\_REV_{j,t}$  are computed using earnings and price target forecasts from the current report and the most recent prior report if released within 60 days of our report. As described previously, we collect prior earnings and price targets from the same analyst's Investext report immediately preceding ours. Since Investext is not complete, i.e. it does not contain all reports, there is a chance that another report was released after the prior report we collect. If so, this will make our regression results weaker. Since an analyst usually writes a minimum of six reports a year on the companies they follow, we do not include

revisions from prior reports issued more than 60 days before our report. This restriction minimizes the effect of missing reports. Regressions using longer time periods, e.g. 60 to 90 days or all reports over 90 days, provide qualitatively similar results, however, the significance levels of the variables are reduced.

Columns 1, 2, and 3 of Table 3 present the results from estimating regressions for earnings forecast revisions, recommendation revisions, and changes in price targets individually (i.e., only including those proxy variables in the OLS regressions). If, as documented in prior research, the market reacts to changes in earnings forecasts and the stock recommendation contained in the typical security analyst report, the coefficients EARN\_REV in column 1 and UP\_GR in column 2 will be positive while DOWN\_GR in column 2 will be negative. If as predicted, analyst price target revisions have information, TGT\_REV in column 3 will be positive.

Consistent with prior research, we find that the coefficient on EARN\_REV is positive and statistically significant, (0.0545,  $t = 2.81$ , one-tailed  $p < 0.01$ ), suggesting that increases (decreases) in earnings forecasts are associated with positive (negative) abnormal returns. Also in agreement with existing work, we find that reiterations, upgrades, and downgrades are associated with insignificant, positive, and negative abnormal returns, respectively. The intercept in column 2 is the mean abnormal return associated with a reiteration ( $-0.0044$ ,  $t = -1.12$ , two-tailed  $p > 0.10$ ). Column 2A calculates the mean returns associated with an upgrade ( $0.0473$ ,  $F = 44.84$ , one-tailed  $p < 0.01$ ) or downgrade ( $-0.0894$ ,  $F = 66.77$ , one-tailed  $p < 0.01$ ) by summing  $(\alpha_0 + \alpha_2)$  and  $(\alpha_0 + \alpha_3)$ , respectively.

The results for price target revisions are reported in column 3. As predicted, TGT\_REV is positive and statistically significant consistent with an association between positive (negative) abnormal returns and increasing (decreasing) price targets ( $0.3191$ ,  $t = 9.34$ , one-tailed  $p < 0.01$ ). This shows that price target revisions contain new information that is quickly impounded by the market. In fact, the market reaction for a given change in a price target forecast is stronger than that for an equal percentage change in an earnings forecast, i.e. higher coefficient,  $t$  value, and a higher adjusted  $R^2$ .

In column 4, we examine whether each of the three summary components of an analyst report, forecast revisions, recommendations, and price target changes, contribute information beyond what's contained in the others. When all three are included in our regression, we find that earnings forecast revisions, price target revisions, and the mean return for an upgrade remain positive and statistically significant while the mean return for a downgrade remains statistically negative. The results for price target revisions remain stronger than those of earnings forecast revisions. Including the three primary components of an analyst's report simultaneously in our regression increases the adjusted  $R^2$  to 22%. Our results extend Francis and Soffer (1997), who only look at earnings forecast revisions and recommendations, and support Brav and Lehavy (2003) who show that the information in each of the three components of an analyst's report is not subsumed by the other two. Column 4A calculates, as column 2A did, the mean returns and F values for upgrades and downgrades by summing  $(\alpha_0 + \alpha_2)$  and  $(\alpha_0 + \alpha_3)$ , respectively.

Regression results reported in column 5 examine the effects of affiliations between the firm covered and the brokerage employing the analyst issuing the report, as well as the strength of an analyst's arguments by adding `UND_HLD` and `STR_ARG`. In cases where a brokerage may have served as an underwriter for or has current holdings in a reviewed firm, we expect investors to exhibit skepticism in responding to good news and a more pronounced reaction to bad news resulting in  $\alpha_6$  being negative. We find that the coefficient for existing relationships between the analyst and company is statistically insignificant contradicting prior work (-0.0011,  $t = -0.16$ , one-tailed  $p > 0.10$ ).<sup>7</sup>

We predict that the strength of arguments contained in the report is likely to amplify investor's reactions to both good and bad news suggesting that  $\alpha_5$  will be positive. The coefficient on `STR_ARG` is positive and statistically significant (0.0104,  $t = 4.40$ , one-tailed  $p < 0.01$ ) indicating that investors react to a report's contents even in the presence of the three primary components previously discussed. However, once information regarding the strength of an analyst's arguments (as contained in a report's text) is considered, investors appear to rely less

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<sup>7</sup> We calculate our underwriting holdings variable several ways. In Eq. (1), reported in Table 3, the variable takes a value of 0 if there is no relationship, 1 if the brokerage is an underwriter or has holdings and 2 if it is both an underwriter and has holdings. We also examine holdings and underwriting relationship as separate variables. There are no significant results, regardless of how the variable is specified.

on earnings forecast revisions and upgrade labels. Earnings forecast revisions are now less significant (0.0618,  $t = 1.77$ , one-tailed  $p < 0.10$ ) and the mean return for upgrades, given in Column 5A, is now 0.0011 with an insignificant F value. Price targets and the mean return for downgrades remain highly significant (0.2116,  $t = 5.76$ , one-tailed  $p < 0.01$  and -0.0551,  $t = 10.69$ , one-tailed  $p < 0.01$  respectively). We examine the effects of report type on the market's reaction to the release of an analyst's report in more detail in Section 4.4.

The importance of the analyst's arguments in explaining the market's reaction to the release of a report also holds if we split the strength of arguments variable into its positive and negative components. That is, we tally separately positive and negative justifications and include them in our regression as two variables. The positive argument coefficient is 0.0071 with a t-statistic of 2.41 and the negative argument coefficient is -0.0205 with a t-statistic of -3.53. This suggests that negative comments have a larger impact on the market than do positive ones, but that both are important. Although not reported here, when the strength of arguments variable is split into positive and negative components, the coefficients on earnings forecast revisions, price target revisions, and upgrades and downgrades are similar to those reported in Table 3, Column 5.

In addition to disaggregating our strength of arguments variable into its positive and negative components, we consider each of our 28 justification variables independently. That is, we added 28 dummy variables to the regression, e.g. positive revenue growth, negative revenue growth, positive cost savings, negative cost savings, etc. The regression results using these 28 variables are reported in Table 4. The coefficients and significance levels on earnings revisions, target price changes, and upgrades and downgrades are similar to those in Table 3, Column 5. Nine of the 28 justification variables are significant, with the correct predicted sign, at the 10% level. Of these, seven are significant at the 5% level; including positive comments regarding repurchases, new projects and risks, and negative comments regarding product introduction and international operations. One variable, negative management comments, is significant at the 10% level with the wrong sign.

Overall, our results in Tables 3 and 4 replicate the findings of prior research that earnings forecast revisions and recommendation changes are positively and significantly associated with the market's reaction at the time a security analyst report is released. Our results also provide support for the hypothesis that price target changes contain information even in the presence of the other key components of an analyst report. This price target information is significant and is stronger than that contained in earnings forecast revisions. Finally, and perhaps most importantly, we demonstrate the value of including the strength of arguments presented by an analyst in support of his recommendations. In fact, once strength of arguments is controlled for, the earnings revision and recommendation upgrades are both less significant. Moreover, the adjusted  $R^2$  for our regression is significantly larger than that found in previous work for either individual variables or less complete multivariate specifications.

#### 4.2. *Firm Specific Variables*

It is a well-known result that the market reaction to analyst earnings forecasts revisions and recommendation changes varies by the firm's information environment (e.g., Lys and Sohn, 1990; Stickel, 1995). Common proxies for the prevalence of information about a firm are its size and analyst following. The reasons commonly given for these results is that individual analysts play a more important function for smaller firms that have less institutional ownership, less press coverage, and less analyst following. Whether a firm is a growth or value firm (as measured by market-to-book) is another factor that may influence the impact of information releases.

Table 5 presents the results from estimating a version of Eq. (1) modified to include firm size cross-products in addition to our report variables (i.e., earnings forecast revisions, recommendation changes, price target revisions, strength of arguments and affiliation). Column 1 shows that the cross product of earnings forecast revision with size is significantly negative (-0.0280,  $t = -2.92$ ,  $p < 0.001$ ). This suggests, consistent with prior literature, that the market reaction to earnings revisions is smaller for large firms when EARN\_REV is the only factor considered. In Column 2 the cross product of firm size with downgrades shows that the market's reaction is less negative for larger firms in the case of downgrades. Similarly, Column 3



demonstrates that the market reaction to price target revisions is significantly less for larger firms. When all the factors are considered simultaneously in Column 5, however, just as in Table 3, the importance of earnings forecast revisions and recommendation changes is now reduced. The earnings coefficient is still positive but no longer significant. Price targets and the strength of arguments variable remain significant in the direction predicted and the effect of size on price targets remains. Also, as in Table 3, the adjusted  $R^2$  for the regressions are much larger when TGT\_REV and STR\_ARG are included.

Table 6 duplicates Column 5 from Table 5 for all three firm specific factors, i.e. firm size, number of analysts, and market-to-book. Column 1 duplicates Column 5 from Table 5, which reports the firm size cross product terms. Columns 2 and 3 substitute number of analysts and market-to-book value as the cross product factors in the regression. Although there are some small differences depending on which firm specific variable is used in Table 6 (i.e. EARN\_REV times MKT\_BK is significant in Column 3 but not Columns 1 and 2) the noteworthy results from Table 5 hold. TGT\_REV and STR\_ARG are positive, large, and statistically significant in all three columns. Furthermore, the coefficients for all three factors interacted with TGT\_REV are negative and statistically significant.

#### 4.3. *Other Information Releases*

The analyst literature usually measures the market's reaction to the release of new information by focusing on a short event window centered on a report's release date. As such, it implicitly assumes that a report provides new and unique information to the market and is not contemporaneous with other releases. This is not necessarily true. Analyst reports may simply publicize or reiterate information already public (e.g., firms release their own earnings reports, 10-Qs, press releases, etc.). This possibility, that analysts merely publicize other information releases, is not currently considered in the literature.

To analyze the question of whether analysts provide new information for our sample (and by extension for much of the analyst literature), we collect simultaneous information events, as detailed above in Section 3.5. To be conservative, we use a nine-day window equal to plus or

minus two days around our five-day return window (i.e., plus or minus four days centered on the report date). We find that other announcements take place approximately 53% of the time. After excluding all of these possible contemporaneous events, we rerun our analysis on the sample of analyst reports that occur independently.<sup>8</sup> Table 7 (which duplicates Table 3 on this more restrictive sample) reports the results. The results are qualitatively similar to those reported in Table 3, and the adjusted R<sup>2</sup> for column five changes from 0.2529 to 0.2591 despite the large decrease in sample size. That is, removing other simultaneous announcements reinforces our previous conclusions. This result supports the view that many analysts' reports provide new information or analysis. We also run the regression on the sample of analyst reports that has other information releases within the nine-day window examined. The results, not reported in a table, show that when the complete model is run on this sub-sample only the coefficients TGT\_REV and STR\_ARG remain significant (0.2217,  $t = 3.31$ ,  $p < 0.001$  and 0.0130,  $t = 3.17$ ,  $p < 0.001$ ) although the adjusted R<sup>2</sup> remains at 0.2479. These results highlight that analysts also have a role in interpreting information released from alternative sources.

#### 4.4. *The effects of report type*

Prior research, the CARs in Table 1, Panel C, and columns 2 and 2A of Tables 3 and 7 indicate that the market reacts as predicted to changes in recommendations, i.e. positively to upgrades and negatively to downgrades. This holds even when earnings forecast revisions and price target revisions are added as shown in columns 4 and 4A of Tables 3 and 7. However, columns 5 and 5A indicate that additional information, i.e. strength of arguments, affects upgrades differently from downgrades. In this section, we further investigate the effects of the information released in an analyst report by conditioning on the direction of the recommendation revision.

Current evidence on whether or not investors tend to place greater reliance on specific information in an analyst's report conditional on report type (e.g., upgrade, downgrade, or reiteration) is inconclusive. As stated earlier, Francis and Soffer (1997) find that investors place

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<sup>8</sup> We did not collect information on conference calls that did not result in a press release to the news media.

greater weight on earnings forecast revisions for favorable reports while Hirst, Koonce, and Simko (1995) find that investors are more likely to analyze other information when reports are unfavorable. Our database allows us to examine this question utilizing a broader set of information than that available to Francis and Soffer and overcomes the shortcomings associated with an experimental setting such as the one employed by Hirst, Koonce, and Simko. To investigate whether potential investors assess the information contained in security analysts' reports conditional on whether the report is an upgrade, a reiteration, or a downgrade, we estimate the following regression using ordinary least squares:

$$\begin{aligned}
CAR_{j,t} = & \gamma_0 + \gamma_1 EARN\_REV_{j,t} + \gamma_2 UP\_GR_{j,t} + \gamma_3 DOWN\_GR_{j,t} + \gamma_4 TGT\_REV_{j,t} \\
& + \gamma_5 STR\_ARG_{j,t} + \gamma_6 UND\_HLD_{j,t} + \gamma_7 EARN\_REV_{j,t} * UP\_GR_{j,t} \\
& + \gamma_8 EARN\_REV_{j,t} * DOWN\_GR_{j,t} + \gamma_9 TGT\_REV_{j,t} * UP\_GR_{j,t} \\
& + \gamma_{10} TGT\_REV_{j,t} * DOWN\_GR_{j,t} + \gamma_{11} STR\_ARG_{j,t} * UP\_GR_{j,t} \\
& + \gamma_{12} STR\_ARG_{j,t} * DOWN\_GR_{j,t} + \gamma_{13} UND\_HLD_{j,t} * UP\_GR_{j,t} \\
& + \gamma_{14} UND\_HLD_{j,t} * DOWN\_GR_{j,t} + \xi_{j,t}
\end{aligned} \tag{2}$$

Eq. (2) is simply Eq. (1) modified by the addition of eight interaction variables computed as  $EARN\_REV * UP\_GR$ ,  $EARN\_REV * DOWN\_GR$ ,  $TGT\_REV * UP\_GR$ ,  $TGT\_REV * DOWN\_GR$ ,  $STR\_ARG * UP\_GR$ ,  $STR\_ARG * DOWN\_GR$ ,  $UND\_HLD * UP\_GR$ , and  $UND\_HLD * DOWN\_GR$ .

The intercept,  $\gamma_0$ , represents an investor's reaction to a reiteration of a prior recommendation, controlling for all the other information found in the analyst's report. Likewise, the coefficient values on  $EARN\_REV$  ( $\gamma_1$ ),  $TGT\_REV$  ( $\gamma_4$ ),  $STR\_ARG$  ( $\gamma_5$ ), and  $UND\_HLD$  ( $\gamma_6$ ) represent the degree an investor reacts to earnings forecast revisions, target revisions, the strength of a report's arguments, and the affiliation of the brokerage issuing the recommendation for a reiteration.

Tests of hypotheses about how a report's type affects investor reaction are based on the upgrade ( $UP\_GR$ ) and downgrade ( $DOWN\_GR$ ) shift and differential variables. For example, a significant negative coefficient on  $TGT\_REV * UP\_GR$  would indicate that investors place less weight on target revisions for upgrades as related to reiterations. The mean coefficients and F

statistics for upgrades as they relate to earnings forecast revisions, target revisions, the strength of a report's arguments and the affiliation characteristics of the brokerage issuing the recommendation are captured by  $(\gamma_1 + \gamma_7, \text{EARN\_REV} + \text{EARN\_REV} * \text{UP\_GR})$ ,  $(\gamma_4 + \gamma_9, \text{TGT\_REV} + \text{TGT\_REV} * \text{UP\_GR})$ ,  $(\gamma_5 + \gamma_{11}, \text{STR\_ARG} + \text{STR\_ARG} * \text{UP\_GR})$ , and  $(\gamma_6 + \gamma_{13}, \text{UND\_HLD} + \text{UND\_HLD} * \text{UP\_GR})$ . Similarly the mean coefficients and F statistics for downgrades are given by  $(\gamma_1 + \gamma_8, \text{EARN\_REV} + \text{EARN\_REV} * \text{DOWN\_GR})$ ,  $(\gamma_4 + \gamma_{10}, \text{TGT\_REV} + \text{TGT\_REV} * \text{DOWN\_GR})$ ,  $(\gamma_5 + \gamma_{12}, \text{STR\_ARG} + \text{STR\_ARG} * \text{DOWN\_GR})$ , and  $(\gamma_6 + \gamma_{14}, \text{UND\_HLD} + \text{UND\_HLD} * \text{DOWN\_GR})$ .

Table 8 reports the results from estimating Eq. (2) organized by recommendation revision type. Our sample is now restricted to only analyst reports without other simultaneous information releases.<sup>9</sup> We find evidence that investors assess the information contained in security analysts' reports conditional on whether the report is an upgrade, a reiteration, or a downgrade. Investors appear most interested in an analyst's supporting documentation and affiliation in the case of a downgrade. As expected, TGT\_REV ( $\gamma_4 + \gamma_{10} = 0.5074$ ,  $F = 19.98$ , one-tailed  $p < 0.01$ ), and STR\_ARG ( $\gamma_5 + \gamma_{12} = 0.0255$ ,  $F = 5.50$ , one-tailed  $p < 0.05$ ) are both significantly positive while UND\_HLD is significantly negative ( $\gamma_6 + \gamma_{14} = -0.0529$ ,  $F = 2.77$ , one-tailed  $p < 0.05$ ). In the case of reiterations, only TGT\_REV ( $\gamma_4 = 0.1198$ ,  $t = 2.34$ , one-tailed  $p < 0.05$ ) and STR\_ARG ( $\gamma_5 = 0.0081$ ,  $t = 2.40$ , one-tailed  $p < 0.05$ ) are statistically significant. Unlike downgrades, investors do not appear to adjust their reaction in response to UND\_HLD for reiterations ( $\gamma_6 = 0.0022$ ,  $t = 0.19$ , one-tailed  $p > 0.10$ ).

In contrast to the results observed for downgrades and reiterations, but consistent with Hirst, Koonce, and Simko (1995), investors do not appear to investigate beyond report type in the case of upgrades. The mean return for upgrades is large, positive, and statistically significant ( $\gamma_0 + \gamma_2 = 0.0712$ ,  $F = 6.86$ , one-tailed  $p < 0.01$ ). However, the coefficient estimates for TGT\_REV ( $\gamma_4 + \gamma_9 = -0.0257$ ,  $F = 0.08$ , one-tailed  $p > 0.10$ ), and UND\_HLD ( $\gamma_6 + \gamma_{13} = -0.0013$ ,  $F = 0.01$ , one-tailed  $p > 0.10$ ) are both insignificant. The only anomaly in our results is the significantly negative coefficient on STR\_ARG for upgrades ( $\gamma_5 + \gamma_{11} = -0.0094$ ,  $F = 2.35$ , one-

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<sup>9</sup> Results for the entire sample generally show similar  $R^2$ , coefficient size and significance levels for our variables. Any differences will be pointed out in the discussion of results.

tailed  $p < 0.10$ ), which is the opposite of our predicted sign. The coefficient for EARN\_REV is insignificant for all recommendation revision types. This is consistent with Tables 3 and 7, which show that EARN\_REV is less significant when a more complete regression, including TGT\_REV and STR\_AGR, is used<sup>10</sup>.

These results lead to the conclusion that investors pay closer attention to the total content of analyst reports in the case of downgrades and reiterations. This is not surprising in the case of reiterations since the recommendation level does not contain much new information. However, investors seem to read downgrade reports closely, utilizing more supporting information than in the case of upgrades. Even though other information contained in an analyst's report beyond the summary recommendation is not significant in the case of recommendation upgrades, the contents of a report are still important for reiterations and downgrades. As shown in Table 1, these two categories constitute 76.6% of all reports issued during our sample period.

## **5. Price Target Accuracy**

Price targets received most of the analyst media coverage prior to the recent emphasis on recommendation levels. Headlines such as "Price Targets are Hazardous to Investors' Wealth" or "Forget Analysts' Price Targets. They're Really Just for Show" represent the content of these articles (see Morgenson, 2001; Maiello, 2000). Skepticism about analysts' research and the projections they produce has also captured the attention of members of congress and the SEC (see Tully, 2001). As discussed earlier, analysts may be more likely to issue highly favorable recommendations due to concerns over personal compensation, relationships with the analyzed firms' management, or their own firm's underwriting business. Price targets may either be a way for analysts to ameliorate the effects of overly optimistic reports, or a part of the sales hype used to peddle stocks. In sections 4.1 through 4.4, we provide evidence consistent with price target changes containing important additional information used by investors. This result is especially true for reiterations and downgrades. This is proof that the market does react to price targets, the

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<sup>10</sup> When the entire sample is used to estimate the regressions, the coefficient for EARN\_REV is positive and statistically significant for downgrades as predicted.

question now becomes should they? In this section, we provide some results on price target accuracy.

A price target is really a combination of several forecasts. First, an analyst must evaluate the firm's specific cash flows and risk level. Second, an evaluation of the industry's prospects must be completed. Finally, an assessment of the macro-economic factors that affect the overall market must be undertaken. We do not attempt to separate or model these forecasts but do examine whether price targets are achieved.

Our analysis uses 818 price targets issued between 1997 and 1999. Of this sample, 796 forecasts are for a price target above the current price. For this sub-sample, we consider a price target prediction to be accurate if the analyzed firm's stock price equals or exceeds the projected price at any time during the 12-month period following the release of a report. Most, but not all analysts, list a twelve-month time horizon for their price targets. For the remaining 22 targets that forecast price decreases, we consider an analyst to be accurate and the target achieved if the stock price falls below the price target. Table 9, Panel A, presents price target accuracy and the time necessary to achieve it categorized by the type of recommendation. For the overall sample, we find that price forecasts are achieved in 54.3% of all cases. Although not broken-out in Table 9, price targets below the current price are achieved in 20 of the 22 instances.

Table 9, Panel B, Column 1, Target Missed, presents the average percentage of the price target achieved by the 45.7% of the firms that do not reach the analysts' price target. The ratio is the maximum price achieved within 12 months divided by the price target if the price target is set above the current price, and the price target divided by the minimum price achieved within 12 months if the price target is set below the current price. Column 3, Target Achieved, shows that firms that achieve the price target usually overshoot it by an average of 37% during the 12 months. We do not consider subsequent price target revisions that may reduce this overshooting percentage.

Although not shown, the probability of achieving a particular target is highly dependent on the level of optimism exhibited by the analyst. Price targets that project a change of zero to ten percent and ten to twenty percent are achieved 74.4% and 59.6% of the time, respectively. In

contrast, price targets that project a change in price of 70% or more are realized in less than 25% of the cases observed.

Taken together, Panels A and B of Table 9 show that slightly more than 50% of the price targets are achieved. In instances where price forecasts are missed, the average maximum (minimum) price observed for projected increases (decreases) was 84% of the price target. Whether this is a good record of accuracy in a rising market is a conclusion we leave to the reader.

## **6. Valuation Methodology**

Most methodologies used in valuing stocks fall into one of three major categories; earnings or cash flow multiples, discounted cash flow (DCF) models, and asset multiples. Earnings or cash flow multiples used by analysts include price to earnings (PE) ratios, relative price to earnings (Relative PE) ratios, earnings before interest, tax, depreciation, and amortization (EBITDA) multiples, and revenue multiples. DCF models use estimated discount rates and projected cash flows, and include free cash flow to the firm, free cash flow to equity, and enterprise value added (EVA). Analysts use market-to-book value as their asset multiple. We group all other valuation methodologies under other models. These are usually unique to the individual analyst and are not recognizable to the readers of modern finance textbooks.

The first question we ask in this section is does the market react differently depending on the valuation methodology employed? We add valuation dummies to Eq. (1) and find that these valuation methodologies are insignificant in all our regressions.<sup>11</sup> That is, the market does not react differently depending on the valuation methodology used by the analyst or whether the analyst uses one or many. As business school professors who teach DCF as the superior valuation method, we find this result disappointing. The methodology is either being misapplied or it is not significant.<sup>12</sup>

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<sup>11</sup> We run the valuation methodologies as individual dummies, i.e. PE, relative PE, etc, and as major categories, i.e. earnings multiples, DCF, asset multiples, and other. We do not report these results but they are available from the authors.

<sup>12</sup> It is possible that a number of analysts use a DCF model to predict prices but translate this into earnings multiples for the text of their report. However, Black (1999) surveys analysts and finds that only 15.2% report using present value methods. This is in line with the 12.8% reported in Table 1, Panel A.

Next, in Table 10, we examine whether the valuation methodology employed by an analyst affects the probability of achieving a particular target. The various iterations of earnings multiples, i.e. PE, relative PE, EBITDA, and revenue multiples are fairly consistent in accuracy. The percentage of target prices achieved ranges from 48.4% for EBITDA multiples to 55.1% for revenue multiples. Note that 99% of analyst reports in our sample use PE multiples. The accuracy of DCF models falls within this range with 52.3% of target prices achieved. Price to book models are slightly less accurate with 45.5%. Analysts are least successful in predicting target prices when they use EVA or other models, i.e. where the analyst employs a “unique” method that is not used by other analysts or covered in most valuation textbooks. The number of analysts that use these other models, however, is much lower than for any other category.

## **7. Conclusion**

This paper first describes the content of security analyst reports and then examines the reaction of the market to all the elements of those reports. Using a database constructed from security analyst reports issued between 1997 and 1999, we replicate prior research that earnings forecast revisions and recommendation revisions are significantly and positively associated with the market’s reaction at the time a security analyst report is released. Next, we examine price targets and find that the market reaction to price target revisions is stronger than that of an equal percentage change in earnings forecasts. Price target revisions also contain new information even in the presence of earnings revisions and stock recommendations. In addition, the adjusted  $R^2$  on our models increases measurably when price target changes are added.

We then investigate the strength of an analyst’s argument by examining the justifications provided in an analyst report. These justifications provide significant to the market both individually and in aggregate. Furthermore, the significance of the market’s reaction associated with changes in earnings forecasts is reduced (in some models below standard statistical cut-offs) when proxies for the strength of an analyst’s arguments and the price target revisions are included in the regression models.



Next, by examining information releases that occur contemporaneously with the analyst report, we find that approximately half of our reports contain new information not previously released. The market reacts to all of the elements of these reports as described above. For those reports that occur with other information releases, the market reacts to the analyst price targets and to the justifications provided. This suggests that analyst reports also have a role in interpreting information from other sources. Future studies of analyst reports should consider whether the information contained is new or an interpretation.

We also examine whether investors assess the information contained in security analysts' reports conditional on whether the report is an upgrade, a reiteration, or a downgrade. We find that investors place the greatest reliance on the content of security analyst reports when it is a downgrade. For reiterations the only elements that matter are target prices and the justifications given. For upgrades none of the elements are important statistically.

Finally, we provide an examination of the accuracy of price targets and the importance of valuation methodology. We find that approximately 54% of analysts' price targets are achieved within 12 months. When the target is missed, the average maximum (minimum) price observed for projected increases (decreases) was 84% of the price target. We fail to observe any systematic association between the valuation method employed by an analyst and either the market's reaction or the probability of achieving a price target.

In summary the addition of both target prices and the analyst justifications are important in explaining the market's reaction to analyst reports. The market reacts positively and significantly to these two sources of information regardless of what other report elements are considered and regardless of whether other information is announced contemporaneously. Their inclusion increases the adjusted  $R^2$  of all of the models employed significantly.

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**TABLE 1: Panel A**

**Security Analyst Report Descriptive Statistics**  
 Percentages of Reports Containing Selected Data Organized by Type of Recommendation

	<b>Strong Buy</b>		<b>Buy</b>			<b>Hold</b>			<b>Sell</b>		<b>S_Sell</b>	<b>All</b>			<b>Total Sample</b>
	Up	Reit	Up	Reit	Down	Up	Reit	Down	Reit	Down	Down	Up	Reit	Down	
<i>Number of Reports</i>	149	198	111	296	43	2	244	77	1	3	2	262	739	125	1126
% of Sample	13.2	17.6	9.9	26.3	3.8	0.2	21.7	6.8	0.0	0.3	0.2	23.3	65.5	11.1	100.0
<i>Earnings Forecast</i>															
1 Year	97.3	100.0	99.1	99.0	97.7	100.0	99.6	98.7	100.0	100.0	100.0	98.1	99.5	98.4	99.1
Multiple Years	95.3	96.5	95.5	95.6	93.0	100.0	95.9	89.6	100.0	100.0	100.0	95.4	95.9	91.2	95.3
<i>Price Targets</i>															
Target Reported	94.0	94.4	98.2	91.2	95.3	100.0	11.1	50.6	100.0	0.0	100.0	95.8	65.5	65.6	72.6
Point Estimate Provided	88.6	95.7	90.7	97.4	80.5	100.0	96.3	92.3	100.0	NA	50.0	89.2	96.9	85.4	93.8
Projected Increase	34.6	44.0	22.6	34.3	21.0	-17.5	8.6	5.5	-9.6	NA	-19.0	28.9	36.6	19.1	32.9
<i>Forecasts</i>															
Income Statement	55.6	24.7	35.1	13.5	39.5	0.0	24.6	39.0	0.0	33.3	100.0	46.6	20.1	40.0	28.5
Balance Sheet	12.1	3.5	9.0	2.7	2.3	0.0	2.0	10.3	0.0	33.3	0.0	10.7	2.7	8.0	5.1
Cash flow Statement	30.9	14.6	27.9	9.8	20.9	0.0	8.6	33.8	0.0	0.0	100.0	29.4	10.7	29.6	17.1
<i>Segment Data</i>															
Geographic	4.7	3.5	3.6	6.1	0.0	0.0	1.2	2.6	0.0	0.0	0.0	4.2	3.8	1.6	3.6
Product	4.0	2.0	6.6	4.7	4.7	0.0	4.5	3.9	0.0	0.0	0.0	5.0	3.9	4.0	4.2
Division	9.4	13.6	12.6	9.5	14.0	0.0	7.8	6.5	0.0	0.0	0.0	10.7	10.0	8.8	10.0
<i>Affiliation</i>															
Underwriter	60.8	64.6	44.1	53.7	60.5	0.0	43.4	39.0	100.0	66.7	0.0	53.3	53.4	46.4	52.6
Holdings	63.5	88.4	74.8	91.9	81.4	50.0	99.6	51.9	0.0	66.7	100.0	68.2	93.4	63.2	84.2
<i>Valuation Models</i>															
Earnings Multiples	99.3	99.5	99.1	98.0	100.0	100.0	100.0	100.0	0.0	100.0	100.0	99.2	98.9	100.0	99.1
DCF Variations	16.8	13.1	9.9	9.5	14.0	0.0	11.5	26.0	0.0	0.0	0.0	13.7	11.1	20.8	12.8
Asset Multiples	23.5	22.7	22.5	26.3	14.0	0.0	32.8	14.3	0.0	33.3	50.0	22.9	27.6	15.2	25.1
Other	3.4	6.6	2.7	3.7	2.3	0.0	1.2	5.2	0.0	0.0	0.0	3.1	3.6	4.0	3.5
<i>Average Number Pages</i>	9.5	5.7	9.0	5.3	5.9	2.0	4.5	7.5	1.0	6.7	11.5	9.3	5.1	7.0	6.3

**TABLE 1: Panel B**

**Security Analyst Report Descriptive Statistics**  
 Percentages of Reports Containing Selected Data Organized by Type of Recommendation

	<b>Strong Buy</b>		<b>Buy</b>			<b>Hold</b>			<b>Sell</b>		<b>S_Sell</b>	<b>All</b>			<b>Total</b>
	Up	Reit	Up	Reit	Down	Up	Reit	Down	Reit	Down	Down	Up	Reit	Down	Sample
<i><b>Recommendation Basis</b></i>															
Revenues (Inc)	39.6	46.0	36.9	64.5	11.6	0.0	6.6	13.0	100.0	0.0	0.0	38.2	40.4	12.0	36.7
Revenues (Dec)	0.0	1.5	3.6	1.4	9.3	0.0	4.5	40.3	0.0	0.0	0.0	1.5	2.4	28.0	5.0
Earnings (Inc)	62.4	42.9	54.1	24.3	23.3	0.0	5.3	9.1	0.0	0.0	0.0	58.4	23.0	13.6	30.2
Earnings (Dec)	0.0	0.0	3.6	5.1	23.3	0.0	6.6	19.5	0.0	100.0	0.0	1.5	4.2	22.4	5.6
Product Intro (Pos)	26.2	17.2	18.0	20.9	7.0	0.0	8.6	3.9	0.0	0.0	0.0	22.5	15.8	4.8	16.1
Product Intro (Neg)	0.0	0.5	0.9	1.4	2.3	0.0	0.0	3.9	0.0	0.0	0.0	0.4	0.7	3.2	0.9
New Projects (Pos)	13.4	9.6	8.1	12.8	7.0	0.0	10.7	10.4	0.0	0.0	0.0	11.1	11.4	8.8	11.0
New Projects (Neg)	0.0	0.0	0.9	1.0	2.3	0.0	1.2	2.6	0.0	0.0	0.0	0.4	0.8	2.4	0.9
Cost Efficiencies	39.6	21.2	24.3	15.2	11.6	50.0	19.7	13.0	0.0	0.0	50.0	33.2	18.5	12.8	21.3
Cost Inefficiencies	2.0	7.6	10.8	18.9	11.6	0.0	12.7	19.5	0.0	33.3	0.0	5.7.0	13.8	16.8	12.2
Expectations Met	37.6	29.3	10.8	33.1	30.2	0.0	37.3	31.2	0.0	0.0	100.0	26.0	33.5	31.2	31.5
Expectations Not Met	9.4	7.1	29.7	7.8	18.6	0.0	11.9	19.5	0.0	66.7	0.0	17.9	8.9	20.0	12.2
M&A Activity (Pos)	28.9	10.6	21.6	13.5	18.6	0.0	6.6	9.1	0.0	0.0	0.0	25.6	10.4	12.0	14.1
M&A Activity (Neg)	0.0	0.5	1.8	0.3	2.3	0.0	2.5	7.8	0.0	0.0	0.0	0.8	1.1	5.6	1.5
Repurchases (Pos)	17.4	7.1	14.4	9.1	7.0	50.0	17.6	14.3	0.0	0.0	0.0	16.4	11.4	11.2	12.5
Repurchases (Neg)	0.0	0.0	0.9	0.3	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.4	0.1	2.4	0.4
Industry Climate (Pos)	24.2	12.1	18.9	11.1	9.3	50.0	4.5	3.9	0.0	0.0	0.0	22.1	9.2	5.6	11.8
Industry Climate (Neg)	3.4	7.1	8.1	5.1	7.0	0.0	7.4	15.6	0.0	66.7	50.0	5.3	6.5	14.4	7.1
Management (Pos)	37.6	15.7	25.2	27.4	7.0	50.0	4.1	22.1	0.0	0.0	50.0	32.4	16.6	16.8	20.3
Management (Neg)	0.0	1.0	0.0	0.7	7.0	0.0	1.6	7.8	0.0	66.7	50.0	0.0	1.1	9.6	1.8
International Ops (Pos)	19.5	9.6	11.7	32.1	4.7	0.0	5.3	0.0	0.0	0.0	0.0	16.0	17.2	1.6	15.2
International Ops (Neg)	2.7	1.0	2.7	2.0	9.3	0.0	7.0	15.6	0.0	33.3	0.0	2.7	3.4	13.6	4.4
Leverage (Pos)	11.4	4.0	4.5	7.4	7.0	0.0	2.5	3.9	0.0	0.0	0.0	8.4	4.9	4.8	5.7
Leverage (Neg)	4.7	2.5	0.9	3.7	2.3	0.0	7.4	10.4	0.0	33.3	0.0	3.1	4.7	8.0	4.7
Competition (Pos)	15.4	6.6	3.6	17.9	4.7	0.0	2.5	7.8	0.0	0.0	0.0	10.3	9.9	6.4	9.6
Competition (Neg)	4.0	4.0	3.6	2.4	7.0	50.0	9.4	10.4	0.0	33.3	0.0	4.2	5.1	9.6	5.4
Risk (Pos)	17.4	8.6	2.7	6.8	11.6	0.0	0.8	6.5	0.0	0.0	0.0	11.1	5.3	8.0	6.9
Risk (Neg)	7.4	4.0	2.7	5.7	7.0	0.0	4.9	20.8	0.0	66.7	50.0	5.3	5.0	17.6	6.5

**TABLE 1: Panel C**  
**Security Analyst Report Descriptive Statistics**

	<b>Strong Buy</b>		Up	<b>Buy</b>		Down	<b>Hold</b>			<b>Sell</b>		<b>S_Sell</b>	Up	<b>All</b>		<b>Total</b>
	Up	Reit		Reit	Down		Up	Reit	Down	Reit	Down	Down		Reit	Down	
<i>Model Variables</i>																
EARN_REV	4.1	-4.4	4.0	2.4	-7.3	0.0	-5.9	-4.5	2.5	-12.1	118.8	4.1	-2.1	-3.6	-1.0	
TGT_REV	13.8	1.0	5.5	2.7	-7.0	0.0	1.0	-7.5	0.0	NA	-14.7	11.7	1.9	-7.3	2.8	
STR_ARG	3.6	2.1	1.8	2.4	0.5	1.5	0.5	-0.5	0.0	-5.0	0.5	2.8	1.7	-0.2	1.7	
UND_HLD	1.2	1.5	1.2	1.5	1.4	0.5	1.4	0.9	1.4	0.9	1.0	1.2	1.5	1.1	1.4	
CAR (%)	4.7	0.3	4.1	0.8	-7.0	10.0	-1.1	-6.4	2.2	-8.7	2.1	4.5	0.0	-6.6	0.3	
<i>Firm Specific Variables</i>																
SIZE	12.60	14.13	11.99	30.88	7.10	16.03	8.11	12.64	0.14	2.03	15.68	12.37	18.82	10.53	16.39	
ANALYSTS	9.81	12.78	9.61	11.75	9.58	7.50	9.22	10.34	2.00	5.67	12.50	9.71	11.18	10.00	10.71	
MKT_BK	2.44	2.56	2.38	3.03	1.67	2.13	1.72	1.75	1.15	0.79	1.54	2.44	2.33	1.67	2.27	
<i>Information Announcements (%)</i>																
Earnings Announcements	18.12	33.67	27.03	38.85	23.26	0.00	34.43	24.68	100.00	0.00	50.00	21.76	36.08	24.00	31.41	
Dividend Changes	0.67	2.01	2.70	1.35	0.00	0.00	2.46	0.00	0.00	0.00	50.00	1.53	1.89	0.80	1.69	
Stock Splits	0.00	1.01	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.54	0.80	0.44	
Changes in Expectations	3.36	10.05	11.71	11.15	23.26	50.00	14.34	12.99	0.00	33.33	0.00	7.25	11.89	16.80	11.35	
Mergers & Divestitures	10.74	11.06	8.11	10.81	6.98	50.00	8.20	11.69	0.00	0.00	0.00	9.92	10.00	9.60	9.94	
Lawsuits	2.68	3.02	0.90	5.74	2.33	0.00	1.23	0.00	0.00	33.33	0.00	1.91	3.51	1.60	2.92	
Debt Rating Changes	0.67	2.51	3.60	1.01	2.33	0.00	2.46	10.39	0.00	33.33	0.00	1.91	1.89	8.00	2.57	
Debt Financing	3.36	2.51	0.90	1.35	0.00	0.00	1.64	0.00	0.00	33.33	0.00	2.29	1.76	0.80	1.77	
Equity Financing	1.34	2.01	4.50	3.72	2.33	50.00	3.69	3.90	0.00	0.00	0.00	3.05	3.24	3.20	3.19	
Management Change	0.67	3.02	0.00	3.38	0.00	0.00	2.46	1.30	0.00	0.00	0.00	0.38	2.97	0.80	2.13	
New Products / Projects	2.68	7.54	1.80	6.76	13.95	50.00	6.97	7.79	0.00	0.00	0.00	2.67	7.03	9.60	6.30	
New Contracts / Clients	4.03	9.05	3.60	7.43	9.30	0.00	8.61	6.49	0.00	0.00	0.00	3.82	8.24	7.20	7.10	
Other	1.34	1.01	0.90	0.68	0.00	0.00	1.23	0.00	0.00	33.33	0.00	1.15	0.95	0.80	0.98	
<i>No Other Announcements</i>	63.09	43.70	57.66	40.88	51.16	0.00	40.57	51.95	0.00	66.67	50.00	60.31	41.49	52.00	47.03	

**Notes to table 1:** All numbers presented are percentages unless otherwise noted. The estimates for the model variables, EARN\_REV, TGT\_REV, STR\_ARG, and UND\_HLD, are means of the respective variables not percentages. They are defined as follows:  $EARN\_REV_{j,t}$  = percentage change in the analyst's projected earnings forecast for firm j at time t computed as  $[(\text{earnings forecast at time } t / \text{earnings forecast at time } t-1) - 1]$ ;  $TGT\_REV_{j,t}$  = percentage change in the analyst's projected price target for firm j at time t computed as  $[(\text{price target at time } t / \text{price target at time } t-1) - 1]$ ;  $STR\_ARG_{j,t}$  = a variable computed by aggregating the number of positive remarks less the number of negative remarks related to 14 specific criteria: revenue growth, earnings growth, new product introductions, new projects, cost efficiencies, expectations met, mergers and acquisitions, repurchase programs, industry climate, management, international operations, leverage, competition, and risk;  $UND\_HLD_{j,t}$  = a variable taking on the value 0 if no relationship between the analyst's brokerage and the firm exists, 1 if the brokerage is an underwriter of the firm or has current holdings in the firm, and 2 if the brokerage is both an underwriter and has current holdings; and  $CAR_{j,t}$  = five-day market adjusted cumulative abnormal return for firm j centered on the report release date. The firm specific variables analyzed are SIZE = the market value reported by CRSP (log of market value is used in OLS regressions); ANALYSTS = the number of analysts following the firm as reported by ZAKS; and MKT\_BK is the firm's market-to-book ratio. The INFORMATION ANNOUNCEMENTS categories are press releases that occur within plus or minus four days from the analyst report. They are defined as follows; Earnings Announcements = quarterly company announcement regarding earnings; Dividend Changes = company announcement regarding increase or decrease in dividend amount; Stock Splits = announcement regarding stock splits or stock dividends; Changes in Expectations = announcement regarding changes in future expectations; Mergers & Divestitures = announcement of change or possible change in corporate business structure through a merger or divestiture; Lawsuits = announcement regarding a new, ongoing, or completed company lawsuit involving the company; Debt Rating Changes = announcement regarding debt rating change by a major rating agency; Debt Financing = announcement regarding new financing or change in debt level; Equity Financing = announcement regarding stock issuance or buyback; Management Change = company announcement regarding significant changes in senior management; New Products / Projects = announcement regarding the development, approval, or marketing of a new product or investment project; New Contracts / Clients = announcement regarding significant new corporate partnership or client business; and Other = other significant announcement. NO OTHER ANNOUNCEMENTS is the percentage of analyst reports without any press releases within plus or minus four days. The percentage of announcements may be greater than 100% because of multiple announcements or more than one type of information released in single announcements. Up, Reit, and Down refer to upgrades, reiterations, and downgrades.

**TABLE 2**

**Pearson / Spearman Correlation Coefficients**

	UP_GR		DOWN_GR		REIT		CAR		EARN_REV		TGT_REV		STR_ARG		UND_HLD
UP_GR							0.2721 *** <.0001		0.0980 ** 0.0152		0.2062 *** <.0001		0.2685 *** <.0001		-0.1570 *** <.0001
DOWN_GR							-0.2994 *** <.0001		-0.0560 0.1663		-0.2777 *** <.0001		-0.2784 *** <.0001		-0.1160 *** 0.0023
REIT							-0.0572 0.1329		-0.0464 0.2516		0.0163 0.7470		-0.0671 * 0.0780		0.2121 *** <.0001
CAR	0.3068 *** <.0001		-0.2514 *** <.0001		-0.1180 *** 0.0019				0.1130 *** 0.0051		0.4266 *** <.0001		0.3343 *** <.0001		-0.0330 0.3872
EARN_REV	0.1285 *** 0.0014		-0.1459 *** 0.0003		-0.0129 0.7492		0.1883 *** <.0001				0.2312 *** <.0001		0.1728 *** <.0001		-0.0288 0.4769
TGT_REV	0.2594 *** <.0001		-0.2635 *** <.0001		-0.0376 0.4573		0.2945 *** <.0001		0.2966 *** <.0001				0.3720 *** <.0001		-0.0331 0.5127
STR_ARG	0.2466 *** <.0001		-0.2507 *** <.0001		-0.0646 * 0.0894		0.3002 *** <.0001		0.4006 *** <.0001		0.3619 *** <.0001				0.0304 0.4252
UND_HLD	-0.1260 *** 0.0009		-0.1031 *** 0.0067		0.1765 *** <.0001		-0.0425 0.2643		0.0116 0.7745		-0.0235 0.6413		0.0450 0.2371		

**Notes to table 2:** This table presents the Pearson (upper triangle) and Spearman (lower triangle) correlations for the following variables: UP\_GR<sub>j,t</sub> = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been upgraded, 0 otherwise; DOWN\_GR<sub>j,t</sub> = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been downgraded, 0 otherwise; REIT<sub>j,t</sub> = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been reiterated, 0 otherwise; CAR<sub>j,t</sub> = five-day market adjusted cumulative abnormal return for firm j centered on the report release date t; EARN\_REV<sub>j,t</sub> = percentage change in the analyst's projected earnings forecast for firm j at time t computed as [(earnings forecast at time t / earnings forecast at time t-1) - 1]; TGT\_REV<sub>j,t</sub> = percentage change in the analyst's projected price target for firm j at time t computed as [(price target at time t / price target at time t-1) - 1]; STR\_ARG<sub>j,t</sub> = a variable computed aggregating the number of positive remarks less the number of negative remarks related to 14 specific criteria: revenue growth, earnings growth, new product introductions, new projects, cost efficiencies, expectations met, mergers and acquisitions, repurchase programs, industry climate, management, international operations, leverage, competition, and risk; UND\_HLD<sub>j,t</sub> = a variable taking on the value 0 if no relationship between the analyst's brokerage and the firm exists, 1 if the brokerage is an underwriter of the firm or has current holdings in the firm, and 2 if the brokerage is both an underwriter and has current holdings; P-values are listed below the correlation numbers. \* one-tailed probability < 0.10; \*\* one-tailed probability < 0.05; \*\*\* one-tailed probability < 0.01.



**TABLE 3**

**The Market's Reaction to the Release of a Security Analyst Report: Regression Results on Earnings forecast revisions, Recommendations, Price Target Revisions, Argument Strength, and Affiliation**

Variable	Predicted Sign	(1)	(2)	(2A)	(3)	(4)	(4A)	(5)	(5A)
INTERCEPT	?	-0.0029 (-0.78)	-0.0044 (-1.12)		-0.0018 (-0.40)	-0.0009 (-0.18)		-0.0211 * (-1.70)	
EARN_REV	+	0.0545 *** (2.81)				0.0804 ** (2.27)		0.0618 * (1.77)	
UP_GR	+		0.0517 *** (6.40)			0.0283 ** (2.24)		0.0222 * (1.76)	
DOWN_GR	-		-0.0850 *** (-7.31)			-0.0494 *** (-3.09)		-0.0340 ** (-2.10)	
Upgrade ( $\alpha_0+\alpha_2$ )	+			0.0473 *** (44.84)			0.0274 ** (5.52)		0.0011 (0.00)
Downgrade ( $\alpha_0+\alpha_3$ )	-			-0.0894 *** (66.77)			-0.0503 *** (11.09)		-0.0551 *** (10.69)
TGT_REV	+				0.3191 *** (9.34)	0.2552 *** (7.06)		0.2116 *** (5.76)	
STR_ARG	+							0.0104 *** (4.40)	
UND_HLD	-							-0.0011 (-0.16)	
Adjusted R <sup>2</sup>		0.0112 *** (7.91)	0.1382 *** (56.40)		0.1799 *** (87.21)	0.2193 *** (28.38)		0.2529 *** (23.00)	
N		612	691		393	390		390	

**Notes to table 3:** This table presents the results of estimating the following regression using ordinary least squares:  $CAR_{j,t} = \alpha_0 + \alpha_1 EARN\_REV_{j,t} + \alpha_2 UP\_GR_{j,t} + \alpha_3 DOWN\_GR_{j,t} + \alpha_4 TGT\_REV_{j,t} + \alpha_5 STR\_ARG_{j,t} + \alpha_6 UND\_HLD_{j,t} + \epsilon_{j,t}$  where the variables are defined as follows:  $CAR_{j,t}$  = five-day market adjusted cumulative abnormal return for firm j centered on the report release date t;  $EARN\_REV_{j,t}$  = percentage change in the analyst's projected earnings forecast for firm j at time t computed as [(earnings forecast at time t / earnings forecast at time t-1) - 1];  $UP\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been upgraded, 0 otherwise;  $DOWN\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been downgraded, 0 otherwise;  $TGT\_REV_{j,t}$  = percentage change in the analyst's projected price target for firm j at time t computed as [(price target at time t / price target at time t-1) - 1];  $STR\_ARG_{j,t}$  = a variable computed aggregating the number of positive remarks less the number of negative remarks related to 14 specific criteria: revenue growth, earnings growth, new product introductions, new projects, cost efficiencies, expectations met, mergers and acquisitions, repurchase programs, industry climate, management, international operations, leverage, competition, and risk;  $UND\_HLD_{j,t}$  = a variable taking on the value 0 if no relationship between the analyst's brokerage and the firm exists, 1 if the brokerage is an underwriter of the firm or has current holdings in the firm, and 2 if the brokerage is both an underwriter and has current holdings;  $\epsilon_{j,t}$  = assumed normally distributed error term with zero mean and constant variance. t-statistics are below the estimated coefficients. F-statistics are below the adjusted  $R^2$  and the aggregated coefficient estimates in columns 2A, 4A and 5A. \* one-tailed probability < 0.10; \*\* one-tailed probability < 0.05; \*\*\* one-tailed probability < 0.01.

**TABLE 4**

**The Market's Reaction to the Release of a Security Analyst Report: Regression Results on Earnings forecast revisions, Recommendations, Price Target Revisions, Argument Strength by Justification Category, and Affiliation**

Variable	Predicted Sign		
INTERCEPT	?	-0.0072	(-0.49)
EARN_REV	+	0.0655	(1.77) **
UP_GR	+	0.0294	(2.18) **
DOWN_GR	-	-0.0368	(-2.04) **
TGT_REV	+	0.1884	(4.83) ***
<b>STR_ARG</b>			
Revenues (Inc)	+	0.0011	(0.11)
Revenues (Dec)	-	-0.0686	(-2.31) **
Earnings (Inc)	+	-0.0057	(-0.58)
Earnings (Dec)	-	-0.0418	(-1.92) **
Product Intro (Pos)	+	0.0050	(0.45)
Product Intro (Neg)	-	-0.0727	(-1.47) *
New Projects (Pos)	+	0.0288	(1.97) **
New Projects (Neg)	-	0.0030	(0.07)
Cost Efficiencies	+	0.0026	(0.23)
Cost Inefficiencies	-	-0.0009	(-0.06)
Expectations Met	+	0.0156	(1.51) *
Expectations Not Met	-	-0.0463	(-2.79) ***
M&A Activity (Pos)	+	-0.0093	(-0.67)
M&A Activity (Neg)	-	0.0250	(0.41)
Repurchases (Pos)	+	0.0270	(1.85) **
Repurchases (Neg)	-	0.0048	(0.07)
Industry Climate (Pos)	+	0.0153	(1.17)
Industry Climate (Neg)	-	-0.0223	(-1.11)
Management (Pos)	+	0.0074	(0.69)
Management (Neg)	-	0.0689	(1.85) **
International Ops (Pos)	+	0.0103	(0.91)
International Ops (Neg)	-	-0.0417	(-1.45) *
Leverage (Pos)	+	-0.0178	(-0.90)
Leverage (Neg)	-	-0.0048	(-0.22)
Competition (Pos)	+	-0.0071	(-0.49)
Competition (Neg)	-	-0.0254	(-1.04)
Risk (Pos)	+	0.0355	(2.16) **
Risk (Neg)	-	-0.0207	(-1.04)
UND_HLD	-	0.0011	(0.15)
Adjusted R <sup>2</sup>		0.2756	(5.50) ***
N		390	

**Notes to table 4:** This table presents the results of estimating the following regression using ordinary least squares:  $CAR_{j,t} = \alpha_0 + \alpha_1 EARN\_REV_{j,t} + \alpha_2 UP\_GR_{j,t} + \alpha_3 DOWN\_GR_{j,t} + \alpha_4 TGT\_REV_{j,t} + \alpha_5 STR\_ARG_{j,t} + \alpha_6 UND\_HLD_{j,t} + \varepsilon_{j,t}$  where the variables are defined as follows:  $CAR_{j,t}$  = five-day market adjusted cumulative abnormal return for firm j centered on the report release date t;  $EARN\_REV_{j,t}$  = percentage change in the analyst's projected earnings forecast for firm j at time t computed as [(earnings forecast at time t / earnings forecast at time t-1) - 1];  $UP\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been upgraded, 0 otherwise;  $DOWN\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been downgraded, 0 otherwise;  $TGT\_REV_{j,t}$  = percentage change in the analyst's projected price target for firm j at time t computed as [(price target at time t / price target at time t-1) - 1];  $STR\_ARG_{j,t}$  = a variable computed aggregating the number of positive remarks less the number of negative remarks related to 14 specific criteria: revenue growth, earnings growth, new product introductions, new projects, cost efficiencies, expectations met, mergers and acquisitions, repurchase programs, industry climate, management, international operations, leverage, competition, and risk;  $UND\_HLD_{j,t}$  = a variable taking on the value 0 if no relationship between the analyst's brokerage and the firm exists, 1 if the brokerage is an underwriter of the firm or has current holdings in the firm, and 2 if the brokerage is both an underwriter and has current holdings;  $\varepsilon_{j,t}$  = assumed normally distributed error term with zero mean and constant variance. t-statistics are below the estimated coefficients. F-statistics are below the adjusted  $R^2$  and the aggregated coefficient estimates in columns 2A, 4A and 5A. \* one-tailed probability < 0.10; \*\* one-tailed probability < 0.05; \*\*\* one-tailed probability < 0.01.

**TABLE 5**

**The Market's Reaction to the Release of a Security Analyst Report: Regression Results on Earnings forecast revisions, Recommendations, Price Target Revisions, Argument Strength, Affiliation, and Firm Size**

Variable	Predicted Sign					
		(1)	(2)	(3)	(4)	(5)
INTERCEPT	?	-0.0028 (-0.74)	-0.0044 (-1.14)	0.0015 (0.35)	0.0024 (0.49)	-0.0214 * (-1.77)
EARN_REV	+	0.2770 *** (3.52)			0.1194 (0.71)	0.1582 (0.96)
EARN_REV x SIZE	+	-0.0280 *** (-2.92)			-0.0120 (-0.49)	-0.0205 (-0.85)
UP_GR	+		0.0680 * (1.85)		-0.0606 (-1.00)	-0.0863 (-1.35)
UP_GR x SIZE	+		-0.0020 (-0.45)		0.0110 (1.52)	0.0133 * (1.76)
DOWN_GR	-		-0.2947 *** (-5.80)		-0.1401 * (-1.90)	-0.1124 (-1.50)
DOWN_GR x SIZE	-		0.0260 *** (4.24)		0.011 (1.20)	0.0092 (1.03)
TGT_REV	+			1.0787 *** (8.32)	0.9431 *** (6.17)	0.8402 *** (5.27)
TGT_REV x SIZE	+			-0.1008 *** (-6.05)	-0.0912 *** (-4.70)	-0.0834 *** (-4.16)
STR_ARG	+					0.0175 * (1.78)
STR_ARG x SIZE	+					-0.0009 (-0.74)
UND_HLD	-					0.0030 (0.16)
UND_HLD x SIZE	-					-0.0001 (-0.05)
Adjusted R <sup>2</sup>		0.0232 *** (8.25)	0.1580 *** (33.36)	0.2484 *** (65.78)	0.2875 *** (20.62)	0.3184 *** (16.14)
N		611	690	392	389	389

**Notes to table 5:** This table presents the results of estimating the following regression using ordinary least squares and SIZE cross products:  $CAR_{j,t} = \alpha_0 + \alpha_1 EARN\_REV_{j,t} + \alpha_2 UP\_GR_{j,t} + \alpha_3 DOWN\_GR_{j,t} + \alpha_4 TGT\_REV_{j,t} + \alpha_5 STR\_ARG_{j,t} + \alpha_6 UND\_HLD_{j,t} + \varepsilon_{j,t}$  where the variables are defined as follows:  $CAR_{j,t}$  = five-day market adjusted cumulative abnormal return for firm j centered on the report release date t;  $EARN\_REV_{j,t}$  = percentage change in the analyst's projected earnings forecast for firm j at time t computed as [(earnings forecast at time t / earnings forecast at time t-1) - 1];  $UP\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been upgraded, 0 otherwise;  $DOWN\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been downgraded, 0 otherwise;  $TGT\_REV_{j,t}$  = percentage change in the analyst's projected price target for firm j at time t computed as [(price target at time t / price target at time t-1) - 1];  $STR\_ARG_{j,t}$  = a variable computed aggregating the number of positive remarks less the number of negative remarks related to 14 specific criteria: revenue growth, earnings growth, new product introductions, new projects, cost efficiencies, expectations met, mergers and acquisitions, repurchase programs, industry climate, management, international operations, leverage, competition, and risk;  $UND\_HLD_{j,t}$  = a variable taking on the value 0 if no relationship between the analyst's brokerage and the firm exists, 1 if the brokerage is an underwriter of the firm or has current holdings in the firm, and 2 if the brokerage is both an underwriter and has current holdings; SIZE = the log of market value as reported by CRSP.  $\varepsilon_{j,t}$  = assumed normally distributed error term with zero mean and constant variance. t-statistics are below the estimated coefficients. F-statistics are below the adjusted R<sup>2</sup> and the aggregated coefficient estimates in columns 2A, 4A and 5A. \* one-tailed probability < 0.10; \*\* one-tailed probability < 0.05; \*\*\* one-tailed probability < 0.01.

**TABLE 6**

**The Market's Reaction to the Release of a Security Analyst Report: Regression Results on Earnings forecast revisions, Recommendations, Price Target Revisions, Argument Strength, Affiliation, and Firm Specific Variables**

	Predicted Sign	Size (1)	Number of Analysts (2)	Market-to-Book (3)
INTERCEPT	?	-0.0214 * (-1.77)	-0.0226 * (-1.80)	-0.0198 (-1.58)
EARN_REV	+	0.1582 (0.96)	0.0878 ** (1.83)	0.0387 (1.06)
EARN_REV x FACTOR <sup>#</sup>	+	-0.0205 (-0.85)	-0.0030 (-0.66)	0.0113 * (1.66)
UP_GR	+	-0.0863 (-1.35)	-0.0016 (-0.08)	0.0117 (0.65)
UP_GR x FACTOR <sup>#</sup>	+	0.0133 * (1.76)	0.0022 (1.44)	0.0024 (0.95)
DOWN_GR	-	-0.1124 (-1.50)	-0.0219 (-0.79)	0.0017 (0.08)
DOWN_GR x FACTOR <sup>#</sup>	-	0.0092 (1.03)	-0.0013 (-0.69)	-0.0092 *** (-2.65)
TGT_REV	+	0.8402 *** (5.27)	0.3650 *** (6.26)	0.2992 *** (5.53)
TGT_REV x FACTOR <sup>#</sup>	+	-0.0834 *** (-4.16)	-0.0138 *** (-3.24)	-0.0130 ** (-2.34)
STR_ARG	+	0.0175 * (1.78)	0.0103 *** (2.77)	0.0115 *** (3.66)
STR_ARG x FACTOR <sup>#</sup>	+	-0.0009 (-0.74)	0.0000 (0.08)	-0.0004 (-1.04)
UND_HLD	-	0.0030 (0.16)	0.0047 (0.51)	-0.0048 (-0.60)
UND_HLD x FACTOR <sup>#</sup>	-	-0.0001 (-0.05)	-0.0003 (-0.63)	0.0011 (1.41)
Adjusted R <sup>2</sup>		0.3184 *** (16.14)	0.2723 *** (13.16)	0.2618 *** (12.50)
N		389	390	389

**Notes to table 6:** This table presents the results of estimating the following regression using ordinary least squares and SIZE, ANALYSTS, or MKT\_BK cross products:  $CAR_{j,t} = \alpha_0 + \alpha_1 EARN\_REV_{j,t} + \alpha_2 UP\_GR_{j,t} + \alpha_3 DOWN\_GR_{j,t} + \alpha_4 TGT\_REV_{j,t} + \alpha_5 STR\_ARG_{j,t} + \alpha_6 UND\_HLD_{j,t} + \varepsilon_{j,t}$  where the variables are defined as follows:  $CAR_{j,t}$  = five-day market adjusted cumulative abnormal return for firm j centered on the report release date t;  $EARN\_REV_{j,t}$  = percentage change in the analyst's projected earnings forecast for firm j at time t computed as [(earnings forecast at time t / earnings forecast at time t-1) - 1];  $UP\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been upgraded, 0 otherwise;  $DOWN\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been downgraded, 0 otherwise;  $TGT\_REV_{j,t}$  = percentage change in the analyst's projected price target for firm j at time t computed as [(price target at time t / price target at time t-1) - 1];  $STR\_ARG_{j,t}$  = a variable computed aggregating the number of positive remarks less the number of negative remarks related to 14 specific criteria: revenue growth, earnings growth, new product introductions, new projects, cost efficiencies, expectations met, mergers and acquisitions, repurchase programs, industry climate, management, international operations, leverage, competition, and risk;  $UND\_HLD_{j,t}$  = a variable taking on the value 0 if no relationship between the analyst's brokerage and the firm exists, 1 if the brokerage is an underwriter of the firm or has current holdings in the firm, and 2 if the brokerage is both an underwriter and has current holdings; SIZE = the log of market value as reported by CRSP; ANALYSTS = the number of analysts following the firm as reported by Zacks; MKT\_BK is the firm's market-to-book ratio;  $\varepsilon_{j,t}$  = assumed normally distributed error term with zero mean and constant variance. # Factor is SIZE in Column 1, Factor is ANALYSTS in Column 2, and Factor is MKT\_BK in Column 3. t-statistics are below the estimated coefficients. F-statistics are below the adjusted R<sup>2</sup> and the aggregated coefficient estimates in columns 2A, 4A and 5A. \* one-tailed probability < 0.10; \*\* one-tailed probability < 0.05; \*\*\* one-tailed probability < 0.01.



**TABLE 7**

**The Market's Reaction to the Release of a Security Analyst Report on the Sample with no Simultaneous Announcements:  
Regression Results on Earnings forecast revisions, Recommendations, Price Target Revisions, Argument Strength, and Affiliation**

Variable	Predicted Sign	(1)	(2)	(2A)	(3)	(4)	(4A)	(5)	(5A)
INTERCEPT	?	-0.0048 (-0.93)	-0.0071 (-1.24)		-0.0062 (-1.04)	-0.0058 (-0.85)		-0.0211 (-1.30)	
EARN_REV	+	0.0310 * (1.47)				0.0507 * (1.41)		0.0471 * (1.95)	
UP_GR	+		0.0497 *** (6.19)			0.0316 ** (2.28)		0.0259 * (1.32)	
DOWN_GR	-		-0.0939 *** (-7.33)			-0.0724 *** (-3.33)		-0.0589 *** (-2.62)	
Upgrade ( $\alpha_0+\alpha_2$ )	+			0.0426 *** (24.64)			0.0258 ** (4.40)		0.0048 (0.07)
Downgrade ( $\alpha_0+\alpha_3$ )	-			-0.1010 *** (43.71)			-0.0782 *** (14.67)		-0.0800 *** (10.72)
TGT_REV	+				0.2756 *** (6.43)	0.2123 *** (4.93)		0.1962 *** (4.49)	
STR_ARG	+							0.0067 ** (2.19)	
UND_HLD	-							0.0011 (0.12)	
Adjusted R <sup>2</sup>		0.0040 (2.15)	0.1717 *** (34.89)		0.1731 *** (41.41)	0.2477 *** (16.89)		0.2591 *** (12.25)	
N		285	327		193	193		193	

**Notes to table 7:** This table presents the results of estimating the following regression using ordinary least squares:  $CAR_{j,t} = \alpha_0 + \alpha_1 EARN\_REV_{j,t} + \alpha_2 UP\_GR_{j,t} + \alpha_3 DOWN\_GR_{j,t} + \alpha_4 TGT\_REV_{j,t} + \alpha_5 STR\_ARG_{j,t} + \alpha_6 UND\_HLD_{j,t} + \varepsilon_{j,t}$  where the variables are defined as follows:  $CAR_{j,t}$  = five-day market adjusted cumulative abnormal return for firm j centered on the report release date t;  $EARN\_REV_{j,t}$  = percentage change in the analyst's projected earnings forecast for firm j at time t computed as [(earnings forecast at time t / earnings forecast at time t-1) - 1];  $UP\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been upgraded, 0 otherwise;  $DOWN\_GR_{j,t}$  = a variable taking on the value 1 for reports issued for firm j at time t that indicates the analyst's recommendation has been downgraded, 0 otherwise;  $TGT\_REV_{j,t}$  = percentage change in the analyst's projected price target for firm j at time t computed as [(price target at time t / price target at time t-1) - 1];  $STR\_ARG_{j,t}$  = a variable computed aggregating the number of positive remarks less the number of negative remarks related to 14 specific criteria: revenue growth, earnings growth, new product introductions, new projects, cost efficiencies, expectations met, mergers and acquisitions, repurchase programs, industry climate, management, international operations, leverage, competition, and risk;  $UND\_HLD_{j,t}$  = a variable taking on the value 0 if no relationship between the analyst's brokerage and the firm exists, 1 if the brokerage is an underwriter of the firm or has current holdings in the firm, and 2 if the brokerage is both an underwriter and has current holdings;  $\varepsilon_{j,t}$  = assumed normally distributed error term with zero mean and constant variance. t-statistics are below the estimated coefficients. F-statistics are below the adjusted  $R^2$  and the aggregated coefficient estimates in columns 2A, 4A and 5A. \* one-tailed probability < 0.10; \*\* one-tailed probability < 0.05; \*\*\* one-tailed probability < 0.01.

**TABLE 8**

**The Market Reaction to the Release of a Security Analyst Report:  
The Effects of Recommendation Revision Type on the Sample with no Simultaneous Announcements**

Variable	Reiterations			Upgrades			Downgrades		
	Predicted Sign	Coefficient	t-stat	Predicted Sign	Coefficient	F-stat	Predicted Sign	Coefficient	F-stat
Intercept	?	$\gamma_0$ -0.0235	(-1.20)						
Upgrade				+	$\gamma_0 + \gamma_2$ 0.0712	*** (6.86)			
Downgrade							-	$\gamma_0 + \gamma_3$ 0.0454	(0.71)
EARN_REV	+	$\gamma_1$ 0.0199	(0.55)	+	$\gamma_1 + \gamma_7$ 0.0949	(0.36)	+	$\gamma_1 + \gamma_8$ 0.0684	(0.47)
TGT_REV	+	$\gamma_4$ 0.1198	** (2.34)	+	$\gamma_4 + \gamma_9$ -0.0257	(0.08)	+	$\gamma_4 + \gamma_{10}$ 0.5074	*** (19.98)
STR_ARG	+	$\gamma_5$ 0.0081	** (2.40)	+	$\gamma_5 + \gamma_{11}$ -0.0094	* (2.35)	+	$\gamma_5 + \gamma_{12}$ 0.0255	** (5.50)
UND_HLD	-	$\gamma_6$ 0.0022	(0.19)	-	$\gamma_6 + \gamma_{13}$ -0.0013	(0.01)	-	$\gamma_6 + \gamma_{14}$ -0.0529	** (2.77)
Adjusted R <sup>2</sup>	0.3822	***							
F-stat	(9.53)								
N	193								

*Notes to table 8:* This table presents the results of estimating the following regression using ordinary least squares:  $CAR_{j,t} = \gamma_0 + \gamma_1 EARN\_REV_{j,t} + \gamma_2 UP\_GR_{j,t} + \gamma_3 DOWN\_GR_{j,t} + \gamma_4 TGT\_REV_{j,t} + \gamma_5 STR\_ARG_{j,t} + \gamma_6 UND\_HLD_{j,t} + \gamma_7 EARN\_REV_{j,t} * UP\_GR_{j,t} + \gamma_8 EARN\_REV_{j,t} * DOWN\_GR_{j,t} + \gamma_9 TGT\_REV_{j,t} * UP\_GR_{j,t} + \gamma_{10} TGT\_REV_{j,t} * DOWN\_GR_{j,t} + \gamma_{11} STR\_ARG_{j,t} * UP\_GR_{j,t} + \gamma_{12} STR\_ARG_{j,t} * DOWN\_GR_{j,t} + \gamma_{13} UND\_HLD_{j,t} * UP\_GR_{j,t} + \gamma_{14} UND\_HLD_{j,t} * DOWN\_GR_{j,t} + \xi_{j,t}$ . See notes to table 2 for variable definitions. t-statistics are to the right of the estimated reiteration coefficients. F-statistics are to the right of the aggregated coefficient estimates for upgrades and downgrades. The adjusted R<sup>2</sup> and associated F-statistic is for the entire regression in Eq. (2). \* one-tailed probability < 0.10; \*\* one-tailed probability < 0.05; \*\*\* one-tailed probability < 0.01.

**TABLE 9: Panel A**  
**Percentage of Reports Achieving 12-Month Price Targets by Recommendation Type**

	Target Achieved	Target Achieved In:				N
		1 to 3 Months	4 to 6 Months	7 to 9 Months	10 to 12 Months	
<b>All</b>	<b>54.28</b>	<b>30.81</b>	<b>13.21</b>	<b>5.62</b>	<b>4.64</b>	<b>818</b>
Upgrades	57.37	25.50	17.13	7.17	7.57	251
Reiterations	50.72	30.93	11.55	5.15	3.09	485
Downgrades	65.85	46.34	10.98	3.66	4.88	82
<b>Strong Buy</b>	<b>45.12</b>	<b>17.99</b>	<b>17.07</b>	<b>4.57</b>	<b>5.49</b>	<b>328</b>
Upgrades	50.00	16.43	20.00	7.14	6.43	140
Reiterations	41.49	19.15	14.89	2.66	4.79	188
<b>Buy</b>	<b>57.14</b>	<b>35.48</b>	<b>11.67</b>	<b>7.38</b>	<b>2.62</b>	<b>420</b>
Upgrades	66.97	36.70	13.76	11.93	4.59	109
Reiterations	54.81	36.67	10.00	6.30	1.85	270
Downgrades	46.34	24.39	17.07	2.44	2.44	41
<b>Hold</b>	<b>77.61</b>	<b>61.2</b>	<b>4.48</b>	<b>7.46</b>	<b>4.48</b>	<b>67</b>
Upgrades	50.00	50.00	0.00	0.00	0.00	2
Reiterations	73.08	53.85	3.85	11.54	3.85	26
Downgrades	84.62	69.23	5.13	5.13	5.13	39
<b>Sell</b>	<b>100.00</b>	<b>100.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>1</b>
Reiterations	100.00	100.00	0.00	0.00	0.00	1
<b>Strong Sell</b>	<b>100.00</b>	<b>50.00</b>	<b>0.00</b>	<b>0.00</b>	<b>50.00</b>	<b>2</b>
Downgrades	100.00	50.00	0.00	0.00	50.00	2

*Notes to table 9, Panel A:* This table presents the percentage of reports achieving 12-month price targets. The data is summarized by recommendation type: strong buy, buy, hold, sell, or strong sell, and by change in recommendation type: upgrade, reiteration, or downgrade.

**TABLE 9: Panel B**  
**12-Month Price Maximums / Minimums and Predicted Price Targets (%)**

	<b>Target Missed</b>	<b>N</b>	<b>Target Achieved</b>	<b>N</b>	<b>Full Sample</b>	<b>N</b>
<b><i>All</i></b>	<b>84.38</b>	<b>374</b>	<b>137.27</b>	<b>444</b>	<b>113.09</b>	<b>818</b>
Upgrades	88.05	107	130.86	144	112.61	251
Reiterations	82.50	239	140.07	246	111.70	485
Downgrades	86.37	28	141.59	54	122.74	82
<b><i>Strong Buy</i></b>	<b>83.20</b>	<b>181</b>	<b>129.30</b>	<b>147</b>	<b>103.86</b>	<b>328</b>
Upgrades	87.20	71	127.53	69	107.08	140
Reiterations	80.61	110	130.86	78	101.46	188
<b><i>Buy</i></b>	<b>85.21</b>	<b>179</b>	<b>141.43</b>	<b>241</b>	<b>117.47</b>	<b>420</b>
Upgrades	90.39	35	133.34	74	119.55	109
Reiterations	83.61	122	146.48	148	118.07	270
Downgrades	85.83	22	133.54	19	107.94	41
<b><i>Hold</i></b>	<b>89.00</b>	<b>14</b>	<b>141.76</b>	<b>53</b>	<b>130.74</b>	<b>67</b>
Upgrades	66.51	1	176.95	1	121.73	2
Reiterations	92.75	7	128.37	19	118.78	26
Downgrades	88.34	6	148.41	33	139.17	39
<b><i>Sell</i></b>	<b>NA</b>	<b>NA</b>	<b>131.63</b>	<b>1</b>	<b>131.63</b>	<b>1</b>
Reiterations	NA	NA	131.63	1	131.63	1
<b><i>Strong Sell</i></b>	<b>NA</b>	<b>NA</b>	<b>105.64</b>	<b>2</b>	<b>105.64</b>	<b>2</b>
Downgrades	NA	NA	105.64	2	105.64	2

*Notes to table 9, Panel B:* This table presents the average percentage maximum and minimum stock price, as compared to the stock price on the date of the analyst report, within 12 months. Maximums are calculated if the target price exceeds the current price and minimums are calculated if the target price is below the current price. The data is broken up into target missed and target achieved categories.

**TABLE 10****Percentage of Reports Achieving 12-Month Price Targets by Valuation Methodology**

	Target Achieved	Target Achieved In:				N
		1 to 3 Months	4 to 6 Months	7 to 9 Months	10 to 12 Months	
<b><i>All</i></b>						
Price to Earnings	54.36	31.10	13.02	6.70	3.54	791
Relative Price to Earnings	53.03	27.58	14.84	6.07	4.54	330
EBITDA	48.39	25.35	11.06	6.91	5.07	245
Revenue Multiples	55.05	24.77	17.44	8.25	4.59	109
Discounted Cash Flow	52.34	24.30	16.83	6.54	4.67	107
EVA	35.00	25.00	5.00	5.00	0.00	20
Price to Book	45.45	22.72	10.10	8.08	4.55	198
Other Models	37.21	18.61	9.30	6.97	2.33	43
<b><i>Upgrades</i></b>						
Price to Earnings	57.61	25.92	17.70	10.29	3.70	243
Relative Price to Earnings	53.03	21.97	16.67	9.84	4.55	132
EBITDA	53.93	21.35	15.73	11.23	5.62	89
Revenue Multiples	50.00	14.29	28.57	7.14	0.00	14
Discounted Cash Flow	52.78	11.11	25.00	13.89	2.78	36
EVA	33.33	0.00	0.00	33.33	0.00	3
Price to Book	59.32	22.03	22.04	8.47	6.78	59
Other Models	63.64	18.19	18.18	27.27	0.00	11
<b><i>Reiterations</i></b>						
Price to Earnings	51.07	31.63	10.89	5.34	3.21	468
Relative Price to Earnings	48.82	27.06	14.11	3.53	4.12	170
EBITDA	36.27	18.62	8.83	3.92	4.90	102
Revenue Multiples	59.77	27.59	17.24	9.19	5.75	87
Discounted Cash Flow	46.43	21.43	14.29	3.57	7.14	56
EVA	28.57	21.43	7.14	0.00	0.00	14
Price to Book	37.80	21.26	4.73	8.66	3.15	127
Other Models	17.86	10.72	3.57	0.00	3.57	28
<b><i>Downgrades</i></b>						
Price to Earnings	63.75	43.75	11.25	3.75	5.00	80
Relative Price to Earnings	78.57	57.14	10.72	3.57	7.14	28
EBITDA	76.92	65.38	3.85	3.84	3.85	26
Revenue Multiples	12.50	12.50	0.00	0.00	0.00	8
Discounted Cash Flow	73.32	66.66	6.66	0.00	0.00	15
EVA	66.67	66.67	0.00	0.00	0.00	3
Price to Book	58.33	41.66	8.34	0.00	8.33	12
Other Models	75.00	50.00	25.00	0.00	0.00	4

**Notes to table 10:** This table presents the percentage of reports achieving 12-month price targets and a break down of how quickly the price target is achieved. The data is summarized by valuation methodology; Price to Earnings = ratio of current stock price divided by current EPS; Relative Price to Earnings = Price to Earnings multiple relative to a stock or industry index; EBITDA = multiple of earnings before interest, taxes, depreciation, and amortization; Revenue Multiples = multiples of company revenue; Discounted Cash Flow = model calculating the present value of predicted future cash flow; EVA = enterprise value added model discounting predicted future cash flow; Price to Book = current stock price divided by stock book value; and Other Models = other models not mentioned above, i.e. those specific to investment bank, industry analysis, or analyst.