Do financial analysts' long-term growth forecasts matter? Evidence from stock recommendations and career outcomes

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ABSTRACT: Prior literature refers to economic incentives to generate investment banking business and trading commissions as explanations for analyst publication of forecasts of firms' long-term earnings growth (LTG). Prior research also documents wildly optimistic LTG forecasts and a negative relation between LTG forecasts and subsequent excess returns. Thus, the literature portrays analysts' LTG forecasts as nonsensical from a valuation perspective. We introduce and investigate a new perspective on the value-relevance of analyst publication of LTG forecasts. We hypothesize that analysts issuing LTG forecasts signal relatively high effort and ability in developing perspective of the subject firms' long-term prospects. Consistent with this hypothesis, we find that the stock market responds more strongly to the stock recommendation revisions of analysts who publish accompanying LTG forecasts. In addition, we hypothesize and find that analysts issuing LTG forecasts are less likely to leave the profession or move to smaller brokerage houses. Consistent with Reg. FD's intention to restrict analyst access to insider information and promote fundamental analysis of the valuation implications of firms' long-term prospects, we find that post-Reg. FD observations drive most of our results. Overall, we identify previously undocumented benefits accruing to analysts who publish LTG forecasts.

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1. Introduction

This paper investigates whether analysts who choose to issue long-term growth forecasts signal effective effort to gain value-relevant perspective of the long-term prospects of the firms they follow. We hypothesize that, if so, the stock recommendations of these analysts yield a greater market response and the analysts have better career prospects than analysts who choose not to issue long-term growth (hereafter LTG) forecasts. We find results generally consistent with our hypotheses. Thus, we identify previously undocumented benefits accruing to analysts who issue LTG forecasts.

Prior literature generally demonstrates that LTG forecasts are optimistically biased, grossly inaccurate and, from a valuation perspective, essentially meaningless (e.g., La Porta 1996; Chan et al. 2003; Barniv et al. 2009). Research suggests that optimism in analysts' forecasts reflects analysts' opportunistic incentives to stimulate investment banking business, generate trading commissions and gain access to managers' private information (e.g., Francis and Philbrick 1993; Lin and McNichols 1998; Cowen et al. 2006). Chan et al. (2003) show that after accounting for dividend yield differences, analysts do not effectively distinguish firms with high versus low future earnings growth rates. Bradshaw (2004) and Barniv et al. (2009) document that analysts' consensus LTG forecasts largely explain the variation in consensus stock recommendations, but trading strategies consistent with those recommendations do not generate positive stock returns.[1] In fact, La Porta (1996), Bradshaw (2004), and Barniv et al. (2009) report that LTG forecasts are *negatively* related to future excess returns. In addition, Liu and Thomas

[1] Other studies of the investment value of stock recommendations provide somewhat mixed results depending on the samples and research designs. The studies generally indicate that trading strategies based on stock recommendations generate positive risk-adjusted returns, but only if implemented promptly on the date of recommendation.

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(2000) find that LTG forecast revisions add little to revisions in forecasts of next year's earnings in explaining the variation in annual returns. Hence, the prior literature suggests that analysts' LTG forecasts potentially lead investors astray. Perhaps consequently, prior studies fail to find a relation between LTG forecast accuracy and analyst compensation (Dechow et al. 2000).[2]

Overall, the extant literature implies that LTG forecasts do not come from a sophisticated process that provides investors with useful information about firms' long-term earnings prospects. Questions that remain puzzling, but unexplored include: why investors are consistently misled by LTG forecasts over many years (e.g., La Porta 1996; Barniv et al. 2009); why *any* or *not all* analysts publish LTG forecasts; and, most puzzling of all, why stock analysts invest effort in a process of producing seemingly nonsensical LTG forecasts and use them in formulating stock recommendations (Bradshaw 2004; Ke and Yu 2009). Our paper attempts to address these issues by introducing a new perspective on the value-relevance of publication of LTG forecasts.

We develop hypotheses as follows. First, the limitation of analysts' time, effort, and resources *and* greater difficulty in forecasting longer-term performance imply that forecasting LTG is costly for all analysts and more costly for less able analysts. The empirical evidence that LTG forecasts issued by Value Line analysts are more accurate than several other metrics computed by Rozeff (1983) and the fact that not all analysts publish LTG forecasts support our description of costs involved in producing and reporting LTG forecasts. Thus, we expect LTG forecast publication to signal analyst ability in generating value-relevant long-term oriented information about firms' prospects. More importantly, we expect the analyst research process that produces LTG forecasts to produce inputs to other summary metrics, such as stock recommendations, that incorporate long-term oriented information, beyond the information in the

[2] See Ramnath et al. (2008a, 2008b) for more extensive reviews of the analyst forecasting literature.

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LTG forecasts themselves.[3] Since stock recommendations are the ultimate product of analysts' research (Schipper 1991), we choose stock recommendations as the primary focus of our study, and hypothesize that stock recommendations accompanied by LTG forecasts are more informative than those unaccompanied by LTG forecasts.

Second, if publication of LTG forecasts signals effort leading to more informative stock recommendations, we expect that analysts exerting such effort have better career prospects. More specifically, we hypothesize that analysts engaging in effort to gain informative long-term perspective of firms' prospects signal such effort with the publication of LTG forecasts and increase (decrease) the probability of upward (downward) mobility in their careers.

Third, if analysts publishing LTG forecasts engage in relatively more informative fundamental analysis of firms' long term prospects we expect the rewards to be greater when regulation precludes access to inside information. Therefore, we hypothesize stronger differential market response to stock recommendations accompanied by LTG forecasts after the October 2000 promulgation of Reg. FD. Similarly, we hypothesize a stronger relation between career outcomes and the publication of LTG forecasts after Reg. FD.

Consistent with the first hypothesis, we find that over the three trading days beginning with the recommendation publication date, the stock market response to recommendation revisions is stronger when the recommendations are accompanied by LTG forecasts and, consistent with our third hypothesis, post-Reg. FD observations drive these results. As described in section 5, these results are robust to a battery of tests that examine alternative explanations, alternative variable specifications, and additional control variables. Section 5 also includes a test

[3] Our review of a random sample of analyst research reports obtained from Investext Plus supports our conjecture. The appendix describes that review in more detail.

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for market inefficiency and we find no evidence of either market overreaction or underreaction to recommendation revisions accompanied by LTG forecasts.

Consistent with our second hypothesis, we find that analysts who issue LTG forecasts are less likely to experience downward mobility and, consistent with our third hypothesis, this result is more pronounced in the post-Reg. FD period. As described in section 5, these results are robust to excluding a period of active consolidation in the brokerage firm industry that likely creates measurement error in our career outcome proxies.

Overall, our evidence is consistent with the inference that issuance of LTG forecasts signals an underlying process whereby analysts effectively gain long-term perspective of the firm's prospects which leads to more value-relevant stock recommendations and greater job security. Our results also suggest that publication of LTG forecasts leads to more efficient resource allocation in capital markets, as market participants recognize and respond to more informative accompanying stock recommendations.

This paper proceeds as follows. Section 2 develops our hypotheses, section 3 describes the models used to test our hypotheses, and section 4 describes the sample and reports the main results. Section 5 provides supplementary test results, and section 6 concludes.

2. Hypotheses

2.1. Value-relevance of stock recommendation revisions (H1)

We investigate whether analysts publishing LTG forecasts engage in a process that uncovers value-relevant information about a firm's long-term prospects. As we describe in the introduction, such a process suggests that stock recommendation revisions accompanied by analysts' LTG forecasts are more informative and, therefore, have a greater contemporaneous impact on stock prices. We examine this research question with the hypothesis below.

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H1: The stock market reacts more strongly to revisions in analysts' stock recommendations accompanied by LTG forecasts published by the same analysts.

2.2. Career outcomes (H2)

If LTG forecast publication reflects analysts' effective effort towards making more value-relevant recommendations, we expect analysts to be rewarded with higher compensation and/or favorable career outcomes. Since we cannot directly observe analyst compensation, following prior literature (e.g., Mikhail et al. 1999; Hong and Kubik 2003), the following hypotheses focus on how the publication of LTG forecasts influences analysts' career outcomes.

H2a: Among analysts who issue stock recommendations, those that also issue LTG forecasts are less likely to be terminated.

H2b: Among analysts who issue stock recommendations, those that also issue LTG forecasts are less likely to be demoted.

H2c: Among analysts who issue stock recommendations, those that also issue LTG forecasts are more likely to be promoted.

2.3. Implications of Regulation Fair Disclosure (H3)

Reg. FD requires management to disclose all material information simultaneously to all market participants. Many studies conclude that Reg. FD succeeded in changing the information environment. For example, Mohanram and Sunder (2006) find that, on average, after Reg. FD analysts generate more precise idiosyncratic information, rely less on information supplied directly by management, cover fewer firms more intensely, and shift coverage towards firms where their efforts at developing idiosyncratic information have bigger payoffs. Bailey et al. (2003) similarly find evidence suggesting that analysts must rely more heavily on their own independent research following Reg. FD.[4] Thus, after Reg. FD, analysts' effort to gain

[4] For additional evidence that Reg. FD achieved its intended purpose, see Shane et al. (2001), Gintschel and Markov (2004), and Eleswarapu et al. (2004).

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perspective on firms' long-term prospects could have bigger rewards in terms of both the value-relevance of the analysts' stock recommendations and analysts' career outcomes.

We investigate whether analysts have more to gain by capable development of perspective on firms' longer horizon prospects after Reg. FD than before Reg. FD. We expect so because: (1) with a leveled playing field, analysts can no longer rely on private access to management information to improve their forecasts; and (2) Reg. FD mitigates opportunistic incentives to bias LTG forecasts (e.g., to gain access to private information from management). Thus, we hypothesize that after Reg. FD, publication of LTG forecasts more strongly signals analysts' ability. In particular, we test the following hypotheses.

> **H3a:** The market response to analysts' stock recommendation revisions accompanied by LTG forecasts, as compared to the market response to recommendation revisions unaccompanied by LTG forecasts, increases after the promulgation of Reg. FD.
>
> **H3b:** The degree to which analysts publishing LTG forecasts experience more favorable career outcomes, relative to analysts who do not issue LTG forecasts, increases after the promulgation of Reg. FD.

Evidence supporting H3a and H3b further supports our conjecture that publication of LTG forecasts signals effective effort at developing long-term perspective of firms' prospects, the market recognizes the value of this long-term perspective, and analysts effectively incorporating this long-term perspective in their recommendations experience more favorable career outcomes.

3. Models

3.1. Models for tests of H1 – market response to recommendation revisions

If investors attach more value to stock recommendations accompanied by analysts' LTG forecasts (H1), then we expect $\alpha_3 > 0$ in model (1) below.

$$CAR_{ijt} = \alpha_0 + \alpha_1 LTGISS_{ijt} + \alpha_2 \Delta REC_{ijt} + \alpha_3 \Delta REC_{ijt} * LTGISS_{ijt} + \alpha_4 \Delta REC_{ijt} * CFISS_{ijt} +$$

$$\sum_{k=5}^{10} (\alpha_k \ \Delta REC_{ijt} * R_ANALYST\ CHARACTERISTIC_k) +$$

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$$\sum_{k=11}^{16}(\alpha_k * \Delta REC_{ijt} * R_FIRM\ CHARACTERISTIC_k) + \alpha_{17} CFISS_{ijt} +$$
$$\sum_{k=18}^{23}(\alpha_k * R_ANALYST\ CHARACTERISTIC_k) +$$
$$\sum_{k=24}^{29}(\alpha_k * R_FIRM\ CHARACTERISTIC_k) +$$
$$\text{Industry effects} + \text{Year effects} + \varepsilon_{ijt} \quad (1)$$

where:

CAR_{ijt} = cumulative abnormal stock return over the three trading days beginning on the date of analyst *j*'s stock recommendation revision for firm *i* in year *t*. We calculate CAR by subtracting the value-weighted market return from the firm's raw stock return.[5]

ΔREC_{ijt} = the change in cardinal recommendation measures. Recommendation changes between "Strong buy" (= 5), "Buy" (= 4), "Hold" (= 3), "Underperform" (= 2), and "Sell" (= 1) are assigned numeric values between −4 and +4, depending on the difference between the cardinal measure attached to the current recommendation and the cardinal measure attached to the previous recommendation for analyst *j* following firm *i*. For example, a downgrade from "Buy" to "Underperform" receives a value of −2 (= 2 − 4).

$LTGISS_{ijt}$ = 1 if analyst *j* issues a LTG forecast for firm *i* during the half-year ending on the day of the analyst's recommendation revision, and 0 otherwise.

$CFISS_{ijt}$ = 1 if analyst *j* issues a cash flow forecast for firm *i* during the half-year ending on the day of the analyst's recommendation revision, and 0 otherwise. $CFISS_{ijt}$ controls for the possibility that cash flow forecasts signal analyst ability.

ANALYST CHARACTERISTIC refers to the following six analyst characteristic variables which control for factors that could affect investors' perceptions of the value-relevance of analysts' recommendation revisions.

$FIRM\#_{jt}$ = number of firms analyst *j* follows in year *t*.

$IND\#_{jt}$ = number of industries analyst *j* follows in year *t*.

$BSIZE_{jt}$ = number of analysts employed by analyst *j*'s brokerage house in year *t*.

$FIRM_EXP_{ijt}$ = number of years analyst *j* issued one or more firm *i* annual earnings forecasts.

[5] Results are robust to using buy-and-hold stock returns and abnormal returns based on the market model regression, the Fama and French three-factor model, and raw stock returns minus the same stock's prior mean returns, with all parameters estimated over the 100 trading days prior to recommendation revision date.

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$EPS_ACCUR_{ij,t-1}$ = absolute value of the difference between year $t-1$ earnings and analyst j's most recent forecast of those earnings.

EPS_FREQ_{ijt} = analyst j's annual earnings forecast frequency for firm i in year t.

We collectively refer to all scaled control variables representing analyst characteristics as R_ANALYST CHARACTERISTIC in model (1). FIRM# and IND# proxy for time constraints, and BSIZE proxies for resources available (Clement 1999). FIRM_EXP proxies for company-specific experience and EPS_ACCUR proxies for innate general forecasting ability (Brown and Mohammad 2010). EPS_FREQ proxies for firm-specific familiarity and effort (Jacob et al. 1999; Clement and Tse 2003).

Equation (2) below scales $FIRM\#_{jt}$, $IND\#_{jt}$, $BSIZE_{jt}$, $FIRM_EXP_{ijt}$, and EPS_FREQ_{ijt} to fall between 0 and 1 within the same firm-year (Clement and Tse 2003).

$$R_VARIABLE_{ijt} = \frac{\text{RAW MEASUREOF VARIABLE}_{ijt} - \text{MIN(RAW MEASUREOF VARIABLE}_{it})}{\text{MAX(RAW MEASUREOF VARIABLE}_{it}) - \text{MIN(RAW MEASUREOF VARIABLE}_{it})} \quad (2)$$

where, MAX(RAW MEASURE OF $VARIABLE_{it}$) and MIN(RAW MEASURE OF $VARIABLE_{it}$) are, respectively, the maximum and minimum values of each independent variable measured among all analysts following firm i in year t.

Equation (3) scales $EPS_ACCUR_{ij,t-1}$ to fall between 0 and 1, with 1 (0) corresponding to the most (least) accurate forecast.

$$R_EPS_ACCUR_{ij,t-1} = \frac{\text{MAX}(|\text{EPS FORECAST ERROR}_{i,t-1}|) - |\text{EPS FORECAST ERROR}_{ij,t-1}|}{\text{MAX}(|\text{EPS FORECAST ERROR}_{i,t-1}|) - \text{MIN}(|\text{EPS FORECAST ERROR}_{i,t-1}|)} \quad (3)$$

where, MAX(|EPS FORECAST $ERROR_{i,t-1}$|) and MIN(|EPS FORECAST $ERROR_{i,t-1}$|) are the maximum and minimum absolute earnings forecast errors, respectively, for all analysts following firm i in year $t-1$.

In equation (1), FIRM CHARACTERISTIC refers to the six variables explained below (COMPUSTAT labels in parentheses). These variables control for factors that potentially create

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variation across firms in the market's response to recommendation changes, e.g., large or old firms may have a richer information environment and weaker response to stock recommendation revisions. Similar to analyst characteristics, with the exception of the variable indicating whether or not firm *i* has a net loss in year *t*, we use equation (2) above to scale all firm characteristic control variables to fall between 0 and 1 within the same analyst-year.

MB_{it} = firm *i*'s market to book ratio at the end of fiscal year *t* (= PRCC_F*CSHO / CEQ).

$ALTMANZ_{it}$ = Altman's (1968) Z-score, measured as [1.2*net working capital / total assets (= WCAP / AT) + 1.4*retained earnings / total assets (= RE / AT) + 3.3*earnings before interest and taxes / total assets (= PI / AT) + 0.6*market value of equity / book value of liabilities (= PRCC_F*CSHO /LT) + 1.0*sales / total assets (= SALE /AT)].

$LOSS_{it}$ = 1 for firms with a net loss in year *t*, and 0 otherwise (= IB).

AGE_{it} = the number of years firm *i* has been publicly traded, per CRSP files.

$lnMV_{it}$ = the natural log of firm *i*'s market value at the end of year *t* (= PRCC_F*CSHO).

$\%INST_{it}$ = percent of firm *i*'s common shares held by institutional investors in year *t*. We use the average of four quarterly amounts reported by institutional managers.

Model (1) includes year and industry dummies constructed following Fama and French (1997).

3.2. Models for tests of H2a, H2b and H2c – analyst career outcomes

Model (4) tests whether publishing a LTG forecast signals underlying ability related to subsequent career outcomes.

Probability ($TERMINATION_{j,t+1}$, or $DEMOTION_{j,t+1}$, or $PROMOTION_{j,t+1}$) =

$$\beta_0 + \beta_1 LTGISS_{jt} + \beta_2 EPS_ACCUR_{jt} + \beta_3 BOLD_{jt} + \beta_4 LNEXP_{jt} + \beta_5 LN\#FIRM_{jt} + \beta_6 LN\#ANALYST_{jt} + \text{Brokerage house effects} + \text{Year effects} + \varepsilon_{jt} \quad (4)$$

where:

Year *t* is the period between July 1 of year *t*−1 and June 30 of year *t*, and $TERMINATION_{j,t+1}$, $DEMOTION_{j,t+1}$, and $PROMOTION_{j,t+1}$ are proxies for analyst *j*'s job status in year *t*+1, which begins on July 1 of year *t*.

$TERMINATION_{j,t+1}$ = 1 if year *t* is the last year any of analyst *j*'s forecasts and recommendations appear on the I/B/E/S database, and 0 otherwise.

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$DEMOTION_{j,t+1}$ ($PROMOTION_{j,t+1}$) = 1 if analyst *j* works for a large (small) brokerage house in year *t* and works for a small (large) brokerage house in year *t*+1, and 0 otherwise. A large (small) brokerage house employs more than 25 (25 or fewer) analysts. When $DEMOTION_{j,t+1}$ ($PROMOTION_{j,t+1}$) is the dependent variable, we eliminate observations where analysts work for small (large) brokerage houses in year *t* because they cannot be demoted (promoted) by definition. We also eliminate observations where analysts are demoted (promoted) in year *t*+2 because it is ambiguous whether the demotion (promotion) is associated with year *t* activity.

$LTGISS_{jt}$ = 1 if analyst *j* issues a LTG forecast for any firm during year *t*, and 0 otherwise.[6]

EPS_ACCUR_{jt} = the average of $R_EPS_ACCUR_{ijt}$ across all firms followed by analyst *j* in year *t*. We measure $R_EPS_ACCUR_{ijt}$ according to equation (3) above for the last annual earnings forecast issued prior to the announcement of year *t* earnings.

$BOLD_{jt}$ = the average boldness rank of analyst *j*'s first annual earnings forecast for all firms followed in year *t*. Boldness equals the absolute deviation between analyst *j*'s first forecast of firm *i*'s annual earnings since the firm's most recent annual earnings announcement and the mean of all other analysts' earliest earnings forecasts for the same firm and year. We, then, use equation (2) to rank analyst *j*'s boldness relative to the average boldness of all analysts following the same firm in year *t*. The ranks are then averaged across all firms followed by analyst *j* in year *t*.

$LNEXP_{jt}$ = the natural log of the number of years since analyst *j*'s first I/B/E/S forecast.

$LN\#FIRM_{jt}$ = the natural log of the number of firms followed by analyst *j* in year *t*.

$LN\#ANALYST_{jt}$ = the natural log of the average number of analysts following the firms covered by analyst *j* in year *t*.

When the dependent variable is $PROMOTION_{j,t+1}$ ($DEMOTION_{j,t+1}$ or $TERMINATION_{j,t+1}$), a positive (negative) coefficient on $LTGISS_{jt}$ supports our hypothesis that the effort underlying LTG forecasts is rewarded with favorable career outcomes (H2). Definitions of variables in model (4) follow prior literature (e.g., Hong et al. 2000; Ke and Yu 2006).

Prior literature documents that earnings forecast accuracy (EPS_ACCUR_{jt}), boldness ($BOLD_{jt}$), and analyst experience ($LNEXP_{jt}$) are related to career outcomes. We therefore include

[6] Because career outcomes are measured annually, we use a window of a year to measure LTGISS. Results are robust to identifying LTG forecasting activity with reference to 180-day periods ending on recommendation dates during the year before the career outcome year.

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those variables as control variables. Given the ways forecast accuracy and boldness are measured, analysts who follow firms with thin coverage or who follow few firms are more likely to have extreme values of the two measures (Hong et al. 2000). Thus, we also control for the number of firms followed by an analyst ($LN\#FIRM_{jt}$), and the average number of analysts following firms followed by analyst *j* ($LN\#ANALYST_{jt}$). In addition, including these variables controls for their correlation with LTG forecast publication. For example, Bradshaw (2004) documents that firms with intensive analyst coverage are more likely to have a LTG forecast.

3.3. Tests of the implications of Reg. FD (H3)

To test H3a and H3b, we compare the results of estimating models (1) and (4) separately on subsamples before and after promulgation of Reg. FD. We define a pre-Reg. FD (post-Reg. FD) observation as one with a recommendation issued before (after) October 23, 2000.

4. Data, descriptive statistics, and empirical results

4.1. Data

We collect earnings forecasts, LTG forecasts, stock recommendations, and other analyst-related variables from the I/B/E/S database. Data on all firm characteristics come from COMPUSTAT, except institutional investors' shareholdings data, which come from Thomson Reuters. Stock returns come from CRSP. All of our tests begin with the population of analyst-level stock recommendation changes available on the I/B/E/S database. For each hypothesis test described in section 4 and each of the additional analyses described in section 5, additional constraints necessary to estimate our models narrow the sample further. As recommendation data are available from 1993, and each observation requires at least a half-year of lead time to assess LTG forecasting activity our sample period begins in 1994. Given the two-year period needed to evaluate career outcomes, the sample period extends through 2006. As described in section 3, tests evaluating the value-relevance of stock recommendations refer to the six-month period

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ending on the recommendation date to determine whether the stock recommendation has an accompanying LTG forecast. Tests evaluating career outcomes refer to the year prior to the year identified with the career outcome to determine whether the analyst engaged in LTG forecasting prior to the career outcome.

Data requirements to estimate model (1) result in a sample of 33,275 recommendation revisions used to test for a relation between LTG forecast publication and the information content of analyst recommendations (H1). Data requirements for estimating model (4) result in 22,678 analyst-year observations used to investigate whether LTG forecasting activity affects career outcomes (H2).

4.2. Tests of the market response to stock recommendation revisions (H1)

4.2.1. Descriptive statistics

The sample used for tests of H1 consists of all recommendation changes for which we can estimate all analyst and firm characteristics defined in model (1). To mitigate independence issues, if two or more analysts have the same current recommendations on the same day for the same firm and the same prior recommendations, we remove them from tests of H1.[7]

Table 1 presents descriptive statistics separately for observations with and without LTG forecasts. Panel A shows that out of all analyst recommendation revisions, 28% (= 9,307/33,275) are accompanied or preceded by at least one LTG forecast published by the same analyst over the 180-day period ending on the recommendation revision date. On average, recommendations with LTG forecasts are more favorable than those without LTG forecasts, but the medians of both groups represent “Buy”. The mean of recommendation revisions (ΔREC) with LTG forecasts is not significantly different from that of recommendation changes without LTG forecasts.

[7] Sensitivity tests based on all recommendation changes produce similar results. To further mitigate independence issues, we re-estimate model (1) after eliminating all recommendation changes that are distributed within 5 days of a recommendation change by a different analyst (Jegadeesh and Kim 2010). Our results are robust to this treatment.

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Panel A also reports that the cumulative (3-day) stock market reactions (CARs) around recommendation revisions do not differ between the subsamples with and without LTG forecasts. The difference in means could be misleading due to averaging more negative stock market reactions to downgrades accompanied by LTG forecasts with more positive stock market reactions to upgrades accompanied by LTG forecasts. Figure 1 depicts CAR by the sign and magnitude of recommendation changes and whether or not a LTG forecast accompanies the recommendation revision. More than 98% of the recommendations are revised within an absolute magnitude of 2. Consistent with H1, CAR is more negative (positive) for all recommendation downgrades (upgrades) accompanied by LTG forecasts, except for the few upgrades with a magnitude of 4. The descriptive evidence in figure 1 is consistent with our hypothesis that recommendation revisions accompanied by LTG forecasts are more informative.

As compared to recommendation revision observations without accompanying LTG forecasts, observations with LTG forecasts are significantly ***less*** likely to have a cash flow forecast; i.e., the decision to publish a LTG forecast is negatively correlated with the decision to publish a cash flow forecast. If analysts publish cash flow forecasts when earnings quality is low (DeFond and Hung 2003), then perhaps the likelihood of publishing a LTG forecast increases with the quality of earnings. We leave exploration of this possibility for future research, but recognize the need to control for the presence (or not) of a cash flow forecast.

At the analyst-year level, analysts forecasting LTG work for larger brokerage houses and cover fewer firms and industries, suggesting that to some extent, publication of LTG forecasts is negatively related to time and effort constraints *and* positively related to resources available. At the firm-year level, analysts following larger profitable firms with lower probability of

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bankruptcy and higher institutional holdings are more likely to make LTG forecasts.[8] At the analyst-firm-year level, it appears that analysts with more firm-specific experience are less likely to publish LTG forecasts along with their stock recommendation revisions. Finally, there is no significant difference in annual earnings forecast accuracy (EPS_ACCUR) between the subsample with LTG forecasts and the subsample without LTG forecasts, suggesting that stock analysts forecasting LTG do not necessarily have better ability in forecasting short-term earnings.

Table 1, Panel B provides Pearson and Spearman correlation coefficients for the various combinations of control and test variables. The correlations between LTGISS and other variables are generally consistent with Panel A. For example, LTGISS is negatively correlated with cash flow availability, and the number of firms or industries an analyst covers, and positively correlated with recommendation levels and brokerage house size. The low to modest correlations among independent variables to be used in the models mitigate concerns about multicollinearity.

4.2.2. Multivariate test

Table 2 presents results of estimating model (1). The coefficient on the interaction of $LTGISS_{ijt}$ and ΔREC_{ijt} is significantly positive (one-tailed p-value < 0.0001),[9] indicating that the stock market reacts more to recommendation revisions with accompanying LTG forecasts than to other recommendation revisions. The relation is also economically significant. Publication of a LTG forecast increases the market reaction to the analyst's stock recommendation by 27% (=

[8] The combination of descriptive statistics in table 1 suggests the possibility of a self-selection bias, whereby analysts with more favorable views and greater resources issue LTG forecasts to support their favorable recommendations regarding the prospects of larger profitable firms with lower probability of bankruptcy. Thus, an alternative explanation for the existence of LTG forecasts is that analysts use them to generate interest in stocks for which they have favorable views. However, this explanation does not negate the hypotheses that analysts issuing the forecasts effectively signal relatively high effort and ability in developing perspective of the subject firms' long-term prospects leading to more informative stock recommendations and better career outcomes. An interesting follow-up study might examine hypotheses about the factors leading some analysts to engage in the effort underlying publication of long-term growth forecasts; however, such a study is beyond the scope of this paper.

[9] For convenience, all tables contain two-tailed p-values. However, hypotheses are one-tailed and, therefore, it is appropriate to divide the tabled p-values associated with hypotheses tests by 2.

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0.4% /1.5%). This result supports H1 that the market perceives recommendation revisions accompanied by LTG forecasts to contain more information than recommendations without accompanying recommendations.

Several control variables have statistically significant coefficients. The market responds less to recommendation revisions accompanied by analysts' cash flow forecasts. The market responds more to recommendation revisions issued by analysts covering more firms and fewer industries, working for larger brokerage houses, having more firm-specific experience, and publishing forecasts of annual earnings more frequently. The market also responds more to recommendations associated with firms that grow more slowly, have losses, and have smaller market capitalization.

4.3. Tests of analysts' career outcomes (H2)

4.3.1. Descriptive statistics

The sample used for tests of H2 consists of all analyst-year observations with both recommendation revisions data and data needed to measure the analyst characteristics described in model (4). Table 3 presents descriptive statistics for tests of H2a through H2c. Panel A shows that, on average, the percentage of analysts who issue LTG forecasts in year *t* and are terminated or demoted (promoted) in year *t*+1 is significantly smaller (larger) than the percentage of analysts without LTG forecasts who are terminated or demoted (promoted). Analysts with LTG forecasts issue less bold earnings forecasts, have longer general experience, follow more firms, and the firms they follow tend to have higher analyst coverage. Correlation results in Panel B are consistent with the differences in means and medians in Panel A, and there is no evidence of significant multicolinearity issues.

4.3.2. Multivariate test

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Results of estimating equation (4) are presented in Table 4. Consistent with the descriptive statistics in Table 3 (and H2a and H2b), LTG forecast publication is associated with a significantly smaller likelihood of job termination and demotion (one-tailed p-values are 0.004 and 0.045, respectively). The test statistic related to the odds of promotion for analysts who issue LTG forecasts versus those who do not is insignificant and does not support H2c. Thus, the evidence implies that the effort in publishing LTG forecasts is rewarded with higher likelihood of job survival and lower likelihood of demotion, but not with a higher likelihood of promotion. The results related to promotions do not support our prediction, but are consistent with the argument in Ke and Yu (2006) that effective analyst effort more likely leads to retention (i.e., avoidance of demotion or termination) than promotion, because "the analyst's current employer will try to offer monetary incentives to retain him" (Ke and Yu 2006, fn 4).[10] Overall, we document that the analyst effort underlying LTG forecasts to gain long-term perspective regarding a firm's prospects is associated with greater job security.

4.4. Tests of the implications of Reg. FD (H3)

To test H3a and H3b, we re-estimate models (1) and (4) separately for the pre- and post-Reg. FD periods and compare coefficients on test variables across the two periods. Table 5 shows the results of tests of whether the difference between the market reaction to recommendation revisions accompanied by LTG forecasts and that not accompanied by LTG forecasts increases after Reg. FD. If recommendations with LTG forecasts are more value-relevant after Reg. FD, the coefficient on $\Delta REC_{ijt} \cdot LTGISS_{ijt}$ will be significantly larger in the post-Reg. FD period. The number of recommendation revisions used to estimate model (1) in the pre- (post-) Reg. FD period is 13,752 (19,523). Consistent with our prediction, the coefficient on $\Delta REC_{ijt} \cdot LTGISS_{ijt}$ is

[10] Wu and Zang (2009) argue that the termination and promotion variables contain measurement error, because I/B/E/S codes neither retirements nor promotions to research director positions. To the extent this occurs in our sample, we have measurement error, which could explain the lack of evidence supporting H2c and (later) H3b.

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significantly positive in the post-Reg. FD period (coefficient = 0.470, one-tailed p-value < 0.0001) and less positive in the pre-Reg. FD period (coefficient = 0.261, one-tailed p-value = 0.009). The difference in coefficients is significant at 0.090 (one-tailed).[11]

Table 6 presents results of examining analysts' career outcomes in the pre- versus post-Reg. FD periods. Relative to analysts who do not publish LTG forecasts, analysts who do publish them are significantly less likely to be terminated or demoted in the post-Reg. FD period (one-tailed p-values = 0.009 and 0.004, respectively); whereas, in the pre-Reg. FD period, analysts issuing LTG forecasts are only marginally significantly less likely to be terminated and not significantly less likely to be demoted (one-tailed p-values = 0.092 and 0.307, respectively). The differences from the pre- to post-Reg. FD period are only significant with respect to the demotion variable (one-tailed p-value = 0.018). Thus, we have strong (weak) support for H3a (H3b).[12]

Surprisingly, the coefficient on LTGISS in the model explaining promotions is significantly positive in the pre-Reg. FD period, but insignificant in the post-Reg. FD period. One possible explanation for this surprising result is that these analysts' LTG forecasts are more optimistic in the pre-Reg. FD period and the analysts are rewarded for gaining investment banking service or acquiring private information from management. Because the promulgation of Reg. FD limits the advantages of LTG forecast optimism and, thus, discourages such opportunistic behavior, we expect less optimism in LTG forecasts in the post-Reg. FD period. To investigate this possibility, we compare LTG forecast optimism between the pre- and post-Reg. FD periods, measuring LTG forecast optimism as the difference between forecasted and actual LTG. The mean of LTG forecast optimism is 5.12% in the six years prior to 2000 and 1.05% in

[11] When using the alternative abnormal return measures described in footnote 5, the coefficients on ΔREC*LTGISS are significantly higher in the post-Reg. FD period. One-tailed p-values for the difference in the coefficients range from 0.049 to 0.082.

[12] Using a 180-day period prior to stock recommendation dates to identify LTG forecasting activity during the year prior to the year of terminations and demotions, the coefficients on LTGISS are significantly negative only in the post-Reg. FD period.

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the three years subsequent to 2000.[13] The difference of 4.07% is statistically and economically significant (p-value < 0.0001), supporting our conjecture that analysts could be rewarded with promotion for issuing more optimistic LTG forecasts in the pre-Reg. FD period. We leave further investigation of this unexpected result for future research.

Overall, our results suggest that analyst publication of LTG forecasts signals more effective effort toward developing a long-term perspective that informs their recommendations and this effort pays off more in the post-Reg. FD period when management is restricted from selectively feeding value-relevant information to favored analysts. We also find some evidence that analysts' job security is more positively associated with the publication of LTG forecasts in the post-Reg. FD period.

5. Supplemental analysis

5.1. Does I/B/E/S systematically exclude certain LTG forecasts?

The results described above are consistent with the interpretation that analysts who publish LTG forecasts signal greater ability to incorporate meaningful long-term perspective of firms' prospects into more informative stock recommendations. An alternative explanation for our results is that I/B/E/S selectively publishes the LTG forecasts of better analysts and excludes the LTG forecasts of other analysts.[14] This subsection explores whether I/B/E/S selection bias exists and, if so, whether it affects our inferences.

[13] Following prior literature, actual LTG is calculated based on the slope coefficient from a regression of the natural logarithm of a firm's actual annual earnings on an independent variable taking on values of one through six, where one refers to year *t*, two refers to year *t*+1, and so on (La Porta 1996; Dechow et al. 2000). Dechow et al. (2000) note that I/B/E/S calculates actual LTG using this same OLS method. As 2003 is the last year for which six years' actual earnings are available, our analysis is based on fiscal years 1994 through 2003.

[14] Another selection bias occurs if some analysts choose not to supply certain forecast data to I/B/E/S. If less capable analysts choose not to supply data to I/B/E/S, this behavior is consistent with our hypotheses that analysts publishing LTG forecasts have more informative stock recommendations and better career outcomes. On the other hand, if more capable analysts choose not to supply their LTG forecasts to I/B/E/S, that works against the power of our tests.

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Among sample firms (firm-analysts) with a LTG forecast in any of our sample years, 87% (93%) have a LTG forecast in all sample years. Thus, LTG forecasts are unlikely to suffer from bias due to change in I/B/E/S's data input process over time. Below we further evaluate possible selection bias effects that may persist over time.

We begin by cross-checking I/B/E/S records with analyst research reports from Investext Plus. Given the cost of hand-collecting data from Investext Plus, we decided to obtain a sample of 200 actual analyst research reports selected randomly with reference to the recommendation observations that we had coded as ***not having*** accompanying LTG forecasts on I/B/E/S. If we identify a LTG forecast in any of these 200 research reports, we further examine the apparent I/B/E/S misclassification. About 85% of I/B/E/S observations do not appear in Investext Plus, and we needed to search the Investext database 1,288 times in order to identify a random sample of 200 matching I/B/E/S-Investext Plus observations.[15]

In our sample of 200 I/B/E/S-Investext observations matched on the existence of a recommendation revision, recommendation date, analyst, and company name, we confirmed that 172 of the Investext reports did not contain LTG forecasts in that report or in any other Investext report issued by that analyst for that firm. In 28 cases, in spite of I/B/E/S reporting no LTG forecast for that analyst-company-recommendation observation, we ***did find*** a corresponding LTG forecast in the research report obtained from Investext Plus. In all 28 of these cases, the LTG forecast came from the research report with the same date as the stock recommendation date on I/B/E/S.

Based on the sample described above, we estimate that 86% (= 172/200) of the stock recommendations appearing on I/B/E/S without accompanying LTG forecasts come from analyst

[15] While our matching procedure did not require this, the level of the recommendation on Investext matched the level on I/B/E/S 100% of the time.

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research reports that confirm the absence of the LTG forecasts. Our concern is with the estimated 14% that I/B/E/S misclassifies. We investigate whether misclassified observations potentially drive our inference that stock recommendations without accompanying LTG forecasts contain less value-relevant information than stock recommendations with accompanying LTG forecasts.

If systematic I/B/E/S exclusion of worse analysts' LTG forecasts drives our results, then we expect: (a) I/B/E/S to also systematically exclude other long-term forecasts for these analysts; (b) the misclassified observations to systematically differ from correctly classified observations with respect to analyst and company characteristics typically associated with forecasting ability; and (c) any significant differences discovered in (b) to be associated with the informativeness of the stock recommendations in our sample. We investigate (a) and (b) by comparing another random sample of 28 observations correctly classified as having LTG forecasts (hereafter the correct classification group) to the 28 observations we found where I/B/E/S does not report the LTG forecast published in an analyst report (hereafter the misclassification group). We then use our entire I/B/E/S sample to examine whether any systematic bias discovered in (b) drives our overall finding regarding the informativeness of analysts' stock recommendations.

First, we assess the availability of two-year ahead EPS forecasts, three-year ahead EPS forecasts, and target price forecasts, and find that the proportion of observations with any one of these long-horizon forecasts in the 28-observation misclassification group does not differ significantly from the proportion in the 28-observation correct classification group.[16]

Second, we compare the correct classification group with the misclassification group in terms of the following analyst and company characteristics: number of firms followed, number of industries followed, brokerage firm size, firm-specific analyst forecasting experience, accuracy of

[16] We find that 96.4% (100%), 57.1% (75%), 92.9% (85.7%) of the observations in the misclassification (correct classification) group have stock recommendations with accompanying 2-year ahead earnings forecasts, 3-year ahead earnings forecasts, and target price forecasts, respectively.

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current year EPS forecasts, annual frequency of current year EPS forecasts, market-to-book ratios, Altman's (1968) Z-score for companies followed, whether the observation occurs in a company loss year, and the company's age, market value, and percentage of shares held by institutions. Out of all these variables, we find significant differences only in the firm-specific experience variable; i.e., as compared to the 28 correctly classified observations, the 28 misclassified observations have stock recommendations and LTG forecasts issued by analysts with significantly less firm-specific experience. Thus, it is possible that I/B/E/S selectively omits LTG forecasts for (lower ability) inexperienced analysts.

While model (1) controls for firm-specific experience and thus, mitigates the possible misclassification bias, we further examine this issue as follows. We estimate model (1) for two subsamples. Both subsamples include the 9,307 observations classified as having LTG forecasts per I/B/E/S. One subsample adds 8,405 recommendation revisions published by inexperienced analysts and coded (per I/B/E/S) as recommendations unaccompanied by LTG forecasts (the possible misclassification group).[17] The other subsample adds 15,563 recommendation revisions distributed by experienced analysts and coded (per I/B/E/S) as unaccompanied by LTG forecasts (the likely correct classification group).

Suppose I/B/E/S systematically assumes that inexperienced analysts are inept when it comes to forecasting LTG and, therefore, I/B/E/S excludes those analysts' LTG forecasts from the database. If that assumption is correct, then we expect a relatively large coefficient relating the interaction term, LTGISS*ΔREC, to CAR in the subsample where no-LTG forecast (LTGISS=0) observations come only from inexperienced analysts. In fact, we find a coefficient

[17] We divide experienced from inexperienced analysts with reference to the median firm-specific experience of analysts for the whole sample.

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of 0.202 (one-tailed p-value = 0.028) on LTGISS*ΔREC (untabulated)[18] when we estimate model (1) with the inexperienced analyst no-LTG forecast comparison group. Using the whole sample with both experienced and inexperienced no-LTG forecast observations, table 2 reports a coefficient of 0.402 (one-tailed p-value < 0.0001) on LTGISS*ΔREC, and when we run the analysis with only experienced analysts in the no-LTG forecast comparison group, the coefficient on LTGISS*ΔREC jumps to 0.544 (one-tailed p-value < 0.0001). This evidence is inconsistent with systematic I/B/E/S misclassification driving our overall results.

Overall, the evidence in this section suggests that the absence of some LTG forecasts in I/B/E/S is more likely due to random error than a systematic attempt to include only the LTG forecasts of better analysts. In any case, it does not appear that a systematic data selection bias, if present in I/B/E/S, drives our results.

5.2. Time lag between dates of the LTG forecast and the stock recommendation

Our primary analysis assumes that LTG forecasts issued within the six month period ending on the stock recommendation revision date signals effective analysis of the long-term prospects of the firm, and that analysis adds value to the stock recommendation. The value added can occur, for example, if the analyst directly incorporates the LTG forecast in a valuation model or incorporates the underlying long-term perspective in the process of developing the recommendation. The choice of six months balances: (1) the power provided by a sufficiently large number of recommendations preceded by LTG forecasts; and (2) the need for a short enough window to reasonably associate the long-term perspective represented by LTG forecast publication with the corresponding stock recommendation. If LTG forecasts issued early in the

[18] For the sake of brevity, most results reported throughout section 5 are untabulated. More detailed tables are available from the authors upon request.

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six-month window are disconnected from the analysis underlying the stock recommendation revision, then this detracts from the power of our tests.

We evaluate this issue in two ways. First, we add the variable LEAD0DAY to model (1), where LEAD0DAY = 1 when I/B/E/S associates the LTG forecast with the same day as the stock recommendation, and LEAD0DAY = 0 otherwise. In an extended version of model (1), we include both the main effect of LEAD0DAY and its interaction with ΔREC. The coefficient on LEAD0DAY*ΔREC captures the stock market reaction to recommendations accompanied by LTG forecasts published on the same day incremental to the stock market reaction to recommendations accompanied by LTG forecasts published during the 180 days preceding the stock recommendation publication date. In the extended model, the coefficient on LTGISS*ΔREC is 0.301 (one-tailed p-value < 0.001) and the coefficient on LEAD0DAY*ΔREC is 0.449 (one-tailed p-value = 0.001). These results are consistent with the interpretation that LTG forecasts issued within six months of the stock recommendation (per I/B/E/S) reflect value-relevant analysis of the long-term prospects of the firm and more-so when I/B/E/S reports that the LTG forecast and stock recommendation are issued on the same day.[19]

Second, in model (1) we remove LTGISS and add four binary variables – LTGISS0, LTGISS180, LTGISS360, and LTGISS540 − and their interactions with ΔREC. LTGISS0 equals 1 when the most recent LTG forecast prior to a recommendation distributed by the same analyst leads the recommendation by 0 to 180 days. LTGISS180, LTGISS360 and LTGISS540 are defined analogously using windows of 181 to 360 days, 361 to 540 days, and more than 540 days, respectively.[20] We find that the coefficients (one-tailed p-values) on LTGISS0*ΔREC,

[19] In our I/B/E/S sample of stock recommendations with accompanying LTG forecasts, the LTG forecasts have the same date as the corresponding recommendations 23% of the time, and they occur in the first, second, third, fourth, fifth, and sixth months prior to the recommendation 16%, 14%, 13%, 13%, 11%, and 11% of the time, respectively.
[20] For our sample, 40%, 20%, 13%, and 27% of all most recent LTG forecasts are issued, respectively, within 180 days, 181 to 360 days, 361 to 540 days, and more than 540 days prior to the corresponding recommendation date.

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LTGISS180*ΔREC, LTGISS360*ΔREC, and LTGISS540 *ΔREC are 0.466 (<0.0001), 0.232 (0.015), 0.127 (0.157), and −0.058 (0.560), respectively. The coefficient on LTGISS0*ΔREC is significantly larger than coefficients on the other three interactions terms (p-values less than 5%).

Overall, the above results suggest that it is reasonable to associate the long-term perspective represented by LTG forecast publication within the six-month period preceding a recommendation with the corresponding stock recommendation.

5.3. LTG forecast levels

Our primary analysis treats all publications of LTG forecasts equally. Our justification is that the act of publishing the forecast signals ability to incorporate value-relevant long-term perspective of the firm's prospects into the analysis underlying the stock recommendation. However, we recognize that the magnitude of the LTG forecast varies across observations and might be associated with the market's confidence in the corresponding stock recommendation. In other words, investors might take an upgrade to a strong buy recommendation accompanied by a large LTG forecast more seriously than a similar upgrade accompanied by a small LTG forecast. This section evaluates robustness to controlling for the level of the LTG forecast.

We expand model (1) to include both the main effect and the interaction of LTGLEVEL with ΔREC. For recommendation revisions without LTG forecasts within the 180-day window, we use the latest consensus LTG forecast to measure LTGLEVEL. Untabulated results from estimating the expanded model show that the interaction of LTGISS with ΔREC is 0.399, which remains highly significant (p-value < 0.0001). The coefficient on the interaction of LTGLEVEL with ΔREC is 0.029 (p-value < 0.0001). Estimation results for the periods before and after Reg. FD show that with LTGLEVEL and its interaction with ΔREC in the model, the coefficient on the interaction of LTGISS with ΔREC remains significantly larger in the post- versus pre-Reg.

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FD period (0.483 versus 0.220, one-tailed p-value = 0.042). We conclude that, while investors respond to the magnitude of the LTG forecast accompanying a recommendation, the mere act of publishing a LTG forecast signals ability corresponding to greater stock recommendation informativeness.

5.4. Recommendation levels

We recognize that the level of a recommendation, even when it reiterates the analyst's prior recommendation, contains information. Thus, the hypothesis for revisions also applies to levels, and we evaluate the coefficient on LTGISS in model (5).

$$CAR'_{ijt} = \beta_0 + \beta_1 LTGISS_{ijt} + \beta_2 CFISS_{ijt} + \sum_{k=3}^{8} (\beta_i \text{ *R_ANALYST CHARACTERISTIC}_k) + \sum_{k=9}^{14} (\beta_i \text{ *R_FIRM CHARACTERISTIC}_k) + \text{Industry effects} + \text{Year effects} + \varepsilon_{ijt} \quad (5)$$

where:

CAR'_{ijt} = cumulative abnormal stock return over the three trading days beginning with the day on which analyst *j* issues a stock recommendation for firm *i* in year *t*. We calculate CAR′ by subtracting the value-weighted market return from the firm's raw stock return. For "Hold," "Sell," or "Strong Sell" recommendations, we take the negative of the cumulative market-adjusted returns (Barber et al. 2007; Fang and Yasuda 2009).[21]

Other independent variables are as previously defined. A significantly positive β_1 is consistent with stronger market reaction to the level of analysts' stock recommendations accompanied by the same analysts' LTG forecasts. β_0 estimates trading profits on a (non-implementable) strategy that takes long positions on the day of "Strong Buy" or "Buy" recommendations without accompanying LTG forecasts and short positions on the day of "Hold", "Sell" or "Strong Sell" recommendations without accompanying LTG forecasts, where both positions are held for three trading days. β_1 estimates incremental trading profit on a (non-implementable) strategy that only considers recommendations accompanied by LTG forecasts.

[21] We obtain similar results using the four alternative abnormal stock return measures described in footnote 5.

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Table 7 reports results from estimating model (5). The coefficient on LTGISS is significantly positive (one-tailed p-value <0.0001), consistent with analysts publishing LTG forecasts producing more informative stock recommendations. The sum of the intercept (= 0.419) and the coefficient (= 0.394) on LTGISS is 0.813, almost twice the magnitude of the intercept. We also estimate model (5) separately in pre-and post-Reg. FD periods. The coefficient on LTGISS is significantly larger in the post-Reg. FD period (one-tailed p-value = 0.002).

5.5. Market efficiency

We find significantly larger 3-day contemporaneous market reactions to analysts' stock recommendations accompanied by LTG forecasts. In this section, we evaluate the efficiency of the market's reaction. The larger market response could represent an overreaction to the incremental informativeness of recommendations accompanied by LTG forecasts. Alternatively, while the market reacts more strongly to recommendations accompanied by LTG forecasts, this could represent an underreaction with the possibility of long-term trading profits from following recommendations accompanied by LTG forecasts. If the market either underreacts or overreacts, then we should observe long-term drifts in returns either in the same or opposite direction as the initial market reaction.

To investigate the possibility of market inefficiency, we examine the cumulative market-adjusted return from following recommendations over the one-year period that starts from 3 days after the report date. Untabulated results show no difference in profitability from following recommendations accompanied by LTG forecasts relative to recommendations unaccompanied by LTG forecasts over this one-year period. Therefore, we conclude that the significantly larger contemporaneous market reaction to stock recommendations accompanied by LTG forecasts represents efficient market reaction to incrementally informative recommendations.

5.6. Consolidation in the brokerage firm industry

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Mergers and acquisitions create measurement error in our promotion and termination variables. For example, an analyst working for a target firm in a merger could appear to get a promotion (termination) if the analyst stays with (leaves) the consolidated firm and this may have nothing to do with the analyst's ability. Intense consolidation in the brokerage industry occurred during the period from 1997 through 2001 (Wu and Zang 2009). To evaluate the importance of this phenomenon in tests of our career outcomes hypothesis, we remove all observations in the 1997 through 2001 period and re-run the analysis.

We find that analysts publishing LTG forecasts are less likely to be terminated (one-tailed p-value = 0.055) or demoted (one-tailed p-value = 0.006), but we find no evidence to suggest that these analysts are more likely to be promoted. When we split the sample into observations before and after Reg. FD, we find significant results only in the post-Reg. FD period. The one-tailed p-value associated with termination (demotion) is 0.022 (0.003), and the coefficient associated with promotion is insignificant, confirming similar results in our primary analysis.

5.7. Other forecasts accompanying stock recommendations

This section considers whether results of tests for the value-relevance of stock recommendation revisions accompanied by LTG forecasts are sensitive to incorporation of other forecasts. In particular, we consider analysts' forecasts of annual earnings for years t+1 through t+5, and analysts' target price forecasts, generally believed to have a one-year horizon (Bradshaw and Brown 2007; Kerl 2011).

5.7.1. Target price forecasts

Like LTG forecasts, target price forecasts are overly optimistic (Bradshaw 2002; Brav and Lehavy 2003; Bradshaw and Brown 2007) and grossly inaccurate (Bradshaw and Brown 2007; Bonini et al. 2010; Kerl 2011). Unlike research related to LTG forecasts, we do not find a rich literature identifying analysts' opportunistic incentives to issue target price forecasts for reasons

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divorced from an attempt to gain value-relevant perspective on the firm's prospects. Furthermore, target price forecasts provide investors with useful information over and above the information in stock recommendations and earnings forecasts (Brav and Lehavy 2003; Asquith et al. 2005); whereas, investors appear to overreact to the implications of LTG forecasts for future earnings (La Porta 1996; Bradshaw 2004). Finally, LTG forecasts cover a longer horizon than target price forecasts and this study focuses on the ability of analysts to gain long-term perspective of a firm's prospects. Hence, our main analysis focuses on LTG forecasts and we examine target prices in this supplemental analysis section.

As described above, prior literature documents that target price forecasts provide investors with useful information over and above the information in stock recommendations and earnings forecasts, and Bradshaw (2002) finds that analysts use target prices to support their stock recommendations. On the other hand, Bradshaw's analysis suggests that analysts use simple heuristics to generate target price forecasts, and analysts use these forecasts to justify their recommendations only when the two signals are consistent. Analysts tend not to publish target prices when they are not consistent with the stock recommendation. Thus, like LTG forecasts, whether target prices forecasts reflect underlying value-relevant analyst research associated with more informative stock recommendations is questionable. We are unaware of any studies addressing this question. We investigate it in this section.

Forty-four percent of the 33,275 stock recommendation revisions in our sample have accompanying target price forecasts during the 180-day period prior to the date of the recommendation revision; whereas, 28% have accompanying LTG forecasts. Only 47% of the observations with LTG forecasts also have accompanying target price forecasts. The correlation between the analyst's decision to issue a LTG forecast (LTGISS) and the decision to issue target price forecast (TPISS) is only 4% in our sample, and these decisions appear to come from

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different processes. Indeed, when we add the terms, TPISS and TPISS*ΔREC to model (1), we find that the coefficient on LTGISS*ΔREC remains statistically significant (p-value < 0.0001) and the coefficient declines insignificantly from 0.402 (table 2) to 0.347. Thus, controlling for the issuance of target price forecasts, our results indicating a larger price reaction to recommendation changes accompanied by LTG forecasts continue to hold. Interestingly, we also find a statistically significant coefficient (0.980) on TPISS*ΔREC (p-value < 0.0001), suggesting that, like LTG forecasts, analyst publication of target price forecasts appears to reflect underlying value-relevant analyst research.

5.7.2. Other long-term earnings forecasts

We also examine the sensitivity of our inferences, regarding the value-relevance of stock recommendations accompanied by LTG forecasts, to inclusion of variables representing analysts' decisions to issue other long-term earnings forecasts. Specifically, we add the variable, $EPSISS^{k}_{ijt}$, indicating whether analyst *j* issued a *k*-year ahead forecast of firm *i*'s EPS at any time during the six-month period ending with an analyst *j* recommendation. $EPSISS^{k}_{ijt}$ is a binary variable that equals 1 for recommendations accompanied or preceded by issuance of a two- (k=2), three- (k=3), four- (k=4), or five-year (k=5) ahead earnings forecast. For our sample, 89.81%, 20.88%, 2.96%, and 1.72% of all recommendations are accompanied or preceded by two-, three-, four-, and five-year ahead earnings forecasts, respectively, where two-year ahead refers to forecasts of earnings for the year following the current year. To examine whether the issuance of other long-term earnings forecasts explains our results, in an untabulated test, we add the $EPSISS^{k}_{ijt}$ main effect, along with the interactions of $EPSISS^{k}_{ijt}$ with ΔREC_{ijt} to equation (1). Including these variables does not change the significance of the coefficient on the test variable, suggesting that publication

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of LTG forecasts signals an information gathering process distinct from the process underlying other long-term earnings forecasts.

We also examine whether earnings forecast revisions published in the same report as the stock recommendation capture the information signaled by issuance of accompanying LTG forecasts. Among the 33,275 recommendation changes, 37.45%, 36.26%, 6.09%, 1.13%, and 0.72% have simultaneously issued one-, two-, three-, four-, and five-year ahead earnings forecasts, respectively. We add an additional variable indicating whether earnings forecast revisions agree or disagree with the direction of the analyst's simultaneously issued stock recommendation revision. The indicator variable equals one (zero) for upward (downward) earnings forecast revisions issued on the same day as the publication of upward stock recommendation revisions. For the downward stock recommendation revisions, the indicator variable is defined analogously. We interact the indicator variable with ΔREC_{ijt}. After controlling for earnings forecast revisions, the coefficient on $LTGISS_{ijt}*\Delta REC_{ijt}$ is 0.392 (one-tailed p-value < 0.0001), versus 0.402 without these controls. Thus, publication of LTG forecasts appears to signal effective analyst effort and ability with respect to gaining a long-term perspective that adds value to the analyst's stock recommendation beyond the information in the analyst's earnings forecasts over various forecast horizons.

6. Conclusion

Long-term growth (LTG) forecasts are widely used by financial analysts in developing stock recommendations (Bradshaw 2004) and in firm valuation by investors and researchers (Gebhardt et al. 2001). In addition, several empirical models require LTG forecasts to compute the cost of equity capital (Botosan and Plumlee 2005).

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Despite the importance of LTG forecasts in accounting and finance, we have very limited knowledge about whether they reflect information that enhances price discovery in capital markets. In fact, prior research documenting incentives-related biases, inaccuracy, and value-irrelevance of analysts' LTG forecasts leaves many readers with the impression that LTG forecasts are irrelevant and should be ignored by astute investors. This impression contradicts the conventional wisdom that analysts expending effort to produce and publish LTG forecasts (or any other statistic) would not survive if the forecasts had no value. To the best of our knowledge, this study makes a first attempt to demonstrate the value added by analysts who expend effort to produce and publish LTG forecasts.

We speculate that publication of LTG forecasts signals effective analyst investment in a process that provides the analyst with a valuable long-term perspective of firms' prospects, and more so in the post-Reg. FD period when analysts have a more level playing field. We document robust results consistent with this conjecture. We find that stock recommendations accompanied by LTG forecasts elicit a stronger market reaction than recommendations unaccompanied by LTG forecasts. In addition, analysts publishing LTG forecasts are less likely to leave the profession or be demoted from large to smaller brokerage houses. Finally, post-Reg. FD observations drive most of our results.

Since we also find no evidence of market under- or overreaction to stock recommendation revisions accompanied by LTG forecasts, we conclude that publication of LTG forecasts plays a meaningful role in promoting price discovery and efficient allocation of resources in capital markets.

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Appendix

Bradshaw (2004) finds that analyst recommendations are largely explained by simple heuristics and relying on these heuristics leads to inferior returns relative to the returns earned by relying on residual income valuation models. Bradshaw's results suggest that superior recommendations emerge from more sophisticated valuation methodologies. To gain more insight into how the issuance of LTG forecasts affects the way analysts formulate their stock recommendations, we examined contextual descriptions used to justify the stock recommendations in a random sample of analyst research reports available from Investext Plus.

This appendix portrays six examples of reports with explicit descriptions of analysts' valuation methodologies, three of which include LTG forecasts and three of which do not. Similar to the reports in this appendix, the larger sample of reports we examined suggest that analysts who do not issue LTG forecasts generally rely on earnings multiples (e.g., price to earnings ratio, price to sales ratio, PEG ratio) to justify their recommendations; whereas analysts issuing LTG forecasts tend to support their stock recommendations with more sophisticated methods of estimating intrinsic equity value (e.g., the earnings-based and discounted free cash flow valuation models). Our analysis of a random sample of research reports is well-represented by the excerpts of six recent analyst reports obtained from Investext Plus and described below.

1. Stock recommendations unaccompanied by LTG forecasts

1.1 Home Depot (NYSE: HD): Justification of valuation is mainly based on P/E multiples.
Rating: BUY **Current Price:** $26.99 **Price Target**: $32.00
Date of analysts' report: November 18, 2009
Brokerage house: Jefferies and Company, Inc
Stock analysts: Daniel Binder, CFA, John Marrin, and Justin L. Kantrowitz

Valuation: "Our $32 price target is based on the shares selling at about 19x our FY11 EPS estimate of $1.70. HD shares are currently trading at about 16x out-year earnings, which is slightly above the company's 3-year average P/E of approximately 15x. We believe the market will continue to put a richer multiple on depressed earnings, but we need to be sensitive to rising mortgage rates. Our target

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multiple is predicated on continued improvement in housing prices, better turnover and continued sequential improvements in comp store sales."

1.2 Boston Scientific Corp. (NYSE: BSX): Justification of valuation is mainly based on P/E multiples.
Rating: NEUTRAL **Current Price:** $8.31 **Price Target:** $8.00
Date of analysts' report: November 11, 2009 **Brokerage house:** WEDBUSH
Stock analyst: Phillip Nalbone

Valuation: "We believe BSX is already fully-valued. Our $8 12-month price target represents a multiple of about 13 times our 2010 EPS estimate, which is in line with the group multiple for the large-cap med tech peer group."

1.3 Apple Inc. (Nasdaq: AAPL): Justification of valuation is mainly based on the PEG ratio which incorporates a forecast of the company's one-year ahead EPS growth rate.
Rating: NEUTRAL **Current Price:** $94.0 **One year Price Target**: $106.40
Date of analysts' report: December 8, 2008 **Brokerage house**: ValueEngine
Stock analysts: no information available

Valuation: "Portfolio managers and professionals traditionally rely on market ratios to gauge whether a stock is fair valued or overvalued. On this page, we present such a valuation based on one of three market ratios: PEG (price to trailing 4 quarter earnings ratio, divided by the consensus analyst forecasted next year EPS growth), P/E (price to forward 4 quarter earnings ratio), and P/S ratio (price to trailing 4 quarter sales). Among the three, PEG is the most informative as it reflects both the price/earnings ratio and expected future EPS growth, while P/E is better than P/S."

"To establish a valuation standard, we use both (i) the average historical market ratio of the stock over the past 10 years, and (ii) the average market ratio today of five comparable stocks in the same sector and from companies of similar size. These two alternative perspectives should give you a good idea about where this stock's valuation stands today."

2. Stock recommendations accompanied by LTG forecasts

2.1. Wal-Mart Stores (NYSE: WMT): The analyst reports a five-year EPS growth forecast of 13% on page 1. For valuation, the analyst uses both P/E multiples and a discounted earnings (or dividend) model that employs the LTG forecast.
RATING: BUY **Current price:** $51.28 **Price target**: $65.00
Date of analysts' report: November 6, 2009 **Brokerage house**: ARGUS
Stock Analyst: Chris Graja, CFA,

Valuation: "The current share price is about 14.5-times our FY10 EPS forecast and 13.7-times our FY11 forecast. We believe that the shares are attractively valued at a discount to the S&P 500's multiple of 20-times our earnings forecast for the current fiscal year. WMT's trailing P/E is 14.7, well below the five-year average of 17.5. On a relative basis, WMT's trailing multiple is 0.68 of the S&P's multiple this is well below the five-year median of 1.5-times and very close to the period low of 0.66 that was set in mid-October. The price/sales ratio of 0.5 is below the five-year average of 0.6. Based on a simple discounted earnings model that assumes earnings will grow 13% annually for the next five years and that the shares trade at a terminal multiple of 16, the Wal-Mart shares would be worth $67. Using the Bloomberg dividend discount model, fair value for Wal-Mart would be about $55-$75 per share, with a point estimate of about $65. In our opinion, a key issue is the sustainability of the company's growth and profitability. WMT shares are currently trading at an enterprise value of

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about 10.25-times trailing EBIT, versus a five-year average of 12.5. We think the current multiple is attractive for a retailer with WMT's market position and financial strength. At about 12.5-times our EBIT forecast for the current fiscal year, the shares would be worth about $66."

2.2. Cisco Systems (Nasdaq: CSCO): The analyst reports a three - five year net income growth forecast of 17% on page 1 and uses a discounted cash flow model to value Cisco's stock.

Rating: OUTPERFORM
Current price (close 11/4/09): $23.29
12-Month Price Target: $28.00
Date of analysts' report: November 5, 2009
Brokerage house: WEDBUSH
Stock analysts: Matthew Robison and Leo Choi

Valuation: The analyst note claims that the price target reflects the calculation of the present value of future cash earnings, including a 3-5 year net income growth forecast of 17% on page 1. The note includes a section describing how to compute the present value (page 8, Exhibit 5). The price target is based on this present value computation.

2.3. Corning Inc. (NYSE: GLW): The analyst reports a five-year EPS growth forecast of 13.00% on page 1. For valuation, the analyst uses both P/E multiples and a discounted cash flow model.

Rating: BUY
Current price (close 10/23/09): $15.65
12-Month Price Target: $22.00
Date of analysts' report: October 27, 2009
Brokerage house: Argus
Stock analysts: Jim Kelleher

Valuation: "GLW is trading at 11.7-times our 2009 pro forma EPS estimate and at 10.4 times our 2010 forecast, below the five-year average P/E of 18.6 for 2004-2008 and the average of 31.2 for 2003-2007. After a period of heavy investment spending on glass capacity, Corning is curtailing capital spending for 3-5 years. Given the reduction in capex, valuation based on discounted free cash flow valuation is increasingly attractive. Our discounted free cash flow model renders a value for GLW in the mid $40s. As investors recognize the company's financial strength and prospects for a recovery in global demand for LCD TVs, we expect GLW to outperform the market. Our 12-month target price on GLW is $22. On October 27 at midday, BUY-rated GLW traded at $15.10, down $0.42."

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Table 1
Descriptive statistics for variables used in testing H1

Panel A: Descriptive statistics of the variables used in tests of H1

	$LTGISS_{ijt}=1$					$LTGISS_{ijt}=0$					Total sample
Variable	**N**	**Mean**	**Q1**	**Median**	**Q3**	**N**	**Mean**	**Q1**	**Median**	**Q3**	**N**
By recommendation											
REC_{ijt}	9307	3.784 [a]	3.000	4.000 [a]	5.000	23968	3.745	3.000	4.000	5.000	33275
ΔREC_{ijt}	9307	-0.128	-1.000	-1.000	1.000	23968	-0.133	-1.000	-1.000	2.000	33275
CAR_{ijt}	9307	-0.006	-0.038	-0.002	0.034	23968	-0.006	-0.036	-0.002	0.033	33275
$CFISS_{ijt}$	9307	0.099 [a]	0.000	0.000 [a]	0.000	23968	0.125	0.000	0.000	0.000	33275
By analyst-year											
$FIRM\#_{jt}$	4267	15.477 [a]	11.000	14.000 [a]	18.000	8401	16.039	11.000	15.000	19.000	12668
$IND\#_{jt}$	4267	3.762 [b]	2.000	3.000	5.000	8401	3.875	2.000	3.000	5.000	12668
$BSIZE_{jt}$	4267	71.161 [a]	23.000	47.000 [a]	91.000	8401	66.013	20.000	43.000	86.000	12668
By firm-year											
MB_{it}	4048	5.040	1.765	2.771 [a]	4.485	6299	4.924	1.653	2.618	4.248	10347
$ALTMANZ_{it}$	4048	6.258 [b]	2.426	4.264 [a]	7.155	6299	5.799	2.175	3.854	6.773	10347
$LOSS_{it}$	4048	0.195 [a]	0.000	0.000 [a]	0.000	6299	0.221	0.000	0.000	0.000	10347
AGE_{it}	4048	15.546	5.000	10.000	21.000	6299	15.634	5.000	10.000	21.000	10347
$lnMV_{it}$	4048	7.477 [a]	6.346	7.383 [a]	8.545	6299	7.317	6.195	7.257	8.364	10347
$\%INST_{it}$	4048	61.628 [b]	47.432	64.112 [b]	78.269	6299	60.596	45.683	63.284	77.630	10347
By analyst-firm-year											
$FIRM_EXP_{ijt}$	6944	3.461 [b]	1.000	2.000 [a]	5.000	17217	3.584	1.000	2.000	5.000	24161
$EPS_ACCUR_{ij,t-1}$	6944	0.564	0.000	0.667	1.000	17217	0.561	0.000	0.667	1.000	24161
EPS_FREQ_{ijt}	6944	4.850	3.000	5.000	6.000	17217	4.837	3.000	5.000	6.000	24161

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Table 1 (Continued)
Panel B: Pearson correlation (lower half) and Spearman correlation (upper half) among variables used in tests of H1 (N = 33,275)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
LTGISS(1)	**1**	0.001	***0.016***	***-0.000***	***-0.036***	***-0.083***	***-0.030***	***0.026***	***-0.025***	0.005	0.001	***0.050***	***0.079***	***-0.038***	***-0.022***	***0.020***	0.005
ΔREC(2)	0.002	**1**	***0.734***	***0.372***	0.006	0.001	-0.005	**-0.012**	***0.025***	*-0.010*	0.001	***0.073***	***0.047***	***-0.051***	**0.029**	***0.071***	0.005
REC(3)	***0.018***	***-0.728***	**1**	***-0.270***	***-0.042***	0.000	***0.036***	***-0.044***	***-0.026***	**0.011**	***-0.023***	0.001	***0.034***	***-0.016***	***-0.068***	***-0.054***	***-0.033***
CAR_1(4)	0.001	***0.317***	***-0.219***	**1**	0.003	*-0.010*	-0.002	0.000	***0.019***	0.001	-0.005	***0.069***	***0.051***	***-0.062***	***0.026***	***0.068***	0.009
CFISS(5)	***-0.036***	0.006	***-0.041***	***0.015***	**1**	***0.044***	***-0.094***	***0.154***	***0.062***	0.006	***0.155***	***-0.052***	***-0.127***	***-0.027***	***0.076***	***0.077***	***0.093***
FIRM#(6)	***-0.080***	0.006	-0.003	0.002	***0.014***	**1**	***0.407***	***0.058***	***0.236***	*-0.009*	***0.044***	***-0.041***	***-0.079***	***-0.042***	***0.072***	-0.003	-0.007
IND#(7)	***-0.045***	-0.003	***0.027***	*0.010*	***-0.098***	***0.521***	**1**	***-0.194***	***0.087***	***-0.019***	***-0.056***	***-0.075***	***0.018***	***-0.115***	***0.038***	***-0.133***	0.000
BSIZE(8)	**0.012**	***-0.024***	***-0.028***	*-0.010*	***0.275***	***-0.030***	***-0.168***	**1**	***0.093***	***0.037***	***0.074***	-0.001	***-0.071***	**0.013**	***0.036***	***0.136***	***0.056***
FIRM_EXP(9)	***-0.018***	***0.020***	***-0.020***	***0.023***	***0.061***	***0.197***	***0.086***	***0.068***	**1**	***0.015***	0.009	0.005	***-0.069***	***-0.100***	***0.364***	***0.228***	***0.043***
EPS_ACCUR(10)	0.004	-0.008	0.006	-0.001	***0.018***	***-0.030***	***-0.043***	***0.033***	***0.022***	**1**	***0.023***	0.007	0.006	*-0.011*	*0.009*	***0.020***	0.002
EPS_FREQ (11)	0.001	0.004	***-0.023***	-0.003	***0.187***	-0.003	***-0.088***	***0.066***	***0.017***	***0.041***	**1**	***-0.093***	***-0.051***	***0.032***	***0.056***	***0.038***	***0.107***
MB(12)	-0.002	**0.013**	-0.008	***0.020***	0.000	0.000	-0.001	-0.002	0.001	-0.004	-0.008	**1**	***0.532***	***-0.239***	***0.062***	***0.453***	-0.005
ALTMANZ (13)	***0.038***	***0.038***	***0.028***	***0.050***	***-0.075***	***-0.050***	**-0.013**	***-0.042***	***-0.073***	-0.004	***-0.041***	***0.017***	**1**	***-0.349***	***-0.047***	***0.181***	***0.042***
LOSS(14)	***-0.038***	***-0.053***	***-0.024***	***-0.075***	***-0.027***	***-0.031***	***-0.101***	***0.026***	***-0.095***	*-0.009*	***0.016***	***0.018***	***-0.177***	**1**	***-0.193***	***-0.290***	***-0.072***
AGE(15)	***-0.023***	***0.022***	***-0.051***	***0.025***	***0.059***	***0.099***	***0.054***	***0.045***	***0.381***	***0.019***	***0.040***	***0.015***	***-0.103***	***-0.156***	**1**	***0.451***	***0.060***
lnMV(16)	***0.023***	***0.076***	***-0.047***	***0.083***	***0.069***	0.007	***-0.115***	***0.107***	***0.250***	***0.051***	***0.051***	0.007	***0.169***	***-0.292***	***0.417***	**1**	***0.097***
%INST(17)	0.006	0.005	***-0.028***	0.002	***0.071***	***-0.051***	***-0.038***	***0.057***	0.002	0.009	***0.097***	0.003	0.005	***-0.070***	***-0.066***	***0.083***	**1**

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Table 1 (Continued)

Panel A of this table compares analyst and firm characteristics in the two categories of our sample observations: stock recommendation revisions accompanied by LTG forecasts and stock recommendation revisions unaccompanied by LTG forecasts. Panel B contains coefficients of correlation among the variables. In Panel A, [a], [b], and [c] indicate that the mean and median differences between the two groups, categorized based on the availability of a LTG forecast, is significant at 0.01, 0.05, and 0.10 levels (two-tailed), respectively. In Panel B, to indicate the Pearson or Spearman correlation that is significant at 0.01, 0.05, and 0.10 levels (two-tailed), we use bold italicized, bold unitalicized, and unbold italicized numbers respectively. The unbold unitalicized numbers are insignificant.

Definition of variables (Compustat labels, where applicable, in parentheses):

At the analyst-firm-recommendation level:

$LTGISS_{ijt}$ = 1 if analyst *j* issues a LTG forecast for firm *i* during the half-year ending on the day of the analyst's recommendation revision, and 0 otherwise.

CAR_{ijt} = cumulative abnormal stock return over the three trading days beginning on the date of analyst *j*'s stock recommendation revision for firm *i* in year *t*. We calculate CAR by subtracting the value-weighted market return from the firm's raw stock return.

REC_{ijt} = the level of the recommendation issued by analyst *j* for firm *i* in year *t*. The corresponding cardinal values for recommendations of "Sell," "Underperform," "Hold," "Buy", and "Strong buy" are 1 to 5, respectively.

ΔREC_{ijt} = the change in cardinal recommendation measures, assigned numeric values between −4 and +4, depending on the difference between the cardinal measure attached to the current recommendation and the cardinal measure attached to the previous recommendation for analyst *j* following firm *i*. For example, a downgrade from "Buy" to "Underperform" receives a value of −2 (= 2 − 4).

$CFISS_{ijt}$ = 1 if analyst *j* issues a cash flow forecast for firm *i* during the half-year ending on the day of the analyst's recommendation revision, and 0 otherwise..

$FIRM_EXP_{ijt}$ = number of years analyst *j* issued one or more firm *i* annual earnings forecasts.

$EPS_ACCUR_{ij,t-1}$ = absolute value of the difference between year *t*−1 earnings and analyst *j*'s most recent forecast of those earnings. It is a scaled to fall between 0 and 1 with smaller absolute forecast errors corresponding to more accurate forecasts. The scaling procedure subtracts the absolute difference from the similarly computed maximum absolute forecast error for all analysts following firm *i* in year *t*−1 and divides the result by the range of all absolute errors in forecasts of firm *i*'s year *t*−1 earnings. See equation (3) in the text.

EPS_FREQ_{ijt} = analyst *j*'s annual earnings forecast frequency for firm *i* in year *t*.

At the analyst-year level:

$FIRM\#_{jt}$ = number of firms analyst *j* follows in year *t*.

$IND\#_{jt}$ = number of industries analyst *j* follows in year *t*.

$BSIZE_{jt}$ = number of analysts employed by analyst *j*'s brokerage house in year *t*.

At the firm-year level:

MB_{it} = firm *i*'s market to book ratio at the end of fiscal year *t* (= PRCC_F*CSHO / CEQ).

$ALTMANZ_{it}$ = Altman's (1968) Z-score, measured as [1.2*net working capital / total assets (= WCAP / AT) + 1.4*retained earnings / total assets (= RE / AT) + 3.3*earnings before interest and taxes / total assets (= PI / AT) + 0.6*market value of equity / book value of liabilities (= PRCC_F*CSHO /LT) + 1.0*sales / total assets (= SALE /AT)].

$LOSS_{it}$ = 1 for firms with a net loss in year *t*, and 0 otherwise (= IB).

AGE_{it} = the number of years firm *i* has been publicly traded, per CRSP files.

$lnMV_{it}$ = the natural log of firm *i*'s market value at the end of year *t* (= PRCC_F*CSHO).

$\%INST_{it}$ = percent of firm *i*'s common shares held by institutional investors in year *t*. We use the average of four quarterly amounts reported by institutional managers.

Table 2
Contemporaneous stock market reaction to recommendation revisions (H1)

Variable	Coefficient*100	*t*-value	*p*-value
INTERCEPT	-0.529	-1.48	0.139
$LTGISS_{ijt}$	0.096	0.88	0.380
ΔREC_{ijt}	1.478	11.09	<.0001
ΔREC_{ijt}·$LTGISS_{ijt}$	**0.402**	**5.46**	**<.0001**
ΔREC_{ijt}·$CFISS_{ijt}$	-0.342	-3.32	0.001
ΔREC_{ijt}·$R_FIRM\#_{jt}$	0.493	5.04	<.0001
ΔREC_{ijt}·$R_IND\#_{jt}$	-0.221	-2.45	0.014
ΔREC_{ijt}·R_BSIZE_{jt}	0.791	8.93	<.0001
ΔREC_{ijt}·$R_FIRM_EXP_{ijt}$	0.171	2.05	0.040
ΔREC_{ijt}·$R_EPS_ACCUR_{ij,t-1}$	0.075	0.98	0.325
ΔREC_{ijt}·$R_EPS_FREQ_{ijt}$	0.507	6.00	<.0001
ΔREC_{ijt}·R_MB_{it}	-0.161	-1.74	0.081
ΔREC_{ijt}·$R_ALTMANZ_{it}$	0.074	0.82	0.415
ΔREC_{ijt}·R_LOSS_{it}	1.069	12.48	<.0001
ΔREC_{ijt}·R_AGE_{it}	-0.084	-0.97	0.331
ΔREC_{ijt}·R_lnMV_{it}	-0.866	-8.97	<.0001
ΔREC_{ijt}·$R_\%INST_{it}$	-0.066	-0.76	0.446
$CFISS_{ijt}$	0.055	0.32	0.746
$R_FIRM\#_{jt}$	-0.341	-2.35	0.019
$R_IND\#_{jt}$	0.139	1.04	0.298
R_BSIZE_{jt}	0.136	1.06	0.290
$R_FIRM_EXP_{ijt}$	0.063	0.51	0.610
$R_EPS_ACCUR_{ij,t-1}$	0.019	0.17	0.865
$R_EPS_FREQ_{ijt}$	0.037	0.30	0.767
R_MB_{it}	0.423	3.10	0.002
$R_ALTMANZ_{it}$	0.008	0.06	0.955
$LOSS_{it}$	-0.798	-5.97	<.0001
R_AGE_{it}	-0.255	-1.99	0.046
R_lnMV_{it}	0.467	3.26	0.001
$R_\%INST_{it}$	0.029	0.23	0.820
Industry Fixed Effects			YES
Year Fixed Effects			YES
N			33,275
Adj. R-Squared			12.42%

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Table 2 (Continued)

Table 2 examines whether stock recommendation revisions accompanied by LTG forecasts are more value relevant than recommendation revisions unaccompanied by LTG forecasts in terms of the stock market reaction to recommendation revisions. This table contains the result of estimating the following regression:

$$\begin{aligned} CAR_{ijt} = {} & \alpha_0 + \alpha_1 LTGISS_{ijt} + \alpha_2 \Delta REC_{ijt} + \alpha_3 \Delta REC_{ijt} * LTGISS_{ijt} + \alpha_4 \Delta REC_{ijt} * CFISS_{ijt} \\ & + \sum_{k=5}^{10} (\alpha_k \ \Delta REC_{ijt} * R_ANALYST\ CHARACTERISTIC_k) + \\ & \sum_{k=11}^{16} (\alpha_k * \Delta REC_{ijt} * R_FIRM\ CHARACTERISTIC_k) + \alpha_{17} CFISS_{ijt} + \\ & \sum_{k=18}^{23} (\alpha_k * R_ANALYST\ CHARACTERISTIC_k) + \sum_{k=24}^{29} (\alpha_k * R_FIRM\ CHARACTERISTIC_k) \\ & + \text{Industry effects} + \text{Year effects} + \varepsilon_{ijt} \end{aligned} \quad (1)$$

The dependent variable CAR_{ijt} and independent variables ΔREC_{ijt}, $LTGISS_{ijt}$, and $CFISS_{ijt}$ are as described in Table 1.

R_ANALYST CHARACTERISTIC refers to six variables that control for analyst characteristics: $FIRM_EXP_{ijt}$, $EPS_ACCUR_{ij,t-1}$, EPS_FREQ_{ijt}, $FIRM\#_{jt}$, $IND\#_{jt}$, $BSIZE_{jt}$. These variables are as defined in Table 1. In this table, they are scaled to fall between 0 and 1 among analysts within the same firm-year. R_FIRM#, R_IND, R_BSIZE, R_FIRM_EXP, and R_EPS_FREQ are transformed measures of FIRM#, IND, BSIZE, FIRM_EXP, and EPS_FREQ in accordance with equation (2) in the text and R_EPS_ACCUR is transformed from EPS_ACCUR in accordance with equation (3) in the text.

R_FIRM CHARACTERISTIC refers to six variables that control for the following firm characteristics: MB_{it}, $ALTMANZ_{it}$, $LOSS_{it}$, AGE_{it}, $lnMV_{it}$, $\%INST_{it}$, These six variables are as defined in Table 1. In this table, all of them, except the $LOSS_{it}$ indicator variable, are transformed to fall between 0 and 1 among firms followed by the same analyst during the same year and denoted as R_MB_{it}, $R_ALTMANZ_{it}$, R_AGE_{it}, R_lnMV_{it}, and $R_\%INST_{it}$, respectively. The transformation follows equation (2) in the text.

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Table 3
Descriptive statistics for variables used in testing H2a through H2c

Panel A: Descriptive statistics of the variables used in tests of H2a through H2c

	Analyst-years with LTG forecast publication ($LTGISS_{jt}$=1)					Analyst-years without LTG forecast publication ($LTGISS_{jt}$=0)				
Variable	**N**	**Mean**	**Q1**	**Median**	**Q3**	**N**	**Mean**	**Q1**	**Median**	**Q3**
$Termination_{t+1}$	14240	0.104 [a]	0.000	0.000 [a]	0.000	8438	0.115	0.000	0.000	0.000
$Demotion_{t+1}$	5751	0.065 [a]	0.000	0.000 [a]	0.000	2492	0.095	0.000	0.000	0.000
$Promotion_{t+1}$	3166	0.116 [a]	0.000	0.000 [a]	0.000	3005	0.092	0.000	0.000	0.000
EPS_ACCUR_{jt}	14240	0.681 [a]	0.600	0.697 [a]	0.784	8438	0.655	0.566	0.673	0.771
$BOLD_{jt}$	14240	0.330 [a]	0.240	0.317 [a]	0.403	8438	0.355	0.252	0.337	0.437
$LNEXP_{jt}$	14240	1.553 [a]	1.099	1.609 [a]	2.303	8438	1.406	0.693	1.386	2.079
$LN\#FIRM_{jt}$	14240	2.235 [a]	1.946	2.303 [a]	2.565	8438	2.151	1.792	2.197	2.565
$LN\#ANALYST_{jt}$	14240	2.680 [a]	2.410	2.716	2.993	8438	2.650	2.332	2.719	3.034

Panel B: Pearson correlation (in the lower half) and Spearman correlation (in the upper half) among variables used in tests of H2a through H2c

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
$Termination_{t+1}$(1)	1.000	-	-	***-0.017***	-0.001	**0.014**	*-0.013*	***-0.046***	-0.005
$Demotion_{t+1}$(2)	-	1.000	-	***-0.050***	-0.016	***0.054***	0.006	***-0.047***	***-0.029***
$Promotion_{t+1}$(3)	-	-	1.000	***0.048***	***0.035***	-0.012	***-0.039***	-0.011	***0.052***
$LTGISS_{jt}$(4)	***-0.017***	***-0.050***	***0.048***	1.000	***0.070***	***-0.075***	***0.085***	***0.064***	0.005
EPS_ACCUR_{jt}(5)	-0.005	*-0.019*	**0.033**	***0.075***	1.000	***-0.125***	-0.005	0.002	***0.245***
$BOLD_{jt}$(6)	***0.018***	***0.071***	-0.003	***-0.084***	***-0.122***	1.000	*-0.012*	***0.035***	***-0.262***
$LNEXP_{jt}$(7)	*-0.013*	0.005	***-0.040***	***0.083***	***0.031***	***-0.026***	1.000	***0.165***	***0.046***
$LN\#FIRM_{jt}$(8)	***-0.053***	***-0.049***	-0.017	***0.070***	***0.034***	***-0.019***	***0.163***	1.000	-0.002
$LN\#ANALYST_{jt}$(9)	*-0.012*	***-0.036***	***0.056***	***0.030***	***0.241***	***-0.268***	***0.061***	***0.024***	1.000

Table 3 (Continued)

Panel A of this table compares analyst characteristics in the two categories of analyst-year observations: those that have LTG forecasts and those that do not. Panel B presents the correlation among these variables. In Panel A, [a], [b], and [c] indicate that the mean and median differences between the two groups categorized based on the availability of a LTG forecast is significant at 0.01, 0.05, and 0.10 levels (two-tailed), respectively. In Panel B, to indicate the Pearson or Spearman correlation that is significant at 0.01, 0.05, and 0.10 levels (two-tailed), we use bold italicized, bold unitalicized, *and* unbold italicized numbers respectively. The unbold unitalicized numbers are insignificant.

TERMINATION$_{j,t+1}$ = 1 if year *t* is the last year any of analyst *j*'s forecasts and recommendations appear on the I/B/E/S database, and 0 otherwise.

DEMOTION$_{j,t+1}$ (**PROMOTION$_{j,t+1}$**) = 1 if analyst *j* works for a large (small) brokerage house in year *t* and works for a small (large) brokerage house in year *t*+1, and 0 otherwise. A large (small) brokerage house employs more than 25 (25 or fewer) analysts. When DEMOTION$_{j,t+1}$ (PROMOTION$_{j,t+1}$) is the dependent variable, we eliminate observations where analysts work for small (large) brokerage houses in year *t* because they cannot be demoted (promoted) by definition. We also eliminate observations where analysts are demoted (promoted) in year *t*+2 because it is ambiguous whether the demotion is associated with year *t* activity.

LTGISS$_{jt}$ = 1 if analyst *j* issues a LTG forecast for any firm during year *t*, and 0 otherwise.

EPS_ACCUR$_{jt}$ = the average of R_EPS_ACCUR$_{ijt}$ across all firms followed by analyst j in year t. R_EPS_ACCUR$_{ijt}$ is measured according to equation (3) in the text for the last annual earnings forecast issued prior to the announcement of year *t* earnings.

BOLD$_{jt}$ = the average boldness rank of analyst *j*'s first annual earnings forecast for all firms followed in year *t*. Boldness equals the absolute deviation between analyst *j*'s first forecast of firm *i*'s annual earnings since the firm's most recent annual earnings announcement and the mean of all other analysts' earliest earnings forecasts for the same firm and year. We, then, use equation (2) in the text to rank analyst j's boldness relative to the average boldness of all analysts following the same firm in year *t*. The ranks are then averaged across all firms followed by analyst *j* in year t.

LNEXP$_{jt}$ = the natural log of the number of years since analyst j's first I/B/E/S forecast.

LN#FIRM$_{jt}$ = the natural log of the number of firms followed by analyst *j* in year *t*.

LN#ANALYST$_{jt}$ = the natural log of the average number of analysts following the firms covered by analyst *j* in year *t*.

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Table 4
The effect of LTG forecast publication on subsequent career outcomes (H2a through H2c)

	Panel A: Termination			Panel B: Demotion			Panel C: Promotion		
	Coef.	**Chi-Sq.**	**p-value**	**Coef.**	**Chi-Sq.**	**p-value**	**Coef.**	**Chi-Sq.**	**p-value**
$LTGISS_{jt}$	**-0.174**	**7.12**	**0.008**	**-0.292**	**2.89**	**0.089**	**0.286**	**1.72**	**0.190**
EPS_ACCUR_{jt}	0.016	0.01	0.915	-0.620	2.51	0.113	0.139	0.09	0.763
$BOLD_{jt}$	0.131	0.56	0.456	1.150	7.37	0.007	0.205	0.12	0.728
$LNEXP_{jt}$	0.044	2.26	0.133	0.156	4.10	0.043	-0.242	6.17	0.013
$LN\#FIRM_{jt}$	-0.308	44.02	<.0001	-0.631	30.63	<.0001	-0.105	0.37	0.540
$LN\#ANALYST_{jt}$	-0.043	0.50	0.480	-0.106	0.45	0.502	0.350	2.75	0.098
Brokerage house fixed effects			YES			YES			YES
Year fixed effects			YES			YES			YES
N (number of analyst-years)			22,678			8,243			5,417
Max-rescaled R-Squared			0.25%			3.84%			2.03%

This table tests whether publishing LTG forecasts affects an analyst's subsequent career path. The following model is used:

Probability ($TERMINATION_{j,t+1}$, or $DEMOTION_{j,t+1}$, or $PROMOTION_{j,t+1}$) =

$$\beta_0 + \beta_1 LTGISS_{jt} + \beta_2 EPS_ACCUR_{jt} + \beta_3 BOLD_{jt} + \beta_4 LNEXP_{jt} + \beta_5 LN\#FIRM_{jt} + \beta_6 LN\#ANALYST_{jt} + \text{Brokerage house effects} + \text{Year effects} + \varepsilon_{jt} \quad (4)$$

All variables are as defined in Table 3.

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Table 5
Contemporaneous stock market reaction to recommendation revisions in pre- and post-Regulation FD periods (H3a)

	Pre-Regulation FD			Post-Regulation FD		
Variable	**Coefficient*100**	***t*-value**	***p*-value**	**Coefficient*100**	***t*-value**	***p*-value**
INTERCEPT	-0.356	-0.82	0.415	-1.307	-3.61	0.000
$LTGISS_{ijt}$	0.171	1.07	0.284	0.058	0.39	0.696
ΔREC_{ijt}	0.828	4.21	<.0001	1.859	10.32	<.0001
ΔREC_{ijt}·$LTGISS_{ijt}$	**0.261**	**2.36**	**0.018**	**0.470**	**4.78**	**<.0001**
ΔREC_{ijt}·$CFISS_{ijt}$	-0.533	-2.25	0.025	-0.526	-4.32	<.0001
ΔREC_{ijt}·$R_FIRM\#_{jt}$	0.395	2.77	0.006	0.594	4.46	<.0001
ΔREC_{ijt}·$R_IND\#_{jt}$	-0.156	-1.15	0.251	-0.219	-1.83	0.067
ΔREC_{ijt}·R_BSIZE_{jt}	1.359	10.36	<.0001	0.562	4.68	<.0001
ΔREC_{ijt}·$R_FIRM_EXP_{ijt}$	-0.045	-0.37	0.709	0.432	3.81	0.000
ΔREC_{ijt}·$R_EPS_ACCUR_{ij,t-1}$	0.109	0.96	0.339	0.046	0.45	0.653
ΔREC_{ijt}·$R_EPS_FREQ_{ijt}$	0.540	4.40	<.0001	0.429	3.70	0.000
ΔREC_{ijt}·R_MB_{it}	-0.003	-0.02	0.982	-0.270	-2.24	0.025
ΔREC_{ijt}·$R_ALTMANZ_{it}$	-0.080	-0.58	0.563	0.082	0.68	0.499
ΔREC_{ijt}·R_LOSS_{it}	0.678	5.12	<.0001	1.202	10.65	<.0001
ΔREC_{ijt}·R_AGE_{it}	-0.011	-0.08	0.935	-0.103	-0.89	0.372
ΔREC_{ijt}·R_lnMV_{it}	-0.642	-4.26	<.0001	-0.926	-7.32	<.0001
ΔREC_{ijt}·$R_\%INST_{it}$	-0.059	-0.45	0.650	-0.103	-0.88	0.377
$CFISS_{ijt}$	0.292	0.78	0.438	-0.122	-0.62	0.538
$R_FIRM\#_{jt}$	-0.358	-1.72	0.086	-0.312	-1.57	0.117
$R_IND\#_{jt}$	0.156	0.79	0.428	0.109	0.61	0.543
R_BSIZE_{jt}	-0.072	-0.39	0.694	0.290	1.63	0.102
$R_FIRM_EXP_{ijt}$	0.051	0.29	0.774	0.173	1.03	0.305
$R_EPS_ACCUR_{ij,t-1}$	0.098	0.59	0.553	0.001	0.00	0.997
$R_EPS_FREQ_{ijt}$	-0.146	-0.83	0.408	0.166	0.96	0.338
R_MB_{it}	0.248	1.19	0.235	0.554	3.07	0.002
$R_ALTMANZ_{it}$	0.124	0.62	0.536	-0.049	-0.27	0.790
$LOSS_{it}$	-0.847	-4.18	<.0001	-0.799	-4.43	<.0001
R_AGE_{it}	0.028	0.15	0.882	-0.418	-2.40	0.016
R_lnMV_{it}	0.484	2.21	0.027	0.514	2.70	0.007
$R_\%INST_{it}$	-0.288	-1.51	0.130	0.247	1.41	0.157
Industry Fixed Effects			YES			YES
Year Fixed Effects			YES			YES
N			13,752			19,523
Adj. R-Squared			9.21%			15.30%

This table estimates equation (1) below separately for pre- and post- Regulation FD periods. All variables are defined in previous tables.

$$CAR_{1ijt} = \alpha_0 + \alpha_1 LTGISS_{ijt} + \alpha_2 \Delta REC_{ijt} + \alpha_3 \Delta REC_{ijt} * LTGISS_{ijt} + \alpha_4 \Delta REC_{ijt} * CFISS_{ijt} + \sum_{k=5}^{10} (\alpha_k * \Delta REC_{ijt} * R_ANALYST\ CHARACTERISTIC_k) + \sum_{k=11}^{16} (\alpha_k * \Delta REC_{ijt} * R_FIRM\ CHARACTERISTIC_k) + \alpha_{17} CFISS_{ijt} + \sum_{k=18}^{23} (\alpha_k * R_ANALYST\ CHARACTERISTIC_k) + \sum_{k=24}^{29} (\alpha_k * R_FIRM\ CHARACTERISTIC_k) + Industry\ effects + Year\ effects + \varepsilon_{ijt} \quad (1)$$

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Table 6
The effect of LTG forecast publication on subsequent career outcomes in pre and post- Regulation FD periods (H3b)

	Pre- Regulation FD								
	Panel A.1: Termination			Panel A.2: Demotion			Panel A.3: Promotion		
	Coef.	Chi-Sq.	p-value	Coef.	Chi-Sq.	p-value	Coef.	Chi-Sq.	p-value
$LTGISS_{jt}$	**-0.138**	**1.77**	**0.183**	**0.130**	**0.25**	**0.614**	**0.536**	**3.33**	**0.068**
EPS_ACCUR_{jt}	-0.118	0.27	0.605	-0.880	2.33	0.127	0.725	1.35	0.245
$BOLD_{jt}$	0.099	0.14	0.705	1.286	4.25	0.039	0.044	0.00	0.953
$LNEXP_{jt}$	-0.011	0.06	0.812	0.212	3.81	0.051	-0.217	2.95	0.086
$LN\#FIRM_{jt}$	-0.385	31.25	<.0001	-0.741	22.51	<.0001	-0.189	0.81	0.369
$LN\#ANALYST_{jt}$	-0.116	1.57	0.211	-0.040	0.03	0.856	0.533	3.68	0.055
Brokerage house fixed effects			YES			YES			YES
Year fixed effects			YES			YES			YES
N			10,878			4,631			2,707
Max-rescaled R-Squared			1.23%			4.89%			4.32%
	Post- Regulation FD								
	Panel B.1: Termination			**Panel B.2: Demotion**			**Panel B.3: Promotion**		
	Coef.	**Chi-Sq.**	**p-value**	**Coef.**	**Chi-Sq.**	**p-value**	**Coef.**	**Chi-Sq.**	**p-value**
$LTGISS_{jt}$	**-0.202**	**5.75**	**0.017**	**-0.625**	**6.99**	**0.008**	**-0.097**	**0.08**	**0.778**
EPS_ACCUR_{jt}	0.100	0.25	0.614	-0.404	0.55	0.460	-0.790	1.23	0.267
$BOLD_{jt}$	0.130	0.29	0.590	1.068	3.19	0.074	0.502	0.25	0.616
$LNEXP_{jt}$	0.088	5.03	0.025	0.133	1.43	0.231	-0.331	4.10	0.043
$LN\#FIRM_{jt}$	-0.234	13.39	0.000	-0.511	8.79	0.003	0.003	0.00	0.993
$LN\#ANALYST_{jt}$	0.040	0.24	0.621	-0.194	0.70	0.402	0.008	0.00	0.982
Brokerage house fixed effects			YES			YES			YES
Year fixed effects			YES			YES			YES
N			11,800			3,612			2,710
Max-rescaled R-Squared			0.58%			3.70%			2.17%

This table estimates equation (4) below separately for pre- and post- Regulation FD periods. All variables are defined in previous tables.

$$\text{Probability}(TERMINATION_{j,t+1}, \text{or } DEMOTION_{j,t+1}, \text{or } PROMOTION_{j,t+1}) = \beta_0 + \beta_1 LTGISS_{jt} + \beta_2 EPS_ACCUR_{jt} + \beta_3 BOLD_{jt} + \beta_4 LNEXP_{jt} + \beta_5 LN\#FIRM_{jt} + \beta_6 LN\#ANALYST_{jt} + \text{Brokerage house effects} + \text{Year effects} + \varepsilon_{jt} \quad (4)$$

Table 7
Contemporaneous stock market reaction to recommendation levels

Variable	Coefficient*100	*t*-value	*p*-value
INTERCEPT	0.419	1.32	0.188
$LTGISS_{ijt}$	**0.394**	**4.16**	**<.0001**
$CFISS_{ijt}$	-0.235	-1.56	0.119
$R_FIRM\#_{jt}$	0.299	2.31	0.021
$R_IND\#_{jt}$	-0.055	-0.46	0.646
R_BSIZE_{jt}	0.381	3.35	0.001
$R_FIRM_EXP_{ijt}$	0.389	3.56	0.000
$R_EPS_ACCUR_{ij,t-1}$	0.044	0.44	0.660
$R_EPS_FREQ_{ijt}$	0.269	2.42	0.016
R_MB_{it}	-0.047	-0.39	0.699
$R_ALTMANZ_{it}$	0.203	1.66	0.096
$LOSS_{it}$	0.536	4.60	<.0001
R_AGE_{it}	0.054	0.46	0.643
R_lnMV_{it}	-0.785	-6.05	<.0001
$R_\%INST_{it}$	-0.159	-1.36	0.173
Industry Fixed Effects			YES
Year Fixed Effects			YES
N (number of recommendations)			42,215
Adj. R-Squared			1.00%

This table examines whether stock recommendations accompanied by LTG forecasts are more value relevant than recommendations unaccompanied by LTG forecasts in terms of the stock market reaction to the level of recommendations. This table shows result of estimating the following regression:

$$CAR'_{ijt} = \beta_0 + \beta_1 LTGISS_{ijt} + \beta_2 CFISS_{ijt} + \sum_{k=3}^{8}(\beta_i * R_ANALYST\ CHARACTERISTIC_k) + \sum_{k=9}^{14}(\beta_i * R_FIRM\ CHARACTERISTIC_k) + Industry\ effects + Year\ effects + \varepsilon_{ijt} \quad (5)$$

Dependent variable: CAR'_{iit} = cumulative abnormal stock return over the three trading days beginning with the day on which analyst *j* issues a stock recommendation for firm *i* in year *t*. We calculate CAR′ by subtracting the value-weighted market return from the firm's raw stock return. For "Hold," "Sell," or "Strong Sell" recommendations, we take the negative of the cumulative market-adjusted returns.

Independent variable of interest $LTGISS_{ijt}$ and **control variables** for analyst characteristics and firm characteristics are as defined in Tables 1 and 2.

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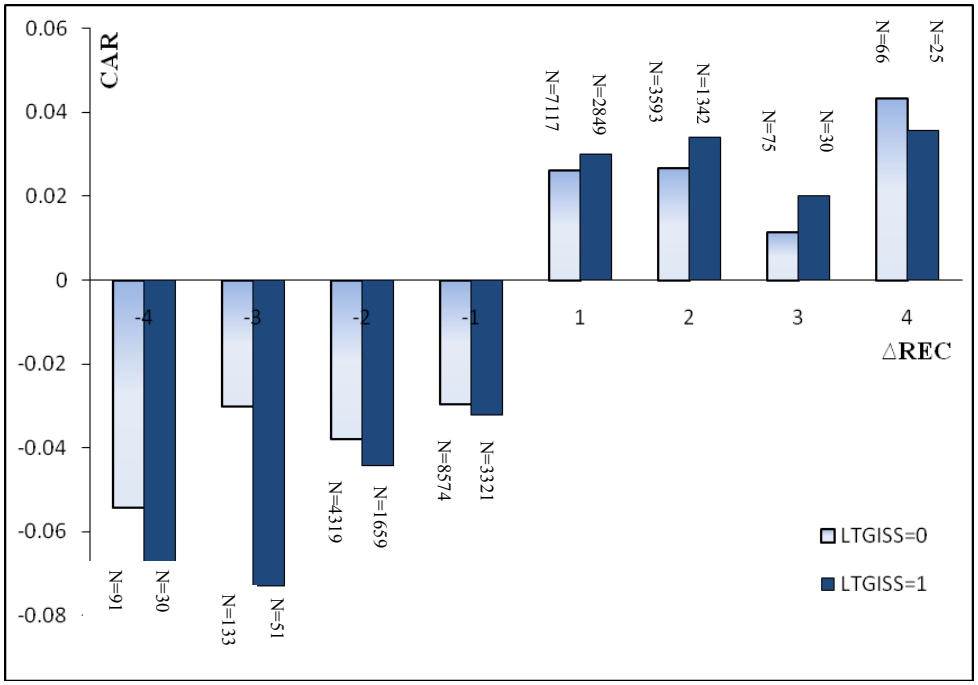


Figure. 1. Abnormal 3-day stock market returns around recommendation changes with and without LTG forecasts
CAR, LTGISS, and ΔREC are defined in Table 1.

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